

CEREBRAL ANEURYSM



A 3-IN-1 MEDICAL REFERENCE

Medical Dictionary

Bibliography &

Annotated Research Guide

TO INTERNET REFERENCES

CEREBRAL ANEURYSM

A MEDICAL DICTIONARY, BIBLIOGRAPHY,
AND ANNOTATED RESEARCH GUIDE TO
INTERNET REFERENCES



JAMES N. PARKER, M.D.
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The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this book which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which produce publications on cerebral aneurysm. Books in this series draw from various agencies and institutions associated with the United States Department of Health and Human Services, and in particular, the Office of the Secretary of Health and Human Services (OS), the Administration for Children and Families (ACF), the Administration on Aging (AOA), the Agency for Healthcare Research and Quality (AHRQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Healthcare Financing Administration (HCFA), the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the institutions of the National Institutes of Health (NIH), the Program Support Center (PSC), and the Substance Abuse and Mental Health Services Administration (SAMHSA). In addition to these sources, information gathered from the National Library of Medicine, the United States Patent Office, the European Union, and their related organizations has been invaluable in the creation of this book. Some of the work represented was financially supported by the Research and Development Committee at INSEAD. This support is gratefully acknowledged. Finally, special thanks are owed to Tiffany Freeman for her excellent editorial support.

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Table of Contents

FORWARD	1
CHAPTER 1. STUDIES ON CEREBRAL ANEURYSM	3
<i>Overview</i>	3
<i>Federally Funded Research on Cerebral Aneurysm</i>	3
<i>The National Library of Medicine: PubMed</i>	19
CHAPTER 2. NUTRITION AND CEREBRAL ANEURYSM.....	63
<i>Overview</i>	63
<i>Finding Nutrition Studies on Cerebral Aneurysm</i>	63
<i>Federal Resources on Nutrition</i>	64
<i>Additional Web Resources</i>	64
CHAPTER 3. ALTERNATIVE MEDICINE AND CEREBRAL ANEURYSM	67
<i>Overview</i>	67
<i>National Center for Complementary and Alternative Medicine</i>	67
<i>Additional Web Resources</i>	70
<i>General References</i>	71
CHAPTER 4. PATENTS ON CEREBRAL ANEURYSM	73
<i>Overview</i>	73
<i>Patents on Cerebral Aneurysm</i>	73
<i>Patent Applications on Cerebral Aneurysm</i>	78
<i>Keeping Current</i>	79
CHAPTER 5. PERIODICALS AND NEWS ON CEREBRAL ANEURYSM	81
<i>Overview</i>	81
<i>News Services and Press Releases</i>	81
<i>Academic Periodicals covering Cerebral Aneurysm</i>	83
CHAPTER 6. RESEARCHING MEDICATIONS	85
<i>Overview</i>	85
<i>U.S. Pharmacopeia</i>	85
<i>Commercial Databases</i>	86
<i>Researching Orphan Drugs</i>	86
APPENDIX A. PHYSICIAN RESOURCES	91
<i>Overview</i>	91
<i>NIH Guidelines</i>	91
<i>NIH Databases</i>	93
<i>Other Commercial Databases</i>	95
APPENDIX B. PATIENT RESOURCES.....	97
<i>Overview</i>	97
<i>Patient Guideline Sources</i>	97
<i>Finding Associations</i>	99
APPENDIX C. FINDING MEDICAL LIBRARIES.....	101
<i>Overview</i>	101
<i>Preparation</i>	101
<i>Finding a Local Medical Library</i>	101
<i>Medical Libraries in the U.S. and Canada</i>	101
ONLINE GLOSSARIES.....	107
<i>Online Dictionary Directories</i>	109
CEREBRAL ANEURYSM DICTIONARY.....	111
INDEX	153

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 cerebral aneurysm 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 cerebral aneurysm, 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 cerebral aneurysm, 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 cerebral aneurysm. 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 cerebral aneurysm, 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 cerebral aneurysm.

