Coma

A 3-in-1 Medical Reference

Medical Dictionary

Bibliography &

Annotated Research Guide

to Internet References

ICON Group International, Inc.

Coma

A Medical Dictionary, Bibliography,
and Annotated Research Guide to
Internet References

James N. Parker, M.D.
and Philip M. Parker, Ph.D., Editors

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FORWARD

In March 2001, the National Institutes of Health issued the following warning: "The number of Web sites offering health-related resources grows every day. Many sites provide valuable information, while others may have information that is unreliable or misleading."[1] Furthermore, because of the rapid increase in Internet-based information, many hours can be wasted searching, selecting, and printing. Since only the smallest fraction of information dealing with coma is indexed in search engines, such as **www.google.com** or others, a non-systematic approach to Internet research can be not only time consuming, but also incomplete. This book was created for medical professionals, students, and members of the general public who want to know as much as possible about coma, using the most advanced research tools available and spending the least amount of time doing so.

In addition to offering a structured and comprehensive bibliography, the pages that follow will tell you where and how to find reliable information covering virtually all topics related to coma, from the essentials to the most advanced areas of research. Public, academic, government, and peer-reviewed research studies are emphasized. Various abstracts are reproduced to give you some of the latest official information available to date on coma. Abundant guidance is given on how to obtain free-of-charge primary research results via the Internet. **While this book focuses on the field of medicine, when some sources provide access to non-medical information relating to coma, these are noted in the text.**

E-book and electronic versions of this book are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). If you are using the hard copy version of this book, you can access a cited Web site by typing the provided Web address directly into your Internet browser. You may find it useful to refer to synonyms or related terms when accessing these Internet databases. **NOTE:** At the time of publication, the Web addresses were functional. However, some links may fail due to URL address changes, which is a common occurrence on the Internet.

For readers unfamiliar with the Internet, detailed instructions are offered on how to access electronic resources. For readers unfamiliar with medical terminology, a comprehensive glossary is provided. For readers without access to Internet resources, a directory of medical libraries, that have or can locate references cited here, is given. We hope these resources will prove useful to the widest possible audience seeking information on coma.

The Editors

[1] From the NIH, National Cancer Institute (NCI): **http://www.cancer.gov/cancerinfo/ten-things-to-know**.

CHAPTER 1. STUDIES ON COMA

Overview

In this chapter, we will show you how to locate peer-reviewed references and studies on coma.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and coma, you will need to use the advanced search options. First, go to **http://chid.nih.gov/index.html**. From there, select the "Detailed Search" option (or go directly to that page with the following hyperlink: **http://chid.nih.gov/detail/detail.html**). The trick in extracting studies is found in the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Journal Article." At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display "whole records." We recommend that you type "coma" (or synonyms) into the "For these words:" box. Consider using the option "anywhere in record" to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the "Search in these fields" drop box. The following is what you can expect from this type of search:

- **Risk of Hyperglycemic, Hyperosmolar Nonketotic Coma (HHNK) in Elderly Patients with Diabetes**

  Source: Diabetes Spectrum. 6(5): 324-325. September-October 1993.

  Summary: In this article, the author presents and discusses a case example of hyperglycemic, hyperosmolar nonketotic **coma** (HHNK) in an elderly person with noninsulin-dependent diabetes mellitus (NIDDM). Topics covered include a discussion of the risks of HHNK in elderly people with diabetes; the pathogenesis of HHNK; and treatment recommendations, including treatment of possible underlying causes of the HHNK. The authors stress that early recognition of HHNK can allow for quick implementation of an appropriate treatment plan with an emphasis on hydration, electrolyte balance, and judicious insulin therapy. 4 references.

- **End-Stage Alzheimer's Disease: Glasgow Coma Scale and the Neurologic Examination**

  Source: Archives of Neurology. 50(12): 1309-1315. December 1993.

  Summary: Researchers characterized cognitive and neurologic features of patients with end-stage Alzheimer's disease (AD) using a standard neurologic examination and the Glasgow **Coma** Scale (GCS). Forty AD patients in nursing homes were drawn from previously enrolled subjects in the Rochester Alzheimer's Disease Project with Clinical Dementia Rating (CDR) scores of 3, 4, or 5. The study compared scores across CDR groups on the GCS and on cognitive screening examinations, and assessed the prevalence of neurologic manifestations such as primitive reflexes and extrapyramidal signs. Compared with patients in CDR stages 3 and 4, patients in CDR stage 5 scored significantly lower on the GCS, with the discriminating subscales being verbal and motor responses. Primitive reflexes, myoclonus, and dyskinesia increasingly were prevalent in the more terminal stages. Cognitive screening assessments did not discriminate between groups. Rudimentary neurologic functions can be assessed readily and, when viewed together with the GCS, may circumvent the floor effect frequently encountered using current cognitive and functional scales and, thereby, better define patients with end-stage AD. 3 tables, 41 references.

- **Increasing Incidence of Hypoglycemic Coma in Children With IDDM**

  Source: Diabetes Care. 14(11): 1001-1005. November 1991.

  Summary: This article describes a research study designed to examine the incidence of hypoglycemic **coma** in children who have insulin-dependent diabetes mellitus (IDDM) for over 8 years. The study also investigated the importance of residual beta-cell function of HbA1 levels and other variables as risk factors for hypoglycemic **coma.** The study consisted of 155 children under the age of 16 with IDDM. The authors describe their research design and methodology, as well as the results obtained. They conclude that, in this group of children, improvement in glycemic control apparently led to an increase in the incidence of severe hypoglycemia. In children with recurrent hypoglycemic **coma** and undetectable C-peptide levels, it may be safer to aim for somewhat less tight glycemic control. 1 figure. 2 tables. 28 references. (AA-M).

- **Prevention is Better Than Coma: Patient Education on Diabetic Coma**

  Source: Professional Nurse. 7(3): 150, 152-156. December 1991.

  Summary: This article, written by a nurse for a nursing audience, reviews the important aspects of patient education for preventing diabetic **coma.** The author focuses on recognizing and treating the two main causes of diabetic coma: hypoglycemia and hyperglycemia. A reproducible patient handout on avoiding **coma** is included. 1 figure. 1 table. 6 references. (AA-M).

Federally Funded Research on Coma

The U.S. Government supports a variety of research studies relating to coma. These studies are tracked by the Office of Extramural Research at the National Institutes of Health.[2] CRISP

[2] Healthcare projects are funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration

(Computerized Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other institutions.

Search the CRISP Web site at **http://crisp.cit.nih.gov/crisp/crisp_query.generate_screen**. You will have the option to perform targeted searches by various criteria, including geography, date, and topics related to coma.

For most of the studies, the agencies reporting into CRISP provide summaries or abstracts. As opposed to clinical trial research using patients, many federally funded studies use animals or simulated models to explore coma. The following is typical of the type of information found when searching the CRISP database for coma:

- **Project Title: AMANTADINE FOR AROUSAL IN PEDIATRIC TBI: A PILOT STUDY.**

  Principal Investigator & Institution: Mc Mahon, Mary A.; Children's Hospital Med Ctr (Cincinnati) 3333 Burnet Ave Cincinnati, Oh 452293039

  Timing: Fiscal Year 2002; Project Start 01-SEP-2001; Project End 30-JUN-2005

  Summary: The long-term objectives of this proposal are to utilize pharmacological interventions to improve arousal and recovery in children following TBI. The specific aims are: 1) Conduct a trial of amantadine therapy in children who have impaired arousal following TBI, 2) Compare the interrater reliability and validity of three different measures of arousal in children with TBI, and 3) Describe the pharmacokinetics of amantadine in children with TBI. The experimental design is a randomized, double-blind, crossover trial of amantadine and placebo. Subjects will include children, ages 5-18 years, admitted to an inpatient rehabilitation unit, who have impaired arousal related to TBI. Each subject will receive three weeks of amantadine and three weeks of placebo, with a one week washout period. Outcome measures will include two standardized measures, the **Coma** Recovery Scale (CRS) and the Coma/Near **Coma** Scale (CNCS), and two nonstandardized measures, a physician's clinical assessment of level of consciousness and the family's and physician's subjective evaluation of change in arousal. Each measure will be conducted at baseline and one to three times per week, depending on the measure. A portion of the CRS, the CNCS, and the physician's clinical assessment will be performed by two raters to determine the interrater reliability of each measure. The results of each measure will also be compared in an effort to establish validity. Serum amantadine levels will be obtained at designated times throughout the study and will be analyzed to provide estimates of individual pharmacokinetic parameters, including clearance, half-life, and volume of distribution, as well as non-compartmental parameters. The study results will provide an estimated treatment effect of amantadine in increasing arousal in pediatric TBI and data on the pharmacokinetics of amantadine in children. In addition, potentially useful standardized measures of arousal in children will be identified. This information will be integral in the design of a larger, multi-center study evaluating the efficacy of amantadine in children with TBI.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

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(FDA), Centers for Disease Control and Prevention (CDCP), Agency for Healthcare Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH).

- **Project Title: BIOMARKER OF NEURONAL DAMAGE IN TRAUMATIC BRAIN INJURY**

  Principal Investigator & Institution: Zemlan, Frank P.; Ceo; Phase 2 Discovery, Inc. 3130 Highland Ave, 3Rd Fl Cincinnati, Oh 452192374

  Timing: Fiscal Year 2002; Project Start 20-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant): The pharmaceutical industry has spent $200 million on drug trials for treating head trauma, all have failed, Identified problems include inappropriate selection of drug candidates, and failure to use prognostic indicators and surrogate biomarkers in clinical trials. Proposed Phase II studies assess the utility of our newly developed biomarker of neuronal damage as a surrogate biomarker and prognostic indicator in clinical drugs trials of neuroprotectant agents. Our Phase I studies developed a biomarker of neuronal damage. After head trauma, neuronal MAP-tau is proteolytically cleaved (C-tau) and gains access to cerebrospinal fluid (CSF) and serum where levels are elevated 30,000 fold and 300 fold respectively compared to controls. Further, patient C-tau levels were highly predictive of clinical outcome. Proposed Phase II studies will assess serial CSF and serum C-tau levels as surrogate biomarkers of clinical outcome in severe head injury patients (N=70). Serial CSF and serum C-tau levels will be measured at 24-hour periods after injury and their ability to predict patient outcome at 3 months determined (Specific Aims 2 and 4). The ability of initial CSF and serum C-tau levels to serve as screening biomarkers to identify head injured patients thought unlikely to respond to drug treatment (dead before end of study) will be determined and compared to the currently employed industry marker, initial Glasgow **Coma** Scores (N=70). PROPOSED COMMERCIAL APPLICATION: The C-tau ELISA will be utilized by the pharmaceutical industry in clinical drug trials as a purchased inhouse assay. Proposed Phase II studies put in place the foundation for a Phase III program which will develop our C-tau ELISA as an FDA approved in vitro diagnostic test for head trauma.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BRAIN TRAUMA ASSESSMENT SYSTEM**

  Principal Investigator & Institution: Sewell, John M.; Active Signal Technologies, Inc. 13025 Beaver Dam Rd Cockeysville, Md 21030

  Timing: Fiscal Year 2003; Project Start 01-JUN-2003; Project End 31-MAY-2004

  Summary: (provided by applicant): With over 1.5 million persons suffering head injury annually in the U.S., and approximately 50,000 dying from these injuries, a need exists for early direct assessment of brain injury. Currently, injuries must be inferred from Glascow **Coma** Scores (GCS), low blood pressure, and/or low pulse oximetry, but there is no direct method of measuring brain condition at the scene. Active Signal proposes to test a small, portable, hand-held device to perform non-invasive measurements of brain injury, allowing direct assessment of injury even with lack of patient responsiveness. Thus, brain injury will be distinguished from low CGS caused by drugs, alcohol and hypoglycemia, and the information used for triaging and even early intervention. The brain trauma assessment system (BTAS) is modeled on one that has successfully identified neurological status on >150 trauma patients at the University of Maryland Shock Trauma Center (STC). Here, EMTs will use the BTAS on patients at the scene of injury and during transport. The measurements will be compared to the diagnosis upon admission to the STC to evaluate the device's sensitivity and specificity. Active Signal will make adjustments to accommodate demands of the EMS environment in preparation for a broad study in Phase II.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: COGNITIVE IMPAIRMENT IN THE ICU: EVALUATION AND OUTCOMES**

  Principal Investigator & Institution: Ely, E W.; Medicine; Vanderbilt University 3319 West End Ave. Nashville, Tn 372036917

  Timing: Fiscal Year 2002; Project Start 01-AUG-2001; Project End 31-JUL-2006

  Summary: (From the application): Global deficits in cognition in the form of delirium, stupor, or **coma** are extremely common and hazardous in older ICU patients. Cognitive impairment is associated with prolonged hospital stays, institutionalization, and death. Because acute cognitive impairment compromises patients' ability to be removed from mechanical ventilation and may be a factor associated with long-term neuropsychological sequelae, physicians and nurses need to be able to identify patients at high risk for cognitive impairment and understand potentially modifiable aspects of care that may reduce cognitive impairment. Consciousness is defined as having two components: arousal (wakefulness) and content (attentiveness). Arousal, a basic process of mental function, is commonly monitored in ICU patients. Attentiveness, which results from more complex neurologic interactions, is often impaired yet rarely objectively monitored. There are no validated instruments available for bedside use by nurses or physicians to monitor both components of consciousness in mechanically ventilated patients. We propose to modify existing instruments for use in the ICU in order to develop and validate a system for monitoring the brain and its function in mechanically ventilated patients during and after ICU care (Aim 1). Once validated, we can determine the prevalence of acute cognitive impairments in elderly ICU patients and its association with clinical outcomes (Aim 2). This cohort of patients will be used to determine factors associated with neuro-psychological deficits at 6 months following the ICU stay (Aim 3). This builds on the candidate's previous work in the ICU and gerontology and extends into an important new area, which is cognitive impairment in critically ill older persons. The long-term goal is to improve health outcomes for elderly ICU patients through future studies which will seek to reduce the incidence of cognitive impairment, to enhance liberation from mechanical ventilation, to integrate these observations into routine ICU monitoring, and to improve the understanding and prevention of post-ICU neuropsychological deficits. To prepare for this goal, his proposed career development plan includes advanced training in geriatric cognitive assessment, epidemiology and biostatistics, psychometrics and research methodology through clinical training, course work, and independent reading. Along with the candidate's record of publications and achievement, he will have rich academic surroundings, excellent mentors and strong institutional commitment to ensure that he achieve these goals.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: COGNITIVE PROCESSING DURING STATES OF CONSCIOUSNESS**

  Principal Investigator & Institution: Albert, Katherine A.; Neurology and Neuroscience; Weill Medical College of Cornell Univ New York, Ny 10021

  Timing: Fiscal Year 1998; Project Start 30-SEP-1994; Project End 31-JUL-2004

  Summary: The broad, long-term objectives of this proposal are to establish a foundation for independent research in human neurophysiology, with focus on cognitive processes during normal and abnormal states of consciousness. The research component of this proposal will center on investigation of the persistent vegetative state (PVS). PVS is a

tragic "experiment of nature" in which behavioral state changes superficially resembling sleep- wake cycles occur, but the wakefulness is without apparent cognitive awareness. The research is designed to address the following fundamental issues: 1. Does cognitive processing occur in PVS?, and 2. What are the similarities and differences between normal sleep-wake cycles and the state changes that occur in PVS? The experimental design and methods to be used are: 1. A series of evoked responses to assess cognition in these patients, including assessing the ability to recognize novelty, the ability to extract meaning from words, and the ability to recognize a personally meaningful stimulus; and 2. Behavioral, electroencephalographic, and polygraphic studies to assess state changes and their relationship to normal sleep-wake cycles. Study of patients in PVS provides a unique opportunity to study fragments of the normal behavioral and cognitive repertoire, to gain insight into the steps involved in normal cognitive processing, and to correlate these functions with anatomy. When research achieves the expected goals, we will be in a better position to judge prognosis and assess possible therapeutic options in these patients.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CORTICAL GLUTAMATE, GLUTAMINE & GABA LEVELS IN HEPATIC ENCEPHALOPATHY**

  Principal Investigator & Institution: Shulman, Gerald I.; Yale University 47 College Street, Suite 203 New Haven, Ct 065208047

  Timing: Fiscal Year 2003

  Summary: This abstract is not available.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CYPS/2D18 LIMIT INFLAMMATION CASCADE FOLLOWING BRAIN INJURY**

  Principal Investigator & Institution: Strobel, Henry W.; Professor/Assistant Dean-Student Affairs; Biochem and Molecular Biology; University of Texas Hlth Sci Ctr Houston Box 20036 Houston, Tx 77225

  Timing: Fiscal Year 2004; Project Start 01-DEC-2003; Project End 30-NOV-2007

  Summary: (provided by applicant): This grant request proposes an integrated multilevel approach to define the role of the cytochrome P450 4F (CYP 4F) subfamily and CYP 2D18 in modulation of the inflammatory cascade following traumatic brain injury (TBI) using a controlled cortical impact model system. In humans, closed head injury resulting from various sources of trauma to the brain (e.g., traffic accidents, violence) constitutes a serious, often intractable clinical problem frequently leading to death or the situation where discontinuation of artificial life support becomes a question. TBI triggers the inflammatory cascade prompted through leukotriene B, and prostaglandins causing the influx of fluids, ions and cells into brain tissue - the subsequent brain swelling often leading to **coma.** Our approach to this problem is prompted first by the demonstration that the CYP 4F subfamily enzymes can metabolize the leukotriene and prostaglandin mediators of inflammation to inactive products with the possible effect of moderating the inflammatory cascade. Second, it is prompted by preliminary data which show that three out of four of the rat CYP 4F forms studied show a decrease in expression in the hippocampus at 24 hours after trauma and an increase in expression at three days through three weeks after cortical impact (i.e., the recovery or reversal of inflammation phase). We will pursue these preliminary data by defining the changes in expression of CYP 4F forms and CYP 2D18 in various brain regions and distal tissues (i.e., liver,

kidney, etc.) as a function of time after impact. We will express, purify and characterize the catalytic activities toward leukotriene and prostaglandin of CYP 4F1 and CYP 4F6 the two remaining forms we have not characterized. We will correlate changes in CYP4F and 2D18 expression following TBI with cellular markers of inflammation and changes in levels of humoral signaling molecules (e.g. IL-6, IL-lbeta, TNFalpha) to test the hypothesis that CYP4Fs modulate inflammatory response as proposed. We will also define changes in the expression of CYP4F and 2D18 and changes in markers of inflammation and signaling molecules in the mouse model of TBI developed by Dr. P. Dash the co-investigator in order for normal and CTP4F14 null phenotype mice after TBI to define the role of a specific CYP4Fs. We feel these approaches will allow a better definition of the modulation of the inflammatory cascade after TBI.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CYTOKINE-MEDIATED T CELL ACTIVATION**

  Principal Investigator & Institution: Slifka, Mark K.; Assistant Professor; Va Institute of Marine Science; Oregon Health & Science University Portland, or 972393098

  Timing: Fiscal Year 2004; Project Start 01-APR-2004; Project End 31-MAR-2009

  Summary: (provided by applicant): Septic shock causes nearly 30% mortality and kills approximately 100,000 people every year in the United States alone. The high mortality rate associated with septic shock is due mainly to a "cytokine storm" that results in pulmonary edema, vascular leakage, organ failure, **coma,** and death. Although macrophages and monocytes are typically blamed for this condition, animal models suggest that cytokines produced by T cells also play a substantial role in this process. Virus-specific CD8+ T cells often avoid causing severe immunopathology by strictly regulating their cytokine production and turning cytokine secretion on, off, and on again in response to direct antigen contact. In contrast, interleukin-12 (IL-12) and interleukin-18 (IL-18) represent two potent inflammatory cytokines that trigger interferon-gamma (IFNg) production by activated T cells in the absence of direct antigen contact. Although activated CD8+ T cells are known to respond to IL-12/IL-18 stimulation, the effects of these cytokines on long-term, resting memory T cells is largely unknown and represents a significant gap in our understanding of this phenomenon. In our proposed studies, we will compare and contrast effector and memory T cells of a defined specificity in terms of: 1) cytokine production, 2) cytolytic activity, 3) proliferation, and 4) global gene expression following stimulation with IL-12 and IL-18. This information will be important for understanding how IL-12/IL-18 secretion might be used by infected cells as an intrinsic "danger" signal to trigger antimicrobial immune responses by nearby antigen-experienced T cells without requiring direct TcR stimulation. On the other hand, this loss of antigen specificity also appears to play a substantial role in certain types of T cell-mediated immunopathology associated with secondary bacterial infections and septic shock. For these reasons, a thorough understanding of cytokine-mediated T cell activation is critical for learning how to maintain or augment appropriate T cell responses while at the same time decreasing T cell-associated symptoms of disease.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: DYNAMIC NEUROIMAGING WITH HIGH-RESOLUTION SSVEPS**

  Principal Investigator & Institution: Srinivasan, Ramesh; Cognitive Science; University of California Irvine Irvine, Ca 926977600

  Timing: Fiscal Year 2004; Project Start 01-JAN-2004; Project End 31-DEC-2006

Summary: The proposed experimental, simulation, and theoretical EEG studies will develop modern engineering tools for future use by cognitive and medical scientists. These tools are potentially applicable to a wide variety of disease states, including mental disorders (ADHD, depression, schizophrenia, depression, sleep disorders, etc.) and neurological conditions (epilepsies, head trauma, strokes, **coma,** Alzheimer's disease, etc.). The proposed tools combine high-resolution EEG with MEG and new methods to quantify dynamic (spatial-temporal) properties of EEG and steady-state visually evoked potentials (SSVEP). Experimental studies will apply high-resolution SSVEP dynamic measures to investigate conscious perception, selective attention, perceptual organization, and working memory. Methods to identify genuine measures of functional integration between cortical areas will be developed and tested with high-resolution SSVEP. SSVEP provides robust measures of neocortical dynamic and cognitive function that are largely artifact-free. SSVEP measures of the "competition" between functional localization and integration will include coherence and other phase locking measures in various frequency bands. The experimental SSVEP data will be interpreted in the context of cell assembly formation embedded within a background of "synaptic action fields" using theoretical models of neocortical dynamic function based on genuine physiology and anatomy. The synaptic action fields are defined as the number densities of active excitatory and inhibitory synapses at any time, independent of function. This theoretical construct provides the necessary connection between physiology and EEG/SSVEP data. In this manner, a triple correspondence between EEG dynamics, cognitive processes, and theoretical models will be obtained. The EEG and SSVEP tools developed in these studies should provide firm foundations for later studies applied to a wide range of specific cognitive or medical conditions. These tools will be freely distributed as software for high-resolution EEG, SSVEP, and MEG analysis with a supporting manual and examples

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: EARLY HEMICRANIECTOMY TO MANAGE TRAUMATIC BRAIN INJURY**

  Principal Investigator & Institution: Coplin, William M.; Associate Professor; Neurology; Wayne State University 656 W. Kirby Detroit, Mi 48202

  Timing: Fiscal Year 1999; Project Start 18-JUL-1999; Project End 31-DEC-2004

  Summary: Severe blunt traumatic brain injury (TBI) is a major cause of mortality and long-term disability in previously healthy young adults. The current standard of initial surgical care includes evacuation of intracranial hematomas, and, often amputation of swollen confused brain. The rationale for the latter intervention is that further edema in this area of presumed unsalvageable cerebrum will cause intracranial hypertension, impeding blood flow to otherwise more health areas of brain, with resultant infarction. To this end, modern neuro-tensive care expends great effort to control intracranial pressure (ICP) and prevent such secondary injury. While effectively reducing ICP, past non-randomized investigations have employed hemicraniectomy at later times, for refractory ICP, and have lacked standardized surgical and/or medical protocols and outcome measures. This randomized pilot study seeks to address the safety and possibly preliminary efficacy of early hemicraniectomy (as the initial surgical intervention) for managing patients with severe TBI. Goals include: 1) reduced therapeutic intensity for ICP over a shorter length of stay (LOS), 2) reduced need for repeat computer tomography (CT) scans and returns to the operating room (OR), and 3) improved neurological outcome. The study will randomly assign, within 24 hours of ictus, 92 TBI patients, Glasgow **Coma** Scale score less than or equal to 9, with midline

shift greater than the size of a surgically removable hematoma. Group I will receive standardized hemicraniectomy; Group II will undergo traditional craniotomy with or without brain amputation, at the discretion of the attending neurosurgeon. I both groups, hematomas greater than or equal to 20 cc will be evacuated, a standardized medical protocol will be followed, and daily monitoring will assess neurological status and ICU therapeutic intensity. The primary outcome measure is the six-month Glasgow Outcome Scale. Secondary outcome measures include the Disability Rating Scale, Functional Independence Measures, and the SF-36 Health Survey o to one year after TBI (to assess quality of live for survivors), the duration and frequency of elevated ICP episodes, ICE Therapeutic Intervention Severity Scores, returns to CT and the OR, and ICU and hospital LOS. We hypothesize that, while both surgical therapies will initially effectively treat intracranial hypertension, the hemicraniectomy group will experience improved neurological outcome, and a reduced intensity of cre to control ICP. These data will prepare us for a full-scale multi-center outcome study of early hemicraniectomy.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: EEG DATA MONITORING SYSTEM USED IN CONJUNCTION WITH FMRI**

  Principal Investigator & Institution: Johnson, William A.; Techen, Inc. 115 Cedar St Milford, Ma 01757

  Timing: Fiscal Year 2003; Project Start 01-JAN-2003; Project End 31-OCT-2003

  Summary: (provided by applicant): In the United States, approximately 600,000 patients have epilepsy uncontrolled by medication [29]. Approximately 3,000 of these patients every year in the USA are treated surgically to relieve from medically refractory seizures [48]. The main goals of the proposed project is to develop and demonstrate the feasibility of data acquisition of clean EEG brain signals in conjunction with MRI, using fields up to a maximum of seven (7) Tesla. The simultaneous measurement of fMRI and EEG will enable neuroscientists to study various physiological brain states such as (a) EEG a-waves, (b) sleep, and (c) anesthesia and pharmacologically induced changes of brain activity, leading to more useful diagnostic procedures. Electroencephalography (EEG) and functional MRI (fMRI) provide complementary information about the timing and location of brain processes. Understanding brain processing requires both types of data. We aim to (1) develop DSP hardware and software (firmware) for noise cancellation to use in the existing prototype for simultaneous EEG and MRI acquisition system based on an adaptive filtering technique; (2) test and improve the system with the use of a special phantom with a piezo-electric transducer to mimic Ballistocardiogram noise; (3) test the real-time version of the adaptive filter on the data acquired. While the main goal of this project is to develop hardware and signal-processing code for the EEG system for research studies in conjunction and simultaneously with fMRI, the system will also have value for the basic science community interested in functional brain imaging, and could have important implications for the monitoring of neuronal activity in other clinical populations (e.g., epilepsy, migraine, coma/neurology ICU, stroke).

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- **Project Title: EFFECT OF NAVAJO INTERPRETERS ON DIABETES OUTCOMES**

  Principal Investigator & Institution: Mccabe, Melvina; Associate Professor; Family and Community Medicine; University of New Mexico Albuquerque Controller's Office Albuquerque, Nm 87131

Timing: Fiscal Year 2002; Project Start 30-SEP-2000; Project End 29-SEP-2005

Summary: The state of New Mexico contains a significant portion of the Navajo Nation which is the second largest American Indian (AI) tribe with 2.5 times the rate of diabetes compared to the US general population. The age-adjusted diabetes death rate for AI's is 41.1/100,000 compared to 12.4/100,000 for the US All Races. The proposal will evaluate the effect that formally trained diabetes medical interpreters have on diabetes outcomes and health care utilization patterns compared to usual care interpreters (no formal medical interpreter or diabetes knowledge training). The project is a pre-test/post-test randomized group design. The specific aims of the proposal are: 1. to avoid development of pathology (retinopathy, creatinine, proteinuria, foot pathology) or improve intermediate clinical outcomes (A1C, blood pressure (B/P), low density lipoprotein (LDL), weight). 2. to evaluate participant adherence to selected examinations and laboratory tests for diabetes care (Opthalmology referrals, urine protein, lipid profile, Podiatry referral, immunizations, and diabetes educator referrals). 3. to evaluate the change in diabetes knowledge. 4. to evaluate the change in self-care practices (self-blood glucose monitoring (SBGM), medication adherence, daily activities and physical fitness). 5. to evaluate participant health care utilization patterns (hospitalizations for hypoglycemia, hyperosmotic non-ketotic states including **coma,** diabetic ketoacidosis, pneumonia, infections of the feet, skin, pyelonephritis; emergency/urgent care visits for medication refills, foot problems, hypoglycemia, urinary tract infections, pyelonephritis). The two research sites are the Indian Health Service (IHS) diabetes clinics located at the Gallup Indian Medical Center (GIMC) in Gallup, New Mexico, and the Northern Navajo Medical Center (NNMC) in Shiprock, New Mexico. Long term objectives of the study are the development and implementation of a Navajo culture-based medical interpreters training program and the expansion of the culture-based medical interpreters training program to other American Indian peoples.

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- **Project Title: ESOPHAGEAL VARICES BY B-ADRENERGIC BLOCKERS**

  Principal Investigator & Institution: Groszmann, Roberto J.; Internal Medicine; Yale University 47 College Street, Suite 203 New Haven, Ct 065208047

  Timing: Fiscal Year 2002; Project Start 20-APR-1993; Project End 31-MAR-2004

  Summary: Cirrhosis is the fifth leading cause of death in the United States in individuals under the age of 65, the productive years of life. It affects men and women equally, and impacts on all races and socio- economical levels. Portal hypertension is the main complication of cirrhosis, regardless of etiology. Gastroesophageal varices and variceal hemorrhage are a direct consequence of portal hypertension and account in large part for the high mortality of cirrhosis. Non-selective beta- adrenergic blockers decrease portal pressure and have been shown to prevent the first variceal hemorrhage in patients with cirrhosis and varices. Early portal hypotensive therapy, before the patients develop varices, would be beneficial not only because it may prevent or delay the formation of varices (and variceal hemorrhage) but because it may prevent or delay the development of other complications of portal hypertension, such a ascites. This ongoing multi-center, prospective, randomized, placebo-controlled, double-blind trial was designed with the primary aim of investigating if early therapy with timolol, a non-selective beta-adrenergic blocker, can prevent or delay the development of varices in patients with cirrhosis and portal hypertension. Secondary aims will examine whether timolol prevents or delays other complications of portal hypertension such as ascites and porto-systemic encephalopathy, as well as liver transplantation or death. Patients with cirrhosis, without varices on endoscopy and with portal hypertension (portal

pressure greater than 6 mmHg) are included in the study. This grant application was funded in April of 1993 and patient randomization began in August of 1993. Patient accrual took longer than originally estimated, however it is now certain that the number of 190 patients required for the study will have been randomized by the end of the current funding period (March 1998), since at the writing of this proposal 158 patients had already been randomized. In calculating sample size, we assumed a rate of development of varices of 50 percent at 4 years in the control arm, to be reduced to 30 percent in the timolol arm. So far our observed rates for development of varices are consistent with our planned estimates. However, we have now estimated that a minimum follow-up of 4 years (after last patient is recruited) is necessary to ensure high statistical power (80 percent at the 2-sided 0.05 level). The trial is highly significant for the promise it holds for the treatment of cirrhosis of all etiologies and for an understanding of the natural history of the disease. The four centers involved are widely renown for their studies in this area and have collaborated productively in the past, including the only published double-blind trial of propranolol in the prevention of first variceal hemorrhage in patients with cirrhosis and varices.

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- **Project Title: EXPRESSION OF AMMONIA-SENSITIVE PROTEINS IN THE CNS**

  Principal Investigator & Institution: Weiner, I. David.; Associate Professor; Medicine; University of Florida Gainesville, Fl 32611

  Timing: Fiscal Year 2004; Project Start 01-DEC-2003; Project End 30-NOV-2005

  Summary: (provided by applicant): Encephalopathy due to elevated ammonia levels is a common and costly clinical condition associated either with congenital deficiency of hepatic urea cycle enzymes, with acquired liver disease and with a variety of other conditions. Despite a long recognition that elevated ammonia levels can lead to impaired neurologic functioning, the exact mechanism through which this occurs remains incompletely understood. Moreover, treatment of hyperammonemic encephalopathy has been limited by a lack of knowledge of the specific CNS protein(s) with which ammonia directly interacts. The broad, long-term objective of this project is to examine the hypothesis that Rh C Glycoprotein (RhCG) is a central nervous system (CNS) ammonia 'sensor.' We hypothesize that RhCG protein is expressed in specific CNS neuron populations, that ammonia-stimulation of RhCG is coupled to specific intracellular signaling pathways, most likely including MAP kinase, and that RhCG expression is regulated by specific physiology/pathophysiologic stimuli. We will examine this hypothesis with two specific aims. In the first, we will determine whether ammonia's stimulation of RhCG, or, possibly the related proteins, Rh A Glycoprotein (RhAG) or Rh B Glycoprotein (RhBG), activates specific intracellular signaling pathways in cultured neurons. We will use primary neuronal cultures, and will use RNA interference techniques to inhibit RhCG expression to show specificity of response. In parallel, we will determine whether RhCG can function as an ammonia sensor by determining whether it can complement the pseudohyphal transformation-defect of Amep2-Amep2 S. cerevisiae. To examine the second aim, we will determine whether cecal ligation and puncture-induced sepsis increases CNS expression of either RhCG, or of RhAG or RhBG. These studies will combine immunohistochemical analyses of cellular protein expression patterns with quantitative analyses of protein and mRNA expression with immunoblot and real-time RT-PCR, respectively. These studies fit the purpose of the R21 mechanism in two different manners. These studies will provide pilot data to assess the feasibility of a novel avenue of investigation into the role of RhCG, or related proteins, as CNS ammonia 'sensors.' Second, while these studies are

admittedly high risk, their results could lead to a breakthrough in the field of hyperammonemic and hepatic encephalopathy.

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- **Project Title: EXTREME AMMONIA TOLERANCE MECHANISMS: A MODEL VERTEBRATE**

  Principal Investigator & Institution: Walsh, Patrick J.; Marine Biology and Fisheries; University of Miami Coral Gables Box 248293 Coral Gables, Fl 33134

  Timing: Fiscal Year 2002; Project Start 08-FEB-2002; Project End 30-NOV-2004

  Summary: (provided by applicant): Hepatic Encephalopathy (HE), and resultant elevated blood and tissue ammonia concentrations (i.e., hyperammonemia, HA), has profound central nervous system (CNS) effects, and can have environmental causes. In particular, liver damage due to exposure to toxicants such as carbon tetrachloride, toluene, DDT, heptachlor, etc., as well as chronic alcoholism and direct exposure to environmental ammonia, can elicit symptoms of HE/HA. However, there are such a wide variety of CNS effects produced in the disease in humans, and in rodent experimental models, that it is difficult to determine which disease biomarkers are the most critical indicators of disease progression. Furthermore, characteristics of the rodent model present several weaknesses in the study of HE/HA. Because of this gap in our knowledge, no practical and effective clinical intervention strategies are available to prevent or reverse biomarkers or symptoms of the disease. Recently, we have identified a vertebrate model, the gulf toadfish (Opsanus beta), which is both extremely tolerant of ammonia insult, and which, by virtue of its aquatic lifestyle, enables a line of experimentation not practical in mammalian models, namely rapid "ammonia washout" protocols. Therefore, we propose to test several hypotheses aimed at exploiting these and other characteristics of this new model to address the lack of biomarkers and intervention strategies for HE/HA. In particular, we will: (1) test the hypothesis that there are reversible vs. irreversible biomarkers of HE/HA, and that these can be readily identified and distinguished in an aquatic model like the toadfish; (2) test the hypotheses that extreme ammonia tolerance in the toadfish, relative to mammals, is due to an unusual aspect of its physiology, in particular, either to a more robust ammonia detoxification system in the brain, or to an inherent insensitivity of brain mitochondrial metabolism to ammonia insult. As a further test of this second hypothesis, we will also explore the possibility that the toadfish has higher levels of naturally occurring ammonia protectant compounds (e.g., carnitine, trimethylamine oxide, etc.) in its brain tissues than do mammals. In sum, these experiments will lead to information which is not readily obtainable from humans and existing mammalian models concerning the mechanisms of action of ammonia and cellular capacity for tolerance and recovery, and thus to a better understanding of the causes and mechanisms underlying HE/HA that could lead to therapeutic strategies.

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- **Project Title: FMRI OF NEUROBEHAVIORAL RECOVERY AFTER TBI**

  Principal Investigator & Institution: Johnson, Sterling C.; Neurogeneticist; Medicine; University of Wisconsin Madison 750 University Ave Madison, Wi 53706

  Timing: Fiscal Year 2002; Project Start 25-SEP-2001; Project End 31-AUG-2006

  Summary: Awareness (accurate, conscious understanding) of one's own cognitive, emotional, and social abilities and limitations is among the highest of all cerebral functions. This aspect of consciousness is often impaired several months to years after a

moderate to severe traumatic brain injury (TBI) and often interferes with treatment and adjustment following injury. The neural correlates of deficits in self-awareness are not well understood, and progress in this area may be helpful in predicting recovery and designing optimal treatment strategies. In this application we propose to use BOLD contrast functional MRI (fMRI) and diffusion tensor imaging (DTI) to probe the neural substrates of self-awareness, as well as executive functions and episodic memory in TBI cases and matched trauma controls (orthopedic, non-brain trauma). We will examine the presence and degree of resolution of injury-induced cognitive and psychosocial deficits, and relate these to neural activity using fMRI during cognitive tasks, and to axonal integrity as measured by DTI. We will examine all subjects (60 moderate, 60 severe TBI cases, and 60 matched trauma controls) at 4 months post-injury, and again at 18 months in order to test the following hypotheses: 1. The anterior medial prefrontal cortex subserves self-reflective thought. Activation in this region will be related to the patient's level of self-awareness, and to the degree of white matter integrity underlying that region. 2. Improvement of executive and memory abilities will be related to longitudinal changes in activation in the lateral prefrontal cortex and mesial temporal cortex respectively. Improvement in cognition, together with a longitudinal change in activation, and a difference from control group activity, will be considered evidence for cerebral reorganization. 3. Functional imaging findings will improve prediction of neurobehavioral outcome. Approach. We will characterize patients with neuropsychological and neurological evaluation, neurobehavioral outcomes, and functional MR imaging. Depth and duration of **coma** will be used as primary measures of injury severity. MRI activation and tensor data will be analyzed using the general linear model with a voxel-based approach. This technique will allow direct and simultaneous assessment of the relationship between MR data and other measurements such as injury severity, outcome and scores on cognitive tests. We expect that successful completion of this project will provide greater understanding of patients with debilitating brain injury, and that these probes of neurobehavioral function may be useful in the future to guide and monitor treatment interventions.

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- **Project Title: GHB ABUSE: MOTIVATIONS, MEDICAL CONSEQUENCES, & RISKS**

  Principal Investigator & Institution: Dyer, Jo E.; Clinical Pharmacy; University of California San Francisco 500 Parnassus Ave San Francisco, Ca 941222747

  Timing: Fiscal Year 2002; Project Start 25-MAY-2002; Project End 30-APR-2007

  Summary: BACKGROUND: Gamma hydroxybutyrate (GHB) and its precursors (GHB-P) are major causes of drug-related **coma** in the U.S. Dramatic and rapid changes in patterns of GHB use are associated with increasing morbidity and mortality. Despite this, little is known about the determinants of adverse outcomes following use. STUDY HYPOTHESIS: Adverse outcomes following GHB use are multi- factorial. We propose to delineate the role of psychosocial and physical factors as predictors of adverse outcomes in GHB use; including socio-demographic factors, attitudinal issues, specific exposures (GHB v. GHB-P), and pharmaco-dynamics. EXPERIMENTAL PLAN: Component C1: California Poison Control System (CPCS) surveillance will capture demographics, exposure, and outcomes for 600 exposure subjects over the study period. Product and blood/urine testing will confirm GHB or its precursors. Component C2: Structured interviews of 390 exposed subjects, recruited from the CPCS surveillance cohort, will collect supplemental data not available from passive surveillance alone. Component C3: Controlled human exposures in 144 volunteers will compare disposition

kinetics and effects of GHB and 1,4 butanediol, examining dose-dependence, gender differences, ethnic differences, genetic influences and interaction with ethanol. Component C4: Focus groups will explore the motivating factors for GHB use and abuse. Nine focus groups (54 subjects) from 3 sources (an adverse experience group from C2; experimentally exposed subjects from C3; and a community-based sample of GHB users without adverse events) will evaluate differences in hazard perception, acquisition, settings and use outcomes. Analyse s: Multivariate modeling will have sufficient power to detect RR's less than 2.0 for key risk factors and outcomes in the 20 percent incidence range. Human exposures will use paired and repeated-measures comparisons with power to detect change slightly greater than one standard deviation. SIGNIFICANCE: This study, by elucidating predictors of adverse outcomes from GHB use will provide data important for clinical and public health interventions to reduce morbidity associated with this drug of abuse.

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- **Project Title: HEPATIC ENCEPHALOPATHY--NEUROPSYCHOLOGY & NEUROCHEMISTRY**

  Principal Investigator & Institution: Thomas, Michael A.; Associate Professor; Radiology; University of California Los Angeles 10920 Wilshire Blvd., Suite 1200 Los Angeles, Ca 90024

  Timing: Fiscal Year 2001; Project Start 05-AUG-1999; Project End 31-JUL-2004

  Summary: (Verbatim from the Applicant's Abstract) Hepatic Encephalopathy (HE) is a well-recognized complication of cirrhosis. These patients display a variety of neuropsychological deficits as well as clinical and serum ammonia abnormalities. Sub-clinical hepatic Encephalopathy (SHE) is a subtler accompaniment of cirrhosis that is associated with neuropsychological abnormalities without significant neurologic findings such as asterixis. Although neuropsychological tests are the current standard for diagnosing SHE, the results are non-specific and reveal little about the underlying neurochemical processes. Cerebral Magnetic Resonance Spectroscopic (MRS) metabolic alterations and MRI signal abnormalities in the basal ganglia reveal a relationship between neuropsychological functioning and biochemical abnormalities found in patients with SHE. This study will involve collaboration among hematologists, radiologists, psychiatrists, MR physicists and neuropsychologists. We will identify a total of 60 liver failure patietns who have SHE and compare them to 60 healthy control subjects. These patients and healthy controls will undergo clinical assessment by hepatologists and neuropsychiatric evaluation by psychiatrists. Subsequently, they will undergo a comprehensive series of neuropsychological tests to characterize the nature of their neurocognitive deficits. Following these tests, all subjects will undergo MR Imaging and Spectroscopic (MRI/MRS) examinations. We aim to use 1H MRS to meare and compare absolute cerebral metabolite levels of myo-inositol, choline, and glutamine/glutamate in the frontal lobe, parietal lobe and basal ganglia of a matched group of SHE patients and healthy controls. The resulting MRS and MRI data will be quantitatively analyzed and correlated with the results of neuropsychological testing and clinical examination. Multivariate methods and correlational analysis will be used to test hypotheses regarding differences between SHE patients and controls. We hypothesize that myo-inositol will be decreased, glutamine/glutamate will be increased and choline will be decreased in patietns with SHE. We propose that these underlying biochemical abnormalities will be correlated with clinical, neuropsychiatric and neuropsychological aspects of SHE. If these relationships are found, they will provide an improved biochemical understanding of the underlined aspects of SHE as characterized

y clinical and neuropsychological testing. This enhanced understanding of pathophysiology will improve our ability to diagnose and treat this condition, resulting in improved patient outcomes.

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- **Project Title: HEPATIC TISSUE ENGINEERING**

  Principal Investigator & Institution: Yarmush, Martin L.; Professor; Massachusetts General Hospital 55 Fruit St Boston, Ma 02114

  Timing: Fiscal Year 2002; Project Start 30-SEP-1992; Project End 30-JUN-2007

  Summary: (provided by applicant): Recent animal studies and clinical trials using bioartificial liver devices have shown great promise for the treatment for acute liver failure, and are providing valuable information on the problems and limitations of current "1st generation" liver assist devices. It is becoming clearer every day, however, that more basic information of the effect of environmental parameters on hepatocellular function, as well as host-bioartificial liver interactions, is necessary before the concept of bioartificial liver becomes a reality available at reasonable cost. Our long-term objective is to help development of 2nd and 3rd generation devices, which are expected to be significantly more effective than currently available devices. In order to reach this goal, we require a better understanding of many critically important questions including: What is the minimum cell mass to support a patient? How long and well do hepatocytes function during plasma exposure? What are the most critical functions for patient survival? What is the impact of bioartificial liver treatment on the immune system and on subsequent liver transplantation? Answers to these questions will often not be obtainable using off-the-shelf tools, and will require the development of new experimental systems. Our main hypothesis is that there is a finite number of hepatic functions which are most critical for patient survival, that it is possible to significantly upregulate them in hepatocyte cultures (both at the single cell level and at the level of tissue), and as a result, reduce the cell mass required in the bioartificial liver. The specific aims are: (1) To use metabolic and genetic engineering approaches to enhance the performance of hepatocyte cultures in plasma; (2) To optimize the oxygenation and geometric configuration of hepatocyte co-cultures for plasma detoxification; (3) To investigate patient-bioartificial liver interactions and characterize the immunological response to extracorporeal perfusion with allo- and xenogeneic cells. These studies will provide the basic knowledge and technologies enabling us to develop the next generation of liver assist devices and speed up the translation of this promising modality to the bedside. The proposed studies will also provide basic tools useful in the development of other engineered tissues and organs.

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- **Project Title: HUMAN BEHAVORIAL PHARMACOLOGY OF GHB**

  Principal Investigator & Institution: Roll, John M.; Assistant Director of Substance Abuse &; None; University of California Los Angeles 10920 Wilshire Blvd., Suite 1200 Los Angeles, Ca 90024

  Timing: Fiscal Year 2002; Project Start 30-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant) Gamma-hydoxybutyrate (GHB) is a compound with a mixed reputation. On one hand it has been used quite successfully to treat persons suffering from narcolepsy and appears to be promising in the treatment of alcohol and opiate withdrawal. Furthermore it has been investigated as a treatment for schizophrenia, cocaine abuse, Parkinson's disease and night eating syndrome. On the

other hand, GHB has been abused, presumably for its' psychoactive effects, with disastrous consequences including the development of a severe withdrawal syndrome, **coma** and even death. GHB has also been used to facilitate the commission of sexual assaults by surreptitiously providing it to the victim. Several investigators have suggested that GHB is a reinforcer with abuse potential while others have suggested exactly the opposite. Despite this wide-ranging history, the behavioral pharmacology of GHB has not been thoroughly examined. We are proposing a rigorous, inpatient double blind, placebo controlled, experimental procedure for assessing the physiological consequences, subjective properties, relative reinforcing potential, direct effects and pharmacokinetics of GHB in a group of regular GHB users. Furthermore, we are proposing to assess the degree to which GHB will be self-administered by volunteers. We believe that the successful completion of the proposed study will provide us with much needed data about the human behavioral pharmacological profile of GHB in the GHB user. We believe the data collected in the proposed study will be useful in developing effective treatments for those who have overdosed on GHB, for those who are in withdrawal from GHB, and for those who are attempting to quit using GHB. Furthermore, it is our belief that securing a fuller understanding of this interesting compound may help explain why it has come to be abused by certain individuals. This last point may be of particular importance as it is likely that other drugs, with profiles similar to that of GHB, will enter the "Club Drug" milieu in the future and we may be able to inform policy surrounding these future agents based on a fuller understanding of GHB.

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- **Project Title: LONG TERM EFFECTS OF DIFFUSE BRAIN TRAUMA**

  Principal Investigator & Institution: Smith, Douglas H.; Associate Professor; Neurosurgery; University of Pennsylvania 3451 Walnut Street Philadelphia, Pa 19104

  Timing: Fiscal Year 2002; Project Start 15-FEB-1999; Project End 31-JAN-2004

  Summary: Substantial interest in long-term pathologic changes following brain trauma has emerged due to recent evidence that neurodegeneration may be initiated by a single incident of brain injury. These neurodegenerative changes are particularly evident in patients suffering diffuse brain injury. Therefore, we propose to explore long-term neurodegeneration using a new model of non-impact head rotational acceleration in the pig that induces diffuse axonal pathology with and without **coma.** We have recently found that this model of brain trauma also produces neurodegenerative changes within one week following injury. These neurodegenerative changes include Abeta and tau accumulation in axons, Abeta plaque formation, tau accumulation in neurons, neurofilament inclusions in neurons, and possible phagocytosis of axons by neutrophils. Uniquely, these clinically relevant pathologic changes have not previously been found in other models of brain trauma. From these data, we have developed several testable hypotheses: 1) diffuse brain trauma will induce progressive Alzheimer's disease-like pathology (Abeta and tau accumulation) and Lewy body pathology (neurofilament cytoplasmic inclusions), 2) diffuse brain trauma will initiate a long- term deleterious immune response resulting in axon phagocytosis by both neutrophils and microglia, and 3) the extent of posttraumatic **coma** will be dependent on the angle of rotation and will correlate with the severity of brainstem injury. We propose to explore each of these hypotheses using multiple histologic and biochemical techniques, evaluating progressive neuropathologic changes over six months posttrauma. Success of these studies may reveal mechanistic links between brain trauma and neurodegenerative

processes and facilitate the development of therapeutic and diagnostic techniques for diffuse brain injury.

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- **Project Title: MAGNESIUM SULFATE FOR NEUROPROTECTION AFTER BRAIN TRAUMA**

  Principal Investigator & Institution: Temkin, Nancy R.; Associate Professor; Neurological Surgery; University of Washington Grant & Contract Services Seattle, Wa 98105

  Timing: Fiscal Year 2002; Project Start 01-JUL-1983; Project End 31-AUG-2005

  Summary: (provided by applicant): Traumatic brain injuries represent an important health problem: they occur with high frequency, the population affected contains many previously healthy young people, and they are associated with high mortality and morbidity. This study continues on our 20 years of experience in conducting clinical trials evaluating treatments for preventing seizures following head injury (Dilantin Prophylaxis of Post-traumatic Seizures. Valproate for Prophylaxis of Post-traumatic Seizures) and in examining neurobehavioral outcome after head injury. The trials and outcome studies found that epileptic seizures, serious cognitive difficulties, high unemployment, and inability to live independently are common among survivors of moderate or severe head injury the ongoing trial tests whether these consequence can be ameliorated by magnesium sulfate. Using a randomized, double-blind design, the present study evaluates magnesium sulfate as a neuroprotectant and anti-epileptogenic agent following head injury. Magnesium sulfate is a widely used, well tolerated compound that has been shown in the laboratory to be effective in reducing seizures and also in limiting neuronal damage and in improving functional outcome following experimental head injury. Specifically, the study will test the hypothesis that magnesium sulfate, when given 8 hours of a moderate or severe head injury, a) increases survival b) decreases seizures, and c) improves neurobehavioral functioning. Additionally, the study will: assess the effects of timing of dosage (e.g. <4 hours vs. 4-8 hours), gender, and race; determine the rate of adverse events; and evaluate the time course and correlates of total and ionized magnesium concentrations. Patients with moderate or severe head injury (post-resuscitation Glasgow **Coma** Scale 3-12 or having an early craniotomy) are randomized to receive moderate doses of magnesium sulfate or placebo. Treatment is started as soon as possible, and definitely within 8 hours of injury. The initial bolus of magnesium sulfate is followed by a 5 day infusion to keep the magnesium levels elevated during the period when secondary damage from the head injury is most likely. Patients are closely monitored for survival and seizures over the first six months after injury and have a brief neurobehavioral assessment at I and 3 months and a comprehensive neurobehavioral assessment at six months after injury. In summary, this placebo-controlled, randomized double-masked clinical trial will determine the effects of magnesium sulfate on survival, post-traumatic seizures, and the patients' functional status and neurobehavioral functioning following traumatic brain injury.

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- **Project Title: MECHANISMS OF NEURONAL HYPOGLYCEMIC INJURY**

  Principal Investigator & Institution: Salton, Stephen R.; Fishberg Res Ctr in Neurobiol; Mount Sinai School of Medicine of Nyu of New York University New York, Ny 10029

  Timing: Fiscal Year 2002; Project Start 30-SEP-2002; Project End 31-JUL-2006

Summary: (provided by applicant): Tight control of serum glucose levels is critically important in reducing long-term complications of diabetes mellitus. Accumulating evidence suggests that these long-term benefits are not risk-free, and that recurrent episodes of hypoglycemia, or severe hypoglycemic **coma** secondary to incorrect insulin dosing, have significant morbidity. Damage to the hippocampus and cerebral cortex has been noted, as have cognitive defects in humans and in animal models. However, the mechanisms that underlie hypoglycemic damage to the nervous system, particularly during embryogenesis, remain largely unknown. We propose to better define how neurons are damaged by hypoglycemia in the nervous system, whether synaptic connectivity and neuronal development are affected, and whether hypoglycemia triggers expression of particular genes within the brain, providing insight into the type of damage that is sustained and identifying possible avenues of therapeutic intervention. Using two complementary hippocampal primary culture models, we plan to identify the pathways that lead to neuronal injury in response to hypoglycemia (Specific Aim I). Neuronal vulnerability to cell death will be determined; type of cell death, death pathways and active intermediates, and the transmitter phenotypes of the affected hippocampal neurons will be defined. In addition, effects of hypoglycemia to delay or disrupt neuronal polarization, axonal and dendritic outgrowth, selective axonal and dendritic protein transport, and synaptogenesis will be analyzed. Since recurrent bouts of hypoglycemia in utero are associated with postnatal cognitive impairment, we propose to examine whether cell death pathways are activated in the hippocampus through exposure to hypoglycemia in utero (Aim II). In addition, we propose to identify genes that are regulated in the embryonic and early post-natal hippocampus by hypoglycemia, which we hope will offer insight into the mechanism(s) by which the hippocampus is damaged.

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- **Project Title: MECHANISMS OF SIGNAL TRANSDUCTION OF GHB ACTION**

  Principal Investigator & Institution: Tunnicliff, Godfrey; Biochem and Molecular Biology; Indiana Univ-Purdue Univ at Indianapolis 620 Union Drive, Room 618 Indianapolis, in 462025167

  Timing: Fiscal Year 2002; Project Start 30-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant) Gamma-hydroxybutyrate (GHB) has gradually gained a foothold as a substance of abuse in the U.S. and has a reputation as being used as a "date-rape" drug, particularly in the presence of alcohol. Increasingly, incidents of untoward reactions and even death have been reported with GHB misuse. Administration of this drug results in a marked central nervous system (CNS) depressant action manifested by sedation and **coma** at higher doses. These effects can be accompanied by seizures, particularly in experimental animals. Owing to its pronounced CNS actions and to the fact that it is an endogenous brain substance, GHB is considered to be a neurotransmitter or a substance with a significant role in regulating neuronal function. Part of GHB action appears intimately tied to the GABAergic system. For this cross-disciplinary pilot project we propose to study the process of GHB signal transduction in both cultured neurons and animal nervous tissue. In Aim 1, we plan to use neuroblastoma hybrid NCB-20 cultures to investigate the effects of GHB on forskolin-induced cAMP production and the ability of GHB to activate pertussis toxin sensitive G-proteins. These studies are expected to lead to the identification of a subfamily of G-proteins associated with the GHB receptor. In Aim 2, this GHB receptor-expressing cell line will be used to study the involvement of plasma membrane Ca2+ regulatory mechanisms (calcium channels, sodium-calcium exchanger, Ca2+ pump,

passive Ca2+ permeability) in GHB signal transduction. For Aim 3, we will map the regional distribution of GHB transport sites in the brain and ascertain the kinetic specificity of the GHB transporter for its substrate. Finally in Aim 4, based on the hypothesis that GHB activity at the GABAA receptors is dependent on their subunit composition, we will study the effects of GHB on GABA-stimulated chloride influx in different brain areas and in cultured cells expressing GABAA receptors composed of different subunits. These studies may reveal the GABAA receptor subtype specificity for the effects of GHB and possibly new targets for drugs to treat GHB dependence and toxicity. The exploratory, four-pronged approach of this project promises to expand our current, limited understanding of how GHB functions as a neuronal regulatory chemical and how its pharmacological effects are linked to cellular events. In turn, this will help to develop therapeutic and preventive strategies resulting in a lessened abuse potential of GHB.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: MEDIC ONE STROKE SCALE**

  Principal Investigator & Institution: Tirschwell, David L.; Assistant Professor of Neurology; Neurology; University of Washington Grant & Contract Services Seattle, Wa 98105

  Timing: Fiscal Year 2002; Project Start 30-SEP-1999; Project End 31-AUG-2004

  Summary: As stroke therapies emerge, they will likely work better if given earlier after stroke onset. This Patient-oriented Research Career Development Award proposal involves the design, implementation and validation of a prehospital stroke scale, the Medic One Stroke Scale (MOSS), with Dr. David Tirschwell as the principal investigator. Dr. Tirschwell is a neurologist completing a Master's degree in epidemiology at the University of Washington and plans a career as a stroke clinical researcher and epidemiologist. He will further his research training through study of issues surrounding the creation and validation of clinical measurement tools. Dr. Tirschwell has been studying the prehospital care of stroke patients in Seattle, Washington in collaboration with members of the Departments of Neurology and Epidemiology and Seattle Medic One (fire department). The hypothesis is that this continued collaboration can produce a rapid, reliable, easy to use stroke evaluation tool for the prehospital setting that will facilitate accurate identification and efficient transport times for acute stroke patients. A further hypothesis is that with this same tool, one can provide a useful early measure of stroke severity. Two versions of the MOSS will be created, a cohort of patients evaluated with each, and Dr. Tirschwell will examine the patients at a 3-month follow-up visit to determine outcomes. The first version (prediction) will record historical and clinical variables and evaluation and transport times. The shorter second version (validation), incorporating only the most predictive variables, will be associated with diagnosis and triage algorithms to minimize transport time for the most urgent stroke cases. The ease of use, reliability and predictive value of the MOSS will be validated in the second cohort and compared with the Glasgow **Coma** Scale and medical record abstracted NIHSS. Diagnostic accuracy, transport times, proportion of ischemic stroke patients receiving tPA and outcomes will be compared between the first and second cohorts. As stroke therapeutic research moves into the prehospital setting, the MOSS will serve as a standardized evaluation tool allowing early and accurate stroke diagnosis and severity stratification.

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- **Project Title: MERRF & MELAS IN TRANSMITOCHONDRIAL MUSCLE CULTURES**

  Principal Investigator & Institution: Davidson, Mercy; Columbia University Health Sciences Po Box 49 New York, Ny 10032

  Timing: Fiscal Year 2002

  Summary: Mitochondria are unique cellular organelles that contain their own DNA, distinct from the nuclear genome. Mitochondrial DNA (mtDNA) mutations affect all tissues, but postmitotic tissues, such as muscle and brain, are affected more severely, most likely due to their increased energy requirement. MERF (myoclonus epilepsy with ragged-red fibers) and MELAS (mitochondrial myopathy, encephalopathy, lactic acidosis and stroke-like episodes) are two maternally inherited mitochondrial diseases associated with point mutations in two different mtDNA- encoded tRNA genes. The two disorders present with distinct clinical phenotypes, but both feature developmental delay, mental retardation, mitochondrial proliferation in muscle, and severe deficiencies in respiratory chain function. We propose to study intergenomic interactions between mitochondrial harboring two populations of mtDNAs containing each of two different point mutations associated with MERRF (A8344G), in order (1) to determine if genetic complementation between the two genomes can restore normal respiratory chain function in postmitotic muscle, and (2) to evaluate other cellular factors, such as mitochondrial movement and shape, and the role of cytoskeletal proteins, that might play a role in interorganellar and intergenomic interactions. We also plan to study the unique vascular pathology associated with MELAS, using a vascular smooth muscle cell line (VSM) that has been repopulated with the A3243G mutation. Clinically, MELAS patients have severe lactic acidosis. In this regard, we also propose to study the regulation of glycolysis and glucose oxidation in these cells, and to determine if dichloroacetate (DCA) can alleviate the biochemical abnormalities, if present. The results of this proposed study will help us to devise strategies for restoring normal oxidative function in post-mitotic muscle, either biochemically or by genetic interaction.

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- **Project Title: MITOCHONDRIA RELATED EVENTS IN TRAUMATIC BRAIN INJURY**

  Principal Investigator & Institution: Bullock, M Ross.; Professor; Neurological Surgery; Virginia Commonwealth University Richmond, Va 232980568

  Timing: Fiscal Year 2002; Project Start 01-APR-1979; Project End 31-AUG-2005

  Summary: The central event after traumatic brain injury (TI) is the transient, or ongoing impairment of electrophysiological function, manifest as **coma,** "concussion" or neurological deficit. Persistent reduction in the Resting Membrane Potential, and consequent failure to adequately re-polarize neuronal and axonal membranes, are the most likely mechanisms for eliciting these effects. This application revolves around the central hypothesis that mitochondrial dysfunction and reduced ionic pumping, leading bioenergetic failure, is the major limiting factor, determining neuronal and axonal recovery after TBI. In this application, we build upon our previous studies, demonstrating massive excitatory neurotransmitter release after TBI, leading to calcium influx. This in turn damages mitochondria, neurofilaments, and second-messenger mediated ion channels, among many other events. These issues will be explored in the clinic and laboratory settings. Specifically, in rat TBI models, we will use immunohistochemistry, molecular biology, electrophysiology, and behavioral testing to validate the hypothesis that calcium-mediated damage to inhibitory GABA Cl channels

exacerbates neuronal damage, and thus worsens outcomes, and that GABA agonists improve outcome. We will directly measure cytochrome oxidase activity, to show that mitochondria are functionally impaired after TBI, and we will posit that specific blockade of the Mitochondria Transition Pore (MPT) with Cyclosporin A, will prevent these changes, and improve outcome. In severely head injured patients, simultaneous microdialysis, and a new coaxial depth electrode, together with a tissue oxygen/CO2/pH sensor system, will be placed in the same brain region to test the effect of increased oxygen tension, and Cyclosporin A under the interplay of neurochemical and neurophysiological events. We will use AVDO2, AVD lactate, and AVD glucose to assess global therapy effects, and relate them to CBF and MRI parameters. Finally, we will use MRI water mapping, Diffusion Weighted Imaging, and CBF mapping, to show that the brain swelling, which almost always follows TBI is due to cytotoxic edema. These methods will also test the hypothesis that Cyclosporin A will ameliorate cytotoxic edema, and that N Acetyl Aspartate spectroscopy will constitute a "surrogate marker" for mitochondrialy, and neuronal damage in human TBI. Thus, these novel techniques, through a tightly integrated set of laboratory and clinical studies, will yield new mechanistic insights, and specifically evaluate Cyclosporin A and several other putative new therapies in TBI.

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- **Project Title: MMP-9 MEDIATES CEREBRAL EDEMA IN FULMINANT LIVER FAILURE**

  Principal Investigator & Institution: Nguyen, Justin H.; Mayo Clinic Coll of Med, Jacksonville Mayo Clinic Jacksonville Jacksonville, Fl 322243899

  Timing: Fiscal Year 2003; Project Start 01-MAY-2003; Project End 30-APR-2005

  Summary: (provided by applicant): Fulminant hepatic failure (FHF) is a life-threatening disease. The definitive treatment for FHF is a liver transplant. Unfortunately, 35% of all FHF patients and 62% of nonacetaminophen-induced FHF patients die within 48 hours after reaching stage 3 or 4 **coma,** while awaiting a transplant. Increasing this narrow therapeutic window would provide substantially more opportunities for these patients to be transplanted. One of the primary causes of death in these individuals is cerebral edema. The mechanisms responsible for cerebral edema in these FHF patients are poorly understood. Recent evidence from other laboratories has shown that matrix metalloproteinase-9 (MMP-9) may play a pivotal role in the development of cerebral edema in other disease states. For example, treatment with either MMP-9 synthetic inhibitors or anti-MMP-9 monoclonal antibodies has been shown to result in a significant reduction in the size of cerebral infarcts. Further, studies using MMP-9 knockout mice have shown a significant attenuation in cerebral edema following either cerebral ischemic or traumatic events. Based on these data we hypothesize that MMP-9 plays a critical role in the development of cerebral edema following FHF. Significant support for this hypothesis has come from two observations made in our laboratory. First, both proMMP-9 and MMP-9 are elevated in the sera of FHF patients and in rats with experimentally induced FHF. Second, in a pilot study, we have shown that treatment with an MMP-9 inhibitor (GM6001) results in an approximate 30% reduction in cerebral edema in rats with experimentally induced FHF. In this application, we specifically propose to: 1. To further determine if inhibition of MMP-9 by the MMP synthetic inhibitor GM6001 attenuates cerebral edema in rats with experimentally induced FHF. 2. To determine whether cerebral edema is attenuated in MMP-9 knockout mice following experimentally induced FHF.

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- **Project Title: MRS STUDIES OF NEUROTRANSMITTER CYCLING IN HUMAN BRAIN**

  Principal Investigator & Institution: Rothman, Douglas L.; Professor; Internal Medicine; Yale University 47 College Street, Suite 203 New Haven, Ct 065208047

  Timing: Fiscal Year 2002; Project Start 01-APR-1998; Project End 14-JUN-2003

  Summary: Glutamate neurotransmitter release depends on a stable precursor cytosolic glutamate concentration. Loss of glutamate by synaptic release will deplete the nerve terminal cytosolic precursor pool unless compensated for by glutamate reuptake and synthesis. Glial uptake efficiently removes released glutamate from the synaptic cleft in order to maintain a low ECF concentration of glutamate. In vivo and in vitro studies indicate that glutamate taken up by glia is converted to glutamine by glutamine synthetase. Glutamine is released from the glia to the ECF where it is taken up by neurons and converted back to glutamate through the action of glutaminase. Despite the critical role of this glutamate/glutamine cycle for normal brain function, little is known about the rate or regulation of this pathway. Recently we have developed and tested in the rat brain a model of this pathway which allows the rate of the glutamate/glutamine cycle to be measured from C MRS measurements of glutamine isotopic labeling. The primary objective of this grant is to determine the rate of the glutamate/glutamine cycle in normal human cortex. C MRS will be used to measured glutamine and glutamate isotopic labeling from infused [1-13C] and [2-13C] glucose. Key aspects of the proposed model of the glutamate/glutamine cycle will be tested through measuring of the effect of altering plasma ammonia concentration on total and anapleurotic glutamine synthesis in subjects with mild hepatic encephalopathy.

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- **Project Title: MULTIPONTENTIAL DRUG TREATMENT STRATEGIES IN NEUROTRAMA**

  Principal Investigator & Institution: Faden, Alan I.; Professor; Neuroscience; Georgetown University Washington, Dc 20057

  Timing: Fiscal Year 2002; Project Start 31-JUL-2000; Project End 30-JUN-2004

  Summary: (Adapted from the Investigator's Abstract) : Brain or spinal cord trauma initiates an endogenous autodestructive process-a cascade of biochemical and metabolic changes that causes delayed neuronal cell death. Pharmacological treatment approaches have generally focused on inhibiting a single injury factor, despite the clear recognition that secondary tissue damage reflects a multifactorial injury process. The failure of any drug treatment strategy to date to improve recovery after human brain trauma supports the conclusion that targeting single components of secondary injury may not be sufficient to substantially modify posttraumatic recovery. The tripeptide, thyrotropin releasing hormone (TRH), modulates multiple components of the secondary injury cascade and treatment with TRH or certain TRH analogs improves outcome across a variety of neurotrauma models and species. In addition, TRH or related analogs have cognitive enhancing effects. However, these compounds also have other substantial physiological actions- including autonomic, endocrine and analeptic effects-that may not be optimal for treatment of severe head injury or for chronic administration (i.e. for cognitive action). For example, pressor effects may serve to increase intraparenchymal bleeding, increased body temperature may limit certain neuroprotective effects; and analeptic actions may compromise ability to utilize pharmacological **coma** treatments. Based upon extensive structure-activity studies, we have conceptualized and developed novel prototypic analogs of TRH and its dipeptide metabolite that exhibit both

neuroprotective and nootropic properties, but appear to be devoid of other key physiological effects of TRH including endocrine, autonomic and analeptic actions. Moreover, using pharmacophore modeling techniques we have identified non-peptide mimics of the effective tripeptides. The proposed studies are intended to extend these preliminary observations by addressing the following hypotheses: (1) small peptide structures, related to TRH but devoid of the primary physiological actions of TRH, provide neuroprotection after traumatic brain injury, (2) neuroprotective actions of these compounds result from modulation of multiple components of the secondary injury cascade, including necrotic and apoptotic pathways; (3) these drugs may also be used to enhance long term cognitive function after brain injury; and (4) non-peptide mimics of these effector compounds may also serve as prototypes for novel drug discovery. Specific aims are to demonstrate that prototype tripeptide and dipeptide derivatives of TRH: (1) inhibit multiple components of the secondary injury cascade after traumatic brain injury; (2) have a high therapeutic index and a broad therapeutic window; (3) reduce both apoptotic and necrotic cell death; and 4) have nootropic properties and enhance cognitive function after chronic brain injury.

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- **Project Title: NEUROBEHAVIORAL OUTCOME OF HEAD INJURY IN CHILDREN**

  Principal Investigator & Institution: Levin, Harvey S.; Professor/Director of Research; Phys Med and Rehabilitation; Baylor College of Medicine 1 Baylor Plaza Houston, Tx 77030

  Timing: Fiscal Year 2002; Project Start 01-JUL-1984; Project End 31-JUL-2004

  Summary: The goals of the proposed research are to (1) elucidate impairments of fundamental cognitive processes, including working memory, inhibition, and metacognitive skills in relation to the severity of closed head injury (CHI) defined by the Glasgow **Coma** Scale, focal brain lesions depicted by MRI, and age at injury; (2) evaluate the impact of deficits in working memory, inhibition, and metacognitive skills on outcome domains, including discourse processing, academic achievement, and adaptive behavior; (3) examine the effects of posttraumatic impairments of inhibition and metacognitive skills, CHI severity, and focal brain lesions on development of new psychiatric disorder, and assess the role of family environment, preinjury psychiatric history, and psychological stress as effect modifiers. To accomplish these goals, 332 children will be studied who sustain a CHI of varying severity, including 166 cases currently age 5-15 years who were injured at least 3 years before testing (Study I, cross-sectional/retrospective) and 166 cases, age 5-12 years at time of injury will be recruited during their initial hospitalization and serially study at 3,6,12, and 24 months postinjury (Study II, prospective). In addition, 110 uninjured, healthy children as part of Study I to obtain age-referenced comparison data. Volumetric determination of focal brain lesions and localization in Talairach space will be used to evaluate the contribution of prefrontal injury relative to other cortical and subcortical sites. Working memory is measured by matching letters on rhyme or identity with variable memory load, the Tower of London, and a divided attention task in which single vs dual task skills are compared. Inhibition is measured by Stroop-like and stop signal reaction time tasks. Metacognitive skills are assessed by tasks involving detection and repair of anomalous sentences, and judgement of learning. Measures of processing speed, motor speed, and declarative memory are also given to study interactions of these abilities with working memory, inhibition, and metacognitive skills. Discourse processing will be analyzed for summarization, lesson, and gist, while standardized tests will measure reading, arithmetic, and adaptive behavior. Structured interviews of the parent and child and

supplemental measures will evaluate psychiatric status. The Specific Aims will be addressed by linear models, including the ones designed for the analysis of change. By analyzing the nature of executive function deficits after CHI and later applying the findings to special education and rehabilitation programs, the applicant postulates that it should be possible to improve methods for assessment and design interventions for the cognitive and behavioral sequelae of head injury.

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- **Project Title: NEUROCOGNITIVE IMPACT OF HYPOGLYCEMIA IN TYPE 1 DIABETES**

  Principal Investigator & Institution: Hershey, Tamara G.; Psychiatry; Washington University Lindell and Skinker Blvd St. Louis, Mo 63130

  Timing: Fiscal Year 2003; Project Start 01-AUG-2003; Project End 31-MAY-2008

  Summary: (provided by applicant): A common difficulty in managing type 1 diabetes mellitus (T1DM) is hypoglycemia (low blood sugar). This complication is particularly common during childhood. Extreme hypoglycemia can cause **coma** or death, but less severe hypoglycemia can have consequences for cognitive function. However, it is not well understood how specific these cognitive consequences are and what their neural mechanisms might be, nor how these effects may differ across neural development. We propose to address these important questions. We hypothesize that severe hypoglycemia has a deleterious and specific effect on the hippocampus, a region particularly sensitive to metabolic insults, and on long-term memory, a skill that relies upon the integrity of the hippocampus, in children with T1DM. Using both retrospective and prospective methods, we will determine if the hippocampus is smaller in children with a history of repeated severe hypoglycemia. These measures will be obtained with high resolution structural magnetic resonance imaging and reliable volumetric measurements. We also will determine if reduced hippocampal volumes correlate with reduced long-term memory function. Memory function will be measured in part by a well-validated spatial delayed response measure that we have previously shown to be sensitive to repeated severe hypoglycemia in children with T1DM. We hypothesize that these effects will follow a developmental trajectory, with greater vulnerability in children who experienced hypoglycemia at younger ages due to interruption of critical developmental processes or to increased susceptibility for neuronal impact. The information obtained in this study will be important for the development of optimal treatment regimens for T1DM that minimize cognitive risk and maximize clinical benefit across the lifespan.

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- **Project Title: PATHOPHYSIOLOGY AND MORTALITY OF STATUS EPILEPTICUS**

  Principal Investigator & Institution: Towne, Alan; Virginia Commonwealth University Richmond, Va 232980568

  Timing: Fiscal Year 2002

  Summary: Despite the significant mortality associated with status epilepticus (SE), little is known concerning the exact pathophysiological basis of death. A major aim of this proposal is to investigate the effects of SE on the central nervous system (CNS) and cardiovascular system (CVS) and determine the causes of mortality associated with SE. Preliminary data from this study have provided the first electrophysiological data on SE patients just prior to and at the time of death, and data on the effects of SE on CVS function. These findings identified two distinct cardiovascular patterns of mean arterial

pressure and rate preceding death in SE. Our research also demonstrated that previously unrecognized CNS and CVS hyper- excitability occurs after SE in a significant percent of patients. We have identified After SE Ictal Discharges (ASIDS) and abnormal evoked potentials (EPs) as electrophysiological high risk markers for a hyper-excitable CNS state. Non-convulsive SE were also demonstrated in up to 10% of **comatose** patients without overt seizure activity. Preliminary results from this study suggested that ASIDS is a predictive indicator of abnormal cardiac function and are associated with increased cardiac arryhythmogenicity. This research project is focused on critically evaluating the pathophysiology of SE by obtaining carefully controlled physiological data on SE in humans. CENTRAL HYPOTHESES will be tested by accomplishing the following Specific Aims. 1. Develop optimal criteria for detecting and evaluating the temporal occurrence of ASIDS; 2. Determine the temporal relationship of ASIDS and cardiac conduction and/or functional abnormalities that can precipitate cardiac arrest or injury; 3. Evaluate the role of EPS in predicting SE patients at high risk of cardiac death. 4. Determine CNS and CVS functional abnormalities prior to death and correlate with pathologic findings; 5. Determine the frequency of occurrence and the clinical presentation of unrecognized non-convulsive SE (NCSE) in **comatose** patients; 6. Establish a prospective data base of clinical CNS and CVS data in a large population of adult SE patients and correlate the functional state of the CNS and CVS with other clinical and laboratory values. By coordinating neurologic and cardiac electrophysiological monitoring with pathological, laboratory, and clinical evaluations in a controlled, prospective, population-based data base, this study may provide the first insights into the causes of death and morbidity from SE in man.

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- **Project Title: POST TRAUMATIC NONCONVULSIVE EPILEPTIFORM ACTIVITY**

  Principal Investigator & Institution: Vespa, Paul M.; Surgery; University of California Los Angeles 10920 Wilshire Blvd., Suite 1200 Los Angeles, Ca 90024

  Timing: Fiscal Year 2002; Project Start 06-SEP-2001; Project End 31-AUG-2006

  Summary: (provided by applicant): The main aim of this proposal is to study the incidence of epileptiform discharges and seizures that occur during **coma** after traumatic brain injury, possible mechanisms of generating epileptiform activity and the neurochemical consequences of this activity. The investigator has made exciting preliminary observations that post-traumatic nonconvulsive seizure activity on continuous electroencephalography (EEG) occurs frequently, is associated with adverse neurochernical changes and increases mortality. Previous animal brain injury models have documented neurochernical and ionic perturbation with an energy crisis and compensatory hyperglycolysis. At the same time there is a selective loss of neuronal inhibition (GABA, y-amino-butyric acid, containing cells) and reduced extracellular magnesium that leads to a decrease in seizure threshold. As a consequence of early post traumatic seizures, cellular energy demand may be increased and lead to secondary injury of cells that survived the initial trauma. Preliminary studies demonstrate an increased incidence of EEG-defined seizures. and epileptiforin activity, however the relationship between early post-traumatic epileptiform activity, the disordered neurochernical state, increased glucose metabolism and secondary cellular injury remain unknown. Thus the central hypothesis of this grant is that early post-traumatic nonconvulsive epileptiform activity is common and leads to further hyperglycolytic neurochernical events (increased lactate, glutamate and decreased glucose) and additional neuronal membrane injury. The specific aims of this proposal will be: (1) delineate the incidence rate, type and duration of early EEG-defined post-traumatic

epileptiform activity (TEEA); (2) define the mechanistic influence of impaired neuronal inhibition in generating TEEA; (3) determine if TEEA results in a hyperglycolytic response; and (4) determine if TEEA leads to additional brain tissue membrane injury, as determined by time-locked increases in extracellular glycerol. The application is intended to pen-nit the candidate to gain important didactic education in research and statistical methods and experience in conducting a human-based basic research paradigm complemented by future animal models. The hypothesis and unique approach come at a crucial time of failed clinical trials and address an important new therapeutic target.

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- **Project Title: PROGESTERONE TREATMENT OF BLUNT TRAUMATIC BRAIN INJURY**

  Principal Investigator & Institution: Kellermann, Arthur L.; Emergency Medicine; Emory University 1784 North Decatur Road Atlanta, Ga 30322

  Timing: Fiscal Year 2002; Project Start 01-AUG-2001; Project End 31-JUL-2004

  Summary: Traumatic brain injury (TBI) is a major cause of premature death and disability worldwide. Few effective treatments exist. Based on encouraging results from studies with animals, we hypothesize that early administration of progesterone to victims of moderate to severe TBI reduces secondary brain injury and improves neurological outcomes. Prior to proceeding with a full-scale clinical trial, we propose to conduct a pilot study by identifying and recruiting eligible subjects at a single level I trauma center. Consenting subjects will be randomly assigned to receive either IV infusion of progesterone or an equivalent volume of placebo. The study team, which will be blinded to treatment status, will monitor each subject's clinical progress and assess outcome at one month post-injury. The primary objectives of this pilot study are to: 1) achieve proper dosing of the study drug, 2) gather data on drug safety, and 3) generate preliminary evidence of efficacy. The secondary objective is to identify the most appropriate clinical subgroup(s) for subsequent treatment in a multi-center trial. To identify the correct dosage and infusion rate to achieve a steady state serum progesterone concentration (SSSPC) level of 450 nmole/L + 100 in our subjects, we will statistically examine the SSSPCs of the first ten subjects randomized to progesterone. To test the safety of the progesterone infusion, we will monitor patients for several unlikely, but potential complications of progesterone administration. To assess the potential efficacy of the progesterone for TBI, we will compare treatment groups with respect to duration of **coma,** death at one month post-injury, and most important, neurological outcome at one month post-injury. Three measures of neurological outcome will be used: the Glasgow Outcome Score, the Disability Rating Scale, and the Galveston Orientation and Amnesia Test. Once these objectives are accomplished, we will apply the lessons learned in this pilot study to mount a multi-center, randomized, double blind, placebo-controlled clinical trial of intravenous progesterone for treatment of traumatic brain injury. If the therapeutic benefits observed in animals are replicated in humans, administration of intravenous progesterone should produce several benefits, including: a) decreased duration of **coma;** b) decreased mortality; and c) improved neurological function. If these hypotheses are verified, this it will represent a major advance in the treatment of traumatic brain injury.

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- **Project Title: PROTON MAGNETIC RESONANCE SPECTROSCOPY OF ACUTE TBI**

  Principal Investigator & Institution: Hillary, Frank G.; Kessler Medical Rehab Res & Educ Corp Research & Education Corp. West Orange, Nj 07052

  Timing: Fiscal Year 2002; Project Start 01-JUL-2002; Project End 30-JUN-2004

  Summary: (provided by applicant): Each year 230,000 people are hospitalized and survive moderate and severe traumatic brain injury (TBI). As a result, a large number of individuals with TBI endure life-long impairment and disability. Acute rating scales such as the Glasgow **Coma** Scale (GCS) have shown limited predictive validity regarding patient outcome and traditional neuroimaging techniques such as CT and MRI maintain limited correlations with brain injury severity and cognitive functioning. Continued advances in neuroimaging, however, have provided researchers with an important opportunity to study the pathophysiology of brain dysfunction following TBI. According to the NCMRR, "the neurobiology of TBI in humans should be studied with modern imaging techniques". The purpose of this study is to correlate proton magnetic resonance spectroscopy (MRS), an advanced neuroimaging technique, with behavioral measures of TBI severity and cognitive outcome. MRS measures the concentration of cerebral metabolites such as N-acetylaspartate (NAA), choline (Cho), and glutamate (Glu). While MRS has shown promise in predicting brain injury severity and patient outcome, the exact protocols for using MRS with TBI remain undetermined and the purpose of the proposed study is to examine three critical areas: (1) the post-injury time period when the MRS data should be acquired (e.g., within one week or within one month of injury); (2) how metabolites should be measured (i.e., absolute concentrations or changes in concentration over time); and (3) the brain locations best suited for MRS data acquisition (i.e., acquisition near lesion sites or acquisition at sites remote from probable brain lesion). The proposed study will make determinations in these three areas through the use of two acute MRS scans following TBI to measure concentrations of NAA, Cho and Glu and their correlation with injury severity and cognitive variables. In addition, correlation of acute MRS data with behavioral data (e.g., duration of loss of consciousness, duration of post-traumatic amnesia) will elucidate the relationship between changes in brain metabolism and changes in patient behavior during acute recovery from TBI. The present proposal will employ a promising, noninvasive neuroimaging technique, MRS, to determine the most appropriate protocols (i.e., timing, metabolic measurement, brain location for data acquisition) for application of MRS to acute TBI. With an established protocol for using MRS, this instrument should prove useful for determining the effectiveness of acute interventions (e.g. hypothermia, pharmacologic intervention) and for predicting the acute course of patient recovery.

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- **Project Title: QUORUM SENSING AND GENE EXPRESSION IN BACILLUS SUBTILIS**

  Principal Investigator & Institution: Grossman, Alan D.; Associate Professor; Biology; Massachusetts Institute of Technology Room E19-750 Cambridge, Ma 02139

  Timing: Fiscal Year 2003; Project Start 01-MAY-1994; Project End 31-AUG-2007

  Summary: (provided by applicant): Cell-cell signaling controls many processes in the biological world, including development, pathogenesis, growth, mating, and transformation. Signaling processes are often mediated by factors (e.g. hormones, pheromones, neurotransmitters) that are produced by some cells and sensed by others. In bacteria, the ability to sense and respond to high population density is a type of cell-

cell signaling often referred to as quorum-sensing. Cells produce extracellular signaling molecules that accumulate as population density increases, and a physiological response occurs at a critical density. The long-term goal of this project is to understand how Bacillus subtilis modulates gene expression and development in response to environmental conditions, with particular focus on aspects of peptide and cell-cell signaling. The major pathway for quorum sensing in B. subtilis involves activation of the transcription factor **ComA,** a response regulator that is active when phosphorylated. The activity of **ComA** is modulated by at least two different peptide signaling molecules that accumulate in culture supernatant as cells grow to high population density. A major challenge is to elucidate the range of cellular processes that are controlled by cell-cell signaling in a single species. This includes characterizing the genes that are regulated in response to population density, identifying the signaling molecules and pathways, and characterizing the web of overlapping interactions between responses to population density and other physiological signals. We will investigate these issues by characterizing the ComA-dependent quorum response, by characterizing other genes that are likely to be involved in cell-cell signaling, and by testing directly for and characterizing additional cell density-regulated responses. Central to this project is the use of DNA microarrays to characterize mRNA levels under a variety of conditions and in a variety of mutants. Our studies on quorum sensing and gene expression in B. subtilis, are relatively simple, experimentally accessible microbe should provide insights into general mechanisms of cell-cell signaling, signal transduction, and regulation.

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- **Project Title: SCREENING FOR ANTIVIRALS AGAINST FLAVIVIRUSES**

  Principal Investigator & Institution: Olivo, Paul D.; President & Cso; Apath, Llc St. Louis, Mo 63141

  Timing: Fiscal Year 2002; Project Start 15-SEP-2002; Project End 31-AUG-2004

  Summary: (provided by applicant): Viral hemorrhagic fever (VHF) refers to a group of illnesses that are caused by members of four families of viruses. These viruses can cause life-threatening disease with signs of bleeding under the skin, in internal organs, or from various body orifices. Severe cases may also show shock, nervous system malfunction, **coma,** delirium, seizures and renal failure. Some VHF agents have been suspect for abuse in biowarfare/bioterrorism. Members of the family Flaviviridae are among the viral agents that cause VHF. Viruses in this family are all enveloped positive-sense RNA viruses with many similar features in their genome structure and replication cycle. There is no specific treatment for any of the agents that cause VHF, although ribavirin has been effective in treating some cases of VHF and shows some activity against a number of RNA viruses including YFV.This application is in response to the challenge to develop specific treatment modalities for these diseases. We plan to develop cell-based assays for testing and screening of compounds with antiviral activity against certain flaviviruses. These assays will be based on cell lines that harbor a constitutively replicating subgenomic replicon and are modeled on a prototype system developed for hepatitis C virus. Our approach is applicable to a number of viruses that cause viral hemorrhagic fever such as category A bioterrorism agents (tick-borne encephalitis virus, Kyasanur Forest disease virus, Omsk hemorrhagic fever virus, etc.) and category C agents (yellow fever virus, Dengue virus, etc.).

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- **Project Title: SELECTIVE PLASMA EXCHANGE THERAPY**

  Principal Investigator & Institution: Rozga, Jacek; Arbios Technologies, Inc. 2331 Buckingham Ln Los Angeles, Ca 90077

  Timing: Fiscal Year 2003; Project Start 01-APR-2003; Project End 31-MAR-2005

  Summary: (provided by applicant): ARBIOS developed a novel liver support therapy (SEPET) to treat patients with severe acute liver failure (ALF). In the absence of any other alternative, such patients must receive a liver transplant or endure prolonged hospitalization with greater than 80 percent mortality. In treating severe ALF it is critical to provide rapid and complete blood detoxification. For many years, it was assumed that toxins, which cause **coma** in hepatic failure, are small (<5 kDa) dialyzable molecules. Today, the repertoire of putative toxins that accumulate in the blood as a result of liver failure and necrosis includes also protein-bound toxins, cytokines and other <100 kDa molecules. These toxins damage not only brain, but also liver and inhibit its function and regenerative capacity. Of all the strategies employed to date for the development of blood detoxification systems, only total plasma exchange therapy was shown to be clinically effective in reversing hepatic **coma** and improving blood coagulopathy. However, this measure has not achieved wide clinical use because a large volume (up to 20 liters) of normal plasma is needed to produce desired clinical effects. SEPET stands for "selective plasma exchange therapy," i.e., for elimination of the "toxic" fraction of the patient's plasma rather than the entire volume of the patient's plasma. The goal of this proposal is to validate the SEPET concept. Plasma filters with 100 kDa molecular weight cut-off will be used. Pigs with surgically induced ALF will be subjected to 6-hour-long SEPET at the rate of 6 ml/min; normal homologous plasma will be used to replace the "toxic" fraction. In the control ALF pigs, whole plasma exchange using macroporous (0.2 micron) filters will be carried out for 6 hours at the rate of 6 ml/min. Survival time and changes in intracranial pressure, cerebral perfusion pressure, and standard liver function tests will be examined. The Company believes that the proposed studies will validate the SEPET concept and would help commercialize this novel therapy for nearly 250,000 patients with liver failure, which are hospitalized each year in the United States.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: SRF OPERON--REGULATION AND ROLE IN GENETIC COMPETENCE**

  Principal Investigator & Institution: Zuber, Peter A.; Professor; Environmental and Biomolecular Systems; Oregon Health & Science University Portland, or 972393098

  Timing: Fiscal Year 2002; Project Start 01-FEB-1992; Project End 31-AUG-2004

  Summary: (adapted from the investigator's abstract): Bacteria possess regulatory networks that sense environmental and metabolic conditions, and respond by generating and transducing signals that affect gene expression. Starvation and high cell density influence the production of virulence factors such as toxins, antibiotics, and degradative enzymes through regulatory networks. They also induce complex cell differentiation processes that give rise to resistant cell types or competent cells that can acquire exogenous DNA. In Bacillus subtilis, the srf operon resides within a regulatory network that governs processes induced by nutrient depletion and high cell density. srf encodes surfactin synthetase, an antibiotic biosynthesis operon, and ComS, a regulatory peptide that controls competence development. The major goal of the project is to understand how srf and comS are regulated and how ComS stimulates competence development. srf is under the control of two converging regulatory pathways. One

mediates quorum-sensing control and involves the two-component regulators ComP and **ComA;** phorphorylated **ComA** activates srf transcription. The other pathway, involving the Phr extracellular peptide and the SpoOK oligopeptide permease, is activated by starvation and high cell density; the Phr peptide, imported via SpoOK, inhibits the Rap phosphatase that converts **ComA** to an inactive form, allowing interplay between the two pathways. Activation of phr expression requires the SigmaH form of RNA polymerase, the activity of which is induced by starvation and requires ClpX, an ATP-dependent chaperone. The role of ClpX in the activation of E-SigmaH will be determined by purification and reconstitution of RNA polymerase in vitro for transcription reactions containing purified ClpX proteins. Mutations which suppress the phenotype of a clpX mutant will be characterized to identify factors influencing ClpX-dependent activation of E-SigmaH. Other functions of ClpX in the activation of srf transcription will be identified by testing the effects of clpX comP and clpX spoOK double mutants on srf expression. ComS is required to release ComK, the transcriptional activator of competence gene expression, from the competence inhibitory proteins MecA and ClpC. The ComS-dependent release is thought to rescue ComK from regulated proteolysis. A collection of ComS point mutations will be analyzed to determine the function of ComS in the activation of competence gene expression. These studies will further understanding of the functional links between stress-induced proteins and the regulation of prokaryotic cellular differentiation.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: STATUS EPILEPATICUS--A CLINICAL STUDY**

  Principal Investigator & Institution: Delorenzo, Robert J.; Virginia Commonwealth University Richmond, Va 232980568

  Timing: Fiscal Year 2002

  Summary: Status epilepticus (SE) is recognized as a major medical and neurological emergency associated with a high morbidity and mortality. Despite the clinical importance of SE, research regarding the frequency, precipitating events and prognosis of SE has remained an underdeveloped area, because of difficulties in studying SE. This research effort is focused on addressing this need and provides a unified population-based study across all age groups in Richmond, VA. Results during the last granting period provided the first epidemiological prospective, population-based study of SE. In addition to developing epidemiological information on SE, this study identified several novel findings that have opened exciting new aspects of research into SE. In addition to developing epidemiological information on SE, this study identified several novel findings that have opened exciting new aspects of research into SE. These new findings represent challenging areas of future research that are the focus of the specific aims in this research project. Having developed and validated this data base, the Richmond study is poised to make fruitful contributions to our understanding of this condition. The CENTRAL HYPOTHESES for the proposed studies are related to information obtained and analyzed from the development of this large data base for SE in the Richmond population. To test these hypotheses, we will accomplish the following specific aims: 1) maintain a prospective, population-based data base for epidemiological studies of SE in the GRMA; 2) further investigate the contribution of etiology to mortality of SE; 3) evaluate variation in incidence, mortality and clinical presentations of SE in high risk populations (the very young, the elderly, and non-white populations); 4) study the epidemiology, morbidity, mortality and prognostic outcome of SE in the neonatal population; 5) use the GRMA data base to compare the incidence and presentation of SE and seizures of various duration lasting up to 30 minutes; 6) evaluate

the effects of clinical variables and their interactions in determining mortality in SE, using both univariate and multi-variate logistic regression models; and 7) develop the Richmond Outcome Scale to predict mortality in SE and test this scale for predicting mortality in a prospective fashion. To the best of our knowledge, this prospective, population-based SE data base across all age groups represents the only one of its kind in the world. The use of this prospective population-based data base will provide insights into specific predictive indicators are associated with mortality and that and that may play a role in identifying SE patients at high risk for morbidity and mortality.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THE CNS AND CIRRHOSIS:PSYCHOBIOLOGICAL APPROACHES**

  Principal Investigator & Institution: Stewart, Charmaine; Medicine; University of Pennsylvania 3451 Walnut Street Philadelphia, Pa 19104

  Timing: Fiscal Year 2002; Project Start 01-SEP-2002; Project End 31-DEC-2002

  Summary: (provided by applicant): Hepatic encephalopathy (HE) is one of the most common manifestations of decompensated cirrhosis. Approximately 70% of patients with cirrhosis also have subacute hepatic encephalopathy (SHE), as demonstrated on neuropsychological testing. The use of transjugular intrahepatic portosystemic shunts (TIPS), which acts as a side-to-side shunt, has become common to manage complications of cirrhosis. However, TIPS are associated with adverse effects, including worsening of existing HE or the precipitation of overt HE and liver failure. Liver transplantation has become the ideal management for patients who have decompensated liver disease. The principal hypothesis of this proposal is that changes of HE and SHE can be determined by neuropsychological testing and changes in cerebral blood flow (CBF). The Specific Aims are the following: (1) Determine the changes in cognitive function in patients with cirrhosis; (2) Identify changes in CBF and neurotransmitter activity, as assessed by central benzodiazepine receptor binding and serotonin transporter binding after TIPS insertion; (3) Identify changes in CBF and neurotransmitter activity, as assessed by central benzodiazepine receptor binding and serotonin transporter binding after liver transplantation; and (4) Correlate the neuropsychological changes with cognitive function and central benzodiazepine receptor binding and serotonin transporter binding. These Specific Aims will be pursued in 60 subjects: group I will be 20 cirrhotics who will undergo TIPS; group II will be 20 cirrhotic patients who are scheduled to undergo liver transplantation; and group III will be 20 age and sex matched cirrhotic controls. All groups will be studied with a battery of neuropsychological tests and stimulated CBF, using 1502 labeled water, while half of groups I and II will be tested with 11C flumazenil PET or (11C)(+)McN5652 positron emission tomography (PET), in order to determine central benzodiazepine receptor binding and serotonin transporter binding, respectively, before and one month after undergoing TIPS or liver transplantation. The control group will be studied with 11C flumazenil PET or (11C)(+)McN5652 PET at baseline and 1 month, thereafter. In aggregate, these studies will provide a platform to elucidate cognitive and biological mechanisms underlying hepatic encephalopathy with the ultimate goal of enhancing diagnosis and management. Additionally, the proposed studies will be guided by a team of mentors and sponsors and supplemented by a didactic curriculum, all to lay the foundation for eventual independent clinical investigator status.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THE PERMEABILITY TRANSITION IN HEPATIC ENCEPHALOPATHY**

  Principal Investigator & Institution: Norenberg, Michael D.; Professor; Pathology; University of Miami-Medical Box 248293 Coral Gables, Fl 33124

  Timing: Fiscal Year 2003; Project Start 01-SEP-2003; Project End 31-JUL-2008

  Summary: (provided by applicant): Hepatic encephalopathy (HE) is an important cause of morbidity and mortality in patients with severe liver failure. Acute HE associated with fulminant hepatic failure has an extremely poor prognosis and specific therapy is not available, short of an emergency liver transplantation. Although its pathogenesis remains poorly understood, ammonia is strongly implicated as a neurotoxin, and astrocytes appear to be the primary target of ammonia neurotoxicity. Additionally, altered bioenergetics and oxidative stress are thought to play a major role in this disorder. These facts led to a consideration of the involvement of mitochondrial permeability transition (MPT) as a factor in the pathogenesis of HE and ammonia neurotoxicity. The MPT is a Ca2+-dependent, cyclosporin A (CsA)-sensitive process due to the opening of a pore in the inner mitochondrial membrane leading to a collapse of ionic gradients and ultimately to mitochondrial dysfunction. We have recently shown that ammonia induced the MPT in cultured astrocytes. We intend to examine the role of the MPT in HE and hyperammonemia using ammonia-treated neural cell cultures and in vivo models of HE/hyperammonemia (HA). Our working hypothesis is that ammonia induces the MPT in astrocytes, culminating in mitochondrial failure and astroglial dysfunction. A corollary of this concept is that inhibition or interference in the development of the MPT in astrocytes may ameliorate CNS dysfunction in HE. The Specific Aims of this proposal are: 1) To identify the factors responsible for the ammonia-induced MPT in cultured neural cells. Our focus will be on agents implicated in the pathogenesis of HE/H that have also been shown to induce the MPT in other cells. Specifically, we will examine the role of Ca 2+, reactive oxygen species, nitric oxide, pH and glutamine. We will determine whether these factors are elevated in ammonia-treated cultures, and whether diminishing their production or blocking their actions reduces or abolishes the MPT. Additionally, we will examine possible sequential interrelationships among these factors. 2) To determine whether ammonia-induced abnormalities in astrocytes (morphological alterations, defects in neurotransmitter uptake, and cell swelling) are mediated by the MPT, we will investigate whether inhibitors of the MPT (CsA, bongkrekik acid) are capable of diminishing or blocking the deleterious effects of ammonia. 3) To investigate the involvement of mitochondrial dysfunction as a potential factor in MPT-mediated cell injury. We will determine the state of mitochondrial function after ammonia treatment, and then investigate whether improving energy metabolism will inhibit ammonia-induced cellular injury. 4) To clarify whether the MPT occurs in in vivo models of HE (thioacetarnide treatment) and hyperammonemia. We will also determine whether factors that inhibit the MPT in vitro (e.g., CsA, trifluoperazine) are also capable of doing so in vivo. Additionally, we will assess the ability of MPT blockers to improve the clinical, histopathologic, neurochemical abnormalities, and the extent of brain swelling observed in HE/HA. We believe that these studies will yield critical data bearing on the pathogenesis of HE, and may potentially aid in the development of novel therapeutic strategies for the treatment of this condition.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: TRAUMATIC BRAIN INJURY CLINICAL TRIALS NETWORK**

  Principal Investigator & Institution: Eisenberg, Howard M.; Professor; Neurosurgery; University of Maryland Balt Prof School Baltimore, Md 21201

  Timing: Fiscal Year 2003; Project Start 01-JUL-2003; Project End 30-JUN-2008

  Summary: (provided by applicant): This is a proposal to join a multicenter clinical trials research network focused on traumatic brain injury. The proposed site, the University of Maryland and its affiliated hospital system, includes the Shock Trauma Center (STC), the primary trauma center in the State which has close relations with the State EMS helicopter and ground transport systems, two rehabilitation hospitals, Kernan Hospital and the University Specialty Hospital, and community outreach programs. In the last academic year STC admitted 735 patients with traumatic brain injury, 250 were considered severe (Glasgow **Coma** Score [GCS] 3 to 8), 66 considered moderately injured (GCS 9 to 12), 147 were less than 21 years of age, 382 were other than white, 176 were women, and 186 patients were discharged to one of the two rehabilitation hospitals within the system. All of the proposed investigators are full-time members of the faculty of the University of Maryland School of Medicine, and members of the Department of Neurosurgery have participated in virtually every large multi-centered study of head injury since the mid 1980s, including in both phases of the NIH Traumatic **Coma** Data Bank. Also within the School of Medicine is the National Study Center for Trauma and Emergency Medical Services whose role is epidemiological study of traumatic injury. As specified in the LOI, the application is to include a concept protocol to study therapy in a multicenter trial. The proposed study of decompression craniotomy could be initiated in a relatively short time once the funding period begins. While this procedure is being done in some trauma centers, specific criteria have not been determined and efficacy with regard to both short and long term outcome is unknown. While the concept is simplistic it has the advantage of potentially mitigating brain swelling without hematoma or contusion, despite the specific mechanism or mechanisms of secondary injury active at any particular time during the course of the injury.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: URSODIOL-METHOTREXATE FOR PRIMARY BILIARY CIRRHOSIS**

  Principal Investigator & Institution: Combes, Burton; Professor of Internal Medicine; Internal Medicine; University of Texas Sw Med Ctr/Dallas Dallas, Tx 753909105

  Timing: Fiscal Year 2002; Project Start 01-APR-1993; Project End 31-MAR-2004

  Summary: The major thrust of this randomized, double-blinded clinical trial is to determine whether treatment of patients with Primary Biliary Cirrhosis (PBC) with Ursodiol (Ursodeoxycholic Acid-UDCA) plus methotrexate (MTX) is more effective than treatment with UDCA alone. PBC is a chronic cholestatic liver disease, predominantly of women, in which interlobular and septal bile ducts undergo inflammation and destruction. Once initiated, the disease persists and progresses at varying rates. Neither the initiating nor perpetuating mechanisms are well understood. Current concepts of pathogenesis include (1) destruction of bile ducts is maintained and perhaps initiated by autoimmune mechanisms; (2) hydrophobic bile acids which accumulate in serum and liver cause functional and cytotoxic liver injury; (3) cytokines and lymphokines released at sites of inflammation may contribute to cell damage and fibrosis. A considerable body of evidence indicates that UDCA when fed orally leads to improvement in liver tests, in pruritus and in liver histology. There exist differences in opinion as to whether development of complications of liver disease, liver transplantation or transplant-free

survival is affected. UDCA a relatively non-toxic bile acid, when administered orally, alters the composition of the bile acid pool in factor of its enrichment with UDCA and appears to protect against the cytotoxic effects of endogenous bile acids that accumulate as a result of bile duct destruction. MTX is being shown to improve liver tests, symptoms and liver histology in a small number of precirrhotic patients with PBC. The mechanism of action is unknown but felt to be related to antiinflammatory-immunosuppressive effects of MTX. The current trial explores whether MTX improves the therapeutic effects of UDCA in PBC. Patients with PBC whose serum bilirubin is less than 3 mg percent, who have been on UDCA for at least 6 months, and who satisfy a series of inclusion and exclusion criteria are stratified into 2 groups on the basis of liver histologic stage (Ludwig classification), i.e. early (Stages I or II) versus late (Stages III or IV). They are then randomized to receive either methotrexate or its placebo as a second drug while continuing to receive UDCA. The relative value of the two treatment arms is assessed by comparing their effects on symptoms, results of laboratory tests, development of complications of liver disease, histologic changes in liver, liver transplantation, and on transplant-free survival. The safety of each therapeutic regimen is also being determined.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

E-Journals: PubMed Central[3]

PubMed Central (PMC) is a digital archive of life sciences journal literature developed and managed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM).[4] Access to this growing archive of e-journals is free and unrestricted.[5] To search, go to **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Pmc**, and type "coma" (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for coma in the PubMed Central database:

- **British hospitals and different versions of the Glasgow coma scale: telephone survey.** by Wiese MF.; 2003 Oct 4; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=214084
- **Cloning and characterization of the regulatory Bacillus subtilis competence genes comA and comB.** by Guillen N, Weinrauch Y, Dubnau DA.; 1989 Oct; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=210373
- **ComA, a phosphorylated response regulator protein of Bacillus subtilis, binds to the promoter region of srfA.** by Roggiani M, Dubnau D.; 1993 May; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=204641
- **Comparison of APACHE II, MEES and Glasgow Coma Scale in patients with nontraumatic coma for prediction of mortality.** by Grmec S, Gasparovic V.; 2001; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=29052

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[3] Adapted from the National Library of Medicine: **http://www.pubmedcentral.nih.gov/about/intro.html**.

[4] With PubMed Central, NCBI is taking the lead in preservation and maintenance of open access to electronic literature, just as NLM has done for decades with printed biomedical literature. PubMed Central aims to become a world-class library of the digital age.

[5] The value of PubMed Central, in addition to its role as an archive, lies in the availability of data from diverse sources stored in a common format in a single repository. Many journals already have online publishing operations, and there is a growing tendency to publish material online only, to the exclusion of print.

- **Control of germination and lipid mobilization by COMATOSE, the Arabidopsis homologue of human ALDP.** by Footitt S, Slocombe SP, Larner V, Kurup S, Wu Y, Larson T, Graham I, Baker A, Holdsworth M.; 2002 Jun 17; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=125387
- **Deficiency of Viral Ribonucleic Acid-Dependent Deoxyribonucleic Acid Polymerase in Noninfectious Virus-Like Particles Released from Murine Sarcoma Virus-Transformed Hamster Cells.** by Peebles PT, Haapala DK, Gazdar AF.; 1972 Mar; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=356323
- **DegS-DegU and ComP-ComA modulator-effector pairs control expression of the Bacillus subtilis pleiotropic regulatory gene degQ.** by Msadek T, Kunst F, Klier A, Rapoport G.; 1991 Apr; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=207789
- **Differential regulation of mRNAs for nerve growth factor, brain-derived neurotrophic factor, and neurotrophin 3 in the adult rat brain following cerebral ischemia and hypoglycemic coma.** by Lindvall O, Ernfors P, Bengzon J, Kokaia Z, Smith ML, Siesjo BK, Persson H.; 1992 Jan 15; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=48296
- **DNA microarray analysis of Bacillus subtilis DegU, ComA and PhoP regulons: an approach to comprehensive analysis of B.subtilis two-component regulatory systems.** by Ogura M, Yamaguchi H, Yoshida KI, Fujita Y, Tanaka T.; 2001 Sep 15; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=55910
- **FBJ osteosarcoma virus in tissue culture. III. Isolation and characterization of non-virus-producing FBJ-transformed cells.** by Levy JA, Kazan PL, Reilly CA, Finkel MP.; 1978 Apr; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=354028
- **Genetic transformation in Streptococcus pneumoniae: nucleotide sequence analysis shows comA, a gene required for competence induction, to be a member of the bacterial ATP-dependent transport protein family.** by Hui FM, Morrison DA.; 1991 Jan; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=207196
- **Helper-independent transformation by unintegrated Harvey sarcoma virus DNA.** by Lowy DR, Rands E, Scolnick EM.; 1978 May; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=354067
- **Mechanisms of Seizures and Coma in Hypoglycemia EVIDENCE FOR A DIRECT EFFECT OF INSULIN ON ELECTROLYTE TRANSPORT IN BRAIN.** by Arieff AI, Doerner T, Zelig H, Massry SG.; 1974 Sep; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=301599
- **Purification of DNA complementary to the env gene of avian sarcoma virus and analysis of relationships among the env genes of avian leukosis-sarcoma viruses.** by Tal J, Fujita DJ, Kawai S, Varmus HE, Bishop JM.; 1977 Feb; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=353850

- **Sequence and transcription mapping of Bacillus subtilis competence genes comB and comA, one of which is related to a family of bacterial regulatory determinants.** by Weinrauch Y, Guillen N, Dubnau DA.; 1989 Oct; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=210374
- **Studies on Mechanisms of Cerebral Edema in Diabetic Comas. EFFECTS OF HYPERGLYCEMIA AND RAPID LOWERING OF PLASMA GLUCOSE IN NORMAL RABBITS.** by Arieff AI, Kleeman CR.; 1973 Mar; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=302295
- **The primary role of comA in establishment of the competent state in Bacillus subtilis is to activate expression of srfA.** by Nakano MM, Zuber P.; 1991 Nov; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=209234
- **Transcription initiation region of the srfA operon, which is controlled by the comP-comA signal transduction system in Bacillus subtilis.** by Nakano MM, Xia LA, Zuber P.; 1991 Sep; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=208261
- **Transcriptional regulation of Bacillus subtilis glucose starvation-inducible genes: control of gsiA by the ComP-ComA signal transduction system.** by Mueller JP, Bukusoglu G, Sonenshein AL.; 1992 Jul; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=206221

The National Library of Medicine: PubMed

One of the quickest and most comprehensive ways to find academic studies in both English and other languages is to use PubMed, maintained by the National Library of Medicine.[6] The advantage of PubMed over previously mentioned sources is that it covers a greater number of domestic and foreign references. It is also free to use. If the publisher has a Web site that offers full text of its journals, PubMed will provide links to that site, as well as to sites offering other related data. User registration, a subscription fee, or some other type of fee may be required to access the full text of articles in some journals.

To generate your own bibliography of studies dealing with coma, simply go to the PubMed Web site at **http://www.ncbi.nlm.nih.gov/pubmed**. Type "coma" (or synonyms) into the search box, and click "Go." The following is the type of output you can expect from PubMed for coma (hyperlinks lead to article summaries):

[6] PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) at the National Institutes of Health (NIH). The PubMed database was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journal articles at Web sites of participating publishers. Publishers that participate in PubMed supply NLM with their citations electronically prior to or at the time of publication.

- **A prospective study of Glasgow Coma Scale (GCS), age, CSF-neutrophil count, and CSF-protein and glucose levels as prognostic indicators in 100 adult patients with meningitis.**
  Author(s): Schutte CM, van der Meyden CH.
  Source: The Journal of Infection. 1998 September; 37(2): 112-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9821083

- **A survey on patients admitted in severe coma: implications for brain death identification and organ donation.**
  Author(s): Senouci K, Guerrini P, Diene E, Atinault A, Claquin J, Bonnet F, Tuppin P.
  Source: Intensive Care Medicine. 2004 January; 30(1): 38-44. Epub 2003 August 16.
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- **A young woman with persistent hypoglycemia, rhabdomyolysis, and coma: recognizing fatty acid oxidation defects in adults.**
  Author(s): Kluge S, Kuhnelt P, Block A, Merkel M, Gocht A, Lukacs Z, Kohlschutter A, Kreymann G.
  Source: Critical Care Medicine. 2003 April; 31(4): 1273-6.
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- **Abdominal lymphomas, convulsive seizure and coma: a case of successfully treated, advanced Whipple's disease with cerebral involvement.**
  Author(s): Mohm J, Naumann R, Schuler U, Ehninger G.
  Source: European Journal of Gastroenterology & Hepatology. 1998 October; 10(10): 893-5.
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  Author(s): Nielsen H, Thomsen JL, Kristensen IB, Ottosen PD.
  Source: Pathology. 2003 August; 35(4): 305-10.
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  Author(s): Young J.
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  Author(s): Peterson DE.
  Source: Obstetrics and Gynecology. 2003 November; 102(5 Pt 2): 1212-5.
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- **Adding up the Glasgow Coma Score.**
  Author(s): Teasdale G, Murray G, Parker L, Jennett B.
  Source: Acta Neurochir Suppl (Wien). 1979; 28(1): 13-6. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=290137

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  Author(s): Feillet F, Steinmann G, Vianey-Saban C, de Chillou C, Sadoul N, Lefebvre E, Vidailhet M, Bollaert PE.
  Source: Intensive Care Medicine. 2003 September; 29(9): 1594-7. Epub 2003 August 01.
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  Author(s): Carroll WM, Mastaglia FL.
  Source: Electroencephalography and Clinical Neurophysiology. 1979 January; 46(1): 95-105.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=88336

- **Alpha-coma in an infant with hypoxic-ischaemic encephalopathy.**
  Author(s): Landau D, Shorer Z, Shinwell E.
  Source: Archives of Disease in Childhood. Fetal and Neonatal Edition. 1999 January; 80(1): F79-80.
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  Author(s): Kokori H, Giannakopoulou C, Paspalaki P, Tsatsakis A, Sbyrakis S.
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  Author(s): Maddock H, Carley S, McCluskey A.
  Source: Anaesthesia. 1999 July; 54(7): 717-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10417478

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CHAPTER 2. NUTRITION AND COMA

Overview

In this chapter, we will show you how to find studies dedicated specifically to nutrition and coma.

Finding Nutrition Studies on Coma

The National Institutes of Health's Office of Dietary Supplements (ODS) offers a searchable bibliographic database called the IBIDS (International Bibliographic Information on Dietary Supplements; National Institutes of Health, Building 31, Room 1B29, 31 Center Drive, MSC 2086, Bethesda, Maryland 20892-2086, Tel: 301-435-2920, Fax: 301-480-1845, E-mail: ods@nih.gov). The IBIDS contains over 460,000 scientific citations and summaries about dietary supplements and nutrition as well as references to published international, scientific literature on dietary supplements such as vitamins, minerals, and botanicals.[7] The IBIDS includes references and citations to both human and animal research studies.

As a service of the ODS, access to the IBIDS database is available free of charge at the following Web address: **http://ods.od.nih.gov/databases/ibids.html**. After entering the search area, you have three choices: (1) IBIDS Consumer Database, (2) Full IBIDS Database, or (3) Peer Reviewed Citations Only.

Now that you have selected a database, click on the "Advanced" tab. An advanced search allows you to retrieve up to 100 fully explained references in a comprehensive format. Type "coma" (or synonyms) into the search box, and click "Go." To narrow the search, you can also select the "Title" field.

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[7] Adapted from **http://ods.od.nih.gov**. IBIDS is produced by the Office of Dietary Supplements (ODS) at the National Institutes of Health to assist the public, healthcare providers, educators, and researchers in locating credible, scientific information on dietary supplements. IBIDS was developed and will be maintained through an interagency partnership with the Food and Nutrition Information Center of the National Agricultural Library, U.S. Department of Agriculture.

The following is a typical result when searching for recently indexed consumer information on coma:

- **Increasing incidence of hypoglycemic coma in children with IDDM.**
  Author(s): Department of Pediatrics, University of Berne, Switzerland.
  Source: Egger, M Gschwend, S Smith, G D Zuppinger, K Diabetes-Care. 1991 November; 14(11): 1001-5 0149-5992
- **Uncontrolled diabetes mellitus in adults: Experience in treating diabetic ketoacidosis and hyperosmolar nonketotic coma with low-dose insulin and a uniform treatment regimen.**
  Source: Diabetes-Care. New York : American Diabetes Association. Nov/December 1983. volume 6 (6) page 579-585. ill., charts. 0149-5992

The following information is typical of that found when using the "Full IBIDS Database" to search for "coma" (or a synonym):

- **A case of hyperglycemic hyperosmolar non-ketotic coma during anesthesia: a possible cause of failed re-awakening.**
  Author(s): Istituto di Clinica Medica, Universita di Sassari, Italy.
  Source: Maioli, M Arca, G M Ganau, A Mastroni, P Pacifico, A Padua, G Piredda, G Solinas, G Tonolo, G Ruiu, P Diabetes-Res. 1991 September; 18(1): 45-8 0265-5985
- **A comatose man with marked acidosis and crystaluria.**
  Author(s): Department of Internal Medicine, Baylor College of Medicine, Houston.
  Source: Olivero, J J Hosp-Pract-(Off-Ed). 1993 July 15; 28(7): 86-8 8750-2836
- **Adrenal crisis presenting as hypoglycemic coma.**
  Author(s): Department of Intensive Care, Children's Hospital, University of Zurich, Steinwiesstrasse 75, CH-8032 Zurich, Swizerland. jfischer@kispi.unizh.ch
  Source: Fischer, J E Stallmach, T Fanconi, S Intensive-Care-Med. 2000 January; 26(1): 105-8 0342-4642
- **Clinical efficacy of stimulation programs aimed at reversing coma or vegetative state (VS) following traumatic brain injury.**
  Author(s): Universite de Montreal, Montreal, Quebec, Canada.
  Source: Vanier, M Lamoureux, J Dutil, E Houde, S Acta-Neurochir-Suppl. 2002; 79: 53-7 0065-1419
- **Coma blisters in a case of fatal theophylline intoxication.**
  Author(s): Institute of Legal Medicine, University of Hamburg, Germany. mstokos@web.de
  Source: Tsokos, M Sperhake, J P Am-J-Forensic-Med-Pathol. 2002 September; 23(3): 292-4 0195-7910
- **Coma induced by intoxication.**
  Author(s): Department of Emergency Medicine, University Hospital, Gent, Belgium.
  Source: Buylaert, W A Acta-Neurol-Belg. 2000 December; 100(4): 221-4 0300-9009
- **Coma probably induced by lorazepam-valproate interaction.**
  Author(s): Department of Neurology and Neurosurgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea. salee@www.amc.seoul.kr
  Source: Lee, Sang Ahm Lee, Jung Kyo Heo, Kyoung Seizure. 2002 March; 11(2): 124-5 1059-1311

- **Comparison of intramuscular glucagon and intravenous dextrose in the treatment of hypoglycaemic coma in an accident and emergency department.**
  Author(s): Diabetic Department, Royal Infirmary, Edinburgh, Scotland.
  Source: Patrick, A W Collier, A Hepburn, D A Steedman, D J Clarke, B F Robertson, C Arch-Emerg-Med. 1990 June; 7(2): 73-7 0264-4924

- **Continuous infusion of vasopressin in comatose children with neurogenic diabetes insipidus.**
  Author(s): Department of Pediatrics, Mackay Memorial Hospital, Taipei, Taiwan.
  Source: Lee, Y J Shen, E Y Huang, F Y Kao, H A Shyur, S D J-Pediatr-Endocrinol-Metab. 1995 Oct-December; 8(4): 257-62

- **Emergency! Myxedema coma.**
  Author(s): Department of Nursing, College of Staten Island, NY, USA.
  Source: McMorrow, M E Am-J-Nurs. 1996 October; 96(10): 55 0002-936X

- **Myxedema coma. Pathophysiology, therapy, and factors affecting prognosis.**
  Author(s): Department of Medicine, Quillen College of Medicine, East Tennessee State University, Johnson City.
  Source: Jordan, R M Med-Clin-North-Am. 1995 January; 79(1): 185-94 0025-7125

- **Myxoedema coma: response of thyroid hormones with oral and intravenous high-dose L-thyroxine treatment.**
  Author(s): Service de Medecine Interne-Endocrinologie, Centre Hospitalier Regional, France.
  Source: Arlot, S Debussche, X Lalau, J D Mesmacque, A Tolani, M Quichaud, J Fournier, A Intensive-Care-Med. 1991; 17(1): 16-8 0342-4642

- **Peritoneal dialysis in an infant with type 1 diabetes and hyperosmolar coma.**
  Author(s): Department of Pediatrics, University of Rome La Sapienza, Italy.
  Source: Multari, G Werner, B Cervoni, M Lubrano, R Costantino, F Demiraj, V Pozzilli, P J-Endocrinol-Invest. 2001 February; 24(2): 104-6 0391-4097

- **Polyarticular heterotopic ossification complicating drug-induced coma.**
  Author(s): V O di Rheumatologia, Azienda Ospedaliera San Camillo-Forlanini, Rome, Italy.
  Source: Sebastiani, G D Antonelli, S Clin-Rheumatol. 2002 May; 21(2): 173-5 0770-3198

- **Practical management of diabetic ketoacidosis and hyperosmolar coma.**
  Author(s): Ewen Downie Metabolic Unit, Alfred Hospital, Melbourne, Vic., Australia.
  Source: Hamblin, P S Topliss, D J Stockigt, J R Aust-N-Z-J-Med. 1990 December; 20(6): 836-41 0004-8291

- **Rapid evaluation of comatose patients.**
  Author(s): Clinical Center, Michigan State University, East Lansing 48824-1315.
  Source: Alguire, P C Postgrad-Med. 1990 May 1; 87(6): 223-8, 233 0032-5481

- **Reversible coma in children after improper baclofen pump insertion.**
  Author(s): Department of Pediatric Anaesthesia, Neurosurgery and Oncology Montreal Childrens' Hospital, McGill University Healthcare Center, Montreal, Quebec, Canada. maria.distefano@muhc.mcgill.ca
  Source: Anderson, K J Farmer, J P Brown, K Paediatr-Anaesth. 2002 June; 12(5): 454-60 1155-5645

- **Sucrose and dental caries--considerations of the COMA panel.**
  Author(s): School of Dental Science, Trinity College, Dublin, Ireland.
  Source: Hobdell, M H J-Ir-Dent-Assoc. 1993; 39(4): 97 0021-1133

- **Suicide of a diabetic by inducing hyperglycemic coma.**
  Author(s): Institute of Legal Medicine, Munster, Germany.
  Source: Banaschak, S Bajanowski, T Brinkmann, B Int-J-Legal-Med. 2000; 113(3): 162-3 0937-9827
- **The COMA Report on dietary reference values.**
  Source: Ashwell, M. B-N-F-Nutr-Bull-Br-Nutr-Found. London : The Foundation. Sept 1991. volume 16 page 132-135. 0141-9684
- **The COMA report: nursing implications.**
  Source: Shore, C Paediatr-Nurs. 1995 April; 7(3): 14-7 0962-9513
- **Triphasic waves in myxedema coma.**
  Author(s): Department of Neurology, Hadassah University Hospital, Hebrew University-Hadassah Medical School, Jerusalem, Israel.
  Source: River, Y Zelig, O Clin-Electroencephalogr. 1993 July; 24(3): 146-50 0009-9155

Federal Resources on Nutrition

In addition to the IBIDS, the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) provide many sources of information on general nutrition and health. Recommended resources include:

- healthfinder®, HHS's gateway to health information, including diet and nutrition: **http://www.healthfinder.gov/scripts/SearchContext.asp?topic=238&page=0**
- The United States Department of Agriculture's Web site dedicated to nutrition information: **www.nutrition.gov**
- The Food and Drug Administration's Web site for federal food safety information: **www.foodsafety.gov**
- The National Action Plan on Overweight and Obesity sponsored by the United States Surgeon General: **http://www.surgeongeneral.gov/topics/obesity/**
- The Center for Food Safety and Applied Nutrition has an Internet site sponsored by the Food and Drug Administration and the Department of Health and Human Services: **http://vm.cfsan.fda.gov/**
- Center for Nutrition Policy and Promotion sponsored by the United States Department of Agriculture: **http://www.usda.gov/cnpp/**
- Food and Nutrition Information Center, National Agricultural Library sponsored by the United States Department of Agriculture: **http://www.nal.usda.gov/fnic/**
- Food and Nutrition Service sponsored by the United States Department of Agriculture: **http://www.fns.usda.gov/fns/**

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering food and nutrition. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=174&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/med_nutrition.html**

- Google: **http://directory.google.com/Top/Health/Nutrition/**
- Healthnotes: **http://www.healthnotes.com/**
- Open Directory Project: **http://dmoz.org/Health/Nutrition/**
- Yahoo.com: **http://dir.yahoo.com/Health/Nutrition/**
- WebMD®Health: **http://my.webmd.com/nutrition**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,00.html**

The following is a specific Web list relating to coma; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **Vitamins**

  Niacin
  Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,892,00.html

  Vitamin A
  Source: Prima Communications, Inc.www.personalhealthzone.com

  Vitamin C
  Source: Healthnotes, Inc.; www.healthnotes.com

- **Minerals**

  Chromium
  Source: Integrative Medicine Communications; www.drkoop.com

  Copper
  Source: Integrative Medicine Communications; www.drkoop.com

  Lovastatin
  Source: Healthnotes, Inc.; www.healthnotes.com

  Magnesium
  Source: Healthnotes, Inc.; www.healthnotes.com

  Magnesium
  Source: Integrative Medicine Communications; www.drkoop.com

  Magnesium
  Source: Prima Communications, Inc.www.personalhealthzone.com

- **Food and Diet**

  High Cholesterol
  Source: Healthnotes, Inc.; www.healthnotes.com

  Omega-3 Fatty Acids
  Source: Integrative Medicine Communications; www.drkoop.com

  Pain
  Source: Healthnotes, Inc.; www.healthnotes.com

  Weight Loss and Obesity
  Source: Healthnotes, Inc.; www.healthnotes.com

  Weight Management Index
  Source: Healthnotes, Inc.; www.healthnotes.com

CHAPTER 3. ALTERNATIVE MEDICINE AND COMA

Overview

In this chapter, we will begin by introducing you to official information sources on complementary and alternative medicine (CAM) relating to coma. At the conclusion of this chapter, we will provide additional sources.

National Center for Complementary and Alternative Medicine

The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (**http://nccam.nih.gov/**) has created a link to the National Library of Medicine's databases to facilitate research for articles that specifically relate to coma and complementary medicine. To search the database, go to the following Web site: **http://www.nlm.nih.gov/nccam/camonpubmed.html**. Select "CAM on PubMed." Enter "coma" (or synonyms) into the search box. Click "Go." The following references provide information on particular aspects of complementary and alternative medicine that are related to coma:

- **"Hypoglycaemic coma due to ayurvedic preparations".**
  Author(s): Glambhir IS, Singh DS, Singh RH.
  Source: J Assoc Physicians India. 1987 December; 35(12): 874. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3449553

- **A CNV-like negative shift in deep coma.**
  Author(s): Dolce G, Sannita W.
  Source: Electroencephalography and Clinical Neurophysiology. 1973 June; 34(6): 647-50.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4122400

- **Active music therapy in the rehabilitation of severe brain injured patients during coma recovery.**
  Author(s): Formisano R, Vinicola V, Penta F, Matteis M, Brunelli S, Weckel JW.

Source: Ann Ist Super Sanita. 2001; 37(4): 627-30.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12046234

- **Acute hyperosmolar coma complicating anesthesia for hydatid disease surgery.**
Author(s): Rakic M, Vegan B, Sprung J, Biocic M, Barnas GM, Bourke DL.
Source: Anesthesiology. 1994 May; 80(5): 1175-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8017656

- **Alcohol-induced hypoglycemia and coma caused by alcohol sponging.**
Author(s): Moss MH.
Source: Pediatrics. 1970 September; 46(3): 445-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5454799

- **Auditory information processing in comatose patients: EPs to synthesised 'musical' tones.**
Author(s): Jones SJ, Pato MV, Longe O.
Source: Electroencephalogr Clin Neurophysiol Suppl. 1999; 50: 402-7. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10689486

- **Auditory stimulation effect on a comatose survivor of traumatic brain injury.**
Author(s): Jones R, Hux K, Morton-Anderson KA, Knepper L.
Source: Archives of Physical Medicine and Rehabilitation. 1994 February; 75(2): 164-71.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8311672

- **Autonomic responses to meaningful and non-meaningful auditory stimuli in coma.**
Author(s): Schuri U, von Cramon D.
Source: Arch Psychiatr Nervenkr. 1979; 227(2): 143-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=543793

- **Brainstem auditory evoked potentials and somatosensory evoked potentials in prediction of posttraumatic coma in children.**
Author(s): Butinar D, Gostisa A.
Source: Pflugers Archiv : European Journal of Physiology. 1996; 431(6 Suppl 2): R289-90.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8739378

- **Brainstem auditory evoked responses in patients comatose as a result of blunt head trauma.**
Author(s): Seales DM, Rossiter VS, Weinstein ME.
Source: The Journal of Trauma. 1979 May; 19(5): 347-53.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=448771

- **Childlike behavior and thought while emerging from insulin coma. studies with hypnosis in schizophrenic patients.**
  Author(s): FRIEDMAN JJ.
  Source: Psychosomatics. 1964 March-April; 57: 102-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14130879

- **Clinical applications of brainstem auditory evoked potentials in comatose patients.**
  Author(s): Uziel A, Benezech J, Lorenzo S, Monstrey Y, Duboin MP, Roquefeuil B.
  Source: Adv Neurol. 1982; 32: 195-202. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7054940

- **Cognitive-behavioral recovery in comatose patients following auditory sensory stimulation.**
  Author(s): Davis AE, Gimenez A.
  Source: The Journal of Neuroscience Nursing : Journal of the American Association of Neuroscience Nurses. 2003 August; 35(4): 202-9, 214.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12942654

- **Coma and neuropathy after ingestion of herbal laxative containing podophyllin.**
  Author(s): Dobb GJ, Edis RH.
  Source: The Medical Journal of Australia. 1984 April 14; 140(8): 495-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6323937

- **Coma associated with vincristine therapy.**
  Author(s): Whittaker JA, Parry DH, Bunch C, Weatherall DJ.
  Source: British Medical Journal. 1973 November 10; 4(5888): 335-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4758426

- **Coma from the health food store: interaction between kava and alprazolam.**
  Author(s): Almeida JC, Grimsley EW.
  Source: Annals of Internal Medicine. 1996 December 1; 125(11): 940-1.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8967683

- **Coma in a park.**
  Author(s): Pilz B, Mesner C, Baetgen S, Luft FC.
  Source: Lancet. 1999 September 25; 354(9184): 1090.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10509501

- **Coma in a patient with Alzheimer's disease taking low dose trazodone and gingko biloba.**
  Author(s): Galluzzi S, Zanetti O, Binetti G, Trabucchi M, Frisoni GB.

Source: Journal of Neurology, Neurosurgery, and Psychiatry. 2000 May; 68(5): 679-80.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10836866

- **Coma produced by topical application of isopropanol.**
Author(s): McFadden SW, Haddow JE.
Source: Pediatrics. 1969 April; 43(4): 622-3.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5777081

- **Coma reversal with cerebral dysfunction recovery after repetitive hyperbaric oxygen therapy for severe carbon monoxide poisoning.**
Author(s): Dean BS, Verdile VP, Krenzelok EP.
Source: The American Journal of Emergency Medicine. 1993 November; 11(6): 616-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8043054

- **Dissociation of somatosensory and motor evoked potentials in non-comatose patients after head injury.**
Author(s): Chistyakov AV, Hafner H, Soustiel JF, Trubnik M, Levy G, Feinsod M.
Source: Clinical Neurophysiology : Official Journal of the International Federation of Clinical Neurophysiology. 1999 June; 110(6): 1080-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10402095

- **Early rehabilitative concepts in therapy of the comatose brain injured patients.**
Author(s): Lippert-Gruner M, Wedekind C, Ernestus RI, Klug N.
Source: Acta Neurochir Suppl. 2002; 79: 21-3.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11974978

- **Effect of iron chelation therapy on recovery from deep coma in children with cerebral malaria.**
Author(s): Gordeuk V, Thuma P, Brittenham G, McLaren C, Parry D, Backenstose A, Biemba G, Msiska R, Holmes L, McKinley E, et al.
Source: The New England Journal of Medicine. 1992 November 19; 327(21): 1473-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1406879

- **Effects of auditory stimuli on comatose patients with head injury.**
Author(s): Prendergast V, Archibald J.
Source: Heart & Lung : the Journal of Critical Care. 1991 January; 20(1): 98-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1988402

- **Effects of auditory stimuli on comatose patients with head injury.**
Author(s): Sisson R.

Source: Heart & Lung : the Journal of Critical Care. 1990 July; 19(4): 373-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2370168

- **Electric coma treatment of mental disorder; a further report.**
Author(s): BLIGNAULT AP.
Source: South African Medical Journal. Suid-Afrikaanse Tydskrif Vir Geneeskunde. 1955 November 5; 29(45): 1046-50.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=13281648

- **Electrical termination of hypoglycaemic coma.**
Author(s): MONTAGU JD.
Source: J Ment Sci. 1953 January; 99(414): 112-22. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=13023373

- **Electroencephalographic rhythms of alpha frequency in comatose patients after cardiopulmonary arrest.**
Author(s): Vignaendra V, Wilkus RJ, Copass MK, Chatrian GE.
Source: Neurology. 1974 June; 24(6): 582-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4857554

- **Environmental deprivation and enrichment in coma.**
Author(s): LeWinn EB, Dimancescu MD.
Source: Lancet. 1978 July 15; 2(8081): 156-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=78357

- **ERPs obtained with the auditory oddball paradigm in coma and altered states of consciousness: clinical relationships, prognostic value, and origin of components.**
Author(s): Guerit JM, Verougstraete D, de Tourtchaninoff M, Debatisse D, Witdoeckt C.
Source: Clinical Neurophysiology : Official Journal of the International Federation of Clinical Neurophysiology. 1999 July; 110(7): 1260-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10423191

- **Event-related potentials--neurophysiological tools for predicting emergence and early outcome from traumatic coma.**
Author(s): Kane NM, Curry SH, Rowlands CA, Manara AR, Lewis T, Moss T, Cummins BH, Butler SR.
Source: Intensive Care Medicine. 1996 January; 22(1): 39-46.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8857436

- **Fatal hepatic coma attributed to paclitaxel.**
Author(s): Feenstra J, Vermeer RJ, Stricker BH.

Source: Journal of the National Cancer Institute. 1997 April 16; 89(8): 582-4.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9106649

- **Fresh cell therapy followed by fatal coma.**
Author(s): Goebel HH, Walther G, Meuth M.
Source: Journal of Neurology. 1986 August; 233(4): 242-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2875134

- **gamma-Hydroxybutyrate: a health-food product producing coma and seizurelike activity.**
Author(s): Dyer JE.
Source: The American Journal of Emergency Medicine. 1991 July; 9(4): 321-4.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2054002

- **Hyperbaric oxygen in reversing carbon monoxide coma. Neurologic and psychologic study.**
Author(s): Winter A, Shatin L.
Source: N Y State J Med. 1970 April 1; 70(7): 880-4. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5264382

- **Hypnotic imagery and suggestion as an adjunctive treatment in a case of coma.**
Author(s): Johnson GM.
Source: Am J Clin Hypn. 1987 April; 29(4): 255-9. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3591717

- **Innovative sensory input for the comatose brain-injured patient.**
Author(s): Davis AE, White JJ.
Source: Critical Care Nursing Clinics of North America. 1995 June; 7(2): 351-61.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7619377

- **Letter: Coma and convulsions associated with vincristine therapy.**
Author(s): Martin J, Mainwaring D.
Source: British Medical Journal. 1973 December 29; 4(5895): 782-3.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4357140

- **Marihuana and the diabetic coma.**
Author(s): Hughes JE, Steahly LP, Bier MM.
Source: Jama : the Journal of the American Medical Association. 1970 November 9; 214(6): 1113-4.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4990907

- **Multimodality evoked potentials (auditory, somatosensory and motor) in coma.**
  Author(s): Facco E, Munari M, Baratto F, Behr AU, Giron GP.
  Source: Neurophysiologie Clinique = Clinical Neurophysiology. 1993 May; 23(2-3): 237-58. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8326933

- **Normal pressure hydrocephalus in diabetic patients with recurrent episodes of hypoglycemic coma.**
  Author(s): Iino K, Yoshinari M, Yoshizumi H, Ichikawa K, Iwase M, Fujishima M.
  Source: Diabetes Research and Clinical Practice. 2000 February; 47(2): 105-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10670909

- **Nutritional goals from COMA and NACNE: how can they be achieved?**
  Author(s): Nelson M.
  Source: Hum Nutr Appl Nutr. 1985 December; 39(6): 456-64.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3005198

- **Pilot study of electrical stimulation on median nerve in comatose severe brain injured patients: 3-month outcome.**
  Author(s): Peri CV, Shaffrey ME, Farace E, Cooper E, Alves WM, Cooper JB, Young JS, Jane JA.
  Source: Brain Injury : [bi]. 2001 October; 15(10): 903-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11595086

- **Potentiation and facilitation of insulin coma therapy.**
  Author(s): HAYES JB, KENNEDY RE.
  Source: The American Journal of Psychiatry. 1959 August; 116: 164-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14400329

- **Reversible hepatic coma possibly induced by docetaxel treatment.**
  Author(s): Chen YM, Tsai CM, Perng RP.
  Source: Lung Cancer (Amsterdam, Netherlands). 2001 February-March; 31(2-3): 347-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11305259

- **Sound-musical stimulation of comatose patients: theoretical basis for a research program.**
  Author(s): Urciuoli R, Scarso G, Livigni S, Emanuelli G, De Bacco C, Salza P, Rovera GG.
  Source: Intensive Care Medicine. 1999 April; 25(4): 422.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10342522

- **Stimulation programs for coma patients.**
  Author(s): Helwick LD.

Source: Critical Care Nurse. 1994 August; 14(4): 47-52. Review.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8055688

- **Successful reversal of presumed carbon monoxide-induced semicoma.**
Author(s): Yee LM, Brandon GK.
Source: Aviation, Space, and Environmental Medicine. 1983 July; 54(7): 641-3.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6882333

- **Teaching resuscitation and comatose patient care.**
Author(s): REDDING JS.
Source: International Anesthesiology Clinics. 1965 February; 47: 241-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14299002

- **The Coma Arousal Team. Procedures for the patient's professional attendants and for his family.**
Author(s): LeWinn EB.
Source: R Soc Health J. 1980 February; 100(1): 19-21. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7367595

- **The prognostic value of three-modality evoked potentials (TMEPs) in anoxic and traumatic comas.**
Author(s): Guerit JM, de Tourtchaninoff M, Soveges L, Mahieu P.
Source: Neurophysiologie Clinique = Clinical Neurophysiology. 1993 May; 23(2-3): 209-26.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8326931

- **The reversal of anticholinergic drug-induced delirium and coma with physostigmine.**
Author(s): Heiser JF, Gillin JC.
Source: The American Journal of Psychiatry. 1971 February; 127(8): 1050-4.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5099944

- **The use of electrostimulation in the treatment of drug coma.**
Author(s): HAWKINS JR, FABING HD, WEAVER GM.
Source: Confin Neurol. 1954; 14(5): 297-304. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=13231484

- **Thrombotic thrombocytopenic purpura: prolonged coma with recovery of neurologic function with intensive plasma exchange.**
Author(s): Frankel AE, Rubenstein MD, Wall RT.
Source: American Journal of Hematology. 1981 June; 10(4): 387-90.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7195646

- **Transferrin saturation and recovery from coma in cerebral malaria.**
  Author(s): Gordeuk VR, Thuma PE, McLaren CE, Biemba G, Zulu S, Poltera AA, Askin JE, Brittenham GM.
  Source: Blood. 1995 June 1; 85(11): 3297-301.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7756663

- **Where am I? Music therapy applied to coma patients.**
  Author(s): Aldridge D, Gustorff D, Hannich HJ.
  Source: Journal of the Royal Society of Medicine. 1990 June; 83(6): 345-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2380961

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering CAM and related topics. The following is a representative sample:

- Alternative Medicine Foundation, Inc.: **http://www.herbmed.org/**
- AOL: **http://search.aol.com/cat.adp?id=169&layer=&from=subcats**
- Chinese Medicine: **http://www.newcenturynutrition.com/**
- drkoop.com®: **http://www.drkoop.com/InteractiveMedicine/IndexC.html**
- Family Village: **http://www.familyvillage.wisc.edu/med_altn.htm**
- Google: **http://directory.google.com/Top/Health/Alternative/**
- Healthnotes: **http://www.healthnotes.com/**
- MedWebPlus: **http://medwebplus.com/subject/Alternative_and_Complementary_Medicine**
- Open Directory Project: **http://dmoz.org/Health/Alternative/**
- HealthGate: **http://www.tnp.com/**
- WebMD®Health: **http://my.webmd.com/drugs_and_herbs**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,00.html**
- Yahoo.com: **http://dir.yahoo.com/Health/Alternative_Medicine/**

The following is a specific Web list relating to coma; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **General Overview**

  AIDS and HIV
  Source: Integrative Medicine Communications; www.drkoop.com

Alcoholism
Source: Integrative Medicine Communications; www.drkoop.com

Allergies and Sensitivities
Source: Healthnotes, Inc.; www.healthnotes.com

Anemia
Source: Integrative Medicine Communications; www.drkoop.com

Anxiety
Source: Healthnotes, Inc.; www.healthnotes.com

Anxiety
Source: Integrative Medicine Communications; www.drkoop.com

Anxiety and Panic Attacks
Source: Prima Communications, Inc.www.personalhealthzone.com

Athletic Performance
Source: Healthnotes, Inc.; www.healthnotes.com

Bone Cancer
Source: Integrative Medicine Communications; www.drkoop.com

Cervical Dysplasia
Source: Integrative Medicine Communications; www.drkoop.com

Conjunctivitis
Source: Integrative Medicine Communications; www.drkoop.com

Constipation
Source: Healthnotes, Inc.; www.healthnotes.com

Diabetes
Source: Healthnotes, Inc.; www.healthnotes.com

Diabetes Mellitus
Source: Integrative Medicine Communications; www.drkoop.com

Diverticular Disease
Source: Healthnotes, Inc.; www.healthnotes.com

Epilepsy
Source: Integrative Medicine Communications; www.drkoop.com

Fainting
Source: Integrative Medicine Communications; www.drkoop.com

Glaucoma
Source: Healthnotes, Inc.; www.healthnotes.com

Glaucoma
Source: Integrative Medicine Communications; www.drkoop.com

Heat Exhaustion
Source: Integrative Medicine Communications; www.drkoop.com

HIV and AIDS
Source: Integrative Medicine Communications; www.drkoop.com

HIV and AIDS Support
Source: Healthnotes, Inc.; www.healthnotes.com

Hypoglycemia
Source: Healthnotes, Inc.; www.healthnotes.com

Hypoglycemia
Source: Integrative Medicine Communications; www.drkoop.com

Hypothermia
Source: Integrative Medicine Communications; www.drkoop.com

Influenza
Source: Healthnotes, Inc.; www.healthnotes.com

Insulin Resistance Syndrome
Source: Healthnotes, Inc.; www.healthnotes.com

Liver Cirrhosis
Source: Healthnotes, Inc.; www.healthnotes.com

Low Blood Sugar
Source: Integrative Medicine Communications; www.drkoop.com

Lymphoma
Source: Integrative Medicine Communications; www.drkoop.com

Measles
Source: Integrative Medicine Communications; www.drkoop.com

Menopause
Source: Integrative Medicine Communications; www.drkoop.com

Parkinson's Disease
Source: Integrative Medicine Communications; www.drkoop.com

Pink Eye
Source: Integrative Medicine Communications; www.drkoop.com

Preeclampsia
Source: Integrative Medicine Communications; www.drkoop.com

Rubella
Source: Integrative Medicine Communications; www.drkoop.com

Seizure Disorders
Source: Integrative Medicine Communications; www.drkoop.com

Skin Cancer
Source: Integrative Medicine Communications; www.drkoop.com

Stroke
Source: Healthnotes, Inc.; www.healthnotes.com

Syncope
Source: Integrative Medicine Communications; www.drkoop.com

Uveitis
Source: Integrative Medicine Communications; www.drkoop.com

Water Retention
Source: Integrative Medicine Communications; www.drkoop.com

- **Alternative Therapy**

Aromatherapy
Source: Integrative Medicine Communications; www.drkoop.com

Holistic Referrals
Source: Healthnotes, Inc.; www.healthnotes.com

Lepore Technique of M.R.T.
Source: The Canoe version of A Dictionary of Alternative-Medicine Methods, by Priorities for Health editor Jack Raso, M.S., R.D.
Hyperlink: http://www.canoe.ca/AltmedDictionary/l.html

Light Therapy
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,713,00.html

Yoga
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,746,00.html

- **Chinese Medicine**

Angong Niuhuang San
Alternative names: An Gong Niu Huang San
Source: Pharmacopoeia Commission of the Ministry of Health, People's Republic of China

Ershiwuwei Zhenzhu Wan
Alternative names: rshiwuwei Zhenzhu Pills (Used by Tibetan Nationality); Ershiwuwei Zhenzhu Wan (Er Shi Wu Wei Zhen Zhu Wan
Source: Pharmacopoeia Commission of the Ministry of Health, People's Republic of China

- **Herbs and Supplements**

5-HTP
Alternative names: 5-Hydroxytryptophan (5-HTP)
Source: Integrative Medicine Communications; www.drkoop.com

5-Hydroxytryptophan (5-HTP)
Alternative names: 5-HTP
Source: Integrative Medicine Communications; www.drkoop.com

Aesculus
Alternative names: Horse Chestnut; Aesculus hippocastanum L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Aloe
Alternative names: Aloe vera L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Alpha Lipoic Acid
Source: Healthnotes, Inc.; www.healthnotes.com

Alpha-Lipoic Acid
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10002,00.html

Alprazolam
Source: Healthnotes, Inc.; www.healthnotes.com

Aminoglycosides
Source: Integrative Medicine Communications; www.drkoop.com

Ashwagandha
Source: Prima Communications, Inc.www.personalhealthzone.com

Ava
Alternative names: Kava Kava
Source: Integrative Medicine Communications; www.drkoop.com

Barbiturates
Source: Healthnotes, Inc.; www.healthnotes.com

Benzodiazepines
Source: Prima Communications, Inc.www.personalhealthzone.com

Beta-Adrenergic Blockers
Source: Healthnotes, Inc.; www.healthnotes.com

Betaxolol
Source: Healthnotes, Inc.; www.healthnotes.com

Bilberry
Alternative names: Vaccinium myrtillus, European Blueberry, Huckleberry
Source: Integrative Medicine Communications; www.drkoop.com

Bitter Melon
Alternative names: Momordica charantia
Source: Healthnotes, Inc.; www.healthnotes.com

Bloodroot
Alternative names: Sanguinaria canadensis
Source: Healthnotes, Inc.; www.healthnotes.com

Brimonidine
Source: Healthnotes, Inc.; www.healthnotes.com

Camellia Sinensis
Source: Integrative Medicine Communications; www.drkoop.com

Coenzyme Q10
Alternative names: CoQ10
Source: Integrative Medicine Communications; www.drkoop.com

Coleus
Alternative names: Coleus forskohlii
Source: Healthnotes, Inc.; www.healthnotes.com

Coleus Forskohlii
Source: Prima Communications, Inc.www.personalhealthzone.com

CoQ10
Alternative names: Coenzyme Q10
Source: Integrative Medicine Communications; www.drkoop.com

Cyclophosphamide
Source: Healthnotes, Inc.; www.healthnotes.com

Dorzolamide
Source: Healthnotes, Inc.; www.healthnotes.com

Echinacea
Alternative names: Echinacea angustifolia, Echinacea pallida, Echinacea purpurea, Purple Coneflower
Source: Integrative Medicine Communications; www.drkoop.com

Echinacea angustifolia
Source: Integrative Medicine Communications; www.drkoop.com

Echinacea pallida
Source: Integrative Medicine Communications; www.drkoop.com

Echinacea purpurea
Source: Integrative Medicine Communications; www.drkoop.com

Eleuthero
Alternative names: Siberian Ginseng, Eleuthero; Acanthopanax/Eleutherococcus senticosus Rupr. & Maxim.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Ephedra
Alternative names: Ephedra sinica, Ephedra intermedia, Ephedra equisetina
Source: Healthnotes, Inc.; www.healthnotes.com

Ephedra
Source: Prima Communications, Inc.www.personalhealthzone.com

Eugenia Clove
Alternative names: Cloves; Eugenia sp.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

European Blueberry
Source: Integrative Medicine Communications; www.drkoop.com

Fiber
Source: Integrative Medicine Communications; www.drkoop.com

Flavonoids
Source: Healthnotes, Inc.; www.healthnotes.com

Forskolin
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10025,00.html

Ginkgo Biloba
Alternative names: Maidenhair Tree
Source: Integrative Medicine Communications; www.drkoop.com

Glucomannan
Source: Healthnotes, Inc.; www.healthnotes.com

Glutathione
Source: Healthnotes, Inc.; www.healthnotes.com

Goldenseal
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,791,00.html

Green Tea
Alternative names: Camellia sinensis
Source: Integrative Medicine Communications; www.drkoop.com

Huckleberry
Source: Integrative Medicine Communications; www.drkoop.com

Indian Tobacco
Source: Integrative Medicine Communications; www.drkoop.com

Isoniazid
Source: Healthnotes, Inc.; www.healthnotes.com

Kava
Alternative names: Piper methysticum
Source: Healthnotes, Inc.; www.healthnotes.com

Kava
Source: Prima Communications, Inc.www.personalhealthzone.com

Kava Kava
Alternative names: Ava
Source: Integrative Medicine Communications; www.drkoop.com

Latanoprost
Source: Healthnotes, Inc.; www.healthnotes.com

Lemon Balm
Alternative names: Melissa officinalis
Source: Healthnotes, Inc.; www.healthnotes.com

Licorice
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,801,00.html

Lobelia
Alternative names: Lobelia inflata, Indian Tobacco
Source: Integrative Medicine Communications; www.drkoop.com

Lobelia Inflata
Source: Integrative Medicine Communications; www.drkoop.com

Maidenhair Tree
Alternative names: Ginkgo Biloba
Source: Integrative Medicine Communications; www.drkoop.com

Melatonin
Source: Healthnotes, Inc.; www.healthnotes.com

Melissa
Source: WholeHealthMD.com, LLC.; www.wholehealthmd.com

Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10043,00.html

Mentha
Alternative names: Pennyroyal; Mentha/Hedeoma pulegium
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Mifepristone
Source: Healthnotes, Inc.; www.healthnotes.com

Neomycin
Source: Healthnotes, Inc.; www.healthnotes.com

Panax
Alternative names: Ginseng; Panax ginseng
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Pennyroyal
Alternative names: Hedeoma pulegoides, Mentha pulegium
Source: Healthnotes, Inc.; www.healthnotes.com

Piper
Alternative names: Kava; Piper methysticum Forst.f
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Piper Methysticum
Alternative names: Kava Kava
Source: Integrative Medicine Communications; www.drkoop.com

Plantago Psyllium
Alternative names: Psyllium, Ispaghula; Plantago psyllium/ovata
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Purple Coneflower
Source: Integrative Medicine Communications; www.drkoop.com

Rosemary
Alternative names: Rosmarinus officinalis
Source: Integrative Medicine Communications; www.drkoop.com

Rosmarinus Officinalis
Source: Integrative Medicine Communications; www.drkoop.com

Ruta
Alternative names: Rue; Ruta graveolens L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Sanguinaria
Alternative names: Bloodroot; Sanguinaria canadensis L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Symphytum
Alternative names: Comfrey; Symphytum officinale L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

Tamoxifen
Source: Healthnotes, Inc.; www.healthnotes.com

Thiazide Diuretics
Source: Integrative Medicine Communications; www.drkoop.com

Timolol
Source: Healthnotes, Inc.; www.healthnotes.com

Trazodone
Source: Healthnotes, Inc.; www.healthnotes.com

Uricosuric Agents
Source: Integrative Medicine Communications; www.drkoop.com

Vaccinium Myrtillus
Source: Integrative Medicine Communications; www.drkoop.com

Withania Ashwagandha
Alternative names: Ashwagandha; Withania somnifera L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org

General References

A good place to find general background information on CAM is the National Library of Medicine. It has prepared within the MEDLINEplus system an information topic page dedicated to complementary and alternative medicine. To access this page, go to the MEDLINEplus site at **http://www.nlm.nih.gov/medlineplus/alternativemedicine.html**. This Web site provides a general overview of various topics and can lead to a number of general sources.

CHAPTER 4. PATENTS ON COMA

Overview

Patents can be physical innovations (e.g. chemicals, pharmaceuticals, medical equipment) or processes (e.g. treatments or diagnostic procedures). The United States Patent and Trademark Office defines a patent as a grant of a property right to the inventor, issued by the Patent and Trademark Office.[8] Patents, therefore, are intellectual property. For the United States, the term of a new patent is 20 years from the date when the patent application was filed. If the inventor wishes to receive economic benefits, it is likely that the invention will become commercially available within 20 years of the initial filing. It is important to understand, therefore, that an inventor's patent does not indicate that a product or service is or will be commercially available. The patent implies only that the inventor has "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States. While this relates to U.S. patents, similar rules govern foreign patents.

In this chapter, we show you how to locate information on patents and their inventors. If you find a patent that is particularly interesting to you, contact the inventor or the assignee for further information. **IMPORTANT NOTE:** When following the search strategy described below, you may discover non-medical patents that use the generic term "coma" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on coma, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Coma

By performing a patent search focusing on coma, you can obtain information such as the title of the invention, the names of the inventor(s), the assignee(s) or the company that owns or controls the patent, a short abstract that summarizes the patent, and a few excerpts from the description of the patent. The abstract of a patent tends to be more technical in nature, while the description is often written for the public. Full patent descriptions contain much more information than is presented here (e.g. claims, references, figures, diagrams, etc.). We

[8]Adapted from the United States Patent and Trademark Office: **http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm**.

will tell you how to obtain this information later in the chapter. The following is an example of the type of information that you can expect to obtain from a patent search on coma:

- **Adaptive brain stimulation method and system**

  Inventor(s): John; Michael Sasha (1010 Orienta Ave., Mamaroneck, NY 10543)

  Assignee(s): None Reported

  Patent Number: 6,463,328

  Date filed: January 10, 2000

  Abstract: Adaptive brain stimulation systems and methods aids in the rehabilitation of patients from traumatic brain injury, **coma,** movement disorder, or other brain dysfunction. After a direct brain stimulator is implanted in a brain region of a patient, the patient is stimulated according to a set of stimulation parameters. A present state is measured and compared to a reference state by statistical and medically relevant criteria. The subsequent program of stimulation is dependent upon the outcome of the comparison. An adaptive brain stimulation and reinforcement system and method is also described in which a second area of the brain is stimulated when stimulation of the first brain area produces a desired effect, thereby reinforcing the prior response of the brain.

  Excerpt(s): This patent specification relates generally to medical monitoring and medical resuscitative systems and methods. More specifically, it relates to an adaptive neural stimulator system and method for the treatment of traumatic brain injury and the often resulting persistent vegetative state or "coma," and to the treatment of other brain dysfunctions such as movement disorders, and psychiatric disorders such as depression, schizophrenia, and anxiety disorders. The system stimulates and modifies parameters of stimulation based upon the outcome of comparing the patient's present state with a reference state with the intention of improving the overall functional state of the patient. The stimulation can be electrical, pharmacological, or both. The term "coma" is used to describe a human patient's state wherein the patient is unconscious and immobile and does not respond to intense sensory stimuli, for example, yelling. A "deep coma" occurs when this state lasts for more than 1 week. Although **coma** may result from several causes including drug reactions or cardiovascular stroke, it is often due to head injury, for example, head trauma due to an automobile accident. Historically, recovery from **coma** has been demonstrated primarily in laboratory animals. Early studies in cats showed that functional disconnection of the reticular formation from the rest of the central nervous system (CNS) resulted in a loss of consciousness, implicating this region as responsible for the state of CNS arousal. Subsequent research (Adametz J H, Recovery of functioning in cats with rostral reticular lesions, J of Neurosurgery, 1959 (16), p. 85-97) showed that if the reticular region was destroyed in consecutive steps, rather than all at once, and the brain was given the opportunity to reorganize itself, the animals would not lose consciousness. A characteristic of the brain that enables it to respond to the insult that resulted in **coma** is neural plasticity which occurs when the functions of a damaged region of neural tissue is taken over by other areas that normally did not previously play a role in that particular function. Some patients are able to regain consciousness after being in a **coma** because the brain can respond to traumatic injury by using such adaptive capacities as functional and structural reorganization, upregulation or downregulation of a neural response to an event, and the establishment of new functional and structural connections by means of collateral sprouting and compensatory synaptogenesis.

Web site: http://www.delphion.com/details?pn=US06463328__

- **Apparatus and method for adjunct (add-on) treatment of coma and traumatic brain injury with neuromodulation using an external stimulator**

  Inventor(s): Boveja; Birinder R. (P.O. Box 210095, Milwaukee, WI 53221)

  Assignee(s): None Reported

  Patent Number: 6,564,102

  Date filed: April 19, 2001

  Abstract: A system and method of neuromodulation adjunct (add-on) therapy for **coma** and traumatic brain injury, comprises an implantable lead-receiver and an external stimulator. Neuromodulation is performed using a pulsed electrical stimulation. The external stimulator contains a power source, controlling circuitry, a primary coil, and predetermined programs. The primary coil of the external stimulator inductively transfers electrical signals to the lead-receiver, which is also in electrical contact with a vagus nerve. The external stimulator emits electrical pulses to stimulate the vagus nerve according to a predetermined program. The predetermined programs have different levels of control, which is password protected. The external stimulator may also be equipped with a telecommunications module to control the predetermined programs remotely.

  Excerpt(s): This invention relates generally to a medical device for the treatment of **coma** and brain injury, more specifically a medical device for adjunct (add-on) treatment of **coma** and traumatic brain injury by electrical stimulation neuromodulation of a selected nerve or nerve bundle utilizing an implanted lead-receiver and an external stimulator. Coma is an abnormally deep state of unconsciousness with an absence of voluntary response to stimuli and with varying degrees of reflex activity. It represents the extreme of a graded continuum of impairment of consciousness, at the opposite pole of the spectrum from full alertness and awareness of the environment. It is not a single uniform disorder, but may stem from different causes such as trauma, disease, or their condition, and which may be characterized by different levels of consciousness. There are degrees of **coma,** but no varieties. **Coma** differs from both sleep and syncope (temporary suspension of consciousness due to generalized cerebral ischemia). Cerebral oxygen uptake is normal in sleep or actually increases during the rapid eye movement stage, but cerebral oxygen uptake is abnormally reduced in **coma.** The patient is incapable of sensing or responding adequately to external stimuli or inner needs, shows little or no spontaneous movement apart from respiration, and no evidence whatever of mental activity. At the deepest state of **coma** there is no reaction to stimuli of any intensity, and corneal, pupillary, pharyngeal, tendon and plantar reflexes are absent. Respiration is slow and sometimes periodic (Cheyne-Stokes respiration) and cardiovascular regulating processes may show signs of failure. Lighter degrees of **coma** (`semicoma`) allow partial response to stimulation, though this is imcomplete, mostly nonpurposive and usually consists of ineffectual movements or rubbing and scratching of the stimulated area. Bladder distension may call forth groaning or ill-coordinated motor stirring but the patient is still incontinent. Tendon refexes may or may not be obtainable, and the plantars may be either flexor or extensor. The Glasgow **Coma** Scale has proved its usefulness for the grading of depth of **coma.**

  Web site: http://www.delphion.com/details?pn=US06564102__

- **Basic free-flowing casting material and preforms produced thereform**

  Inventor(s): Bugajski; Jerzy (Magnesitstrasse 6/19, A-8700 Leoben, AT)

  Assignee(s): None Reported

  Patent Number: 6,548,435

  Date filed: August 30, 2000

  Abstract: The invention relates to free-flowing refractory castable material and castings produced therefrom. Refractory nonbasic and basic refractory castable materials have been known for a long time. The traditional refractory castable materials have thixotropic properties and must be lined sing vibration technology. In the past, free-flowing refractory castable materials were solely based on alumina raw materials. Attempts to produce an aqueous, highly concentrated basic suspension which would **Coma** the basis of free-flowing refractory castable materials failed to meet the requirements in terms of theological properties and a low degree of to hydration of the MgO-based materials. It is the aim of the invention to provide the above-mentioned refractory castable material for the monolithic lining or repair of high-temperature equipment and for the production of refractory castings. This is achieved by providing a fine-grained and a mixed fine and coarse-grained alternative. For the fine-grained alternative a refractory, dilatancy-promoting material on MgO basis with a grain size between 0.1 and 45.mu.m and at least one dilatancy-promoting dispersing and wetting agent is employed with the addition of predetermined amounts of mixing water. For the minced fine and coarse-grained alternative, again on MgO basis, in addition a refractory material with a grain size of up to 15 mm as well as binding agents are employed. In both alternatives, refractory and other additives improving the quality of the final products can also be employed.

  Excerpt(s): The invention concerns a basic dilatant refractory, free-flowing refractory castable material and precast shapes produced therefrom, such as bricks, prefabricated elements, insulating refractory products and/or functional products such as pocket block, porous plugs, and sleeves. Refractory castable materials are defined as refractory materials introduced or shaped by casting. The appropriate consistency of the castable materials is achieved by mixing dry components with to mixing water or mixing solution. The refractory castable material can solidify by hydraulic setting of the calcium aluminate cements without heating, by chemical bonding or micropowderbonding without and with heating, and by sinter processes at operating temperatures. Examples for chemical bonding are a phosphate bonding, water glass bonding, microsilica bonding, or bonding arising when metal powders are used. Micropowder bonding is chiefly a result of the operation of London-van der Waals attraction forces. Refractory castable materials exhibiting more than one bonding type at once are advantageous for numerous applications, as they show the desired strength over a wide temperature range.

  Web site: http://www.delphion.com/details?pn=US06548435__

- **Beam steering optical arrangement using Risley prisms with surface contours for aberration correction**

  Inventor(s): Arndt; Thomas D. (Amada, AZ), Ellis; Kenneth S. (Tucson, AZ), Knapp; David J. (Tucson, AZ), Mills; James P. (Tucson, AZ), Paiva; Richard A. (Tucson, AZ), Sparrold; Scott W. (Tucson, AZ)

  Assignee(s): Raytheon Company (Lexington, MA)

  Patent Number: 6,344,937

  Date filed: March 3, 1999

  Abstract: A steerable optical arrangement. The inventive arrangement includes a first prism mounted for rotation about an optical axis and a second prism mounted for rotation about the optical axis. In accordance with the inventive teachings, the first prism and/or the second prism have at least one surface contoured to correct for optical aberration. In the illustrative embodiment, the first and second prisms are Risley prisms. In addition, the illustrative implementation includes a first motor arrangement for rotating the first prism about the optical axis and a second motor arrangement for rotating the second prism about the optical axis. A controller is provided for activating the first and second motors to steer the beam at an angle.phi. and nod the beam at an angle.theta. At least two surfaces at least one prism is contoured to correct for astigmatism, **coma,** trefoil and other non-rotationally symmetric aberration. The contour is effected by laser etching, micro-machining or optical thin-film coating of the prisms in the manner disclosed herein.

  Excerpt(s): The present invention relates to optical systems. More specifically, the present invention relates to beam steering optical arrangements. For many applications, there is a need for a compact, high performance optical arrangement with a steerable beam. Such applications include astronomy, medicine, weaponry and numerous other commercial, industrial and military applications. For such applications, beam steering is typically accomplished with a gimbaled arrangement. Typically, a lens or optical element is mounted to a gimbal. The gimbal is free to rotate about one to three axes. Hence, with a motor, the optical arrangement may be directed to a desired roll angle to steer the beam as necessary. Unfortunately, the gimbal and the actuators for same add to the cost and complexity of the system. In addition, for certain applications, it is desirable to effect beam steering with a more compact arrangement than would be afforded by a typical gimbaled arrangement.

  Web site: http://www.delphion.com/details?pn=US06344937__

- **Catadioptric lens, optical head and optical recording and/or reproducing apparatus**

  Inventor(s): Kubota; Shigeo (Kanagawa, JP), Watanabe; Kenjiro (Tokyo, JP)

  Assignee(s): Sony Corporation (Tokyo, JP)

  Patent Number: 6,256,154

  Date filed: May 15, 2000

  Abstract: A lens which has corrected the **coma** aberration substantially completely is provided as a catadioptric lens used with advantage in utilizing the evanescent light.The catadioptric lens is a concave non-spherical mirror having a concave refractive surface as a first surface S1 , a plane mirror as a second surface S2 and a concave non-spherical mirror arranged coaxially with the concave refractive surface of the first surface S1. The

parallel incident light is converged through an aperture in the plane mirror of the second surface S2 on a total reflection plane of the fourth surface S4. The radius of curvature of the first surface S1 and the optical length d from the first surface S1 to the apex of the third surface S3 are set to satisfy the sine condition.

Excerpt(s): This invention relates to a catadioptric lens usable with advantage for exploiting evanescent light. This invention also relates to an optical head and an optical recording and/or reproducing apparatus employing the catadioptric lens. As a technique for realising high recording density of an optical recording medium, such a technique has been devised which exploits evanescent light to enable recording and/or reproduction at an extremely small recording pit not larger than the diffraction threshold. In recording and/or reproducing an optical disc using the evanescent light, the incident light beam to a lens is converged on an end face of the lens such that its major portion undergoes total reflection on the lens end face. If the distance between the lens end face and the optical recording medium is made sufficiently narrow, a portion of the evanescent light is coupled with the optical recording medium so as to be taken out to outside the lens to enable recording and/or reproduction exploiting the evanescent light. The distance for which the evanescent light can be coupled in this manner in air is on the order of 100 nm if the numerical aperture NA of the lens is 1.5. Therefore, if recording and/or reproduction of an optical recording medium is to be performed using the evanescent light, the distance between the lens end face and the optical recording medium needs to be maintained at a level not larger than approximately 100 nm. This can be realized using the flying head technique used e.g., in a magnetic disc.

Web site: http://www.delphion.com/details?pn=US06256154__

- **Charged particle beam exposure device exhibiting reduced image blur**

  Inventor(s): Kojima; Shinichi (Kamagaya, JP)

  Assignee(s): Nikon Corporation (Tokyo, JP)

  Patent Number: 6,441,384

  Date filed: April 8, 1999

  Abstract: Charged-particle-beam microlithography apparatus and methods are disclosed that reduce spherical aberrations and other aberrations of the beam without increasing blurring from Coulomb effects or space-charge effects. The beam semi-angle of the beam as incident on the reticle and/or substrate is limited to a range greater than zero but less than an upper limit, so as to remove paraxial portions of the beam. Also, the substrate can be moved as required along the optical axis to place the substrate at the optimal image plane where beam spreading from spherical aberration is minimal. The beam semi-angle is preferably limited by passage of the beam through an annular aperture placed axially upstream of the substrate. A preferred range for beam semi-angle at the reticle is 1.5 to 3 mrad. Alternatively, at least six deflectors are disposed on the reticle side of a scattering aperture located in the projection-optical system, and at least three deflectors are disposed on the substrate side of the scattering aperture to simultaneously correct, respectively, deflection-induced image-plane inclination, deflection **coma,** deflection astigmatism, deflection chromatic aberration, deflection-induced secondary distortion (x and y directions), axial propagation of the beam through the scattering aperture, incidence of the beam at a target position on the substrate, and zero angle of incidence of the beam on the substrate.