The Editors

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

CHAPTER 1. STUDIES ON CEREBRAL ANEURYSM

Overview

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

Federally Funded Research on Cerebral Aneurysm

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

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 cerebral aneurysm. The following is typical of the type of information found when searching the CRISP database for cerebral aneurysm:

- **Project Title: ANGIOPLASTY IN ANEURYSMAL SUBARACHNOID HEMORRHAGE**

Principal Investigator & Institution: Muizelaar, Paul; Professor and Chair; Neurological Surgery; University of California Davis Sponsored Programs, 118 Everson Hall Davis, Ca 956165200

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

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

Summary: Aneurysmal subarachnoid hemorrhage (SAH) afflicts 30,000 patients/year in the U.S.A. Amongst those who survive the initial bleed, 15% die or suffer disabilities because of Delayed Ischemic Deficit (DID) due to vasospasm. Enormous research efforts into the pharmacological prevention and/or treatment of vasospasm have resulted in only minimal improvement for this problem. In a dog model of vasospasm, transluminal balloon angioplasty (TBA) immediately after clot placement was able to totally prevent vasospasm. In a preliminary study of 12 patients with severe bleeds (Fisher grade III, and III + IV), TBA performed within three days from their SAH also totally eliminated DID and transcranial doppler (TCD) defined moderate to severe vasospasm, although the expected incidences were 45% and 80%, respectively. However, there was one procedure-related death due to patient movement of a non-intubated, non-paralyzed/anesthetized patient. We now propose to do a multi-center, randomized trial of standard treatment versus standard treatment plus prophylactic TBA. In three centers over 2.5 years, we will enroll 185 patients with severe bleeds (Fisher grade III) and 120 patients with less severe SAH (Fisher grade I, II) in this study and randomize them separately. In the severe group, TBA will be performed on all vessels forming the Circle of Willis, in the less severe group, only the aneurysm-bearing part of the circulation. TBA will be performed immediately following surgery (or endovascular treatment) under general endotracheal anesthesia and/or paralysis to maximize safety. Primary outcome will be the dichotomized Glasgow Outcome Scale (GOS) at three months. In the severe group, the number of patients is sufficient to detect an increase in favorable outcome from 40 to 70%. In the less severe group, we will have enough data to determine whether a larger multi-center trial should be done to establish the role of prophylactic TBA. Secondary outcome measures are the full five-point GOS, procedure-related death, TCD data, the occurrence of DID, and economic data. Finally 50 years after the first description of vasospasm, it appears that an effective preventative treatment is ready to be tested.

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

- **Project Title: BIOACTIVE-ABSORBABLE COIL FOR BRAIN ANEURYSM THERAPY**

Principal Investigator & Institution: Vinuela, Fernando; Radiology; University of California Los Angeles 10920 Wilshire Blvd., Suite 1200 Los Angeles, Ca 90024

Timing: Fiscal Year 2002; Project Start 10-SEP-2002; Project End 30-JUN-2005

Summary: (provided by applicant): Guglielmi detachable coils (GDCs) are the gold standard for endovascular treatment of brain aneurysms. However, GDCs appear to be less effective in wide-necked aneurysms (> 4mm). We propose to develop a new, bio-active, bio-absorbable polymeric material (BPM) coil that improves aneurysm healing by accelerating clot maturation and organization within the aneurysm. We hypothesize that aneurysm healing can be controlled by using BPMs. LONG-TERM OBJECTIVE: To improve clinical management of brain aneurysms by overcoming the present limitations of GDC system. The knowledge of the bio-molecular cascade eliciting aneurysm healing will allow its manipulation and development of better embolic agents. IMMEDIATE OBJECTIVE: 1) Bio-molecular and histological evaluations of natural thrombus formation in surgically created aneurysm. Special attention will be paid on cytokine expression related to clot maturation. 2) In-vitro evaluation of physical, chemical and degradation properties of commercially available Polymers for potential application in brain aneurysm therapy. 3) Utilization of a lateral aneurysm model in swine to evaluate anatomical and histological effects of different bioabsorption properties of commercially available Polymers and their impact in aneurysm healing. 4) Transform current GDC

technology to bioactive surface GDC (Hybrid BPM/GDC) and evaluation of angiographic and histological effectiveness of a Hybrid BPWGDC coil. 5) Development of a 100 percent bio-absorbable bio-active intravascular coil for endovascular embolization of intracranial aneurysms

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

- **Project Title: CELL AND MOLECULAR STUDIES IN CARDIOVASCULAR ENGINEERING**

Principal Investigator & Institution: Davies, Peter F.; Professor and Director; Pathology and Lab Medicine; University of Pennsylvania 3451 Walnut Street Philadelphia, Pa 19104