Excerpt(s): This invention pertains to microlithography apparatus for transferring a pattern (e.g., a circuit pattern), defined by a reticle, onto a sensitive substrate (e.g., semiconductor wafer) using a charged particle beam (e.g., electron beam or ion beam), as used in the manufacture of, e.g., semiconductor integrated circuits and displays. Increases in the level of integration of semiconductor devices have so far kept pace with demand for increasingly more intricate integrated circuits. To meet this demand, it has been necessary that microlithographic exposure apparatus used in the manufacture of such devices be capable of resolving circuit features having increasingly smaller critical dimensions so as to produce such increasingly intricate circuits. In view of the resolution limits of optical microlithography, microlithographic apparatus employing a charged particle beam (e.g., an electron beam) are the subject of much interest as the candidate pattern-transfer technology for achieving resolution of pattern features that are substantially smaller than resolvable by optical microlithography. In charged-particle-beam (CPB) microlithography, the pattern is usually defined by a reticle. The reticle is illuminated by the charged particle beam; charged particles in the beam passing through the illuminated portion of the reticle carry downstream of the reticle an image of the illuminated portion. The image-carrying beam is focused onto a corresponding region of the substrate which is coated with a suitable "resist" that imprints the pattern. Thus, the reticle pattern is "transferred" to the substrate.

Web site: http://www.delphion.com/details?pn=US06441384__

- **Color cathode ray tube with coma reduced**

  Inventor(s): Misono; Masayoshi (Chousei-gun, JP), Tamura; Hiroyuki (Mobara, JP), Tojyo; Tsutomu (Mobara, JP)

  Assignee(s): Hitachi Engineering Co., Ltd. (Mobara, JP), Hitachi, Ltd. (Tokyo, JP)

  Patent Number: 6,337,534

  Date filed: September 15, 2000

  Abstract: A color cathode ray tube includes a phosphor screen, a three-beam in-line electron gun, a beam deflection device, and a convergence correction device disposed on a phosphor screen side of the electron gun. The convergence correction device includes a first pair of magnetic pieces positioned on a tube-neck wall side of side electron beams and a second pair of magnetic pieces positioned on opposite sides of a center electron beam, in the in-line direction. The first pair of magnetic pieces each have a first pair of protruding portions extending toward an adjacent one of the second pair of magnetic pieces, and the first pair of protruding portions are arranged on opposite sides of a corresponding one of the side electron beams in a direction perpendicular to the in-line direction. The second pair of magnetic pieces each have two second pairs of protruding portions, one of the second pairs of protruding portions extends toward an adjacent one of the first pair of magnetic pieces and the other of the second pairs of protruding portions extends toward an adjacent one of the second pair of magnetic pieces, each of the second pairs of protruding portions being arranged on opposite sides of a corresponding one of the electron beams in a direction perpendicular to the in-line direction. The first pair of magnetic pieces have a portion of an axial length greater than that of the second pair of magnetic pieces.

  Excerpt(s): The present invention relates to a color cathode ray tube in which the amounts of horizontal and vertical deflection of a plurality of electron beams is individually controlled to correct **coma** caused by a deflection magnetic field, and convergence errors of the plurality of electron beams are suppressed to thereby obtain a

good image display over the entire phosphor screen. In a color cathode ray tube having at least an electron gun comprising a plurality of electrodes, a deflection device, and a phosphor screen (a screen having a phosphor film, hereinafter also referred to as a phosphor. film or merely referred to as a screen), the following techniques have been known as means for reproducing a good image over the entire phosphor screen. Japanese Patent Publication No. Hei 4-52586 discloses an electron gun emitting three in-line electron beams in which a pair of parallel flat electrodes are disposed on the bottom face of a shield cup in such a manner as to be positioned above and below paths of the three electron beams in parallel to the in-line direction and to extend toward a main lens.

Web site: http://www.delphion.com/details?pn=US06337534__

- **Coma aberration automatic measuring mark and measuring method**

  Inventor(s): Saito; Hirofumi (Tokyo, JP)

  Assignee(s): Nec Corporation (Tokyo, JP)

  Patent Number: 6,323,945

  Date filed: December 15, 1999

  Abstract: Two **coma** aberration automatic measuring marks M1 and M2 of a first-order diffraction grating are each composed of a plurality of elongated isosceles triangle patterns which are so arranged that the axis of symmetry passing on the center of each elongated isosceles triangle is parallel to one another, that a half P1, P2, and P3 of the elongated isosceles triangle patterns have the widths thereof which extend in a direction opposite to that of the remaining half P4, P5 and P6 of the elongated isosceles triangle patterns, and the elongated isosceles triangle patterns are located separately from one another, in a direction perpendicular to the axis of symmetry passing on the center of each elongated isosceles triangle, and at a pitch diffracting a measuring coherent light. The two first-order diffraction gratings M1 and M2 are located separately from each other in a direction of the axis of symmetry passing on the center of the elongated isosceles triangle, in such a manner that the elongated isosceles triangle patterns included in the two first-order diffraction gratings are in symmetry to each other, in connection with a line positioned between the two first-order diffraction gratings and which is perpendicular to the axis of symmetry passing on the center of the elongated isosceles triangle. The two first-order diffraction gratings are scanned by the measuring coherent light, and a relative distance R1 between diffraction lights generated by the two first-order diffraction gratings, is measured and compared with a distance R between the two first-order diffraction gratings.

  Excerpt(s): The present invention relates to a **coma** aberration automatic measuring mark used for measuring only a **coma** aberration of various aberrations of a lens system used in a reduction projection exposure, and a method for measuring the **coma** aberration by using the **coma** aberration automatic measuring mark. One important factor is to quickly and simply measure a **coma** aberration of a reduction projection lens system. Now, a prior art method for measuring the **coma** aberration of the reduction projection lens system will be described with reference to FIGS. 1A and 1B. In the prior art, however, when the **coma** aberration is very large, it is not possible to carry out an automatic measurement utilizing an image processing, and therefore, the **coma** aberration must be measured manually, with the result that the measurement needs a considerable time. Therefore, adjustment of the reduction projection lens system cannot be smoothly performed, and a satisfactory degree of reproduction cannot be obtained

because of the manual measurement. In addition, it is difficult to separate the **coma** aberration from the other aberrations occurring in the reduction projection lens system.

Web site: http://www.delphion.com/details?pn=US06323945__

- **Compact imaging spectrometer**

  Inventor(s): Aikens; David M. (Chester, CT), Wang; David Y. (Fremont, CA)

  Assignee(s): Therma-wave, Inc. (Fremont, CA)

  Patent Number: 6,744,505

  Date filed: July 30, 2002

  Abstract: The subject invention relates to the design of a compact imaging spectrometer for use in thin film measurement and general spectroscopic applications. The spectrometer includes only two elements, a rotationally symmetric aspheric reflector and a plane grating. When employed in a pupil centric geometry the spectrometer has no **coma** or image distortion. Both spherical aberration and astigmatism can be independently corrected. The invention is broadly applicable to the field of optical metrology, particularly optical metrology tools for performing measurements of patterned thin films on semiconductor integrated circuits

  Excerpt(s): The subject invention relates to the design of a broadband imaging spectrometer for use in thin film measurement and general spectroscopic applications. The invention is broadly applicable to the field of optical metrology, particularly optical metrology tools for performing measurements of patterned thin films on semiconductor integrated circuits. The use of thin film measurement technologies such as spectroscopic ellipsometry [SE], broadband reflectometry [BBR] and visible light reflectometry [VR] is well established. These technologies typically use a spectrometer to simultaneously gather information about the sample under test at different wavelengths. Examples in the prior art include U.S. Pat. No. 6,278,519 and U.S. Pat. No. 5,910,842 incorporated herein by reference. For optical wafer metrology the wavelength region of interest spans the vacuum ultra-violet [VUV] and near infrared [NIR]. a) High efficiency over the desired wavelength range. This implies large dynamic range and high wafer throughput. This may permit low power light sources to be used reducing thermal loading of the optical system permitting a simplified design for the thermal management system and the optical mounts. All of these effects combine to improve metrology system performance at reduced cost of ownership.

  Web site: http://www.delphion.com/details?pn=US06744505__

- **Corneal aplanation device**

  Inventor(s): Juhasz; Tibor (Irvine, CA), Kurtz; Ronald M. (Irvine, CA)

  Assignee(s): Intralase Corporation (Irvine, CA)

  Patent Number: 6,254,595

  Date filed: October 15, 1998

  Abstract: A disposable aplanatic lens for reconfiguring the cornea of an eye for ophthalmic laser surgery includes a lens which has a flat anterior surface that is substantially parallel to a flat aplanation surface. A skirt surrounds the aplanation surface and extends outwardly therefrom to define a chamber. Additionally, the skirt is

formed with a groove which creates a suction channel between the skirt and the aplanation surface in the chamber. A vacuum pump is connected in fluid communication with the suction channel and is selectively activated to create a partial vacuum in the channel. In its operation, the aplanatic lens is positioned over the cornea and the pump is activated to create the partial vacuum. Due to this partial vacuum, the cornea is drawn into the chamber where it is urged against the aplanation surface of the lens. The result of this is that the cornea is flattened into an aplanation configuration which is free from spherical aberration and **coma** during ophthalmic surgery.

Excerpt(s): For ophthalmic laser procedures wherein eye tissue is to be photdisrupted or ablated, it is extremely important for the laser beam to be properly focused to a specific focal spot in the tissue that is to be affected. Also, it is extremely important that the focal spot have good definition. To do all of this, it is necessary for the laser beam to be as free from aberrations as possible. Considerations here include the eye itself, as well as the laser system. In particular, for ophthalmic laser procedures involving the cornea, it happens that the spherical geometry of the cornea introduces aberrations on its own which are separate and independent of the laser system being used. Importantly, these corneal induced aberrations distort the definition of the focal spot of the laser beam in the cornea. In order to improve this situation, these aberrations need to be eliminated or significantly minimized. where n.sub.1 and n.sub.2 are the refractive indices of the media on the laser source and focal spot sides of a media interface respectively, I.sub.1 and I.sub.2 are the linear dimensions of the laser source and focal spot, and.alpha.sub.1 and.alpha.sub.2 are the angles made with the principal axis by the conjugate portions of a ray passing between the laser source and the focal spot through the media interface. As recognized by the present invention, aplanatic refraction at the anterior surface of the cornea can be effectively accomplished by flattening the anterior surface. With such a reconfiguration of the cornea, as a laser beam enters the cornea the sine condition will be satisfied and, importantly, the laser beam will be free of aberrations (other than chromatic) which would otherwise result from the spherical geometry of the cornea's anterior surface.

Web site: http://www.delphion.com/details?pn=US06254595__

- **Deflection apparatus**

  Inventor(s): Takagishi; Toshiya (Kanagawa, JP)

  Assignee(s): Sony Corporation (Tokyo, JP)

  Patent Number: 6,252,359

  Date filed: March 7, 2000

  Abstract: The present invention is intended to provide a deflection apparatus which is able to effect an excellent convergence correction by improving an interference between a **coma** aberration correction coil and a convergence correction coil. In the deflection apparatus according to the present invention, a circuit comprising a **coma** aberration correction coil, resistors and a reactance means is connected to a vertical deflection coil in series. In the above-mentioned circuit, coil pair comprising the **coma** aberration correction coil are connected in series. One end of the reactance means is connected to a junction, i.e. middle point of the coil pair. One ends of the respective resistors are connected across the respective ends of the coil pair connected in series. Remaining one ends of those resistors are connected to a remaining one end of the reactance means. The above-described circuit further includes convergence correction coil attached thereto so as to have the **coma** aberration correction coils and the cores in common. Although an

induced current is generated in the coil pair by an interference between the **coma** aberration correction coils and the convergence correction coil, the reactance means acts on the deflection apparatus so as to reduce the resultant induced current.

Excerpt(s): The present invention relates to a deflection apparatus for use with a color cathode-ray tube, and more particularly to a deflection apparatus which is able to correct a convergence satisfactorily by improving an interference between a **coma** aberration correction coil and a convergence correction coil. The deflection coil 22 comprises an annular core 23, a horizontal deflection coil (not shown), a vertical deflection coil (not shown), or the like. An inline type electron gun 24 is attached to a neck portion 21A of the cathode-ray tube 21. The inline type electron gun 24 emits three electron beams for displaying red (R), green (G) and blue (B) colors.

Web site: http://www.delphion.com/details?pn=US06252359__

- **Deflection coil of a deflection yoke**

  Inventor(s): Azzi; Nacerdine (Fontaine les Dijon, FR), Masson; Olivier (Dijon, FR), Volatier; Sebastien (Dijon, FR)

  Assignee(s): Thomson Licensing S.a. (Boulogne Cedex, FR)

  Patent Number: 6,690,105

  Date filed: August 18, 2000

  Abstract: Electromagnetic deflection unit for color cathode-ray tubes, comprising a pair of horizontal deflection coils and a pair of vertical deflection coils, the saddle-shaped vertical deflection coils having a rear bundle on the electron-gun side and a front bundle located on the screen side, lateral conductor harnesses 120 connecting the two bundles so as to produce a main window in the intermediate region lying between these said bundles, the conductor harnesses being arranged so that, at the end of the main window 18, on the gun side, at least 98% of the lateral harness conductors lie within an angular aperture.THETA.sub.m of between 60 and 80.degree.This arrangement of the conductors in the rear part of the window makes it possible to minimize the aberrations due to **coma** parabola so as to avoid the use of additional field shapers.

  Excerpt(s): The invention relates to a deflection unit for colour cathode-ray tubes, which unit is also called a deflector and comprises a pair of vertical deflection coils and a pair of horizontal deflection coils in the form of a saddle, whose particular shape allows the **coma** errors to be minimized. A cathode-ray tube designed to generate colour images generally comprises an electron gun emitting three coplanar electron beams, each beam being intended to excite bands of luminescent material of the corresponding colour (red, green or blue) on the tube's screen. The electron beams scan the tube's screen under the influence of the deflection fields created by the horizontal and vertical deflection coils of the deflector which is fixed to the neck of the tube. A ring of ferromagnetic material conventionally surrounds the deflection coils so as to concentrate the deflection fields in the appropriate region.

  Web site: http://www.delphion.com/details?pn=US06690105__

- **Deflection unit for in-line type cathode ray tubes having grooves separated by groove walls including a thickened groove wall section**

  Inventor(s): Ehrhardt; Andreas (Plochingen, DE), Nelle; Friedrich-Karl (Stuttgart, DE)

  Assignee(s): Matsushita Display Devices (Germany) GmbH (Esslingen, DE)

  Patent Number: 6,621,203

  Date filed: March 29, 2001

  Abstract: The present invention relates to a deflection unit for mounting on an in-line type cathode ray tube comprising a coil body including grooves for receiving wound coil wires, the grooves extending substantially in a straight line. The groove extension of at least one groove is changed at at least one location such that the coil wires received in the groove become curved in the area of the changed groove extension. In a preferred embodiment the grooves are separated from each other by groove walls which in the area of the changed groove extension comprise a thickening and optionally a bulge. The coil wires wound onto the coil body form the horizontal coil or the vertical coil. The arrangement serves the selective fine adjustment of the deflection fields for eliminating convergence, **coma** and/or geometry errors.

  Excerpt(s): The present invention relates in general to deflection units for in-line type cathode ray tubes and refers, in particular, to those deflection units that comprise a coil body including substantially straight grooves for receiving wound coil wires. In color picture tubes of the in-line type, an electron beam generating system is designed for generating three coplanar electron beams that converge on the screen. The deflection unit which is arranged around the neck portion of the picture tube is used for deflecting the electron beams from their normally straight path into the one or other direction so that the beams impinge upon selected points of the screen to produce a visual signal. With a suitable time variation of the magnetic deflection fields the electron beams can be deflected upwards or downwards and to the right or left side across the screen. In in-line type color picture tubes three electron guns are positioned side by side. To deflect the generated electron beams into the X- and Y-direction, the funnel-shaped deflection unit mounted on the color picture tube produces deflection fields so that a self-converging picture without north-south raster distortion is obtained on the screen. This funnel-shaped deflection unit consists essentially of a pair of horizontal coils that produce a magnetic field which deflects the beams into the X-direction, a pair of vertical coils for deflection into the Y-direction, a ferrite core which encloses the coils, and correction magnets and possibly soft-magnetic field shapers.

  Web site: http://www.delphion.com/details?pn=US06621203__

- **Device and method for reducing corneal induced aberrations during ophthalmic laser surgery**

  Inventor(s): Juhasz; Tibor (Irvine, CA), Kurtz; Ronald M. (Irvine, CA), Suarez; Carlos G. (Irvine, CA)

  Assignee(s): Intralase Corp. (Irvine, CA)

  Patent Number: 6,623,476

  Date filed: April 13, 2001

  Abstract: A disposable lens for reconfiguring the cornea of an eye for ophthalmic laser surgery includes a lens which has a flat anterior surface that is formed opposite a

contact surface. A skirt surrounds the contact surface and extends outwardly therefrom to define a chamber. The skirt is formed with a groove which creates a suction channel between the skirt and the contact surface in the chamber. In its operation, the lens is positioned over the cornea and a vacuum pump is selectively activated to create a partial vacuum in the suction channel. Due to this partial vacuum, the cornea is drawn into the chamber where it is urged against the contact surface of the lens. The result of this is that the cornea is flattened into a configuration where the introduction of spherical aberration and **coma** into a light beam passing into the cornea is reduced or eliminated.

Excerpt(s): The present invention pertains generally to surgical devices. More particularly, the present invention pertains to surgical lenses which are used in ophthalmic laser surgery. The present invention is particularly, but not exclusively, useful as a lens for temporarily reconfiguring the cornea from an imperfect shape which causes light passing through the cornea to experience aberration into a shape that allows light to pass through the cornea with little or no aberration. For ophthalmic laser procedures involving the photodisruption of eye tissue, it is extremely important for the laser beam to be properly focused to a spot at a prescribed location inside the tissue. To make accurate incisions with the laser, it is extremely important that the focal spot have good definition. Specifically, it is desirable that the laser beam reach the focal spot free from aberrations that can distort the definition of the focal spot. For ophthalmic laser procedures involving the cornea, a beam of laser light is generally passed through the anterior surface of the cornea and focused within the cornea. Unfortunately, since the anterior surface of the cornea in its natural state is nearly spherical, once a beam of light passes through the anterior surface of the cornea, aberrations are introduced into the beam that cause the beam to distort. For light beams that are focused to a focal spot within the cornea, these corneal induced aberrations distort the definition of the focal spot. It follows that more accurate incisions can be performed by reducing or eliminating these corneal induced aberrations.

Web site: http://www.delphion.com/details?pn=US06623476__

- **Device for correcting third-order spherical aberration in a lens, especially the objective lens of an electronic microscope**

  Inventor(s): Haider; Maximilian (Pfarrgasse 20, D-69251 Gaiberg, DE), Uhlemann; Stephan (Rathausstrasse 20, D-69126 Heidelberg, DE)

  Assignee(s): None Reported

  Patent Number: 6,605,810

  Date filed: September 5, 2000

  Abstract: A device for correcting third-order spherical aberration in the objective lens of an electron microscope, including an objective lens and a correction device which is formed by two hexapoles and a round-lens doublet arranged therebetween having two round lenses with the same focal length, whereby a single round lens (3) is arranged between the objective lens (2) and the correction device (1) in such a way that a parallel optical path hits the correction device (1) and the coma-free plane (6) of the objective lens is represented on the plane of the first hexapole (8) of the correction device (1) or two round lenses with different focal lengths are arranged between the objective lens and the correction device, whereby the distance between the round lens (14) close to the objective and the coma-free plane (16) of the objective and the distance between the round lens (15) close to the correction device and the coma-free plane (17) of the

correction device is the same is terms of focal length and the distance between both round lenses (14, 15) is equal to the sum of their focal lengths.

Excerpt(s): The invention relates to a device for correcting third-order spherical aberration in a lens, especially the objective lens of an electron microscope, comprising an objective lens and in the direction of the optical path a downstream correction device, which is formed by a first and a second hexapole and a round-lens doublet arranged therebetween comprising two round lenses with the same focal length, whereby the distance between the two lenses is twice their focal length, each being located at the focal point distance from the centre plane of the respective adjacent hexapole. The term spherical aberration covers all those optical image defects which in the Gaussian dioptrics are determined by the elementary path, which originate from the optical axis in the object plane to be mapped. In high resolution electron optical systems the performance, i.e. the resolving capacity, is limited by the spherical aberration. It is therefore a principle concern in high resolution electron microscopic optics to eliminate this spherical aberration. In the case of round-lens systems with a straight optical axis, the defect is the third-order spherical aberration. As a correction device, the journal `Nuclear Instruments and Methods Vol. 187, 1981, page 187ff., has already proposed a suitable solution, especially for scanning transmission electron microscopes. Basically, the design comprises two hexapoles, between which there is a located a round-lens system comprising two round lenses with the same focal length, whereby the distance between the lenses is twice their focal length. The two hexapoles are located at the focal point distance from the respectively adjacent round lens so that the centre plane of the first hexapole is imaged on the centre plane of the second hexapole. European Patent Application No. 0,451,370 proposes a concrete application of this correction device to eliminate the third-order spherical aberration for a round lens serving as an objective, whereby between the correction device described above and the objective lens a further round-lens doublet is situated, which in configuration and arrangement to the entrance side hexapole of the corrector matches the round-lens doublet of the corrector.

Web site: http://www.delphion.com/details?pn=US06605810__

- **Electron gun and color cathode-ray tube utilizing the same**

  Inventor(s): Kim; Deog-ho (Kyungki-do, KR), Kwon; Yong-geol (Kyungki-do, KR), Lee; Yang-je (Kyungki-do, KR), Yoon; Young-jun (Kyungki-do, KR), Yun; Kwang-jin (Kyungki-do, KR)

  Assignee(s): Samsung Sdi Co., Ltd. (Kyungki-Do, KR)

  Patent Number: 6,630,777

  Date filed: January 25, 2001

  Abstract: A color cathode-ray tube includes a housing including a panel having a phosphor screen on its inside and a funnel fastened to the panel, the funnel including a neck portion; an electron gun housed in the neck portion and emitting electron beams for exciting the phosphor screen and forming an image, the electron gun including cathodes arranged in line, electrodes sequentially disposed from the cathodes and having electron beam passages for passing three electron beams, a shield cup coupled to a last electrode among the electrodes and provided with three electron beam passages in line, and magnetic pieces disposed on the shield cup or one or more electrodes so that the center of a **coma** correction portion composed of the magnetic pieces is positioned above and below the line and in spaces between the center of a central electron beam passage and the centers of side electron beam passages; and a deflection yoke disposed

on the neck and cone portions of the funnel, the deflection yoke deflecting electron beams emitted from the electron gun to land on positions on the phosphor screen.

Excerpt(s): The present invention relates to a color cathode-ray tube, and more particularly, to an electron gun having an improved shield cup to improve the deflection (defocusing or aberration) or **coma,** and a color cathode-ray tube using the same. In the color cathode-ray tube 10 having such a configuration, three electron beams emitted from the electron gun 20 are selectively deflected by the deflection yoke 15 and land on the phosphor screen 11, exciting phosphor materials, so that an image is displayed. Examples of an electron gun for reducing the problem of a **coma** are disclosed in Japanese Patent Publication No. Hei 4-52586, Japanese Patent Laid-open No. Sho 51-61766, Japanese Patent Laid-open No. Sho 51-64368 and Japanese Patent Publication No. Hei 10-116569.

Web site: http://www.delphion.com/details?pn=US06630777__

- **Folding mirror structure**

  Inventor(s): Lee; Hsiao-Wen (Hsinchu, TW), Wei; Li-Ding (Taipei, TW)

  Assignee(s): Industrial Technology Research Institute (Hsinchu, TW)

  Patent Number: 6,496,466

  Date filed: March 8, 2000

  Abstract: A folding mirror structure comprises a folding mirror, a piezoelectric film and electrodes attached to the surfaces of the piezoelectric film. The folding mirror is used for deflecting a laser beam. The piezoelectric film and electrodes are stacked in an interleaving manner and attached to the folding mirror. The surfaces of the electrodes have particular patterns for compensating the **coma** aberrations due to the tilt of an optical disc.

  Excerpt(s): This application claims the priority benefit of Taiwan application Ser. No. 88111661, filed Jul. 9, 1999. The present invention relates to a folding mirror. More particularly, the present invention relates to a folding mirror used for a pick-up head of an optical recording/reproducing device. Generally speaking, an optical recording/reproducing device can use a optical disc, such as a compact disc-read only memory (CD-ROM) or a digital versatile disc (DVD), to record a large amount of data therein, and can reproduce data stored in the optical disc. As the multimedia technology highly developes, the optical disc capable of storing a large amount of video and audio data is more popular. Furthermore, because of highly developed DVD technology, the capacitance dramatically increases to 4.7 gigabyte (GB) from 650 megabyte (MB) of the traditional CD-ROM disc, and even increases to 15 GB in the feature.

  Web site: http://www.delphion.com/details?pn=US06496466__

- **Four--states warning switch**

  Inventor(s): Eskander; Nader Nessem (3, Amrou Ebn El Asse St. Apt. 24, Roushdy, Alexandria, EG)

  Assignee(s): Eskander; Nader Nessem (EG)

  Patent Number: 6,262,665

  Date filed: March 19, 1999

Abstract: The four-states warning switch is a special warning device of exceptional features. One of these features, allows the user to send an initial signal, in case he only suspects that he may be attacked, assaulted, go into a **coma** or may face a danger of any other type. He does so by pressing the device's handle, closing a "suspicion circuit" that transmits a "suspicion signal" to a security office, a police station, an ambulance or a doctor's clinic. The user then shifts the handle rightwards while it is still pressed, bringing it to a position, where the device is ready to automatically close a warning circuit in case he releases the handle. This is the second important feature of the device, for if the user releases his/her hand involuntarily in case of an attack or in case he becomes unconscious, a warning signal is automatically transmitted. On the other hand, the user can bring the device back to its "idle state" manually from the "suspicion state", whenever he feels safe. However, besides these two exceptional features, the device also keeps its prime feature as a direct warning facility. The user can simply bring the device to its "direct warning state" by shifting the handle leftwards without pressing it. He/she benefits from this feature of the device in case of a sudden attack or on facing an unexpected danger.

Excerpt(s): An ordinary alarm switch is an electric switch which--when pressed--closes a circuit to operate a siren, a camera or any other warning device. The alarm circuit could also be connected to any security office or police station. Wireless sets carried by policemen, guards and other people who work in dangerous places may be looked at as an alarm switch when used to call for help. Even the pressing of a telephone's buttons can be likened to the use of an alarm switch when someone rings the police or the ambulance to call for help. The victim is required to actuate the switch just before, or while being assaulted. He is supposed to do so at the very precious time he needs to defend himself or to escape. He may be in a situation that does not enable him to reach the alarm switch. Due to confusion, his attempt may further endanger his life. It is sometimes impossible for the victim to actuate the switch if he is closely threatened, injured or actually assaulted. In situations such as unconsciousness, a telephone or an ordinary alarm switch becomes useless.

Web site: http://www.delphion.com/details?pn=US06262665__

- **Hybrid NUMA/S-COMA system and method**

  Inventor(s): Liberty; Dean A. (Palenville, NY)

  Assignee(s): International Business Machines Company (Armonk, NY)

  Patent Number: 6,275,900

  Date filed: January 27, 1999

  Abstract: A hybrid non-uniform-memory-architecture/simple-cache-only-memory-architecture (NUMA/S-COMA) memory system and method are described useful in association with a computer system having a plurality of nodes coupled to each other. The plurality of nodes include NUMA memory which are configured to store data lines. The NUMA memories include a NUMA coherence subsystem for coordinating transfer of data between the nodes. At least one S-COMA cache is provided on at least one node of the computer system. The at least one S-COMA cache is configured to employ the NUMA coherence subsystem in sending data communication to or receiving data communication from another node of the plurality of nodes of the computer system. Data stored at another node of the system is accessed using a home node real address as the network address. The home node real address is translated into a local real address at the client node using a boundary function translation table. The NUMA coherence

subsystem is employed by the S-COMA cache to provide data reference capture, data movement and coherence mechanisms, thereby avoiding the need for a separate S-COMA coherence mechanism to accomplish these functions.

Excerpt(s): The present invention relates to the field of distributed shared memory systems and caches. More particularly, the invention relates to a hybrid architecture wherein a first type of memory (simple COMA) is built atop and integral with another type of memory (NUMA). Global Memory: Refers to memory objects which are addressable by processes on different nodes. Created and attached in a UNIX System V like way, and attached into the effective address space of each process which wants to address the global memory object. S-COMA: Simple Cache Only Memory Architecture. A DSM scheme in which each node reserves a portion of its local memory to be used as a cache for global memory. This cache is managed through a combination of S-COMA software and hardware. Processes reference the data through process specific virtual addresses, node memory hardware references the data through local real addresses, and S-COMA hardware passes global addresses between nodes. The S-COMA subsystem takes care of translating between local real addresses and global addresses.

Web site: http://www.delphion.com/details?pn=US06275900__

- **Light-receiving element array device and optical demultiplexer using the same**

  Inventor(s): Nakama; Kenichi (Osaka, JP), Tagami; Takashi (Osaka, JP)

  Assignee(s): Nippon Sheet Glass Co., Ltd. (Osaka, JP)

  Patent Number: 6,710,330

  Date filed: January 25, 2001

  Abstract: In the light-receiving element array device according to the present invention, a light-receiving section can be arranged at a position close to an input optical fiber so that the light-receiving element array device can be used as an optical demultiplexer based on the Littrow arrangement. Further the present invention enables suppression of **coma** aberration and minimization of an optical demultiplexer by shortening a length of the optical system. To achieve the above-described object, a rectangular chip having a light-receiving section with a number of light-receiving elements arrayed in row thereon is sealed in a rectangular package having external leads and the bonding pads on the chip and the bonding terminals of the packages are connected with a bonding wire or the like. This light-receiving element array device has any of the following constructions: (1) in which no bonding pad is provided along one longer edge of the chip in an area around a light-receiving section of the chip, (2) in which no bonding terminal is provided along one longer edge of the package, or (3) in which no external lead is provided along one longer edge of the package, or a combination of the constructions, and the chip is accommodated in the package at a position displaced to one side of the package.

  Excerpt(s): The present invention relates to a light-receiving element array device comprising a rectangular light-receiving element array chip incorporated in a package, and more specifically to a light-receiving element array device in which a distance from a center of a light-receiving section of the light-receiving element array chip to a longer edge of the rectangular package is small. Further this invention relates to an optical demultiplexer using the light-receiving element array device as described above. The optical demultiplexer is used, for instance, in the photoelectric communications based on the wavelength multiplexed transmission system as a device for separating light

transferred to the receiving side in the multiplexed form to several light components each corresponding to a wavelength. Optical demultiplexers having various configurations have been developed, and one of the representative optical demultiplexers uses therein a diffraction grating as an optical demultiplexing element. One of the optical demultiplexers using a diffraction filter therein has the configuration generally called as "Littrow type arrangement". This type of optical demultiplexer comprises an input optical fiber, a collimator lens, and a diffraction grating, and in this optical demultiplexer, an optical signal from the input optical fiber is collimated by the collimator lens and is guided to the diffraction grating, and the diffracted light is again converged by the collimator lens for the light to be detected. For detection of the light, the diffracted light is guided to a light detector using a number of optical fibers or a light guide path array.

Web site: http://www.delphion.com/details?pn=US06710330__

- **Measurement method of Zernike coma aberration coefficient**

  Inventor(s): Kye; Jongwook (Pleasanton, CA)

  Assignee(s): Advanced Micro Devices, Inc. (Sunnyvale, CA)

  Patent Number: 6,459,480

  Date filed: September 14, 2000

  Abstract: The present invention provides a method for measuring lens aberration of light on a wafer. The method includes printing a pattern on the wafer by projecting the pattern through a lens in a plurality of pitches and directions; measuring a plurality of critical dimension (CD) differences between two locations on the printed pattern for each of the plurality of pitches and directions; and determining at least one Zernike **coma** aberration coefficient based on the measured plurality of CD differences. The method in accordance with the present invention measures the CD difference between two locations on the printed pattern on a wafer. This CD difference is then used to calculate the Zernike **coma** aberration coefficients. No projected reference pattern is required to measure the CD difference, and thus an absolute **coma** aberration can be calculated. Also, the **coma** aberration coefficients are based on the light projected onto the wafer, allowing chip manufacturers to more precisely select a stepper with an appropriate lens aberration. This in turn allows better quality control in the clarity of patterns printed on wafers.

  Excerpt(s): The present invention relates to lens aberrations, and more particularly to the lens aberrations in lithography. Lithography, a well known process in the art, is often used to print patterns onto a silicon wafer. In lithography, a device called the "stepper" emits light through a lens. The light is then emitted through a patterned mask, projecting the pattern onto the wafer. The projected pattern is then printed onto the wafer. The clarity of the printed pattern depends upon the lens aberration. Because of the increasingly high density of devices on a single wafer, the clarity of the printed pattern is increasingly important. To properly control the clarity of the printed pattern, a chip manufacturer needs to have an accurate measurement of the aberration in the lens so that a stepper with an acceptable lens aberration is purchased. Typically, the lens manufacturer, and the stepper manufacturer who installs the lens into its stepper, have calculated the lens aberration. Various conventional methods are used. Each of these methods use "Zernike polynomials". The Zernike polynomials are a set of equations which represent the effects of various types of lens aberrations. The sum of all of the Zernike polynomials give the total aberration of the lens. Each of the Zernike

polynomials has a coefficient. By measuring the effects of the aberrations, one or more of the Zernike polynomial coefficients may be calculated. One type of aberrations is referred to as "coma". **Coma** results from unequal bending of parallel light rays from an off-axis object. The effects of **coma** is image asymmetry and pattern shift. The amount of image asymmetry is referred to as the "critical dimension", or "CD", difference. The CD difference is measured by a CD measuring (CDM) tool to determine the amount of asymmetry between two locations of a pattern projected through the lens. Zernike polynomials are well known in the art and will not be further described here.

Web site: http://www.delphion.com/details?pn=US06459480__

- **Method and apparatus for automated acquisition of the glasgow coma score (AGCS)**

  Inventor(s): Nenov; Valeriy (6597 Kentwood Bluffs Dr., Los Angeles, CA 90045)

  Assignee(s): None Reported

  Patent Number: 6,416,480

  Date filed: March 23, 2000

  Abstract: A system and a method for computerized automated acquisition of the Glasgow **Coma** Score (GCS) for quantifying level of consciousness following traumatic brain injury performs the assessment of the GCS of critically ill patients on a periodic basis. Based on measurement of stimulus-induced standard physiological and verbal responses of the patient such as EMG, EOG and simple utterances, the system produces a **coma** score, which corresponds one-to-one with the score obtained by human assessors. The apparatus used for automated assessment of a degree of consciousness in a patient comprises a computer having a program stored therein to assess consciousness of the patient, at least one electrode coupled to the computer for sensing a physical response, a speaker coupled to the computer for producing an audio signal, a microphone coupled to the computer configured to sense an audio response from the patient, and a pain stimulator coupled to the computer to generate a pain stimulus in the patient. The method used for automated assessment of a degree of consciousness in a patient using a computer comprises the steps of sensing a response from the patient, recording the response in the computer, the response being characterizable in nature, analyzing the characterizable nature of the response to determine the nature in the computer, categorizing the nature of the response in the computer, and producing by the computer a stimulus dependent on the categorization of the response.

  Excerpt(s): The present invention relates to systems and methods for computerized monitoring the levels of consciousness of patients admitted to medical units such as intensive care units, emergency rooms, operating rooms, etc. Specifically it automates and ultimately completely eliminates the need for human assessment of the most commonly used **coma** score--the Glasgow **Coma** Score (GCS), while still using the same scale. The Glasgow **Coma** Scale (GCS) was proposed by Teasdale and Jennett (Teasdale and Jennett 1974) and further elaborated Avezaat et. al., "A Scoring Device For The Level Of Consciousness: The Glasgow "Coma" Scale" Ned Tijdschr Geneeskd 121 2117-21 (1977). GCS is the most widely used scoring system in quantifying level of consciousness following traumatic brain injury. It is used primarily because it is simple, has a relatively high degree of inter-observer reliability, and because it correlates well with outcome following severe brain injury. (2) The motor response is scored on a scale from 1 to 6. A maximum score of 6 is assigned to a patient capable of obeying verbal commands such as "Show me two fingers". If the patient does not react to verbal commands, but can localize painful stimuli by moving his or her arm toward the pain

source in an attempt to remove the irritant, he or she will receive a score of 5. A patient only capable of a withdrawal response (a reflexive non-localizing movement) is assigned a score of 4. A score of 3 is given to an abnormal flexion response in which the arms are flexed at the elbows. If the motor response is an abnormal rigid extension ("brain stem level") the score is 2. A minimum score of 1 is assigned to a patient who produces no motor response to verbal or pain stimulus.

Web site: http://www.delphion.com/details?pn=US06416480__

- **Method for detecting and compensating disk tilt and apparatus used it**

  Inventor(s): Chang; Hung-Lu (Taichung, TW), Ho; Ming-Feng (Hsinchu, TW)

  Assignee(s): Industrial Technology Research Institute (Hsinchu, TW)

  Patent Number: 6,525,332

  Date filed: December 27, 1999

  Abstract: This invention relates to a method for detecting and compensating the disk tilt of an optical disk and an apparatus using it. The disk tilt causes the **coma** which degrades the carrier-to-signal ratio of a pickup. To reduce the **coma** induced by the disk tilt of an optical disk, the pickup of the present invention adapts a two-dimension (2-D) grating to produce a plurality of laser beams for detecting the disk tilt in the radial and tangential direction of the optical disk. In addition, according to the radial and tangential tilts of the disk, an actuation device adjusts a reflection angle of a reflective mean to change the incident angles of the laser beams for the compensation of the **coma** induced by the disk tilt of the optical disk.

  Excerpt(s): The present invention relates to a method and an apparatus for detecting and compensating disk tilt, more particular to a technique for pickups to solve the reading-error problem induced by **coma** as there are optical disk tilts in the radial and tangential directions. Optical disks include a transparent substrate having a recording layer where data is recorded and stored. Data can be stored on the recording layer in various forms, including pits, marks, and magneto-optic domains. In an optical disk system, a laser beam is focused by an objective lens through the transparent substrate and onto the stored data. The laser beam is then reflected back through the same objective lens for focusing. Since surface defects on the disk, such as dust particles and scratches, can have dimensions on the order of the focused spot size of the laser beam, the laser beam is typically focused onto the rear surface of the disk substrate to ensure that any surface defects will be out of focus with respect to the recording layer containing the data. Any spherical aberration caused by focusing the laser beam through the substrate will generally be corrected by the design of the objective lens. Typically, the optical disk is not perfectly flat, and any local deviations from flatness appear as a slight tilt of the front surface of the disk with respect to the incident beam. In addition, when the optical disk placed on a turntable of a player is warped, the front surface of the disk is tilted relative to the optical axis of the focused laser beam, and **coma** aberration occurs. Additional tilt components can be caused by spindle misalignment or disk droop. The disk tilt causes a degradation of the focused spot quality of the laser beam, which results in a decrease in the carrier-to-noise ratio during readout, an increase in crosstalk and intersymbol interference, and a reduction in recording sensitivity.

  Web site: http://www.delphion.com/details?pn=US06525332__

- **Method for forming via-first dual damascene interconnect structure**

  Inventor(s): Chang; Vencent (Taipei, TW), Chang; Ya-Hui (Ping-Tung, TW), Huang; I-Hsiung (Kaohsiung, TW), Hung; Kuei-Chun (Hsin-Chu, TW)

  Assignee(s): United Microelectronics Corp. (TW)

  Patent Number: 6,458,705

  Date filed: June 6, 2001

  Abstract: In accordance with the present invention, a method for forming a via-first dual damascene interconnect structure by using gap-filling material whose thickness is easily controlled by a developer is provided. The essential part of the present invention is the application of gap-filling materials such as novolak, PHS, acrylate, methacrylate, and **COMA** to fill vias. Filling vias with these materials can get a greater planar topography for trench patterning due to its excellent gap-filling capacity, protect the bottom of vias from damage during the trench etch, and prevent the fence problem by using a developer to control its thickness in vias.

  Excerpt(s): The present invention generally relates to a method for forming multi-level interconnect in an integrated circuit, and more particularly to a method for forming a via-first dual damascene interconnect structure by using gap-filling materials whose thickness is controlled by a developer. As feature sizes shrink, more devices can be built per unit substrate area. The multi-layer interconnects are employed in order to accommodate higher densities as device dimensions shrink well below one micron design rules. Through advanced semiconductor processing techniques, integrated circuit devices with sub-micron and sub-half-micron features have driven the need for multi-layer interconnects. At the same time, the size of interconnect structures will also need to shrink, in order to accommodate the smaller dimensions. Thus, as integrated circuit technology advances into the deep sub-micron range, more advanced interconnect architecture and application are required. Damascene integration scheme is one such architecture to satisfy this need. The main advantage of the damascene process is the elimination of the need to etch the metal layer that provides the interconnections. Another advantage is that it can eliminate the need for a dielectric gap fill. A third advantage is that it avoids some of the problems associated with lithographic overlay tolerance, making it possible to achieve higher interconnect packing density. There are two major classes of damascene processes: single-damascene and dual-damascene. A single damascene process involves making contact to a lower conductive layer by patterning dielectric layer and forming a conducting plug in the dielectric layer, then patterning a second dielectric layer and forming the actual interconnect wiring metallization in the dielectric layer. The dual damascene technology is applied, as integrated circuit technology advances to 0.18 micrometer. In a dual damascene process, the interconnect wiring and plug are formed by patterning both the via and the trench patterns into dielectric layer, then filling them simultaneously with conducting material, such as metal. The dual damascene process offers an advantage in process simplification and low manufacturing cost by reducing the process steps required to form the vias and trenches for a given metallization level. The openings, for the wiring of a metallization level and the underlying via connecting the wiring to a lower conducting level, are formed at the same time.

  Web site: http://www.delphion.com/details?pn=US06458705__

- **Missile seeker having a beam steering optical arrangement using risley prisms**

  Inventor(s): Arndt; Thomas D. (Amado, AZ), Ellis; Kenneth S. (Tucson, AZ), Knapp; David J. (Tucson, AZ), Mills; James P. (Tucson, AZ), Paiva; Richard A. (Tucson, AZ), Sparrold; Scott W. (Tucson, AZ)

  Assignee(s): Raytheon Company (Lexington, MA)

  Patent Number: 6,343,767

  Date filed: March 3, 1999

  Abstract: A missile seeker. The inventive missile seeker includes a dome within which a novel optical arrangement is retained. The optical arrangement includes a first prism mounted for rotation about an optical axis and a second prism mounted for rotation about the optical axis. In the illustrative embodiment, the first and second prisms are Risley prisms. In addition, the illustrative implementation includes a first motor arrangement for rotating the first prism about the optical axis and a second motor arrangement for rotating the second prism about the optical axis. A controller is provided for activating the first and second motors to steer the beam at an angle.phi. and nod the beam at an angle.theta. In a specific implementation, the first prism and/or the second prism have at least two surfaces contoured to correct for optical aberration. A teaching is provided to contour the surfaces to correct for astigmatism, **coma,** trefoil and other non-rotationally symettric abberation. The contour may be effected by laser etching, micro-machining optical thin-film coating or other such technique.

  Excerpt(s): The present invention relates to missile systems. More specifically, the present invention relates to optically guided missile systems. For certain applications, optical systems are preferred for missile guidance. Current optically-guided missiles are often constrained by the need to balance aerodynamic considerations and optical considerations with respect to the missile dome. That is, from an optical perspective, a flat dome is preferred. However, from an aerodynamic perspective, an elongate aerodynamically shaped dome is preferred to reduce drag. Hence, using conventional teachings, an optically-guided missile can not be optimized with respect to either aerodynamic or optical considerations and consequently the designer is forced to accept certain performance compromises to meet design objectives. Accordingly, there is a need in the art for a missile having a conformal dome. That is, there is a need in the art for a missile having an optical guidance system which allows for the dome to be `conformed` for aerodynamic considerations.

  Web site: http://www.delphion.com/details?pn=US06343767__

- **Modular infrared kepler telescope**

  Inventor(s): Ulrich; Wilhelm (Aalen, DE)

  Assignee(s): Carl-Zeiss-Stiftung (Heidenheim/Brenz, DE)

  Patent Number: 6,246,516

  Date filed: February 3, 2000

  Abstract: The invention is directed to an infrared Kepler telescope which includes an objective defining an optical axis and including a positive front group and a negative rear group all arranged on the optical axis. The objective further includes an interchangeable optic interposed between the positive front group and the negative rear group with the interchangeable optic being configured to operate as a magnification

changer. An ocular is mounted on the optical axis rearward of the negative rear group and the rear group and the ocular are fixedly pregiven. The positive front group is a first positive front group and is exchangeable with at least a second positive front group. The interchangeable optic is a first interchangeable optic and is exchangeable with at least a second interchangeable optic. The first and second positive front groups are optically so configured that each one of the positive front groups undercorrects spherical aberration and **coma** forward of the negative rear group to the same extent with or without the interchangeable optic. It is also provided that each combination has an overall diffraction-limited correction except for the distortion. The interchangeable optics (W11, W21) generate a second field of view. The telescope having interchangeable optics (W11, W21) has a negative distortion and has a positive distortion without these interchangeable optics.

Excerpt(s): The invention relates to an infrared Kepler telescope, that is, an afocal optical system providing an intermediate image and including an objective and an ocular. Optics of this kind are, for example, built into thermal imaging apparatus. A modular zoom reimager which includes an interchangeable compensator/ocular unit is disclosed in the paper of A. Mann entitled "Infrared zoom lenses in the 1980s and beyond" published in Optical Engineering, 31 (5), pages 1064 to 1071 (May 1992). U.S. Pat. No. 5,044,706 discloses a telescope (Galilei, afocal) having a focal length (field of view) which can be changed by insertable lens groups. Diffractive optical elements and aspheric elements are provided in the additional lenses and in the base objective.

Web site: http://www.delphion.com/details?pn=US06246516__

- **Objective lens used with high density optical recording medium**

  Inventor(s): Ori; Tetsuya (Saitama, JP)

  Assignee(s): Fuji Photo Optical Co., Ltd. (Omiya, JP)

  Patent Number: 6,353,588

  Date filed: December 15, 1999

  Abstract: An objective lens having no more that two lens elements with refractive power is disclosed for reading or writing at high density on a recording medium. The first lens element, in order from a light source side, is biconvex and includes at least one aspheric surface so that it is individually well-corrected for spherical aberration. The second lens element is of a meniscus shape with its concave surface on the recording medium side of the objective lens. If the objective lens is used without a cover glass at the recording medium, the convex surface of the second lens element is made to have an aplanatic surface, which is a surface that is capable of changing the convergence or divergence of a cone of rays without introducing any spherical aberration, **coma** or astigmatism. Whether or not there is a cover glass at the recording medium, the following condition is satisfied0.8<R.sub.4 /BF<1.2whereR.sub.4 is the radius of curvature of the surface on the optical recording side of the second lens element L.sub.2, andBF is the back focal length of objective lens.The surface of the second lens element on the optical recording medium side is preferably made to be normal to rays converging to/diverging from the focus of the objective lens, thereby minimizing aberrations. If there is no cover glass, this is accomplished by making R.sub.4 equal BF. In addition, the following condition is preferably satisfied1.45<F.sub.1 /F<1.7whereF.sub.1 is the focal length of the first lens element, andF is the focal length of the objective lens.

Excerpt(s): In recent years, CD's (compact disks), MO (magneto-optical) disks and DVD's (digital video disks) have been used as optical recording media for recording data such as video images and the like, as well as a recording media for computers. The objective lenses that are used with an optical pick-up device for accomplishing the writing or reading of data signals with these recording media usually have a numerical aperture of about 0.45 for CD's, 0.5-0.6 for MO disks and 0.6 for DVD's. In addition, there has been a strong demand for optical pick-up devices to be miniaturized, light weight, and low cost. In order to satisfy these requirements, the objective lens is often made of a synthetic resin material having at least one aspherical surface, or the lens is formed from glass material having at least one aspherical surface. k is a constant. Thus, in order to make the light collecting spot smaller, it is necessary to either shorten the wavelength of the light source, or to use an objective lens having a higher numerical aperture. Shortening the wavelength of the light source requires either a shorter base wavelength semiconductor laser light source or the use of second harmonic generation techniques.

Web site: http://www.delphion.com/details?pn=US06353588__

- **Optical head and information recording and reproducing apparatus using it**

  Inventor(s): Arikawa; Kouji (Hitachinaka, JP), Nakamura; Shigeru (Tachikawa, JP), Shigematsu; Kazuo (Yoshikawa, JP)

  Assignee(s): Hitachi, Ltd. (Tokyo, JP)

  Patent Number: 6,298,028

  Date filed: March 8, 2000

  Abstract: In an optical head for recording on or reproducing from a plurality of kinds of optical information recording media corresponding to a plurality of kinds of different wavelengths, **coma** aberration is prevented, and low price and high reliability are realized. To that end, in an optical head constituted by laser light sources of three wavelengths and photodetectors corresponding to the laser light sources of the three wavelengths, a two-laser module including laser light sources of two adjacent wavelengths and photodetectors corresponding to the laser light sources, a laser module including a laser light source of the rest one wavelength and a photodetector corresponding to the laser light source, and a dichroic mirror bonded with a rising mirror are combined.

  Excerpt(s): The present invention relates to a laser module for optical information processing to record or read information recorded onto an optical recording medium such as an optical disc, a photomagnetic disc, or the like, with laser light, and particularly relates to a laser module for dealing with a plurality of wavelengths for the combination of DVD and CD or the like, an optical head and an optical information recording and reproducing apparatus using it. Recently, a DVD (Digital Versatile Disc) drive using laser light having a wavelength of 650 nm has come into a wide use rapidly as a dual-wavelength drive which is also applicable to CD using laser light having a wavelength of 780 nm. In an optical head used in this drive, semiconductor lasers, collimating lenses, objective lenses, photodetector, etc. are mounted for the respective CD and DVD in order to keep compatibility between DVD and CD. As a result, the number of parts is doubled, and their optical adjustment is complicated, so that the cost increases. On the other hand, a blue laser having a wavelength of 410 nm has been lively developed, and expected to be put into practical use in the near future. It is therefore necessary to develop a three-wavelength optical head which can also deal with a blue

laser while keeping compatibility with CD and DVD. However, preparing and assembling parts for the three wavelengths causes not only a large increase in the cost but also a serious problem in downsizing of the optical head and in ensurance of reliability.

Web site: http://www.delphion.com/details?pn=US06298028__

- **Optical record carrier scanning device**

  Inventor(s): Wals; Jeroen (Eindhoven, NL)

  Assignee(s): Koninklijke Philips Electronics N.v. (Eindhoven, NL)

  Patent Number: 6,399,932

  Date filed: December 22, 1999

  Abstract: An optical scanning device for scanning a record carrier directs a radiation beam towards the record carrier. Two detection systems are arranged in the path of the beam reflected by the record carrier, one before and one after the focus of the beam. Output signals of the detection systems represent the intensity distribution of the beam in the plane of each detection system. The output signals are processed to form a signal representing an aberration of the reflected beam. The aberration may be **coma** or spherical aberration. The aberration signal is used to control a compensation element in the optical path of the radiation beam incident on the record carrier.

  Excerpt(s): The invention relates to the field of optical information storage and more specifically to optics systems for scanning rotating optical disks. The invention relates to an optical scanning device for scanning an optical record carrier with an information layer, the device having an objective lens for converging a first radiation beam to a spot on the information layer. An optical scanning device of the this type is known from the article "Tilt correction in an optical system" by Gerber and Mansuripur, Applied Optics, Vol. 35, No. 35, pp. 7000-7007. In the known device a radiation source generates a radiation beam, which is converged to a spot on an information layer by an objective lens. The radiation beam reflected from the record carrier falls on a detection system. The electric output signals of the detection system are used to form a tilt signal, representing the tilt between the normal to the record carrier and the optical axis of the objective system. The tilt causes a comatic aberration of the spot. The tilt signal is used to control a tilt corrector arranged in the path of the first beam to compensate the comatic aberration. It is a disadvantage of the known scanning device that the quality of the spot is not sufficient when scanning high-density optical record carriers.

  Web site: http://www.delphion.com/details?pn=US06399932__

- **Optical scanning with aberration correction**

  Inventor(s): Stallinga; Sjoerd (Eindhoven, NL), Vrehen; Joris Jan (Eindhoven, NL), Wals; Jeroen (Eindhoven, NL)

  Assignee(s): Koninklijke Philips Electroncis N.v. (Eindhoven, NL)

  Patent Number: 6,496,452

  Date filed: December 20, 2000

  Abstract: An optical head scans the information layer (3) of an optical record carrier (1) by means of a radiation beam (13). Optical aberrations in the beam such as **coma** and

spherical aberration, caused by tilt and thickness variations in the optical disc respectively, are compensated by an aberration compensator (27) arranged in the radiation beam. The tilt or thickness variation is measured by a detector (30) and used to control the aberration compensator. The radiation beam is focused onto the information layer by an objective system (11). A displacement of the objective system in the transverse direction (26) as used for radial tracking of the optical beam, causes a mismatch between the wavefront to be compensated and the wavefront introduced by the aberration compensator (27). The detrimental effects of the mismatch are reduced by compensating only part of the aberration. The degree of compensation depends on the maximum displacement of the objective system and the tolerable wavefront error.

Excerpt(s): The invention relates to an optical head for scanning an optical record carrier having an information layer, comprising a radiation source for generating a radiation beam and an objective system for converging the radiation beam to a focus on the information layer, an actuator for displacing the objective system over a range in a direction transverse to its optical axis, an aberration detector for detecting an amount of an optical aberration in the radiation beam, an aberration compensator arranged in the optical path between the radiation source and the objective system, and a control circuit connected to an output of the aberration detector for controlling the aberration compensator. The invention also relates to a device for scanning an optical record carrier having an information layer and a transparent layer. The information stored in an optical record carrier is arranged in tracks in the information layer of the record carrier. The information is written, read or erased by means of a focussed radiation beam that follows the track. The position of the focus is kept in the plane of the information layer by means of a focus servo that controls the axial position of the objective lens used for focussing the radiation beam. A second servo system controls the transverse position of the focus in order to keep the focus on the track being scanned. The transverse direction is the direction in the plane of the information layer perpendicular to the direction of the track. The second servo system causes the objective lens to move in the transverse direction, i.e. in a direction perpendicular to its optical axis, thereby moving the focus also in the transverse direction. On a disk-shaped record carrier the transverse direction corresponds to the radial direction; therefore the second servo system is also called the radial tracking servo. The trend of increasing information density on optical record carriers requires a commensurate decrease in the size of the focus of the radiation beam formed on the information layer. A smaller focus can be realized by increasing the numerical aperture of the radiation beam incident on the record carrier. However, an increase of the numerical aperture increases the susceptibility of the optical system in the head to optical aberrations. One of the aberrations is **coma,** caused by the transparent layer of the record carrier when it is not perpendicular to the principal ray of the radiation beam incident on the record carrier. Such non-perpendicular incidence of the radiation beam on the record carrier, generally referred to as tilt, may be caused by warping of the record carrier. Optical heads having a high numerical aperture require compensation of the **coma** caused by the tilt in order to scan the information layer of the record carrier properly.

Web site: http://www.delphion.com/details?pn=US06496452__

- **Test object for use in detecting aberrations of an optical imaging system**

  Inventor(s): Dirksen; Peter (Eindhoven, NL), Juffermans; Casparus A. H. (Eindhoven, NL)

  Assignee(s): U.S. Philips Corporation (New York, NY)

  Patent Number: 6,331,368

  Date filed: April 27, 2001

  Abstract: Aberrations of an imaging system (PL) can be detected in an accurate and reliable way by imaging, by means of the imaging system, a test object having circular phase structure (22) on a photoresist (PR), developing the resis and scanning it with a scanning detection device (SEM) which is coupled to an image processor (IP). The circular phase structure is imaged in a ring structure (25) and each of several possible aberrations, like **coma,** astigmatism, three-point aberration, etc. causes a specific change in the shape of the inner contour (CI) and the outer contour (CE) of the ring and/or a change in the distance between these contours, so that the aberrations can be detected independently of each other.

  Excerpt(s): detecting the developed image by means of a scanning detection device having a resolution which is considerably larger than that of the imaging system. The fact that the resolution of the scanning detection device is considerably larger than that of the imaging system means that the detection device allows observation of details which are considerably smaller than the details that can still be separately imaged by the imaging system. An optical imaging system in the form of a projection lens system having a large number of lens elements is used in photolithographic projection apparatuses which are known as wafer steppers or as wafer step-and-scanners. Such apparatuses are used, inter alia, for manufacturing integrated circuits, or ICs. In a photolithographic projection apparatus, a mask pattern present in the mask is imaged a large number of times, each time on a different area (IC area) of the substrate by means of a projection beam having a wavelength of, for example, 365 nm in the UV range, or a wavelength of, for example, 248 nm in the deep UV range, and by means of the projection lens system.

  Web site: http://www.delphion.com/details?pn=US06331368__

- **Vertical deflection circuit and color picture tube apparatus**

  Inventor(s): Iwamoto; Tomoaki (Osaka, JP), Uchida; Yukio (Osaka, JP)

  Assignee(s): Matsushita Electronics Corporation (Osaka, JP)

  Patent Number: 6,294,884

  Date filed: April 12, 1999

  Abstract: A vertical deflection circuit for a color picture tube apparatus, which reduces a white horizontal belt-like area that appears near vertical center of a color picture tube screen, caused by the operation of a convergence correction circuit using switching characteristics of a diode. The circuit comprises a vertical deflection yoke and a vertical linearity correction circuit connected to the vertical deflection yoke. The vertical deflection yoke has a vertical deflection coil, a convergence correction circuit using a diode as a switch, and a vertical **coma** aberration correction coil. An impedance of the vertical linearity correction circuit varies within a range where a vertical deflection

current is in the vicinity of 0 A so as to reduce an impedance of the vertical deflection circuit.

Excerpt(s): The present invention relates to a vertical deflection circuit to be used in a color picture tube apparatus of a television or a display monitor. In in-line color picture tubes used in televisions and display monitors, when there is a misalignment between the central axis of the vertical deflection magnetic field and the central axis of the color picture tube, or there is a rotational misalignment between the vertical deflection magnetic field and the color picture tube, mis-convergence occurs separately at the upper and lower portions of the color picture tube screen (fluorescent screen). As means for separately correcting these kinds of mis-convergences at the upper portion and the lower portion of the color picture tube's screen, Publication of Unexamined Japanese Publication No. Hei 8-102270 discloses two auxiliary coils that are provided at a rear portion, i.e. on the electron gun side, of a deflection yoke. Those auxiliary coils are supplied with correction current by a convergence correction circuit that uses a diode bridge circuit.

Web site: http://www.delphion.com/details?pn=US06294884__

Patent Applications on Coma

As of December 2000, U.S. patent applications are open to public viewing.[9] Applications are patent requests which have yet to be granted. (The process to achieve a patent can take several years.) The following patent applications have been filed since December 2000 relating to coma:

- **Arrayed waveguide grating**

  Inventor(s): Beelen, Gunter; (Zoutleeuw, BE), Bulthuis, Hindrick Freerk; (Enschede, NL), Stoffer, Remco; (Enschede, NL)

  Correspondence: Sughrue Mion, Pllc; 2100 Pennsylvania Avenue, NW; Washington; DC; 20037-3213; US

  Patent Application Number: 20030063858

  Date filed: September 10, 2002

  Abstract: In an arrayed waveguide grating (AWG) comprising fist and second slab waveguides and an array of waveguides optically coupled therebetween, the angle of the array waveguides at the slab waveguides is chirped according to the following equation:.theta.sub.i=Arc Sine(i.DELTA.theta.), where i=-(N-1)/2, -(N-1)/2+1,. , +(N-1)/2where i is the array waveguide number, N is the number of array waveguides, and.DELTA.theta. is a constant. The chirping removes third-order aberration (**COMA**) which would otherwise cause asymmetry in the AWG output channel signals, especially where the AWG has a flattened passband.

  Excerpt(s): The present invention relates to arrayed waveguide gratings (AWGs). In particular, though not exclusively, the invention concerns passband flattening in AWGs and an improvement for increasing passband uniformity in AWGs having flattened passbands. AWGs, sometimes also known as "phasars" or "phased arrays", are now well-known components in the optical communications network industry. An AWG is a planar structure comprising an array of waveguides arranged side-by-side which

[9] This has been a common practice outside the United States prior to December 2000.

together act like a diffraction grating in a spectrometer. AWGs can be used as multiplexers and as demultiplexers, and a single AWG design can commonly be used both as a multiplexer and demultiplexer. The construction and operation of such AWGs is well known in the art. See for example, "PHASAR-based WDM-Devices: Principles, Design and Applications", M K Siit, IEEE Journal of Selected Topics in Quantum Electronics Vol.2, No.2, June 1996, and U.S. Pat. No. 5,002,350 and WO97/23969. where.lambda.sub.c is the central wavelength of the grating, n.sub.c is the effective refractive index of the array waveguides, and m is an integer number. In known manner, the transmission waveguides and slab waveguides are typically formed (e.g. using standard photolithographic techniques) as "cores" on a silicon substrate (an oxide layer and/or cladding layer may be provided on the substrate prior to depositing the waveguide cores) and are covered in a cladding material, this being done for example by Flame Hydrolysis Deposition (FHD) or Chemical Vapour Deposition (CVD) fabrication processes.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Cache management using a buffer for invalidation requests**

  Inventor(s): Mounes-Toussi, Farnaz; (Minneapolis, MN)

  Correspondence: James R. Nock; Ibm Corporation, DEPT. 917; 3605 Highway 52 North; Rochester; MN; 55901-7829; US

  Patent Application Number: 20020083271

  Date filed: December 21, 2000

  Abstract: An invalidation buffer is associated with each cache wherein either multiple processors and/or multiple caches maintain cache coherency. Rather than to decode the addresses and interrogate the cache directory to determine if data requested by an incoming command is in a cache, the invalidation buffer is quickly checked to determine if the data associated with the requested data has been recently invalidated. If so and if the command is not intended to replace the recently invalidated data, then the tag and data array of the cache are immediately bypassed to save precious processor time. If lower level caches maintain the same cache coherency and are accessed only through an adjacent cache, then those lower level caches may also be bypassed and a cache miss can be directed immediately to memory. In a multiprocessor system, such as NUMA, **COMA,** SMP, where other processors may access different cache levels independent of the adjacent cache level, then each invalidation buffer is checked. If the data is not in the invalidation buffer, a speculative cache hit can be generated and transferred to the requesting processor or upper level cache for earlier processing or to reserve a cache block, respectively.

  Excerpt(s): This invention relates generally to field of computer processing and more specifically relates to a method and apparatus to eliminate unnecessary detection of hardware cache misses. Computer architecture refers to the physical structure and interconnections of the registers, logical and arithmetic units, control units, and other hardware within a computer. All computers have at least one processor and more complex computers, such as servers, have many processors working together. Also, there are at least two kinds of memory devices associated with the computer: an internal volatile memory called random access memory which is erased when the computer is turned off; and an external memory, called a hard drive, which permanently stores the programs, also called applications, to be executed by a processor when called. Of course, there are a number of peripheral devices such as monitors, Internet connections,

keypads, mouses, other pointing devices, other optical and magnetic drives, connections to other computers, etc. This invention is concerned with keeping the processor(s) busy. The processor retrieves the applications or programs from the external memory into the internal memory. When data and/or instructions are needed for the application, the processor may retrieve the data/instructions from internal memory to its registers for arithmetic and logical processing. When the processor needs data/instructions from memory, it is idle until the data/instructions are available. Now that processor speeds are faster and faster, computer architects have directed an aspect of research and development into keeping the processor occupied and its registers filled for the next operation. One of many approaches taken by computer architects has been to minimize the time required to retrieve data/instructions from external and internal memory into the processor's registers. Incorporating smaller high speed memory units called caches nearer the memory is an implementation of this approach. These caches, moreover, may be hierarchical meaning that a level one (L1) cache is very close to the processor and is very fast which may be accessed in only one or very few processor cycles. There may be a L1 cache for instructions and a different L1 cache for data. There also may be level two (L2) and/or level three (L3) caches with the higher number denoting a larger, more distant, and perhaps slower cache but still closer and faster than either internal or external memory. Thus, when a processor needs data/instructions which is not readily available in its registers, it accesses its L1 cache by generating a control signal to access the cache directory and the data array in which the data is actually stored. A typical entry in a cache's directory, also called tag array, includes the cache coherency state of the data/instruction and a block address corresponding to the data in a data array of the cache. The address of the requested data/instruction is compared with the address in the cache's tag array. A cache miss occurs if the addresses of data/instructions do not match; a cache hit occurs if the addresses do match and the state is not invalid. If there is a L1 cache miss, the processor interrogates the L2 cache directory for the address of the requested data/instructions. If there is a L2 cache miss, the processor checks to see if the data/instruction is in the next layer's cache directory and so on until, if the data/instructions are not in any cache, it retrieves the data/instructions from memory. Access to a L1 cache typically takes on the order of one or just a few processor cycles with L2 and L3 cache accesses taking more cycles. Interrogating each of these caches may take a long time and actually degrade processor performance in the absence of nonblocking caches. Introducing resource conflicts may prevent the cache controllers to respond at optimum speed to incoming requests.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Color picture tube device in which YH misconvergence is corrected**

  Inventor(s): Tagami, Etsuji; (Takatsuki-shi, JP)

  Correspondence: Price And Gess; STE. 250; 2100 S.E. Main ST.; Irvine; CA; 92614; US

  Patent Application Number: 20030057893

  Date filed: August 30, 2002

  Abstract: A group of an upper **coma** correction coil and an upper four-pole coil is positioned in opposition to a group of a lower **coma** correction coil and a lower four-pole coil, with respect to an electron beam. A first circuit is composed of a circuit in which the lower four-pole coil and a first diode are connected in series is connected in parallel to the upper **coma** correction coil. A second circuit is composed of a circuit in which the upper four-pole coil and a second diode are connected in series is connected

in parallel to the lower **coma** correction coil. The first circuit and the second circuit connected in series compose a YH correction circuit. The first diode and the second diode are positioned so as to have opposite polarities. Vertical deflection current is diverted to the YH correction circuit.

Excerpt(s): The present invention relates to a color picture tube device that is used in a television, a computer display or the like, and in particular to a technique for correcting YH misconvergence in the color picture tube device. Japanese patent number 2667215 discloses one example of a technique for correcting YH misconvergence in a color picture tube device. This color picture tube has four-pole coils on the electron gun side of the deflection yoke, and corrects YH misconvergence by supplying a vertical deflection current to a YH misconvergence correction circuit (hereinafter "YH correction circuit") that includes the four-pole coils. However, while the amount that YH misconvergence is corrected (hereinafter "YH correction amount") by the YH correction circuit 140 increases linearly in proportion to the size (absolute value) of vertical deflection current, the amount of YH misconvergence increases in a parabola shape the closer it becomes to the edge portions in the vertical direction.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Coma aberration correcting apparatus for optical pickup**

  Inventor(s): Hong, Min; (Seoul City, KR), Jung, Jae-Hyun; (Anyang City, KR), Kim, Jun-Bo; (Seoul City, KR), Ryu, Young-Su; (Suwon City, KR)

  Correspondence: Staas & Halsey Llp; Suite 700; 1201 New York Avenue, N.W.; Washington; DC; 20005; US

  Patent Application Number: 20040105360

  Date filed: October 24, 2003

  Abstract: A **coma** aberration correcting apparatus of an optical pickup includes an optical pickup main body having a photo diode, and an actuator mounted on an objective lens focusing a beam emitted from the photo diode onto a recording medium. The **coma** aberration correcting apparatus includes a main supporting unit, a holding unit, an optical system, a driving part, and a controller. The main supporting unit detachably supports the optical pickup main body. The holding unit holds and releases the actuator on the optical pickup main body supported by the main supporting unit. The optical system magnifies and photographs the beam emitted from the photo diode through the objective lens of the actuator held by the holding unit. The driving part adjusts a position of the actuator relative to the optical pickup main body. The controller controls the driving part to correct the **coma** aberration of the objective lens.

  Excerpt(s): This application claims the benefit of Korean Patent Application No. 2002-75343, filed Nov. 29, 2002, in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference. The present invention relates to a **coma** aberration correcting apparatus for an optical pickup, and more particularly, to a **coma** aberration correcting apparatus for an optical pickup, including an optical pickup main body having a photo diode, and an actuator mounted on an objective lens focusing a beam emitted from the photo diode. Generally, an optical pickup reads or writes data on a recording medium, such as a CD (compact disk) in an optical device, such as a CD-ROM (compact disk read only memory) drive, a CD-RW (compact disk rewritable) drive, a DVD (digital versatile disk) drive, etc.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Composition for treatment of night sight problems(halos, comas and glare) after refractive surgery, intra ocular lens implant after lensectomy or intraocular implant in phakic patients comprising aceclidine employed at low concentrations**

  Inventor(s): Randazzo, Alessandro; (Milano, IT)

  Correspondence: Sughrue Mion, Pllc; 2100 Pennsylvania Avenue, N.W.; Suite 800; Washington; DC; 20037; US

  Patent Application Number: 20040106644

  Date filed: October 2, 2003

  Abstract: After refractive surgery to reduce ametropy (i.e. myopia, astigmatism or hypermetropia) an average percentage of patients between 15.8% after PRK (Photo Refractive Keratectomy) and 33% after LASIK (Laser in situ Keratomileusis) shows a poor night sight due to the presence of halos, glare and **coma.** A comparable disorder is present in a percentage of patients that underwent lensectomy (cataract or refractive lensectomy) with intra ocular lens (IOL) implant and IOL implants in phakic patients to reduce ametropy. Thanks to the effect on pupillary kinetics, diluted low concentrations (from 0.002% to 0.040%) of Aceclidine were surprisingly found to effectively reduce and/or eliminate night sight problems for about 6 hours.

  Excerpt(s): The present invention relates to the treatment of night sight problems like halos, **coma** and glare to which are exposed a percentage of patients who underwent refractive surgery or lensectomy with intra ocular lens (IOL: monofocal, multifocal, etc) implant in aphakic patients or intra ocular lens implant in phakic patients ("phakic IOL" like intra chamber lens ICL; Artisan, NuVita etc.). The treatment generally relates to the ophthalmic use of a pharmaceutical composition, in particular ophthalmic composition, containing aceclidine (3-acetoxyquinuclidine, R. Paoletti et al., 1998), at very low concentrations. A highly preferred concentration range of aceclidine in total weight percent is from 0.002% to 0.040%, more preferably from 0.016 to 0.032% (of total weight percent of composition). After refractive surgery to reduce ametropy (like for example myopia, astigmatism or hypermetropia), an average percentage of patients between 15.8% after PRK (Photo Refractive Keratectomy) and 33% after LASIK (Laser in Situ Keratomileusis) suffers of severe night sight problems due to light ray aberrations and diffraction (Rossetti et al, 2001). A comparable disorder is present in a percentage of patients that underwent lensectomy with intra ocular lens (IOL) implant (cataract or refractive lensectomy) (Martin L et al 1999; Schmitz S et al 2000; Pieh S et al 2001; Hwang IP et al 2001; Walkow L et al 2001) or with intra ocular lens implants in phakic patients to reduce ametropy (Maroccos R et al 2001).

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Crystals and structures of members of the E. coli comA and yddB protein families (ComA)**

  Inventor(s): Buchanan, Sean Grant; (Encinitas, CA), Gajiwala, Ketan S.; (San Diego, CA), Louie, Gordon V.; (San Diego, CA)

  Correspondence: Kawai Lau; Morrison & Foerster Llp; Suite 500; 3811 Valley Centre Drive; San Diego; CA; 92130-2332; US

  Patent Application Number: 20030158384

  Date filed: November 8, 2002

Abstract: The present invention provides machine readable media embedded with the three-dimensional molecular structure coordinates of **ComA** proteins, and subsets thereof, including binding pockets, methods of using the structure to identify and design affecters, including inhibitors and activator, mutants of **ComA,** and compounds and compositions that affect **ComA** activity.

Excerpt(s): This application claims benefit of priority from U.S. Provisional Patent Application No. 60/337,683, filed Nov. 9, 2001, which is hereby incorporated by reference in its entirety as if fully set forth. The present invention concerns crystalline forms of polypeptides that correspond to ybdB protein and ydiI (**comA**) protein (ComA proteins), methods of obtaining such crystals, and to the high-resolution X-ray diffraction structures and molecular structure coordinates obtained therefrom. The crystals of the invention and the atomic structural information obtained therefrom are useful for solving the crystal and solution structures of related and unrelated proteins, for screening for, identifying, and/or designing protein analogues and modified proteins, and for screening for, identifying and/or designing compounds that bind and/or modulate a biological activity of **comA** or ybdB, including inhibitors and activators of **comA** or ybdB activity. Sequences encoding the **ComA** proteins have been identified and isolated from some organisms. Such sequences, and portions thereof, may be used to identify and isolate additional sequences as well as used to disrupt expression of a **ComA** protein to confirm its importance in the normal life cycle of an organism.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Curcuma Plant Named 'Laddawan'**

  Inventor(s): Manichote, Pichai; (Bangkok, TH)

  Correspondence: Christie, Parker & Hale, Llp; 350 West Colorado Boulevard; Suite 500; Pasadena; CA; 91105; US

  Patent Application Number: 20030126659

  Date filed: January 2, 2002

  Abstract: A new and distinct cultivar of Patumma named `LADDAWAN` characterized by green bracts, purplish pink **coma** bracts on a cylindical inflorescence and florets with yellow labellum.

  Excerpt(s): The present invention is directed to a new and distinct cultivar of Patumma, botanically know as Curcuma hybrid, and having the cultivar name `LADDAWAN`. The new cultivar was a seedling among a progeny of Curcuma alismatifolia.times.Curcuma cf. cordata, selected by the inventor. Asexual propagation of the new cultivar in Nakhon Pathom, Thailand by division and micro-propagation has demonstrated the uniformity and the stability throughout successive generations of this new Patumma.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Deflection unit for in-line type cathode ray tubes**

  Inventor(s): Ehrhardt, Andreas; (Plochingen, DE), Nelle, Friedrich-Karl; (Stuttgart, DE)

  Correspondence: Timothy E. Newholm; Boyle Fredrickson Newholm Stein & Gratz, S.C.; Suite 1030; 250 East Wisconsin Avenue; Milwaukee; WI; 53020; US

  Patent Application Number: 20020014825

  Date filed: March 29, 2001

  Abstract: The present invention relates to a deflection unit for mounting on an in-line type cathode ray tube comprising a coil body including grooves for receiving wound coil wires, the grooves extending substantially in a straight line. The groove extension of at least one groove is changed at at least one location such that the coil wires received in the groove become curved in the area of the changed groove extension. In a preferred embodiment the grooves are separated from each other by groove walls which in the area of the changed groove extension comprise a thickening and optionally a bulge. The coil wires wound onto the coil body form the horizontal coil or the vertical coil. The arrangement serves the selective fine adjustment of the deflection fields for eliminating convergence, **coma** and/or geometry errors.

  Excerpt(s): The present invention relates in general to deflection units for in-line type cathode ray tubes and refers, in particular, to those deflection units that comprise a coil body including substantially straight grooves for receiving wound coil wires. In color picture tubes of the in-line type, an electron beam generating system is designed for generating three coplanar electron beams that converge on the screen. The deflection unit which is arranged around the neck portion of the picture tube is used for deflecting the electron beams from their normally straight path into the one or other direction so that the beams impinge upon selected points of the screen to produce a visual signal. With a suitable time variation of the magnetic deflection fields the electron beams can be deflected upwards or downwards and to the right or left side across the screen. In in-line type color picture tubes three electron guns are positioned side by side. To deflect the generated electron beams into the X- and Y-direction, the funnel-shaped deflection unit mounted on the color picture tube produces deflection fields so that a self-converging picture without north-south raster distortion is obtained on the screen. This funnel-shaped deflection unit consists essentially of a pair of horizontal coils that produce a magnetic field which deflects the beams into the X-direction, a pair of vertical coils for deflection into the Y-direction, a ferrite core which encloses the coils, and correction magnets and possibly soft-magnetic field shapers.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Deflection yoke device**

  Inventor(s): Iwasaki, Katsuyo; (Hyogo, JP), Taniwa, Kenichiro; (Osaka, JP), Yoshinaga, Takahiro; (Osaka, JP)

  Correspondence: Merchant & Gould PC; P.O. Box 2903; Minneapolis; MN; 55402-0903; US

  Patent Application Number: 20030173913

  Date filed: September 30, 2002

  Abstract: A deflection yoke device includes a deflection yoke for deflecting electron beams in horizontal and vertical directions, the electron beams being emitted from an

electron gun of a color cathode ray tube; **coma** correcting coils positioned on an electron gun side of the deflection yoke so as to be opposed to each other in such a manner that the electron beams pass therebetween; and a pair of cores around which the **coma** correcting coils are wound, wherein a sliding mechanism is further provided for allowing each of the **coma** correcting coils to be slidable with respect to the corresponding core. Therefore, a misconvergence can be corrected by a simplified configuration without reducing a sensitivity of the **coma** correcting coils.

Excerpt(s): The present invention relates to a deflection yoke device for use in a color cathode ray tube of a television receiver, a computer display or the like. Generally, convergence properties are affected by a shift of a central axis of a deflection yoke device from a central axis of a color cathode ray tube or a so-called deflection yoke tilt such that the central axes cross each other at a certain angle. As a solution to this, the following technique has been disclosed in JP 11 (1999)-54067 A. However, in order to correct the misconvergence, the above-mentioned configuration requires a space or sliding mechanisms for allowing the U-shaped cores 4a and 4b to be slidable in a vertical direction or in a lateral direction from positions shown by solid lines to positions shown by dashed lines as shown in FIGS. 10A and 10B. Consequently, there is a possibility that a distance from the electron beams to each end of the U-shaped cores 4a and 4b might increase undesirably, which causes a reduction of sensitivity (efficiency) of the **coma** correcting coils 5a and 5b. Further, it is necessary to employ a mechanical component for allowing the U-shaped cores 4a and 4b to be slidable, which results in a complicated configuration.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Electron-optical corrector for eliminating third-order aberations**

  Inventor(s): Rose, Harald; (Darmstadt, DE)

  Correspondence: Birch Stewart Kolasch & Birch; PO Box 747; Falls Church; VA; 22040-0747; US

  Patent Application Number: 20030034457

  Date filed: July 12, 2002

  Abstract: The invention relates to an electron-optical corrector for elimanting third-order aberrations, such as spherical aberrations, field curvature and off-axis astigmatism; said corrector being devoid of third-order off-axis **coma,** third-order distrortion and first-order chromatic aberration of the first degree. The corrector has a construction which is symmetrical about the central plane in the direction of the linear optical axis. A hexapole S.sub.1 of length l.sub.1is first positioned in the direction of the beam path, followed by a circular lens R.sub.l, a hexapole S.sub.2 of length l.sub.2 and subsequently a circular lens R.sub.2 which is followed by a third hexapole S.sub.3 with the same strength with the same strength of the hexapole S.sub.l and double the length of the latter 1.sub.3=21.sub.3. The separation of the two circular lenses R.sub.1, R.sub.2 and the distance from the circular lens to the first hexapole S.sub.1 is chosen in such a way that the internal plane of S.sub.1 comes to rest in the front principal focus of the corcular lens that is positioned downstream and the center of the hexapoles S.sub.2 and S.sub.3 is located on the focal plane. Additional elements of the corrector also follow in sequence, said clements being symmetrical about the cnetral plane Z.sub.m of the hexapole S.sub.3.

Excerpt(s): The invention relates to an electron-optical corrector for eliminating third-order aberrations, such as spherical aberrations, field curvature and off-axis astigmatism; said corrector being devoid of third-order off-axis **coma,** third-order distortion and first-order chromatic aberrations of the first degree. The corrector has a construction which is symmetrical about the central plane in the direction of the linear optical axis. The efficiency of electron-optical systems, which in the sense of this invention are also understood to include those with ion-imaging systems, is limited by their image aberrations, of which, depending on the specific application and the extent of the corrections already made, particular image aberrations are responsible for limiting the performance, the elimination of which represents considerable progress in the improvement of electron-optical systems. It is possible to systematically subdivide and classify the image aberrations into axial image aberrations, which are also determined by the fundamental paths emerging in the two sections of the optical axis in the object plane, off-axis image aberrations, which in turn are dependent on the fundamental paths emerging outside the optical axis in the object plane, and chromatic aberrations, which only occur with different speeds of the imaging electrons. With magnifying electron-optical systems, such as those used in electron microscopy, it is most important to eliminate the axial image aberrations to increase efficiency. With size-reducing electron-optical systems, such as those used in lithography for writing on objects with the aid of electron beams, the elimination of off-axis image aberrations is decisive. The aim is always to set up and adjust, in its entirety, the system comprising the imaging lens system and the corrector such that the efficiency-limiting image aberrations of the entire system are eliminated or substantially minimised, the corrector having the function of, on one hand, achieving, by negative image aberration coefficients, an elimination or at least a reduction and on the other hand causing no increase of disadvantageous image aberration coefficients. The aim is always to set up and adjust, in its entirety, the system comprising the imaging lens system and the corrector such that the efficiency-limiting image aberrations of the entire system are eliminated or substantially minimised, the corrector having the function of, on one hand, achieving, by negative image aberration coefficients, an elimination or at least a reduction, and on the other hand not causing an increase, of disadvantageous image aberration coefficients.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **External pupil lens system**

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  Patent Application Number: 20020149856

  Date filed: April 12, 2001

  Abstract: An external pupil lens system (200) with an entrance pupil distance at least three times that of the effective focal length. The lens system is comprised of several conventional lenses and a diffractive optical element (DOE) for secondary chromatic aberration correction. In the illustrative embodiment, the system includes an entrance pupil (50), followed by a lens group (52) containing two refractive elements for primary color correction. Next along the optical axis is lens group (54), which contains two refractive elements for astigmatism and higher order **coma** correction, followed by lens

group (60), which contains one refractive element (62) and one DOE (64) for secondary color correction.