Timing: Fiscal Year 2002; Project Start 12-SEP-2001; Project End 31-AUG-2006

Summary: (provided by applicant): This BRP proposal from the University of Pennsylvania is a partnership of interdisciplinary scientists in bioengineering and medical research focused on the biomechanics of cardiovascular cells, membranes, and tissues in the context of site-specific therapy and tissue engineering. Complementary design-driven and hypothesis-driven approaches to vascular cell physiology and pathology are proposed. The center for the program is the Institute for Medicine and Engineering located centrally on the Penn campus. There is a subcontract to Childrens Hospital of Philadelphia (CHOP) and a collaborative partnership with N.I.S.T. The Partnership is composed of two interactive components: (i) fundamental cell and molecular investigations of cardiovascular mechanotransduction. and (ii) preclinical studies of engineered arteries, heart valve calcification, and microcoil treatment of intracranial aneurysms. The basic studies focus on the continuum of force-membrane-cytoskeleton-adhesion and extracellular matrix. The experimental approaches include geometric constraints, spatial analyses, protein conformational changes, deformation properties, and mass transport characteristics that regulate vascular cell structure, gene expression, function, and maladaptation to hemodynamic forces that may lead to pathological change. Also proposed are the development of new materials to regulate cell adhesion (and hence phenotype), and for the delivery of therapeutics in situ. Parallel, complementary preclinical studies focus on tissue engineered arteries ex vivo, heart valve pathology (both ex vivo and in vivo), and the delivery of therapeutic factors to correct intracranial aneurysms in vivo. Specific first year objectives include quantitative spatial analyses of cell deformation, localization of mechanically-induced protein conformational changes, analyses of protein phosphorylation, and the first alterations of cell mechanics through manipulations of substrate chemistry. The preclinical short-term objectives are sustained retention of structure and function of arteries maintained ex vivo and their reintroduction in vivo, the elucidation of heart valve gene expression, and both in vitro and in vivo evaluation of the release of potential therapeutic agents from coated platinum microcoils. The proposal addresses the objectives of the BRP program by integrating physical, chemical, and engineering sciences into fundamental and preclinical studies of vascular mechanotransduction, and by developing innovative materials and devices for both basic research and clinical therapy.

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

- **Project Title: COGNITIVE FUNCTION AFTER INTRACRANIAL ANEURYSM SURGERY**

Principal Investigator & Institution: Samra, Satwant K.; Anesthesiology; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, Mi 481091274

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

Summary: (provided by applicant): This is an ancillary study to be conducted in conjunction with a multicenter trial of mild intraoperative hypothermia on neurological outcome (IHAST), already funded by NINDS (NS38554), which is currently in progress. This will be a multicenter, prospective, partially blinded clinical study of the rate of recovery of cognitive function in patients who have undergone craniotomy for clipping of intracranial aneurysms. Specific aim of this investigation is to study the effects of intraoperative hypothermia and anatomical location of aneurysm on the rate of recovery of neurocognitive function. Patients in IHAST are randomized to normothermic (36.5 degrees C) and hypothermic (33 degrees C) groups based on the core body temperature at the time of aneurysm clip application. Patients, neurosurgeons, neurological examiners and study coordinators are blinded to the group assignments. Long term outcome is assessed 3 months after surgery, which is the end point of current study. We propose to do two additional tests of neuropsychological function and prolong the period of follow up to 1 year in a subset of English speaking patients, enrolled in IHAST. Patients will be recruited for this study, at the time of last visit for IHAST, therefore this study can not possibly interfere with IHAST protocol. In consenting patients, an assessment of neuropsychological function will be done at 3, 6 and 12 months after surgery. Neuropsychologists, administering/scoring these tests will be blinded to the group assignment (hypothermia/normothermia) and location of the aneurysm. The effect of hypothermia and location of aneurysm (anterior communicating, anterior cerebral, middle cerebral, posterior communicating and basilar arteries) on performance and rate of recovery of neuropsychological function will be studied by appropriate statistical analyses. We hypothesize that intraoperative hypothermia will result in better preservation of neurocognitive function and aneurysm location will have significant effect on rate of recovery of cognitive function. Information gained from this investigation will be important in giving a prognosis for returning back to work as well as planning rehabilitation of patients suffering from aneurysmal SAH in future.

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

- **Project Title: COLLAGEN-BASED TEMPLATE FOR TREATMENT /CEREBRAL ANEURYSM**

Principal Investigator & Institution: Li, Shu-Tung T.; President & Ceo; Collagen Matrix, Inc. 509 Commerce St Franklin Lakes, Nj 07417