Excerpt(s): The present invention relates to optical systems. More specifically, the present invention relates to external pupil lens systems. Designing an external pupil imager in the visible spectral band is one of the most difficult tasks in lens design. The difficulty arises from the secondary chromatic aberration correction for the lateral and higher order aberrations such as spherochromatism and chromatic **coma.** Since the entrance pupil (aperture stop) is external to the optical system, any residual axial chromatic aberration and spherochromatism will introduce a significant amount of lateral chromatic aberration and chromatic **coma.** The difficulty in correcting the secondary chromatic aberration is due to the nonlinear property of the index of refraction of typical glass materials. Special glass materials such as KzSN4 and PSK52 can be used to minimize the secondary chromatic aberrations, but the lens curvatures will need to be very steep due to the inefficient nature of special glass material in primary chromatic aberration correction. Therefore, the lens tend to be very expensive and are difficult to fabricate and assemble. The aberrations are more pronounced when the pupil is further away from the lens. This is due to the fact that the intersection of the chief ray on each lens surface is further away from the optical axis. Additionally, the angle of incidence of the chief ray on the lens surface is often very steep. The pupil distance (from the entrance pupil to the first lens) of a typical external pupil lens system is limited to about 0.7 of the effective focal length (EFL). Even with lenses constructed of special glass materials, the entrance pupil distance is still limited to about 1.5 times the EFL.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Flat cathode-ray tube, electron gun for flat cathode-ray tube and producing method thereof**

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Patent Application Number: 20030020390

Date filed: June 28, 2001

Abstract: In a flat cathode-ray tube, there are problems that an axis of electron beam is separated before the electron beam enters a main lens due to magnetic field of a magnet disposed outside a neck, and **coma** aberration is generated to degrade an image quality. It is an object of the present invention to solve these problems. A flat cathode-ray tube comprises an electron gun 281 having a main lens 35M whose center coincides with a tube axis, a deflection yoke, and a magnet disposed outside a neck. An axis of a prefocus lens of the electron gun is separated from the tube axis.

Excerpt(s): The present invention relates to a flat cathode-ray tube, an electron gun used for the flat cathode-ray tube and a producing method of the gun. Conventionally, in the case of a flat cathode-ray tube, since the depth dimension thereof in a direction for watching a screen panel can be reduced, the flat cathode-ray tubes are preferably used for a portable television set, an in-car television set, a door phone and the like which require thin image receivers for example. A flat cathode-ray tube 1 includes a glass tube body 7 comprising a front panel 2, a screen panel 4 formed with a fluorescent surface 3 and a funnel 6 having a neck 5 which are frit-jointed to one another. An electron gun 8 is

disposed in the neck 5 of the funnel 6 such that a center axis of the electron gun 8 coincides with a tube axis 11 of the neck 5. A deflection yoke 14 having a horizontal deflection coil 12 and a vertical deflection coil 13 is provided outside from the neck 5 of the glass tube body 7 to the funnel 6. A magnet, a so-called centering magnet 9 for adjusting electron beam such that the electron beam scans an effective screen, i.e., a fluorescent surface is disposed at a position closer to a front portion of the deflection yoke 14. The centering magnet 9 comprises two ring-like double-pole magnets (permanent magnets) 9a and 9b.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **High NA objective lens for optical pick-up**

  Inventor(s): Maruyama, Koichi; (Tokyo, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1950 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20030156334

  Date filed: September 6, 2002

  Abstract: A single-element objective lens for an optical pick-up directs an incident light beam to a data recording surface of an optical disc through a cover layer to form a beam spot thereon. A numerical aperture of the objective lens is 0.7 or more. The objective lens is configured to compensate for **coma** such that a characteristic of a change of spherical aberration due to a degree of divergence/convergence of the incident beam is comparable with respect to a characteristic of a change of spherical aberration due to variation of the cover layer so that the change of spherical aberration due to variation of the cover layer can be cancelled by the change of spherical aberration due to a degree of divergence/convergence of the incident beam.

  Excerpt(s): The present invention relates to an objective lens for an optical pick-up of an optical disc drive, and more particularly to an objective lens having an NA (numerical aperture) of 0.7 or more. The invention also relates to an optical pick-up employing such an objective lens. The NA of such an objective lens is determined in accordance with a data density of a recording medium. For example, the NA of an objective lens of an optical pick-up for a CD (compact disc) is approximately 0.45. The NA of the objective lens for a DVD (digital versatile disc) is approximately 0.6. The objective lens of the CD drives or DVD drives is generally a single lens formed by plastic molding, and having aspherical surfaces as both refraction surfaces. The objective lens for the CD or DVD drive is required such that spherical aberration is well compensated for in order to converge an incident light beam as a diffraction limited spot.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **High NA system for multiple mode imaging**

  Inventor(s): Armstrong, J. Joseph; (Milipitas, CA), Chuang, Yung-Ho; (Cupertino, CA), Shafer, David; (Fairfield, CT), Tsai, Bin-Ming B.; (Saratoga, CA)

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  Patent Application Number: 20030002147

  Date filed: May 20, 2002

  Abstract: A system for multiple mode imaging is disclosed herein. The system is a catadioptric system preferably having an NA greater than 0.9, highly corrected for low and high order monochromatic aberrations. This system uses unique illumination entrances and can collect reflected, diffracted, and scattered light over a range of angles. The system includes a catadioptric group, focusing optics group, and tube lens group. The catadioptric group includes a focusing mirror and a refractive lens/mirror element. The focusing optics group is proximate to an intermediate image, and corrects for aberrations from the catadioptric group, especially high order spherical aberration and **coma.** The tube lens group forms the magnified image. Different tube lens groups can be used to obtain different magnifications, such as a varifocal tube lens group to continuously change magnifications from 20 to 200.times. Multiple imaging modes are possible by varying the illumination geometry and apertures at the pupil plane. Imaging modes include bright-field, full sky, ring dark-field, inverted ring dark-field, directional dark-field, double dark-field, Manhattan geometry, confocal bright-field, confocal dark-field, conoscopic, etc. Illumination can enter the catadioptric optical system using an auxiliary beamsplitter or mirror, or through the catadioptric group at any angle from 0 to 85 degrees from vertical. Multiple beams at multiple angles may be used for illumination. The high NA catadioptric system can also have a relayed pupil plane, used to select different imaging modes, providing simultaneous operation of different imaging modes, Fourier filtering, and other pupil shaping operations.

  Excerpt(s): This application is a continuation in part of co-pending U.S. patent application Ser. No. 08/908,247, entitled "Ultra-Broadband UV Microscope Imaging System with Wide Range Zoom Capability," filed on Aug. 7, 1997, which is a continuation in part of U.S. patent application Ser. No. 08/681,528, entitled "Broad Spectrum Ultraviolet Catadioptric Imaging. System," filed on Jul. 22, 1996, both of which are hereby incorporated by reference. The present invention relates generally to a method and apparatus for multiple mode imaging, and more particularly to catadioptric optical systems used for dark field imaging applications. High precision optical instruments and imaging systems used in many different applications must operate effectively and efficiently. To accommodate optical functionality under varied conditions, precision lenses are often employed in different complex combinations.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Image pickup lens**

  Inventor(s): Saito, Tomohiro; (Kawaguchi, JP)

  Correspondence: Koda & Androlia; Suite 3850; 2029 Century Park East; Los Angeles; CA; 90067; US

  Patent Application Number: 20030169362

  Date filed: January 31, 2003

Abstract: Provided is an image pickup lens, in which the optical characteristic can be improved and, further, the productivity can be improved through increasing the telecentricity by keeping the distance between the exit pupil and the sensor and effectively correcting the **coma** aberration and the distortion aberration. A first lens which is a meniscus lens having a positive power with its convex face facing an object side, a diaphragm, and a second lens which is a lens having a positive power with a strong convex face facing an image pickup surface side are provided in order from the object side. The first lens and the second lens are to satisfy the condition represented by following expressions:4.times.f.sub.2.gtoreq.f.sub.1.gtoreq.f.sub.2 (1)1.5.times.f1.gtoreq.f.sub.2.gtoreq.0.9.times.f1 (2)where,f1: focal length of the whole lens systemf.sub.1: focal length of the first lensf.sub.2: focal length of the second lens.

Excerpt(s): The present invention relates to an image pickup lens and particularly, to an image pickup lens comprising two lenses which can be reduced in size and weight while achieving a wider angle of view to be used for an image pickup device utilizing an image pickup element such as a CCD, a CMOS or the like to be mounted on a portable computer, a visual telephone, a cellular phone and the like. Recently, there is a remarkable development in the multimedia industry. For example, there has been an increasing demand for a camera utilizing an image pickup element such as a CCD, a CMOS or the like to be mounted on a portable computer, a visual telephone, a cellular phone and the like. Such camera needs to be mounted on a limited space. Thus, it is desirable that the camera be small in size and light in weight. Accordingly, an image pickup lens used for such CCD camera is also required to be small and lightweight as well. Conventionally, the so-called one-lens system using a single lens is used as such image pickup lens.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Laser induced fluorescence capillary interface**

  Inventor(s): Gilby, Anthony C.; (Foxborough, MA)

  Correspondence: Brian L. Michaelis, ESQ.; Brown, Rudnick, Freed & Gesmer; One Financial Center; Boston; MA; 02111; US

  Patent Application Number: 20020030810

  Date filed: April 11, 2001

  Abstract: An optical scheme that substantially eliminates spherical aberration and **coma,** thereby substantially improving fluorescence excitation and collection efficiency. The optical scheme utilizes a laser beam focused by an optical component through the curved surface of a hyper-hemisphere. The hyper-hemisphere focuses the beam sharply at a known point while avoiding spherical aberration and **coma.** The optical scheme includes both a hyper-hemisphere and a hemisphere. Both the hyper-hemisphere and hemisphere have a substantially planar surface. The substantially planar surface of the hyper-hemisphere is optimally located so that a capillary or cell can be positioned at an internal aplanatic radius. This results in an aplanatic focus at the capillary or cell such that the spherical aberration and **coma** are zero. A single hyper-hemisphere having a substantially planar surface can be used, wherein the capillary is located at an aplanatic point on the substantially planar surface of the single hyper-hemisphere.

  Excerpt(s): The present invention relates to the field of spectroscopy, and more particularly to spectroscopy of samples occupying small volumes. Capillary electrophoresis (CE) is a separation technique based on the differential migration of

charged particles in an electric field. A thin capillary (20-100.mu.m internal diameter) is filled with an electrolyte providing a medium in which analytes can migrate through. The sample is introduced at one end of the CE unit. An electric field typically of 100-600 V cm.sup.-1 is applied across the capillary facilitating analyte species migration according to their electrophoretic mobility (u) passing a detector as they migrate (usually UV or fluorescence) at or near the end of the capillary. This separation technique as well as others, such as packed capillary liquid chromatography, capillary electrochromatography and super critical chromatography, require spectroscopic measurements to be made on extremely small volumes of flowing liquid samples. The typical application has a sample flowing through a fused silica capillary tube where inside diameters range from 15 to 150 micrometers and the outside diameters range from 150 to 300 micrometers. Various techniques presently are used for directing light from a suitable source into and/or through such a small volume sample cell, as well as taking the light emanating from the inside of the cell and directing it toward a light detecting or analyzing instrument to effect optical analysis or detection of samples contained in the cell. Alignment of the optical system to efficiently direct the light from the source to the capillary cell, particularly to the bore and sample therein, and/or to direct the radiation emanating from the cell to a detector, presents problems.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **METHOD AND APPARATUS RELATING TO THE OPTICAL ZONE OF AN OPTICAL ELEMENT**

  Inventor(s): Altmann, Griffith E.; (Webster, NY)

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  Patent Application Number: 20040057010

  Date filed: September 25, 2002

  Abstract: The invention relates to the determination of higher-order aberrations of an optical element over an optical zone that is larger than the typically limited measured zone over which the aberrations are measured. This is accomplished by apparatus, systems, and methods in which, preferably, the Zernike data from an aberration measurement is fit to a conic function. The conic function smoothly and continuously increases or decreases between the measured zone and the optical zone allowing the extrapolated data to accurately determine the aberrations over the optical zone. According to the invention, a plurality of independent conic plus piston sections that vary azimuthally can very accurately describe a wavefront aberration composed of defocus, astigmatism, spherical aberration, secondary astigmatism, and tetrafoil. The description of primary **coma** and trefoil will not be as good because they vary with the 3.sup.rd order of the radial component. However, the description error is relatively small. A tilt term can be added to account for the tilt component of the **coma** and trefoil terms.

  Excerpt(s): The invention is generally directed to the field of ophthalmic vision correction, and more specifically to a method, a readable medium, and a system related to determining the optical zone associated with higher-order aberration correction provided by a custom contact lens, a custom IOL, a corneal inlay, or refractive laser surgery. Until about the beginning of the last decade, vision correction consisted of approximately determining the lower order aberrations of a person's eyes, namely defocus, cylinder (astigmatism) and the cylinder axis, and prescribing spectacle or

contact lenses to approximately correct these aberrations. More recently, however, the application of wavefront sensor technology (aberrometers) to the field of ophthalmic vision correction has allowed practitioners to accurately measure the higher-order aberrations of optical systems such as the eye. These higher-order aberrations include secondary astigmatism, spherical aberration, **coma,** trefoil, and others known to those skilled in the art. Moreover, advances in lens design and manufacturing, and laser vision correction methods and apparatus, have made it possible to correct certain of the higher-order aberrations with customized contact lenses, custom IOLs, and photoablative refractive surgery. In many patients, the theoretical limit of visual acuity, 20/8, has been achieved.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Method for measuring coma aberration in optical system**

  Inventor(s): Fujimoto, Masashi; (Tokyo, JP)

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  Patent Application Number: 20020048018

  Date filed: October 19, 2001

  Abstract: A **coma** aberration measuring method which takes the following steps. An object is exposed to light with a mask which bears a plurality of evaluation patterns each having at least two line patterns, wherein the width of lines in each of the plural evaluation patterns is different from that in any of the other evaluation patterns. Alternatively, a plurality of exposures are made on an object with a mask bearing evaluation patterns each having at least two line patterns, while varying the amount of light exposure for each exposure. As a result, a plurality of transfer patterns are created on the object. A detection is made as to in which one or ones among these plural transfer patterns either of the two line patterns is missing. Depending on the magnitude of **coma** aberration in the optical system used to make exposures, a line pattern with a certain line width among the line patterns to be transferred is not actually transferred. Therefore, the magnitude of **coma** aberration can be determined according to in which one or ones among the transfer patterns made on the object this phenomenon is observed.

  Excerpt(s): The present invention relates to an optical system such as a projection exposure device using optical lenses and, more particularly, to a method for measuring a **coma** aberration known as one of aberrations in such system. A **coma** aberration in an optical system comes about by a light being irradiated obliquely with respect to the optical axis of the lens, resulting in difference in focal position between the center portion of the lens and the peripheral portion thereof. The **coma** aberration causes an image like a comet as an output through the lens. For this reason, if such **coma** aberration occurs in a projection exposure device, that is used in process of a semiconductor device to form patterns on a semiconductor wafer, a portion of a fine pattern to be exposed is not resolved on the wafer. The optical systems including the projection exposure device are thus required to correct the lens interval and/or the optical axis of lens according to the **coma** aberration. However, it is considerably burdensome to measure such a tiny difference in width between the lines PL11 and PL15. In addition, the **coma** aberration may vary depending on the positions within a one-shot exposure area or a single chip area. For this reason, evaluation pattern is required to be formed at a plurality of places within the one-shot exposure area, and the

above difference measurement have to be done at the respective places. Thus, the measurement work requires a lot of steps and is complicated.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Method of treating the human eye with a wavefront sensor-based ophthalmic instrument**

  Inventor(s): Levine, Bruce Martin; (Arcadia, CA)

  Correspondence: Jay P. Sbrollini, ESQ.; Thomas J. Perkowski, ESQ., PC; Soundview Plaza; 1266 East Main Street; Stamford; CT; 06902; US

  Patent Application Number: 20030009156

  Date filed: June 5, 2001

  Abstract: An improved method for treating the eye includes the step of providing an ophthalmic instrument including an integral wavefront sensor. The wavefront sensor measures phase aberrations in reflections directed thereto to characterize aberrations of the eye. The wavefront sensor may be operably coupled to a display device, which displays a graphical representation of the aberrations of the eye. Such graphical representation may include: two dimensional contour maps that graphically depict contribution of pre-specified terms (such as spherical aberration, astigmatism and coma) for the aberrations of the eye, coefficients corresponding to such pre-specified terms that characterize the aberrations of the eye, or predefined two-dimensional icons that provide a general graphical depiction of such pre-specified terms. Such graphical representations provide the practitioner with valuable information characterizing the high order optical errors of the eye (which is far beyond the diopter information typically provided by current ophthalmic instruments) for use in diagnosis and treatment of abnormalities and disease in the eye. In addition, the wavefront sensor may be part of an adaptive optical subsystem that compensates for the phase aberrations measured therein to provide phase-aligned images of the eye for capture by an image capture subsystem. Such images may be used by practitioner in diagnosis and treatment of abnormalities and disease in the eye.

  Excerpt(s): The present application is related to U.S. application Ser. No. 09/874,401 entitled "Modular Adaptive Optical Subsystem For Integration With A Fundus Camera Body And CCD Camera Unit And Improved Fundus Camera Employing Same" by Bruce M. Levine; U.S. application Ser. No. 09/874,403, entitled "Ophthalmic Imaging Instrument Having An Adaptive Optical Subsystem That Measures Phase Aberrations in Reflections Derived From Light Produced By An Imaging Light Source And That Compensates For Such Phase Aberrations When Capturing Images of Reflections Derived From Light Produced By The Same Imaging Light Source," by Bruce M. Levine; U.S. application Ser. No. 09/874,404, entitled "Ophthalmic Instrument Having An Integral Wavefront Sensor and Display Device That Displays A Graphical Representation of High Order Aberrations of the Human Eye Measured by the Wavefront Sensor," by Bruce M. Levine; each application filed Jun. 5, 2001 and incorporated herein by reference in its entirety. The present invention relates to ophthalmic instruments that aid in detection and diagnosis of eye disease, pre-surgery preparation and computer-assisted eye surgery (such as laser refractive surgery), including ophthalmic imaging and/or topography instruments (such as fundus cameras, corneal imaging devices, retinal imaging devices, corneal topographers, and retinal topographers) in addition to ophthalmic examination instruments (such as autorefractors, slit lamps and other indirect ophthalmoscopes). The optical system of the

human eye has provided man with the basic design specification for the camera. Light comes in through the cornea, pupil and lens at the front of the eye (as the lens of the camera lets light in). This light is then focused on the inside wall of the eye called the retina (as on the film in a camera). This image is detected by detectors that are distributed over the surface of the retina and sent to the brain by the optic nerve which connects the eye to the brain (as film captures the image focused thereon).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **MULTI-BEAM EXPOSER UNIT**

  Inventor(s): FUKUTOME, YASUYUKI; (TOKYO, JP), SHIRAISHI, TAKASHI; (SAGAMIRA-SHI, JP), YAMAGUCHI, MASAO; (FUNABASHI-SHI, JP)

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  Patent Application Number: 20020051054

  Date filed: December 21, 1999

  Abstract: A multi-beam exposer unit 1 includes 1 i = 1 M(Ni-1) half mirror 11 for synthesizing 2 i = 1 MNi light to M groups of light beams, M sets of optical members 12, having positive power with a large absolute value as compared with a case of a main scanning direction, for further converging the beam in a sub-scanning direction, a synthesizing reflection mirror 13 for reflecting M groups of beams to be substantially overlaid on each other in a first direction, a polygon mirror unit 5 for deflecting M groups of beams, and a dust prevention glass 14 inclined to a direction opposite to a direction where the half mirror is inclined, thereby reducing influence of **coma** aberration exerted on M groups of beams by the half mirror.

  Excerpt(s): The present invention relates to a multi-beam exposer unit, which is used in a color printer device of a plurality of drums type, a color copy machine of a plurality of drums type, a multi-color printer, a multi-color copy machine, a monochromatic high-speed laser printer, a monochromatic high-speed digital copy machine, for scanning a plurality of beams. For example, in an image forming device such as a color printer or a color copy machine, there are used a plurality of image forming units, and a laser exposer unit or an optical scanning device, which provides image data corresponding to color components, which are color-separated, that is, a plurality of laser beams to the image forming units. The exposer unit has a first lens group, an optical deflector, and a second lens group. The first lens group reduces a cross-sectional beam diameter of a laser beam emitted from a semiconductor laser element to a predetermined size. The optical deflector is used to continuously deflect the laser beam reduced by the first lens group to a direction perpendicular to a direction where a recording medium is transferred. The second lens group is used to image-form the laser beam deflected by the optical deflector at a predetermined position of the recording medium. In many cases, a direction where the laser beam is deflected by the optical deflector is shown as a main scanning direction. Then, a direction where the recording medium is transferred, that is, a direction, which is perpendicular to the main scanning direction, is shown as a sub-scanning direction.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective lens and optical head device**

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  Patent Application Number: 20030035226

  Date filed: October 11, 2002

  Abstract: An objective lens (1) for an optical disk, which focuses a light beam from a light source, is designed so that a third-order **coma** aberration generated when the objective lens is inclined at a unit angle is larger than a third-order **coma** aberration generated when the optical disk (2) is inclined at the unit angle, mounted on an actuator for inclining the objective lens according to an inclination amount of the optical disk, and used. With this structure, it is possible to obtain an objective lens for an optical disk that has a large numerical aperture and is easy to manufacture and assemble, and in which the third-order **coma** aberration generated when the optical disk surface is inclined owing to a warp or the like can be corrected by small inclination of the objective lens, so as to reduce a residual astigmatism, which is generated according to the inclination amount, after the correction.

  Excerpt(s): The present invention relates to an objective lens for an optical disk that focuses a light beam from a light source on an information recording surface of the optical disk such as a digital video disk, a digital audio disk or an optical memory disk for a computer, and an optical head device using the same. In optical head devices for optical disks, a single lens having an aspherical surface commonly is used as an objective lens for recording information or reproducing recorded information by focusing a light beam onto a diffraction-limited spot on an information recording surface of the optical disk. In the following, a conventional optical head device will be described, with reference to an accompanying drawing.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective lens for optical head**

  Inventor(s): Maruyama, Koichi; (Tokyo, JP), Yamanouchi, Takashi; (Tokyo, JP)

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  Patent Application Number: 20020060973

  Date filed: October 2, 2001

  Abstract: An objective lens for an optical head converges a first laser beam having a relatively short wavelength and a second laser beam having a relatively long wavelength on first optical disc (DVD) and a second optical disc (CD), respectively. A protective layer of the first disc is thinner than a protective layer of the second optical disc. The objective lens is compensated for astigmatism with respect to the first beam, which is incident on the objective lens as an off-axis beam at a predetermined incident angle, by providing on-axis astigmatism corresponding to wave front aberration greater than or equal to 0.01.lambda. (rms), and the objective lens is configured such that the **coma** is compensated better in a case where the first laser beam is converged on the first

optical disc than in a case where the second laser beam is converged on the second optical disc.

Excerpt(s): The present invention relates to an objective lens for an optical head employed in an optical disc drive, which is capable of recording/readout data on/from various types of optical discs having different data densities and/or thickness of protective layers. There are various standards for optical discs. Different optical discs according to different standards may have different data densities, different thickness of protective layers and the like. For example, a CD (compact disc) or a CD-R (compact disc recordable) has a relatively low data density, and the thickness of the protective layer is 1.2 mm. A DVD (digital versatile disc) has a relatively high data density, and the thickness of the protective layer is 0.6 mm. For data recording/readout of the DVD, it is necessary to use a laser beam having a wavelength of 635-660 nm. For the CD-R, in view of its reflective characteristics, a laser beam having a wavelength of approximately 780 nm is to be used.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective lens for optical pick-up**

  Inventor(s): Maruyama, Koichi; (Tokyo, JP), Yamanouchi, Takashi; (Tokyo, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1950 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20030189772

  Date filed: April 1, 2003

  Abstract: An objective lens of an optical pick-up is formed to provide axial astigmatism corresponding to wavefront aberration of 0.01.lambda. [rms] or more when a shorter wavelength laser beam emitted by a first laser diode is converged on a first optical disc, and to provide **coma** so that its sign when the shorter wavelength laser beam is converged on the first optical disc will be opposite to its sign when a longer wavelength laser beam emitted by a second laser diode is converged on a second optical disc.

  Excerpt(s): The present invention relates to an objective lens employed in an optical pick-up to be employed in an optical disc device capable of reading/writing from/to two or more types of optical discs having different cover layer thicknesses and data densities. There exist many types of optical discs according to various standards having different thicknesses of the cover layer (transparent substrate covering the recording surface) and different data densities. For instance, the cover layer thickness of CD (Compact Disc) and CD-R (Compact Disc Recordable) having relatively low data density is 1.2 mm, while that of DVD (Digital Versatile Disc) having relatively high data density is 0.6 mm (1/2 of that of CD/CD-R). For the reading/writing of DVDs having high data density, a laser beam having a relatively short wavelength (635-660 nm) is necessary in order to realize a small beam spot diameter. On the other hand, a laser beam having a relatively long wavelength (approximately 780 nm) is necessary for the reading/writing of CD-Rs due to their reflection characteristics.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective lens for optical pick-up apparatus and optical pick-up apparatus**

  Inventor(s): Atarashi, Yuichi; (Tokyo, JP), Ota, Kohei; (Tokyo, JP), Totsuka, Hidekazu; (Tokyo, JP)

  Correspondence: Finnegan, Henderson, Farabow; Garrett & Dunner, L.L.P.; 1300 I Street, N. W.; Washington; DC; 20005-3315; US

  Patent Application Number: 20030103272

  Date filed: November 18, 2002

  Abstract: An objective lens for use in an optical pickup apparatus in which first and second light sources are provided on a same flat surface, converges each of the light fluxes from the first and second light sources onto an information recording plane through each of transparent substrates of a first and second optical information recording mediums and has a **coma** aberration of 0.015.lambda.1 rms or less when recording or reproducing information is conducted for the first optical information recording medium, and a **coma** aberration of 0.015.lambda.2 rms or less when recording or reproducing information is conducted for the second optical information recording medium.

  Excerpt(s): The present invention relates to an objective lens used for an optical pick-up apparatus and an optical pick-up apparatus, and particularly relates to an objective lens for conducting recording/reproducing of optical information recording media whose recording density is different, by one objective lens, and an optical pick-up apparatus. In the present, many kinds of optical information recording media exist and the standard of these optical information recording media is decided as shown in [Table 1]. In this connection, hereinafter (including the lens data in the table), an exponent of 10 (for example, 2.5.times.10.sup.-3) is expressed by E (for example, 2.5.times.E-3). Herein, as an example in which the interchangeability of mutual optical information recording media whose recording density is different is required, there is DVD and CD. In these optical information recording media, as shown in [Table 1], the transparent substrate thickness are respectively different. In order to secure the interchangeability, it is necessary that the spherical aberration generated by the difference of this transparent substrate thickness is corrected by any means. Further, in the DVD and CD, because the required numerical aperture is different, any countermeasure is necessary also for this.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective lens optical system, optical head and optical information reproduction apparatus**

  Inventor(s): Ariyoshi, Tetsuo; (Kokubunji, JP), Maruyama, Koichi; (Tokyo, JP), Shigematsu, Kazuo; (Yoshikawa, JP), Shimano, Takeshi; (Tokorozawa, JP), Takeuchi, Shuichi; (Wako, JP)

  Correspondence: Reed Smith Llp; Suite 1400; 3110 Fairview Park Drive; Falls Church; VA; 22042; US

  Patent Application Number: 20030076767

  Date filed: February 19, 2002

  Abstract: When it is intended to realize a lens having a large NA with one lens, an adjustment precision between both surfaces of the lens is very strict. Accordingly an objective lens having an NA of 0.8 or more was usually realized by two lenses.

However, a working distance is small, and collision of the objective lens with a disc is apt to occur. A **coma** corrector for compensating **coma** caused by decentering of both surfaces in realizing the high NA lens with one lens is added. However, in this case, astigmatism occurs when the objective lens decenters from the **coma** corrector relatively accompanied with a tracking operation. The objective lens and the **coma** corrector are fixed to a mirror barrel so as to be unified with each other, and driven by a two-dimensional lens actuator. With such a constitution, decentering of the objective lens and the **coma** corrector does not occur, and hence astigmatism does not occur.

Excerpt(s): The present invention relates to an optical information reproducing apparatus for reproducing a next-generation high density optical disc, as well as to an optical head and an objective lens optical system which are incorporated therein. Recent years, high-density recording of an optical disc has been steadily developed, and in a digital versatile disc (DVD) the storage capacity of both of a read-only memory disc (ROM) and a rewritable disc (RAM) is as high as 4.7 GB. In addition to this, in recent years at which satellite broadcasting is to be digitized immediately, the optical disc is expected to be large capacity of 20 GB or more where high definition moving picture can be recorded for two hours or more. A size of a light beam spot that directly restricts a recording density of the optical disc is given as.lambda./NA when a wavelength of a light beam is represented as.lambda. and a numerical aperture of an objective lens is represented as NA. Accordingly, the wavelength must be set short or the numerical aperture must be set large in order to realize an optical disc with large capacity. With respect to the wavelength, development of a blue-violet laser diode which emit a light beam of 405 nm has been advanced, and it has been forecasted to realize an optical disc with capacity of 12 GB that is about 2.6 times as large as the present DVD for which a light beam of 650 nm is used. In order to further increase the capacity to 20 GB or more, NA must be increased to be 1.3 times as large as the present DVD, that is, 0.77 or more.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Objective optical element, optical pick-up apparatus, and optical information recording repreducing apparatus**

  Inventor(s): Ikenaka, Kiyono; (Tokyo, JP), Saito, Shinichiro; (Tokyo, JP), Sakamoto, Katsuya; (Tokyo, JP), Totsuka, Hidekazu; (Tokyo, JP)

  Correspondence: Cohen, Pontani, Lieberman & Pavane; 551 Fifth Avenue; Suite 1210; New York; NY; 10176; US

  Patent Application Number: 20030174417

  Date filed: February 19, 2003

  Abstract: An objective optical element for use in an optical pickup apparatus, includes an objective lens to converge the light flux emitted from the first and second light sources; and an optical functional surface including a common region and an exclusive region. When a first optical information medium is used, a sine condition unsatisfied-amount whose value is maximum exists on the common region. The following formula is satisfied:0.5.ltoreq.COMA2/COMA1.ltoreq.1.0 where COMA1 is a comaaberration (.lambda.1 rms) when a light flux goes slantingly to be incident with a view angle of 1.degree. onto the objective optical element when the first optical information medium is used, and COMA2 is a **coma** aberration (.lambda.2 rms) when a light flux goes slantingly to be incident with a view angle of 1.degree. onto the objective optical element when the second optical information medium is used.

Excerpt(s): The present invention relates to an objective optical element used for an optical pick-up apparatus by which the recording/reproducing of an optical information recording medium whose operating wavelength is different and transparent substrate thickness is different is conducted by one objective lens, and optical pick-up apparatus and optical information recording reproducing apparatus, and particularly to the objective optical element in which a light source portion which oscillates the different wavelength is used for the modularized light source (2-laser 1 package module), or used for an optical system in which the focal length of the objective lens is short and which is sensitive to the error factors, and in which the image height **coma** characteristic at the time when each optical information recording medium is used, is improved, and the optical pick-up apparatus using it, and the optical information recording reproducing apparatus. Nowadays, many kinds of optical information recording media exist, and the regulations for these optical information recording media are determined as shown in [Table 1]. In this connection, after this (the lens data in Table is included), it is defined that the exponent of 10 (for example, 2.5.times.10.sup.-3) is expressed by using E (for example, 2.5.times.E-3). Herein, as the media for which the interchangeability of mutual optical information recording media whose recording density is different is required, there are DVD and CD. In these optical information recording media, as shown in [Table 1], respectively, each transparent substrate thickness is different. In order to secure the interchangeability, it is necessary that the spherical aberration generated by the difference of this transparent substrate thickness is corrected by any means. Further, in DVD and CD, because the required numerical aperture is different, any countermeasure is necessary also for this.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Opening-and-closing member control device**

  Inventor(s): Shimizu, Keiichi; (Kasugai-shi, JP), Tanaka, Yasuhide; (Owariasahi-shi, JP)

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  Patent Application Number: 20040004454

  Date filed: June 18, 2003

  Abstract: A power-window control device is provided which is capable of inexpensively avoiding the occurrence of a failure, not to overlook in safety, due to a short-circuit (including current leak) at between adjacent ones of switch terminals. The switch terminals are arranged in a combination that the terminals having a possibility to cause a failure due to short-circuit are not in an adjacent relationship. Specifically, in the case of a configuration of FIG. 1, arrangement is made such that there is no adjacent relationship between the MU and the **COMA,** the MD and the **COMA,** the NC and the **COMA,** the NC and the NO, the NC and the COMS, the NO and the **COMA,** the NO and the COMS, and the **COMA** and the COMS, e.g. in an order of the COMS, MD, NO, AD, **COMA,** AU, NC and MU.

  Excerpt(s): The present invention relates to an opening-and-closing member control device for controlling a motor to open and close a vehicular power window, and more particularly to an opening-and-closing member control device that the failure by short-circuit (including current leak), not to be overlook, can be avoided from occurring at between adjacent ones of switch terminals. In controlling an opening-and-closing member as in a vehicular power window (controlling at least the driver's seat window), the mainstream is on the electronic control that realizes window auto operation

(operation that the window automatically moves to the full closure or open position even if the user quits manipulation), auto-reverse operation during a detection of catching in. It is a general practice to use a relay-based driving scheme, as an opening-and-closing member control device that appropriately supplies power to a driving source motor and controls the operation thereof. Namely, the opening-and-closing control device of this kind has two small-sized relays (those having what is called 1c contacts) for supplying power to the motor and driving the motor toward opening (toward opening the window) or toward closing (toward closing the window), a small-sized switch for generating an operation signal (terminal voltage) instructing motor operation (opening-and-closing member operation) responsive to user's manipulation, and a control circuit for driving any of the relays depending upon an operating state of the switch (voltage change on the terminal due to internal contact operation). The device, in a state these elements are densely mounted on one board, is set up in a slight unoccupied space, such as vehicular door interior (in a backside of the window operating part).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical disc drive**

  Inventor(s): Arimoto, Akira; (Tokyo, JP), Maruyama, Koichi; (Tokyo, JP), Nakamura, Shigeru; (Tokyo, JP), Shigematsu, Kazuo; (Saitama-ken, JP), Shimano, Takeshi; (Saitama-ken, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1941 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20010043549

  Date filed: February 28, 2001

  Abstract: An optical disc drive using either one of a first disc (e.g., DVD) and a second disc (e.g., CD), is provided with a first laser diode that emits a shorter wavelength beam, a second laser diode that emits a longer wavelength beam, an objective lens, and a driving unit that holds and rotates the optical disc. The optical axis of the objective lens is inclined relative to a normal to the optical disc. The first laser diode is located at a first position so that the **coma,** which is caused when the first laser beam is converged on a data recording surface of the first disc, is minimized, and the second laser diode is located at a second position so that the **coma,** which is caused when the second laser beam is converged on a data recording surface of the second disc, is minimized.

  Excerpt(s): The present invention relates to an optical disc drive capable of recording and/or reproducing data to/from various types of optical discs having different characteristics, such as a thickness of a protective layer and a data recording density. There are a plurality of standards regarding the characteristics of the optical discs, including the thickness of the protective layer which covers a data recording surface of the optical disc and/or the data recording density. For example, the thickness of the protective layer of a CD (Compact Disc) or a CD-R (CD recordable) whose recording density is relatively low is 1.2 mm, while that of a DVD (Digital Versatile Disc) whose recording density is relatively high is 0.60 mm. For recording and/or reproducing data to/from the DVD, since it has a relatively high data recording density, in order to make the size of a beam spot sufficiently small, a laser beam whose wavelength is in a range of approximately 635-660 nm is to be used. For the CD-R, in view of its reflection characteristics, a laser beam whose wavelength is approximately 780 nm is to be used.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical disc recording and/or reproducing apparatus and aberration adjustment method**

  Inventor(s): Kobayashi, Yuhei; (Kanagawa, JP)

  Correspondence: Oblon Spivak Mcclelland Maier & Neustadt PC; Fourth Floor; 1755 Jefferson Davis Highway; Arlington; VA; 22202; US

  Patent Application Number: 20020085465

  Date filed: December 27, 2001

  Abstract: The astigmatic aberration in an optical system is to be adjusted. Specifically, in an optical disc device on which can be selectively loaded a first optical disc having a first index of double refraction or a second optical disc having a second index of double refraction larger than said first index of double refraction, and which includes a liquid crystal device 31 between a light source 11 and an objective lens 15 converging a light beam radiated from said light source on the optical disc 2 loaded on the optical disc device, the voltage applied to the liquid crystal device 31 is adjusted to correct the **coma** aberration or the astigmatic aberration for the first disc or the second disc, respectively.

  Excerpt(s): This invention relates to a method and an apparatus for recording and/or reproducing information signals for a plurality of sorts of optical discs having reciprocally different values of track pitch of the recording tracks and hence differential recording densities. This invention also relates to a method for adjusting the aberration of the present optical disc recording and/or reproducing method and apparatus. In an optical disc used up to now as a recording medium for information signals, attempts have been made for raising the recording density. For example, in the case of a magneto-optical disc having a diameter of approximately 65 mm, proposals have been made for reducing the track pitch of the recording track carrying the information signals from 1.6.mu.m to 0.95.mu.m to increase the recording density by a factor of approximately five. For recording information signals on the magneto-optical disc, having the reduced track pitch as described above, and for reproducing the recording information signals, the spot diameter of the light beam scanning the recording track formed on the magneto-optical disc needs to be of a smaller value. The reason is that, if the spot diameter of the light beam becomes larger than the track pitch of the recording track, the recording track cannot be tracked correctly, with the result that information signals cannot be recorded or reproduced on or from a desired recording track.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical head**

  Inventor(s): Arai, Akihiro; (Kyoto, JP), Hayashi, Takao; (Osaka, JP)

  Correspondence: Allan Ratner; Ratner & Prestia; One Westlakes Berwyn; P O Box 980; Valley Forge; PA; 19482; US

  Patent Application Number: 20040062158

  Date filed: September 3, 2003

  Abstract: When an optical disk is tilted in its radial direction, **coma** aberration may occur to cause a phase shift in a tracking signal, thereby making tracking control less accurate.

There are provided an optical head that records information on an optical disk and/or reproduces information written in the optical disk, the optical head comprising an objective lens 4 that condenses light on the optical disk, light receiving means 8 of receiving a reflected beam from the optical disk to obtain a received light signal, tracking error signal detecting means 9 of detecting a tracking error signal in the received light signal, and optical means 6 of attenuating the quantity of light in a central area of a tracking error signal detecting beam of the reflected beam incident on the light receiving means 8, the tracking error signal detecting beam being used to detect the tracking error signal.

Excerpt(s): The present invention relates to tracking control for an optical head that optically records and reproduces information on and from an information recording medium such as an optical disk. The present invention relates to optical disk tilt detection that detects a tilt in the optical disk relative to an optical axis of condensing means such as an objective lens. For optical heads for optical disks, it is important to ensure the accuracy of tracking control for allowing an optical spot to accurately follow the center of an information track. If this control is inaccurate, then during recording, a signal on an adjacent information track may be erased or cross talk may increase. Consequently, critical malfunction may occur, such as a failure to accurately reproduce information.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical head and optical disk apparatus**

  Inventor(s): Ariyoshi, Tetsuo; (Kokubunji, JP), Shimano, Takeshi; (Tokorozawa, JP), Umeda, Mariko; (Tokyo, JP)

  Correspondence: Antonelli Terry Stout And Kraus; Suite 1800; 1300 North Seventeenth Street; Arlington; VA; 22209

  Patent Application Number: 20020176331

  Date filed: August 3, 2001

  Abstract: To stably carry out recording and reproducing to and from a high density optical disk without using a double servo in the optical disk using a high NA objective lens.A detection of a spherical aberration and a detection of a **coma** aberration in a radial direction are simultaneously performed, and the **coma** aberration generated with the offset of an objective lens 109 is corrected in real time, thus enlarging an allowable offset amount of the objective lens. In order to simultaneously detect the spherical aberration and the **coma** aberration, focal shift and tracking shift signals in an inside region and outside region of reflected light flux are detected respectively, and the differential signals are set as spherical aberration and **coma** aberration signals.

  Excerpt(s): The present invention relates to an optical disk apparatus, which records and reproduces information by use of laser beam, and to an optical head incorporated in the optical disk apparatus. As a recording machine prevalent currently, a recording machine utilizing a videotape is in popular use. However, a recording machine utilizing an optical disk has been commercially available. The optical disk is more superior to the videotape in random access performance. From viewpoints of a easiness to handle, a repetitive reproduction, a fact that an image deterioration scarcely occurs due to change over time, compactness, or the like, it is considered that the recording machine using the optical disk will widely spread in the future. Furthermore, in addition to the recording, an optical disk apparatus is utilized for various kinds of applications such as an external

recording device of a computer, a recording/reproducing apparatus of musical information, or the like. Therefore, it is considered that the optical disk apparatus gains increasingly in importance in the future. In Japan, targeting at around Year 2003 to 2005, in a television broadcast, digitization of a satellite broadcasting, and digitization of a ground wave broadcasting are likely to be realized. Currently, a broadcast of higher definition moving pictures than a present analog broadcast will be widespread in ordinary homes, and thus it is considered that a demand for digitally recording this high definition moving picture will increase. In order to record this high definition moving picture for about 2 hours without impairing the quality of images, it is necessary that a large capacity storage of 20 to 25 GB in capacity is provided in a disk having a diameter of 12 cm which has the same size as a compact disk or DVD. In other words, it is necessary that the recording density is increased about 4 to 5 times the present DVD.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical head and optical disk device using the same**

  Inventor(s): Arikawa, Kouji; (Hitachinaka, JP), Nakamura, Shigeru; (Tachikawa, JP), Shigematsu, Kazuo; (Yoshikawa, JP)

  Correspondence: Mcdermott, Will & Emery; 600 13th Street, N.W.; Washington; DC; 20005-3096; US

  Patent Application Number: 20010024418

  Date filed: March 2, 2001

  Abstract: In optical heads with multiple semiconductor laser chips with different wavelengths, **coma** aberrations generated by laser beams projected at an angle relative to the entry axis of a focus lens is reduced.To achieve this, a beam-shaping upward prism having dispersion characteristics is disposed on the entry side of the focus lens. The semiconductor laser chip with the longer wavelength is positioned closer to a line extending a refracted beam resulting from refraction.

  Excerpt(s): The present invention relates to an optical head and an optical disk using the same for recording or playing back information to and from an optical information medium such as an optical disk. More specifically, the present invention relates to an optical head and an optical disk using the same that can record information using a laser module in which multiple semiconductor laser chips having different wavelengths are mounted. In optical information recording/playback devices such as optical disk devices, various features are desired in addition to a compact and thin design. For example, there is a significant demand for using a single compact optical head that can record and playback both CD-R (Compact Disk-Recordable), which has seen widespread use as a writable optical disk medium, and DVD-RAM (Digital Versatile Disc/Digital Video Disc), which was developed recently as an optical disk medium allowing high-density recording. The wavelength of lasers used in recording and playback of CD-Rs is approximately 780 nm, while the wavelength of lasers used in recording and playback of DVDs is approximately 660 nm. Thus, there is a need to mount both a laser light source with a 780 nm wavelength and a laser light source with a 660 nm wavelength on a single optical head.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical pickup**

  Inventor(s): Kitamura, Kazuya; (Tenri-shi, JP), Kurata, Yukio; (Tenri-shi, JP)

  Correspondence: Dike, Bronstein, Roberts & Cushman Llp; 130 Water Street; Boston; MA; 02103; US

  Patent Application Number: 20020097504

  Date filed: November 1, 2001

  Abstract: A lightweight, highly reliable optical pickup including a singlet objective lens is offered by correcting **coma** aberrations which adversely affect properties of the objective lens having an increased NA. A convergent optical system is composed of a singlet objective lens with a NA of 0.75 or more and includes an aberration-correcting optical system which corrects **coma** aberrations due to an inclination or shift of central axes of both surfaces of the objective lens or an inclination of the objective lens or the optical storage medium to an optical axis of the optical pickup.

  Excerpt(s): The present invention relates to optical pickups for optically reading/writing data on an optical storage medium. Light-based technologies are extensively researched, with some of them already in commercial use, in various fields including communications, measurement, and fabrication to exploit their many advantages in frequency (speed), capability to handle phase and space data processing, etc. The technology depends on a highly precise objective lens to focus a light beam. The highly precise objective lens is playing an increasingly important role in recent development of bulk storage technology, due to an outstanding demand for light-based, image-capturing apparatus.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical pickup apparatus**

  Inventor(s): Furuhata, Hitoshi; (Tokorozawa-shi, JP), Koyama, Masayuki; (Tokorozawa-shi, JP), Nishimura, Tomotaka; (Tokorozawa-shi, JP)

  Correspondence: Morgan Lewis & Bockius Llp; 1111 Pennsylvania Avenue NW; Washington; DC; 20004; US

  Patent Application Number: 20040070848

  Date filed: October 7, 2003

  Abstract: An optical pickup apparatus comprises a first light source for emitting a first laser beam having a first wavelength; a second light source for emitting a second laser beam having a second wavelength; and an objective lens for condensing the first laser beam and the second laser beam. The first light source and the second light source are disposed in positions in such a way that a total amount of **coma** aberration, which is generated on the first laser beam in accordance with a distance between the first light source and an optical axis of a whole optical system and **coma** aberration, which is generated on the first laser beam in accordance with a tilting amount of the objective lens becomes null, and a total amount of **coma** aberration, which is generated on the second laser beam in accordance with a distance between the second light source and said optical axis and **coma** aberration, which is generated on the second laser beam in accordance with the tilting amount of the objective lens becomes null.

  Excerpt(s): The present invention relates to an optical pickup apparatus. As a light source of an optical pickup apparatus that reproduces an optical information recording

medium such as a CD (Compact Disc) and DVD (Digital Versatile Disc), a semiconductor laser element is generally used. The wavelength of a laser beam as used and the number of apertures (NA) of the objective lens as used differ depending on whether a recording medium to be reproduced is a CD or DVD. For example, the wavelength of the laser beam is 650 nm and NA is 0.6 for a DVD. On the other hand, the wavelength of the laser beam is 780 nm and NA is 0.45 for a CD. In order to allow a single player to reproduce both CD and DVD, an optical pickup apparatus incorporating a light source with two wavelengths of 650 nm and 780 nm has been under development and a semiconductor laser unit for emitting laser beams having two different wavelengths has been used in recent years in particular. This type of semiconductor laser unit includes a laser diode with a wavelength of 780 nm for a CD and a laser diode with a wavelength of 650 nm for a DVD, each of which is mounted in a single package.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical pickup apparatus restricting aberration and optical disc apparatus using the same**

  Inventor(s): Furukawa, Fuminobu; (Onojo-shi, JP), Goto, Hiroshi; (Munakata-shi, JP), Mori, Taiichi; (Koga-shi, JP)

  Correspondence: Stevens, Davis, Miller & Mosher, L.L.P.; Suite 850; 1615 L Street, N.W.; Washington; DC; 20036; US

  Patent Application Number: 20020048249

  Date filed: October 18, 2001

  Abstract: An object of the invention is to provide an optical pickup apparatus which restricts a generation of a **coma** aberration caused by an objective lens shift, maintains a high quality signal reproduction, improves an accuracy of recording position and can restrict a loss of a recording optical power, and an optical disc apparatus using the optical pickup apparatus. The optical pickup apparatus is provided with optical units having light sources radiating laser beams and optical detectors detecting reflected lights, a collimator lens converting the radiated beam into a fine divergent light and an objective lens, and the collimator lens is formed in a wavefront shape corresponding to the fine divergent light in a center area close to an optical axis, and is formed in a wavefront shape correcting a **coma** aberration in correspondence to an increase of a radius of the collimator lens. Further, there is provided the optical apparatus using the optical pickup apparatus.

  Excerpt(s): The present invention relates to an optical pickup apparatus used for recording and reproducing on an optical disc, an optical pickup apparatus using light sources having different wavelengths for the purpose of corresponding to recording mediums having different recording densities and an optical disc apparatus using the optical pickup apparatus. An optical recording medium has become rapidly popular because advantages that a recording capacity thereof is great and a treatment is easily executed are recognized. Further, in order to increase a recording capacity, various kinds of recording mediums have been proposed. On the other hands, a demand of a disc apparatus capable of corresponding to these kinds of recording mediums has been increased. In response to the demand mentioned above, an optical pickup disclosed in JP-A-10-154344 has been proposed as an optical structure using light sources having two kinds of different wavelengths. Long and short of it is that two kinds of light sources having the different wavelengths are prepared, an objective lens corresponding to an

optical performance of a high density recording medium is provided, and the same objective lens is commonly used for a low density recording medium by forward shifting a position of a light source having a long wavelength so as to set an incident light flux to the objective lens to a fine divergent light.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical reading apparatus having aberration-correcting function**

  Inventor(s): Ogasawara, Masakazu; (Tsurugashima-shi, JP)

  Correspondence: Morgan Lewis & Bockius Llp; 1111 Pennsylvania Avenue NW; Washington; DC; 20004; US

  Patent Application Number: 20020181367

  Date filed: May 29, 2002

  Abstract: An optical reading apparatus includes an objective lens for focusing an optical beam; an actuator for driving the objective lens; an aberration detector for detecting spherical and **coma** aberration of the optical beam; an aberration correction element, including a liquid crystal element, for correcting the spherical and **coma** aberration by applying voltages to the liquid crystal element; a lens location detector for detecting displacement of the objective lens with respect to a reference location; and a controller for controlling the amount of aberration correction of the aberration correction element in accordance with the spherical aberration, the **coma** aberration, and the displacement.

  Excerpt(s): The present invention relates to an optical reading apparatus, and more particularly to an optical reading apparatus having a capability of correcting aberration generated in a light beam of an optical system. Among information recording media to and from which information is optically recorded and read, there are optical discs such as DVDs (digital versatile discs or digital video discs). There have been great efforts to increase the recording density of such optical discs as information communications technologies have advanced in recent years. Furthermore, high-performance optical pickup devices and information recording and reproducing devices are required in accordance with the progress of such high-density optical discs. There is an approach to irradiate a light beam having a smaller irradiating diameter to the optical disc by increasing the numerical aperture (NA) of an objective lens provided in the optical pickup device so as to cope with the increase in recording density of the optical disc. Furthermore, the density of the optical disc can be increased by using a short wavelength optical beam.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical scanning head**

  Inventor(s): Stallinga, Sjoerd; (Eindhoven, NL), Vrehen, Joris Jan; (Eindhoven, NL), Wals, Jeroen; (Eindhoven, NL)

  Correspondence: Philips Electronics North America Corporation; Corporate Patent Counsel; 580 White Plains Road; Tarrytown; NY; 10591; US

  Patent Application Number: 20020175266

  Date filed: August 21, 2001

Abstract: An optical head scans the information layer (3) of an optical record carrier (1) by means of a radiation beam (13). Optical aberrations in the beam such as **coma** and spherical aberration, caused by tilt and thickness variations in the optical disc respectively, are compensated by an aberration compensator (27) arranged in the radiation beam. The tilt or thickness variation is measured by a detector (30) and used to control the aberration compensator. The radiation beam is focused onto the information layer by an objective system (11). A displacement of the objective system in the transverse direction (26) as used for radial tracking of the optical beam, causes a mismatch between the wavefront to be compensated and the wavefront introduced by the aberration compensator (27). The mismatch is reduced by using a position detector (33) for measuring the transverse position of the objective system and using the position signal (34) as input for the control of the aberration compensator.

Excerpt(s): The invention relates to an optical head for scanning an optical recording carrier having an information layer and a transparent layer, comprising a radiation force for generating a radiation beam and an objective system for converging the radiation beam through the transparent layer to a focus on the beam information layer, an aberration detector for detecting an optical aberration in the radiation beam, an aberration compensator arranged in the optical path between the radiation force and the objective system, and a control circuit connected to an output of the aberration detector for controlling the aberration compensator. The information stored in an optical record carrier is arranged in tracks in the information layer of the record carrier. The information is written, read or erased by means of a focussed radiation beam that follows the track. The position of the focus is kept in the plane of the information layer by means of a focus servo that controls the axial position of the objective lens used for focussing the radiation beam. A second servo system controls the transverse position of the focus in order to keep the focus on the track being scanned. The transverse direction is the direction in the plane of the information layer perpendicular to the direction of the track. The second servo system causes the objective lens to move in the transverse direction, i.e. in a direction perpendicular to its optical axis, thereby moving the focus also in the transverse direction. On a disk-shaped record carrier the transverse direction corresponds to the radial direction; therefore the second servo system is also called the radial tracking servo. The trend of increasing information density on optical record carriers requires a commensurate decrease in the size of the focus of the radiation beam formed on the information layer. A smaller focus can be realized by increasing the numerical aperture of the radiation beam incident on the record carrier. However, an increase of the numerical aperture increases the susceptibility of the optical system in the head to optical aberrations. One of the aberrations is **coma,** caused by the transparent layer of the record carrier when it is not perpendicular to the principal ray of the radiation beam incident on the record carrier. Such non-perpendicular incidence of the radiation beam on the record carrier, generally referred to as tilt, may be caused by warping of the record carrier. Optical heads having a high numerical aperture require compensation of the **coma** caused by the tilt in order to scan the information layer of the record carrier properly.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical system for optical pickup apparatus**

  Inventor(s): Kimura, Tohru; (Tokyo, JP)

  Correspondence: Cohen, Pontani, Lieberman & Pavane; 551 Fifth Avenue; Suite 1210; New York; NY; 10176; US

  Patent Application Number: 20040085884

  Date filed: October 22, 2003

  Abstract: An optical system has an expander lens and an objective lens. The following formula is satisfied: W1.sub.CM>W2.sub.CM, where W1.sub.CM is a **coma** abrerration (.lambda.rms) converged light spot when an off-axial light flux of a wavelength.lambda. (nm) emitted so as to converge at a distance position from the optical axis comes into the objective lens, and W2.sub.CM is a **coma** aberration (.lambda.rms) of a converge spot when an off-axial light flux of the wavelength.lambda. (nm) emitted so converge at the distant position distance comes through the expander lens into the expander lens is arranged so as to the optical axis of the expander lens is arranged so as to conform with the optical axis of the objective lens.

  Excerpt(s): The present invention relates to an optical system for an optical pickup apparatus, optical pickup apparatus and optical information recording reproducing apparatus, and particularly to an optical system for the optical pickup apparatus, optical pickup apparatus and optical information recording reproducing apparatus by which the high density optical information recording or reproducing can be attained. Conventionally, an optical disk represented by a CD (compact disk) or DVD (digital versatile disk) is widely used for the accumulation of the music information or image information or the storage of the digital data such as the program data. Furthermore, as the arrival of the high degree information society, an amount of the managed information is becoming great, and the increase of the capacity of these optical disks is strongly required. Herein, the increase of the recording capacity (recording density) per unit area in the optical disk can be realized by the engineering by which the spot diameter of the converged light spot obtained from the optical system for the optical pickup apparatus is decreased. As being well known, because this spot diameter is proportional to.lambda./NA (where.lambda. is the wavelength of the light source, and NA is numerical aperture of an objective lens), in order to reduce the spot diameter, the reduction of the wavelength of the light source used for the optical pickup apparatus and the increase of the numerical aperture of the objective lens positioned opposite to the optical disk in the optical system for the optical pickup apparatus are effective.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Optical system for optical pickup employing coma compensating element**

  Inventor(s): Maruyama, Koichi; (Tokyo, JP), Shimano, Takeshi; (Tokorozawa-shi, JP), Takeuchi, Shuichi; (Tokyo, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1950 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20030117718

  Date filed: October 11, 2002

  Abstract: A **coma** compensating element has two refraction surfaces. The refraction surfaces provide, as a whole, no aberration with respect to rays perpendicularly incident

thereon, while the refraction surfaces provide **coma** with respect to rays obliquely incident thereon.

Excerpt(s): The present invention relates to a **coma** compensating element for compensating **coma** of a high NA optical system employed in an optical pickup for an optical disc having a relatively high data recording density, and an optical system for such an optical disc employing the **coma** compensating element. An optical system for an optical pickup is generally provided with a light source for emitting a laser beam, an objective lens for converging the light beam emitted by the light source onto an optical recording medium such as an optical disc, and a light receiving unit for receiving the light beam reflected by the data recording surface of the optical disc, and outputting signals. The objective lens is generally a single-element lens having aspherical surfaces. Alternatively, the object lens may consist of a plurality of lens elements each having spherical surfaces. The objective lens is generally designed so that spherical aberration and **coma** are well suppressed, and the laser beam is converged to form a diffraction-limited beam spot. If the optical axes of both surfaces of the aspherical single-element lens are decentered (i.e., parallelly shifted from each other), or at least one lens element within a combination lens is decentered with respect to the optical axis of the remaining lens elements. even if the light beam incident on the objective lens coincides with the optical axis of the objective lens, **coma** is generated. In particular, for a disc drive using a disc having a relatively high data recording density, the objective lens should have a high NA (numerical aperture). Such a high NA objective lens is sensitive to the decentering of the surfaces. That is, with a slight decentering, significantly large **coma** is generated. Generally, the objective lens whose surfaces are aspherical is formed using metal molds. Specifically, two metal molds are used for both aspherical surfaces, respectively. Since a certain clearance is required between the two molds for manufacturing procedure, it is unavoidable that the two surfaces are decentered (i.e., shifted in a direction perpendicular to the optical axes thereof) with respect to each other, and the thus formed lens provides **coma** (i.e., decentering coma).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Phase shifted test pattern for monitoring focus and aberrations in optical projection systems**

  Inventor(s): Ausschnitt, Christopher P.; (Lexington, MA), Brunner, Timothy A.; (Ridgefield, CT), Kirk, Joseph P.; (Chelsea, NY), Seong, Nakgeuon; (Wappingers Falls, NY)

  Correspondence: International Business Machines Corporation; DEPT. 18g; BLDG. 300-482; 2070 Route 52; Hopewell Junction; NY; 12533; US

  Patent Application Number: 20030123052

  Date filed: December 28, 2001

  Abstract: A method is described for determining lens aberrations using a test reticle and a standard metrology tool. The method provides test patterns, preferably in the form of standard overlay metrology test patterns, that include blazed gratings having orientation and pitch selected to sample desired portions of the lens pupil. The method measures relative shifts in the imaged test patterns using standard metrology tools to provide both magnitude and sign of the aberrations. The metrology tools need not be modified if standard test patterns are used, but can be adapted to obtain additional information. The test reticles may be formed with multiple test patterns having a range of orientations and pitch in order to compute any desired order of lens aberration.

Alternatively, single test patterns may be used to determine both the magnitude and sign of lower order lens aberrations, such as defocus or **coma.**

Excerpt(s): The present invention generally relates to testing and characterization of lenses and, more particularly, to the quantitative measurement of aberrations in lithographic lenses. In various high performance optical imaging systems, A very large scale integrated (VLSI) complementary metal oxide semiconductor (CMOS) chip is manufactured on a silicon wafer by a sequence of material additions (i.e., low pressure chemical vapor depositions, sputtering operations, etc.), material removals (i.e., wet etches, reactive ion etches, etc.), and material modifications (i.e., oxidations, ion implants, etc.). These physical and chemical operations interact with the entire wafer. For example, if a wafer is placed into an acid bath, the entire surface of the wafer will be etched away. In order to build very small electrically active devices on the wafer, the impact of these operations has to be confined to small, well defined regions. Lithography in the context of VLSI manufacturing of CMOS devices is the process of patterning openings in photosensitive polymers (sometimes referred to as photoresists or resists) which define small areas in which the silicon base material is modified by a specific operation in a sequence of processing steps. The manufacturing of CMOS chips involves the repeated patterning of photoresist, followed by an etch, implant, deposition, or other operation, and ending with the removal of the expended photoresist to make way for the new resist to be applied for another iteration of this process sequence.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Projection lens and liquid crystal projector**

Inventor(s): Maruyama, Sadao; (Saitama-Shi, JP)

Correspondence: Jacobson Holman Pllc; 400 Seventh Street N.W.; Suite 600; Washington; DC; 20004; US

Patent Application Number: 20040100702

Date filed: November 24, 2003

Abstract: The present invention is directed to a projection lens that has a sufficiently long back focus to enable a wide-angle projection and has astigmatism, abaxial spherical aberration (coma), distortion, and other types of aberration satisfactorily corrected. The projection lens includes first to third groups of lenses G1, G2 and G3. The first group of lenses G1 consist of four pieces of lenses, and the first or foremost negative one of the lenses is an aspheric lens. The second group of lenses G2 consist of two pieces of lenses, and the first or foremost negative one and the second positive one of the lenses are joined together. The third group of lenses G3 consist of six pieces of lenses, and the second foremost positive one, the third negative one, and the fourth positive one of the lenses are joined together. The projection lens is characterized in that the following formulae are satisfied;bf/f.gtoreq.2.8 (1)1.1.ltoreq.f2/f3.ltoreq.1.6 , and (2)1.65.ltoreq.vertline.f1.vertline./f.ltoreq.2.05, (3)where f1, f2 and f3 are focal lengths unique to the first, the second and the third groups of lenses G1, G2 and G3, respectively, and f and bf are total focal length and back focus of the whole optics, respectively.

Excerpt(s): The present invention relates to a projection lens, and more particularly, to a projection lens used for a liquid crystal projector that magnifies and then projects an image produced by liquid crystal valves of liquid crystal display (LCD) elements. The

present invention is also related to a liquid crystal projector incorporating the projection lens therein. A liquid crystal projector produces image data of three primary colors, B (blue), G (green) and R (red) on its respective light valves, and then, after letting light fluxes of the image data of the primaries pass through a cross-prism to refract the light fluxes into optically coaxial fluxes, directs them upon a single projection lens to have a projection image on a screen. Since the cross-prism is disposed between the liquid crystal panel and the projection lens, the projection lens of the liquid crystal projector is required to take a long back focus. To produce a clear image from light beams of G, B and R in color entering and exiting a dichroic mirror, it is desired that the projection lens is strongly telecentric to propagate a principal light beam with merely slight inclination. Also to make a produced image clear, aberration, especially, astigmatism, abaxial spherical aberration (coma), distortion, and the like must be corrected.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Refractive-diffractive hybrid lens**

  Inventor(s): Maruyama, Koichi; (Tokyo, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1941 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20010055156

  Date filed: December 27, 2000

  Abstract: Disclosed is a refractive-diffractive hybrid lens that includes a refractive lens having at least one aspherical surface, and a diffractive lens structure having a plurality of concentric ring-shaped steps that are formed on at least one lens surface of the refractive lens. The refractive lens and the diffractive lens structure are designed such that a change of the spherical aberration due to a change of the refractive index becomes small. That is, the refractive lens is designed to correct a **coma** and to reduce the change of the spherical aberration due to the variation of the refractive index, and the diffractive lens structure is designed to correct the residual spherical aberration. The refractive lens is a single biconvex lens, and at least one surface is aspherical. The diffractive lens structure generates a negative spherical aberration to reduce the ratio of a change of the spherical aberration to a variation of the refractive index.

  Excerpt(s): The present invention relates to the refractive-diffractive hybrid lens that has a refractive lens and a diffractive lens structure formed on a lens surface of the refractive lens. Aberrations of a refractive lens vary as refractive index varies. For an aspherical positive single lens satisfying a sine condition, a focal length shortens and a spherical aberration becomes negative (undercorrected) as a refractive index increases, and the focal length becomes longer and the spherical aberration becomes positive (overcorrected) as the refractive index decreases. In an optical system of an optical disc apparatus, a change of a focal length of an objective lens due to the change of the refractive index causes no problem because it can be corrected by a focusing mechanism.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Scanning optical system**

  Inventor(s): Iizuka, Takashi; (Saitama-ken, JP)

  Correspondence: Greenblum & Bernstein, P.L.C.; 1941 Roland Clarke Place; Reston; VA; 20191; US

  Patent Application Number: 20010022680

  Date filed: February 23, 2001

  Abstract: Disclosed is a scanning optical system that includes a semiconductor laser; a polygon mirror that deflects and scans a light beam emitted from the laser; and an imaging optical system that forms a beam spot on a photoconductive drum. The imaging optical system consists of a curved surface mirror having a positive power mainly in the main scanning direction and an anamorphic lens having a positive power mainly in the auxiliary scanning direction. The anamorphic lens having an anamorphic surface whose optical axis is decentered from a reference ray that reaches the center of the scanning range. The sectional shape of the anamorphic surface in an auxiliary scanning direction being a non-circular curved line to correct **coma** in the auxiliary scanning direction. The anamorphic surface is a rotationally asymmetrical surface that is defined by a two dimensional polynomial expression.

  Excerpt(s): The present invention relates to a scanning optical system used for an optical scanning unit such as a laser beam printer. In particular, the present invention relates to a scanning optical system whose imaging optical system includes an anamorphic lens that is decentered from a reference ray that reaches the center of a scanning range on an object surface to be scanned. Such a scanning optical system is disclosed in U.S. Patent No.5,748,354. In the disclosed scanning optical system, a laser beam emitted from a laser source is deflected by a polygon mirror and forms a beam spot on an object surface such as a photoconductive drum through an imaging optical system that consists of a curved surface mirror and an anamorphic lens. The beam spot formed on the object surface moves (i.e., scans) on the object surface in a predetermined scanning direction as the polygonal mirror rotates. In this specification, a scanning direction of the beam spot on the object surface is referred to as a "main scanning direction", a direction perpendicular to the main scanning direction on the object surface is referred to as an "auxiliary scanning direction". Shapes and orientations of powers of respective optical elements will be defined on the basis of these scanning directions. Further, a ray that reaches the center of a scanning range on the object surface is defined as a reference ray.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **System and method for characterizing optical systems using holographic reticles**

  Inventor(s): Hansen, Matthew E.; (Ridgefield, CT)

  Correspondence: Sterne, Kessler, Goldstein & Fox Pllc; 1100 New York Avenue, N.W., Suite 600; Washington; DC; 20005-3934; US

  Patent Application Number: 20020021460

  Date filed: July 19, 2001

  Abstract: Characterization of an optical system is quickly and easily obtained in a single acquisition step by obtaining image data within a volume of image space. A reticle and image plane are positioned obliquely with respect to each other such that a reticle having a plurality of feature sets thereon, including periodic patterns or gratings, is

imaged in a volume of space, including the depth of focus. Metrology tools are used to analyze the detected or recorded image in the volume of space through the depth of focus in a single step or exposure to determine the imaging characteristics of an optical system. Focus, field curvature, astigmatism, spherical, **coma,** and/or focal plane deviations can be determined. The present invention is particularly applicable to semiconductor manufacturing and photolithographic techniques used therein, and is able to quickly characterize an optical system in a single exposure with dramatically increased data quality and continuous coverage of the full parameter space. In embodiments, the test reticle is holographically generated by interfering two or more beams of optical radiation. The resulting interference pattern is recorded on a reticle and used for testing the optical system. The geometry of the holographic interference pattern is tightly controlled by the properties of the interfering beams and is therefore more accurate than conventional reticle writing techniques.

Excerpt(s): This application is a continuation-in-part of U.S. application Ser. No. 09/339,506, filed on Jun. 24, 1999, which is incorporated by reference herein in its entirety. This application also claims the benefit of U.S. Provisional Application No. 60/219,187, filed Jul. 19, 2000, which is incorporated by reference herein in its entirety. The present invention relates to characterizing an optical system, and particularly to the rapid and precise characterization of an optical system including focus, field curvature, astigmatism, spherical, **coma,** and/or focal plane deviation using holographically produced reticles. Photolithography is often used in the manufacture of semiconductor devices and other electronic equipment. In photolithography, projection optics of high quality are often used to image features on a reticle onto a photosensitive substrate, such as a resist covered wafer. As the feature sizes desirable to be reproduced become ever smaller, the optical system or projection optics must be continually maintained and checked for image quality.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Test object for detecting aberrations of an optical imaging system**

  Inventor(s): Dirksen, Peter; (Eindhoven, NL), Juffermans, Casparus A.H.; (Eindhoven, NL)

  Correspondence: U. S. Philips Corporation; Corporate Patent Counsel; 580 White Plains Road; Tarrytown; NY; 10591; US

  Patent Application Number: 20010023042

  Date filed: April 27, 2001

  Abstract: Aberrations of an imaging system (PL) can be detected in an accurate and reliable way by imaging, by means of the imaging system, a circular phase structure (22) on a photoresist (PR), developing the resist and scanning it with a scanning detection device (SEM) which is coupled to an image processor (IP). The circular phase structure is imaged in a ring structure (25) and each of several possible aberrations, like **coma,** astigmatism, three-point aberration, etc. causes a specific change in the shape of the inner contour (CI) and the outer contour (CE) of the ring and/or a change in the distance between these contours, so that the aberrations can be detected independently of each other.The new method may be used for measuring a projection system for a lithographic projection apparatus.

  Excerpt(s): detecting the developed image by means of a scanning detection device having a resolution which is considerably larger than that of the imaging system. The

fact that the resolution of the scanning detection device is considerably larger than that of the imaging system means that the detection device allows observation of details which are considerably smaller than the details that can still be separately imaged by the imaging system. An optical imaging system in the form of a projection lens system having a large number of lens elements is used in photolithographic projection apparatuses which are known as wafer steppers or as wafer step-and-scanners. Such apparatuses are used, inter alia, for manufacturing integrated circuits, or ICs. In a photolithographic projection apparatus, a mask pattern present in the mask is imaged a large number of times, each time on a different area (IC area) of the substrate by means of a projection beam having a wavelength of, for example, 365 nm in the UV range, or a wavelength of, for example, 248 nm in the deep UV range, and by means of the projection lens system.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

Keeping Current

In order to stay informed about patents and patent applications dealing with coma, you can access the U.S. Patent Office archive via the Internet at the following Web address: **http://www.uspto.gov/patft/index.html**. You will see two broad options: (1) Issued Patent, and (2) Published Applications. To see a list of issued patents, perform the following steps: Under "Issued Patents," click "Quick Search." Then, type "coma" (or synonyms) into the "Term 1" box. After clicking on the search button, scroll down to see the various patents which have been granted to date on coma.

You can also use this procedure to view pending patent applications concerning coma. Simply go back to **http://www.uspto.gov/patft/index.html**. Select "Quick Search" under "Published Applications." Then proceed with the steps listed above.

CHAPTER 5. BOOKS ON COMA

Overview

This chapter provides bibliographic book references relating to coma. In addition to online booksellers such as **www.amazon.com** and **www.bn.com**, excellent sources for book titles on coma include the Combined Health Information Database and the National Library of Medicine. Your local medical library also may have these titles available for loan.

Book Summaries: Federal Agencies

The Combined Health Information Database collects various book abstracts from a variety of healthcare institutions and federal agencies. To access these summaries, go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. You will need to use the "Detailed Search" option. To find book summaries, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer. For the format option, select "Monograph/Book." Now type "coma" (or synonyms) into the "For these words:" box. You should check back periodically with this database which is updated every three months. The following is a typical result when searching for books on coma:

- **Diabetes Mellitus in the Elderly: A Practical Guide**

  Source: New York, NY: Raven Press. 1990. 276 p.

  Contact: Available from Raven Press. 1185 Avenue of the Americas, Dept. 5B, New York, NY 10036. (800) 777-2836 or (212) 930-9500. Fax (212) 869-3495. PRICE: $80.50 plus shipping (as of 1995). ISBN: 0881676241.

  Summary: This book consists of a series of state-of-the-art essays discussing practical aspects of diabetes mellitus as it relates to the elderly. Eighteen chapters cover topics including: the impact of diabetes on an aging society; glucose intolerance versus diabetes mellitus; glycemic control and diabetic complications; diet therapy; the role of exercise; pharmacological therapy; dermatological disorders; foot care and foot problems; diabetic retinopathy and eye disorders; diabetic renal disease; diabetic neuropathy; atherosclerotic, cardiovascular and cerebrovascular disease; hypoglycemia; glucose monitoring; hyperosmolar nonketotic **coma;** education and counseling for

diabetes self-care; and diabetes mellitus and its relationship to other age-prevalent illnesses. Numerous tables, flowsheets, and diagrams are used to simplify the material presented and to provide ready reference. A section of handouts is also provided for patient education purposes. A subject index is included. 165 references.

- **Diabetes: Questions You Have, Answers You Need. Revised ed**

  Source: Allentown, PA: People's Medical Society. 1997. 191 p.

  Contact: Available from Independent Publishers Group. Order Department, 814 N. Franklin Street, Chicago, IL 60610. (800) 888-4741 or (312) 337-0747. Fax (312) 337-5985. E-mail: ipgbook@mcs.com. PRICE: $12.95. ISBN: 1882606531.

  Summary: This book provides readers with a 'consumer's guide' to managing diabetes. The author emphasizes that, while diabetes is incurable, with proper medical treatment and a great deal of self management, most people with diabetes can live normal length lives with little or no restrictions on their lifestyles. The author hopes that the information in the book can help empower people with diabetes and encourage them to become and remain active participants in their own health care. The first chapter introduces the basics of Type I and Type II diabetes (insulin-dependent and noninsulin-dependent, respectively), including risk factors for diabetes, impaired glucose tolerance, secondary diabetes, and gestational diabetes. The next chapter focuses on the use of insulin in Type I diabetes, including insulin pumps, jet injectors, and insulin pens. The chapter on Type II diabetes covers insulin resistance, heredity, obesity, diet, oral therapy, insulin therapy, combination therapy, and new treatment options. Chapter Four covers the short term complications of diabetes, including hypoglycemia, ketoacidosis, and hyperosmolar or nonketotic **coma;** and the longterm complications, including eye problems, nephropathy (kidney disease), cardiovascular complications, neuropathy, and foot problems. The final chapter emphasizes self management, discussing issues including the self monitoring of blood glucose (SMBG), nutrition, exercise, foot care, dental care, smoking, children and diabetes, pregnancy and diabetes, and aging. The book concludes with a glossary, a selected bibliography, and a subject index. 47 references.

- **Handbook of Diabetes**

  Source: Malden, MA: Blackwell Science, Inc. 1992. 125 p.

  Contact: Available from Blackwell Science, Inc. 350 Main Street, Commerce Place, Malden, MA 02148. (800) 215-1000 or (617) 388-8250. Fax (617) 388-8270. E-mail: books@blacksci.com. PRICE: $39.95. ISBN: 0632028882.

  Summary: This book summarizes some of the information contained in its parent volume, the Textbook of Diabetes. This handbook is devoted to the daily treatment and surveillance of diabetes and its more common problems and is written for health professionals with an interest in diabetes who work outside the hospital setting. Twenty-four chapters cover the diagnosis and classification of diabetes; clinical problems of insulin-dependent and noninsulin-dependent diabetes mellitus (IDDM or Type I, and NIDDM or Type II, respectively); the causes of diabetes; diabetic control and diabetes management; the treatment of IDDM and of NIDDM; hypoglycemia; diabetic ketoacidosis; nonketotic hyperosmolar **coma;** microvascular disease; everyday living with diabetes; drugs and diabetes; diabetic eye disease; diabetic neuropathies; diabetic nephropathy; cardiac, macrovascular and hypertensive disease in people with diabetes; foot problems; skin care and problems in diabetes; sexual function in men with diabetes; and the role of various members of the diabetes health care team. Each chapter includes

numerous full-color tables, charts, and photographs. A subject index concludes the volume.

- **Uncomplicated Guide to Diabetes Complications**

  Source: Alexandria, VA: American Diabetes Association. 1998. 256 p.

  Contact: Available from American Diabetes Association, Inc. Order Fulfillment Department, P.O. Box 930850, Atlanta, GA 31193-0850. (800) 232-6733. Fax (770) 442-9742. Website: www.diabetes.org. PRICE: $18.95 plus shipping and handling. ISBN: 0945448872. Order number 481401.

  Summary: This book uses a question and answer format to provide information on the symptoms, prevention, treatment, and self-care of diabetes complications. The information presented in the book is intended to help people who have diabetes cope with the uncertainty and fear of developing complications. Chapters cover all major complications: diabetic ketoacidosis, hyperglycemic hyperosmolar nonketotic **coma,** lactic acidosis, hypoglycemia, foot problems, eye disease and blindness, kidney and heart disease, hypertension and stroke, neuropathy and vascular disease, gastrointestinal problems, skin and dental problems, psychosocial complications, and impotence and other sexual disorders. Chapters also address special concerns such as hypoglycemia and obesity. Many chapters include a case study or studies to illustrate the complications of diabetes. The book concludes with a glossary and an index. 2 appendices. 33 figures. 32 tables.

- **Pediatric Brain Injury: A Practical Resource**

  Source: San Antonio, TX: Communication Skill Builders, Inc. 1993. 192 p.

  Contact: Available from Communication Skill Builders. Psychological Corporation, Order Service Center, P.O. Box 839954, San Antonio, TX 78283-3954. Voice (800) 211-8378; TTY (800) 723-1318; Fax (800) 232-1223. PRICE: $52.00 plus shipping and handling. ISBN: 0884506436.

  Summary: This book, intended for speech-language pathologists, parents, teachers, and students, presents information on treatment of children who experience brain injury after a history of normal development. The authors discuss the nature and incidence of brain injury in children, the philosophy of therapy, suggestions for working with parents and family members, and current research on brain injury in children. Factors in the prevention of injury to children are also discussed. Specific topics include closed head injury, open head injury, anoxia, infection, the structure of the brain, diagnostic tests used to confirm or classify brain injuries, the neuropathology of brain injury in children, the implications of normal development stages in recovery, **coma,** the multidisciplinary care team involved in treating patients with brain injury, the family's role, philosophies of therapy, the functionally **comatose** child, the structure-dependent child, the concrete processor, issues of feeding, the continuum of care, and caring for the caregivers. For each of classification of brain injury, the authors discuss symptoms and specific therapeutic recommendations. The book concludes with a bibliography and appendices on levels of consciousness, suggested tests and assessment tools, and suggested language and cognitive activities. 73 references. (AA-M).

- **Johns Hopkins Guide to Diabetes for Today and Tomorrow**

  Source: Baltimore, MD: Johns Hopkins University Press. 1997. 422 p.

Contact: Available from Johns Hopkins University Press. 2715 North Charles Street, Baltimore, MD 21218. (410) 516-6939. PRICE: $39.95 (hardcover); $16.95 (paperback). ISBN: 0801855802 (hardcover); 0801855810 (paperback).

Summary: This book, written by a physician, a mental health counselor, and a nurse, is designed to help people take control of their diabetes. The authors note that the real challenge of diabetes is to eliminate its complications and reduce the personal burden it places on people. Six sections provide information about the diagnosis and various types of diabetes; diabetes management; coping with diabetes; complications; sexuality, pregnancy, and genetics; and the future of diabetes care. Complications include ketoacidosis and hyperosmolar **coma;** hardening of the arteries; eye diseases; diabetic nephropathy; diabetic neuropathies; foot diseases; and skin diseases. The authors conclude that readers should take advantage of available diabetes care so that they may be in the best possible position to be healthy when diabetes is ultimately cured. Personal vignettes to which the authors respond are included throughout the book. A subject index concludes the book. 21 figures. 17 tables. (AA-M).

- **Handbook of Diabetes, Second Edition**

  Source: Malden, MA: Blackwell Science, Inc. 1999. 220 p.

  Contact: Available from Blackwell Science, Inc. 350 Main Street, Commerce Place, Malden, MA 02148. (800) 215-1000 or (617) 388-8250. Fax (617) 388-8270. E-mail: books@blacksci.com. Website: www.blackwell-science.com. PRICE: $60.95. ISBN: 0632055049.

  Summary: This handbook covers a wide spectrum of information on diabetes mellitus. The handbook includes an introduction and 31 topical chapters: the history of diabetes, diagnosis of diabetes, classification, public health aspects, normal physiology of insulin secretion and action, the epidemiology and etiology of type 1 diabetes, the epidemiology and etiology of type 2 diabetes, other types of diabetes, assessing control in diabetes, the management of type 1 diabetes, the management of type 2 diabetes, diabetic ketoacidosis and hyperosmolar non-ketotic **coma,** hypoglycemia (low blood glucose levels), control and complications, diabetic eye disease (retinopathy), diabetic nephropathy (kidney disease), diabetic neuropathy (nerve disease), hyperlipidemia (high levels of blood fats) in diabetes, hypertension (high blood pressure) in diabetes, macrovascular disease in diabetes, the diabetic foot, sexual problems in diabetes, gastrointestinal problems in diabetes, the skin in diabetes, psychological and psychiatric problems in diabetes, some intercurrent problems (exercise, drugs, infection, surgery), pregnancy and diabetes, diabetes in children, diabetes in the elderly, lifestyle considerations (driving, employment, smoking, travel), and the organization of diabetes care. The handbook design includes information presented in small chunks, with numerous color illustrations, charts, and photographs to make the information more accessible. A detailed subject index concludes the book.

- **The handbook: Pediatric dentistry. (2nd ed.)**

  Source: Chicago, IL: American Academy of Pediatric Dentistry. 1999. 316 pp.

  Contact: Available from American Academy of Pediatric Dentistry, 211 East Chicago Avenue, Suite 700, Chicago, IL 60611-2663. Telephone: (312) 337-2169 / fax: (312) 337-6329 / e-mail: aapdinfo@aapd.org / Web site: http://www.aapd.org.

  Summary: This handbook is written as a quick clinical reference aid for practitioners. Chapter topics include infant oral health, dental development, oral pathology, fluoride,

radiology, periodontal disease, pulp therapy, restorative dentistry, trauma, and growth and development/orthodontics. Additional chapters include information on legal issues, recordkeeping, infection control guidelines, behavior management and sedation, and pain control. Further chapters include hospital planning and admission, medical emergencies, common disorders and diseases, special needs patients. Also provided is an oral medicine formulary, tables for temperature conversion, kilograms - pounds, common abbreviations, Glasgow **coma** scale, and metric equivalents. A section describing common laboratory tests is provided, along with an index.

- **Manual for Management of Diabetes Mellitus: A Hong Kong Chinese Perspective**

  Source: Hong Kong: Chinese University Press. 1998. 144 p.

  Contact: Available from Chinese University Press. Chinese University of Hong Kong, Sha Tin, N.T., Hong Kong. (852) 2609 6508. Fax (852) 2603 6692. E-mail: cup @cuhk.hk. PRICE: $19.00 plus shipping and handling. ISBN: 9622017576.

  Summary: This manual, which combines the latest international and Chinese information on diabetes, serves as a quick reference to all health care personnel involved in the management of diabetes. The manual begins with a chapter on the classification and pathogenesis of diabetes, focusing on intermediary metabolism, insulin, and counterregulatory hormones; the classification, presentation, and pathogenesis of diabetes; the overlap between type 1 and type 2 diabetes; and diabetes in Chinese people. This is followed by a chapter on the diagnosis of diabetes. Topics include the American Diabetes Association and World Health Organization diagnostic criteria and the oral glucose tolerance test. The third chapter recommends standards of medical care for patients who have diabetes, focusing on the initial visit, continuing care, the annual assessment, target values, hospital admission criteria, and referral for specialist assessment. The next chapter addresses the issue of patient education. Topics include health beliefs and affective responses, knowledge and skills, patient rights and roles, obstacles to glycemic control, self monitoring of blood glucose, insulin administration, sick day management, hypoglycemia, diabetic complications, treatment noncompliance, psychosociological problems, and finances. The fifth chapter focuses on the dietary management of diabetes and exercise in diabetes. Diet-related topics include the goals of dietary management, diet composition, healthy eating and dining out guidelines, food choices, weight control, and sweeteners. This is followed by a chapter on oral drugs for treating diabetes, including sulfonylureas, biguanides, antiabsorptive drugs, antiobesity drugs, and insulin and oral agent combinations. The next chapter discusses insulin use in terms of indications for use, actions and duration, types, regimen, dosage, adjustment of dosage, and use while travelling. The eighth chapter describes diabetic complications, including ophthalmic complications, diabetic foot, diabetic neuropathy, and microalbuminuria and renal involvement. This is followed by chapters on the treatment of hypertension and dyslipidemia. Perioperative management of people who have poorly and well controlled type 1 or type 2 diabetes is the topic of the next chapter. This is followed by a chapter on diabetic emergencies such as diabetic ketoacidosis, hyperosmolar nonketotic **coma,** and lactic acidosis. Remaining chapters discusses the diagnosis and management of gestational diabetes and the primary, secondary, and tertiary prevention of diabetes. 2 appendices. 9 figures. 1 table.

- **Management of Diabetes Mellitus. 2nd ed**

  Source: Durant, OK: Essential Medical Information Systems, Inc. 1991. 267 p.

Contact: Available from Essential Medical Information Systems, Inc. P.O. Box 1607 Durant, OK 74702. (800) 225-0694. FAX (405) 924-9414. PRICE: $12.95 plus $1.95 shipping and handling. Bulk prices available. ISBN: 0929240316.

Summary: This reference guide for the management of diabetes mellitus consists of 34 chapters on the following topics: fuel-hormonal dynamics; the cellular effects of insulin; diagnosis; insulin-dependent diabetes mellitus; noninsulin-dependent diabetes mellitus; secondary causes; effects of glucose normalization; laboratory methods; self blood glucose monitoring; diet therapy; methods of exercise; oral agents; insulin; dealing with the difficult patient; hypoglycemia; diabetic ketoacidosis; hyperglycemic hyperosmolar nonketotic **coma;** diabetes and the eyes; nephropathy; hypertension; neuropathy; sexuality; foot disease; lipids; macrovascular disease; digestive disease; prepartum planning and genetic counseling; glucose control during pregnancy; obstetrical considerations; surgery; outpatient sick day therapy; pump therapy; pancreatic transplantation; and enhancing adherence. Most chapters include references, charts, and figures where necessary.

- **Pediatric Clinical Gastroenterology. 4th ed**

  Source: St. Louis, MO: Mosby-Year Book, Inc. 1995. 1065 p.

  Contact: Available from Mosby-Year Book, Inc. 11830 Westline Industrial Drive. St. Louis, MO 63146. (800) 426-4545 or (800) 325-4177 or (314) 872-8370. Fax (314) 432-1380. PRICE: $100 (as of 1995). ISBN: 0815174063.

  Summary: This textbook of pediatric clinical gastroenterology presents 37 chapters in 5 sections: symptoms and signs; diseases of the gastrointestinal tract; diseases of the liver; diseases of the pancreas; and nutritional support. Specific topics include gastrointestinal (GI) emergencies of the neonate; intestinal obstruction; sucking and swallowing disorders; diseases of the esophagus; disorders of the stomach and duodenum; diarrheal disorders; carbohydrate intolerance; malabsorption syndrome; protein losing gastroenteropathy; immune homeostasis and the gut; inflammatory bowel diseases; constipation, fecal incontinence, and proctologic conditions; functional recurrent abdominal pain; parasitic and fungal disease of the GI tract; neonatal unconjugated hyperbilirubinemias; neonatal hepatitis; prolonged obstructive jaundice; acute and chronic viral hepatitis; bacterial, rickettsial, and parasitic infections and infestations; fulminant hepatic failure and hepatic **coma;** cirrhosis; portal hypertension; inborn errors of metabolism; hepatic tumors; liver transplantation; congenital anomalies and heredity disorders; cystic fibrosis; pancreatitis and pancreatic tumors; energy and nutrient requirements; infant feeding; and enteral and parenteral alimentation. Each chapter includes numerous references and a subject index concludes the volume.

- **Endocrinology. 4th ed**

  Source: Philadelphia, PA: Harcourt Health Sciences. 2001. 3 v., 3048 p.

  Contact: Available from W.B. Saunders. 6277 Sea Harbor Drive, Orlando, FL 32887-4800. (800) 654-2452 or (314) 453-7010. Fax (800) 568-5136 or (314) 453-7095. E-mail: wbsbcs@harcourt.com. Website: customerservice.wbsaunders.com. PRICE: $495.00 plus shipping and handling. ISBN: 0721678408 (three volume set).

  Summary: This three volume set of books provides a complete, authoritative, up to date analysis of endocrine disease and basic endocrine physiology. This edition consists of 194 chapters that cover every aspect of endocrinology in detail by an authority in the field. About one third of the chapters are new, and the remainder have been rewritten

and updated. Topics covered in volume one include the principles of hormone action; neuroendocrinology and the pituitary gland; growth and maturation; immunology and endocrinology; obesity, anorexia nervosa, and nutrition in endocrinology; and diabetes mellitus, carbohydrate metabolism, and lipid disorders. Chapters on diabetes mellitus focus on anatomy and physiology, classification, etiology, diagnosis, and treatment. Specific clinical disorders discussed include syndromes of insulin resistance, oculopathy, neuropathy, nephropathy, diabetic foot complications, ketoacidosis, hyperosmolar **coma,** lactic acidosis, hypoglycemia, atherosclerosis, syndrome X, and hyperglycemia. Volume two includes information on the parathyroid gland, calciotropic hormones, bone metabolism, the thyroid gland, the adrenal gland, and glucocorticoids. Topics covered in volume three include endocrine hypertension and mineralocorticoids, reproductive endocrinology and sexual development, female reproduction, endocrinology of the breast, male reproduction, endocrinology and pregnancy, endocrine tumor syndromes, and endocrine testing and treatment. Numerous figures. Numerous tables. Numerous references.

Book Summaries: Online Booksellers

Commercial Internet-based booksellers, such as Amazon.com and Barnes&Noble.com, offer summaries which have been supplied by each title's publisher. Some summaries also include customer reviews. Your local bookseller may have access to in-house and commercial databases that index all published books (e.g. Books in Print®). **IMPORTANT NOTE:** Online booksellers typically produce search results for medical and non-medical books. When searching for "coma" at online booksellers' Web sites, you may discover non-medical books that use the generic term "coma" (or a synonym) in their titles. The following is indicative of the results you might find when searching for "coma" (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- **21st Century Complete Medical Guide to Head and Brain Injuries: Traumatic Brain Injury (TBI), Coma, Concussion--Authoritative Government Documents, Clinical References, and Practical Information for Patients and Physicians** by PM Medical Health News; ISBN: 1592487815; http://www.amazon.com/exec/obidos/ASIN/1592487815/icongroupinterna
- **A New Vision of an Old Cluster: Untangling Coma Berencies: Marseille, France 17-20 June 1997** by A. Mazure (Editor), et al; ISBN: 9810233221; http://www.amazon.com/exec/obidos/ASIN/9810233221/icongroupinterna
- **An analysis of CCD images of the coma of Comet Halley (SuDoc NAS 1.26:187725)** by Michael R. Combi; ISBN: B00010BM9M; http://www.amazon.com/exec/obidos/ASIN/B00010BM9M/icongroupinterna
- **Beyond Coma** by Patricia Echevarria; ISBN: 0533124573; http://www.amazon.com/exec/obidos/ASIN/0533124573/icongroupinterna
- **Catastrophe of Coma: A Way Back** by Edward Alan Freeman, Henry Stonnington (Introduction); ISBN: 0911378936; http://www.amazon.com/exec/obidos/ASIN/0911378936/icongroupinterna
- **City Hospital: Coma (City Hospital)** by Keith Miles; ISBN: 000675158X; http://www.amazon.com/exec/obidos/ASIN/000675158X/icongroupinterna
- **Coma** by Robin Cook; ISBN: 9500419319; http://www.amazon.com/exec/obidos/ASIN/9500419319/icongroupinterna

- **Coma** by Xavier Couture (Author); ISBN: 2246620813; http://www.amazon.com/exec/obidos/ASIN/2246620813/icongroupinterna
- **Coma** by Francis More; ISBN: 2259008135; http://www.amazon.com/exec/obidos/ASIN/2259008135/icongroupinterna
- **Coma : Awakening Loved Ones with Hypnosis** by Iris K. Barratt; ISBN: 1893087166; http://www.amazon.com/exec/obidos/ASIN/1893087166/icongroupinterna
- **Coma and Head Trauma: Handbook for Speech Rehabilitation and Management** by Faiga Disking; ISBN: 088450932X; http://www.amazon.com/exec/obidos/ASIN/088450932X/icongroupinterna
- **Coma Arousal: The Family As a Team** by Edward B., M.D. Lewinn; ISBN: 0385193726; http://www.amazon.com/exec/obidos/ASIN/0385193726/icongroupinterna
- **Coma-Physiopathology, Diagnosis, and Management** by Leslie P. Ivan, Bruce Derek; ISBN: 0398046832; http://www.amazon.com/exec/obidos/ASIN/0398046832/icongroupinterna
- **Conscious Coma: Ten Years in an Iranian Prison** by David Rabhan; ISBN: 0972049568; http://www.amazon.com/exec/obidos/ASIN/0972049568/icongroupinterna
- **David: A Mother's Story of Her Son's Recovery from a Coma and Brain Damage** by Dorothy, Landvater; ISBN: 0131969560; http://www.amazon.com/exec/obidos/ASIN/0131969560/icongroupinterna
- **Diabetic Coma, Ketoacidotic and Hyperosmolar** by David S. Schade; ISBN: 082630589X; http://www.amazon.com/exec/obidos/ASIN/082630589X/icongroupinterna
- **Neuropsychological Rehabilitation: Coma and the Persistent Vegetative State, Issue 2, Pages 97-216, 1993** by T. M. McMillan, Sarah L. Wilson (Editor); ISBN: 0863779131; http://www.amazon.com/exec/obidos/ASIN/0863779131/icongroupinterna
- **Neurotransmitters in Cerebral Coma and Stroke: Proceedings of the Workshop, Vienna, July 11, 1978** by K. Jellinger; ISBN: 0387815104; http://www.amazon.com/exec/obidos/ASIN/0387815104/icongroupinterna
- **Recalled to Life: The Story of a Coma** by Esther Goshen-Gottstein, et al; ISBN: 0300044739; http://www.amazon.com/exec/obidos/ASIN/0300044739/icongroupinterna
- **The Coma-Emerging Patient (State of the Art Reviews - Physical Medicine and Rehabilitation, Volume 4, Number 3)** by M.D. M. Elizabeth Sandel (Editor), Ph.D. David W. Ellis (Editor); ISBN: 1560530308; http://www.amazon.com/exec/obidos/ASIN/1560530308/icongroupinterna
- **The hepatic coma syndromes and lactulose** by Harold O. Conn; ISBN: 0683021001; http://www.amazon.com/exec/obidos/ASIN/0683021001/icongroupinterna
- **Therapeutic Education for the Child With Traumatic Brain Injury: From Coma to Kindergarten** by Dorothy McKerns, Leslie McKerns Motchkavitz; ISBN: 0761642854; http://www.amazon.com/exec/obidos/ASIN/0761642854/icongroupinterna
- **Thoughts from a Coma** by Glenn Bagley; ISBN: 1413723462; http://www.amazon.com/exec/obidos/ASIN/1413723462/icongroupinterna
- **Walking Through a Miracle: One Woman, One Daughter, One God, and a Miraculous Recovery from a Life-Threatening Coma** by Mary Frances Varallo, Mary Fran Varallo;

ISBN: 1577942094;
http://www.amazon.com/exec/obidos/ASIN/1577942094/icongroupinterna

- **X-ray archeology in the coma cluster (SuDoc NAS 1.26:194799)** by Simon D. M. White; ISBN: B00010JNOI;
http://www.amazon.com/exec/obidos/ASIN/B00010JNOI/icongroupinterna

Chapters on Coma

In order to find chapters that specifically relate to coma, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and coma using the "Detailed Search" option. Go to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find book chapters, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Book Chapter." Type "coma" (or synonyms) into the "For these words:" box. The following is a typical result when searching for book chapters on coma:

- **Hypoglycemia**

  Source: in Leahy, J.L.; Clark, N.G.; Cefalu, W.T. Medical Management of Diabetes Mellitus. Monticello, NY: Marcel Dekker, Inc. 2000. p. 527-537.

  Contact: Available from Marcel Dekker, Inc. Cimarron Road, P.O. Box 5005, Monticello, NY 12701. (845) 796-1919 or (800) 228-1160. Fax (845) 796-1772. Email: custserv@dekker.com. Website: www.dekker.com. PRICE: $99.75. ISBN: 824788575.

  Summary: Hypoglycemia (low blood glucose levels) is a common limiting factor that may prevent patients with either type 1 or type 2 diabetes from achieving tight metabolic control over their disease. The mechanisms leading to low glucose concentrations diverge somewhat between the two types of the disease, but the net result is that during critical deficits of glucose provision to the brain, the patient falls into a **coma** or experiences a seizure. This chapter on hypoglycemia is from a textbook for practicing providers and for physicians in training that offers a comprehensive, up-to-date overview of diabetes mellitus. The text outlines the most effective diagnostic and therapeutic approaches to clinical problems, rather than try to be encyclopedic in coverage. In this chapter, the author discusses glucose counterregulation, type 1 diabetes, type 2 diabetes, hypoglycemic unawareness, special issues surrounding intensive diabetes management, treatment of hypoglycemia (oral glucose, glucagon), sulfonylurea overdose, and rare causes of hypoglycemia. The author concludes that with appropriate care and education of the patient, tight glycemic control can be achieved in most patients in tandem with an acceptable frequency of relatively mild hypoglycemia. 8 references.

- **Renal Disease in Patients with Substance Abuse**

  Source: in Schena, F.P., ed. Nephrology. New York, NY: McGraw-Hill, Inc. 2001. p. 237-243.

  Contact: Available from McGraw-Hill, Inc. Shoppenhangers Road, Maidenhead, Berkshire SL6 2QL. 44 (0)1628 502700. Fax: +44 (0)1628 635895 E-mail: emea_orders@mcgraw-hill.com. Website: www.mcgraw-hill.co.uk. PRICE: $79.95; plus shipping and handling. ISBN: 0077095251.

Summary: The use of various different prescription and nonprescription drugs that may lead to dependency or that may have recreational or psychological effects can cause renal (kidney) disease. This chapter on renal disease in patients with substance abuse is from a book on nephrology (the study of the kidney and kidney diseases) designed for general practitioners and family care providers that offers strategies for the management of patients with renal (kidney) damage. The authors suggest a syndrome analytic approach as the easiest first step in differentiating these renal diseases. Patients who use alcohol or cocaine may develop acute renal failure (ARF) from rhabdomyolysis (a potentially fatal disease of skeletal muscle) and myoglobinuria (myoglobin, responsible for the red color of muscle tissue and its ability to store oxygen, in the urine), which may be traumatic or nontraumatic, the latter often a direct effect of muscle injury caused by alcohol. The authors caution that any drug that causes central nervous system depression may be critical in the pathogenesis of rhabdomlyolysis, since muscular compression and seizures may be associated with the outpouring of intracellular contents that causes the nephropathy (kidney disease). Compression of muscles may be the critical factor in producing rhabdomyolysis in patients with drug-related **coma** or stupor. Rhabdomyolysis may present with weakness and myalgia (pain in the muscles), nausea and vomiting, disorientation, stupor or **coma,** and hard swollen muscles. This chapter also discusses nephrotic syndrome associated with intravenous drug use, including infective endocarditis, vasculitis, hepatitis B or C infections, and HIV infection; and chronic renal disease, including amyloidosis (accumulation of a waxy, glycoprotein in tissues and organs), problems arising from nonsteroidal antiinflammatory drugs (NSAIDs), heroin nephropathy, HIV associated nephropathy, and lead nephropathy. 1 table. 14 references.

- **Your Endocrine System**

Source: in Larson, D.E., ed. Mayo Clinic Family Health Book. 2nd ed. New York, NY: William Morrow and Company, Inc. 1996. p. 923-952.

Contact: Available from Mayo Clinic. 200 First Street, S.W., Rochester, MN 55905. (800) 291-1128 or (507) 284-2511. Fax (507) 284-0161. Website: www.mayo.edu. PRICE: $39.95 plus shipping and handling. ISBN: 0688144780.

Summary: This chapter from a comprehensive medical reference focuses on endocrine system disorders and begins with a description of the functioning of the endocrine glands: the pituitary, the thyroid and parathyroid glands, the pancreas, the adrenal glands, the ovaries, and the testicles. The endocrine system coordinates the body's activities and responses to usual and unusual events. Each endocrine gland secretes a different hormone, which is released into the bloodstream so that it can deliver instructions to various organs and tissues. Although the endocrine system usually controls the ebb and flow of hormones so efficiently that the body's glandular activity goes virtually unnoticed, sometimes the system malfunctions. Many problems can result from a malfunction, including diabetes, the most common endocrine disorder. The chapter discusses diabetes in terms of its signs and symptoms, emergency symptoms, diagnosis, short term and long term effects, treatment, and prevention. The features that differentiate type 1 diabetes from type 2 are presented. In addition, the chapter discusses the symptoms and treatment of hypoglycemia and ketoacidosis and highlights other effects of diabetes, including hyperosmolar **coma,** atherosclerosis, hypertension, coronary artery disease, vision problems, kidney disease, diabetic neuropathy, foot problems, and Charcot's joint. Information on treatment focuses on nutrition, exercise, oral hypoglycemic medications, insulin, and pancreas transplantation. The chapter also provides information on the treatment for, as well as the signs and symptoms,

diagnosis, and seriousness of other pancreatic disorders, adrenal gland disorders, pituitary gland disorders such as diabetes insipidus, thyroid disorders, and parathyroid gland disorders. 16 figures.

- **Medical Emergencies**

  Source: in Lockhart, P.B. Oral Medicine and Hospital Practice. Chicago, IL: Special Care Dentistry. 1997. p. 6.3-6.36.

  Contact: Available from Special Care Dentistry. 211 East Chicago Avenue, Chicago, IL 60611. (312) 440-2660. Fax (312) 440-2824. PRICE: $27.00 (member) or $30.00 (nonmember), plus shipping and handling; institutional prices and bulk orders available. ISBN: 0965719103.

  Summary: This chapter is from a manual designed to help dental residents, students, and practitioners engaged in the care of patients in the hospital setting. This chapter discusses medical emergencies. Topics include respiratory difficulty due to foreign body or asthma; cardiac and vascular emergencies, including angina pectoris, myocardial infarction, cardiac arrest, pulmonary edema, and cerebral vascular accident (stroke); allergic reactions; hemostasis, including patient evaluation and the treatment of hemorrhage; syncope, including vasovagal syncope, hypoglycemia, drug reactions, and postural hypotension; shock; adrenal cortical insufficiency; convulsive disorders; drug overdose and toxicity, including asymptomatic and symptomatic patients, narcotic overdose, benzodiazepine overdose, sedative or barbiturate overdose, and local anesthetic toxicity; and the diabetic emergencies of hypoglycemia shock and hyperglycemia **coma.** Most information is presented in outline format, for ease of access. 9 tables.

- **Acute Metabolic Complications in Diabetes**

  Source: in Harris, M.I., et al., eds., for the National Diabetes Data Group (NDDG). Diabetes in America. 2nd ed. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. 1995. p. 283-291.

  Contact: Available from National Diabetes Information Clearinghouse (NDIC). 1 Information Way, Bethesda, MD 20892-3560. (800) 860-8747 or (301) 654-3327. Fax (301) 634-0716. E-mail: ndic@info.niddk.nih.gov. PRICE: $20.00. Also available at http://www.niddk.nih.gov/. Order number: DM-96.

  Summary: This chapter on acute metabolic complications in diabetes is from a compilation and assessment of data on diabetes and its complications in the United States. The acute metabolic complications of diabetes consist of diabetic ketoacidosis (DKA), hyperosmolar nonketotic **coma** (HNC), lactic acidosis (LA), and hypoglycemia. The incidence rate for DKA varies with definition, age, and sex. Precipitating factors for DKA, HNC, and LA include acute illness or comorbidity such as cardiovascular disease, injury or infection, medications, and poor compliance or errors in compliance with treatment. Precipitating factors for hypoglycemia include dosage of oral hypoglycemic agent or insulin; errors in dosage administered; timing of the medication, particularly insulin; delay in meals; and comorbidity such as renal insufficiency, adrenal insufficiency, and pituitary insufficiency. Prevention of these acute complications remains an important element in their management. DKA, HNC, and LA require hospitalization for treatment and thereby result in the use of significant health care resources with increased health care costs. Hypoglycemia can usually be treated in an ambulatory care setting without using significant health care resources. Severe hypoglycemia with loss of consciousness may necessitate hospitalization, however.

Significant morbidity and mortality is associated with DKA, HNC, and LA. Hypoglycemia is usually associated with symptoms that are reversible with prompt treatment. However, severe and profound hypoglycemia may be associated with longterm neurologic impairment. 4 figures. 5 tables. 19 references. (AA-M).

- **Hyponatremia and Hypernatremia**

  Source: in Mandal, A.K. and Nahman, N.S., Jr., eds. Kidney Disease in Primary Care. Baltimore, MD: Williams and Wilkins. 1998. p. 70-80.

  Contact: Available from Williams and Wilkins. 351 West Camden Street, Baltimore, MD 21201-2436. (800) 638-0672 or (410) 528-4223. Fax (800) 447-8438 or (410) 528-8550. E-mail: custserv@wwilkins.com. PRICE: $39.95. ISBN: 0683300571.

  Summary: This chapter on hyponatremia (low sodium levels) and hypernatremia (elevated sodium levels) is from a textbook that provides primary care physicians with practical approaches to common clinical problems of kidney diseases. For each condition, the author outlines the basics, associated conditions, patients at risk, signs and symptoms, diagnostic considerations, management strategies, indications for referral, and prevention. Hyponatremia of variable severity is a common laboratory abnormality among hospitalized patients. Hyponatremia often produces mild symptoms, or no symptoms; however, it can give rise to serious symptoms such as **coma,** convulsion, and respiratory failure. Although total fluid restriction and salt tablets are adequate treatment in mildly symptomatic patients, infusion of hypertonic (3 percent) saline with 1 mg per kg furosemide intravenously is the treatment of choice in severely symptomatic hyponatremic patients. Hypernatremia occurs with increased frequency in elderly patients, mainly as a result of hypodipsia and chronic disability, in that they often do not have access to free water. Hypernatremia can be severely symptomatic or asymptomatic. Central nervous system signs and symptoms are common. Impaired cognitive function observed in elderly patients could be caused by chronic or recurrent hypernatremia. Prevention is key for hypernatremia. Availability of and access to free water are the only requirements necessary to prevent hypernatremia. 1 figure. 3 tables. 23 references.

- **Liver and Gallbladder Disorders**

  Source: in Shaw, M., et al., eds. Everything You Need to Know About Diseases. Springhouse, PA: Springhouse Corporation. 1996. p. 257-272.

  Contact: Available from Springhouse Publishing. Attention: Trade and Textbook Department, 1111 Bethlehem Pike, P.O. Box 908, Springhouse, PA 19477-0908. (800) 331-3170 or (215) 646-4670 or (215) 646-4671. Fax (215) 646-8716. PRICE: $24.95 (as of 1995). ISBN: 0874348226.

  Summary: This chapter on liver and gallbladder disorders is from a consumer reference guide to over 500 diseases. For each disease, the book covers the causes of the illness, symptoms, diagnosis, and treatment. Conditions covered in this chapter include cirrhosis of the liver; fatty liver; gallstones; hepatic **coma;** liver abscess; nonviral hepatitis; and viral hepatitis. The chapter includes many sidebars that note common complications and provides readers with guidelines and suggestions for prevention and everyday management.

- **Mortality in Insulin-Dependent Diabetes**

  Source: in Harris, M.I., et al., eds., for the National Diabetes Data Group (NDDG). Diabetes in America. 2nd ed. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. 1995. p. 221-232.

  Contact: Available from National Diabetes Information Clearinghouse (NDIC). 1 Information Way, Bethesda, MD 20892-3560. (800) 860-8747 or (301) 654-3327. Fax (301) 634-0716. E-mail: ndic@info.niddk.nih.gov. Also available at http://www.niddk.nih.gov/. PRICE: Full-text book and chapter available online at no charge; book may be purchased for $20.00. Order number: DM-96 (book).

  Summary: This chapter on mortality in insulin-dependent diabetes mellitus (IDDM) is from a compilation and assessment of data on diabetes and its complications in the United States. The authors note that mortality rates among IDDM patients remain high. For childhood onset cases, data suggest that more than 15 percent will die by age 40 years, at which time the annual mortality will be 20 times that seen in the general population. National data suggest that a downward trend in mortality for patients with IDDM occurred up to the early 1980s but may now be leveling off. There is marked variation in the cause of death with increasing duration of IDDM. In the early years after diagnosis of IDDM, acute **coma** is the leading cause of death, while in the middle years, renal disease predominates. After 30 years of IDDM, two-thirds of IDDM deaths result from cardiovascular disease. A strong link is seen between renal disease and cardiovascular death. Examination of risk factors for IDDM mortality show differences by sex, with female IDDM subjects having a relatively greater increase in mortality, compared with nondiabetic females, than is found for males. In IDDM, as in the general U.S. population, African Americans have a higher mortality rate than whites. A familial effect has also been described, wherein premature mortality in relatives (those with diabetes as well as nondiabetics) clusters in families in which there is a deceased IDDM patient. Smoking is an important predictor of all-cause mortality. Onset of IDDM before puberty appears to be associated with a lower mortality rate than peripubertal onset. Comparisons between U.S. populations and other countries reveal considerable differences. For example, a cohort of IDDM subjects from Allegheny County, PA, had more than twice the mortality rate of IDDM subjects in Finland. The authors note that such findings raise potential concerns with regard to health care in the United States. 10 figures. 54 references. (AA-M).

- **Special Issues in Diabetes Management**

  Source: in Haire-Joshu, D., ed. Management of Diabetes Mellitus: Perspectives of Care Across the Life Span. 2nd ed. St. Louis, MO: Mosby Year-Book, Inc. 1996. p. 342-404.

  Contact: Available from Mosby Year-Book, Inc. 11830 Westline Industrial Drive, St. Louis, MO 63146. (800) 426-4545. Fax (800) 535-9935. E-mail: customer.support@mosby.com. PRICE: $41.95. ISBN: 0815142234.

  Summary: This chapter on special issues in the management of patients with diabetes mellitus is from a textbook that provides information to health care professionals who deliver comprehensive diabetes care. Topics include diabetic ketoacidosis, hypersomolar nonketotic **coma** syndrome, the recognition and treatment of hypoglycemia, the glucose counterregulatory hormones, glucose counterregulation in nondiabetes persons, glucose counterregulation in persons with insulin-dependent diabetes mellitus (IDDM), manifestations of normal or altered glucose counterregulatory systems in diabetes, brittle diabetes, stable insulin-dependent diabetes, growth failure in diabetes and Mauriac's syndrome, sick day management, surgery in the patient with diabetes

mellitus, alternatives to standard insulin therapy for the treatment of IDDM, intensive diabetes therapy, and age-related considerations in three groups: children, adolescence to adulthood, and the older adult. For each issue, the authors describe the condition or problem, and present recommendations for optimal patient care. 14 figures. 5 tables. 165 references.

- **Trace Element Metabolism in Renal Disease and Renal Failure**

  Source: in Kopple, J.D. and Massry, S.G. Nutritional Management of Renal Disease. Baltimore, MD: Williams and Wilkins. 1997. p. 395-414.

  Contact: Available from Williams and Wilkins. 351 West Camden Street, Baltimore, MD 21201-2436. (800) 638-0672 or (410) 528-4223. Fax (800) 447-8438 or (410) 528-8550. PRICE: $99.00. ISBN: 068304740X.

  Summary: This chapter on trace element metabolism is from a medical textbook on nutrition and metabolism of individuals with renal disease or renal failure. It is generally accepted that the term 'trace element' applies to elements that occur in the body at concentrations of less than 50 mg per kg under normal conditions. The definition of 'essential' trace elements is that the element should be present in healthy tissues; deficiency of the element consistently produces functional impairment; the abnormalities induced by the deficiency are always followed by specific biochemical changes; and addition of the element prevents or corrects these changes. Topics include methodology for the measurement of trace elements; trace element concentrations in uremia; the potential contribution of trace elements to the uremic syndrome, including impairment of renal function, susceptibility to cancer, cardiovascular disease, glucose intolerance, bone disease, anemia, enzyme dysfunction, encephalopathy and **coma,** and immune deficiency; factors affecting trace element concentration, including inadequate intake, decreased availability, impaired reabsorption, excessive excretion, and extracorporeal losses; specific examples relating to aluminum, lead, selenium and arsenic, zinc, vanadium, silicon, and chromium; and therapeutic considerations. The authors caution that the treatment of uremia by dialysis strategies may cause changes in trace element handling. Trace elements should be considered in the case of any unexplained toxic event in uremia. 5 tables. 89 references. (AA-M).

- **Diabetes Mellitus**

  Source: in Wilson, J.D., et al., eds. Williams Textbook of Endocrinology. 9th ed. Philadelphia, PA: W.B. Saunders Company. 1998. p. 973-1059.

  Contact: Available from W.B. Saunders Company. Book Order Fulfillment Department. 11830 Westline Industrial Drive, Saint Louis, MO 63146-9988. (800) 545-2522 or (314) 453-7010. Fax (800) 568-5136 or (314) 453-7095. E-mail: wbsbcs@harcourt.com. Website: www.wbsaunders.com. PRICE: $150.00 plus shipping and handling. ISBN: 0721661521.

  Summary: This chapter provides an overview of diabetes mellitus. This condition comprises a heterogenous group of hyperglycemic disorders. The chapter begins with a description of the tests used to diagnose diabetes, including measurement of fasting plasma glucose, glycosylated hemoglobin, and the muscle capillary basement membrane; the oral glucose tolerance test; and the intravenous glucose tolerance test. This is followed by a discussion of nomenclature and definitions. The chapter then provides detailed information on type 1 and type 2 diabetes. Topics related to both types of diabetes include their prevalence, incidence, genetics, and clinical features. Other topics relevant to type 1 diabetes include environmental-genetic interactions, islet antibodies, and superantigens. In addition, the natural history, prevention, and

hormonal pathophysiology of type 1 diabetes are discussed. Topics related to the prevention of type 1 diabetes include potential prophylactic agents, immunomodulation in autoimmune diabetes, and the pathology of the Islets of Langerhans in type 1 diabetes. Topics concerning type 2 diabetes include islet cell function, hormonal pathophysiology, and molecular genetics. Molecular genetic topics include mutations in genes involved in insulin resistance, mutations in genes encoding beta cell proteins involved in the quality and quantity of secreted insulin, mutations in genes involved in lipid metabolism and obesity, mutations in genes relevant to insulin action, miscellaneous mutations in genes without known diabetogenicity, the current state of candidate genes, the inheritance of type 2 diabetes, and autoimmune type 2 diabetes. The chapter continues with a discussion of insulin resistance, management of the diabetic pregnancy, gestational diabetes, and surgery in diabetic patients. Information is provided on the complications of diabetes, including the role of metabolic control in preventing complications and the potential mechanisms in the pathogenesis of complications. Complications discussed include cardiomyopathy, dermopathy, diabetic foot syndrome, nephropathy, retinopathy, cataracts, neuropathy, and peripheral vascular disease. The issue of treatment is also addressed. Topics include the treatment of type 1 diabetes with insulin, diet, and exercise; the treatment of type 2 diabetes with diet, oral antihyperglycemic drugs, and insulin; the treatment of diabetic ketoacidosis and nonketotic hyperosmolar **coma;** the prevention and treatment of vascular complications; and pancreas and islet transplantation. 49 figures. 28 tables. 1207 references.

- **Battling Short-Term Complications**

  Source: in Rubin, A.L. Diabetes for Dummies. Foster City, CA: IDG Books Worldwide, Inc. 1999. p. 45-56.

  Contact: Available from IDG Books Worldwide, Inc. 919 E. Hillsdale Blvd., Suite 400, Foster City, CA 94404-2112. (800) 762-2974 or (416) 293-8464. Website: www.idgbooks.com. PRICE: $19.99 plus shipping and handling. ISBN: 076455154X.

  Summary: This chapter provides people who have diabetes with information on the short term complications of this disease. These complications affect a person's ability to function normally. One acute complication of diabetes is hypoglycemia, or low blood glucose. Hypoglycemia may occur if a person takes too much of a medication, exercises too much, or eats too little. The symptoms of hypoglycemia include those that are due to the brain not receiving enough glucose and those that are due to the side effects of the hormones that the body sends out to counter the glucose lowering effect of insulin. Mild hypoglycemia can be treated with a small quantity of glucose. A glucagon injection may be needed for a more severe episode. People who have type 1 diabetes have a tendency to suffer from a severe diabetic complication called ketoacidosis, or a very high blood glucose with large amounts of acid in the urine. Ketoacidosis is caused by the interruption of insulin treatment or an infection. Symptoms of this complication include nausea and vomiting, rapid breathing, extreme tiredness and drowsiness, and weakness. Ketoacidosis requires professional treatment. Another medical emergency complication is hyperosmolar syndrome, or extremely high blood sugar. Age and neglect of diabetes contribute to this condition. Symptoms include frequent urination, thirst, weakness, leg cramps, sunken eyeballs, rapid pulse, decreased mental awareness or **coma,** and blood glucose of 600 or higher. Treatment involves restoring large volumes of fluid to the body, lowering blood glucose level, and restoring other substances that the body has lost.

- **Complications of Diabetes Mellitus and Implications for Nutrition Therapy**

  Source: in Powers, M.A., ed. Handbook of Diabetes Medical Nutrition Therapy. Gaithersburg, MD: Aspen Publishers, Inc. 1996. p. 15-30.

  Contact: Available from Aspen Publishers. P.O. Box 990, Frederick, MD 21705-9727. (800) 638-8437. Fax (301) 695-7931. PRICE: $89.00. ISBN: 0834206315.

  Summary: This chapter, from a handbook on diabetes medical nutrition therapy, familiarizes readers with the complications of diabetes and the implications for nutrition therapy. Topics include the acute complications of diabetic ketoacidosis, hyperosmolar hyperglycemic nonketotic **coma,** and hypoglycemia; and the chronic complications of eye disease, vascular disease, kidney disease, infections, osteopenia, and pancreatic exocrine insufficiency. For each complication, the author describes the risk factors, symptoms, diagnosis, and treatment. The author stresses that the dietitian plays a critical role to help the person with diabetes achieve the control necessary to avoid short-term complications and postpone or prevent long-term complications.

- **Approach to Hyperglycemia in the Patient with Diabetes Mellitus**

  Source: Kelley, W.N., ed. Textbook of Internal Medicine. 3rd ed. Vol 2. Philadelphia, PA: Lippincott-Raven Publishers. 1997. p. 2155-2165.

  Contact: Available from Lippincott-Raven Publishers. P.O. Box 1600, Hagerstown, MD 21741. (800) 638-3030 or (301) 714-2300. Fax (301) 824-7390. PRICE: $125.00 (2 volume edition) or $99.00 (single volume edition). ISBN: 0397515405 (2 volume set); 0397517297 (volume 1); 0397517300 (volume 2); 039751283x (paper).

  Summary: This chapter, from a textbook on internal medicine, describes for health professionals the therapeutic approach to hyperglycemia in patients with diabetes. The chapter's three sections discuss therapy of hyperglycemia in type 1 diabetes, in type 2 diabetes, and therapy of acute decompensated diabetes (diabetic ketoacidosis and hyperosmolar hyperglycemic nonketotic coma). For type 1 and type 2 hyperglycemic therapy, the author discusses therapeutic objectives, treatment modalities, assessment and monitoring, and special considerations. Information about type 1 therapy includes details about levels of treatment, nutritional plans, exercise, insulin dosage, education and support, and planning for pregnancy. For type 2 therapy, the author provides additional information about nutritional planning, indices of glycemic control, exercise, sulfonylureas, biguanides, other drug therapies, and insulin. The chapter briefly reviews treatment priorities for diabetic ketoacidosis and hyperosmolar hyperglycemic nonketotic **coma.** 4 figures. 9 tables. 17 references. (AA-M).

- **Maple Syrup Urine Disease**

  Source: in Complete Directory for Pediatric Disorders. Millerton, NY: Grey House Publishing, Inc. 2002. p. 498-499.

  Contact: Available from Grey House Publishing, Inc. 185 Millerton Road, Millerton, NY 12546. Website: www.greyhouse.com. PRICE: $165.00 plus shipping and handling. ISBN: 1930956614.

  Summary: This entry, from a directory of pediatric disorders, describes maple syrup urine disease (MSUD), a metabolic disorder characterized by the deficiency of certain enzymes. There are four basic types of MSUD: classic, intermittent, mild or intermediate MSUD, and thiamine-responsive MSUD. Classic MSUD, the most severe form of this disorder, becomes apparent within the first week of life and is recognizable by a

characteristic maple syrup odor of the urine and on the body. Symptoms and physical findings associated with this life-threatening form of MSUD include listlessness, drowsiness, exaggerated muscular tension (hypertonicity) and rigidity with periods of loss of muscle tone (flaccidity), severe muscle spasms, convulsions, and **coma.** Treatment for classic MSUD includes the removal of leucine, isoleucine, valine, and certain other related elements from the blood by a procedure known as peritoneal dialysis. Subsequent therapy includes a diet low in leucine, isoleucine, and valine (amino acids, the building blocks of protein). MSUD is inherited as an autosomal recessive trait. Approximately one in 200,000 people in the United States is affected by this disorder. The entry concludes with a reference to organizations that may be helpful (listed in the General Resources Section of the book), the addresses of related websites, national associations and support groups, and the citations for related children's books.

- **Complications During Hemodialysis**

  Source: in Nissenson, A.R.; Fine, R.N. Dialysis Therapy. Philadelphia, PA: Hanley and Belfus, Inc. 2002. p. 171-179.

  Contact: Available from Hanley and Belfus, Inc. Medical Publishers, 210 South 13th Street, Philadelphia, PA 19107. (215) 546-7293 or (215) 546-4995. (800) 962-1892. Fax: (215) 790-9330. Website: www.hanleyandbelfus.com. PRICE: $59.95; plus shipping and handling. ISBN: 1560534265.

  Summary: With improving outcomes, replacement of renal (kidney) function by hemodialysis (HD) is a well established therapy, but it is not free of complications. This chapter is one part of a section on complications during hemodialysis, from a textbook on dialysis therapy. The chapter covers hypotension (low blood pressure), muscle cramps, dialyzer reactions, hypoxemia (low levels of oxygen in the blood), febrile (fever) reactions, dialysis disequilibrium syndrome (DDS, a neurologic disorder characterized by headaches and nausea in the mild form and confusion, blurred vision, seizures and even **coma** in the more severe forms), bleeding, pruritus (itching), heart rate disturbances, cardiopulmonary arrest (heart stopping) during dialysis, air embolism (a rare complication), hemolysis (the breakdown of red blood cells), and electrolyte disturbances. The author concludes that the incidence of clinical problems during HD has been greatly reduced, thanks to technological advances and to higher standards in the routine delivery of therapy. Despite these advances, clinical problems may still occur, especially in elderly or unstable patients, or in individuals with underlying comorbid (other illness present at the same time) conditions. Accurate supervision and physical examination of the patient may prevent several of these problems. Hemodialysis can be better tolerated and done more smoothly when potential clinical problems are anticipated and appropriate countermeasures are instituted in a timely fashion. 3 figures.

CHAPTER 6. MULTIMEDIA ON COMA

Overview

In this chapter, we show you how to keep current on multimedia sources of information on coma. We start with sources that have been summarized by federal agencies, and then show you how to find bibliographic information catalogued by the National Library of Medicine.

Video Recordings

An excellent source of multimedia information on coma is the Combined Health Information Database. You will need to limit your search to "Videorecording" and "coma" using the "Detailed Search" option. Go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find video productions, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Videorecording (videotape, videocassette, etc.)." Type "coma" (or synonyms) into the "For these words:" box. The following is a typical result when searching for video recordings on coma:

- **Coma Stimulation and Update**

  Source: Tucson, AZ: National Center for Neurogenic Communication Disorders. 1993. (videocassette and handout).

  Contact: Available from National Center for Neurogenic Communication Disorders. Telerounds Coordinator, Building 71, Room 500, University of Arizona, Tucson, AZ 85721. (520) 621-1819 or (520) 621-1472. PRICE: $25.00.

  Summary: This telerounds program presents a discussion of **coma** stimulation programs and their impact on patient recovery. The program begins with a description of key medical terms related to **coma.** This is followed by a comprehensive review of the literature on **coma** stimulation and a presentation of the position of a multi-society task force on the medical aspects of persistent vegetative state. Viewers also hear the comments of two patients who have recovered from **comas** and their opinions of the use of **coma** stimulation. The handout provided with the videotape includes an abstract, a list of objectives, a brief outline of the program, a reference list, and an evaluation form for viewers to complete and return. The handout also reprints the position statement of

the Multi-Society Task Force on the Medical Aspects of Persistent Vegetative State. 11 references. (AA-M).

CHAPTER 7. PERIODICALS AND NEWS ON COMA

Overview

In this chapter, we suggest a number of news sources and present various periodicals that cover coma.

News Services and Press Releases

One of the simplest ways of tracking press releases on coma is to search the news wires. In the following sample of sources, we will briefly describe how to access each service. These services only post recent news intended for public viewing.

PR Newswire

To access the PR Newswire archive, simply go to **http://www.prnewswire.com/**. Select your country. Type "coma" (or synonyms) into the search box. You will automatically receive information on relevant news releases posted within the last 30 days. The search results are shown by order of relevance.

Reuters Health

The Reuters' Medical News and Health eLine databases can be very useful in exploring news archives relating to coma. While some of the listed articles are free to view, others are available for purchase for a nominal fee. To access this archive, go to **http://www.reutershealth.com/en/index.html** and search by "coma" (or synonyms). The following was recently listed in this archive for coma:

- **Spanish judge says comatose man cannot be father**
  Source: Reuters Health eLine
  Date: May 16, 2003
- **Diet doctor Atkins in coma in hospital**
  Source: Reuters Health eLine
  Date: April 14, 2003

- **Girl emerges from coma during Bryan Adams concert**
  Source: Reuters Health eLine
  Date: March 12, 2003
- **Parents ask Florida gov. to save comatose daughter**
  Source: Reuters Health eLine
  Date: October 14, 2003

The NIH

Within MEDLINEplus, the NIH has made an agreement with the New York Times Syndicate, the AP News Service, and Reuters to deliver news that can be browsed by the public. Search news releases at **http://www.nlm.nih.gov/medlineplus/alphanews_a.html**. MEDLINEplus allows you to browse across an alphabetical index. Or you can search by date at the following Web page: **http://www.nlm.nih.gov/medlineplus/newsbydate.html**. Often, news items are indexed by MEDLINEplus within its search engine.

Business Wire

Business Wire is similar to PR Newswire. To access this archive, simply go to **http://www.businesswire.com/**. You can scan the news by industry category or company name.

Market Wire

Market Wire is more focused on technology than the other wires. To browse the latest press releases by topic, such as alternative medicine, biotechnology, fitness, healthcare, legal, nutrition, and pharmaceuticals, access Market Wire's Medical/Health channel at **http://www.marketwire.com/mw/release_index?channel=MedicalHealth**. Or simply go to Market Wire's home page at **http://www.marketwire.com/mw/home**, type "coma" (or synonyms) into the search box, and click on "Search News." As this service is technology oriented, you may wish to use it when searching for press releases covering diagnostic procedures or tests.

Search Engines

Medical news is also available in the news sections of commercial Internet search engines. See the health news page at Yahoo (**http://dir.yahoo.com/Health/News_and_Media/**), or you can use this Web site's general news search page at **http://news.yahoo.com/**. Type in "coma" (or synonyms). If you know the name of a company that is relevant to coma, you can go to any stock trading Web site (such as **http://www.etrade.com/**) and search for the company name there. News items across various news sources are reported on indicated hyperlinks. Google offers a similar service at **http://news.google.com/**.

BBC

Covering news from a more European perspective, the British Broadcasting Corporation (BBC) allows the public free access to their news archive located at **http://www.bbc.co.uk/**. Search by "coma" (or synonyms).

Academic Periodicals covering Coma

Numerous periodicals are currently indexed within the National Library of Medicine's PubMed database that are known to publish articles relating to coma. In addition to these sources, you can search for articles covering coma that have been published by any of the periodicals listed in previous chapters. To find the latest studies published, go to **http://www.ncbi.nlm.nih.gov/pubmed**, type the name of the periodical into the search box, and click "Go."

If you want complete details about the historical contents of a journal, you can also visit the following Web site: **http://www.ncbi.nlm.nih.gov/entrez/jrbrowser.cgi**. Here, type in the name of the journal or its abbreviation, and you will receive an index of published articles. At **http://locatorplus.gov/**, you can retrieve more indexing information on medical periodicals (e.g. the name of the publisher). Select the button "Search LOCATORplus." Then type in the name of the journal and select the advanced search option "Journal Title Search."

CHAPTER 8. RESEARCHING MEDICATIONS

Overview

While a number of hard copy or CD-ROM resources are available for researching medications, a more flexible method is to use Internet-based databases. Broadly speaking, there are two sources of information on approved medications: public sources and private sources. We will emphasize free-to-use public sources.

U.S. Pharmacopeia

Because of historical investments by various organizations and the emergence of the Internet, it has become rather simple to learn about the medications recommended for coma. One such source is the United States Pharmacopeia. In 1820, eleven physicians met in Washington, D.C. to establish the first compendium of standard drugs for the United States. They called this compendium the U.S. Pharmacopeia (USP). Today, the USP is a non-profit organization consisting of 800 volunteer scientists, eleven elected officials, and 400 representatives of state associations and colleges of medicine and pharmacy. The USP is located in Rockville, Maryland, and its home page is located at **http://www.usp.org/**. The USP currently provides standards for over 3,700 medications. The resulting USP DI® Advice for the Patient® can be accessed through the National Library of Medicine of the National Institutes of Health. The database is partially derived from lists of federally approved medications in the Food and Drug Administration's (FDA) Drug Approvals database, located at **http://www.fda.gov/cder/da/da.htm**.

While the FDA database is rather large and difficult to navigate, the Phamacopeia is both user-friendly and free to use. It covers more than 9,000 prescription and over-the-counter medications. To access this database, simply type the following hyperlink into your Web browser: **http://www.nlm.nih.gov/medlineplus/druginformation.html**. To view examples of a given medication (brand names, category, description, preparation, proper use, precautions, side effects, etc.), simply follow the hyperlinks indicated within the United States Pharmacopeia (USP).

Below, we have compiled a list of medications associated with coma. If you would like more information on a particular medication, the provided hyperlinks will direct you to ample documentation (e.g. typical dosage, side effects, drug-interaction risks, etc.). The following

drugs have been mentioned in the Pharmacopeia and other sources as being potentially applicable to coma:

Alitretinoin

- **Topical - U.S. Brands:** Panretin Gel
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/500024.html

Antidiabetic Agents, Sulfonylurea

- **Systemic - U.S. Brands:** Amaryl; DiaBeta; Diabinese; Dymelor; Glucotrol; Glucotrol XL; Glynase PresTab; Micronase; Orinase; Tolinase
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202742.html

Antiglaucoma Agents, Cholinergic, Long-Acting

- **Ophthalmic - U.S. Brands:** Humorsol; Phospholine Iodide
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202059.html

Apraclonidine

- **Ophthalmic - U.S. Brands:** Iopidine
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202070.html

Beta-Adrenergic Blocking Agents

- **Ophthalmic - U.S. Brands:** AKBeta; Betagan; Betaxon; Betimol; Betoptic; Betoptic S; Ocupress; OptiPranolol; Timoptic; Timoptic in Ocudose; Timoptic-XE
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202654.html
- **Systemic - U.S. Brands:** Betapace; Blocadren; Cartrol; Corgard; Inderal; Inderal LA; Kerlone; Levatol; Lopressor; Normodyne; Sectral; Tenormin; Toprol-XL; Trandate; Visken; Zebeta
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202087.html

Bimatoprost

- **Ophthalmic - U.S. Brands:** Lumigan
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/500295.html

Bleomycin

- **Systemic - U.S. Brands:** Blenoxane
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202093.html

Brimonidine

- **Ophthalmic - U.S. Brands:** Alphagan
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203130.html

Brinzolamide

- **Ophthalmic - U.S. Brands:** Azopt
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203544.html

Carbachol

- **Ophthalmic - U.S. Brands:** Carbastat; Carboptic; Isopto Carbachol; Miostat
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202110.html

Carbonic Anhydrase Inhibitors

- **Systemic - U.S. Brands:** Ak-Zol; Daranide; Dazamide; Diamox; Diamox Sequels; MZM; Neptazane; Storzolamide
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202114.html

Cisplatin

- **Systemic - U.S. Brands:** Platinol; Platinol-AQ
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202143.html

Cyclophosphamide

- **Systemic - U.S. Brands:** Cytoxan; Neosar
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202174.html

Dacarbazine

- **Systemic - U.S. Brands:** DTIC-Dome
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202178.html

Dactinomycin

- **Systemic - U.S. Brands:** Cosmegen
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202179.html

Danazol

- **Systemic - U.S. Brands:** Danocrine
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202180.html

Daunorubicin, Liposomal

- **Systemic - U.S. Brands:** DaunoXome
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203539.html

Dipivefrin

- **Ophthalmic - U.S. Brands:** AKPro; Propine C Cap B.I.D.
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202202.html

Dorzolamide

- **Ophthalmic - U.S. Brands:** Trusopt
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202773.html

Dorzolamide and Timolol

- **Ophthalmic - U.S. Brands:** Cosopt
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203550.html

Doxorubicin

- **Systemic - U.S. Brands:** Adriamycin PFS; Adriamycin RDF; Rubex
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202209.html

Epinephrine

- **Ophthalmic - U.S. Brands:** Epifrin; Epinal; Eppy/N; Glaucon
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202213.html

Etoposide

- **Systemic - U.S. Brands:** Etopophos; Toposar; VePesid
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202234.html

Fluorouracil

- **Systemic - U.S. Brands:** Adrucil
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202245.html

Glycerin

- **Systemic - U.S. Brands:** Glyrol; Osmoglyn
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202263.html

Ifosfamide

- **Systemic - U.S. Brands:** IFEX
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202293.html

Interferons, Alpha

- **Systemic - U.S. Brands:** Alferon N; Intron A; Roferon-A
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202299.html

Ipratropium and Albuterol

- **Inhalation-Local - U.S. Brands:** Combivent; DuoNeb
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203487.html

Kanamycin

- **Oral - U.S. Brands:** Kantrex
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202312.html

Latanoprost

- **Ophthalmic - U.S. Brands:** Xalatan
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203607.html

Leucovorin

- **Systemic - U.S. Brands:** Wellcovorin
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202321.html

Levobetaxolol

- **Ophthalmic - U.S. Brands:** Betaxon
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/500125.html

Neomycin

- **Oral - U.S. Brands:** Mycifradin
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202396.html

Physostigmine

- **Ophthalmic - U.S. Brands:** Eserine Salicylate; Eserine Sulfate; Isopto Eserine
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202464.html

Pilocarpine

- **Ophthalmic - U.S. Brands:** Adsorbocarpine; Akarpine; Isopto Carpine; Ocu-Carpine; Ocusert Pilo-20; Ocusert Pilo-40; Pilagan; Pilocar; Pilopine HS; Piloptic-1; Piloptic-2; Piloptic-3; Piloptic-4; Piloptic-6; Pilostat
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202465.html

Thyroid Hormones

- **Systemic - U.S. Brands:** Armour Thyroid; Cytomel; Levo-T; Levothroid; Levoxyl; Synthroid; Thyrar; Thyroid Strong; Thyrolar; Triostat; Westhroid
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202566.html

Travoprost

- **Ophthalmic - U.S. Brands:** Travatan
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/500293.html

Unoprostone

- **Ophthalmic - U.S. Brands:** Rescula
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/500199.html

Commercial Databases

In addition to the medications listed in the USP above, a number of commercial sites are available by subscription to physicians and their institutions. Or, you may be able to access these sources from your local medical library.

Mosby's Drug Consult™

Mosby's Drug Consult™ database (also available on CD-ROM and book format) covers 45,000 drug products including generics and international brands. It provides prescribing information, drug interactions, and patient information. Subscription information is available at the following hyperlink: **http://www.mosbysdrugconsult.com/**.

PDR*health*

The PDR*health* database is a free-to-use, drug information search engine that has been written for the public in layman's terms. It contains FDA-approved drug information adapted from the Physicians' Desk Reference (PDR) database. PDR*health* can be searched by brand name, generic name, or indication. It features multiple drug interactions reports. Search PDR*health* at **http://www.pdrhealth.com/drug_info/index.html**.

Other Web Sites

Drugs.com (**www.drugs.com**) reproduces the information in the Pharmacopeia as well as commercial information. You may also want to consider the Web site of the Medical Letter, Inc. (**http://www.medletter.com/**) which allows users to download articles on various drugs and therapeutics for a nominal fee.

Researching Orphan Drugs

Although the list of orphan drugs is revised on a daily basis, you can quickly research orphan drugs that might be applicable to coma by using the database managed by the National Organization for Rare Disorders, Inc. (NORD), at **http://www.rarediseases.org/**. Scroll down the page, and on the left toolbar, click on "Orphan Drug Designation Database." On this page (**http://www.rarediseases.org/search/noddsearch.html**), type "coma" (or synonyms) into the search box, and click "Submit Query." When you receive your results, note that not all of the drugs may be relevant, as some may have been withdrawn from orphan status. Write down or print out the name of each drug and the relevant contact information. From there, visit the Pharmacopeia Web site and type the name of each orphan drug into the search box at **http://www.nlm.nih.gov/medlineplus/druginformation.html**. You may need to contact the sponsor or NORD for further information.

NORD conducts "early access programs for investigational new drugs (IND) under the Food and Drug Administration's (FDA's) approval 'Treatment INDs' programs which allow for a limited number of individuals to receive investigational drugs before FDA marketing approval." If the orphan product about which you are seeking information is approved for marketing, information on side effects can be found on the product's label. If the product is not approved, you may need to contact the sponsor.

The following is a list of orphan drugs currently listed in the NORD Orphan Drug Designation Database for coma:

- **Interferon beta (recombinant) (trade name: R-IFN-beta)**
  http://www.rarediseases.org/nord/search/nodd_full?code=105
- **Trimetrexate (trade name: Neutrexin)**
  http://www.rarediseases.org/nord/search/nodd_full?code=1064
- **Dimethyl sulfoxide**
  http://www.rarediseases.org/nord/search/nodd_full?code=238
- **digitoxin (trade name: NONE Assigned)**
  http://www.rarediseases.org/nord/search/nodd_full?code=1159
- **muramyltripeptide, phosphatidy1-ethanolamine encas (trade name: NONE Assigned)**
  http://www.rarediseases.org/nord/search/nodd_full?code=1182
- **Methotrexate sodium (trade name: Methotrexate)**
  http://www.rarediseases.org/nord/search/nodd_full?code=119
- **Digitoxin (trade name: NONE Assigned)**
  http://www.rarediseases.org/nord/search/nodd_full?code=1218
- **L-leucovorin (trade name: Isovorin)**
  http://www.rarediseases.org/nord/search/nodd_full?code=192
- **Leucovorin (trade name: Leucovorin calcium)**
  http://www.rarediseases.org/nord/search/nodd_full?code=217
- **Liothyronine sodium injection (trade name: Triostat)**
  http://www.rarediseases.org/nord/search/nodd_full?code=268

- **L-leucovorin (trade name: Isovorin)**
  http://www.rarediseases.org/nord/search/nodd_full?code=423
- **Daunorubicin citrate liposome injection (trade name: DaunoXome)**
  http://www.rarediseases.org/nord/search/nodd_full?code=445
- **Interferon beta (recombinant) (trade name: R-IFN-beta)**
  http://www.rarediseases.org/nord/search/nodd_full?code=579
- **Daunorubicin citrate liposome injection (trade name: DaunoXome)**
  http://www.rarediseases.org/nord/search/nodd_full?code=806
- **Thalidomide**
  http://www.rarediseases.org/nord/search/nodd_full?code=932
- **Paclitaxel (trade name: Taxol)**
  http://www.rarediseases.org/nord/search/nodd_full?code=834
- **3-(3,5-dimethyl-1H-2ylmethylene)-1,3-dihydro-indol**
  http://www.rarediseases.org/nord/search/nodd_full?code=937
- **Idoxuridine**
  http://www.rarediseases.org/nord/search/nodd_full?code=776
- **Ifosfamide (trade name: Ifex)**
  http://www.rarediseases.org/nord/search/nodd_full?code=777
- **Ifosfamide (trade name: Ifex)**
  http://www.rarediseases.org/nord/search/nodd_full?code=778
- **Interferon alfa-2a (recombinant) (trade name: Roferon-A)**
  http://www.rarediseases.org/nord/search/nodd_full?code=78
- **Mitomycin-C**
  http://www.rarediseases.org/nord/search/nodd_full?code=88
- **Paclitaxel (trade name: Paxene)**
  http://www.rarediseases.org/nord/search/nodd_full?code=891
- **Liposomal N-Acetylglucosminyl-N-Acetylmurmaly-L-Al (trade name: ImmTher)**
  http://www.rarediseases.org/nord/search/nodd_full?code=924
- **Liposomal N-Acetylglucosminyl-N-Acetylmurmaly-L-Al (trade name: ImmTher)**
  http://www.rarediseases.org/nord/search/nodd_full?code=925
- **Interferon alfa-2b (recombinant) (trade name: Intron A)**
  http://www.rarediseases.org/nord/search/nodd_full?code=93
- **CT-2584 mesylate**
  http://www.rarediseases.org/nord/search/nodd_full?code=973
- **L-glutamy1-tryptophan**
  http://www.rarediseases.org/nord/search/nodd_full?code=998

If you have any questions about a medical treatment, the FDA may have an office near you. Look for their number in the blue pages of the phone book. You can also contact the FDA through its toll-free number, 1-888-INFO-FDA (1-888-463-6332), or on the World Wide Web at **www.fda.gov**.

APPENDICES

APPENDIX A. PHYSICIAN RESOURCES

Overview

In this chapter, we focus on databases and Internet-based guidelines and information resources created or written for a professional audience.

NIH Guidelines

Commonly referred to as "clinical" or "professional" guidelines, the National Institutes of Health publish physician guidelines for the most common diseases. Publications are available at the following by relevant Institute[10]:

- Office of the Director (OD); guidelines consolidated across agencies available at **http://www.nih.gov/health/consumer/conkey.htm**
- National Institute of General Medical Sciences (NIGMS); fact sheets available at **http://www.nigms.nih.gov/news/facts/**
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines: **http://www.nlm.nih.gov/medlineplus/healthtopics.html**
- National Cancer Institute (NCI); guidelines available at **http://www.cancer.gov/cancerinfo/list.aspx?viewid=5f35036e-5497-4d86-8c2c-714a9f7c8d25**
- National Eye Institute (NEI); guidelines available at **http://www.nei.nih.gov/order/index.htm**
- National Heart, Lung, and Blood Institute (NHLBI); guidelines available at **http://www.nhlbi.nih.gov/guidelines/index.htm**
- National Human Genome Research Institute (NHGRI); research available at **http://www.genome.gov/page.cfm?pageID=10000375**
- National Institute on Aging (NIA); guidelines available at **http://www.nia.nih.gov/health/**

[10] These publications are typically written by one or more of the various NIH Institutes.

- National Institute on Alcohol Abuse and Alcoholism (NIAAA); guidelines available at **http://www.niaaa.nih.gov/publications/publications.htm**
- National Institute of Allergy and Infectious Diseases (NIAID); guidelines available at **http://www.niaid.nih.gov/publications/**
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS); fact sheets and guidelines available at **http://www.niams.nih.gov/hi/index.htm**
- National Institute of Child Health and Human Development (NICHD); guidelines available at **http://www.nichd.nih.gov/publications/pubskey.cfm**
- National Institute on Deafness and Other Communication Disorders (NIDCD); fact sheets and guidelines at **http://www.nidcd.nih.gov/health/**
- National Institute of Dental and Craniofacial Research (NIDCR); guidelines available at **http://www.nidr.nih.gov/health/**
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK); guidelines available at **http://www.niddk.nih.gov/health/health.htm**
- National Institute on Drug Abuse (NIDA); guidelines available at **http://www.nida.nih.gov/DrugAbuse.html**
- National Institute of Environmental Health Sciences (NIEHS); environmental health information available at **http://www.niehs.nih.gov/external/facts.htm**
- National Institute of Mental Health (NIMH); guidelines available at **http://www.nimh.nih.gov/practitioners/index.cfm**
- National Institute of Neurological Disorders and Stroke (NINDS); neurological disorder information pages available at **http://www.ninds.nih.gov/health_and_medical/disorder_index.htm**
- National Institute of Nursing Research (NINR); publications on selected illnesses at **http://www.nih.gov/ninr/news-info/publications.html**
- National Institute of Biomedical Imaging and Bioengineering; general information at **http://grants.nih.gov/grants/becon/becon_info.htm**
- Center for Information Technology (CIT); referrals to other agencies based on keyword searches available at **http://kb.nih.gov/www_query_main.asp**
- National Center for Complementary and Alternative Medicine (NCCAM); health information available at **http://nccam.nih.gov/health/**
- National Center for Research Resources (NCRR); various information directories available at **http://www.ncrr.nih.gov/publications.asp**
- Office of Rare Diseases; various fact sheets available at **http://rarediseases.info.nih.gov/html/resources/rep_pubs.html**
- Centers for Disease Control and Prevention; various fact sheets on infectious diseases available at **http://www.cdc.gov/publications.htm**

NIH Databases

In addition to the various Institutes of Health that publish professional guidelines, the NIH has designed a number of databases for professionals.[11] Physician-oriented resources provide a wide variety of information related to the biomedical and health sciences, both past and present. The format of these resources varies. Searchable databases, bibliographic citations, full-text articles (when available), archival collections, and images are all available. The following are referenced by the National Library of Medicine:[12]

- **Bioethics:** Access to published literature on the ethical, legal, and public policy issues surrounding healthcare and biomedical research. This information is provided in conjunction with the Kennedy Institute of Ethics located at Georgetown University, Washington, D.C.: **http://www.nlm.nih.gov/databases/databases_bioethics.html**
- **HIV/AIDS Resources:** Describes various links and databases dedicated to HIV/AIDS research: **http://www.nlm.nih.gov/pubs/factsheets/aidsinfs.html**
- **NLM Online Exhibitions:** Describes "Exhibitions in the History of Medicine": **http://www.nlm.nih.gov/exhibition/exhibition.html**. Additional resources for historical scholarship in medicine: **http://www.nlm.nih.gov/hmd/hmd.html**
- **Biotechnology Information:** Access to public databases. The National Center for Biotechnology Information conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information for the better understanding of molecular processes affecting human health and disease: **http://www.ncbi.nlm.nih.gov/**
- **Population Information:** The National Library of Medicine provides access to worldwide coverage of population, family planning, and related health issues, including family planning technology and programs, fertility, and population law and policy: **http://www.nlm.nih.gov/databases/databases_population.html**
- **Cancer Information:** Access to cancer-oriented databases: **http://www.nlm.nih.gov/databases/databases_cancer.html**
- **Profiles in Science:** Offering the archival collections of prominent twentieth-century biomedical scientists to the public through modern digital technology: **http://www.profiles.nlm.nih.gov/**
- **Chemical Information:** Provides links to various chemical databases and references: **http://sis.nlm.nih.gov/Chem/ChemMain.html**
- **Clinical Alerts:** Reports the release of findings from the NIH-funded clinical trials where such release could significantly affect morbidity and mortality: **http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html**
- **Space Life Sciences:** Provides links and information to space-based research (including NASA): **http://www.nlm.nih.gov/databases/databases_space.html**
- **MEDLINE:** Bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the healthcare system, and the pre-clinical sciences: **http://www.nlm.nih.gov/databases/databases_medline.html**

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[11] Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINE*plus* (**http://medlineplus.gov/** or **http://www.nlm.nih.gov/medlineplus/databases.html**).

[12] See **http://www.nlm.nih.gov/databases/databases.html**.

- **Toxicology and Environmental Health Information (TOXNET):** Databases covering toxicology and environmental health: **http://sis.nlm.nih.gov/Tox/ToxMain.html**
- **Visible Human Interface:** Anatomically detailed, three-dimensional representations of normal male and female human bodies: **http://www.nlm.nih.gov/research/visible/visible_human.html**

The NLM Gateway[13]

The NLM (National Library of Medicine) Gateway is a Web-based system that lets users search simultaneously in multiple retrieval systems at the U.S. National Library of Medicine (NLM). It allows users of NLM services to initiate searches from one Web interface, providing one-stop searching for many of NLM's information resources or databases.[14] To use the NLM Gateway, simply go to the search site at **http://gateway.nlm.nih.gov/gw/Cmd**. Type "coma" (or synonyms) into the search box and click "Search." The results will be presented in a tabular form, indicating the number of references in each database category.

Results Summary

Category	Items Found
Journal Articles	28192
Books / Periodicals / Audio Visual	250
Consumer Health	944
Meeting Abstracts	63
Other Collections	2111
Total	31560

HSTAT[15]

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.[16] These documents include clinical practice guidelines, quick-reference guides for clinicians, consumer health brochures, evidence reports and technology assessments from the Agency for Healthcare Research and Quality (AHRQ), as well as AHRQ's Put Prevention Into Practice.[17] Simply search by "coma" (or synonyms) at the following Web site: **http://text.nlm.nih.gov**.

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[13] Adapted from NLM: **http://gateway.nlm.nih.gov/gw/Cmd?Overview.x**.

[14] The NLM Gateway is currently being developed by the Lister Hill National Center for Biomedical Communications (LHNCBC) at the National Library of Medicine (NLM) of the National Institutes of Health (NIH).

[15] Adapted from HSTAT: **http://www.nlm.nih.gov/pubs/factsheets/hstat.html**.

[16] The HSTAT URL is **http://hstat.nlm.nih.gov/**.

[17] Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's *Guide to Clinical Preventive Services*; the independent, nonfederal Task Force on Community Services' *Guide to Community Preventive Services*; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.

Coffee Break: Tutorials for Biologists[18]

Coffee Break is a general healthcare site that takes a scientific view of the news and covers recent breakthroughs in biology that may one day assist physicians in developing treatments. Here you will find a collection of short reports on recent biological discoveries. Each report incorporates interactive tutorials that demonstrate how bioinformatics tools are used as a part of the research process. Currently, all Coffee Breaks are written by NCBI staff.[19] Each report is about 400 words and is usually based on a discovery reported in one or more articles from recently published, peer-reviewed literature.[20] This site has new articles every few weeks, so it can be considered an online magazine of sorts. It is intended for general background information. You can access the Coffee Break Web site at the following hyperlink: **http://www.ncbi.nlm.nih.gov/Coffeebreak/**.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are some examples that may interest you:

- **CliniWeb International:** Index and table of contents to selected clinical information on the Internet; see **http://www.ohsu.edu/cliniweb/**.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see **http://www.mwsearch.com/**.

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[18] Adapted from **http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html**.

[19] The figure that accompanies each article is frequently supplied by an expert external to NCBI, in which case the source of the figure is cited. The result is an interactive tutorial that tells a biological story.

[20] After a brief introduction that sets the work described into a broader context, the report focuses on how a molecular understanding can provide explanations of observed biology and lead to therapies for diseases. Each vignette is accompanied by a figure and hypertext links that lead to a series of pages that interactively show how NCBI tools and resources are used in the research process.

APPENDIX B. PATIENT RESOURCES

Overview

Official agencies, as well as federally funded institutions supported by national grants, frequently publish a variety of guidelines written with the patient in mind. These are typically called "Fact Sheets" or "Guidelines." They can take the form of a brochure, information kit, pamphlet, or flyer. Often they are only a few pages in length. Since new guidelines on coma can appear at any moment and be published by a number of sources, the best approach to finding guidelines is to systematically scan the Internet-based services that post them.

Patient Guideline Sources

The remainder of this chapter directs you to sources which either publish or can help you find additional guidelines on topics related to coma. Due to space limitations, these sources are listed in a concise manner. Do not hesitate to consult the following sources by either using the Internet hyperlink provided, or, in cases where the contact information is provided, contacting the publisher or author directly.

The National Institutes of Health

The NIH gateway to patients is located at **http://health.nih.gov/**. From this site, you can search across various sources and institutes, a number of which are summarized below.

Topic Pages: MEDLINEplus

The National Library of Medicine has created a vast and patient-oriented healthcare information portal called MEDLINEplus. Within this Internet-based system are "health topic pages" which list links to available materials relevant to coma. To access this system, log on to **http://www.nlm.nih.gov/medlineplus/healthtopics.html**. From there you can either search using the alphabetical index or browse by broad topic areas. Recently, MEDLINEplus listed the following when searched for "coma":

Brain Diseases
http://www.nlm.nih.gov/medlineplus/braindiseases.html

Child Abuse
http://www.nlm.nih.gov/medlineplus/childabuse.html

Club Drugs
http://www.nlm.nih.gov/medlineplus/clubdrugs.html

Creutzfeldt-Jakob Disease
http://www.nlm.nih.gov/medlineplus/creutzfeldtjakobdisease.html

Death and Dying
http://www.nlm.nih.gov/medlineplus/deathanddying.html

Head and Brain Injuries
http://www.nlm.nih.gov/medlineplus/headandbraininjuries.html

Liver Diseases
http://www.nlm.nih.gov/medlineplus/liverdiseases.html

Sports Injuries
http://www.nlm.nih.gov/medlineplus/sportsinjuries.html

You may also choose to use the search utility provided by MEDLINEplus at the following Web address: **http://www.nlm.nih.gov/medlineplus/**. Simply type a keyword into the search box and click "Search." This utility is similar to the NIH search utility, with the exception that it only includes materials that are linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The Combined Health Information Database (CHID)

CHID Online is a reference tool that maintains a database directory of thousands of journal articles and patient education guidelines on coma. CHID offers summaries that describe the guidelines available, including contact information and pricing. CHID's general Web site is **http://chid.nih.gov/**. To search this database, go to **http://chid.nih.gov/detail/detail.html**. In particular, you can use the advanced search options to look up pamphlets, reports, brochures, and information kits. The following was recently posted in this archive:

- **Understanding Brain Death**

  Source: New York, NY: National Kidney Foundation, Inc. 1996. 4 p.

  Contact: Available from National Kidney Foundation. U.S. Materials Orders, 30 East 33rd Street, New York, NY 10016. (212) 889-2210. Fax (212) 689-9261. PRICE: $15.00 for 100 copies. Item number: 06-20.

  Summary: This booklet helps define and explain brain death and provides information for family members of patients who have been declared brain dead. The diagnosis of brain death is defined as 'death based on the absence of all neurologic function.' The booklet, prepared by other families who have had a loved one declared brain dead, is designed to answer questions about brain death. Topics covered include a full definition of brain death, how brain death is determined (the tests undertaken), what happens to the patient during these tests, the role of drugs that can stop the brain from working and

give a false diagnosis, why the heart still beats even during brain death, the difference between **coma** and brain death, what happens when the patient is declared brain dead, saying goodbye to a loved one who is brain dead, and making decisions about ventilator removal and the possibility of organ or tissue donation. The booklet emphasizes that brain death is permanent and irreversible. Information is provided to help the survivors through their time of grieving.

- **Cirrhosis: Many Causes**

  Source: Cedar Grove, NJ: American Liver Foundation. 1995. 4 p.

  Contact: Available from American Liver Foundation. 1425 Pompton Avenue, Cedar Grove, NJ 07009. (800) 223-0179 or (201) 256-2550. PRICE: $0.50 each; $6 for 25 copies; $12 for 50 copies (as of 1995); discounts available for larger quantities.

  Summary: This brochure, written in question-and-answer format, presents basic facts about cirrhosis of the liver. Topics are causes, signs, symptoms, and treatments. Identification of conditions responsible for cirrhosis and its relationship to alcohol use and hepatitis are discussed. The treatments for complications, including ascites, **coma,** and hemorrhage from esophageal varices, are briefly described. Ways to avoid cirrhosis and the outlook for people with cirrhosis are discussed.

- **Your Diabetes Sick-Day Plan**

  Source: South Deerfield, MA: Channing L. Bete Co., Inc. 2000. [2 p.].

  Contact: Available from Channing L. Bete, Co., Inc. 200 State Road, South Deerfield, MA 01373-0200. (800) 628-7733. Fax (800) 499-6464. PRICE: $16.39 per pad of 50 sheets; plus shipping and handling; quantity discounts available. Order number 97735.

  Summary: This fact sheet helps people who have diabetes control their blood sugar when they are sick. Colds and other illnesses put stress on the body and cause problems that can lead to severe illness, **coma,** and even death. The fact sheet provides easy to follow guidelines that instruct readers to test their glucose levels frequently, keep sick day foods available, drink some fluid at least every hour, follow medication instructions exactly and adjust medications if necessary, keep a record during an illness, and know when to call their health care provider.

- **Reye's Syndrome**

  Source: Toronto, Ontario: Canadian Liver Foundation. 200x. 2 p.

  Contact: Available from Canadian Liver Foundation. Suite 1500, 2235 Sheppard Avenue East, Toronto Ontario, M2J 5B5. (416) 491-3353 or (800) 563-5483. Fax (416) 491-4952. E-mail: clf@liver.ca. Website: clf@liver.ca. PRICE: Full-text available online at no charge; Contact organization for print copies.

  Summary: This fact sheet, from the Canadian Liver Foundation, reviews Reye's syndrome, a rare complication of common childhood respiratory infections, including chickenpox. Written in question-and-answer format, the fact sheet covers the symptoms of this disease, diagnostic tests, treatment options, and prevention strategies. Diagnosis of Reye's syndrome is based on a recent history of flu-like illness, persistent vomiting, and blood tests. Other possible causes such as meningitis and encephalitis should be excluded prior to making a final diagnosis. There is an excellent chance of recovery when Reye's syndrome is diagnosed and treated early, before delirium or **coma** has developed. It is believed that aspirin may contribute to the development of Reye's

syndrome, thus doctors advise against the use of aspirin to treat chickenpox and during outbreaks of influenza-like disease. Acetaminophen is the preferred antifever medicine. The fact sheet concludes with the contact information for the Canadian Liver Foundation (www.liver.ca or 800-563-5483).

- **Special Populations: Stroke and Communication Disorders**

  Source: Rockville, MD: American Speech-Language-Hearing Association (ASHA). 1999. [2 p.].

  Contact: Available from American Speech-Language-Hearing Association (ASHA). Product Sales, 10801 Rockville Pike, Rockville, MD 20852. (888) 498-6699. TTY (301) 897-0157. Website: www.asha.org. PRICE: Single copy free.

  Summary: This fact sheet, one in a series on special populations, discusses stroke and communication disorders. Stroke is a cerebrovascular injury that occurs when blood flow to the brain is interrupted by a clogged or burst artery. The interruption deprives the brain of blood and oxygen, thereby causing brain cells to die. When brain cells die, function of the body parts they control is impaired or lost, causing paralysis, speech problems, memory and reasoning deficits, **coma,** and possibly death. The fact sheet offers general demographics on stroke, age factors, and the sequelae of stroke, then discusses communication disorders and stroke, including aphasia, dysarthria, and apraxia of speech. 1 figure. 8 references.

- **Toxoplasmosis**

  Contact: University of New Mexico School of Medicine, New Mexico AIDS Education and Training Center, New Mexico AIDS InfoNet, PO Box 810, Arroyo Seco, NM, 87514, (505) 776-8032, http://www.aidsinfonet.org.

  Summary: This fact sheet, written for individuals with the human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), discusses the opportunistic infection, toxoplasmosis (toxo). Toxo is a parasitic infection. The toxo parasite is often found in cat feces, raw meats and vegetables, and the soil. Toxo usually causes encephalitis of the brain and can lead to **coma** and death. The symptoms of toxo include fever, confusion, headache, disorientation, personality changes, tremors, and seizures. This infection is detected using a toxo antibody test, a computerized tomography (CT scan), and/or a magnetic resonance imaging (MRI scan). The therapeutic drugs -- pyrimethamine and sulfadiazine -- and the ways that they work against toxo are explained. The side effects associated with these drugs and ways to cope with the reactions are described. Individuals can help to prevent toxo by not eating undercooked meat or fish and by wearing gloves and a facemask when cleaning a cat box. Individuals with HIV/AIDS and CD4 cell counts less than one hundred should take medications to prevent toxo.

The NIH Search Utility

The NIH search utility allows you to search for documents on over 100 selected Web sites that comprise the NIH-WEB-SPACE. Each of these servers is “crawled” and indexed on an ongoing basis. Your search will produce a list of various documents, all of which will relate in some way to coma. The drawbacks of this approach are that the information is not organized by theme and that the references are often a mix of information for professionals and patients. Nevertheless, a large number of the listed Web sites provide useful

background information. We can only recommend this route, therefore, for relatively rare or specific disorders, or when using highly targeted searches. To use the NIH search utility, visit the following Web page: **http://search.nih.gov/index.html**.

Additional Web Sources

A number of Web sites are available to the public that often link to government sites. These can also point you in the direction of essential information. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=168&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/specific.htm**
- Google: **http://directory.google.com/Top/Health/Conditions_and_Diseases/**
- Med Help International: **http://www.medhelp.org/HealthTopics/A.html**
- Open Directory Project: **http://dmoz.org/Health/Conditions_and_Diseases/**
- Yahoo.com: **http://dir.yahoo.com/Health/Diseases_and_Conditions/**
- WebMD®Health: **http://my.webmd.com/health_topics**

Associations and Coma

The following is a list of associations that provide information on and resources relating to coma:

- **Coma Recovery Association, Inc**

  Telephone: (516) 997-1826

  Fax: (516) 997-1613

  Email: inquiry@comarecovery.org

  Background: The **Coma** Recovery Association (CRA) is a not-for-profit organization dedicated to acting as a support group for friends and families of individuals who have survived **coma** and head injury. Established in 1980, CRA works to provide information and referrals to affected families to offer support and enable them to make informed choices regarding treatment, rehabilitation, and socialization alternatives. CRA is also an advocate for higher quality care, education, and research for individuals and families affected by **coma** and/or head injury. The Association also hosts conferences and offers educational materials including a regular newsletter entitled 'Coma Recovery Association' and brochures entitled 'Traumatic Brain Injury' and 'Neurological Dysfunctions.'.

  Relevant area(s) of interest: Coma

Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to coma. By consulting all of associations listed in this

chapter, you will have nearly exhausted all sources for patient associations concerned with coma.

The National Health Information Center (NHIC)

The National Health Information Center (NHIC) offers a free referral service to help people find organizations that provide information about coma. For more information, see the NHIC's Web site at **http://www.health.gov/NHIC/** or contact an information specialist by calling 1-800-336-4797.

Directory of Health Organizations

The Directory of Health Organizations, provided by the National Library of Medicine Specialized Information Services, is a comprehensive source of information on associations. The Directory of Health Organizations database can be accessed via the Internet at **http://www.sis.nlm.nih.gov/Dir/DirMain.html**. It is composed of two parts: DIRLINE and Health Hotlines.

The DIRLINE database comprises some 10,000 records of organizations, research centers, and government institutes and associations that primarily focus on health and biomedicine. To access DIRLINE directly, go to the following Web site: **http://dirline.nlm.nih.gov/**. Simply type in "coma" (or a synonym), and you will receive information on all relevant organizations listed in the database.

Health Hotlines directs you to toll-free numbers to over 300 organizations. You can access this database directly at **http://www.sis.nlm.nih.gov/hotlines/**. On this page, you are given the option to search by keyword or by browsing the subject list. When you have received your search results, click on the name of the organization for its description and contact information.

The Combined Health Information Database

Another comprehensive source of information on healthcare associations is the Combined Health Information Database. Using the "Detailed Search" option, you will need to limit your search to "Organizations" and "coma". Type the following hyperlink into your Web browser: **http://chid.nih.gov/detail/detail.html**. To find associations, use the drop boxes at the bottom of the search page where "You may refine your search by." For publication date, select "All Years." Then, select your preferred language and the format option "Organization Resource Sheet." Type "coma" (or synonyms) into the "For these words:" box. You should check back periodically with this database since it is updated every three months.

The National Organization for Rare Disorders, Inc.

The National Organization for Rare Disorders, Inc. has prepared a Web site that provides, at no charge, lists of associations organized by health topic. You can access this database at the following Web site: **http://www.rarediseases.org/search/orgsearch.html**. Type "coma" (or a synonym) into the search box, and click "Submit Query."

APPENDIX C. FINDING MEDICAL LIBRARIES

Overview

In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Your local public library and medical libraries have interlibrary loan programs with the National Library of Medicine (NLM), one of the largest medical collections in the world. According to the NLM, most of the literature in the general and historical collections of the National Library of Medicine is available on interlibrary loan to any library. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.[21]

Finding a Local Medical Library

The quickest method to locate medical libraries is to use the Internet-based directory published by the National Network of Libraries of Medicine (NN/LM). This network includes 4626 members and affiliates that provide many services to librarians, health professionals, and the public. To find a library in your area, simply visit **http://nnlm.gov/members/adv.html** or call 1-800-338-7657.

Medical Libraries in the U.S. and Canada

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries with reference facilities that are open to the public. The following is the NLM's list and includes hyperlinks to each library's Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of

[21] Adapted from the NLM: **http://www.nlm.nih.gov/psd/cas/interlibrary.html**.

libraries recommended by the National Library of Medicine (sorted alphabetically by name of the U.S. state or Canadian province where the library is located)[22]:

- **Alabama:** Health InfoNet of Jefferson County (Jefferson County Library Cooperative, Lister Hill Library of the Health Sciences), **http://www.uab.edu/infonet/**
- **Alabama:** Richard M. Scrushy Library (American Sports Medicine Institute)
- **Arizona:** Samaritan Regional Medical Center: The Learning Center (Samaritan Health System, Phoenix, Arizona), **http://www.samaritan.edu/library/bannerlibs.htm**
- **California:** Kris Kelly Health Information Center (St. Joseph Health System, Humboldt), **http://www.humboldt1.com/~kkhic/index.html**
- **California:** Community Health Library of Los Gatos, **http://www.healthlib.org/orgresources.html**
- **California:** Consumer Health Program and Services (CHIPS) (County of Los Angeles Public Library, Los Angeles County Harbor-UCLA Medical Center Library) - Carson, CA, **http://www.colapublib.org/services/chips.html**
- **California:** Gateway Health Library (Sutter Gould Medical Foundation)
- **California:** Health Library (Stanford University Medical Center), **http://www-med.stanford.edu/healthlibrary/**
- **California:** Patient Education Resource Center - Health Information and Resources (University of California, San Francisco), **http://sfghdean.ucsf.edu/barnett/PERC/default.asp**
- **California:** Redwood Health Library (Petaluma Health Care District), **http://www.phcd.org/rdwdlib.html**
- **California:** Los Gatos PlaneTree Health Library, **http://planetreesanjose.org/**
- **California:** Sutter Resource Library (Sutter Hospitals Foundation, Sacramento), **http://suttermedicalcenter.org/library/**
- **California:** Health Sciences Libraries (University of California, Davis), **http://www.lib.ucdavis.edu/healthsci/**
- **California:** ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System, Pleasanton), **http://gaelnet.stmarys-ca.edu/other.libs/gbal/east/vchl.html**
- **California:** Washington Community Health Resource Library (Fremont), **http://www.healthlibrary.org/**
- **Colorado:** William V. Gervasini Memorial Library (Exempla Healthcare), **http://www.saintjosephdenver.org/yourhealth/libraries/**
- **Connecticut:** Hartford Hospital Health Science Libraries (Hartford Hospital), **http://www.harthosp.org/library/**
- **Connecticut:** Healthnet: Connecticut Consumer Health Information Center (University of Connecticut Health Center, Lyman Maynard Stowe Library), **http://library.uchc.edu/departm/hnet/**

[22] Abstracted from **http://www.nlm.nih.gov/medlineplus/libraries.html**.

- **Connecticut:** Waterbury Hospital Health Center Library (Waterbury Hospital, Waterbury), **http://www.waterburyhospital.com/library/consumer.shtml**
- **Delaware:** Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute, Wilmington), **http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm**
- **Delaware:** Lewis B. Flinn Library (Delaware Academy of Medicine, Wilmington), **http://www.delamed.org/chls.html**
- **Georgia:** Family Resource Library (Medical College of Georgia, Augusta), **http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/frl.htm**
- **Georgia:** Health Resource Center (Medical Center of Central Georgia, Macon), **http://www.mccg.org/hrc/hrchome.asp**
- **Hawaii:** Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library, Honolulu), **http://hml.org/CHIS/**
- **Idaho:** DeArmond Consumer Health Library (Kootenai Medical Center, Coeur d'Alene), **http://www.nicon.org/DeArmond/index.htm**
- **Illinois:** Health Learning Center of Northwestern Memorial Hospital (Chicago), **http://www.nmh.org/health_info/hlc.html**
- **Illinois:** Medical Library (OSF Saint Francis Medical Center, Peoria), **http://www.osfsaintfrancis.org/general/library/**
- **Kentucky:** Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital, Lexington), **http://www.centralbap.com/education/community/library.cfm**
- **Kentucky:** University of Kentucky - Health Information Library (Chandler Medical Center, Lexington), **http://www.mc.uky.edu/PatientEd/**
- **Louisiana:** Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation, New Orleans), **http://www.ochsner.org/library/**
- **Louisiana:** Louisiana State University Health Sciences Center Medical Library-Shreveport, **http://lib-sh.lsuhsc.edu/**
- **Maine:** Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital, Farmington), **http://www.fchn.org/fmh/lib.htm**
- **Maine:** Gerrish-True Health Sciences Library (Central Maine Medical Center, Lewiston), **http://www.cmmc.org/library/library.html**
- **Maine:** Hadley Parrot Health Science Library (Eastern Maine Healthcare, Bangor), **http://www.emh.org/hll/hpl/guide.htm**
- **Maine:** Maine Medical Center Library (Maine Medical Center, Portland), **http://www.mmc.org/library/**
- **Maine:** Parkview Hospital (Brunswick), **http://www.parkviewhospital.org/**
- **Maine:** Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center, Biddeford), **http://www.smmc.org/services/service.php3?choice=10**
- **Maine:** Stephens Memorial Hospital's Health Information Library (Western Maine Health, Norway), **http://www.wmhcc.org/Library/**

- **Manitoba, Canada:** Consumer & Patient Health Information Service (University of Manitoba Libraries), **http://www.umanitoba.ca/libraries/units/health/reference/chis.html**
- **Manitoba, Canada:** J.W. Crane Memorial Library (Deer Lodge Centre, Winnipeg), **http://www.deerlodge.mb.ca/crane_library/about.asp**
- **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Dept. of Public Libraries, Wheaton Regional Library), **http://www.mont.lib.md.us/healthinfo/hic.asp**
- **Massachusetts:** Baystate Medical Center Library (Baystate Health System), **http://www.baystatehealth.com/1024/**
- **Massachusetts:** Boston University Medical Center Alumni Medical Library (Boston University Medical Center), **http://med-libwww.bu.edu/library/lib.html**
- **Massachusetts:** Lowell General Hospital Health Sciences Library (Lowell General Hospital, Lowell), **http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm**
- **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital, Boston), **http://www.nebh.org/health_lib.asp**
- **Massachusetts:** St. Luke's Hospital Health Sciences Library (St. Luke's Hospital, Southcoast Health System, New Bedford), **http://www.southcoast.org/library/**
- **Massachusetts:** Treadwell Library Consumer Health Reference Center (Massachusetts General Hospital), **http://www.mgh.harvard.edu/library/chrcindex.html**
- **Massachusetts:** UMass HealthNet (University of Massachusetts Medical School, Worchester), **http://healthnet.umassmed.edu/**
- **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services), **http://www.botsfordlibrary.org/consumer.htm**
- **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers), **http://www.providence-hospital.org/library/**
- **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center), **http://www.mgh.org/center.html**
- **Michigan:** Patient Education Resouce Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center, Ann Arbor), **http://www.cancer.med.umich.edu/learn/leares.htm**
- **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information (Detroit), **http://www.henryford.com/body.cfm?id=39330**
- **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center, Missoula)
- **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section), **http://caphis.mlanet.org/directory/index.html**
- **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, **http://nnlm.gov/**
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), **http://nnlm.gov/members/**

- **Nevada:** Health Science Library, West Charleston Library (Las Vegas-Clark County Library District, Las Vegas), **http://www.lvccld.org/special_collections/medical/index.htm**
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library, Hanover), **http://www.dartmouth.edu/~biomed/resources.htmld/conshealth.htmld/**
- **New Jersey:** Consumer Health Library (Rahway Hospital, Rahway), **http://www.rahwayhospital.com/library.htm**
- **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center, Englewood), **http://www.englewoodhospital.com/links/index.htm**
- **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center, Englewood), **http://www.geocities.com/ResearchTriangle/9360/**
- **New York:** Choices in Health Information (New York Public Library) - NLM Consumer Pilot Project participant, **http://www.nypl.org/branch/health/links.html**
- **New York:** Health Information Center (Upstate Medical University, State University of New York, Syracuse), **http://www.upstate.edu/library/hic/**
- **New York:** Health Sciences Library (Long Island Jewish Medical Center, New Hyde Park), **http://www.lij.edu/library/library.html**
- **New York:** ViaHealth Medical Library (Rochester General Hospital), **http://www.nyam.org/library/**
- **Ohio:** Consumer Health Library (Akron General Medical Center, Medical & Consumer Health Library), **http://www.akrongeneral.org/hwlibrary.htm**
- **Oklahoma:** The Health Information Center at Saint Francis Hospital (Saint Francis Health System, Tulsa), **http://www.sfh-tulsa.com/services/healthinfo.asp**
- **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center, The Dalles), **http://www.mcmc.net/phrc/**
- **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center, Hershey), **http://www.hmc.psu.edu/commhealth/**
- **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center, Danville), **http://www.geisinger.edu/education/commlib.shtml**
- **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital, Scranton), **http://www.mth.org/healthwellness.html**
- **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System, Pittsburgh), **http://www.hsls.pitt.edu/guides/chi/hopwood/index_html**
- **Pennsylvania:** Koop Community Health Information Center (College of Physicians of Philadelphia), **http://www.collphyphil.org/kooppg1.shtml**
- **Pennsylvania:** Learning Resources Center - Medical Library (Susquehanna Health System, Williamsport), **http://www.shscares.org/services/lrc/index.asp**
- **Pennsylvania:** Medical Library (UPMC Health System, Pittsburgh), **http://www.upmc.edu/passavant/library.htm**
- **Quebec, Canada:** Medical Library (Montreal General Hospital), **http://www.mghlib.mcgill.ca/**

- **South Dakota:** Rapid City Regional Hospital Medical Library (Rapid City Regional Hospital), **http://www.rcrh.org/Services/Library/Default.asp**
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), **http://hhw.library.tmc.edu/**
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), **http://www.kvch.com/**
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center, Vancouver), **http://www.swmedicalcenter.com/body.cfm?id=72**

ONLINE GLOSSARIES

The Internet provides access to a number of free-to-use medical dictionaries. The National Library of Medicine has compiled the following list of online dictionaries:

- ADAM Medical Encyclopedia (A.D.A.M., Inc.), comprehensive medical reference: **http://www.nlm.nih.gov/medlineplus/encyclopedia.html**
- MedicineNet.com Medical Dictionary (MedicineNet, Inc.): **http://www.medterms.com/Script/Main/hp.asp**
- Merriam-Webster Medical Dictionary (Inteli-Health, Inc.): **http://www.intelihealth.com/IH/**
- Multilingual Glossary of Technical and Popular Medical Terms in Eight European Languages (European Commission) - Danish, Dutch, English, French, German, Italian, Portuguese, and Spanish: **http://allserv.rug.ac.be/~rvdstich/eugloss/welcome.html**
- On-line Medical Dictionary (CancerWEB): **http://cancerweb.ncl.ac.uk/omd/**
- Rare Diseases Terms (Office of Rare Diseases): **http://ord.aspensys.com/asp/diseases/diseases.asp**
- Technology Glossary (National Library of Medicine) - Health Care Technology: **http://www.nlm.nih.gov/nichsr/ta101/ta10108.htm**

Beyond these, MEDLINEplus contains a very patient-friendly encyclopedia covering every aspect of medicine (licensed from A.D.A.M., Inc.). The ADAM Medical Encyclopedia can be accessed at **http://www.nlm.nih.gov/medlineplus/encyclopedia.html**. ADAM is also available on commercial Web sites such as drkoop.com (**http://www.drkoop.com/**) and Web MD (**http://my.webmd.com/adam/asset/adam_disease_articles/a_to_z/a**).

Online Dictionary Directories

The following are additional online directories compiled by the National Library of Medicine, including a number of specialized medical dictionaries:

- Medical Dictionaries: Medical & Biological (World Health Organization): **http://www.who.int/hlt/virtuallibrary/English/diction.htm#Medical**
- MEL-Michigan Electronic Library List of Online Health and Medical Dictionaries (Michigan Electronic Library): **http://mel.lib.mi.us/health/health-dictionaries.html**
- Patient Education: Glossaries (DMOZ Open Directory Project): **http://dmoz.org/Health/Education/Patient_Education/Glossaries/**
- Web of Online Dictionaries (Bucknell University): **http://www.yourdictionary.com/diction5.html#medicine**

COMA DICTIONARY

The definitions below are derived from official public sources, including the National Institutes of Health [NIH] and the European Union [EU].

Abdomen: That portion of the body that lies between the thorax and the pelvis. [NIH]

Abdominal: Having to do with the abdomen, which is the part of the body between the chest and the hips that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs. [NIH]

Abdominal Pain: Sensation of discomfort, distress, or agony in the abdominal region. [NIH]

Abscess: A localized, circumscribed collection of pus. [NIH]

Acceptor: A substance which, while normally not oxidized by oxygen or reduced by hydrogen, can be oxidized or reduced in presence of a substance which is itself undergoing oxidation or reduction. [NIH]

Accommodation: Adjustment, especially that of the eye for various distances. [EU]

Acetaminophen: Analgesic antipyretic derivative of acetanilide. It has weak anti-inflammatory properties and is used as a common analgesic, but may cause liver, blood cell, and kidney damage. [NIH]

Acetylcholine: A neurotransmitter. Acetylcholine in vertebrates is the major transmitter at neuromuscular junctions, autonomic ganglia, parasympathetic effector junctions, a subset of sympathetic effector junctions, and at many sites in the central nervous system. It is generally not used as an administered drug because it is broken down very rapidly by cholinesterases, but it is useful in some ophthalmological applications. [NIH]

Acidosis: A pathologic condition resulting from accumulation of acid or depletion of the alkaline reserve (bicarbonate content) in the blood and body tissues, and characterized by an increase in hydrogen ion concentration. [EU]

Activities of Daily Living: The performance of the basic activities of self care, such as dressing, ambulation, eating, etc., in rehabilitation. [NIH]

Acute renal: A condition in which the kidneys suddenly stop working. In most cases, kidneys can recover from almost complete loss of function. [NIH]

Adaptability: Ability to develop some form of tolerance to conditions extremely different from those under which a living organism evolved. [NIH]

Adaptation: 1. The adjustment of an organism to its environment, or the process by which it enhances such fitness. 2. The normal ability of the eye to adjust itself to variations in the intensity of light; the adjustment to such variations. 3. The decline in the frequency of firing of a neuron, particularly of a receptor, under conditions of constant stimulation. 4. In dentistry, (a) the proper fitting of a denture, (b) the degree of proximity and interlocking of restorative material to a tooth preparation, (c) the exact adjustment of bands to teeth. 5. In microbiology, the adjustment of bacterial physiology to a new environment. [EU]

Adenocarcinoma: A malignant epithelial tumor with a glandular organization. [NIH]

Adenosine: A nucleoside that is composed of adenine and d-ribose. Adenosine or adenosine derivatives play many important biological roles in addition to being components of DNA and RNA. Adenosine itself is a neurotransmitter. [NIH]

Adenylate Cyclase: An enzyme of the lyase class that catalyzes the formation of cyclic AMP and pyrophosphate from ATP. EC 4.6.1.1. [NIH]

Adipose Tissue: Connective tissue composed of fat cells lodged in the meshes of areolar tissue. [NIH]

Adjunctive Therapy: Another treatment used together with the primary treatment. Its purpose is to assist the primary treatment. [NIH]

Adjustment: The dynamic process wherein the thoughts, feelings, behavior, and biophysiological mechanisms of the individual continually change to adjust to the environment. [NIH]

Adolescence: The period of life beginning with the appearance of secondary sex characteristics and terminating with the cessation of somatic growth. The years usually referred to as adolescence lie between 13 and 18 years of age. [NIH]

Adrenal Cortex: The outer layer of the adrenal gland. It secretes mineralocorticoids, androgens, and glucocorticoids. [NIH]

Adrenal Glands: Paired glands situated in the retroperitoneal tissues at the superior pole of each kidney. [NIH]

Adrenal insufficiency: The reduced secretion of adrenal glands. [NIH]

Adrenergic: Activated by, characteristic of, or secreting epinephrine or substances with similar activity; the term is applied to those nerve fibres that liberate norepinephrine at a synapse when a nerve impulse passes, i.e., the sympathetic fibres. [EU]

Adverse Effect: An unwanted side effect of treatment. [NIH]

Aerobic: In biochemistry, reactions that need oxygen to happen or happen when oxygen is present. [NIH]

Aetiology: Study of the causes of disease. [EU]

Afferent: Concerned with the transmission of neural impulse toward the central part of the nervous system. [NIH]

Affinity: 1. Inherent likeness or relationship. 2. A special attraction for a specific element, organ, or structure. 3. Chemical affinity; the force that binds atoms in molecules; the tendency of substances to combine by chemical reaction. 4. The strength of noncovalent chemical binding between two substances as measured by the dissociation constant of the complex. 5. In immunology, a thermodynamic expression of the strength of interaction between a single antigen-binding site and a single antigenic determinant (and thus of the stereochemical compatibility between them), most accurately applied to interactions among simple, uniform antigenic determinants such as haptens. Expressed as the association constant (K litres mole -1), which, owing to the heterogeneity of affinities in a population of antibody molecules of a given specificity, actually represents an average value (mean intrinsic association constant). 6. The reciprocal of the dissociation constant. [EU]

Agar: A complex sulfated polymer of galactose units, extracted from Gelidium cartilagineum, Gracilaria confervoides, and related red algae. It is used as a gel in the preparation of solid culture media for microorganisms, as a bulk laxative, in making emulsions, and as a supporting medium for immunodiffusion and immunoelectrophoresis. [NIH]

Age Factors: Age as a constituent element or influence contributing to the production of a result. It may be applicable to the cause or the effect of a circumstance. It is used with human or animal concepts but should be differentiated from aging, a physiological process, and time factors which refers only to the passage of time. [NIH]

Age Groups: Persons classified by age from birth (infant, newborn) to octogenarians and older (aged, 80 and over). [NIH]

Age of Onset: The age or period of life at which a disease or the initial symptoms or

manifestations of a disease appear in an individual. [NIH]

Age-Adjusted: Summary measures of rates of morbidity or mortality in a population using statistical procedures to remove the effect of age differences in populations that are being compared. Age is probably the most important and the most common variable in determining the risk of morbidity and mortality. [NIH]

Aged, 80 and Over: A person 80 years of age and older. [NIH]

Agonist: In anatomy, a prime mover. In pharmacology, a drug that has affinity for and stimulates physiologic activity at cell receptors normally stimulated by naturally occurring substances. [EU]

Air Embolism: Occurs when the lungs over expand to the point that air bubbles are forced through the air sacs of the lungs into the circulatory system. [NIH]

Air Sacs: Thin-walled sacs or spaces which function as a part of the respiratory system in birds, fishes, insects, and mammals. [NIH]

Albumin: 1. Any protein that is soluble in water and moderately concentrated salt solutions and is coagulable by heat. 2. Serum albumin; the major plasma protein (approximately 60 per cent of the total), which is responsible for much of the plasma colloidal osmotic pressure and serves as a transport protein carrying large organic anions, such as fatty acids, bilirubin, and many drugs, and also carrying certain hormones, such as cortisol and thyroxine, when their specific binding globulins are saturated. Albumin is synthesized in the liver. Low serum levels occur in protein malnutrition, active inflammation and serious hepatic and renal disease. [EU]

Alertness: A state of readiness to detect and respond to certain specified small changes occurring at random intervals in the environment. [NIH]

Algorithms: A procedure consisting of a sequence of algebraic formulas and/or logical steps to calculate or determine a given task. [NIH]

Alimentary: Pertaining to food or nutritive material, or to the organs of digestion. [EU]

Alkaline: Having the reactions of an alkali. [EU]

Alkaloid: A member of a large group of chemicals that are made by plants and have nitrogen in them. Some alkaloids have been shown to work against cancer. [NIH]

Allo: A female hormone. [NIH]

Alpha Particles: Positively charged particles composed of two protons and two neutrons, i.e., helium nuclei, emitted during disintegration of very heavy isotopes; a beam of alpha particles or an alpha ray has very strong ionizing power, but weak penetrability. [NIH]

Alpha-1: A protein with the property of inactivating proteolytic enzymes such as leucocyte collagenase and elastase. [NIH]

Alternative medicine: Practices not generally recognized by the medical community as standard or conventional medical approaches and used instead of standard treatments. Alternative medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Aluminum: A metallic element that has the atomic number 13, atomic symbol Al, and atomic weight 26.98. [NIH]

Alveoli: Tiny air sacs at the end of the bronchioles in the lungs. [NIH]

Amantadine: An antiviral that is used in the prophylactic or symptomatic treatment of Influenza A. It is also used as an antiparkinsonian agent, to treat extrapyramidal reactions, and for postherpetic neuralgia. The mechanisms of its effects in movement disorders are not

well understood but probably reflect an increase in synthesis and release of dopamine, with perhaps some inhibition of dopamine uptake. [NIH]

Ambulatory Care: Health care services provided to patients on an ambulatory basis, rather than by admission to a hospital or other health care facility. The services may be a part of a hospital, augmenting its inpatient services, or may be provided at a free-standing facility. [NIH]

Ameliorated: A changeable condition which prevents the consequence of a failure or accident from becoming as bad as it otherwise would. [NIH]

Amenorrhea: Absence of menstruation. [NIH]

Amino Acid Sequence: The order of amino acids as they occur in a polypeptide chain. This is referred to as the primary structure of proteins. It is of fundamental importance in determining protein conformation. [NIH]

Amino Acids: Organic compounds that generally contain an amino (-NH2) and a carboxyl (-COOH) group. Twenty alpha-amino acids are the subunits which are polymerized to form proteins. [NIH]

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Amiodarone: An antianginal and antiarrhythmic drug. It increases the duration of ventricular and atrial muscle action by inhibiting Na,K-activated myocardial adenosine triphosphatase. There is a resulting decrease in heart rate and in vascular resistance. [NIH]

Ammonia: A colorless alkaline gas. It is formed in the body during decomposition of organic materials during a large number of metabolically important reactions. [NIH]

Amnesia: Lack or loss of memory; inability to remember past experiences. [EU]

Amphetamine: A powerful central nervous system stimulant and sympathomimetic. Amphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulation of release of monamines, and inhibiting monoamine oxidase. Amphetamine is also a drug of abuse and a psychotomimetic. The l- and the d,l-forms are included here. The l-form has less central nervous system activity but stronger cardiovascular effects. The d-form is dextroamphetamine. [NIH]

Amputation: Surgery to remove part or all of a limb or appendage. [NIH]

Amygdala: Almond-shaped group of basal nuclei anterior to the inferior horn of the lateral ventricle of the brain, within the temporal lobe. The amygdala is part of the limbic system. [NIH]

Amyloid: A general term for a variety of different proteins that accumulate as extracellular fibrils of 7-10 nm and have common structural features, including a beta-pleated sheet conformation and the ability to bind such dyes as Congo red and thioflavine (Kandel, Schwartz, and Jessel, Principles of Neural Science, 3rd ed). [NIH]

Amyloidosis: A group of diseases in which protein is deposited in specific organs (localized amyloidosis) or throughout the body (systemic amyloidosis). Amyloidosis may be either primary (with no known cause) or secondary (caused by another disease, including some types of cancer). Generally, primary amyloidosis affects the nerves, skin, tongue, joints, heart, and liver; secondary amyloidosis often affects the spleen, kidneys, liver, and adrenal glands. [NIH]

Anaemia: A reduction below normal in the number of erythrocytes per cu. mm., in the quantity of haemoglobin, or in the volume of packed red cells per 100 ml. of blood which occurs when the equilibrium between blood loss (through bleeding or destruction) and

blood production is disturbed. [EU]

Anaesthesia: Loss of feeling or sensation. Although the term is used for loss of tactile sensibility, or of any of the other senses, it is applied especially to loss of the sensation of pain, as it is induced to permit performance of surgery or other painful procedures. [EU]

Anal: Having to do with the anus, which is the posterior opening of the large bowel. [NIH]

Analeptic: A drug which acts as a restorative, such as caffeine, amphetamine, pentylenetetrazol, etc. [EU]

Analgesic: An agent that alleviates pain without causing loss of consciousness. [EU]

Analog: In chemistry, a substance that is similar, but not identical, to another. [NIH]

Analytes: A component of a test sample the presence of which has to be demonstrated. The term "analyte" includes where appropriate formed from the analyte during the analyses. [NIH]

Anaphylatoxins: The family of peptides C3a, C4a, C5a, and C5a des-arginine produced in the serum during complement activation. They produce smooth muscle contraction, mast cell histamine release, affect platelet aggregation, and act as mediators of the local inflammatory process. The order of anaphylatoxin activity from strongest to weakest is C5a, C3a, C4a, and C5a des-arginine. The latter is the so-called "classical" anaphylatoxin but shows no spasmogenic activity though it contains some chemotactic ability. [NIH]

Anatomical: Pertaining to anatomy, or to the structure of the organism. [EU]

Anemia: A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin. [NIH]

Anergy: Absence of immune response to particular substances. [NIH]

Anesthesia: A state characterized by loss of feeling or sensation. This depression of nerve function is usually the result of pharmacologic action and is induced to allow performance of surgery or other painful procedures. [NIH]

Anesthetics: Agents that are capable of inducing a total or partial loss of sensation, especially tactile sensation and pain. They may act to induce general anesthesia, in which an unconscious state is achieved, or may act locally to induce numbness or lack of sensation at a targeted site. [NIH]

Aneurysm: A sac formed by the dilatation of the wall of an artery, a vein, or the heart. [NIH]

Angina: Chest pain that originates in the heart. [NIH]

Angina Pectoris: The symptom of paroxysmal pain consequent to myocardial ischemia usually of distinctive character, location and radiation, and provoked by a transient stressful situation during which the oxygen requirements of the myocardium exceed the capacity of the coronary circulation to supply it. [NIH]

Angiopathy: Disease of the blood vessels (arteries, veins, and capillaries) that occurs when someone has diabetes for a long time. There are two types of angiopathy: macroangiopathy and microangiopathy. In macroangiopathy, fat and blood clots build up in the large blood vessels, stick to the vessel walls, and block the flow of blood. In microangiopathy, the walls of the smaller blood vessels become so thick and weak that they bleed, leak protein, and slow the flow of blood through the body. Then the cells, for example, the ones in the center of the eye, do not get enough blood and may be damaged. [NIH]

Animal model: An animal with a disease either the same as or like a disease in humans. Animal models are used to study the development and progression of diseases and to test new treatments before they are given to humans. Animals with transplanted human cancers or other tissues are called xenograft models. [NIH]

Anions: Negatively charged atoms, radicals or groups of atoms which travel to the anode or positive pole during electrolysis. [NIH]

Anomalies: Birth defects; abnormalities. [NIH]

Anorexia: Lack or loss of appetite for food. Appetite is psychologic, dependent on memory and associations. Anorexia can be brought about by unattractive food, surroundings, or company. [NIH]

Anorexia Nervosa: The chief symptoms are inability to eat, weight loss, and amenorrhea. [NIH]

Antagonism: Interference with, or inhibition of, the growth of a living organism by another living organism, due either to creation of unfavorable conditions (e. g. exhaustion of food supplies) or to production of a specific antibiotic substance (e. g. penicillin). [NIH]

Antianginal: Counteracting angina or anginal conditions. [EU]

Antiarrhythmic: An agent that prevents or alleviates cardiac arrhythmia. [EU]

Antibacterial: A substance that destroys bacteria or suppresses their growth or reproduction. [EU]

Antibiotic: A drug used to treat infections caused by bacteria and other microorganisms. [NIH]

Antibodies: Immunoglobulin molecules having a specific amino acid sequence by virtue of which they interact only with the antigen that induced their synthesis in cells of the lymphoid series (especially plasma cells), or with an antigen closely related to it. [NIH]

Antibody: A type of protein made by certain white blood cells in response to a foreign substance (antigen). Each antibody can bind to only a specific antigen. The purpose of this binding is to help destroy the antigen. Antibodies can work in several ways, depending on the nature of the antigen. Some antibodies destroy antigens directly. Others make it easier for white blood cells to destroy the antigen. [NIH]

Anticholinergic: An agent that blocks the parasympathetic nerves. Called also parasympatholytic. [EU]

Anticonvulsant: An agent that prevents or relieves convulsions. [EU]

Antidiuretic: Suppressing the rate of urine formation. [EU]

Antidote: A remedy for counteracting a poison. [EU]

Antiemetic: An agent that prevents or alleviates nausea and vomiting. Also antinauseant. [EU]

Antigen: Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of that response, that is, with specific antibody or specifically sensitized T-lymphocytes, or both. Antigens may be soluble substances, such as toxins and foreign proteins, or particulate, such as bacteria and tissue cells; however, only the portion of the protein or polysaccharide molecule known as the antigenic determinant (q.v.) combines with antibody or a specific receptor on a lymphocyte. Abbreviated Ag. [EU]

Antigen-Antibody Complex: The complex formed by the binding of antigen and antibody molecules. The deposition of large antigen-antibody complexes leading to tissue damage causes immune complex diseases. [NIH]

Antihypertensive: An agent that reduces high blood pressure. [EU]

Anti-inflammatory: Having to do with reducing inflammation. [NIH]

Anti-Inflammatory Agents: Substances that reduce or suppress inflammation. [NIH]

Antimetabolite: A chemical that is very similar to one required in a normal biochemical reaction in cells. Antimetabolites can stop or slow down the reaction. [NIH]

Antimicrobial: Killing microorganisms, or suppressing their multiplication or growth. [EU]

Antineoplastic: Inhibiting or preventing the development of neoplasms, checking the maturation and proliferation of malignant cells. [EU]

Antioxidant: A substance that prevents damage caused by free radicals. Free radicals are highly reactive chemicals that often contain oxygen. They are produced when molecules are split to give products that have unpaired electrons. This process is called oxidation. [NIH]

Antipsychotic: Effective in the treatment of psychosis. Antipsychotic drugs (called also neuroleptic drugs and major tranquilizers) are a chemically diverse (including phenothiazines, thioxanthenes, butyrophenones, dibenzoxazepines, dibenzodiazepines, and diphenylbutylpiperidines) but pharmacologically similar class of drugs used to treat schizophrenic, paranoid, schizoaffective, and other psychotic disorders; acute delirium and dementia, and manic episodes (during induction of lithium therapy); to control the movement disorders associated with Huntington's chorea, Gilles de la Tourette's syndrome, and ballismus; and to treat intractable hiccups and severe nausea and vomiting. Antipsychotic agents bind to dopamine, histamine, muscarinic cholinergic, a-adrenergic, and serotonin receptors. Blockade of dopaminergic transmission in various areas is thought to be responsible for their major effects : antipsychotic action by blockade in the mesolimbic and mesocortical areas; extrapyramidal side effects (dystonia, akathisia, parkinsonism, and tardive dyskinesia) by blockade in the basal ganglia; and antiemetic effects by blockade in the chemoreceptor trigger zone of the medulla. Sedation and autonomic side effects (orthostatic hypotension, blurred vision, dry mouth, nasal congestion and constipation) are caused by blockade of histamine, cholinergic, and adrenergic receptors. [EU]

Antipyretic: An agent that relieves or reduces fever. Called also antifebrile, antithermic and febrifuge. [EU]

Antiviral: Destroying viruses or suppressing their replication. [EU]

Anus: The opening of the rectum to the outside of the body. [NIH]

Anxiety: Persistent feeling of dread, apprehension, and impending disaster. [NIH]

Anxiety Disorders: Disorders in which anxiety (persistent feelings of apprehension, tension, or uneasiness) is the predominant disturbance. [NIH]

Aorta: The main trunk of the systemic arteries. [NIH]

Aphasia: A cognitive disorder marked by an impaired ability to comprehend or express language in its written or spoken form. This condition is caused by diseases which affect the language areas of the dominant hemisphere. Clinical features are used to classify the various subtypes of this condition. General categories include receptive, expressive, and mixed forms of aphasia. [NIH]

Apolipoproteins: The protein components of lipoproteins which remain after the lipids to which the proteins are bound have been removed. They play an important role in lipid transport and metabolism. [NIH]

Aponeurosis: Tendinous expansion consisting of a fibrous or membranous sheath which serves as a fascia to enclose or bind a group of muscles. [NIH]

Approximate: Approximal [EU]

Apraxia: Loss of ability to perform purposeful movements, in the absence of paralysis or sensory disturbance, caused by lesions in the cortex. [NIH]

Aqueous: Having to do with water. [NIH]

Arachidonic Acid: An unsaturated, essential fatty acid. It is found in animal and human fat as well as in the liver, brain, and glandular organs, and is a constituent of animal phosphatides. It is formed by the synthesis from dietary linoleic acid and is a precursor in the biosynthesis of prostaglandins, thromboxanes, and leukotrienes. [NIH]

Arginine: An essential amino acid that is physiologically active in the L-form. [NIH]

Argipressin: Cys-Tyr-Phe-Gln-Asn-Cys-Pro-Arg-Gly-NH2, cyclic 1-6 disulfide. The usual mammalian antidiuretic hormone, it is a cyclic nonapeptide with arginine in position 8 of the chain. Argipressin is used to treat diabetes insipidus and as hemostatic because of its vasoconstrictor action. [NIH]

Arterial: Pertaining to an artery or to the arteries. [EU]

Arteries: The vessels carrying blood away from the heart. [NIH]

Arterioles: The smallest divisions of the arteries located between the muscular arteries and the capillaries. [NIH]

Arteriolosclerosis: Sclerosis and thickening of the walls of the smaller arteries (arterioles). Hyaline arteriolosclerosis, in which there is homogeneous pink hyaline thickening of the arteriolar walls, is associated with benign nephrosclerosis. Hyperplastic arteriolosclerosis, in which there is a concentric thickening with progressive narrowing of the lumina may be associated with malignant hypertension, nephrosclerosis, and scleroderma. [EU]

Arteriosclerosis: Thickening and loss of elasticity of arterial walls. Atherosclerosis is the most common form of arteriosclerosis and involves lipid deposition and thickening of the intimal cell layers within arteries. Additional forms of arteriosclerosis involve calcification of the media of muscular arteries (Monkeberg medial calcific sclerosis) and thickening of the walls of small arteries or arterioles due to cell proliferation or hyaline deposition (arteriolosclerosis). [NIH]

Arteriovenous: Both arterial and venous; pertaining to or affecting an artery and a vein. [EU]

Artery: Vessel-carrying blood from the heart to various parts of the body. [NIH]

Articulation: The relationship of two bodies by means of a moveable joint. [NIH]

Artificial life: New branch of computational science which focuses on the spontaneous computer generation of emergent behavior that mimics the dynamics of natural evolution. [NIH]

Ascites: Accumulation or retention of free fluid within the peritoneal cavity. [NIH]

Aspirin: A drug that reduces pain, fever, inflammation, and blood clotting. Aspirin belongs to the family of drugs called nonsteroidal anti-inflammatory agents. It is also being studied in cancer prevention. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Asterixis: A motor disturbance marked by intermittency of sustained contraction of groups of muscles. [NIH]

Astigmatism: A condition in which the surface of the cornea is not spherical; causes a blurred image to be received at the retina. [NIH]

Astrocytes: The largest and most numerous neuroglial cells in the brain and spinal cord. Astrocytes (from "star" cells) are irregularly shaped with many long processes, including those with "end feet" which form the glial (limiting) membrane and directly and indirectly contribute to the blood brain barrier. They regulate the extracellular ionic and chemical environment, and "reactive astrocytes" (along with microglia) respond to injury. Astrocytes have high- affinity transmitter uptake systems, voltage-dependent and transmitter-gated ion

channels, and can release transmitter, but their role in signaling (as in many other functions) is not well understood. [NIH]

Asymptomatic: Having no signs or symptoms of disease. [NIH]

Ataxia: Impairment of the ability to perform smoothly coordinated voluntary movements. This condition may affect the limbs, trunk, eyes, pharnyx, larnyx, and other structures. Ataxia may result from impaired sensory or motor function. Sensory ataxia may result from posterior column injury or peripheral nerve diseases. Motor ataxia may be associated with cerebellar diseases; cerebral cortex diseases; thalamic diseases; basal ganglia diseases; injury to the red nucleus; and other conditions. [NIH]

Atmospheric Pressure: The pressure at any point in an atmosphere due solely to the weight of the atmospheric gases above the point concerned. [NIH]

Atrial: Pertaining to an atrium. [EU]

Atrium: A chamber; used in anatomical nomenclature to designate a chamber affording entrance to another structure or organ. Usually used alone to designate an atrium of the heart. [EU]

Attenuated: Strain with weakened or reduced virulence. [NIH]

Attenuation: Reduction of transmitted sound energy or its electrical equivalent. [NIH]

Auditory: Pertaining to the sense of hearing. [EU]

Autodigestion: Autolysis; a condition found in disease of the stomach: the stomach wall is digested by the gastric juice. [NIH]

Autoimmune disease: A condition in which the body recognizes its own tissues as foreign and directs an immune response against them. [NIH]

Avian: A plasmodial infection in birds. [NIH]

Avian Leukosis: A group of transmissible viral diseases of chickens and turkeys. Liver tumors are found in most forms, but tumors can be found elsewhere. [NIH]

Axons: Nerve fibers that are capable of rapidly conducting impulses away from the neuron cell body. [NIH]

Baclofen: A GABA derivative that is a specific agonist at GABA-B receptors. It is used in the treatment of spasticity, especially that due to spinal cord damage. Its therapeutic effects result from actions at spinal and supraspinal sites, generally the reduction of excitatory transmission. [NIH]

Bacteria: Unicellular prokaryotic microorganisms which generally possess rigid cell walls, multiply by cell division, and exhibit three principal forms: round or coccal, rodlike or bacillary, and spiral or spirochetal. [NIH]

Bacterial Infections: Infections by bacteria, general or unspecified. [NIH]

Bactericidal: Substance lethal to bacteria; substance capable of killing bacteria. [NIH]

Bacterium: Microscopic organism which may have a spherical, rod-like, or spiral unicellular or non-cellular body. Bacteria usually reproduce through asexual processes. [NIH]

Barbiturate: A drug with sedative and hypnotic effects. Barbiturates have been used as sedatives and anesthetics, and they have been used to treat the convulsions associated with epilepsy. [NIH]

Basal Ganglia: Large subcortical nuclear masses derived from the telencephalon and located in the basal regions of the cerebral hemispheres. [NIH]

Basal Ganglia Diseases: Diseases of the basal ganglia including the putamen; globus pallidus; claustrum; amygdala; and caudate nucleus. Dyskinesias (most notably involuntary

movements and alterations of the rate of movement) represent the primary clinical manifestations of these disorders. Common etiologies include cerebrovascular disease; neurodegenerative diseases; and craniocerebral trauma. [NIH]

Base: In chemistry, the nonacid part of a salt; a substance that combines with acids to form salts; a substance that dissociates to give hydroxide ions in aqueous solutions; a substance whose molecule or ion can combine with a proton (hydrogen ion); a substance capable of donating a pair of electrons (to an acid) for the formation of a coordinate covalent bond. [EU]

Basement Membrane: Ubiquitous supportive tissue adjacent to epithelium and around smooth and striated muscle cells. This tissue contains intrinsic macromolecular components such as collagen, laminin, and sulfated proteoglycans. As seen by light microscopy one of its subdivisions is the basal (basement) lamina. [NIH]

Benign: Not cancerous; does not invade nearby tissue or spread to other parts of the body. [NIH]

Benzodiazepines: A two-ring heterocyclic compound consisting of a benzene ring fused to a diazepine ring. Permitted is any degree of hydrogenation, any substituents and any H-isomer. [NIH]

Beta Rays: A stream of positive or negative electrons ejected with high energy from a disintegrating atomic nucleus; most biomedically used isotopes emit negative particles (electrons or negatrons, rather than positrons). Cathode rays are low-energy negative electrons produced in cathode ray tubes, also called television tubes or oscilloscopes. [NIH]

Bewilderment: Impairment or loss of will power. [NIH]

Biconvex: A double-convex lens has two convex surfaces. It is used in various magnifying glasses. [NIH]

Bilateral: Affecting both the right and left side of body. [NIH]

Bile: An emulsifying agent produced in the liver and secreted into the duodenum. Its composition includes bile acids and salts, cholesterol, and electrolytes. It aids digestion of fats in the duodenum. [NIH]

Bile Acids: Acids made by the liver that work with bile to break down fats. [NIH]

Bile Acids and Salts: Steroid acids and salts. The primary bile acids are derived from cholesterol in the liver and usually conjugated with glycine or taurine. The secondary bile acids are further modified by bacteria in the intestine. They play an important role in the digestion and absorption of fat. They have also been used pharmacologically, especially in the treatment of gallstones. [NIH]

Bile duct: A tube through which bile passes in and out of the liver. [NIH]

Bile Pigments: Pigments that give a characteristic color to bile including: bilirubin, biliverdine, and bilicyanin. [NIH]

Biliary: Having to do with the liver, bile ducts, and/or gallbladder. [NIH]

Biliary Tract: The gallbladder and its ducts. [NIH]

Bilirubin: A bile pigment that is a degradation product of heme. [NIH]

Binding agent: A substance that makes a loose mixture stick together. For example, binding agents can be used to make solid pills from loose powders. [NIH]

Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

Biological response modifier: BRM. A substance that stimulates the body's response to infection and disease. [NIH]

Biological Transport: The movement of materials (including biochemical substances and drugs) across cell membranes and epithelial layers, usually by passive diffusion. [NIH]

Biomarkers: Substances sometimes found in an increased amount in the blood, other body fluids, or tissues and that may suggest the presence of some types of cancer. Biomarkers include CA 125 (ovarian cancer), CA 15-3 (breast cancer), CEA (ovarian, lung, breast, pancreas, and GI tract cancers), and PSA (prostate cancer). Also called tumor markers. [NIH]

Biopsy: Removal and pathologic examination of specimens in the form of small pieces of tissue from the living body. [NIH]

Biosynthesis: The building up of a chemical compound in the physiologic processes of a living organism. [EU]

Biotechnology: Body of knowledge related to the use of organisms, cells or cell-derived constituents for the purpose of developing products which are technically, scientifically and clinically useful. Alteration of biologic function at the molecular level (i.e., genetic engineering) is a central focus; laboratory methods used include transfection and cloning technologies, sequence and structure analysis algorithms, computer databases, and gene and protein structure function analysis and prediction. [NIH]

Bioterrorism: The use of biological agents in terrorism. This includes the malevolent use of bacteria, viruses, or toxins against people, animals, or plants. [NIH]

Bladder: The organ that stores urine. [NIH]

Bloating: Fullness or swelling in the abdomen that often occurs after meals. [NIH]

Blood Coagulation: The process of the interaction of blood coagulation factors that results in an insoluble fibrin clot. [NIH]

Blood Glucose: Glucose in blood. [NIH]

Blood Platelets: Non-nucleated disk-shaped cells formed in the megakaryocyte and found in the blood of all mammals. They are mainly involved in blood coagulation. [NIH]

Blood pressure: The pressure of blood against the walls of a blood vessel or heart chamber. Unless there is reference to another location, such as the pulmonary artery or one of the heart chambers, it refers to the pressure in the systemic arteries, as measured, for example, in the forearm. [NIH]

Blood vessel: A tube in the body through which blood circulates. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins. [NIH]

Blood-Brain Barrier: Specialized non-fenestrated tightly-joined endothelial cells (tight junctions) that form a transport barrier for certain substances between the cerebral capillaries and the brain tissue. [NIH]

Body Fluids: Liquid components of living organisms. [NIH]

Bolus: A single dose of drug usually injected into a blood vessel over a short period of time. Also called bolus infusion. [NIH]

Bolus infusion: A single dose of drug usually injected into a blood vessel over a short period of time. Also called bolus. [NIH]

Bone Marrow: The soft tissue filling the cavities of bones. Bone marrow exists in two types, yellow and red. Yellow marrow is found in the large cavities of large bones and consists mostly of fat cells and a few primitive blood cells. Red marrow is a hematopoietic tissue and is the site of production of erythrocytes and granular leukocytes. Bone marrow is made up of a framework of connective tissue containing branching fibers with the frame being filled with marrow cells. [NIH]

Bone scan: A technique to create images of bones on a computer screen or on film. A small

amount of radioactive material is injected into a blood vessel and travels through the bloodstream; it collects in the bones and is detected by a scanner. [NIH]

Bowel: The long tube-shaped organ in the abdomen that completes the process of digestion. There is both a small and a large bowel. Also called the intestine. [NIH]

Brachial: All the nerves from the arm are ripped from the spinal cord. [NIH]

Brachial Plexus: The large network of nerve fibers which distributes the innervation of the upper extremity. The brachial plexus extends from the neck into the axilla. In humans, the nerves of the plexus usually originate from the lower cervical and the first thoracic spinal cord segments (C5-C8 and T1), but variations are not uncommon. [NIH]

Bradykinin: A nonapeptide messenger that is enzymatically produced from kallidin in the blood where it is a potent but short-lived agent of arteriolar dilation and increased capillary permeability. Bradykinin is also released from mast cells during asthma attacks, from gut walls as a gastrointestinal vasodilator, from damaged tissues as a pain signal, and may be a neurotransmitter. [NIH]

Brain Injuries: Acute and chronic injuries to the brain, including the cerebral hemispheres, cerebellum, and brain stem. Clinical manifestations depend on the nature of injury. Diffuse trauma to the brain is frequently associated with diffuse axonal injury or coma, post-traumatic. Localized injuries may be associated with neurobehavioral manifestations; hemiparesis, or other focal neurologic deficits. [NIH]

Brain Neoplasms: Neoplasms of the intracranial components of the central nervous system, including the cerebral hemispheres, basal ganglia, hypothalamus, thalamus, brain stem, and cerebellum. Brain neoplasms are subdivided into primary (originating from brain tissue) and secondary (i.e., metastatic) forms. Primary neoplasms are subdivided into benign and malignant forms. In general, brain tumors may also be classified by age of onset, histologic type, or presenting location in the brain. [NIH]

Brain Stem: The part of the brain that connects the cerebral hemispheres with the spinal cord. It consists of the mesencephalon, pons, and medulla oblongata. [NIH]

Bronchi: The larger air passages of the lungs arising from the terminal bifurcation of the trachea. [NIH]

Bronchial: Pertaining to one or more bronchi. [EU]

Bronchiseptica: A small, gram-negative, motile bacillus. A normal inhabitant of the respiratory tract in man, dogs, and pigs, but is also associated with canine infectious tracheobronchitis and atrophic rhinitis in pigs. [NIH]

Butyric Acid: A four carbon acid, CH3CH2CH2COOH, with an unpleasant odor that occurs in butter and animal fat as the glycerol ester. [NIH]

Caffeine: A methylxanthine naturally occurring in some beverages and also used as a pharmacological agent. Caffeine's most notable pharmacological effect is as a central nervous system stimulant, increasing alertness and producing agitation. It also relaxes smooth muscle, stimulates cardiac muscle, stimulates diuresis, and appears to be useful in the treatment of some types of headache. Several cellular actions of caffeine have been observed, but it is not entirely clear how each contributes to its pharmacological profile. Among the most important are inhibition of cyclic nucleotide phosphodiesterases, antagonism of adenosine receptors, and modulation of intracellular calcium handling. [NIH]

Calcification: Deposits of calcium in the tissues of the breast. Calcification in the breast can be seen on a mammogram, but cannot be detected by touch. There are two types of breast calcification, macrocalcification and microcalcification. Macrocalcifications are large deposits and are usually not related to cancer. Microcalcifications are specks of calcium that may be

found in an area of rapidly dividing cells. Many microcalcifications clustered together may be a sign of cancer. [NIH]

Calcium: A basic element found in nearly all organized tissues. It is a member of the alkaline earth family of metals with the atomic symbol Ca, atomic number 20, and atomic weight 40. Calcium is the most abundant mineral in the body and combines with phosphorus to form calcium phosphate in the bones and teeth. It is essential for the normal functioning of nerves and muscles and plays a role in blood coagulation (as factor IV) and in many enzymatic processes. [NIH]

Calcium Channels: Voltage-dependent cell membrane glycoproteins selectively permeable to calcium ions. They are categorized as L-, T-, N-, P-, Q-, and R-types based on the activation and inactivation kinetics, ion specificity, and sensitivity to drugs and toxins. The L- and T-types are present throughout the cardiovascular and central nervous systems and the N-, P-, Q-, & R-types are located in neuronal tissue. [NIH]

Callus: A callosity or hard, thick skin; the bone-like reparative substance that is formed round the edges and fragments of broken bone. [NIH]

Capillary: Any one of the minute vessels that connect the arterioles and venules, forming a network in nearly all parts of the body. Their walls act as semipermeable membranes for the interchange of various substances, including fluids, between the blood and tissue fluid; called also vas capillare. [EU]

Carbohydrate: An aldehyde or ketone derivative of a polyhydric alcohol, particularly of the pentahydric and hexahydric alcohols. They are so named because the hydrogen and oxygen are usually in the proportion to form water, (CH2O)n. The most important carbohydrates are the starches, sugars, celluloses, and gums. They are classified into mono-, di-, tri-, poly- and heterosaccharides. [EU]

Carbon Dioxide: A colorless, odorless gas that can be formed by the body and is necessary for the respiration cycle of plants and animals. [NIH]

Carbon Monoxide Poisoning: Toxic asphyxiation due to the displacement of oxygen from oxyhemoglobin by carbon monoxide. [NIH]

Carcinogenic: Producing carcinoma. [EU]

Carcinogens: Substances that increase the risk of neoplasms in humans or animals. Both genotoxic chemicals, which affect DNA directly, and nongenotoxic chemicals, which induce neoplasms by other mechanism, are included. [NIH]

Carcinoma: Cancer that begins in the skin or in tissues that line or cover internal organs. [NIH]

Cardiac: Having to do with the heart. [NIH]

Cardiac arrest: A sudden stop of heart function. [NIH]

Cardiomyopathy: A general diagnostic term designating primary myocardial disease, often of obscure or unknown etiology. [EU]

Cardiopulmonary: Having to do with the heart and lungs. [NIH]

Cardiopulmonary Bypass: Diversion of the flow of blood from the entrance of the right atrium directly to the aorta (or femoral artery) via an oxygenator thus bypassing both the heart and lungs. [NIH]

Cardiopulmonary Resuscitation: The artificial substitution of heart and lung action as indicated for heart arrest resulting from electric shock, drowning, respiratory arrest, or other causes. The two major components of cardiopulmonary resuscitation are artificial ventilation and closed-chest cardiac massage. [NIH]

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Cardiorespiratory: Relating to the heart and lungs and their function. [EU]

Cardioselective: Having greater activity on heart tissue than on other tissue. [EU]

Cardiovascular: Having to do with the heart and blood vessels. [NIH]

Cardiovascular disease: Any abnormal condition characterized by dysfunction of the heart and blood vessels. CVD includes atherosclerosis (especially coronary heart disease, which can lead to heart attacks), cerebrovascular disease (e.g., stroke), and hypertension (high blood pressure). [NIH]

Cardiovascular System: The heart and the blood vessels by which blood is pumped and circulated through the body. [NIH]

Carnitine: Constituent of striated muscle and liver. It is used therapeutically to stimulate gastric and pancreatic secretions and in the treatment of hyperlipoproteinemias. [NIH]

Carotene: The general name for a group of pigments found in green, yellow, and leafy vegetables, and yellow fruits. The pigments are fat-soluble, unsaturated aliphatic hydrocarbons functioning as provitamins and are converted to vitamin A through enzymatic processes in the intestinal wall. [NIH]

Carrier State: The condition of harboring an infective organism without manifesting symptoms of infection. The organism must be readily transmissable to another susceptible host. [NIH]

Case report: A detailed report of the diagnosis, treatment, and follow-up of an individual patient. Case reports also contain some demographic information about the patient (for example, age, gender, ethnic origin). [NIH]

Cataract: An opacity, partial or complete, of one or both eyes, on or in the lens or capsule, especially an opacity impairing vision or causing blindness. The many kinds of cataract are classified by their morphology (size, shape, location) or etiology (cause and time of occurrence). [EU]

Cathode: An electrode, usually an incandescent filament of tungsten, which emits electrons in an X-ray tube. [NIH]

Cations: Postively charged atoms, radicals or groups of atoms which travel to the cathode or negative pole during electrolysis. [NIH]

Causal: Pertaining to a cause; directed against a cause. [EU]

Cause of Death: Factors which produce cessation of all vital bodily functions. They can be analyzed from an epidemiologic viewpoint. [NIH]

Cell: The individual unit that makes up all of the tissues of the body. All living things are made up of one or more cells. [NIH]

Cell Count: A count of the number of cells of a specific kind, usually measured per unit volume of sample. [NIH]

Cell Cycle: The complex series of phenomena, occurring between the end of one cell division and the end of the next, by which cellular material is divided between daughter cells. [NIH]

Cell Death: The termination of the cell's ability to carry out vital functions such as metabolism, growth, reproduction, responsiveness, and adaptability. [NIH]

Cell Differentiation: Progressive restriction of the developmental potential and increasing

specialization of function which takes place during the development of the embryo and leads to the formation of specialized cells, tissues, and organs. [NIH]

Cell Division: The fission of a cell. [NIH]

Cell membrane: Cell membrane = plasma membrane. The structure enveloping a cell, enclosing the cytoplasm, and forming a selective permeability barrier; it consists of lipids, proteins, and some carbohydrates, the lipids thought to form a bilayer in which integral proteins are embedded to varying degrees. [EU]

Cell proliferation: An increase in the number of cells as a result of cell growth and cell division. [NIH]

Cell Respiration: The metabolic process of all living cells (animal and plant) in which oxygen is used to provide a source of energy for the cell. [NIH]

Central Nervous System: The main information-processing organs of the nervous system, consisting of the brain, spinal cord, and meninges. [NIH]

Central Nervous System Infections: Pathogenic infections of the brain, spinal cord, and meninges. DNA virus infections; RNA virus infections; bacterial infections; mycoplasma infections; Spirochaetales infections; fungal infections; protozoan infections; helminthiasis; and prion diseases may involve the central nervous system as a primary or secondary process. [NIH]

Cerebellar: Pertaining to the cerebellum. [EU]

Cerebellum: Part of the metencephalon that lies in the posterior cranial fossa behind the brain stem. It is concerned with the coordination of movement. [NIH]

Cerebral: Of or pertaining of the cerebrum or the brain. [EU]

Cerebral Cortex: The thin layer of gray matter on the surface of the cerebral hemisphere that develops from the telencephalon and folds into gyri. It reaches its highest development in man and is responsible for intellectual faculties and higher mental functions. [NIH]

Cerebral hemispheres: The two halves of the cerebrum, the part of the brain that controls muscle functions of the body and also controls speech, emotions, reading, writing, and learning. The right hemisphere controls muscle movement on the left side of the body, and the left hemisphere controls muscle movement on the right side of the body. [NIH]

Cerebral Hemorrhage: Bleeding into a cerebral hemisphere of the brain, including lobar, subcortical white matter, and basal ganglia hemorrhages. Commonly associated conditions include hypertension; intracranial arteriosclerosis; intracranial aneurysm; craniocerebral trauma; intracranial arteriovenous malformations; cerebral amyloid angiopathy; and cerebral infarction. [NIH]

Cerebral Infarction: The formation of an area of necrosis in the cerebrum caused by an insufficiency of arterial or venous blood flow. Infarcts of the cerebrum are generally classified by hemisphere (i.e., left vs. right), lobe (e.g., frontal lobe infarction), arterial distribution (e.g., infarction, anterior cerebral artery), and etiology (e.g., embolic infarction). [NIH]

Cerebrospinal: Pertaining to the brain and spinal cord. [EU]

Cerebrospinal fluid: CSF. The fluid flowing around the brain and spinal cord. Cerebrospinal fluid is produced in the ventricles in the brain. [NIH]

Cerebrovascular: Pertaining to the blood vessels of the cerebrum, or brain. [EU]

Cerebrum: The largest part of the brain. It is divided into two hemispheres, or halves, called the cerebral hemispheres. The cerebrum controls muscle functions of the body and also controls speech, emotions, reading, writing, and learning. [NIH]

Cervical: Relating to the neck, or to the neck of any organ or structure. Cervical lymph nodes are located in the neck; cervical cancer refers to cancer of the uterine cervix, which is the lower, narrow end (the "neck") of the uterus. [NIH]

Cervix: The lower, narrow end of the uterus that forms a canal between the uterus and vagina. [NIH]

Character: In current usage, approximately equivalent to personality. The sum of the relatively fixed personality traits and habitual modes of response of an individual. [NIH]

Chelation: Combination with a metal in complexes in which the metal is part of a ring. [EU]

Chemotactic Factors: Chemical substances that attract or repel cells or organisms. The concept denotes especially those factors released as a result of tissue injury, invasion, or immunologic activity, that attract leukocytes, macrophages, or other cells to the site of infection or insult. [NIH]

Chemotherapy: Treatment with anticancer drugs. [NIH]

Chickenpox: A mild, highly contagious virus characterized by itchy blisters all over the body. [NIH]

Chin: The anatomical frontal portion of the mandible, also known as the mentum, that contains the line of fusion of the two separate halves of the mandible (symphysis menti). This line of fusion divides inferiorly to enclose a triangular area called the mental protuberance. On each side, inferior to the second premolar tooth, is the mental foramen for the passage of blood vessels and a nerve. [NIH]

Chlorpromazine: The prototypical phenothiazine antipsychotic drug. Like the other drugs in this class chlorpromazine's antipsychotic actions are thought to be due to long-term adaptation by the brain to blocking dopamine receptors. Chlorpromazine has several other actions and therapeutic uses, including as an antiemetic and in the treatment of intractable hiccup. [NIH]

Cholesterol: The principal sterol of all higher animals, distributed in body tissues, especially the brain and spinal cord, and in animal fats and oils. [NIH]

Cholesterol Esters: Fatty acid esters of cholesterol which constitute about two-thirds of the cholesterol in the plasma. The accumulation of cholesterol esters in the arterial intima is a characteristic feature of atherosclerosis. [NIH]

Choline: A basic constituent of lecithin that is found in many plants and animal organs. It is important as a precursor of acetylcholine, as a methyl donor in various metabolic processes, and in lipid metabolism. [NIH]

Choroid: The thin, highly vascular membrane covering most of the posterior of the eye between the retina and sclera. [NIH]

Chromaffin System: The cells of the body which stain with chromium salts. They occur along the sympathetic nerves, in the adrenal gland, and in various other organs. [NIH]

Chromium: A trace element that plays a role in glucose metabolism. It has the atomic symbol Cr, atomic number 24, and atomic weight 52. According to the Fourth Annual Report on Carcinogens (NTP85-002,1985), chromium and some of its compounds have been listed as known carcinogens. [NIH]

Chromosomal: Pertaining to chromosomes. [EU]

Chromosome: Part of a cell that contains genetic information. Except for sperm and eggs, all human cells contain 46 chromosomes. [NIH]

Chronic: A disease or condition that persists or progresses over a long period of time. [NIH]

Chronic renal: Slow and progressive loss of kidney function over several years, often

resulting in end-stage renal disease. People with end-stage renal disease need dialysis or transplantation to replace the work of the kidneys. [NIH]

Chylomicrons: A class of lipoproteins that carry dietary cholesterol and triglycerides from the small intestines to the tissues. [NIH]

Circulatory system: The system that contains the heart and the blood vessels and moves blood throughout the body. This system helps tissues get enough oxygen and nutrients, and it helps them get rid of waste products. The lymph system, which connects with the blood system, is often considered part of the circulatory system. [NIH]

Cirrhosis: A type of chronic, progressive liver disease. [NIH]

CIS: Cancer Information Service. The CIS is the National Cancer Institute's link to the public, interpreting and explaining research findings in a clear and understandable manner, and providing personalized responses to specific questions about cancer. Access the CIS by calling 1-800-4-CANCER, or by using the Web site at http://cis.nci.nih.gov. [NIH]

Clinical Medicine: The study and practice of medicine by direct examination of the patient. [NIH]

Clinical study: A research study in which patients receive treatment in a clinic or other medical facility. Reports of clinical studies can contain results for single patients (case reports) or many patients (case series or clinical trials). [NIH]

Clinical trial: A research study that tests how well new medical treatments or other interventions work in people. Each study is designed to test new methods of screening, prevention, diagnosis, or treatment of a disease. [NIH]

Cloning: The production of a number of genetically identical individuals; in genetic engineering, a process for the efficient replication of a great number of identical DNA molecules. [NIH]

Coagulation: 1. The process of clot formation. 2. In colloid chemistry, the solidification of a sol into a gelatinous mass; an alteration of a disperse phase or of a dissolved solid which causes the separation of the system into a liquid phase and an insoluble mass called the clot or curd. Coagulation is usually irreversible. 3. In surgery, the disruption of tissue by physical means to form an amorphous residuum, as in electrocoagulation and photocoagulation. [EU]

Coca: Any of several South American shrubs of the Erythroxylon genus (and family) that yield cocaine; the leaves are chewed with alum for CNS stimulation. [NIH]

Cocaine: An alkaloid ester extracted from the leaves of plants including coca. It is a local anesthetic and vasoconstrictor and is clinically used for that purpose, particularly in the eye, ear, nose, and throat. It also has powerful central nervous system effects similar to the amphetamines and is a drug of abuse. Cocaine, like amphetamines, acts by multiple mechanisms on brain catecholaminergic neurons; the mechanism of its reinforcing effects is thought to involve inhibition of dopamine uptake. [NIH]

Codeine: An opioid analgesic related to morphine but with less potent analgesic properties and mild sedative effects. It also acts centrally to suppress cough. [NIH]

Cognition: Intellectual or mental process whereby an organism becomes aware of or obtains knowledge. [NIH]

Colitis: Inflammation of the colon. [NIH]

Collagen: A polypeptide substance comprising about one third of the total protein in mammalian organisms. It is the main constituent of skin, connective tissue, and the organic substance of bones and teeth. Different forms of collagen are produced in the body but all consist of three alpha-polypeptide chains arranged in a triple helix. Collagen is

differentiated from other fibrous proteins, such as elastin, by the content of proline, hydroxyproline, and hydroxylysine; by the absence of tryptophan; and particularly by the high content of polar groups which are responsible for its swelling properties. [NIH]

Collapse: 1. A state of extreme prostration and depression, with failure of circulation. 2. Abnormal falling in of the walls of any part of organ. [EU]

Colloidal: Of the nature of a colloid. [EU]

Colon: The long, coiled, tubelike organ that removes water from digested food. The remaining material, solid waste called stool, moves through the colon to the rectum and leaves the body through the anus. [NIH]

Comatose: Pertaining to or affected with coma. [EU]

Combination Therapy: Association of 3 drugs to treat AIDS (AZT + DDC or DDI + protease inhibitor). [NIH]

Combinatorial: A cut-and-paste process that churns out thousands of potentially valuable compounds at once. [NIH]

Communication Disorders: Disorders of verbal and nonverbal communication caused by receptive or expressive language disorders, cognitive dysfunction (e.g., mental retardation), psychiatric conditions, and hearing disorders. [NIH]

Comorbidity: The presence of co-existing or additional diseases with reference to an initial diagnosis or with reference to the index condition that is the subject of study. Comorbidity may affect the ability of affected individuals to function and also their survival; it may be used as a prognostic indicator for length of hospital stay, cost factors, and outcome or survival. [NIH]

Compact Disks: Computer disks storing data with a maximum reduction of space and bandwidth. The compact size reduces cost of transmission and storage. [NIH]

Complement: A term originally used to refer to the heat-labile factor in serum that causes immune cytolysis, the lysis of antibody-coated cells, and now referring to the entire functionally related system comprising at least 20 distinct serum proteins that is the effector not only of immune cytolysis but also of other biologic functions. Complement activation occurs by two different sequences, the classic and alternative pathways. The proteins of the classic pathway are termed 'components of complement' and are designated by the symbols C1 through C9. C1 is a calcium-dependent complex of three distinct proteins C1q, C1r and C1s. The proteins of the alternative pathway (collectively referred to as the properdin system) and complement regulatory proteins are known by semisystematic or trivial names. Fragments resulting from proteolytic cleavage of complement proteins are designated with lower-case letter suffixes, e.g., C3a. Inactivated fragments may be designated with the suffix 'i', e.g. C3bi. Activated components or complexes with biological activity are designated by a bar over the symbol e.g. C1 or C4b,2a. The classic pathway is activated by the binding of C1 to classic pathway activators, primarily antigen-antibody complexes containing IgM, IgG1, IgG3; C1q binds to a single IgM molecule or two adjacent IgG molecules. The alternative pathway can be activated by IgA immune complexes and also by nonimmunologic materials including bacterial endotoxins, microbial polysaccharides, and cell walls. Activation of the classic pathway triggers an enzymatic cascade involving C1, C4, C2 and C3; activation of the alternative pathway triggers a cascade involving C3 and factors B, D and P. Both result in the cleavage of C5 and the formation of the membrane attack complex. Complement activation also results in the formation of many biologically active complement fragments that act as anaphylatoxins, opsonins, or chemotactic factors. [EU]

Complementary and alternative medicine: CAM. Forms of treatment that are used in addition to (complementary) or instead of (alternative) standard treatments. These practices

are not considered standard medical approaches. CAM includes dietary supplements, megadose vitamins, herbal preparations, special teas, massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Complementary medicine: Practices not generally recognized by the medical community as standard or conventional medical approaches and used to enhance or complement the standard treatments. Complementary medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Complementation: The production of a wild-type phenotype when two different mutations are combined in a diploid or a heterokaryon and tested in trans-configuration. [NIH]

Compliance: Distensibility measure of a chamber such as the lungs (lung compliance) or bladder. Compliance is expressed as a change in volume per unit change in pressure. [NIH]

Computational Biology: A field of biology concerned with the development of techniques for the collection and manipulation of biological data, and the use of such data to make biological discoveries or predictions. This field encompasses all computational methods and theories applicable to molecular biology and areas of computer-based techniques for solving biological problems including manipulation of models and datasets. [NIH]

Computed tomography: CT scan. A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine. Also called computerized tomography and computerized axial tomography (CAT) scan. [NIH]

Computerized axial tomography: A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine. Also called CAT scan, computed tomography (CT scan), or computerized tomography. [NIH]

Computerized tomography: A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine. Also called computerized axial tomography (CAT) scan and computed tomography (CT scan). [NIH]

Concentric: Having a common center of curvature or symmetry. [NIH]

Conduction: The transfer of sound waves, heat, nervous impulses, or electricity. [EU]

Cones: One type of specialized light-sensitive cells (photoreceptors) in the retina that provide sharp central vision and color vision. [NIH]

Confusion: A mental state characterized by bewilderment, emotional disturbance, lack of clear thinking, and perceptual disorientation. [NIH]

Conjugated: Acting or operating as if joined; simultaneous. [EU]

Conjunctiva: The mucous membrane that lines the inner surface of the eyelids and the anterior part of the sclera. [NIH]

Connective Tissue: Tissue that supports and binds other tissues. It consists of connective tissue cells embedded in a large amount of extracellular matrix. [NIH]

Connective Tissue: Tissue that supports and binds other tissues. It consists of connective tissue cells embedded in a large amount of extracellular matrix. [NIH]

Consciousness: Sense of awareness of self and of the environment. [NIH]

Constipation: Infrequent or difficult evacuation of feces. [NIH]

Constriction: The act of constricting. [NIH]

Contamination: The soiling or pollution by inferior material, as by the introduction of

organisms into a wound, or sewage into a stream. [EU]

Continuum: An area over which the vegetation or animal population is of constantly changing composition so that homogeneous, separate communities cannot be distinguished. [NIH]

Contraindications: Any factor or sign that it is unwise to pursue a certain kind of action or treatment, e. g. giving a general anesthetic to a person with pneumonia. [NIH]

Contralateral: Having to do with the opposite side of the body. [NIH]

Control group: In a clinical trial, the group that does not receive the new treatment being studied. This group is compared to the group that receives the new treatment, to see if the new treatment works. [NIH]

Controlled clinical trial: A clinical study that includes a comparison (control) group. The comparison group receives a placebo, another treatment, or no treatment at all. [NIH]

Contusion: A bruise; an injury of a part without a break in the skin. [EU]

Convulsion: A violent involuntary contraction or series of contractions of the voluntary muscles. [EU]

Convulsive: Relating or referring to spasm; affected with spasm; characterized by a spasm or spasms. [NIH]

Cor: The muscular organ that maintains the circulation of the blood. c. adiposum a heart that has undergone fatty degeneration or that has an accumulation of fat around it; called also fat or fatty, heart. c. arteriosum the left side of the heart, so called because it contains oxygenated (arterial) blood. c. biloculare a congenital anomaly characterized by failure of formation of the atrial and ventricular septums, the heart having only two chambers, a single atrium and a single ventricle, and a common atrioventricular valve. c. bovinum (L. 'ox heart') a greatly enlarged heart due to a hypertrophied left ventricle; called also c. taurinum and bucardia. c. dextrum (L. 'right heart') the right atrium and ventricle. c. hirsutum, c. villosum. c. mobile (obs.) an abnormally movable heart. c. pendulum a heart so movable that it seems to be hanging by the great blood vessels. c. pseudotriloculare biatriatum a congenital cardiac anomaly in which the heart functions as a three-chambered heart because of tricuspid atresia, the right ventricle being extremely small or rudimentary and the right atrium greatly dilated. Blood passes from the right to the left atrium and thence disease due to pulmonary hypertension secondary to disease of the lung, or its blood vessels, with hypertrophy of the right ventricle. [EU]

Cornea: The transparent part of the eye that covers the iris and the pupil and allows light to enter the inside. [NIH]

Coronary: Encircling in the manner of a crown; a term applied to vessels; nerves, ligaments, etc. The term usually denotes the arteries that supply the heart muscle and, by extension, a pathologic involvement of them. [EU]

Coronary Circulation: The circulation of blood through the coronary vessels of the heart. [NIH]

Coronary heart disease: A type of heart disease caused by narrowing of the coronary arteries that feed the heart, which needs a constant supply of oxygen and nutrients carried by the blood in the coronary arteries. When the coronary arteries become narrowed or clogged by fat and cholesterol deposits and cannot supply enough blood to the heart, CHD results. [NIH]

Coronary Thrombosis: Presence of a thrombus in a coronary artery, often causing a myocardial infarction. [NIH]

Corpus: The body of the uterus. [NIH]

Corpus Luteum: The yellow glandular mass formed in the ovary by an ovarian follicle that has ruptured and discharged its ovum. [NIH]

Cortex: The outer layer of an organ or other body structure, as distinguished from the internal substance. [EU]

Cortical: Pertaining to or of the nature of a cortex or bark. [EU]

Corticosteroids: Hormones that have antitumor activity in lymphomas and lymphoid leukemias; in addition, corticosteroids (steroids) may be used for hormone replacement and for the management of some of the complications of cancer and its treatment. [NIH]

Cranial: Pertaining to the cranium, or to the anterior (in animals) or superior (in humans) end of the body. [EU]

Craniocerebral Trauma: Traumatic injuries involving the cranium and intracranial structures (i.e., brain; cranial nerves; meninges; and other structures). Injuries may be classified by whether or not the skull is penetrated (i.e., penetrating vs. nonpenetrating) or whether there is an associated hemorrhage. [NIH]

Craniotomy: An operation in which an opening is made in the skull. [NIH]

Creatine: An amino acid that occurs in vertebrate tissues and in urine. In muscle tissue, creatine generally occurs as phosphocreatine. Creatine is excreted as creatinine in the urine. [NIH]

Creatine Kinase: A transferase that catalyzes formation of phosphocreatine from ATP + creatine. The reaction stores ATP energy as phosphocreatine. Three cytoplasmic isoenzymes have been identified in human tissues: MM from skeletal muscle, MB from myocardial tissue, and BB from nervous tissue as well as a mitochondrial isoenzyme. Macro-creatine kinase refers to creatine kinase complexed with other serum proteins. EC 2.7.3.2. [NIH]

Creatinine: A compound that is excreted from the body in urine. Creatinine levels are measured to monitor kidney function. [NIH]

Critical Care: Health care provided to a critically ill patient during a medical emergency or crisis. [NIH]

Cultured cells: Animal or human cells that are grown in the laboratory. [NIH]

Curative: Tending to overcome disease and promote recovery. [EU]

Cyclic: Pertaining to or occurring in a cycle or cycles; the term is applied to chemical compounds that contain a ring of atoms in the nucleus. [EU]

Cytochrome: Any electron transfer hemoprotein having a mode of action in which the transfer of a single electron is effected by a reversible valence change of the central iron atom of the heme prosthetic group between the +2 and +3 oxidation states; classified as cytochromes a in which the heme contains a formyl side chain, cytochromes b, which contain protoheme or a closely similar heme that is not covalently bound to the protein, cytochromes c in which protoheme or other heme is covalently bound to the protein, and cytochromes d in which the iron-tetrapyrrole has fewer conjugated double bonds than the hemes have. Well-known cytochromes have been numbered consecutively within groups and are designated by subscripts (beginning with no subscript), e.g. cytochromes c, c1, C2, . New cytochromes are named according to the wavelength in nanometres of the absorption maximum of the a-band of the iron (II) form in pyridine, e.g., c-555. [EU]

Cytogenetics: A branch of genetics which deals with the cytological and molecular behavior of genes and chromosomes during cell division. [NIH]

Cytokine: Small but highly potent protein that modulates the activity of many cell types, including T and B cells. [NIH]

Cytoplasm: The protoplasm of a cell exclusive of that of the nucleus; it consists of a continuous aqueous solution (cytosol) and the organelles and inclusions suspended in it (phaneroplasm), and is the site of most of the chemical activities of the cell. [EU]

Cytoskeletal Proteins: Major constituent of the cytoskeleton found in the cytoplasm of eukaryotic cells. They form a flexible framework for the cell, provide attachment points for organelles and formed bodies, and make communication between parts of the cell possible. [NIH]

Cytoskeleton: The network of filaments, tubules, and interconnecting filamentous bridges which give shape, structure, and organization to the cytoplasm. [NIH]

Cytotoxic: Cell-killing. [NIH]

Data Collection: Systematic gathering of data for a particular purpose from various sources, including questionnaires, interviews, observation, existing records, and electronic devices. The process is usually preliminary to statistical analysis of the data. [NIH]

Deamination: The removal of an amino group (NH2) from a chemical compound. [NIH]

Decompression: Decompression external to the body, most often the slow lessening of external pressure on the whole body (especially in caisson workers, deep sea divers, and persons who ascend to great heights) to prevent decompression sickness. It includes also sudden accidental decompression, but not surgical (local) decompression or decompression applied through body openings. [NIH]

Decompression Sickness: A condition occurring as a result of exposure to a rapid fall in ambient pressure. Gases, nitrogen in particular, come out of solution and form bubbles in body fluid and blood. These gas bubbles accumulate in joint spaces and the peripheral circulation impairing tissue oxygenation causing disorientation, severe pain, and potentially death. [NIH]

Decubitus: An act of lying down; also the position assumed in lying down. [EU]

Decubitus Ulcer: An ulceration caused by prolonged pressure in patients permitted to lie too still for a long period of time. The bony prominences of the body are the most frequently affected sites. The ulcer is caused by ischemia of the underlying structures of the skin, fat, and muscles as a result of the sustained and constant pressure. [NIH]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

Dehydration: The condition that results from excessive loss of body water. [NIH]

Delirium: (DSM III-R) an acute, reversible organic mental disorder characterized by reduced ability to maintain attention to external stimuli and disorganized thinking as manifested by rambling, irrelevant, or incoherent speech; there are also a reduced level of consciousness, sensory misperceptions, disturbance of the sleep-wakefulness cycle and level of psychomotor activity, disorientation to time, place, or person, and memory impairment. Delirium may be caused by a large number of conditions resulting in derangement of cerebral metabolism, including systemic infection, poisoning, drug intoxication or withdrawal, seizures or head trauma, and metabolic disturbances such as hypoxia, hypoglycaemia, fluid, electrolyte, or acid-base imbalances, or hepatic or renal failure. Called also acute confusional state and acute brain syndrome. [EU]

Delivery of Health Care: The concept concerned with all aspects of providing and distributing health services to a patient population. [NIH]

Delusions: A false belief regarding the self or persons or objects outside the self that persists despite the facts, and is not considered tenable by one's associates. [NIH]

Dendrites: Extensions of the nerve cell body. They are short and branched and receive

stimuli from other neurons. [NIH]

Dendritic: 1. Branched like a tree. 2. Pertaining to or possessing dendrites. [EU]

Dental Care: The total of dental diagnostic, preventive, and restorative services provided to meet the needs of a patient (from Illustrated Dictionary of Dentistry, 1982). [NIH]

Dental Caries: Localized destruction of the tooth surface initiated by decalcification of the enamel followed by enzymatic lysis of organic structures and leading to cavity formation. If left unchecked, the cavity may penetrate the enamel and dentin and reach the pulp. The three most prominent theories used to explain the etiology of the disase are that acids produced by bacteria lead to decalcification; that micro-organisms destroy the enamel protein; or that keratolytic micro-organisms produce chelates that lead to decalcification. [NIH]

Dentate Gyrus: Gray matter situated above the gyrus hippocampi. It is composed of three layers. The molecular layer is continuous with the hippocampus in the hippocampal fissure. The granular layer consists of closely arranged spherical or oval neurons, called granule cells, whose axons pass through the polymorphic layer ending on the dendrites of pyramidal cells in the hippocampus. [NIH]

Depolarization: The process or act of neutralizing polarity. In neurophysiology, the reversal of the resting potential in excitable cell membranes when stimulated, i.e., the tendency of the cell membrane potential to become positive with respect to the potential outside the cell. [EU]

Deprivation: Loss or absence of parts, organs, powers, or things that are needed. [EU]

Dermis: A layer of vascular connective tissue underneath the epidermis. The surface of the dermis contains sensitive papillae. Embedded in or beneath the dermis are sweat glands, hair follicles, and sebaceous glands. [NIH]

Desmopressin: A synthetic analog of the natural hormone 8-arginine vasopressin (argipressin). Its action is mediated by the vasopressin receptor V2. It has prolonged antidiuretic activity, but little pressor effects. It also modulates levels of circulating factor VIII and von Willebrand factor. [NIH]

Detergents: Purifying or cleansing agents, usually salts of long-chain aliphatic bases or acids, that exert cleansing (oil-dissolving) and antimicrobial effects through a surface action that depends on possessing both hydrophilic and hydrophobic properties. [NIH]

Detoxification: Treatment designed to free an addict from his drug habit. [EU]

Deuterium: Deuterium. The stable isotope of hydrogen. It has one neutron and one proton in the nucleus. [NIH]

Diabetes Insipidus: A metabolic disorder due to disorders in the production or release of vasopressin. It is characterized by the chronic excretion of large amounts of low specific gravity urine and great thirst. [NIH]

Diabetes Mellitus: A heterogeneous group of disorders that share glucose intolerance in common. [NIH]

Diabetic Foot: Ulcers of the foot as a complication of diabetes. Diabetic foot, often with infection, is a common serious complication of diabetes and may require hospitalization and disfiguring surgery. The foot ulcers are probably secondary to neuropathies and vascular problems. [NIH]

Diabetic Ketoacidosis: Complication of diabetes resulting from severe insulin deficiency coupled with an absolute or relative increase in glucagon concentration. The metabolic acidosis is caused by the breakdown of adipose stores and resulting increased levels of free fatty acids. Glucagon accelerates the oxidation of the free fatty acids producing excess ketone bodies (ketosis). [NIH]

Diabetic Retinopathy: Retinopathy associated with diabetes mellitus, which may be of the background type, progressively characterized by microaneurysms, interretinal punctuate macular edema, or of the proliferative type, characterized by neovascularization of the retina and optic disk, which may project into the vitreous, proliferation of fibrous tissue, vitreous hemorrhage, and retinal detachment. [NIH]

Diagnostic procedure: A method used to identify a disease. [NIH]

Dialysate: A cleansing liquid used in the two major forms of dialysis--hemodialysis and peritoneal dialysis. [NIH]

Dialyzer: A part of the hemodialysis machine. (See hemodialysis under dialysis.) The dialyzer has two sections separated by a membrane. One section holds dialysate. The other holds the patient's blood. [NIH]

Diaphragm: The musculofibrous partition that separates the thoracic cavity from the abdominal cavity. Contraction of the diaphragm increases the volume of the thoracic cavity aiding inspiration. [NIH]

Diarrhea: Passage of excessively liquid or excessively frequent stools. [NIH]

Diastolic: Of or pertaining to the diastole. [EU]

Dichloroacetate: A derivative of acetic acid which increases the activity of pyruvate dehydrogenase and rate of lipogenesis. It is used in organic synthesis, pharmaceuticals, and medicine. [NIH]

Dietitian: An expert in nutrition who helps people plan what and how much food to eat. [NIH]

Diffuse Axonal Injury: A relatively common sequela of blunt head injury, characterized by a global disruption of axons throughout the brain. Associated clinical features may include neurobehavioral manifestations; persistent vegetative state; dementia; and other disorders. [NIH]

Diffusion: The tendency of a gas or solute to pass from a point of higher pressure or concentration to a point of lower pressure or concentration and to distribute itself throughout the available space; a major mechanism of biological transport. [NIH]

Digestion: The process of breakdown of food for metabolism and use by the body. [NIH]

Digestive system: The organs that take in food and turn it into products that the body can use to stay healthy. Waste products the body cannot use leave the body through bowel movements. The digestive system includes the salivary glands, mouth, esophagus, stomach, liver, pancreas, gallbladder, small and large intestines, and rectum. [NIH]

Dilation: A process by which the pupil is temporarily enlarged with special eye drops (mydriatic); allows the eye care specialist to better view the inside of the eye. [NIH]

Dimethyl: A volatile metabolite of the amino acid methionine. [NIH]

Diopter: The measurement of refractive error. A negative diopter value signifies an eye with myopia and positive diopter value signifies an eye with hyperopia. [NIH]

Diploid: Having two sets of chromosomes. [NIH]

Direct: 1. Straight; in a straight line. 2. Performed immediately and without the intervention of subsidiary means. [EU]

Discrete: Made up of separate parts or characterized by lesions which do not become blended; not running together; separate. [NIH]

Disease Progression: The worsening of a disease over time. This concept is most often used for chronic and incurable diseases where the stage of the disease is an important determinant of therapy and prognosis. [NIH]

Disinfectant: An agent that disinfects; applied particularly to agents used on inanimate objects. [EU]

Disorientation: The loss of proper bearings, or a state of mental confusion as to time, place, or identity. [EU]

Disposition: A tendency either physical or mental toward certain diseases. [EU]

Distal: Remote; farther from any point of reference; opposed to proximal. In dentistry, used to designate a position on the dental arch farther from the median line of the jaw. [EU]

Diuresis: Increased excretion of urine. [EU]

Diuretic: A drug that increases the production of urine. [NIH]

Docetaxel: An anticancer drug that belongs to the family of drugs called mitotic inhibitors. [NIH]

Dopamine: An endogenous catecholamine and prominent neurotransmitter in several systems of the brain. In the synthesis of catecholamines from tyrosine, it is the immediate precursor to norepinephrine and epinephrine. Dopamine is a major transmitter in the extrapyramidal system of the brain, and important in regulating movement. A family of dopaminergic receptor subtypes mediate its action. Dopamine is used pharmacologically for its direct (beta adrenergic agonist) and indirect (adrenergic releasing) sympathomimetic effects including its actions as an inotropic agent and as a renal vasodilator. [NIH]

Dorsum: A plate of bone which forms the posterior boundary of the sella turcica. [NIH]

Double-blind: Pertaining to a clinical trial or other experiment in which neither the subject nor the person administering treatment knows which treatment any particular subject is receiving. [EU]

Double-blinded: A clinical trial in which neither the medical staff nor the person knows which of several possible therapies the person is receiving. [NIH]

Drive: A state of internal activity of an organism that is a necessary condition before a given stimulus will elicit a class of responses; e.g., a certain level of hunger (drive) must be present before food will elicit an eating response. [NIH]

Drug Interactions: The action of a drug that may affect the activity, metabolism, or toxicity of another drug. [NIH]

Drug Tolerance: Progressive diminution of the susceptibility of a human or animal to the effects of a drug, resulting from its continued administration. It should be differentiated from drug resistance wherein an organism, disease, or tissue fails to respond to the intended effectiveness of a chemical or drug. It should also be differentiated from maximum tolerated dose and no-observed-adverse-effect level. [NIH]

Duct: A tube through which body fluids pass. [NIH]

Duodenum: The first part of the small intestine. [NIH]

Dura mater: The outermost, toughest, and most fibrous of the three membranes (meninges) covering the brain and spinal cord; called also pachymeninx. [EU]

Dysarthria: Imperfect articulation of speech due to disturbances of muscular control which result from damage to the central or peripheral nervous system. [EU]

Dyskinesia: Impairment of the power of voluntary movement, resulting in fragmentary or incomplete movements. [EU]

Dyslipidemia: Disorders in the lipoprotein metabolism; classified as hypercholesterolemia, hypertriglyceridemia, combined hyperlipidemia, and low levels of high-density lipoprotein (HDL) cholesterol. All of the dyslipidemias can be primary or secondary. Both elevated levels of low-density lipoprotein (LDL) cholesterol and low levels of HDL cholesterol

predispose to premature atherosclerosis. [NIH]

Eclampsia: Onset of convulsions or coma in a previously diagnosed pre-eclamptic patient. [NIH]

Edema: Excessive amount of watery fluid accumulated in the intercellular spaces, most commonly present in subcutaneous tissue. [NIH]

Effector: It is often an enzyme that converts an inactive precursor molecule into an active second messenger. [NIH]

Efficacy: The extent to which a specific intervention, procedure, regimen, or service produces a beneficial result under ideal conditions. Ideally, the determination of efficacy is based on the results of a randomized control trial. [NIH]

Elasticity: Resistance and recovery from distortion of shape. [NIH]

Electric shock: A dangerous patho-physiological effect resulting from an electric current passing through the body of a human or animal. [NIH]

Electrode: Component of the pacing system which is at the distal end of the lead. It is the interface with living cardiac tissue across which the stimulus is transmitted. [NIH]

Electroencephalography: Recording of electric currents developed in the brain by means of electrodes applied to the scalp, to the surface of the brain, or placed within the substance of the brain. [NIH]

Electrolyte: A substance that dissociates into ions when fused or in solution, and thus becomes capable of conducting electricity; an ionic solute. [EU]

Electron microscope: A microscope (device used to magnify small objects) that uses electrons (instead of light) to produce an enlarged image. An electron microscopes shows tiny details better than any other type of microscope. [NIH]

Electrons: Stable elementary particles having the smallest known negative charge, present in all elements; also called negatrons. Positively charged electrons are called positrons. The numbers, energies and arrangement of electrons around atomic nuclei determine the chemical identities of elements. Beams of electrons are called cathode rays or beta rays, the latter being a high-energy biproduct of nuclear decay. [NIH]

Electrophoresis: An electrochemical process in which macromolecules or colloidal particles with a net electric charge migrate in a solution under the influence of an electric current. [NIH]

Elementary Particles: Individual components of atoms, usually subatomic; subnuclear particles are usually detected only when the atomic nucleus decays and then only transiently, as most of them are unstable, often yielding pure energy without substance, i.e., radiation. [NIH]

Embolism: Blocking of a blood vessel by a blood clot or foreign matter that has been transported from a distant site by the blood stream. [NIH]

Embolus: Bit of foreign matter which enters the blood stream at one point and is carried until it is lodged or impacted in an artery and obstructs it. It may be a blood clot, an air bubble, fat or other tissue, or clumps of bacteria. [NIH]

Embryo: The prenatal stage of mammalian development characterized by rapid morphological changes and the differentiation of basic structures. [NIH]

Embryogenesis: The process of embryo or embryoid formation, whether by sexual (zygotic) or asexual means. In asexual embryogenesis embryoids arise directly from the explant or on intermediary callus tissue. In some cases they arise from individual cells (somatic cell embryoge). [NIH]

Emollient: Softening or soothing; called also malactic. [EU]

Enamel: A very hard whitish substance which covers the dentine of the anatomical crown of a tooth. [NIH]

Encephalitis: Inflammation of the brain due to infection, autoimmune processes, toxins, and other conditions. Viral infections (see encephalitis, viral) are a relatively frequent cause of this condition. [NIH]

Encephalitis, Viral: Inflammation of brain parenchymal tissue as a result of viral infection. Encephalitis may occur as primary or secondary manifestation of Togaviridae infections; Herpesviridae infections; Adenoviridae infections; Flaviviridae infections; Bunyaviridae infections; Picornaviridae infections; Paramyxoviridae infections; Orthomyxoviridae infections; Retroviridae infections; and Arenaviridae infections. [NIH]

Encephalopathy: A disorder of the brain that can be caused by disease, injury, drugs, or chemicals. [NIH]

Endemic: Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

Endocarditis: Exudative and proliferative inflammatory alterations of the endocardium, characterized by the presence of vegetations on the surface of the endocardium or in the endocardium itself, and most commonly involving a heart valve, but sometimes affecting the inner lining of the cardiac chambers or the endocardium elsewhere. It may occur as a primary disorder or as a complication of or in association with another disease. [EU]

Endocardium: The innermost layer of the heart, comprised of endothelial cells. [NIH]

Endocrine Glands: Ductless glands that secrete substances which are released directly into the circulation and which influence metabolism and other body functions. [NIH]

Endocrine System: The system of glands that release their secretions (hormones) directly into the circulatory system. In addition to the endocrine glands, included are the chromaffin system and the neurosecretory systems. [NIH]

Endocrinology: A subspecialty of internal medicine concerned with the metabolism, physiology, and disorders of the endocrine system. [NIH]

Endogenous: Produced inside an organism or cell. The opposite is external (exogenous) production. [NIH]

Endorphins: One of the three major groups of endogenous opioid peptides. They are large peptides derived from the pro-opiomelanocortin precursor. The known members of this group are alpha-, beta-, and gamma-endorphin. The term endorphin is also sometimes used to refer to all opioid peptides, but the narrower sense is used here; opioid peptides is used for the broader group. [NIH]

Endoscopy: Endoscopic examination, therapy or surgery performed on interior parts of the body. [NIH]

Endothelium: A layer of epithelium that lines the heart, blood vessels (endothelium, vascular), lymph vessels (endothelium, lymphatic), and the serous cavities of the body. [NIH]

Endothelium-derived: Small molecule that diffuses to the adjacent muscle layer and relaxes it. [NIH]

Endotoxins: Toxins closely associated with the living cytoplasm or cell wall of certain microorganisms, which do not readily diffuse into the culture medium, but are released upon lysis of the cells. [NIH]

End-stage renal: Total chronic kidney failure. When the kidneys fail, the body retains fluid and harmful wastes build up. A person with ESRD needs treatment to replace the work of

the failed kidneys. [NIH]

Enkephalins: One of the three major families of endogenous opioid peptides. The enkephalins are pentapeptides that are widespread in the central and peripheral nervous systems and in the adrenal medulla. [NIH]

Entorhinal Cortex: Cortex where the signals are combined with those from other sensory systems. [NIH]

Environmental Health: The science of controlling or modifying those conditions, influences, or forces surrounding man which relate to promoting, establishing, and maintaining health. [NIH]

Enzymatic: Phase where enzyme cuts the precursor protein. [NIH]

Enzyme: A protein that speeds up chemical reactions in the body. [NIH]

Epidemiological: Relating to, or involving epidemiology. [EU]

Epidermis: Nonvascular layer of the skin. It is made up, from within outward, of five layers: 1) basal layer (stratum basale epidermidis); 2) spinous layer (stratum spinosum epidermidis); 3) granular layer (stratum granulosum epidermidis); 4) clear layer (stratum lucidum epidermidis); and 5) horny layer (stratum corneum epidermidis). [NIH]

Epigastric: Having to do with the upper middle area of the abdomen. [NIH]

Epilepticus: Repeated and prolonged epileptic seizures without recovery of consciousness between attacks. [NIH]

Epinephrine: The active sympathomimetic hormone from the adrenal medulla in most species. It stimulates both the alpha- and beta- adrenergic systems, causes systemic vasoconstriction and gastrointestinal relaxation, stimulates the heart, and dilates bronchi and cerebral vessels. It is used in asthma and cardiac failure and to delay absorption of local anesthetics. [NIH]

Epithelium: One or more layers of epithelial cells, supported by the basal lamina, which covers the inner or outer surfaces of the body. [NIH]

Ergot: Cataract due to ergot poisoning caused by eating of rye cereals contaminated by a fungus. [NIH]

Ergotamine: A vasoconstrictor found in ergot of Central Europe. It is an alpha-1 selective adrenergic agonist and is commonly used in the treatment of migraine headaches. [NIH]

Erythrocytes: Red blood cells. Mature erythrocytes are non-nucleated, biconcave disks containing hemoglobin whose function is to transport oxygen. [NIH]

Esophageal: Having to do with the esophagus, the muscular tube through which food passes from the throat to the stomach. [NIH]

Esophageal Varices: Stretched veins in the esophagus that occur when the liver is not working properly. If the veins burst, the bleeding can cause death. [NIH]

Esophagus: The muscular tube through which food passes from the throat to the stomach. [NIH]

Ethanol: A clear, colorless liquid rapidly absorbed from the gastrointestinal tract and distributed throughout the body. It has bactericidal activity and is used often as a topical disinfectant. It is widely used as a solvent and preservative in pharmaceutical preparations as well as serving as the primary ingredient in alcoholic beverages. [NIH]

Ethanolamine: A viscous, hygroscopic amino alcohol with an ammoniacal odor. It is widely distributed in biological tissue and is a component of lecithin. It is used as a surfactant, fluorimetric reagent, and to remove CO2 and H2S from natural gas and other gases. [NIH]

Eukaryotic Cells: Cells of the higher organisms, containing a true nucleus bounded by a

nuclear membrane. [NIH]

Evacuation: An emptying, as of the bowels. [EU]

Evoke: The electric response recorded from the cerebral cortex after stimulation of a peripheral sense organ. [NIH]

Excitability: Property of a cardiac cell whereby, when the cell is depolarized to a critical level (called threshold), the membrane becomes permeable and a regenerative inward current causes an action potential. [NIH]

Excitation: An act of irritation or stimulation or of responding to a stimulus; the addition of energy, as the excitation of a molecule by absorption of photons. [EU]

Excitatory: When cortical neurons are excited, their output increases and each new input they receive while they are still excited raises their output markedly. [NIH]

Excitatory Amino Acids: Endogenous amino acids released by neurons as excitatory neurotransmitters. Glutamic acid is the most common excitatory neurotransmitter in the brain. Aspartic acid has been regarded as an excitatory transmitter for many years, but the extent of its role as a transmitter is unclear. [NIH]

Exhaustion: The feeling of weariness of mind and body. [NIH]

Exocrine: Secreting outwardly, via a duct. [EU]

Exogenous: Developed or originating outside the organism, as exogenous disease. [EU]

Expander: Any of several colloidal substances of high molecular weight. used as a blood or plasma substitute in transfusion for increasing the volume of the circulating blood. called also extender. [NIH]

Expert Systems: Computer programs based on knowledge developed from consultation with experts on a problem, and the processing and/or formalizing of this knowledge using these programs in such a manner that the problems may be solved. [NIH]

Expiration: The act of breathing out, or expelling air from the lungs. [EU]

Extender: Any of several colloidal substances of high molecular weight, used as a blood or plasma substitute in transfusion for increasing the volume of the circulating blood. [NIH]

Extensor: A muscle whose contraction tends to straighten a limb; the antagonist of a flexor. [NIH]

Extracellular: Outside a cell or cells. [EU]

Extracellular Matrix: A meshwork-like substance found within the extracellular space and in association with the basement membrane of the cell surface. It promotes cellular proliferation and provides a supporting structure to which cells or cell lysates in culture dishes adhere. [NIH]

Extracellular Matrix Proteins: Macromolecular organic compounds that contain carbon, hydrogen, oxygen, nitrogen, and usually, sulfur. These macromolecules (proteins) form an intricate meshwork in which cells are embedded to construct tissues. Variations in the relative types of macromolecules and their organization determine the type of extracellular matrix, each adapted to the functional requirements of the tissue. The two main classes of macromolecules that form the extracellular matrix are: glycosaminoglycans, usually linked to proteins (proteoglycans), and fibrous proteins (e.g., collagen, elastin, fibronectins and laminin). [NIH]

Extracellular Space: Interstitial space between cells, occupied by fluid as well as amorphous and fibrous substances. [NIH]

Extracorporeal: Situated or occurring outside the body. [EU]

Extrapyramidal: Outside of the pyramidal tracts. [EU]

Extravasation: A discharge or escape, as of blood, from a vessel into the tissues. [EU]

Extremity: A limb; an arm or leg (membrum); sometimes applied specifically to a hand or foot. [EU]

Eye Movements: Voluntary or reflex-controlled movements of the eye. [NIH]

Family Planning: Programs or services designed to assist the family in controlling reproduction by either improving or diminishing fertility. [NIH]

Fat: Total lipids including phospholipids. [NIH]

Fatal Outcome: Death resulting from the presence of a disease in an individual, as shown by a single case report or a limited number of patients. This should be differentiated from death, the physiological cessation of life and from mortality, an epidemiological or statistical concept. [NIH]

Fatty acids: A major component of fats that are used by the body for energy and tissue development. [NIH]

Fatty Liver: The buildup of fat in liver cells. The most common cause is alcoholism. Other causes include obesity, diabetes, and pregnancy. Also called steatosis. [NIH]

Febrile: Pertaining to or characterized by fever. [EU]

Fecal Incontinence: Failure of voluntary control of the anal sphincters, with involuntary passage of feces and flatus. [NIH]

Feces: The excrement discharged from the intestines, consisting of bacteria, cells exfoliated from the intestines, secretions, chiefly of the liver, and a small amount of food residue. [EU]

Femoral: Pertaining to the femur, or to the thigh. [EU]

Femoral Artery: The main artery of the thigh, a continuation of the external iliac artery. [NIH]

Fence: A hearing threshold level above which degrees of hearing handicap (or disability) are deemed to exist. [NIH]

Fibrosis: Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury. [NIH]

Fissure: Any cleft or groove, normal or otherwise; especially a deep fold in the cerebral cortex which involves the entire thickness of the brain wall. [EU]

Flatus: Gas passed through the rectum. [NIH]

Flexion: In gynaecology, a displacement of the uterus in which the organ is bent so far forward or backward that an acute angle forms between the fundus and the cervix. [EU]

Flexor: Muscles which flex a joint. [NIH]

Fluid Therapy: Therapy whose basic objective is to restore the volume and composition of the body fluids to normal with respect to water-electrolyte balance. Fluids may be administered intravenously, orally, by intermittent gavage, or by hypodermoclysis. [NIH]

Flumazenil: A potent benzodiazepine receptor antagonist. Since it reverses the sedative and other actions of benzodiazepines, it has been suggested as an antidote to benzodiazepine overdoses. [NIH]

Fluorescence: The property of emitting radiation while being irradiated. The radiation emitted is usually of longer wavelength than that incident or absorbed, e.g., a substance can be irradiated with invisible radiation and emit visible light. X-ray fluorescence is used in diagnosis. [NIH]

Focus Groups: A method of data collection and a qualitative research tool in which a small

group of individuals are brought together and allowed to interact in a discussion of their opinions about topics, issues, or questions. [NIH]

Fold: A plication or doubling of various parts of the body. [NIH]

Folic Acid: N-(4-(((2-Amino-1,4-dihydro-4-oxo-6-pteridinyl)methyl)amino)benzoyl)-L-glutamic acid. A member of the vitamin B family that stimulates the hematopoietic system. It is present in the liver and kidney and is found in mushrooms, spinach, yeast, green leaves, and grasses. Folic acid is used in the treatment and prevention of folate deficiencies and megaloblastic anemia. [NIH]

Foot Care: Taking special steps to avoid foot problems such as sores, cuts, bunions, and calluses. Good care includes daily examination of the feet, toes, and toenails and choosing shoes and socks or stockings that fit well. People with diabetes have to take special care of their feet because nerve damage and reduced blood flow sometimes mean they will have less feeling in their feet than normal. They may not notice cuts and other problems as soon as they should. [NIH]

Foot Diseases: Anatomical and functional disorders affecting the foot. [NIH]

Foot Ulcer: Lesion on the surface of the skin of the foot, usually accompanied by inflammation. The lesion may become infected or necrotic and is frequently associated with diabetes or leprosy. [NIH]

Forearm: The part between the elbow and the wrist. [NIH]

Formulary: A book containing a list of pharmaceutical products with their formulas and means of preparation. [NIH]

Forskolin: Potent activator of the adenylate cyclase system and the biosynthesis of cyclic AMP. From the plant Coleus forskohlii. Has antihypertensive, positive ionotropic, platelet aggregation inhibitory, and smooth muscle relaxant activities; also lowers intraocular pressure and promotes release of hormones from the pituitary gland. [NIH]

Frail Elderly: Older adults or aged individuals who are lacking in general strength and are unusually susceptible to disease or to other infirmity. [NIH]

Frontal Lobe: The anterior part of the cerebral hemisphere. [NIH]

Fulminant Hepatic Failure: Liver failure that occurs suddenly in a previously healthy person. The most common causes of FHF are acute hepatitis, acetaminophen overdose, and liver damage from prescription drugs. [NIH]

Functional Disorders: Disorders such as irritable bowel syndrome. These conditions result from poor nerve and muscle function. Symptoms such as gas, pain, constipation, and diarrhea come back again and again, but there are no signs of disease or damage. Emotional stress can trigger symptoms. Also called motility disorders. [NIH]

Fundus: The larger part of a hollow organ that is farthest away from the organ's opening. The bladder, gallbladder, stomach, uterus, eye, and cavity of the middle ear all have a fundus. [NIH]

Furosemide: A sulfamyl saluretic and diuretic. It has a fast onset and short duration of action and is used in edema and chronic renal insufficiency. [NIH]

Fuzzy Logic: Approximate, quantitative reasoning that is concerned with the linguistic ambiguity which exists in natural or synthetic language. At its core are variables such as good, bad, and young as well as modifiers such as more, less, and very. These ordinary terms represent fuzzy sets in a particular problem. Fuzzy logic plays a key role in many medical expert systems. [NIH]

Gallbladder: The pear-shaped organ that sits below the liver. Bile is concentrated and stored

in the gallbladder. [NIH]

Ganglia: Clusters of multipolar neurons surrounded by a capsule of loosely organized connective tissue located outside the central nervous system. [NIH]

Ganglion: 1. A knot, or knotlike mass. 2. A general term for a group of nerve cell bodies located outside the central nervous system; occasionally applied to certain nuclear groups within the brain or spinal cord, e.g. basal ganglia. 3. A benign cystic tumour occurring on a aponeurosis or tendon, as in the wrist or dorsum of the foot; it consists of a thin fibrous capsule enclosing a clear mucinous fluid. [EU]

Gangrene: Death and putrefaction of tissue usually due to a loss of blood supply. [NIH]

Gap Junctions: Connections between cells which allow passage of small molecules and electric current. Gap junctions were first described anatomically as regions of close apposition between cells with a narrow (1-2 nm) gap between cell membranes. The variety in the properties of gap junctions is reflected in the number of connexins, the family of proteins which form the junctions. [NIH]

Gas: Air that comes from normal breakdown of food. The gases are passed out of the body through the rectum (flatus) or the mouth (burp). [NIH]

Gas exchange: Primary function of the lungs; transfer of oxygen from inhaled air into the blood and of carbon dioxide from the blood into the lungs. [NIH]

Gastric: Having to do with the stomach. [NIH]

Gastrin: A hormone released after eating. Gastrin causes the stomach to produce more acid. [NIH]

Gastroenterology: A subspecialty of internal medicine concerned with the study of the physiology and diseases of the digestive system and related structures (esophagus, liver, gallbladder, and pancreas). [NIH]

Gastrointestinal: Refers to the stomach and intestines. [NIH]

Gastrointestinal tract: The stomach and intestines. [NIH]

Gene: The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein. [NIH]

Gene Expression: The phenotypic manifestation of a gene or genes by the processes of gene action. [NIH]

General practitioner: A medical practitioner who does not specialize in a particular branch of medicine or limit his practice to a specific class of diseases. [NIH]

Genetic Engineering: Directed modification of the gene complement of a living organism by such techniques as altering the DNA, substituting genetic material by means of a virus, transplanting whole nuclei, transplanting cell hybrids, etc. [NIH]

Genetics: The biological science that deals with the phenomena and mechanisms of heredity. [NIH]

Genotype: The genetic constitution of the individual; the characterization of the genes. [NIH]

Geriatric: Pertaining to the treatment of the aged. [EU]

Gestational: Psychosis attributable to or occurring during pregnancy. [NIH]

Ginseng: An araliaceous genus of plants that contains a number of pharmacologically active agents used as stimulants, sedatives, and tonics, especially in traditional medicine. [NIH]

Gland: An organ that produces and releases one or more substances for use in the body. Some glands produce fluids that affect tissues or organs. Others produce hormones or

participate in blood production. [NIH]

Glare: Scatter from bright light that decreases vision. [NIH]

Glasgow Coma Scale: A scale that assesses the response to stimuli in patients with craniocerebral injuries. The parameters are eye opening, motor reponse, and verbal response. [NIH]

Glomerular: Pertaining to or of the nature of a glomerulus, especially a renal glomerulus. [EU]

Glomerular Filtration Rate: The volume of water filtered out of plasma through glomerular capillary walls into Bowman's capsules per unit of time. It is considered to be equivalent to inulin clearance. [NIH]

Glomeruli: Plural of glomerulus. [NIH]

Glottis: The vocal apparatus of the larynx, consisting of the true vocal cords (plica vocalis) and the opening between them (rima glottidis). [NIH]

Glucocorticoids: A group of corticosteroids that affect carbohydrate metabolism (gluconeogenesis, liver glycogen deposition, elevation of blood sugar), inhibit corticotropin secretion, and possess pronounced anti-inflammatory activity. They also play a role in fat and protein metabolism, maintenance of arterial blood pressure, alteration of the connective tissue response to injury, reduction in the number of circulating lymphocytes, and functioning of the central nervous system. [NIH]

Gluconeogenesis: The process by which glucose is formed from a non-carbohydrate source. [NIH]

Glucose: D-Glucose. A primary source of energy for living organisms. It is naturally occurring and is found in fruits and other parts of plants in its free state. It is used therapeutically in fluid and nutrient replacement. [NIH]

Glucose Intolerance: A pathological state in which the fasting plasma glucose level is less than 140 mg per deciliter and the 30-, 60-, or 90-minute plasma glucose concentration following a glucose tolerance test exceeds 200 mg per deciliter. This condition is seen frequently in diabetes mellitus but also occurs with other diseases. [NIH]

Glucose tolerance: The power of the normal liver to absorb and store large quantities of glucose and the effectiveness of intestinal absorption of glucose. The glucose tolerance test is a metabolic test of carbohydrate tolerance that measures active insulin, a hepatic function based on the ability of the liver to absorb glucose. The test consists of ingesting 100 grams of glucose into a fasting stomach; blood sugar should return to normal in 2 to 21 hours after ingestion. [NIH]

Glucose Tolerance Test: Determination of whole blood or plasma sugar in a fasting state before and at prescribed intervals (usually 1/2 hr, 1 hr, 3 hr, 4 hr) after taking a specified amount (usually 100 gm orally) of glucose. [NIH]

Glutamate: Excitatory neurotransmitter of the brain. [NIH]

Glutamic Acid: A non-essential amino acid naturally occurring in the L-form. Glutamic acid (glutamate) is the most common excitatory neurotransmitter in the central nervous system. [NIH]

Glutamine: A non-essential amino acid present abundantly throught the body and is involved in many metabolic processes. It is synthesized from glutamic acid and ammonia. It is the principal carrier of nitrogen in the body and is an important energy source for many cells. [NIH]

Glutathione Peroxidase: An enzyme catalyzing the oxidation of 2 moles of glutathione in the presence of hydrogen peroxide to yield oxidized glutathione and water. EC 1.11.1.9.

[NIH]

Glutethimide: A hypnotic and sedative. Its use has been largely superseded by other drugs. [NIH]

Glycerol: A trihydroxy sugar alcohol that is an intermediate in carbohydrate and lipid metabolism. It is used as a solvent, emollient, pharmaceutical agent, and sweetening agent. [NIH]

Glycine: A non-essential amino acid. It is found primarily in gelatin and silk fibroin and used therapeutically as a nutrient. It is also a fast inhibitory neurotransmitter. [NIH]

Glycogen: A sugar stored in the liver and muscles. It releases glucose into the blood when cells need it for energy. Glycogen is the chief source of stored fuel in the body. [NIH]

Glycolysis: The pathway by which glucose is catabolized into two molecules of pyruvic acid with the generation of ATP. [NIH]

Glycoprotein: A protein that has sugar molecules attached to it. [NIH]

Gonads: The gamete-producing glands, ovary or testis. [NIH]

Governing Board: The group in which legal authority is vested for the control of health-related institutions and organizations. [NIH]

Gp120: 120-kD HIV envelope glycoprotein which is involved in the binding of the virus to its membrane receptor, the CD4 molecule, found on the surface of certain cells in the body. [NIH]

Grade: The grade of a tumor depends on how abnormal the cancer cells look under a microscope and how quickly the tumor is likely to grow and spread. Grading systems are different for each type of cancer. [NIH]

Grading: A system for classifying cancer cells in terms of how abnormal they appear when examined under a microscope. The objective of a grading system is to provide information about the probable growth rate of the tumor and its tendency to spread. The systems used to grade tumors vary with each type of cancer. Grading plays a role in treatment decisions. [NIH]

Granulocytes: Leukocytes with abundant granules in the cytoplasm. They are divided into three groups: neutrophils, eosinophils, and basophils. [NIH]

Growth factors: Substances made by the body that function to regulate cell division and cell survival. Some growth factors are also produced in the laboratory and used in biological therapy. [NIH]

Guanylate Cyclase: An enzyme that catalyzes the conversion of GTP to 3',5'-cyclic GMP and pyrophosphate. It also acts on ITP and dGTP. (From Enzyme Nomenclature, 1992) EC 4.6.1.2. [NIH]

Haematoma: A localized collection of blood, usually clotted, in an organ, space, or tissue, due to a break in the wall of a blood vessel. [EU]

Haemolysis: Disruption of the integrity of the red cell membrane causing release of haemoglobin. Haemolysis may be caused by bacterial haemolysins, by antibodies that cause complement-dependent lysis, by placing red cells in a hyptonic solution, or by defects in the red cell membrane. [EU]

Haemorrhage: The escape of blood from the vessels; bleeding. Small haemorrhages are classified according to size as petechiae (very small), purpura (up to 1 cm), and ecchymoses (larger). The massive accumulation of blood within a tissue is called a haematoma. [EU]

Half-Life: The time it takes for a substance (drug, radioactive nuclide, or other) to lose half of its pharmacologic, physiologic, or radiologic activity. [NIH]

Halos: Rings around lights due to optical imperfections in or in front of the eye. [NIH]

Handicap: A handicap occurs as a result of disability, but disability does not always constitute a handicap. A handicap may be said to exist when a disability causes a substantial and continuing reduction in a person's capacity to function socially and vocationally. [NIH]

Headache: Pain in the cranial region that may occur as an isolated and benign symptom or as a manifestation of a wide variety of conditions including subarachnoid hemorrhage; craniocerebral trauma; central nervous system infections; intracranial hypertension; and other disorders. In general, recurrent headaches that are not associated with a primary disease process are referred to as headache disorders (e.g., migraine). [NIH]

Headache Disorders: Common conditions characterized by persistent or recurrent headaches. Headache syndrome classification systems may be based on etiology (e.g., vascular headache, post-traumatic headaches, etc.), temporal pattern (e.g., cluster headache, paroxysmal hemicrania, etc.), and precipitating factors (e.g., cough headache). [NIH]

Health Care Costs: The actual costs of providing services related to the delivery of health care, including the costs of procedures, therapies, and medications. It is differentiated from health expenditures, which refers to the amount of money paid for the services, and from fees, which refers to the amount charged, regardless of cost. [NIH]

Health Expenditures: The amounts spent by individuals, groups, nations, or private or public organizations for total health care and/or its various components. These amounts may or may not be equivalent to the actual costs (health care costs) and may or may not be shared among the patient, insurers, and/or employers. [NIH]

Hearing Disorders: Conditions that impair the transmission or perception of auditory impulses and information from the level of the ear to the temporal cortices, including the sensorineural pathways. [NIH]

Heart Arrest: Sudden and usually momentary cessation of the heart beat. This sudden cessation may, but not usually, lead to death, sudden, cardiac. [NIH]

Heart attack: A seizure of weak or abnormal functioning of the heart. [NIH]

Heart-Lung Transplantation: The simultaneous, or near simultaneous, transference of heart and lungs from one human or animal to another. [NIH]

Hematoma: An extravasation of blood localized in an organ, space, or tissue. [NIH]

Hemiparesis: The weakness or paralysis affecting one side of the body. [NIH]

Hemodialysis: The use of a machine to clean wastes from the blood after the kidneys have failed. The blood travels through tubes to a dialyzer, which removes wastes and extra fluid. The cleaned blood then flows through another set of tubes back into the body. [NIH]

Hemoglobin: One of the fractions of glycosylated hemoglobin A1c. Glycosylated hemoglobin is formed when linkages of glucose and related monosaccharides bind to hemoglobin A and its concentration represents the average blood glucose level over the previous several weeks. HbA1c levels are used as a measure of long-term control of plasma glucose (normal, 4 to 6 percent). In controlled diabetes mellitus, the concentration of glycosylated hemoglobin A is within the normal range, but in uncontrolled cases the level may be 3 to 4 times the normal conentration. Generally, complications are substantially lower among patients with Hb levels of 7 percent or less than in patients with HbA1c levels of 9 percent or more. [NIH]

Hemolysis: The destruction of erythrocytes by many different causal agents such as antibodies, bacteria, chemicals, temperature, and changes in tonicity. [NIH]

Hemolytic: A disease that affects the blood and blood vessels. It destroys red blood cells, cells that cause the blood to clot, and the lining of blood vessels. HUS is often caused by the Escherichia coli bacterium in contaminated food. People with HUS may develop acute renal

failure. [NIH]

Hemorrhage: Bleeding or escape of blood from a vessel. [NIH]

Hemostasis: The process which spontaneously arrests the flow of blood from vessels carrying blood under pressure. It is accomplished by contraction of the vessels, adhesion and aggregation of formed blood elements, and the process of blood or plasma coagulation. [NIH]

Hepatic: Refers to the liver. [NIH]

Hepatic Encephalopathy: A condition that may cause loss of consciousness and coma. It is usually the result of advanced liver disease. Also called hepatic coma. [NIH]

Hepatitis: Inflammation of the liver and liver disease involving degenerative or necrotic alterations of hepatocytes. [NIH]

Hepatitis A: Hepatitis caused by hepatovirus. It can be transmitted through fecal contamination of food or water. [NIH]

Hepatocellular: Pertaining to or affecting liver cells. [EU]

Hepatocellular carcinoma: A type of adenocarcinoma, the most common type of liver tumor. [NIH]

Hepatocyte: A liver cell. [NIH]

Hepatovirus: A genus of Picornaviridae causing infectious hepatitis naturally in humans and experimentally in other primates. It is transmitted through fecal contamination of food or water. [NIH]

Hereditary: Of, relating to, or denoting factors that can be transmitted genetically from one generation to another. [NIH]

Heredity: 1. The genetic transmission of a particular quality or trait from parent to offspring. 2. The genetic constitution of an individual. [EU]

Heterogenic: Derived from a different source or species. Also called heterogenous. [NIH]

Heterogenous: Derived from a different source or species. Also called heterogenic. [NIH]

Hippocampus: A curved elevation of gray matter extending the entire length of the floor of the temporal horn of the lateral ventricle (Dorland, 28th ed). The hippocampus, subiculum, and dentate gyrus constitute the hippocampal formation. Sometimes authors include the entorhinal cortex in the hippocampal formation. [NIH]

Histology: The study of tissues and cells under a microscope. [NIH]

Homeostasis: The processes whereby the internal environment of an organism tends to remain balanced and stable. [NIH]

Homogeneous: Consisting of or composed of similar elements or ingredients; of a uniform quality throughout. [EU]

Homologous: Corresponding in structure, position, origin, etc., as (a) the feathers of a bird and the scales of a fish, (b) antigen and its specific antibody, (c) allelic chromosomes. [EU]

Hormonal: Pertaining to or of the nature of a hormone. [EU]

Hormone: A substance in the body that regulates certain organs. Hormones such as gastrin help in breaking down food. Some hormones come from cells in the stomach and small intestine. [NIH]

Hospital Design and Construction: The architecture, functional design, and construction of hospitals. [NIH]

Hospital Planning: Areawide planning for hospitals or planning of a particular hospital unit

on the basis of projected consumer need. This does not include hospital design and construction or architectural plans. [NIH]

Humoral: Of, relating to, proceeding from, or involving a bodily humour - now often used of endocrine factors as opposed to neural or somatic. [EU]

Humour: 1. A normal functioning fluid or semifluid of the body (as the blood, lymph or bile) especially of vertebrates. 2. A secretion that is itself an excitant of activity (as certain hormones). [EU]

Hybrid: Cross fertilization between two varieties or, more usually, two species of vines, see also crossing. [NIH]

Hybridization: The genetic process of crossbreeding to produce a hybrid. Hybrid nucleic acids can be formed by nucleic acid hybridization of DNA and RNA molecules. Protein hybridization allows for hybrid proteins to be formed from polypeptide chains. [NIH]

Hydration: Combining with water. [NIH]

Hydrocephalus: Excessive accumulation of cerebrospinal fluid within the cranium which may be associated with dilation of cerebral ventricles, intracranial hypertension; headache; lethargy; urinary incontinence; and ataxia (and in infants macrocephaly). This condition may be caused by obstruction of cerebrospinal fluid pathways due to neurologic abnormalities, intracranial hemorrhages; central nervous system infections; brain neoplasms; craniocerebral trauma; and other conditions. Impaired resorption of cerebrospinal fluid from the arachnoid villi results in a communicating form of hydrocephalus. Hydrocephalus ex-vacuo refers to ventricular dilation that occurs as a result of brain substance loss from cerebral infarction and other conditions. [NIH]

Hydrogen: The first chemical element in the periodic table. It has the atomic symbol H, atomic number 1, and atomic weight 1. It exists, under normal conditions, as a colorless, odorless, tasteless, diatomic gas. Hydrogen ions are protons. Besides the common H1 isotope, hydrogen exists as the stable isotope deuterium and the unstable, radioactive isotope tritium. [NIH]

Hydrogenation: Specific method of reduction in which hydrogen is added to a substance by the direct use of gaseous hydrogen. [NIH]

Hydrolysis: The process of cleaving a chemical compound by the addition of a molecule of water. [NIH]

Hydrophobic: Not readily absorbing water, or being adversely affected by water, as a hydrophobic colloid. [EU]

Hygienic: Pertaining to hygiene, or conducive to health. [EU]

Hyperammonemia: Metabolic disorder characterized by elevated level of ammonia in blood. [NIH]

Hyperbaric: Characterized by greater than normal pressure or weight; applied to gases under greater than atmospheric pressure, as hyperbaric oxygen, or to a solution of greater specific gravity than another taken as a standard of reference. [EU]

Hyperbaric oxygen: Oxygen that is at an atmospheric pressure higher than the pressure at sea level. Breathing hyperbaric oxygen to enhance the effectiveness of radiation therapy is being studied. [NIH]

Hyperbilirubinemia: Pathologic process consisting of an abnormal increase in the amount of bilirubin in the circulating blood, which may result in jaundice. [NIH]

Hypercholesterolemia: Abnormally high levels of cholesterol in the blood. [NIH]

Hyperglycemia: Abnormally high blood sugar. [NIH]

Hyperglycemic Hyperosmolar Nonketotic Coma: A syndrome consisting of extreme hyperglycemia, serum hyperosmolarity and dehydration in the absence of ketosis and acidosis. [NIH]

Hyperkalaemia: Pathology: an abnormally high concentration of potassium in the blood. [EU]

Hyperlipidemia: An excess of lipids in the blood. [NIH]

Hypermetropia: Visual disorder caused by an insufficient refractive power of the eye; only objects far from the eyes appear to be in focus. [NIH]

Hyperopia: Farsightedness; ability to see distant objects more clearly than close objects; may be corrected with glasses or contact lenses. [NIH]

Hypertension: Persistently high arterial blood pressure. Currently accepted threshold levels are 140 mm Hg systolic and 90 mm Hg diastolic pressure. [NIH]

Hyperthyroidism: Excessive functional activity of the thyroid gland. [NIH]

Hypertriglyceridemia: Condition of elevated triglyceride concentration in the blood; an inherited form occurs in familial hyperlipoproteinemia IIb and hyperlipoproteinemia type IV. It has been linked to higher risk of heart disease and arteriosclerosis. [NIH]

Hypnotic: A drug that acts to induce sleep. [EU]

Hypoglycaemia: An abnormally diminished concentration of glucose in the blood, which may lead to tremulousness, cold sweat, piloerection, hypothermia, and headache, accompanied by irritability, confusion, hallucinations, bizarre behaviour, and ultimately, convulsions and coma. [EU]

Hypoglycemia: Abnormally low blood sugar [NIH]

Hypoglycemic: An orally active drug that produces a fall in blood glucose concentration. [NIH]

Hypogonadism: Condition resulting from or characterized by abnormally decreased functional activity of the gonads, with retardation of growth and sexual development. [NIH]

Hypotension: Abnormally low blood pressure. [NIH]

Hypotensive: Characterized by or causing diminished tension or pressure, as abnormally low blood pressure. [EU]

Hypothalamus: Ventral part of the diencephalon extending from the region of the optic chiasm to the caudal border of the mammillary bodies and forming the inferior and lateral walls of the third ventricle. [NIH]

Hypothermia: Lower than normal body temperature, especially in warm-blooded animals; in man usually accidental or unintentional. [NIH]

Hypoxemia: Deficient oxygenation of the blood; hypoxia. [EU]

Hypoxia: Reduction of oxygen supply to tissue below physiological levels despite adequate perfusion of the tissue by blood. [EU]

Hypoxic: Having too little oxygen. [NIH]

Ibuprofen: A nonsteroidal anti-inflammatory agent with analgesic properties used in the therapy of rheumatism and arthritis. [NIH]

Immune Complex Diseases: Group of diseases mediated by the deposition of large soluble complexes of antigen and antibody with resultant damage to tissue. Besides serum sickness and the arthus reaction, evidence supports a pathogenic role for immune complexes in many other systemic immunologic diseases including glomerulonephritis, systemic lupus erythematosus and polyarteritis nodosa. [NIH]

Immune response: The activity of the immune system against foreign substances (antigens). [NIH]

Immune system: The organs, cells, and molecules responsible for the recognition and disposal of foreign ("non-self") material which enters the body. [NIH]

Immunity: Nonsusceptibility to the invasive or pathogenic effects of foreign microorganisms or to the toxic effect of antigenic substances. [NIH]

Immunodeficiency: The decreased ability of the body to fight infection and disease. [NIH]

Immunodeficiency syndrome: The inability of the body to produce an immune response. [NIH]

Immunohistochemistry: Histochemical localization of immunoreactive substances using labeled antibodies as reagents. [NIH]

Immunology: The study of the body's immune system. [NIH]

Immunosuppressant: An agent capable of suppressing immune responses. [EU]

Immunosuppressive: Describes the ability to lower immune system responses. [NIH]

Impairment: In the context of health experience, an impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function. [NIH]

Impotence: The inability to perform sexual intercourse. [NIH]

In situ: In the natural or normal place; confined to the site of origin without invasion of neighbouring tissues. [EU]

In vitro: In the laboratory (outside the body). The opposite of in vivo (in the body). [NIH]

In vivo: In the body. The opposite of in vitro (outside the body or in the laboratory). [NIH]

Incision: A cut made in the body during surgery. [NIH]

Incontinence: Inability to control the flow of urine from the bladder (urinary incontinence) or the escape of stool from the rectum (fecal incontinence). [NIH]

Incubation: The development of an infectious disease from the entrance of the pathogen to the appearance of clinical symptoms. [EU]

Incubation period: The period of time likely to elapse between exposure to the agent of the disease and the onset of clinical symptoms. [NIH]

Induction: The act or process of inducing or causing to occur, especially the production of a specific morphogenetic effect in the developing embryo through the influence of evocators or organizers, or the production of anaesthesia or unconsciousness by use of appropriate agents. [EU]

Infant, Newborn: An infant during the first month after birth. [NIH]

Infarction: A pathological process consisting of a sudden insufficient blood supply to an area, which results in necrosis of that area. It is usually caused by a thrombus, an embolus, or a vascular torsion. [NIH]

Infection: 1. Invasion and multiplication of microorganisms in body tissues, which may be clinically unapparent or result in local cellular injury due to competitive metabolism, toxins, intracellular replication, or antigen-antibody response. The infection may remain localized, subclinical, and temporary if the body's defensive mechanisms are effective. A local infection may persist and spread by extension to become an acute, subacute, or chronic clinical infection or disease state. A local infection may also become systemic when the microorganisms gain access to the lymphatic or vascular system. 2. An infectious disease. [EU]

Infection Control: Programs of disease surveillance, generally within health care facilities,

designed to investigate, prevent, and control the spread of infections and their causative microorganisms. [NIH]

Inflammation: A pathological process characterized by injury or destruction of tissues caused by a variety of cytologic and chemical reactions. It is usually manifested by typical signs of pain, heat, redness, swelling, and loss of function. [NIH]

Inflammatory bowel disease: A general term that refers to the inflammation of the colon and rectum. Inflammatory bowel disease includes ulcerative colitis and Crohn's disease. [NIH]

Influenza: An acute viral infection involving the respiratory tract. It is marked by inflammation of the nasal mucosa, the pharynx, and conjunctiva, and by headache and severe, often generalized, myalgia. [NIH]

Infusion: A method of putting fluids, including drugs, into the bloodstream. Also called intravenous infusion. [NIH]

Ingestion: Taking into the body by mouth [NIH]

Inhalation: The drawing of air or other substances into the lungs. [EU]

Initiation: Mutation induced by a chemical reactive substance causing cell changes; being a step in a carcinogenic process. [NIH]

Initiator: A chemically reactive substance which may cause cell changes if ingested, inhaled or absorbed into the body; the substance may thus initiate a carcinogenic process. [NIH]

Inlay: In dentistry, a filling first made to correspond with the form of a dental cavity and then cemented into the cavity. [NIH]

In-line: A sexually-reproducing population derived from a common parentage. [NIH]

Innervation: 1. The distribution or supply of nerves to a part. 2. The supply of nervous energy or of nerve stimulus sent to a part. [EU]

Inositol: An isomer of glucose that has traditionally been considered to be a B vitamin although it has an uncertain status as a vitamin and a deficiency syndrome has not been identified in man. (From Martindale, The Extra Pharmacopoeia, 30th ed, p1379) Inositol phospholipids are important in signal transduction. [NIH]

Insight: The capacity to understand one's own motives, to be aware of one's own psychodynamics, to appreciate the meaning of symbolic behavior. [NIH]

Institutionalization: The caring for individuals in institutions and their adaptation to routines characteristic of the institutional environment, and/or their loss of adaptation to life outside the institution. [NIH]

Insulin: A protein hormone secreted by beta cells of the pancreas. Insulin plays a major role in the regulation of glucose metabolism, generally promoting the cellular utilization of glucose. It is also an important regulator of protein and lipid metabolism. Insulin is used as a drug to control insulin-dependent diabetes mellitus. [NIH]

Insulin-dependent diabetes mellitus: A disease characterized by high levels of blood glucose resulting from defects in insulin secretion, insulin action, or both. Autoimmune, genetic, and environmental factors are involved in the development of type I diabetes. [NIH]

Intensive Care: Advanced and highly specialized care provided to medical or surgical patients whose conditions are life-threatening and require comprehensive care and constant monitoring. It is usually administered in specially equipped units of a health care facility. [NIH]

Intensive Care Units: Hospital units providing continuous surveillance and care to acutely ill patients. [NIH]

Interferon: A biological response modifier (a substance that can improve the body's natural response to disease). Interferons interfere with the division of cancer cells and can slow tumor growth. There are several types of interferons, including interferon-alpha, -beta, and -gamma. These substances are normally produced by the body. They are also made in the laboratory for use in treating cancer and other diseases. [NIH]

Interferon-alpha: One of the type I interferons produced by peripheral blood leukocytes or lymphoblastoid cells when exposed to live or inactivated virus, double-stranded RNA, or bacterial products. It is the major interferon produced by virus-induced leukocyte cultures and, in addition to its pronounced antiviral activity, it causes activation of NK cells. [NIH]

Interleukin-1: A soluble factor produced by monocytes, macrophages, and other cells which activates T-lymphocytes and potentiates their response to mitogens or antigens. IL-1 consists of two distinct forms, IL-1 alpha and IL-1 beta which perform the same functions but are distinct proteins. The biological effects of IL-1 include the ability to replace macrophage requirements for T-cell activation. The factor is distinct from interleukin-2. [NIH]

Interleukin-12: A heterodimeric cytokine that stimulates the production of interferon gamma from T-cells and natural killer cells, and also induces differentiation of Th1 helper cells. It is an initiator of cell-mediated immunity. [NIH]

Interleukin-18: Cytokine which resembles IL-1 structurally and IL-12 functionally. It enhances the cytotoxic activity of NK cells and CTLs, and appears to play a role both as neuroimmunomodulator and in the induction of mucosal immunity. [NIH]

Interleukin-2: Chemical mediator produced by activated T lymphocytes and which regulates the proliferation of T cells, as well as playing a role in the regulation of NK cell activity. [NIH]

Intermittent: Occurring at separated intervals; having periods of cessation of activity. [EU]

Internal Medicine: A medical specialty concerned with the diagnosis and treatment of diseases of the internal organ systems of adults. [NIH]

Interstitial: Pertaining to or situated between parts or in the interspaces of a tissue. [EU]

Intestinal: Having to do with the intestines. [NIH]

Intestinal Obstruction: Any impairment, arrest, or reversal of the normal flow of intestinal contents toward the anus. [NIH]

Intestines: The section of the alimentary canal from the stomach to the anus. It includes the large intestine and small intestine. [NIH]

Intoxication: Poisoning, the state of being poisoned. [EU]

Intracellular: Inside a cell. [NIH]

Intracranial Aneurysm: A saclike dilatation of the walls of a blood vessel, usually an artery. [NIH]

Intracranial Arteriosclerosis: Vascular diseases characterized by thickening, hardening, and remodeling of the walls of intracranial arteries. There are three subtypes: (1) atherosclerosis, marked by fatty depositions in the innermost layer of the arterial walls, (2) Monckeberg's sclerosis, which features calcium deposition in the media and (3) arteriolosclerosis, which refers to sclerosis of small caliber arteries. Clinically, this process may be associated with transient ischemic attack, brain infarction, intracranial embolism and thrombosis, or intracranial aneurysm. [NIH]

Intracranial Hemorrhages: Bleeding within the intracranial cavity, including hemorrhages in the brain and within the cranial epidural, subdural, and subarachnoid spaces. [NIH]

Intracranial Hypertension: Increased pressure within the cranial vault. This may result

from several conditions, including hydrocephalus; brain edema; intracranial masses; severe systemic hypertension; pseudotumor cerebri; and other disorders. [NIH]

Intracranial Hypotension: A condition in which there is a diminution or loss of muscular tonicity, in consequence of which the muscles may be stretched beyond their normal limits. [NIH]

Intrahepatic: Within the liver. [NIH]

Intramuscular: IM. Within or into muscle. [NIH]

Intraocular: Within the eye. [EU]

Intraocular pressure: Pressure of the fluid inside the eye; normal IOP varies among individuals. [NIH]

Intravenous: IV. Into a vein. [NIH]

Intrinsic: Situated entirely within or pertaining exclusively to a part. [EU]

Invasive: 1. Having the quality of invasiveness. 2. Involving puncture or incision of the skin or insertion of an instrument or foreign material into the body; said of diagnostic techniques. [EU]

Involuntary: Reaction occurring without intention or volition. [NIH]

Ion Channels: Gated, ion-selective glycoproteins that traverse membranes. The stimulus for channel gating can be a membrane potential, drug, transmitter, cytoplasmic messenger, or a mechanical deformation. Ion channels which are integral parts of ionotropic neurotransmitter receptors are not included. [NIH]

Ion Exchange: Reversible chemical reaction between a solid, often an ION exchange resin, and a fluid whereby ions may be exchanged from one substance to another. This technique is used in water purification, in research, and in industry. [NIH]

Ion Transport: The movement of ions across energy-transducing cell membranes. Transport can be active or passive. Passive ion transport (facilitated diffusion) derives its energy from the concentration gradient of the ion itself and allows the transport of a single solute in one direction (uniport). Active ion transport is usually coupled to an energy-yielding chemical or photochemical reaction such as ATP hydrolysis. This form of primary active transport is called an ion pump. Secondary active transport utilizes the voltage and ion gradients produced by the primary transport to drive the cotransport of other ions or molecules. These may be transported in the same (symport) or opposite (antiport) direction. [NIH]

Ions: An atom or group of atoms that have a positive or negative electric charge due to a gain (negative charge) or loss (positive charge) of one or more electrons. Atoms with a positive charge are known as cations; those with a negative charge are anions. [NIH]

Iris: The most anterior portion of the uveal layer, separating the anterior chamber from the posterior. It consists of two layers - the stroma and the pigmented epithelium. Color of the iris depends on the amount of melanin in the stroma on reflection from the pigmented epithelium. [NIH]

Ischemia: Deficiency of blood in a part, due to functional constriction or actual obstruction of a blood vessel. [EU]

Ischemic stroke: A condition in which the blood supply to part of the brain is cut off. Also called "plug-type" strokes. Blocked arteries starve areas of the brain controlling sight, speech, sensation, and movement so that these functions are partially or completely lost. Ischemic stroke is the most common type of stroke, accounting for 80 percent of all strokes. Most ischemic strokes are caused by a blood clot called a thrombus, which blocks blood flow in the arteries feeding the brain, usually the carotid artery in the neck, the major vessel bringing blood to the brain. When it becomes blocked, the risk of stroke is very high. [NIH]

Isoenzyme: Different forms of an enzyme, usually occurring in different tissues. The isoenzymes of a particular enzyme catalyze the same reaction but they differ in some of their properties. [NIH]

Isoleucine: An essential branched-chain amino acid found in many proteins. It is an isomer of LEUCINE. It is important in hemoglobin synthesis and regulation of blood sugar and energy levels. [NIH]

Iteration: Unvarying repetition or unvarying persistence. [NIH]

Jaundice: A clinical manifestation of hyperbilirubinemia, consisting of deposition of bile pigments in the skin, resulting in a yellowish staining of the skin and mucous membranes. [NIH]

Kava: Dried rhizome and roots of Piper methysticum, a shrub native to Oceania and known for its anti-anxiety and sedative properties. Heavy usage results in some adverse effects. It contains alkaloids, lactones, kawain, methysticin, mucilage, starch, and yangonin. Kava is also the name of the pungent beverage prepared from the plant's roots. [NIH]

Kb: A measure of the length of DNA fragments, 1 Kb = 1000 base pairs. The largest DNA fragments are up to 50 kilobases long. [NIH]

Keratolytic: An agent that promotes keratolysis. [EU]

Ketoacidosis: Acidosis accompanied by the accumulation of ketone bodies (ketosis) in the body tissues and fluids, as in diabetic acidosis. [EU]

Ketone Bodies: Chemicals that the body makes when there is not enough insulin in the blood and it must break down fat for its energy. Ketone bodies can poison and even kill body cells. When the body does not have the help of insulin, the ketones build up in the blood and then "spill" over into the urine so that the body can get rid of them. The body can also rid itself of one type of ketone, called acetone, through the lungs. This gives the breath a fruity odor. Ketones that build up in the body for a long time lead to serious illness and coma. [NIH]

Ketosis: A condition of having ketone bodies build up in body tissues and fluids. The signs of ketosis are nausea, vomiting, and stomach pain. Ketosis can lead to ketoacidosis. [NIH]

Kidney Disease: Any one of several chronic conditions that are caused by damage to the cells of the kidney. People who have had diabetes for a long time may have kidney damage. Also called nephropathy. [NIH]

Kidney Failure: The inability of a kidney to excrete metabolites at normal plasma levels under conditions of normal loading, or the inability to retain electrolytes under conditions of normal intake. In the acute form (kidney failure, acute), it is marked by uremia and usually by oliguria or anuria, with hyperkalemia and pulmonary edema. The chronic form (kidney failure, chronic) is irreversible and requires hemodialysis. [NIH]

Kinetic: Pertaining to or producing motion. [EU]

Labile: 1. Gliding; moving from point to point over the surface; unstable; fluctuating. 2. Chemically unstable. [EU]

Lactulose: A mild laxative. [NIH]

Laminin: Large, noncollagenous glycoprotein with antigenic properties. It is localized in the basement membrane lamina lucida and functions to bind epithelial cells to the basement membrane. Evidence suggests that the protein plays a role in tumor invasion. [NIH]

Language Disorders: Conditions characterized by deficiencies of comprehension or expression of written and spoken forms of language. These include acquired and developmental disorders. [NIH]

Larynx: An irregularly shaped, musculocartilaginous tubular structure, lined with mucous membrane, located at the top of the trachea and below the root of the tongue and the hyoid bone. It is the essential sphincter guarding the entrance into the trachea and functioning secondarily as the organ of voice. [NIH]

Laser Surgery: The use of a laser either to vaporize surface lesions or to make bloodless cuts in tissue. It does not include the coagulation of tissue by laser. [NIH]

Latency: The period of apparent inactivity between the time when a stimulus is presented and the moment a response occurs. [NIH]

Laxative: An agent that acts to promote evacuation of the bowel; a cathartic or purgative. [EU]

Length of Stay: The period of confinement of a patient to a hospital or other health facility. [NIH]

Lens: The transparent, double convex (outward curve on both sides) structure suspended between the aqueous and vitreous; helps to focus light on the retina. [NIH]

Lesion: An area of abnormal tissue change. [NIH]

Lethal: Deadly, fatal. [EU]

Lethargy: Abnormal drowsiness or stupor; a condition of indifference. [EU]

Leucine: An essential branched-chain amino acid important for hemoglobin formation. [NIH]

Leucovorin: The active metabolite of folic acid. Leucovorin is used principally as its calcium salt as an antidote to folic acid antagonists which block the conversion of folic acid to folinic acid. [NIH]

Levo: It is an experimental treatment for heroin addiction that was developed by German scientists around 1948 as an analgesic. Like methadone, it binds with opioid receptors, but it is longer acting. [NIH]

Life cycle: The successive stages through which an organism passes from fertilized ovum or spore to the fertilized ovum or spore of the next generation. [NIH]

Ligaments: Shiny, flexible bands of fibrous tissue connecting together articular extremities of bones. They are pliant, tough, and inextensile. [NIH]

Ligation: Application of a ligature to tie a vessel or strangulate a part. [NIH]

Limbic: Pertaining to a limbus, or margin; forming a border around. [EU]

Limbic System: A set of forebrain structures common to all mammals that is defined functionally and anatomically. It is implicated in the higher integration of visceral, olfactory, and somatic information as well as homeostatic responses including fundamental survival behaviors (feeding, mating, emotion). For most authors, it includes the amygdala, epithalamus, gyrus cinguli, hippocampal formation (see hippocampus), hypothalamus, parahippocampal gyrus, septal nuclei, anterior nuclear group of thalamus, and portions of the basal ganglia. (Parent, Carpenter's Human Neuroanatomy, 9th ed, p744; NeuroNames, http://rprcsgi.rprc.washington.edu/neuronames/index.html (September 2, 1998)). [NIH]

Linear Models: Statistical models in which the value of a parameter for a given value of a factor is assumed to be equal to a + bx, where a and b are constants. The models predict a linear regression. [NIH]

Linkages: The tendency of two or more genes in the same chromosome to remain together from one generation to the next more frequently than expected according to the law of independent assortment. [NIH]

Lipase: An enzyme of the hydrolase class that catalyzes the reaction of triacylglycerol and water to yield diacylglycerol and a fatty acid anion. It is produced by glands on the tongue

and by the pancreas and initiates the digestion of dietary fats. (From Dorland, 27th ed) EC 3.1.1.3. [NIH]

Lipid: Fat. [NIH]

Lipid Mobilization: The breakdown of stored triglyceride in adipose tissue with the release of free fatty acids and glycerol. Depot fat hydrolysis is catalyzed by a lipase in response to pituitary lipid mobilization factors (LMF), various hormones, serotonin, or hepatotoxins such as carbon tetrachloride. [NIH]

Lipid Peroxidation: Peroxidase catalyzed oxidation of lipids using hydrogen peroxide as an electron acceptor. [NIH]

Lipoprotein: Any of the lipid-protein complexes in which lipids are transported in the blood; lipoprotein particles consist of a spherical hydrophobic core of triglycerides or cholesterol esters surrounded by an amphipathic monolayer of phospholipids, cholesterol, and apolipoproteins; the four principal classes are high-density, low-density, and very-low-density lipoproteins and chylomicrons. [EU]

Liposome: A spherical particle in an aqueous medium, formed by a lipid bilayer enclosing an aqueous compartment. [EU]

Liver: A large, glandular organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile. [NIH]

Liver Cirrhosis: Liver disease in which the normal microcirculation, the gross vascular anatomy, and the hepatic architecture have been variably destroyed and altered with fibrous septa surrounding regenerated or regenerating parenchymal nodules. [NIH]

Liver scan: An image of the liver created on a computer screen or on film. A radioactive substance is injected into a blood vessel and travels through the bloodstream. It collects in the liver, especially in abnormal areas, and can be detected by the scanner. [NIH]

Liver Transplantation: The transference of a part of or an entire liver from one human or animal to another. [NIH]

Localization: The process of determining or marking the location or site of a lesion or disease. May also refer to the process of keeping a lesion or disease in a specific location or site. [NIH]

Localized: Cancer which has not metastasized yet. [NIH]

Lorazepam: An anti-anxiety agent with few side effects. It also has hypnotic, anticonvulsant, and considerable sedative properties and has been proposed as a preanesthetic agent. [NIH]

Low-density lipoprotein: Lipoprotein that contains most of the cholesterol in the blood. LDL carries cholesterol to the tissues of the body, including the arteries. A high level of LDL increases the risk of heart disease. LDL typically contains 60 to 70 percent of the total serum cholesterol and both are directly correlated with CHD risk. [NIH]

Lymph: The almost colorless fluid that travels through the lymphatic system and carries cells that help fight infection and disease. [NIH]

Lymph node: A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Also known as a lymph gland. Lymph nodes are spread out along lymphatic vessels and contain many lymphocytes, which filter the lymphatic fluid (lymph). [NIH]

Lymphatic: The tissues and organs, including the bone marrow, spleen, thymus, and lymph nodes, that produce and store cells that fight infection and disease. [NIH]

Lymphocytes: White blood cells formed in the body's lymphoid tissue. The nucleus is round or ovoid with coarse, irregularly clumped chromatin while the cytoplasm is typically pale

blue with azurophilic (if any) granules. Most lymphocytes can be classified as either T or B (with subpopulations of each); those with characteristics of neither major class are called null cells. [NIH]

Lymphoid: Referring to lymphocytes, a type of white blood cell. Also refers to tissue in which lymphocytes develop. [NIH]

Lymphokines: Soluble protein factors generated by activated lymphocytes that affect other cells, primarily those involved in cellular immunity. [NIH]

Macroglia: A type of neuroglia composed of astrocytes. [NIH]

Macrophage: A type of white blood cell that surrounds and kills microorganisms, removes dead cells, and stimulates the action of other immune system cells. [NIH]

Magnetic Resonance Imaging: Non-invasive method of demonstrating internal anatomy based on the principle that atomic nuclei in a strong magnetic field absorb pulses of radiofrequency energy and emit them as radiowaves which can be reconstructed into computerized images. The concept includes proton spin tomographic techniques. [NIH]

Magnetic Resonance Spectroscopy: Spectroscopic method of measuring the magnetic moment of elementary particles such as atomic nuclei, protons or electrons. It is employed in clinical applications such as NMR Tomography (magnetic resonance imaging). [NIH]

Malabsorption: Impaired intestinal absorption of nutrients. [EU]

Malabsorption syndrome: A group of symptoms such as gas, bloating, abdominal pain, and diarrhea resulting from the body's inability to properly absorb nutrients. [NIH]

Malaria: A protozoan disease caused in humans by four species of the genus Plasmodium (P. falciparum (malaria, falciparum), P. vivax (malaria, vivax), P. ovale, and P. malariae) and transmitted by the bite of an infected female mosquito of the genus Anopheles. Malaria is endemic in parts of Asia, Africa, Central and South America, Oceania, and certain Caribbean islands. It is characterized by extreme exhaustion associated with paroxysms of high fever, sweating, shaking chills, and anemia. Malaria in animals is caused by other species of plasmodia. [NIH]

Malaria, Falciparum: Malaria caused by Plasmodium falciparum. This is the severest form of malaria and is associated with the highest levels of parasites in the blood. This disease is characterized by irregularly recurring febrile paroxysms that in extreme cases occur with acute cerebral, renal, or gastrointestinal manifestations. [NIH]

Malaria, Vivax: Malaria caused by Plasmodium vivax. This form of malaria is less severe than malaria, falciparum, but there is a higher probability for relapses to occur. Febrile paroxysms often occur every other day. [NIH]

Malignant: Cancerous; a growth with a tendency to invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malignant fibrous histiocytoma: A sarcoma that usually begins in soft tissue. It usually appears as an enlarging, painful mass that can cause fracture due to destruction of the bone by a spreading tumor. [NIH]

Malignant tumor: A tumor capable of metastasizing. [NIH]

Manic: Affected with mania. [EU]

Manic-depressive psychosis: One of a group of psychotic reactions, fundamentally marked by severe mood swings and a tendency to remission and recurrence. [NIH]

Manifest: Being the part or aspect of a phenomenon that is directly observable : concretely expressed in behaviour. [EU]

Mannitol: A diuretic and renal diagnostic aid related to sorbitol. It has little significant

energy value as it is largely eliminated from the body before any metabolism can take place. It can be used to treat oliguria associated with kidney failure or other manifestations of inadequate renal function and has been used for determination of glomerular filtration rate. Mannitol is also commonly used as a research tool in cell biological studies, usually to control osmolarity. [NIH]

Maple Syrup Urine Disease: A genetic disorder involving deficiency of an enzyme necessary in the metabolism of branched-chain amino acids, and named for the characteristic odor of the urine. [NIH]

Matrix metalloproteinase: A member of a group of enzymes that can break down proteins, such as collagen, that are normally found in the spaces between cells in tissues (i.e., extracellular matrix proteins). Because these enzymes need zinc or calcium atoms to work properly, they are called metalloproteinases. Matrix metalloproteinases are involved in wound healing, angiogenesis, and tumor cell metastasis. [NIH]

Meat: The edible portions of any animal used for food including domestic mammals (the major ones being cattle, swine, and sheep) along with poultry, fish, shellfish, and game. [NIH]

Meatus: A canal running from the internal auditory foramen through the petrous portion of the temporal bone. It gives passage to the facial and auditory nerves together with the auditory branch of the basilar artery and the internal auditory veins. [NIH]

Mechanical ventilation: Use of a machine called a ventilator or respirator to improve the exchange of air between the lungs and the atmosphere. [NIH]

Medial: Lying near the midsaggital plane of the body; opposed to lateral. [NIH]

Median Nerve: A major nerve of the upper extremity. In humans, the fibers of the median nerve originate in the lower cervical and upper thoracic spinal cord (usually C6 to T1), travel via the brachial plexus, and supply sensory and motor innervation to parts of the forearm and hand. [NIH]

Mediator: An object or substance by which something is mediated, such as (1) a structure of the nervous system that transmits impulses eliciting a specific response; (2) a chemical substance (transmitter substance) that induces activity in an excitable tissue, such as nerve or muscle; or (3) a substance released from cells as the result of the interaction of antigen with antibody or by the action of antigen with a sensitized lymphocyte. [EU]

Medical Staff: Professional medical personnel who provide care to patients in an organized facility, institution or agency. [NIH]

MEDLINE: An online database of MEDLARS, the computerized bibliographic Medical Literature Analysis and Retrieval System of the National Library of Medicine. [NIH]

Meiosis: A special method of cell division, occurring in maturation of the germ cells, by means of which each daughter nucleus receives half the number of chromosomes characteristic of the somatic cells of the species. [NIH]

Membrane: A very thin layer of tissue that covers a surface. [NIH]

Memory: Complex mental function having four distinct phases: (1) memorizing or learning, (2) retention, (3) recall, and (4) recognition. Clinically, it is usually subdivided into immediate, recent, and remote memory. [NIH]

Meninges: The three membranes that cover and protect the brain and spinal cord. [NIH]

Meningitis: Inflammation of the meninges. When it affects the dura mater, the disease is termed pachymeningitis; when the arachnoid and pia mater are involved, it is called leptomeningitis, or meningitis proper. [EU]

Menopause: Permanent cessation of menstruation. [NIH]

Menstrual Cycle: The period of the regularly recurring physiologic changes in the endometrium occurring during the reproductive period in human females and some primates and culminating in partial sloughing of the endometrium (menstruation). [NIH]

Mental: Pertaining to the mind; psychic. 2. (L. mentum chin) pertaining to the chin. [EU]

Mental Disorders: Psychiatric illness or diseases manifested by breakdowns in the adaptational process expressed primarily as abnormalities of thought, feeling, and behavior producing either distress or impairment of function. [NIH]

Mental Health: The state wherein the person is well adjusted. [NIH]

Mental Retardation: Refers to sub-average general intellectual functioning which originated during the developmental period and is associated with impairment in adaptive behavior. [NIH]

Mentors: Senior professionals who provide guidance, direction and support to those persons desirous of improvement in academic positions, administrative positions or other career development situations. [NIH]

Mesencephalic: Ipsilateral oculomotor paralysis and contralateral tremor, spasm. or choreic movements of the face and limbs. [NIH]

Metabolic acidosis: (met-ah-BOL-ik as-id-O-sis): A condition in which the blood is too acidic. It may be caused by severe illness or sepsis (bacteria in the bloodstream). [NIH]

Metabolic disorder: A condition in which normal metabolic processes are disrupted, usually because of a missing enzyme. [NIH]

Metabolite: Any substance produced by metabolism or by a metabolic process. [EU]

Metastasis: The spread of cancer from one part of the body to another. Tumors formed from cells that have spread are called "secondary tumors" and contain cells that are like those in the original (primary) tumor. The plural is metastases. [NIH]

Methacrylate: A vinyl monomer. [NIH]

Methotrexate: An antineoplastic antimetabolite with immunosuppressant properties. It is an inhibitor of dihydrofolate reductase and prevents the formation of tetrahydrofolate, necessary for synthesis of thymidylate, an essential component of DNA. [NIH]

Microbe: An organism which cannot be observed with the naked eye; e. g. unicellular animals, lower algae, lower fungi, bacteria. [NIH]

Microcirculation: The vascular network lying between the arterioles and venules; includes capillaries, metarterioles and arteriovenous anastomoses. Also, the flow of blood through this network. [NIH]

Microdialysis: A technique for measuring extracellular concentrations of substances in tissues, usually in vivo, by means of a small probe equipped with a semipermeable membrane. Substances may also be introduced into the extracellular space through the membrane. [NIH]

Microglia: The third type of glial cell, along with astrocytes and oligodendrocytes (which together form the macroglia). Microglia vary in appearance depending on developmental stage, functional state, and anatomical location; subtype terms include ramified, perivascular, ameboid, resting, and activated. Microglia clearly are capable of phagocytosis and play an important role in a wide spectrum of neuropathologies. They have also been suggested to act in several other roles including in secretion (e.g., of cytokines and neural growth factors), in immunological processing (e.g., antigen presentation), and in central nervous system development and remodeling. [NIH]

Micro-organism: An organism which cannot be observed with the naked eye; e. g.

unicellular animals, lower algae, lower fungi, bacteria. [NIH]

Microscopy: The application of microscope magnification to the study of materials that cannot be properly seen by the unaided eye. [NIH]

Microtubules: Slender, cylindrical filaments found in the cytoskeleton of plant and animal cells. They are composed of the protein tubulin. [NIH]

Migration: The systematic movement of genes between populations of the same species, geographic race, or variety. [NIH]

Mineralocorticoids: A group of corticosteroids primarily associated with the regulation of water and electrolyte balance. This is accomplished through the effect on ion transport in renal tubules, resulting in retention of sodium and loss of potassium. Mineralocorticoid secretion is itself regulated by plasma volume, serum potassium, and angiotensin II. [NIH]

Mitochondria: Parts of a cell where aerobic production (also known as cell respiration) takes place. [NIH]

Mitochondrial Swelling: Increase in volume of mitochondria due to an influx of fluid; it occurs in hypotonic solutions due to osmotic pressure and in isotonic solutions as a result of altered permeability of the membranes of respiring mitochondria. [NIH]

Mitosis: A method of indirect cell division by means of which the two daughter nuclei normally receive identical complements of the number of chromosomes of the somatic cells of the species. [NIH]

Mitotic: Cell resulting from mitosis. [NIH]

Mitotic inhibitors: Drugs that kill cancer cells by interfering with cell division (mitostis). [NIH]

Mobility: Capability of movement, of being moved, or of flowing freely. [EU]

Modeling: A treatment procedure whereby the therapist presents the target behavior which the learner is to imitate and make part of his repertoire. [NIH]

Modification: A change in an organism, or in a process in an organism, that is acquired from its own activity or environment. [NIH]

Modulator: A specific inductor that brings out characteristics peculiar to a definite region. [EU]

Molecular: Of, pertaining to, or composed of molecules : a very small mass of matter. [EU]

Molecular Structure: The location of the atoms, groups or ions relative to one another in a molecule, as well as the number, type and location of covalent bonds. [NIH]

Molecule: A chemical made up of two or more atoms. The atoms in a molecule can be the same (an oxygen molecule has two oxygen atoms) or different (a water molecule has two hydrogen atoms and one oxygen atom). Biological molecules, such as proteins and DNA, can be made up of many thousands of atoms. [NIH]

Monitor: An apparatus which automatically records such physiological signs as respiration, pulse, and blood pressure in an anesthetized patient or one undergoing surgical or other procedures. [NIH]

Monoclonal: An antibody produced by culturing a single type of cell. It therefore consists of a single species of immunoglobulin molecules. [NIH]

Monoclonal antibodies: Laboratory-produced substances that can locate and bind to cancer cells wherever they are in the body. Many monoclonal antibodies are used in cancer detection or therapy; each one recognizes a different protein on certain cancer cells. Monoclonal antibodies can be used alone, or they can be used to deliver drugs, toxins, or radioactive material directly to a tumor. [NIH]

Monocytes: Large, phagocytic mononuclear leukocytes produced in the vertebrate bone marrow and released into the blood; contain a large, oval or somewhat indented nucleus surrounded by voluminous cytoplasm and numerous organelles. [NIH]

Mononuclear: A cell with one nucleus. [NIH]

Morphine: The principal alkaloid in opium and the prototype opiate analgesic and narcotic. Morphine has widespread effects in the central nervous system and on smooth muscle. [NIH]

Morphological: Relating to the configuration or the structure of live organs. [NIH]

Morphology: The science of the form and structure of organisms (plants, animals, and other forms of life). [NIH]

Motility: The ability to move spontaneously. [EU]

Motion Sickness: Sickness caused by motion, as sea sickness, train sickness, car sickness, and air sickness. [NIH]

Motor nerve: An efferent nerve conveying an impulse that excites muscular contraction. [NIH]

Movement Disorders: Syndromes which feature dyskinesias as a cardinal manifestation of the disease process. Included in this category are degenerative, hereditary, post-infectious, medication-induced, post-inflammatory, and post-traumatic conditions. [NIH]

Mucinous: Containing or resembling mucin, the main compound in mucus. [NIH]

Mucus: The viscous secretion of mucous membranes. It contains mucin, white blood cells, water, inorganic salts, and exfoliated cells. [NIH]

Music Therapy: The use of music as an adjunctive therapy in the treatment of neurological, mental, or behavioral disorders. [NIH]

Myalgia: Pain in a muscle or muscles. [EU]

Myocardial infarction: Gross necrosis of the myocardium as a result of interruption of the blood supply to the area; it is almost always caused by atherosclerosis of the coronary arteries, upon which coronary thrombosis is usually superimposed. [NIH]

Myocardial Ischemia: A disorder of cardiac function caused by insufficient blood flow to the muscle tissue of the heart. The decreased blood flow may be due to narrowing of the coronary arteries (coronary arteriosclerosis), to obstruction by a thrombus (coronary thrombosis), or less commonly, to diffuse narrowing of arterioles and other small vessels within the heart. Severe interruption of the blood supply to the myocardial tissue may result in necrosis of cardiac muscle (myocardial infarction). [NIH]

Myocardium: The muscle tissue of the heart composed of striated, involuntary muscle known as cardiac muscle. [NIH]

Myoclonus: Involuntary shock-like contractions, irregular in rhythm and amplitude, followed by relaxation, of a muscle or a group of muscles. This condition may be a feature of some central nervous systems diseases (e.g., epilepsy, myoclonic). Nocturnal myoclonus may represent a normal physiologic event or occur as the principal feature of the nocturnal myoclonus syndrome. (From Adams et al., Principles of Neurology, 6th ed, pp102-3). [NIH]

Myoglobin: A conjugated protein which is the oxygen-transporting pigment of muscle. It is made up of one globin polypeptide chain and one heme group. [NIH]

Myopathy: Any disease of a muscle. [EU]

Myopia: That error of refraction in which rays of light entering the eye parallel to the optic axis are brought to a focus in front of the retina, as a result of the eyeball being too long from front to back (axial m.) or of an increased strength in refractive power of the media of the eye (index m.). Called also nearsightedness, because the near point is less distant than it is in

emmetropia with an equal amplitude of accommodation. [EU]

Myotonic Dystrophy: A condition presenting muscle weakness and wasting which may be progressive. [NIH]

Myxedema: A condition characterized by a dry, waxy type of swelling with abnormal deposits of mucin in the skin and other tissues. It is produced by a functional insufficiency of the thyroid gland, resulting in deficiency of thyroid hormone. The skin becomes puffy around the eyes and on the cheeks and the face is dull and expressionless with thickened nose and lips. The congenital form of the disease is cretinism. [NIH]

Naloxone: A specific opiate antagonist that has no agonist activity. It is a competitive antagonist at mu, delta, and kappa opioid receptors. [NIH]

Narcolepsy: A condition of unknown cause characterized by a periodic uncontrollable tendency to fall asleep. [NIH]

Narcosis: A general and nonspecific reversible depression of neuronal excitability, produced by a number of physical and chemical aspects, usually resulting in stupor. [NIH]

Narcotic: 1. Pertaining to or producing narcosis. 2. An agent that produces insensibility or stupor, applied especially to the opioids, i.e. to any natural or synthetic drug that has morphine-like actions. [EU]

Nasal Mucosa: The mucous membrane lining the nasal cavity. [NIH]

Natural killer cells: NK cells. A type of white blood cell that contains granules with enzymes that can kill tumor cells or microbial cells. Also called large granular lymphocytes (LGL). [NIH]

Nausea: An unpleasant sensation in the stomach usually accompanied by the urge to vomit. Common causes are early pregnancy, sea and motion sickness, emotional stress, intense pain, food poisoning, and various enteroviruses. [NIH]

NCI: National Cancer Institute. NCI, part of the National Institutes of Health of the United States Department of Health and Human Services, is the federal government's principal agency for cancer research. NCI conducts, coordinates, and funds cancer research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer. Access the NCI Web site at http://cancer.gov. [NIH]

Nearsightedness: The common term for myopia. [NIH]

Necrosis: A pathological process caused by the progressive degradative action of enzymes that is generally associated with severe cellular trauma. It is characterized by mitochondrial swelling, nuclear flocculation, uncontrolled cell lysis, and ultimately cell death. [NIH]

Neonatal: Pertaining to the first four weeks after birth. [EU]

Neonatal Hepatitis: Irritation of the liver with no known cause. Occurs in newborn babies. Symptoms include jaundice and liver cell changes. [NIH]

Neoplasm: A new growth of benign or malignant tissue. [NIH]

Nephrectomy: Surgery to remove a kidney. Radical nephrectomy removes the kidney, the adrenal gland, nearby lymph nodes, and other surrounding tissue. Simple nephrectomy removes only the kidney. Partial nephrectomy removes the tumor but not the entire kidney. [NIH]

Nephrology: A subspecialty of internal medicine concerned with the anatomy, physiology, and pathology of the kidney. [NIH]

Nephropathy: Disease of the kidneys. [EU]

Nephrosis: Descriptive histopathologic term for renal disease without an inflammatory component. [NIH]

Nephrotic: Pertaining to, resembling, or caused by nephrosis. [EU]

Nephrotic Syndrome: Clinical association of heavy proteinuria, hypoalbuminemia, and generalized edema. [NIH]

Nerve Growth Factor: Nerve growth factor is the first of a series of neurotrophic factors that were found to influence the growth and differentiation of sympathetic and sensory neurons. It is comprised of alpha, beta, and gamma subunits. The beta subunit is responsible for its growth stimulating activity. [NIH]

Nervous System: The entire nerve apparatus composed of the brain, spinal cord, nerves and ganglia. [NIH]

Networks: Pertaining to a nerve or to the nerves, a meshlike structure of interlocking fibers or strands. [NIH]

Neural: 1. Pertaining to a nerve or to the nerves. 2. Situated in the region of the spinal axis, as the neutral arch. [EU]

Neurobehavioral Manifestations: Signs and symptoms of higher cortical dysfunction caused by organic conditions. These include certain behavioral alterations and impairments of skills involved in the acquisition, processing, and utilization of knowledge or information. [NIH]

Neuroblastoma: Cancer that arises in immature nerve cells and affects mostly infants and children. [NIH]

Neuroendocrinology: The study of the anatomical and functional relationships between the nervous system and the endocrine system. [NIH]

Neurofilaments: Bundle of neuronal fibers. [NIH]

Neurogenic: Loss of bladder control caused by damage to the nerves controlling the bladder. [NIH]

Neurologic: Having to do with nerves or the nervous system. [NIH]

Neurologic Manifestations: Clinical signs and symptoms caused by nervous system injury or dysfunction. [NIH]

Neurologist: A doctor who specializes in the diagnosis and treatment of disorders of the nervous system. [NIH]

Neurology: A medical specialty concerned with the study of the structures, functions, and diseases of the nervous system. [NIH]

Neuronal: Pertaining to a neuron or neurons (= conducting cells of the nervous system). [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neuropathy: A problem in any part of the nervous system except the brain and spinal cord. Neuropathies can be caused by infection, toxic substances, or disease. [NIH]

Neurophysiology: The scientific discipline concerned with the physiology of the nervous system. [NIH]

Neuropsychological Tests: Tests designed to assess neurological function associated with certain behaviors. They are used in diagnosing brain dysfunction or damage and central nervous system disorders or injury. [NIH]

Neurosecretory Systems: A system of neurons that has the specialized function to produce and secrete hormones, and that constitutes, in whole or in part, an endocrine organ or system. [NIH]

Neurosurgeon: A doctor who specializes in surgery on the brain, spine, and other parts of the nervous system. [NIH]

Neurotoxicity: The tendency of some treatments to cause damage to the nervous system. [NIH]

Neurotoxin: A substance that is poisonous to nerve tissue. [NIH]

Neurotransmitter: Any of a group of substances that are released on excitation from the axon terminal of a presynaptic neuron of the central or peripheral nervous system and travel across the synaptic cleft to either excite or inhibit the target cell. Among the many substances that have the properties of a neurotransmitter are acetylcholine, norepinephrine, epinephrine, dopamine, glycine, y-aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Neurotrophin 3: A neurotrophic factor involved in regulating the survival of visceral and proprioceptive sensory neurons. It is closely homologous to nerve growth factor beta and brain-derived neurotrophic factor. [NIH]

Neutrons: Electrically neutral elementary particles found in all atomic nuclei except light hydrogen; the mass is equal to that of the proton and electron combined and they are unstable when isolated from the nucleus, undergoing beta decay. Slow, thermal, epithermal, and fast neutrons refer to the energy levels with which the neutrons are ejected from heavier nuclei during their decay. [NIH]

Neutrophil: A type of white blood cell. [NIH]

Niacin: Water-soluble vitamin of the B complex occurring in various animal and plant tissues. Required by the body for the formation of coenzymes NAD and NADP. Has pellagra-curative, vasodilating, and antilipemic properties. [NIH]

Nitric Oxide: A free radical gas produced endogenously by a variety of mammalian cells. It is synthesized from arginine by a complex reaction, catalyzed by nitric oxide synthase. Nitric oxide is endothelium-derived relaxing factor. It is released by the vascular endothelium and mediates the relaxation induced by some vasodilators such as acetylcholine and bradykinin. It also inhibits platelet aggregation, induces disaggregation of aggregated platelets, and inhibits platelet adhesion to the vascular endothelium. Nitric oxide activates cytosolic guanylate cyclase and thus elevates intracellular levels of cyclic GMP. [NIH]

Nitrogen: An element with the atomic symbol N, atomic number 7, and atomic weight 14. Nitrogen exists as a diatomic gas and makes up about 78% of the earth's atmosphere by volume. It is a constituent of proteins and nucleic acids and found in all living cells. [NIH]

Nonverbal Communication: Transmission of emotions, ideas, and attitudes between individuals in ways other than the spoken language. [NIH]

Norepinephrine: Precursor of epinephrine that is secreted by the adrenal medulla and is a widespread central and autonomic neurotransmitter. Norepinephrine is the principal transmitter of most postganglionic sympathetic fibers and of the diffuse projection system in the brain arising from the locus ceruleus. It is also found in plants and is used pharmacologically as a sympathomimetic. [NIH]

Nuclear: A test of the structure, blood flow, and function of the kidneys. The doctor injects a mildly radioactive solution into an arm vein and uses x-rays to monitor its progress through the kidneys. [NIH]

Nuclei: A body of specialized protoplasm found in nearly all cells and containing the chromosomes. [NIH]

Nucleic acid: Either of two types of macromolecule (DNA or RNA) formed by polymerization of nucleotides. Nucleic acids are found in all living cells and contain the

information (genetic code) for the transfer of genetic information from one generation to the next. [NIH]

Nucleic Acid Hybridization: The process whereby two single-stranded polynucleotides form a double-stranded molecule, with hydrogen bonding between the complementary bases in the two strains. [NIH]

Nucleus: A body of specialized protoplasm found in nearly all cells and containing the chromosomes. [NIH]

Nursing Care: Care given to patients by nursing service personnel. [NIH]

Nutritional Support: The administration of nutrients for assimilation and utilization by a patient by means other than normal eating. It does not include fluid therapy which normalizes body fluids to restore water-electrolyte balance. [NIH]

Ocular: 1. Of, pertaining to, or affecting the eye. 2. Eyepiece. [EU]

Oculomotor: Cranial nerve III. It originate from the lower ventral surface of the midbrain and is classified as a motor nerve. [NIH]

Ointments: Semisolid preparations used topically for protective emollient effects or as a vehicle for local administration of medications. Ointment bases are various mixtures of fats, waxes, animal and plant oils and solid and liquid hydrocarbons. [NIH]

Oliguria: Clinical manifestation of the urinary system consisting of a decrease in the amount of urine secreted. [NIH]

Opacity: Degree of density (area most dense taken for reading). [NIH]

Operating Rooms: Facilities equipped for performing surgery. [NIH]

Operon: The genetic unit consisting of a feedback system under the control of an operator gene, in which a structural gene transcribes its message in the form of mRNA upon blockade of a repressor produced by a regulator gene. Included here is the attenuator site of bacterial operons where transcription termination is regulated. [NIH]

Ophthalmic: Pertaining to the eye. [EU]

Ophthalmoscopes: Instrument for viewing the fundus and the interior of the eye consisting essentially of a mirror, a prism, and a viewing aperture or optical system. [NIH]

Opiate: A remedy containing or derived from opium; also any drug that induces sleep. [EU]

Opium: The air-dried exudate from the unripe seed capsule of the opium poppy, Papaver somniferum, or its variant, P. album. It contains a number of alkaloids, but only a few - morphine, codeine, and papaverine - have clinical significance. Opium has been used as an analgesic, antitussive, antidiarrheal, and antispasmodic. [NIH]

Opsin: A protein formed, together with retinene, by the chemical breakdown of meta-rhodopsin. [NIH]

Optic Chiasm: The X-shaped structure formed by the meeting of the two optic nerves. At the optic chiasm the fibers from the medial part of each retina cross to project to the other side of the brain while the lateral retinal fibers continue on the same side. As a result each half of the brain receives information about the contralateral visual field from both eyes. [NIH]

Optic Disk: The portion of the optic nerve seen in the fundus with the ophthalmoscope. It is formed by the meeting of all the retinal ganglion cell axons as they enter the optic nerve. [NIH]

Optic Nerve: The 2nd cranial nerve. The optic nerve conveys visual information from the retina to the brain. The nerve carries the axons of the retinal ganglion cells which sort at the optic chiasm and continue via the optic tracts to the brain. The largest projection is to the

lateral geniculate nuclei; other important targets include the superior colliculi and the suprachiasmatic nuclei. Though known as the second cranial nerve, it is considered part of the central nervous system. [NIH]

Oral Health: The optimal state of the mouth and normal functioning of the organs of the mouth without evidence of disease. [NIH]

Organ Culture: The growth in aseptic culture of plant organs such as roots or shoots, beginning with organ primordia or segments and maintaining the characteristics of the organ. [NIH]

Organelles: Specific particles of membrane-bound organized living substances present in eukaryotic cells, such as the mitochondria; the golgi apparatus; endoplasmic reticulum; lysomomes; plastids; and vacuoles. [NIH]

Ornithine: An amino acid produced in the urea cycle by the splitting off of urea from arginine. [NIH]

Ornithine Carbamoyltransferase: A urea cycle enzyme that catalyzes the formation of orthophosphate and L-citrulline from carbamoyl phosphate and L-ornithine. Deficiency of this enzyme may be transmitted as an X-linked trait. EC 2.1.3.3. [NIH]

Orthodontics: A dental specialty concerned with the prevention and correction of dental and oral anomalies (malocclusion). [NIH]

Osmolarity: The concentration of osmotically active particles expressed in terms of osmoles of solute per litre of solution. [EU]

Ossification: The formation of bone or of a bony substance; the conversion of fibrous tissue or of cartilage into bone or a bony substance. [EU]

Osteogenic sarcoma: A malignant tumor of the bone. Also called osteosarcoma. [NIH]

Osteosarcoma: A cancer of the bone that affects primarily children and adolescents. Also called osteogenic sarcoma. [NIH]

Outpatient: A patient who is not an inmate of a hospital but receives diagnosis or treatment in a clinic or dispensary connected with the hospital. [NIH]

Ovaries: The pair of female reproductive glands in which the ova, or eggs, are formed. The ovaries are located in the pelvis, one on each side of the uterus. [NIH]

Overdose: An accidental or deliberate dose of a medication or street drug that is in excess of what is normally used. [NIH]

Ovum: A female germ cell extruded from the ovary at ovulation. [NIH]

Ownership: The legal relation between an entity (individual, group, corporation, or-profit, secular, government) and an object. The object may be corporeal, such as equipment, or completely a creature of law, such as a patent; it may be movable, such as an animal, or immovable, such as a building. [NIH]

Oxidation: The act of oxidizing or state of being oxidized. Chemically it consists in the increase of positive charges on an atom or the loss of negative charges. Most biological oxidations are accomplished by the removal of a pair of hydrogen atoms (dehydrogenation) from a molecule. Such oxidations must be accompanied by reduction of an acceptor molecule. Univalent o. indicates loss of one electron; divalent o., the loss of two electrons. [EU]

Oxidative Stress: A disturbance in the prooxidant-antioxidant balance in favor of the former, leading to potential damage. Indicators of oxidative stress include damaged DNA bases, protein oxidation products, and lipid peroxidation products (Sies, Oxidative Stress, 1991, pxv-xvi). [NIH]

Oximetry: The determination of oxygen-hemoglobin saturation of blood either by withdrawing a sample and passing it through a classical photoelectric oximeter or by electrodes attached to some translucent part of the body like finger, earlobe, or skin fold. It includes non-invasive oxygen monitoring by pulse oximetry. [NIH]

Oxygen Consumption: The oxygen consumption is determined by calculating the difference between the amount of oxygen inhaled and exhaled. [NIH]

Oxygenation: The process of supplying, treating, or mixing with oxygen. No:1245 - oxygenation the process of supplying, treating, or mixing with oxygen. [EU]

Oxygenator: An apparatus by which oxygen is introduced into the blood during circulation outside the body, as during open heart surgery. [NIH]

Pachymeningitis: Inflammation of the dura mater of the brain, the spinal cord or the optic nerve. [NIH]

Paclitaxel: Antineoplastic agent isolated from the bark of the Pacific yew tree, Taxus brevifolia. Paclitaxel stabilizes microtubules in their polymerized form and thus mimics the action of the proto-oncogene proteins c-mos. [NIH]

Paediatric: Of or relating to the care and medical treatment of children; belonging to or concerned with paediatrics. [EU]

Palliative: 1. Affording relief, but not cure. 2. An alleviating medicine. [EU]

Palsy: Disease of the peripheral nervous system occurring usually after many years of increased lead absorption. [NIH]

Pancreas: A mixed exocrine and endocrine gland situated transversely across the posterior abdominal wall in the epigastric and hypochondriac regions. The endocrine portion is comprised of the Islets of Langerhans, while the exocrine portion is a compound acinar gland that secretes digestive enzymes. [NIH]

Pancreas Transplant: A surgical procedure that involves replacing the pancreas of a person who has diabetes with a healthy pancreas that can make insulin. The healthy pancreas comes from a donor who has just died or from a living relative. A person can donate half a pancreas and still live normally. [NIH]

Pancreas Transplantation: The transference of a pancreas from one human or animal to another. [NIH]

Pancreatic: Having to do with the pancreas. [NIH]

Pancreatitis: Acute or chronic inflammation of the pancreas, which may be asymptomatic or symptomatic, and which is due to autodigestion of a pancreatic tissue by its own enzymes. It is caused most often by alcoholism or biliary tract disease; less commonly it may be associated with hyperlipaemia, hyperparathyroidism, abdominal trauma (accidental or operative injury), vasculitis, or uraemia. [EU]

Paralysis: Loss of ability to move all or part of the body. [NIH]

Parasite: An animal or a plant that lives on or in an organism of another species and gets at least some of its nutrition from that other organism. [NIH]

Parasitic: Having to do with or being a parasite. A parasite is an animal or a plant that lives on or in an organism of another species and gets at least some of its nutrients from it. [NIH]

Parathyroid: 1. Situated beside the thyroid gland. 2. One of the parathyroid glands. 3. A sterile preparation of the water-soluble principle(s) of the parathyroid glands, ad-ministered parenterally as an antihypocalcaemic, especially in the treatment of acute hypoparathyroidism with tetany. [EU]

Parathyroid Glands: Two small paired endocrine glands in the region of the thyroid gland.

They secrete parathyroid hormone and are concerned with the metabolism of calcium and phosphorus. [NIH]

Parathyroid hormone: A substance made by the parathyroid gland that helps the body store and use calcium. Also called parathormone, parathyrin, or PTH. [NIH]

Parenteral: Not through the alimentary canal but rather by injection through some other route, as subcutaneous, intramuscular, intraorbital, intracapsular, intraspinal, intrasternal, intravenous, etc. [EU]

Parietal: 1. Of or pertaining to the walls of a cavity. 2. Pertaining to or located near the parietal bone, as the parietal lobe. [EU]

Parietal Lobe: Upper central part of the cerebral hemisphere. [NIH]

Paroxysmal: Recurring in paroxysms (= spasms or seizures). [EU]

Partial response: A decrease in the size of a tumor, or in the extent of cancer in the body, in response to treatment. [NIH]

Particle: A tiny mass of material. [EU]

Patch: A piece of material used to cover or protect a wound, an injured part, etc.: a patch over the eye. [NIH]

Pathologic: 1. Indicative of or caused by a morbid condition. 2. Pertaining to pathology (= branch of medicine that treats the essential nature of the disease, especially the structural and functional changes in tissues and organs of the body caused by the disease). [EU]

Pathophysiology: Altered functions in an individual or an organ due to disease. [NIH]

Patient Education: The teaching or training of patients concerning their own health needs. [NIH]

PDQ: Physician Data Query. PDQ is an online database developed and maintained by the National Cancer Institute. Designed to make the most current, credible, and accurate cancer information available to health professionals and the public, PDQ contains peer-reviewed summaries on cancer treatment, screening, prevention, genetics, and supportive care; a registry of cancer clinical trials from around the world; and directories of physicians, professionals who provide genetics services, and organizations that provide cancer care. Most of this information is available on the CancerNet Web site, and more specific information about PDQ can be found at http://cancernet.nci.nih.gov/pdq.html. [NIH]

Pelvis: The lower part of the abdomen, located between the hip bones. [NIH]

Penicillin: An antibiotic drug used to treat infection. [NIH]

Peptide: Any compound consisting of two or more amino acids, the building blocks of proteins. Peptides are combined to make proteins. [NIH]

Peptide T: N-(N-(N(2)-(N-(N-(N-(N-D-Alanyl L-seryl)-L-threonyl)-L-threonyl) L-threonyl)-L-asparaginyl)-L-tyrosyl) L-threonine. Octapeptide sharing sequence homology with HIV envelope protein gp120. It is potentially useful as antiviral agent in AIDS therapy. The core pentapeptide sequence, TTNYT, consisting of amino acids 4-8 in peptide T, is the HIV envelope sequence required for attachment to the CD4 receptor. [NIH]

Perception: The ability quickly and accurately to recognize similarities and differences among presented objects, whether these be pairs of words, pairs of number series, or multiple sets of these or other symbols such as geometric figures. [NIH]

Percutaneous: Performed through the skin, as injection of radiopacque material in radiological examination, or the removal of tissue for biopsy accomplished by a needle. [EU]

Perfusion: Bathing an organ or tissue with a fluid. In regional perfusion, a specific area of the body (usually an arm or a leg) receives high doses of anticancer drugs through a blood

vessel. Such a procedure is performed to treat cancer that has not spread. [NIH]

Periodontal disease: Disease involving the supporting structures of the teeth (as the gums and periodontal membranes). [NIH]

Periodontal disease: Disease involving the supporting structures of the teeth (as the gums and periodontal membranes). [NIH]

Peripheral Nervous System: The nervous system outside of the brain and spinal cord. The peripheral nervous system has autonomic and somatic divisions. The autonomic nervous system includes the enteric, parasympathetic, and sympathetic subdivisions. The somatic nervous system includes the cranial and spinal nerves and their ganglia and the peripheral sensory receptors. [NIH]

Peripheral Vascular Disease: Disease in the large blood vessels of the arms, legs, and feet. People who have had diabetes for a long time may get this because major blood vessels in their arms, legs, and feet are blocked and these limbs do not receive enough blood. The signs of PVD are aching pains in the arms, legs, and feet (especially when walking) and foot sores that heal slowly. Although people with diabetes cannot always avoid PVD, doctors say they have a better chance of avoiding it if they take good care of their feet, do not smoke, and keep both their blood pressure and diabetes under good control. [NIH]

Peritoneal: Having to do with the peritoneum (the tissue that lines the abdominal wall and covers most of the organs in the abdomen). [NIH]

Peritoneal Cavity: The space enclosed by the peritoneum. It is divided into two portions, the greater sac and the lesser sac or omental bursa, which lies behind the stomach. The two sacs are connected by the foramen of Winslow, or epiploic foramen. [NIH]

Peritoneal Dialysis: Dialysis fluid being introduced into and removed from the peritoneal cavity as either a continuous or an intermittent procedure. [NIH]

Peritoneum: Endothelial lining of the abdominal cavity, the parietal peritoneum covering the inside of the abdominal wall and the visceral peritoneum covering the bowel, the mesentery, and certain of the organs. The portion that covers the bowel becomes the serosal layer of the bowel wall. [NIH]

Perivascular: Situated around a vessel. [EU]

Pertussis: An acute, highly contagious infection of the respiratory tract, most frequently affecting young children, usually caused by Bordetella pertussis; a similar illness has been associated with infection by B. parapertussis and B. bronchiseptica. It is characterized by a catarrhal stage, beginning after an incubation period of about two weeks, with slight fever, sneezing, running at the nose, and a dry cough. In a week or two the paroxysmal stage begins, with the characteristic paroxysmal cough, consisting of a deep inspiration, followed by a series of quick, short coughs, continuing until the air is expelled from the lungs; the close of the paroxysm is marked by a long-drawn, shrill, whooping inspiration, due to spasmodic closure of the glottis. This stage lasts three to four weeks, after which the convalescent stage begins, in which paroxysms grow less frequent and less violent, and finally cease. Called also whooping cough. [EU]

Petechiae: Pinpoint, unraised, round red spots under the skin caused by bleeding. [NIH]

Phagocytosis: The engulfing of microorganisms, other cells, and foreign particles by phagocytic cells. [NIH]

Phantom: Used to absorb and/or scatter radiation equivalently to a patient, and hence to estimate radiation doses and test imaging systems without actually exposing a patient. It may be an anthropomorphic or a physical test object. [NIH]

Pharmaceutical Preparations: Drugs intended for human or veterinary use, presented in

their finished dosage form. Included here are materials used in the preparation and/or formulation of the finished dosage form. [NIH]

Pharmacokinetic: The mathematical analysis of the time courses of absorption, distribution, and elimination of drugs. [NIH]

Pharmacologic: Pertaining to pharmacology or to the properties and reactions of drugs. [EU]

Pharynx: The hollow tube about 5 inches long that starts behind the nose and ends at the top of the trachea (windpipe) and esophagus (the tube that goes to the stomach). [NIH]

Phenotype: The outward appearance of the individual. It is the product of interactions between genes and between the genotype and the environment. This includes the killer phenotype, characteristic of yeasts. [NIH]

Pheromones: Chemical substances which, when secreted by an individual into the environment, cause specific reactions in other individuals, usually of the same species. The substances relate only to multicellular organisms. This includes kairomones. Allomones are repellent pheromones. [NIH]

Phospholipases: A class of enzymes that catalyze the hydrolysis of phosphoglycerides or glycerophosphatidates. EC 3.1.-. [NIH]

Phospholipids: Lipids containing one or more phosphate groups, particularly those derived from either glycerol (phosphoglycerides; glycerophospholipids) or sphingosine (sphingolipids). They are polar lipids that are of great importance for the structure and function of cell membranes and are the most abundant of membrane lipids, although not stored in large amounts in the system. [NIH]

Phosphorus: A non-metallic element that is found in the blood, muscles, nevers, bones, and teeth, and is a component of adenosine triphosphate (ATP; the primary energy source for the body's cells.) [NIH]

Phosphorylated: Attached to a phosphate group. [NIH]

Physical Examination: Systematic and thorough inspection of the patient for physical signs of disease or abnormality. [NIH]

Physical Fitness: A state of well-being in which performance is optimal, often as a result of physical conditioning which may be prescribed for disease therapy. [NIH]

Physiologic: Having to do with the functions of the body. When used in the phrase "physiologic age," it refers to an age assigned by general health, as opposed to calendar age. [NIH]

Physiology: The science that deals with the life processes and functions of organismus, their cells, tissues, and organs. [NIH]

Physostigmine: A cholinesterase inhibitor that is rapidly absorbed through membranes. It can be applied topically to the conjunctiva. It also can cross the blood-brain barrier and is used when central nervous system effects are desired, as in the treatment of severe anticholinergic toxicity. [NIH]

Pigment: A substance that gives color to tissue. Pigments are responsible for the color of skin, eyes, and hair. [NIH]

Pilot study: The initial study examining a new method or treatment. [NIH]

Pitch: The subjective awareness of the frequency or spectral distribution of a sound. [NIH]

Pituitary Gland: A small, unpaired gland situated in the sella turcica tissue. It is connected to the hypothalamus by a short stalk. [NIH]

Placenta: A highly vascular fetal organ through which the fetus absorbs oxygen and other nutrients and excretes carbon dioxide and other wastes. It begins to form about the eighth

day of gestation when the blastocyst adheres to the decidua. [NIH]

Plants: Multicellular, eukaryotic life forms of the kingdom Plantae. They are characterized by a mainly photosynthetic mode of nutrition; essentially unlimited growth at localized regions of cell divisions (meristems); cellulose within cells providing rigidity; the absence of organs of locomotion; absense of nervous and sensory systems; and an alteration of haploid and diploid generations. [NIH]

Plaque: A clear zone in a bacterial culture grown on an agar plate caused by localized destruction of bacterial cells by a bacteriophage. The concentration of infective virus in a fluid can be estimated by applying the fluid to a culture and counting the number of. [NIH]

Plasma: The clear, yellowish, fluid part of the blood that carries the blood cells. The proteins that form blood clots are in plasma. [NIH]

Plasma cells: A type of white blood cell that produces antibodies. [NIH]

Plasma Exchange: Removal of plasma and replacement with various fluids, e.g., fresh frozen plasma, plasma protein fractions (PPF), albumin preparations, dextran solutions, saline. Used in treatment of autoimmune diseases, immune complex diseases, diseases of excess plasma factors, and other conditions. [NIH]

Plasma protein: One of the hundreds of different proteins present in blood plasma, including carrier proteins (such albumin, transferrin, and haptoglobin), fibrinogen and other coagulation factors, complement components, immunoglobulins, enzyme inhibitors, precursors of substances such as angiotension and bradykinin, and many other types of proteins. [EU]

Plasma Volume: Volume of plasma in the circulation. It is usually measured by indicator dilution techniques. [NIH]

Plasmapheresis: Procedure whereby plasma is separated and extracted from anticoagulated whole blood and the red cells retransfused to the donor. Plasmapheresis is also employed for therapeutic use. [NIH]

Plasticity: In an individual or a population, the capacity for adaptation: a) through gene changes (genetic plasticity) or b) through internal physiological modifications in response to changes of environment (physiological plasticity). [NIH]

Plastids: Self-replicating cytoplasmic organelles of plant and algal cells that contain pigments and may synthesize and accumulate various substances. Plastids are used in phylogenetic studies. [NIH]

Platelet Activation: A series of progressive, overlapping events triggered by exposure of the platelets to subendothelial tissue. These events include shape change, adhesiveness, aggregation, and release reactions. When carried through to completion, these events lead to the formation of a stable hemostatic plug. [NIH]

Platelet Aggregation: The attachment of platelets to one another. This clumping together can be induced by a number of agents (e.g., thrombin, collagen) and is part of the mechanism leading to the formation of a thrombus. [NIH]

Platelets: A type of blood cell that helps prevent bleeding by causing blood clots to form. Also called thrombocytes. [NIH]

Pneumonia: Inflammation of the lungs. [NIH]

Podophyllin: Caustic extract from the roots of Podophyllum peltatum and P. emodi. It contains podophyllotoxin and its congeners and is very irritating to mucous membranes and skin. Podophyllin is a violent purgative that may cause CNS damage and teratogenesis. It is used as a paint for warts, skin neoplasms, and senile keratoses. [NIH]

Podophyllotoxin: The main active constituent of the resin from the roots of may apple or mandrake (Podophyllum peltatum and P. emodi). It is a potent spindle poison, toxic if taken internally, and has been used as a cathartic. It is very irritating to skin and mucous membranes, has keratolytic actions, has been used to treat warts and keratoses, and may have antineoplastic properties, as do some of its congeners and derivatives. [NIH]

Point Mutation: A mutation caused by the substitution of one nucleotide for another. This results in the DNA molecule having a change in a single base pair. [NIH]

Poisoning: A condition or physical state produced by the ingestion, injection or inhalation of, or exposure to a deleterious agent. [NIH]

Polymerase: An enzyme which catalyses the synthesis of DNA using a single DNA strand as a template. The polymerase copies the template in the 5'-3'direction provided that sufficient quantities of free nucleotides, dATP and dTTP are present. [NIH]

Polymers: Compounds formed by the joining of smaller, usually repeating, units linked by covalent bonds. These compounds often form large macromolecules (e.g., polypeptides, proteins, plastics). [NIH]

Polypeptide: A peptide which on hydrolysis yields more than two amino acids; called tripeptides, tetrapeptides, etc. according to the number of amino acids contained. [EU]

Polysaccharide: A type of carbohydrate. It contains sugar molecules that are linked together chemically. [NIH]

Pons: The part of the central nervous system lying between the medulla oblongata and the mesencephalon, ventral to the cerebellum, and consisting of a pars dorsalis and a pars ventralis. [NIH]

Population Density: Number of individuals in a population relative to space. [NIH]

Portal Hypertension: High blood pressure in the portal vein. This vein carries blood into the liver. Portal hypertension is caused by a blood clot. This is a common complication of cirrhosis. [NIH]

Portal Pressure: The venous pressure measured in the portal vein. [NIH]

Portal Vein: A short thick vein formed by union of the superior mesenteric vein and the splenic vein. [NIH]

Portosystemic Shunt: An operation to create an opening between the portal vein and other veins around the liver. [NIH]

Positive pressure ventilation: Provision of oxygen under pressure by a mechanical respirator. [NIH]

Posterior: Situated in back of, or in the back part of, or affecting the back or dorsal surface of the body. In lower animals, it refers to the caudal end of the body. [EU]

Postherpetic Neuralgia: Variety of neuralgia associated with migraine in which pain is felt in or behind the eye. [NIH]

Postnatal: Occurring after birth, with reference to the newborn. [EU]

Postoperative: After surgery. [NIH]

Postsynaptic: Nerve potential generated by an inhibitory hyperpolarizing stimulation. [NIH]

Post-traumatic: Occurring as a result of or after injury. [EU]

Postural: Pertaining to posture or position. [EU]

Potassium: An element that is in the alkali group of metals. It has an atomic symbol K, atomic number 19, and atomic weight 39.10. It is the chief cation in the intracellular fluid of muscle and other cells. Potassium ion is a strong electrolyte and it plays a significant role in

the regulation of fluid volume and maintenance of the water-electrolyte balance. [NIH]

Potentiates: A degree of synergism which causes the exposure of the organism to a harmful substance to worsen a disease already contracted. [NIH]

Potentiation: An overall effect of two drugs taken together which is greater than the sum of the effects of each drug taken alone. [NIH]

Practice Guidelines: Directions or principles presenting current or future rules of policy for the health care practitioner to assist him in patient care decisions regarding diagnosis, therapy, or related clinical circumstances. The guidelines may be developed by government agencies at any level, institutions, professional societies, governing boards, or by the convening of expert panels. The guidelines form a basis for the evaluation of all aspects of health care and delivery. [NIH]

Precipitation: The act or process of precipitating. [EU]

Precursor: Something that precedes. In biological processes, a substance from which another, usually more active or mature substance is formed. In clinical medicine, a sign or symptom that heralds another. [EU]

Pre-eclamptic: A syndrome characterized by hypertension, albuminuria, and generalized oedema, occurring only in pregnancy. [NIH]

Prefrontal Cortex: The rostral part of the frontal lobe, bounded by the inferior precentral fissure in humans, which receives projection fibers from the mediodorsal nucleus of the thalamus. The prefrontal cortex receives afferent fibers from numerous structures of the diencephalon, mesencephalon, and limbic system as well as cortical afferents of visual, auditory, and somatic origin. [NIH]

Presynaptic: Situated proximal to a synapse, or occurring before the synapse is crossed. [EU]

Prevalence: The total number of cases of a given disease in a specified population at a designated time. It is differentiated from incidence, which refers to the number of new cases in the population at a given time. [NIH]

Probe: An instrument used in exploring cavities, or in the detection and dilatation of strictures, or in demonstrating the potency of channels; an elongated instrument for exploring or sounding body cavities. [NIH]

Progeny: The offspring produced in any generation. [NIH]

Progesterone: Pregn-4-ene-3,20-dione. The principal progestational hormone of the body, secreted by the corpus luteum, adrenal cortex, and placenta. Its chief function is to prepare the uterus for the reception and development of the fertilized ovum. It acts as an antiovulatory agent when administered on days 5-25 of the menstrual cycle. [NIH]

Progression: Increase in the size of a tumor or spread of cancer in the body. [NIH]

Progressive: Advancing; going forward; going from bad to worse; increasing in scope or severity. [EU]

Projection: A defense mechanism, operating unconsciously, whereby that which is emotionally unacceptable in the self is rejected and attributed (projected) to others. [NIH]

Promoter: A chemical substance that increases the activity of a carcinogenic process. [NIH]

Prophase: The first phase of cell division, in which the chromosomes become visible, the nucleus starts to lose its identity, the spindle appears, and the centrioles migrate toward opposite poles. [NIH]

Propofol: A widely used anesthetic. [NIH]

Propranolol: A widely used non-cardioselective beta-adrenergic antagonist. Propranolol is used in the treatment or prevention of many disorders including acute myocardial

infarction, arrhythmias, angina pectoris, hypertension, hypertensive emergencies, hyperthyroidism, migraine, pheochromocytoma, menopause, and anxiety. [NIH]

Propylene Glycol: A clear, colorless, viscous organic solvent and diluent used in pharmaceutical preparations. [NIH]

Prospective study: An epidemiologic study in which a group of individuals (a cohort), all free of a particular disease and varying in their exposure to a possible risk factor, is followed over a specific amount of time to determine the incidence rates of the disease in the exposed and unexposed groups. [NIH]

Prostaglandin: Any of a group of components derived from unsaturated 20-carbon fatty acids, primarily arachidonic acid, via the cyclooxygenase pathway that are extremely potent mediators of a diverse group of physiologic processes. The abbreviation for prostaglandin is PG; specific compounds are designated by adding one of the letters A through I to indicate the type of substituents found on the hydrocarbon skeleton and a subscript (1, 2 or 3) to indicate the number of double bonds in the hydrocarbon skeleton e.g., PGE2. The predominant naturally occurring prostaglandins all have two double bonds and are synthesized from arachidonic acid (5,8,11,14-eicosatetraenoic acid) by the pathway shown in the illustration. The 1 series and 3 series are produced by the same pathway with fatty acids having one fewer double bond (8,11,14-eicosatrienoic acid or one more double bond (5,8,11,14,17-eicosapentaenoic acid) than arachidonic acid. The subscript a or ß indicates the configuration at C-9 (a denotes a substituent below the plane of the ring, ß, above the plane). The naturally occurring PGF's have the a configuration, e.g., PGF2a. All of the prostaglandins act by binding to specific cell-surface receptors causing an increase in the level of the intracellular second messenger cyclic AMP (and in some cases cyclic GMP also). The effect produced by the cyclic AMP increase depends on the specific cell type. In some cases there is also a positive feedback effect. Increased cyclic AMP increases prostaglandin synthesis leading to further increases in cyclic AMP. [EU]

Prostaglandins A: (13E,15S)-15-Hydroxy-9-oxoprosta-10,13-dien-1-oic acid (PGA(1)); (5Z,13E,15S)-15-hydroxy-9-oxoprosta-5,10,13-trien-1-oic acid (PGA(2)); (5Z,13E,15S,17Z)-15-hydroxy-9-oxoprosta-5,10,13,17-tetraen-1-oic acid (PGA(3)). A group of naturally occurring secondary prostaglandins derived from PGE. PGA(1) and PGA(2) as well as their 19-hydroxy derivatives are found in many organs and tissues. [NIH]

Prostate: A gland in males that surrounds the neck of the bladder and the urethra. It secretes a substance that liquifies coagulated semen. It is situated in the pelvic cavity behind the lower part of the pubic symphysis, above the deep layer of the triangular ligament, and rests upon the rectum. [NIH]

Protease: Proteinase (= any enzyme that catalyses the splitting of interior peptide bonds in a protein). [EU]

Protein C: A vitamin-K dependent zymogen present in the blood, which, upon activation by thrombin and thrombomodulin exerts anticoagulant properties by inactivating factors Va and VIIIa at the rate-limiting steps of thrombin formation. [NIH]

Protein S: The vitamin K-dependent cofactor of activated protein C. Together with protein C, it inhibits the action of factors VIIIa and Va. A deficiency in protein S can lead to recurrent venous and arterial thrombosis. [NIH]

Protein Transport: The process of moving proteins from one cellular compartment (including extracellular) to another by various sorting and transport mechanisms such as gated transport, protein translocation, and vesicular transport. [NIH]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [NIH]

Proteinuria: The presence of protein in the urine, indicating that the kidneys are not working properly. [NIH]

Proteoglycans: Glycoproteins which have a very high polysaccharide content. [NIH]

Proteolytic: 1. Pertaining to, characterized by, or promoting proteolysis. 2. An enzyme that promotes proteolysis (= the splitting of proteins by hydrolysis of the peptide bonds with formation of smaller polypeptides). [EU]

Protocol: The detailed plan for a clinical trial that states the trial's rationale, purpose, drug or vaccine dosages, length of study, routes of administration, who may participate, and other aspects of trial design. [NIH]

Protons: Stable elementary particles having the smallest known positive charge, found in the nuclei of all elements. The proton mass is less than that of a neutron. A proton is the nucleus of the light hydrogen atom, i.e., the hydrogen ion. [NIH]

Proto-Oncogene Proteins: Products of proto-oncogenes. Normally they do not have oncogenic or transforming properties, but are involved in the regulation or differentiation of cell growth. They often have protein kinase activity. [NIH]

Proto-Oncogene Proteins c-mos: Cellular proteins encoded by the c-mos genes. They function in the cell cycle to maintain maturation promoting factor in the active state and have protein-serine/threonine kinase activity. Oncogenic transformation can take place when c-mos proteins are expressed at the wrong time. [NIH]

Protozoan: 1. Any individual of the protozoa; protozoon. 2. Of or pertaining to the protozoa; protozoal. [EU]

Proximal: Nearest; closer to any point of reference; opposed to distal. [EU]

Pruritus: An intense itching sensation that produces the urge to rub or scratch the skin to obtain relief. [NIH]

Pseudotumor Cerebri: A condition marked by raised intracranial pressure and characterized clinically by headaches; nausea; papilledema, peripheral constriction of the visual fields, transient visual obscurations, and pulsatile tinnitus. Obesity is frequently associated with this condition, which primarily affects women between 20 and 44 years of age. Chronic papilledema may lead to optic nerve injury (optic nerve diseases) and visual loss (blindness). [NIH]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Psychiatry: The medical science that deals with the origin, diagnosis, prevention, and treatment of mental disorders. [NIH]

Psychic: Pertaining to the psyche or to the mind; mental. [EU]

Psychoactive: Those drugs which alter sensation, mood, consciousness or other psychological or behavioral functions. [NIH]

Psychometrics: Assessment of psychological variables by the application of mathematical procedures. [NIH]

Psychosis: A mental disorder characterized by gross impairment in reality testing as evidenced by delusions, hallucinations, markedly incoherent speech, or disorganized and agitated behaviour without apparent awareness on the part of the patient of the incomprehensibility of his behaviour; the term is also used in a more general sense to refer to mental disorders in which mental functioning is sufficiently impaired as to interfere grossly with the patient's capacity to meet the ordinary demands of life. Historically, the term has been applied to many conditions, e.g. manic-depressive psychosis, that were first described in psychotic patients, although many patients with the disorder are not judged

psychotic. [EU]

Psyllium: Dried, ripe seeds of Plantago psyllium, P. indica, and P. ovata (Plantaginaceae). Plantain seeds swell in water and are used as demulcents and bulk laxatives. [NIH]

Ptosis: 1. Prolapse of an organ or part. 2. Drooping of the upper eyelid from paralysis of the third nerve or from sympathetic innervation. [EU]

Puberty: The period during which the secondary sex characteristics begin to develop and the capability of sexual reproduction is attained. [EU]

Public Health: Branch of medicine concerned with the prevention and control of disease and disability, and the promotion of physical and mental health of the population on the international, national, state, or municipal level. [NIH]

Public Policy: A course or method of action selected, usually by a government, from among alternatives to guide and determine present and future decisions. [NIH]

Publishing: "The business or profession of the commercial production and issuance of literature" (Webster's 3d). It includes the publisher, publication processes, editing and editors. Production may be by conventional printing methods or by electronic publishing. [NIH]

Pulmonary: Relating to the lungs. [NIH]

Pulmonary Artery: The short wide vessel arising from the conus arteriosus of the right ventricle and conveying unaerated blood to the lungs. [NIH]

Pulmonary Edema: An accumulation of an excessive amount of watery fluid in the lungs, may be caused by acute exposure to dangerous concentrations of irritant gasses. [NIH]

Pulmonary hypertension: Abnormally high blood pressure in the arteries of the lungs. [NIH]

Pulse: The rhythmical expansion and contraction of an artery produced by waves of pressure caused by the ejection of blood from the left ventricle of the heart as it contracts. [NIH]

Pupil: The aperture in the iris through which light passes. [NIH]

Purgative: 1. Cathartic (def. 1); causing evacuation of the bowels. 2. A cathartic, particularly one that stimulates peristaltic action. [EU]

Purpura: Purplish or brownish red discoloration, easily visible through the epidermis, caused by hemorrhage into the tissues. [NIH]

Putrefaction: The process of decomposition of animal and vegetable matter by living organisms. [NIH]

Pyelonephritis: Inflammation of the kidney and its pelvis, beginning in the interstitium and rapidly extending to involve the tubules, glomeruli, and blood vessels; due to bacterial infection. [EU]

Pyramidal Tracts: Fibers that arise from cells within the cerebral cortex, pass through the medullary pyramid, and descend in the spinal cord. Many authorities say the pyramidal tracts include both the corticospinal and corticobulbar tracts. [NIH]

Race: A population within a species which exhibits general similarities within itself, but is both discontinuous and distinct from other populations of that species, though not sufficiently so as to achieve the status of a taxon. [NIH]

Radiation: Emission or propagation of electromagnetic energy (waves/rays), or the waves/rays themselves; a stream of electromagnetic particles (electrons, neutrons, protons, alpha particles) or a mixture of these. The most common source is the sun. [NIH]

Radiation therapy: The use of high-energy radiation from x-rays, gamma rays, neutrons, and other sources to kill cancer cells and shrink tumors. Radiation may come from a

machine outside the body (external-beam radiation therapy), or it may come from radioactive material placed in the body in the area near cancer cells (internal radiation therapy, implant radiation, or brachytherapy). Systemic radiation therapy uses a radioactive substance, such as a radiolabeled monoclonal antibody, that circulates throughout the body. Also called radiotherapy. [NIH]

Radioactive: Giving off radiation. [NIH]

Radiological: Pertaining to radiodiagnostic and radiotherapeutic procedures, and interventional radiology or other planning and guiding medical radiology. [NIH]

Radiology: A specialty concerned with the use of x-ray and other forms of radiant energy in the diagnosis and treatment of disease. [NIH]

Random Allocation: A process involving chance used in therapeutic trials or other research endeavor for allocating experimental subjects, human or animal, between treatment and control groups, or among treatment groups. It may also apply to experiments on inanimate objects. [NIH]

Randomization: Also called random allocation. Is allocation of individuals to groups, e.g., for experimental and control regimens, by chance. Within the limits of chance variation, random allocation should make the control and experimental groups similar at the start of an investigation and ensure that personal judgment and prejudices of the investigator do not influence allocation. [NIH]

Randomized: Describes an experiment or clinical trial in which animal or human subjects are assigned by chance to separate groups that compare different treatments. [NIH]

Rape: Unlawful sexual intercourse without consent of the victim. [NIH]

Reabsorption: 1. The act or process of absorbing again, as the selective absorption by the kidneys of substances (glucose, proteins, sodium, etc.) already secreted into the renal tubules, and their return to the circulating blood. 2. Resorption. [EU]

Reaction Time: The time from the onset of a stimulus until the organism responds. [NIH]

Reactive Oxygen Species: Reactive intermediate oxygen species including both radicals and non-radicals. These substances are constantly formed in the human body and have been shown to kill bacteria and inactivate proteins, and have been implicated in a number of diseases. Scientific data exist that link the reactive oxygen species produced by inflammatory phagocytes to cancer development. [NIH]

Reagent: A substance employed to produce a chemical reaction so as to detect, measure, produce, etc., other substances. [EU]

Reality Testing: The individual's objective evaluation of the external world and the ability to differentiate adequately between it and the internal world; considered to be a primary ego function. [NIH]

Receptor: A molecule inside or on the surface of a cell that binds to a specific substance and causes a specific physiologic effect in the cell. [NIH]

Receptors, Serotonin: Cell-surface proteins that bind serotonin and trigger intracellular changes which influence the behavior of cells. Several types of serotonin receptors have been recognized which differ in their pharmacology, molecular biology, and mode of action. [NIH]

Recombinant: A cell or an individual with a new combination of genes not found together in either parent; usually applied to linked genes. [EU]

Rectum: The last 8 to 10 inches of the large intestine. [NIH]

Red blood cells: RBCs. Cells that carry oxygen to all parts of the body. Also called erythrocytes. [NIH]

Red Nucleus: A pinkish-yellow portion of the midbrain situated in the rostral mesencephalic tegmentum. It receives a large projection from the contralateral half of the cerebellum via the superior cerebellar peduncle and a projection from the ipsilateral motor cortex. [NIH]

Reductase: Enzyme converting testosterone to dihydrotestosterone. [NIH]

Refer: To send or direct for treatment, aid, information, de decision. [NIH]

Reference Values: The range or frequency distribution of a measurement in a population (of organisms, organs or things) that has not been selected for the presence of disease or abnormality. [NIH]

Reflective: Capable of throwing back light, images, sound waves : reflecting. [EU]

Reflex: An involuntary movement or exercise of function in a part, excited in response to a stimulus applied to the periphery and transmitted to the brain or spinal cord. [NIH]

Refraction: A test to determine the best eyeglasses or contact lenses to correct a refractive error (myopia, hyperopia, or astigmatism). [NIH]

Refractive Power: The ability of an object, such as the eye, to bend light as light passes through it. [NIH]

Refractory: Not readily yielding to treatment. [EU]

Regimen: A treatment plan that specifies the dosage, the schedule, and the duration of treatment. [NIH]

Rehabilitative: Instruction of incapacitated individuals or of those affected with some mental disorder, so that some or all of their lost ability may be regained. [NIH]

Relaxant: 1. Lessening or reducing tension. 2. An agent that lessens tension. [EU]

Reliability: Used technically, in a statistical sense, of consistency of a test with itself, i. e. the extent to which we can assume that it will yield the same result if repeated a second time. [NIH]

Renal failure: Progressive renal insufficiency and uremia, due to irreversible and progressive renal glomerular tubular or interstitial disease. [NIH]

Replicon: In order to be replicated, DNA molecules must contain an origin of duplication and in bacteria and viruses there is usually only one per genome. Such molecules are called replicons. [NIH]

Repressor: Any of the specific allosteric protein molecules, products of regulator genes, which bind to the operator of operons and prevent RNA polymerase from proceeding into the operon to transcribe messenger RNA. [NIH]

Research Design: A plan for collecting and utilizing data so that desired information can be obtained with sufficient precision or so that an hypothesis can be tested properly. [NIH]

Resorption: The loss of substance through physiologic or pathologic means, such as loss of dentin and cementum of a tooth, or of the alveolar process of the mandible or maxilla. [EU]

Respiration: The act of breathing with the lungs, consisting of inspiration, or the taking into the lungs of the ambient air, and of expiration, or the expelling of the modified air which contains more carbon dioxide than the air taken in (Blakiston's Gould Medical Dictionary, 4th ed.). This does not include tissue respiration (= oxygen consumption) or cell respiration (= cell respiration). [NIH]

Respirator: A mechanical device that helps a patient breathe; a mechanical ventilator. [NIH]

Respiratory failure: Inability of the lungs to conduct gas exchange. [NIH]

Respiratory Physiology: Functions and activities of the respiratory tract as a whole or of any

of its parts. [NIH]

Resuscitation: The restoration to life or consciousness of one apparently dead; it includes such measures as artificial respiration and cardiac massage. [EU]

Reticular: Coarse-fibered, netlike dermis layer. [NIH]

Reticular Formation: A region extending from the pons & medulla oblongata through the mesencephalon, characterized by a diversity of neurons of various sizes and shapes, arranged in different aggregations and enmeshed in a complicated fiber network. [NIH]

Retina: The ten-layered nervous tissue membrane of the eye. It is continuous with the optic nerve and receives images of external objects and transmits visual impulses to the brain. Its outer surface is in contact with the choroid and the inner surface with the vitreous body. The outer-most layer is pigmented, whereas the inner nine layers are transparent. [NIH]

Retinal: 1. Pertaining to the retina. 2. The aldehyde of retinol, derived by the oxidative enzymatic splitting of absorbed dietary carotene, and having vitamin A activity. In the retina, retinal combines with opsins to form visual pigments. One isomer, 11-cis retinal combines with opsin in the rods (scotopsin) to form rhodopsin, or visual purple. Another, all-trans retinal (trans-r.); visual yellow; xanthopsin) results from the bleaching of rhodopsin by light, in which the 11-cis form is converted to the all-trans form. Retinal also combines with opsins in the cones (photopsins) to form the three pigments responsible for colour vision. Called also retinal, and retinene1. [EU]

Retinal Ganglion Cells: Cells of the innermost nuclear layer of the retina, the ganglion cell layer, which project axons through the optic nerve to the brain. They are quite variable in size and in the shapes of their dendritic arbors, which are generally confined to the inner plexiform layer. [NIH]

Retinol: Vitamin A. It is essential for proper vision and healthy skin and mucous membranes. Retinol is being studied for cancer prevention; it belongs to the family of drugs called retinoids. [NIH]

Retinopathy: 1. Retinitis (= inflammation of the retina). 2. Retinosis (= degenerative, noninflammatory condition of the retina). [EU]

Retroperitoneal: Having to do with the area outside or behind the peritoneum (the tissue that lines the abdominal wall and covers most of the organs in the abdomen). [NIH]

Retrospective: Looking back at events that have already taken place. [NIH]

Rhabdomyolysis: Necrosis or disintegration of skeletal muscle often followed by myoglobinuria. [NIH]

Rhabdomyosarcoma: A malignant tumor of muscle tissue. [NIH]

Rhodopsin: A photoreceptor protein found in retinal rods. It is a complex formed by the binding of retinal, the oxidized form of retinol, to the protein opsin and undergoes a series of complex reactions in response to visible light resulting in the transmission of nerve impulses to the brain. [NIH]

Ribavirin: 1-beta-D-Ribofuranosyl-1H-1,2,4-triazole-3-carboxamide. A nucleoside antimetabolite antiviral agent that blocks nucleic acid synthesis and is used against both RNA and DNA viruses. [NIH]

Ribosome: A granule of protein and RNA, synthesized in the nucleolus and found in the cytoplasm of cells. Ribosomes are the main sites of protein synthesis. Messenger RNA attaches to them and there receives molecules of transfer RNA bearing amino acids. [NIH]

Rigidity: Stiffness or inflexibility, chiefly that which is abnormal or morbid; rigor. [EU]

Risk factor: A habit, trait, condition, or genetic alteration that increases a person's chance of

developing a disease. [NIH]

Ritonavir: An HIV protease inhibitor that works by interfering with the reproductive cycle of HIV. [NIH]

Rods: One type of specialized light-sensitive cells (photoreceptors) in the retina that provide side vision and the ability to see objects in dim light (night vision). [NIH]

Salicylic: A tuberculosis drug. [NIH]

Saline: A solution of salt and water. [NIH]

Sarcoma: A connective tissue neoplasm formed by proliferation of mesodermal cells; it is usually highly malignant. [NIH]

Satellite: Applied to a vein which closely accompanies an artery for some distance; in cytogenetics, a chromosomal agent separated by a secondary constriction from the main body of the chromosome. [NIH]

Scans: Pictures of structures inside the body. Scans often used in diagnosing, staging, and monitoring disease include liver scans, bone scans, and computed tomography (CT) or computerized axial tomography (CAT) scans and magnetic resonance imaging (MRI) scans. In liver scanning and bone scanning, radioactive substances that are injected into the bloodstream collect in these organs. A scanner that detects the radiation is used to create pictures. In CT scanning, an x-ray machine linked to a computer is used to produce detailed pictures of organs inside the body. MRI scans use a large magnet connected to a computer to create pictures of areas inside the body. [NIH]

Scatter: The extent to which relative success and failure are divergently manifested in qualitatively different tests. [NIH]

Schizoid: Having qualities resembling those found in greater degree in schizophrenics; a person of schizoid personality. [NIH]

Schizophrenia: A mental disorder characterized by a special type of disintegration of the personality. [NIH]

Schizotypal Personality Disorder: A personality disorder in which there are oddities of thought (magical thinking, paranoid ideation, suspiciousness), perception (illusions, depersonalization), speech (digressive, vague, overelaborate), and behavior (inappropriate affect in social interactions, frequently social isolation) that are not severe enough to characterize schizophrenia. [NIH]

Sclerosis: A pathological process consisting of hardening or fibrosis of an anatomical structure, often a vessel or a nerve. [NIH]

Screening: Checking for disease when there are no symptoms. [NIH]

Scrotum: In males, the external sac that contains the testicles. [NIH]

Secretion: 1. The process of elaborating a specific product as a result of the activity of a gland; this activity may range from separating a specific substance of the blood to the elaboration of a new chemical substance. 2. Any substance produced by secretion. [EU]

Secretory: Secreting; relating to or influencing secretion or the secretions. [NIH]

Sedative: 1. Allaying activity and excitement. 2. An agent that allays excitement. [EU]

Seizures: Clinical or subclinical disturbances of cortical function due to a sudden, abnormal, excessive, and disorganized discharge of brain cells. Clinical manifestations include abnormal motor, sensory and psychic phenomena. Recurrent seizures are usually referred to as epilepsy or "seizure disorder." [NIH]

Selenium: An element with the atomic symbol Se, atomic number 34, and atomic weight 78.96. It is an essential micronutrient for mammals and other animals but is toxic in large

amounts. Selenium protects intracellular structures against oxidative damage. It is an essential component of glutathione peroxidase. [NIH]

Self Care: Performance of activities or tasks traditionally performed by professional health care providers. The concept includes care of oneself or one's family and friends. [NIH]

Sella: A deep depression in the shape of a Turkish saddle in the upper surface of the body of the sphenoid bone in the deepest part of which is lodged the hypophysis cerebri. [NIH]

Sella Turcica: A bony prominence situated on the upper surface of the body of the sphenoid bone. It houses the pituitary gland. [NIH]

Senile: Relating or belonging to old age; characteristic of old age; resulting from infirmity of old age. [NIH]

Sensor: A device designed to respond to physical stimuli such as temperature, light, magnetism or movement and transmit resulting impulses for interpretation, recording, movement, or operating control. [NIH]

Sepsis: The presence of bacteria in the bloodstream. [NIH]

Septal: An abscess occurring at the root of the tooth on the proximal surface. [NIH]

Septic: Produced by or due to decomposition by microorganisms; putrefactive. [EU]

Sequence Analysis: A multistage process that includes the determination of a sequence (protein, carbohydrate, etc.), its fragmentation and analysis, and the interpretation of the resulting sequence information. [NIH]

Sequence Homology: The degree of similarity between sequences. Studies of amino acid and nucleotide sequences provide useful information about the genetic relatedness of certain species. [NIH]

Serotonin: A biochemical messenger and regulator, synthesized from the essential amino acid L-tryptophan. In humans it is found primarily in the central nervous system, gastrointestinal tract, and blood platelets. Serotonin mediates several important physiological functions including neurotransmission, gastrointestinal motility, hemostasis, and cardiovascular integrity. Multiple receptor families (receptors, serotonin) explain the broad physiological actions and distribution of this biochemical mediator. [NIH]

Serum: The clear liquid part of the blood that remains after blood cells and clotting proteins have been removed. [NIH]

Sex Characteristics: Those characteristics that distinguish one sex from the other. The primary sex characteristics are the ovaries and testes and their related hormones. Secondary sex characteristics are those which are masculine or feminine but not directly related to reproduction. [NIH]

Sharpness: The apparent blurring of the border between two adjacent areas of a radiograph having different optical densities. [NIH]

Shock: The general bodily disturbance following a severe injury; an emotional or moral upset occasioned by some disturbing or unexpected experience; disruption of the circulation, which can upset all body functions: sometimes referred to as circulatory shock. [NIH]

Shunt: A surgically created diversion of fluid (e.g., blood or cerebrospinal fluid) from one area of the body to another area of the body. [NIH]

Side effect: A consequence other than the one(s) for which an agent or measure is used, as the adverse effects produced by a drug, especially on a tissue or organ system other than the one sought to be benefited by its administration. [EU]

Signal Transduction: The intercellular or intracellular transfer of information (biological

activation/inhibition) through a signal pathway. In each signal transduction system, an activation/inhibition signal from a biologically active molecule (hormone, neurotransmitter) is mediated via the coupling of a receptor/enzyme to a second messenger system or to an ion channel. Signal transduction plays an important role in activating cellular functions, cell differentiation, and cell proliferation. Examples of signal transduction systems are the GABA-postsynaptic receptor-calcium ion channel system, the receptor-mediated T-cell activation pathway, and the receptor-mediated activation of phospholipases. Those coupled to membrane depolarization or intracellular release of calcium include the receptor-mediated activation of cytotoxic functions in granulocytes and the synaptic potentiation of protein kinase activation. Some signal transduction pathways may be part of larger signal transduction pathways; for example, protein kinase activation is part of the platelet activation signal pathway. [NIH]

Signs and Symptoms: Clinical manifestations that can be either objective when observed by a physician, or subjective when perceived by the patient. [NIH]

Silicon: A trace element that constitutes about 27.6% of the earth's crust in the form of silicon dioxide. It does not occur free in nature. Silicon has the atomic symbol Si, atomic number 14, and atomic weight 28.09. [NIH]

Silicon Dioxide: Silica. Transparent, tasteless crystals found in nature as agate, amethyst, chalcedony, cristobalite, flint, sand, quartz, and tridymite. The compound is insoluble in water or acids except hydrofluoric acid. [NIH]

Skeletal: Having to do with the skeleton (boney part of the body). [NIH]

Skeleton: The framework that supports the soft tissues of vertebrate animals and protects many of their internal organs. The skeletons of vertebrates are made of bone and/or cartilage. [NIH]

Skin Care: Maintenance of the hygienic state of the skin under optimal conditions of cleanliness and comfort. Effective in skin care are proper washing, bathing, cleansing, and the use of soaps, detergents, oils, etc. In various disease states, therapeutic and protective solutions and ointments are useful. The care of the skin is particularly important in various occupations, in exposure to sunlight, in neonates, and in decubitus ulcer. [NIH]

Skull: The skeleton of the head including the bones of the face and the bones enclosing the brain. [NIH]

Small intestine: The part of the digestive tract that is located between the stomach and the large intestine. [NIH]

Smooth muscle: Muscle that performs automatic tasks, such as constricting blood vessels. [NIH]

Sneezing: Sudden, forceful, involuntary expulsion of air from the nose and mouth caused by irritation to the mucous membranes of the upper respiratory tract. [NIH]

Soaps: Sodium or potassium salts of long chain fatty acids. These detergent substances are obtained by boiling natural oils or fats with caustic alkali. Sodium soaps are harder and are used as topical anti-infectives and vehicles in pills and liniments; potassium soaps are soft, used as vehicles for ointments and also as topical antimicrobials. [NIH]

Socialization: The training or molding of an individual through various relationships, educational agencies, and social controls, which enables him to become a member of a particular society. [NIH]

Sodium: An element that is a member of the alkali group of metals. It has the atomic symbol Na, atomic number 11, and atomic weight 23. With a valence of 1, it has a strong affinity for oxygen and other nonmetallic elements. Sodium provides the chief cation of the extracellular body fluids. Its salts are the most widely used in medicine. (From Dorland,

27th ed) Physiologically the sodium ion plays a major role in blood pressure regulation, maintenance of fluid volume, and electrolyte balance. [NIH]

Sodium Channels: Cell membrane glycoproteins selective for sodium ions. Fast sodium current is associated with the action potential in neural membranes. [NIH]

Sodium-Calcium Exchanger: An electrogenic ion exchange protein that maintains a steady level of calcium by removing an amount of calcium equal to that which enters the cells. It is widely distributed in most excitable membranes, including the brain and heart. [NIH]

Soft tissue: Refers to muscle, fat, fibrous tissue, blood vessels, or other supporting tissue of the body. [NIH]

Solvent: 1. Dissolving; effecting a solution. 2. A liquid that dissolves or that is capable of dissolving; the component of a solution that is present in greater amount. [EU]

Somatic: 1. Pertaining to or characteristic of the soma or body. 2. Pertaining to the body wall in contrast to the viscera. [EU]

Sorbitol: A polyhydric alcohol with about half the sweetness of sucrose. Sorbitol occurs naturally and is also produced synthetically from glucose. It was formerly used as a diuretic and may still be used as a laxative and in irrigating solutions for some surgical procedures. It is also used in many manufacturing processes, as a pharmaceutical aid, and in several research applications. [NIH]

Sound wave: An alteration of properties of an elastic medium, such as pressure, particle displacement, or density, that propagates through the medium, or a superposition of such alterations. [NIH]

Spasm: An involuntary contraction of a muscle or group of muscles. Spasms may involve skeletal muscle or smooth muscle. [NIH]

Spasmodic: Of the nature of a spasm. [EU]

Spasticity: A state of hypertonicity, or increase over the normal tone of a muscle, with heightened deep tendon reflexes. [EU]

Specialist: In medicine, one who concentrates on 1 special branch of medical science. [NIH]

Species: A taxonomic category subordinate to a genus (or subgenus) and superior to a subspecies or variety, composed of individuals possessing common characters distinguishing them from other categories of individuals of the same taxonomic level. In taxonomic nomenclature, species are designated by the genus name followed by a Latin or Latinized adjective or noun. [EU]

Specificity: Degree of selectivity shown by an antibody with respect to the number and types of antigens with which the antibody combines, as well as with respect to the rates and the extents of these reactions. [NIH]

Spectrometer: An apparatus for determining spectra; measures quantities such as wavelengths and relative amplitudes of components. [NIH]

Spectroscopic: The recognition of elements through their emission spectra. [NIH]

Spectrum: A charted band of wavelengths of electromagnetic vibrations obtained by refraction and diffraction. By extension, a measurable range of activity, such as the range of bacteria affected by an antibiotic (antibacterial s.) or the complete range of manifestations of a disease. [EU]

Sperm: The fecundating fluid of the male. [NIH]

Sphincters: Any annular muscle closing an orifice. [NIH]

Spinal cord: The main trunk or bundle of nerves running down the spine through holes in the spinal bone (the vertebrae) from the brain to the level of the lower back. [NIH]

Spleen: An organ that is part of the lymphatic system. The spleen produces lymphocytes, filters the blood, stores blood cells, and destroys old blood cells. It is located on the left side of the abdomen near the stomach. [NIH]

Staging: Performing exams and tests to learn the extent of the cancer within the body, especially whether the disease has spread from the original site to other parts of the body. [NIH]

Status Epilepticus: Repeated and prolonged epileptic seizures without recovery of consciousness between attacks. [NIH]

Steady state: Dynamic equilibrium. [EU]

Steatosis: Fatty degeneration. [EU]

Steel: A tough, malleable, iron-based alloy containing up to, but no more than, two percent carbon and often other metals. It is used in medicine and dentistry in implants and instrumentation. [NIH]

Sterile: Unable to produce children. [NIH]

Steroids: Drugs used to relieve swelling and inflammation. [NIH]

Stimulant: 1. Producing stimulation; especially producing stimulation by causing tension on muscle fibre through the nervous tissue. 2. An agent or remedy that produces stimulation. [EU]

Stimulus: That which can elicit or evoke action (response) in a muscle, nerve, gland or other excitable issue, or cause an augmenting action upon any function or metabolic process. [NIH]

Stomach: An organ of digestion situated in the left upper quadrant of the abdomen between the termination of the esophagus and the beginning of the duodenum. [NIH]

Stramonium: One of the very toxic Solanaceae, Datura stramonium, also called thornapple and jimsonweed. It contains the same alkaloids as in Belladonna and causes toxicity to cattle and other grazers. [NIH]

Strand: DNA normally exists in the bacterial nucleus in a helix, in which two strands are coiled together. [NIH]

Stress: Forcibly exerted influence; pressure. Any condition or situation that causes strain or tension. Stress may be either physical or psychologic, or both. [NIH]

Stroke: Sudden loss of function of part of the brain because of loss of blood flow. Stroke may be caused by a clot (thrombosis) or rupture (hemorrhage) of a blood vessel to the brain. [NIH]

Stupor: Partial or nearly complete unconsciousness, manifested by the subject's responding only to vigorous stimulation. Also, in psychiatry, a disorder marked by reduced responsiveness. [EU]

Subacute: Somewhat acute; between acute and chronic. [EU]

Subarachnoid: Situated or occurring between the arachnoid and the pia mater. [EU]

Subclinical: Without clinical manifestations; said of the early stage(s) of an infection or other disease or abnormality before symptoms and signs become apparent or detectable by clinical examination or laboratory tests, or of a very mild form of an infection or other disease or abnormality. [EU]

Subcutaneous: Beneath the skin. [NIH]

Subiculum: A region of the hippocampus that projects to other areas of the brain. [NIH]

Subspecies: A category intermediate in rank between species and variety, based on a smaller number of correlated characters than are used to differentiate species and generally conditioned by geographical and/or ecological occurrence. [NIH]

Substance P: An eleven-amino acid neurotransmitter that appears in both the central and peripheral nervous systems. It is involved in transmission of pain, causes rapid contractions of the gastrointestinal smooth muscle, and modulates inflammatory and immune responses. [NIH]

Substrate: A substance upon which an enzyme acts. [EU]

Suction: The removal of secretions, gas or fluid from hollow or tubular organs or cavities by means of a tube and a device that acts on negative pressure. [NIH]

Sulfadiazine: A short-acting sulfonamide used in combination with pyrimethamine to treat toxoplasmosis in patients with acquired immunodeficiency syndrome and in newborns with congenital infections. [NIH]

Superantigens: Microbial antigens that have in common an extremely potent activating effect on T-cells that bear a specific variable region. Superantigens cross-link the variable region with class II MHC proteins regardless of the peptide binding in the T-cell receptor's pocket. The result is a transient expansion and subsequent death and anergy of the T-cells with the appropriate variable regions. [NIH]

Support group: A group of people with similar disease who meet to discuss how better to cope with their cancer and treatment. [NIH]

Supportive care: Treatment given to prevent, control, or relieve complications and side effects and to improve the comfort and quality of life of people who have cancer. [NIH]

Suppression: A conscious exclusion of disapproved desire contrary with repression, in which the process of exclusion is not conscious. [NIH]

Supraspinal: Above the spinal column or any spine. [NIH]

Surfactant: A fat-containing protein in the respiratory passages which reduces the surface tension of pulmonary fluids and contributes to the elastic properties of pulmonary tissue. [NIH]

Symptomatic: Having to do with symptoms, which are signs of a condition or disease. [NIH]

Symptomatic treatment: Therapy that eases symptoms without addressing the cause of disease. [NIH]

Synapse: The region where the processes of two neurons come into close contiguity, and the nervous impulse passes from one to the other; the fibers of the two are intermeshed, but, according to the general view, there is no direct contiguity. [NIH]

Synapsis: The pairing between homologous chromosomes of maternal and paternal origin during the prophase of meiosis, leading to the formation of gametes. [NIH]

Synaptic: Pertaining to or affecting a synapse (= site of functional apposition between neurons, at which an impulse is transmitted from one neuron to another by electrical or chemical means); pertaining to synapsis (= pairing off in point-for-point association of homologous chromosomes from the male and female pronuclei during the early prophase of meiosis). [EU]

Synaptic Vesicles: Membrane-bound compartments which contain transmitter molecules. Synaptic vesicles are concentrated at presynaptic terminals. They actively sequester transmitter molecules from the cytoplasm. In at least some synapses, transmitter release occurs by fusion of these vesicles with the presynaptic membrane, followed by exocytosis of their contents. [NIH]

Syncope: A temporary suspension of consciousness due to generalized cerebral schemia, a faint or swoon. [EU]

Systemic: Affecting the entire body. [NIH]

Systolic: Indicating the maximum arterial pressure during contraction of the left ventricle of the heart. [EU]

Telecommunications: Transmission of information over distances via electronic means. [NIH]

Telencephalon: Paired anteriolateral evaginations of the prosencephalon plus the lamina terminalis. The cerebral hemispheres are derived from it. Many authors consider cerebrum a synonymous term to telencephalon, though a minority include diencephalon as part of the cerebrum (Anthoney, 1994). [NIH]

Temporal: One of the two irregular bones forming part of the lateral surfaces and base of the skull, and containing the organs of hearing. [NIH]

Temporal Lobe: Lower lateral part of the cerebral hemisphere. [NIH]

Tendon: A discrete band of connective tissue mainly composed of parallel bundles of collagenous fibers by which muscles are attached, or two muscles bellies joined. [NIH]

Teratogenesis: Production of monstrous growths or fetuses. [NIH]

Testicles: The two egg-shaped glands found inside the scrotum. They produce sperm and male hormones. Also called testes. [NIH]

Tetany: 1. Hyperexcitability of nerves and muscles due to decrease in concentration of extracellular ionized calcium, which may be associated with such conditions as parathyroid hypofunction, vitamin D deficiency, and alkalosis or result from ingestion of alkaline salts; it is characterized by carpopedal spasm, muscular twitching and cramps, laryngospasm with inspiratory stridor, hyperreflexia and choreiform movements. 2. Tetanus. [EU]

Thalamic: Cell that reaches the lateral nucleus of amygdala. [NIH]

Thalamic Diseases: Disorders of the centrally located thalamus, which integrates a wide range of cortical and subcortical information. Manifestations include sensory loss, movement disorders; ataxia, pain syndromes, visual disorders, a variety of neuropsychological conditions, and coma. Relatively common etiologies include cerebrovascular disorders; craniocerebral trauma; brain neoplasms; brain hypoxia; intracranial hemorrhages; and infectious processes. [NIH]

Thalamus: Paired bodies containing mostly gray substance and forming part of the lateral wall of the third ventricle of the brain. The thalamus represents the major portion of the diencephalon and is commonly divided into cellular aggregates known as nuclear groups. [NIH]

Theophylline: Alkaloid obtained from Thea sinensis (tea) and others. It stimulates the heart and central nervous system, dilates bronchi and blood vessels, and causes diuresis. The drug is used mainly in bronchial asthma and for myocardial stimulation. Among its more prominent cellular effects are inhibition of cyclic nucleotide phosphodiesterases and antagonism of adenosine receptors. [NIH]

Therapeutics: The branch of medicine which is concerned with the treatment of diseases, palliative or curative. [NIH]

Thermal: Pertaining to or characterized by heat. [EU]

Thiamine: 3-((4-Amino-2-methyl-5-pyrimidinyl)methyl)-5-(2-hydroxyethyl)-4-methylthiazolium chloride. [NIH]

Thoracic: Having to do with the chest. [NIH]

Threonine: An essential amino acid occurring naturally in the L-form, which is the active form. It is found in eggs, milk, gelatin, and other proteins. [NIH]

Threshold: For a specified sensory modality (e. g. light, sound, vibration), the lowest level

(absolute threshold) or smallest difference (difference threshold, difference limen) or intensity of the stimulus discernible in prescribed conditions of stimulation. [NIH]

Thrombosis: The formation or presence of a blood clot inside a blood vessel. [NIH]

Thyroid: A gland located near the windpipe (trachea) that produces thyroid hormone, which helps regulate growth and metabolism. [NIH]

Thyroid Gland: A highly vascular endocrine gland consisting of two lobes, one on either side of the trachea, joined by a narrow isthmus; it produces the thyroid hormones which are concerned in regulating the metabolic rate of the body. [NIH]

Thyroid Hormones: Hormones secreted by the thyroid gland. [NIH]

Thyrotropin: A peptide hormone secreted by the anterior pituitary. It promotes the growth of the thyroid gland and stimulates the synthesis of thyroid hormones and the release of thyroxine by the thyroid gland. [NIH]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

Timolol: A beta-adrenergic antagonist similar in action to propranolol. The levo-isomer is the more active. Timolol has been proposed as an antihypertensive, antiarrhythmic, antiangina, and antiglaucoma agent. It is also used in the treatment of migraine and tremor. [NIH]

Tissue: A group or layer of cells that are alike in type and work together to perform a specific function. [NIH]

Tissue Culture: Maintaining or growing of tissue, organ primordia, or the whole or part of an organ in vitro so as to preserve its architecture and/or function (Dorland, 28th ed). Tissue culture includes both organ culture and cell culture. [NIH]

Tolerance: 1. The ability to endure unusually large doses of a drug or toxin. 2. Acquired drug tolerance; a decreasing response to repeated constant doses of a drug or the need for increasing doses to maintain a constant response. [EU]

Tome: A zone produced by a number of irregular spaces contained in the outermost layer of denture of the root of a tooth. [NIH]

Tomography: Imaging methods that result in sharp images of objects located on a chosen plane and blurred images located above or below the plane. [NIH]

Tone: 1. The normal degree of vigour and tension; in muscle, the resistance to passive elongation or stretch; tonus. 2. A particular quality of sound or of voice. 3. To make permanent, or to change, the colour of silver stain by chemical treatment, usually with a heavy metal. [EU]

Tonicity: The normal state of muscular tension. [NIH]

Tonus: A state of slight tension usually present in muscles even when they are not undergoing active contraction. [NIH]

Topical: On the surface of the body. [NIH]

Torsion: A twisting or rotation of a bodily part or member on its axis. [NIH]

Toxic: Having to do with poison or something harmful to the body. Toxic substances usually cause unwanted side effects. [NIH]

Toxicity: The quality of being poisonous, especially the degree of virulence of a toxic microbe or of a poison. [EU]

Toxicology: The science concerned with the detection, chemical composition, and pharmacologic action of toxic substances or poisons and the treatment and prevention of

toxic manifestations. [NIH]

Toxin: A poison; frequently used to refer specifically to a protein produced by some higher plants, certain animals, and pathogenic bacteria, which is highly toxic for other living organisms. Such substances are differentiated from the simple chemical poisons and the vegetable alkaloids by their high molecular weight and antigenicity. [EU]

Toxoplasmosis: The acquired form of infection by Toxoplasma gondii in animals and man. [NIH]

Trace element: Substance or element essential to plant or animal life, but present in extremely small amounts. [NIH]

Trachea: The cartilaginous and membranous tube descending from the larynx and branching into the right and left main bronchi. [NIH]

Tracheostomy: Surgical formation of an opening into the trachea through the neck, or the opening so created. [NIH]

Transdermal: Entering through the dermis, or skin, as in administration of a drug applied to the skin in ointment or patch form. [EU]

Transduction: The transfer of genes from one cell to another by means of a viral (in the case of bacteria, a bacteriophage) vector or a vector which is similar to a virus particle (pseudovirion). [NIH]

Transfection: The uptake of naked or purified DNA into cells, usually eukaryotic. It is analogous to bacterial transformation. [NIH]

Transfusion: The infusion of components of blood or whole blood into the bloodstream. The blood may be donated from another person, or it may have been taken from the person earlier and stored until needed. [NIH]

Translating: Conversion from one language to another language. [NIH]

Translation: The process whereby the genetic information present in the linear sequence of ribonucleotides in mRNA is converted into a corresponding sequence of amino acids in a protein. It occurs on the ribosome and is unidirectional. [NIH]

Translocation: The movement of material in solution inside the body of the plant. [NIH]

Transmitter: A chemical substance which effects the passage of nerve impulses from one cell to the other at the synapse. [NIH]

Transplantation: Transference of a tissue or organ, alive or dead, within an individual, between individuals of the same species, or between individuals of different species. [NIH]

Trauma: Any injury, wound, or shock, must frequently physical or structural shock, producing a disturbance. [NIH]

Trauma Centers: Specialized hospital facilities which provide diagnostic and therapeutic services for trauma patients. [NIH]

Tremor: Cyclical movement of a body part that can represent either a physiologic process or a manifestation of disease. Intention or action tremor, a common manifestation of cerebellar diseases, is aggravated by movement. In contrast, resting tremor is maximal when there is no attempt at voluntary movement, and occurs as a relatively frequent manifestation of Parkinson disease. [NIH]

Triage: The sorting out and classification of patients or casualties to determine priority of need and proper place of treatment. [NIH]

Trifluoperazine: A phenothiazine with actions similar to chlorpromazine. It is used as an antipsychotic and an antiemetic. [NIH]

Triglyceride: A lipid carried through the blood stream to tissues. Most of the body's fat tissue is in the form of triglycerides, stored for use as energy. Triglycerides are obtained primarily from fat in foods. [NIH]

Tryptophan: An essential amino acid that is necessary for normal growth in infants and for nitrogen balance in adults. It is a precursor serotonin and niacin. [NIH]

Tuberculosis: Any of the infectious diseases of man and other animals caused by species of Mycobacterium. [NIH]

Tumor marker: A substance sometimes found in an increased amount in the blood, other body fluids, or tissues and which may mean that a certain type of cancer is in the body. Examples of tumor markers include CA 125 (ovarian cancer), CA 15-3 (breast cancer), CEA (ovarian, lung, breast, pancreas, and gastrointestinal tract cancers), and PSA (prostate cancer). Also called biomarker. [NIH]

Tumour: 1. Swelling, one of the cardinal signs of inflammations; morbid enlargement. 2. A new growth of tissue in which the multiplication of cells is uncontrolled and progressive; called also neoplasm. [EU]

Tungsten: A metallic element with the atomic symbol W, atomic number 74, and atomic weight 183.85. It is used in many manufacturing applications, including increasing the hardness, toughness, and tensile strength of steel; manufacture of filaments for incandescent light bulbs; and in contact points for automotive and electrical apparatus. [NIH]

Type 2 diabetes: Usually characterized by a gradual onset with minimal or no symptoms of metabolic disturbance and no requirement for exogenous insulin. The peak age of onset is 50 to 60 years. Obesity and possibly a genetic factor are usually present. [NIH]

Unconscious: Experience which was once conscious, but was subsequently rejected, as the "personal unconscious". [NIH]

Uraemia: 1. An excess in the blood of urea, creatinine, and other nitrogenous end products of protein and amino acids metabolism; more correctly referred to as azotemia. 2. In current usage the entire constellation of signs and symptoms of chronic renal failure, including nausea, vomiting anorexia, a metallic taste in the mouth, a uraemic odour of the breath, pruritus, uraemic frost on the skin, neuromuscular disorders, pain and twitching in the muscles, hypertension, edema, mental confusion, and acid-base and electrolyte imbalances. [EU]

Urea: A compound (CO(NH2)2), formed in the liver from ammonia produced by the deamination of amino acids. It is the principal end product of protein catabolism and constitutes about one half of the total urinary solids. [NIH]

Uremia: The illness associated with the buildup of urea in the blood because the kidneys are not working effectively. Symptoms include nausea, vomiting, loss of appetite, weakness, and mental confusion. [NIH]

Ureters: Tubes that carry urine from the kidneys to the bladder. [NIH]

Urethra: The tube through which urine leaves the body. It empties urine from the bladder. [NIH]

Urinary: Having to do with urine or the organs of the body that produce and get rid of urine. [NIH]

Urinary tract: The organs of the body that produce and discharge urine. These include the kidneys, ureters, bladder, and urethra. [NIH]

Urinary tract infection: An illness caused by harmful bacteria growing in the urinary tract. [NIH]

Urine: Fluid containing water and waste products. Urine is made by the kidneys, stored in

the bladder, and leaves the body through the urethra. [NIH]

Urine Testing: Checking urine to see if it contains glucose (sugar) and ketones. Special strips of paper or tablets (called reagents) are put into a small amount of urine or urine plus water. Changes in the color of the strip show the amount of glucose or ketones in the urine. Urine testing is the only way to check for the presence of ketones, a sign of serious illness. However, urine testing is less desirable then blood testing for monitoring the level of glucose in the body. [NIH]

Uterus: The small, hollow, pear-shaped organ in a woman's pelvis. This is the organ in which a fetus develops. Also called the womb. [NIH]

Vaccine: A substance or group of substances meant to cause the immune system to respond to a tumor or to microorganisms, such as bacteria or viruses. [NIH]

Vacuoles: Any spaces or cavities within a cell. They may function in digestion, storage, secretion, or excretion. [NIH]

Vagus Nerve: The 10th cranial nerve. The vagus is a mixed nerve which contains somatic afferents (from skin in back of the ear and the external auditory meatus), visceral afferents (from the pharynx, larynx, thorax, and abdomen), parasympathetic efferents (to the thorax and abdomen), and efferents to striated muscle (of the larynx and pharynx). [NIH]

Valine: A branched-chain essential amino acid that has stimulant activity. It promotes muscle growth and tissue repair. It is a precursor in the penicillin biosynthetic pathway. [NIH]

Valproic Acid: A fatty acid with anticonvulsant properties used in the treatment of epilepsy. The mechanisms of its therapeutic actions are not well understood. It may act by increasing GABA levels in the brain or by altering the properties of voltage dependent sodium channels. [NIH]

Valves: Flap-like structures that control the direction of blood flow through the heart. [NIH]

Vanadium: Vanadium. A metallic element with the atomic symbol V, atomic number 23, and atomic weight 50.94. It is used in the manufacture of vanadium steel. Prolonged exposure can lead to chronic intoxication caused by absorption usually via the lungs. [NIH]

Varices: Stretched veins such as those that form in the esophagus from cirrhosis. [NIH]

Vascular: Pertaining to blood vessels or indicative of a copious blood supply. [EU]

Vascular Resistance: An expression of the resistance offered by the systemic arterioles, and to a lesser extent by the capillaries, to the flow of blood. [NIH]

Vasculitis: Inflammation of a blood vessel. [NIH]

Vasodilators: Any nerve or agent which induces dilatation of the blood vessels. [NIH]

Vector: Plasmid or other self-replicating DNA molecule that transfers DNA between cells in nature or in recombinant DNA technology. [NIH]

Vegetative: 1. Concerned with growth and with nutrition. 2. Functioning involuntarily or unconsciously, as the vegetative nervous system. 3. Resting; denoting the portion of a cell cycle during which the cell is not involved in replication. 4. Of, pertaining to, or characteristic of plants. [EU]

Vein: Vessel-carrying blood from various parts of the body to the heart. [NIH]

Venous: Of or pertaining to the veins. [EU]

Venous Pressure: The blood pressure in a vein. It is usually measured to assess the filling pressure to the ventricle. [NIH]

Ventilation: 1. In respiratory physiology, the process of exchange of air between the lungs

and the ambient air. Pulmonary ventilation (usually measured in litres per minute) refers to the total exchange, whereas alveolar ventilation refers to the effective ventilation of the alveoli, in which gas exchange with the blood takes place. 2. In psychiatry, verbalization of one's emotional problems. [EU]

Ventral: 1. Pertaining to the belly or to any venter. 2. Denoting a position more toward the belly surface than some other object of reference; same as anterior in human anatomy. [EU]

Ventricle: One of the two pumping chambers of the heart. The right ventricle receives oxygen-poor blood from the right atrium and pumps it to the lungs through the pulmonary artery. The left ventricle receives oxygen-rich blood from the left atrium and pumps it to the body through the aorta. [NIH]

Ventricular: Pertaining to a ventricle. [EU]

Venules: The minute vessels that collect blood from the capillary plexuses and join together to form veins. [NIH]

Vertebrae: A bony unit of the segmented spinal column. [NIH]

Vesicular: 1. Composed of or relating to small, saclike bodies. 2. Pertaining to or made up of vesicles on the skin. [EU]

Veterinary Medicine: The medical science concerned with the prevention, diagnosis, and treatment of diseases in animals. [NIH]

Villi: The tiny, fingerlike projections on the surface of the small intestine. Villi help absorb nutrients. [NIH]

Vinca Alkaloids: A class of alkaloids from the genus of apocyanaceous woody herbs including periwinkles. They are some of the most useful antineoplastic agents. [NIH]

Vincristine: An anticancer drug that belongs to the family of plant drugs called vinca alkaloids. [NIH]

Viral: Pertaining to, caused by, or of the nature of virus. [EU]

Viral Hepatitis: Hepatitis caused by a virus. Five different viruses (A, B, C, D, and E) most commonly cause this form of hepatitis. Other rare viruses may also cause hepatitis. [NIH]

Virulence: The degree of pathogenicity within a group or species of microorganisms or viruses as indicated by case fatality rates and/or the ability of the organism to invade the tissues of the host. [NIH]

Virus: Submicroscopic organism that causes infectious disease. In cancer therapy, some viruses may be made into vaccines that help the body build an immune response to, and kill, tumor cells. [NIH]

Visceral: , from viscus a viscus) pertaining to a viscus. [EU]

Visceral Afferents: The sensory fibers innervating the viscera. [NIH]

Visual Acuity: Acuteness or clearness of vision, especially of form vision, which is dependent mainly on the sharpness of the retinal focus. [NIH]

Vitamin A: A substance used in cancer prevention; it belongs to the family of drugs called retinoids. [NIH]

Vitreous: Glasslike or hyaline; often used alone to designate the vitreous body of the eye (corpus vitreum). [EU]

Vitreous Body: The transparent, semigelatinous substance that fills the cavity behind the crystalline lens of the eye and in front of the retina. It is contained in a thin hyoid membrane and forms about four fifths of the optic globe. [NIH]

Vitro: Descriptive of an event or enzyme reaction under experimental investigation

occurring outside a living organism. Parts of an organism or microorganism are used together with artificial substrates and/or conditions. [NIH]

Vivo: Outside of or removed from the body of a living organism. [NIH]

Wakefulness: A state in which there is an enhanced potential for sensitivity and an efficient responsiveness to external stimuli. [NIH]

Warts: Benign epidermal proliferations or tumors; some are viral in origin. [NIH]

White blood cell: A type of cell in the immune system that helps the body fight infection and disease. White blood cells include lymphocytes, granulocytes, macrophages, and others. [NIH]

Whooping Cough: A respiratory infection caused by Bordetella pertussis and characterized by paroxysmal coughing ending in a prolonged crowing intake of breath. [NIH]

Whooping Cough: A respiratory infection caused by Bordetella pertussis and characterized by paroxysmal coughing ending in a prolonged crowing intake of breath. [NIH]

Windpipe: A rigid tube, 10 cm long, extending from the cricoid cartilage to the upper border of the fifth thoracic vertebra. [NIH]

Withdrawal: 1. A pathological retreat from interpersonal contact and social involvement, as may occur in schizophrenia, depression, or schizoid avoidant and schizotypal personality disorders. 2. (DSM III-R) A substance-specific organic brain syndrome that follows the cessation of use or reduction in intake of a psychoactive substance that had been regularly used to induce a state of intoxication. [EU]

Wound Healing: Restoration of integrity to traumatized tissue. [NIH]

Xenograft: The cells of one species transplanted to another species. [NIH]

X-ray: High-energy radiation used in low doses to diagnose diseases and in high doses to treat cancer. [NIH]

Yeasts: A general term for single-celled rounded fungi that reproduce by budding. Brewers' and bakers' yeasts are Saccharomyces cerevisiae; therapeutic dried yeast is dried yeast. [NIH]

Yellow Fever: An acute infectious disease primarily of the tropics, caused by a virus and transmitted to man by mosquitoes of the genera Aedes and Haemagogus. [NIH]

Yellow Fever Virus: The type species of the Flavivirus genus. Principal vector transmission to humans is by Aedes spp. mosquitoes. [NIH]

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