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

Summary: The overall goal of this research proposal is to design, engineer, and test in vivo a type I collagen-based endovascular template for the therapy of cerebral aneurysms. Cerebral aneurysms are present in at least 0.5-1.0% of the United States population, and aneurysm rupture remains an important cause of morbidity and mortality. Even in major referral centers, a significant number of aneurysms are not amenable to surgical repair. The device described in this proposal is specifically designed to act as a vascular template to support and guide vascular regeneration at the base of the aneurysm and to inhibit blood flow into the aneurysm sac, resulting in thrombosis of the aneurysm. A preliminary in vitro study was performed using the initial prototype developed by the principle investigator of this proposal. The results demonstrated that type I collagen may be used to construct a hemocompatible tubular template that produces a modest reduction in arterial luminal dimension and little change in flow. During phase I, we will examine the in vivo feasibility of the collagen template in a rabbit model, while in phase II we will extend the period of study in the rabbit model to evaluate the long term effects of the collagen template. The

neurosurgical and interventional neuroradiology community is in serious need of a viable therapy for wide-neck aneurysms. If an acceptable template is developed, it is estimated that the yearly gross revenues from such a template would exceed at least \$100 million. Furthermore, the work described in this proposal could be expanded to apply to a wide range of clinical applications, including percutaneous angioplasty, closure of arteriovenous fistulae, and biliary, renal and esophageal procedures. If widely applied clinically, a collagen-based template could generate well over \$1 billion per year worldwide. PROPOSED COMMERCIAL APPLICATIONS: See above abstract

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

- **Project Title: DISSOCIATING BASAL FOREBRAIN VS. MEDIAL TEMPORAL AMNESIA**

Principal Investigator & Institution: Myers, Catherine E.; Psychology; Rutgers the State Univ of Nj Newark Blumenthal Hall, Suite 206 Newark, Nj 07102

Timing: Fiscal Year 2003; Project Start 01-JAN-2003; Project End 31-DEC-2004

Summary: (provided by applicant): Anterograde amnesia is a specific memory impairment that can result from damage to the medial temporal (MT) lobes -- including hippocampus -- as well as from damage to the basal forebrain. Clinically, both MT and basal forebrain amnesics appear similar, which has led many researchers to posit a unified "organic amnesia" syndrome following either etiology. The proposed study will more closely examine the underlying brain mechanisms of this memory impairment and offer an alternate model resulting in the dissociation of these two etiologies. Based on evidence from both animal studies and computational modeling of hippocampal-basal forebrain interaction, we propose to differentiate distinct patterns of learning and memory impairments between persons with MT and basal forebrain amnesia. Specifically, our developed computational model predicts that simple associative learning should generally be spared following MT damage but slowed (although not abolished) following basal forebrain damage. Conversely, our model predicts that more complex forms of associative learning, which require hippocampal-region mediation in animals, may be abolished in MT amnesia but remain intact in basal forebrain amnesia. Thus, the model predicts that specific areas of memory are differentially affected in different forms of amnesia. Initial pilot work to test our model has provided further evidence for this dissociation, whereby a simple form of associative memory (classical delay eyeblink conditioning), which has previously been shown to be spared in persons with MT amnesia, was demonstrated to be severely disrupted in persons with ACoA amnesia. The proposed study seeks to extend these findings and provide further evidence for this dissociation in human amnesia by using a battery of iteratively acquired associative learning tasks to extend the pilot findings to a variety of other learning paradigms, comparing performance among individuals with MT amnesia, individuals with basal forebrain amnesia subsequent to ACoA aneurysm, and matched controls. If our proposed dissociation holds, the findings will not only expand our understanding of hippocampus and basal forebrain interactions, but may also provide a foundation for the development of useful therapeutic interventions. Specifically, the identification of distinct patterns of memory impairments between these two groups may suggest future approaches for optimizing patient rehabilitation by tailoring therapy based on an amnesic individual's specific pattern of impairment.

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

- **Project Title: FAMILIAL INTRACRANIAL ANEURYSM STUDY**

Principal Investigator & Institution: Broderick, Joseph P.; Professor and Chair; Neurology; University of Cincinnati 2624 Clifton Ave Cincinnati, Oh 45221

Timing: Fiscal Year 2002; Project Start 18-SEP-2002; Project End 31-JUL-2007

Summary: (provided by applicant): Our long-term objective is to identify susceptibility genes that are related to the formation of intracranial aneurysms (IA). Rupture of IAs occurs in 16,000 to 17,000 persons in the U.S. annually, and nearly half of affected persons are dead within the first 30 days. An additional 6,000 to 7,000 persons with unruptured IAs are identified each year. Accumulated evidence indicates that a genetic component plays an important role in the development of IAs, but specific loci affecting the risk of IA have not been identified. The primary hypothesis of this study is that there are specific human chromosomal regions that are associated with an increased risk of IAs. Specific Aims of the proposal are: 1. Recruitment of 400 families with multiple individuals who have an IA through 23 referral centers throughout North America, Australia, and New Zealand that represent 35 recruitment sites. 2. Ascertainment of interviews and blood samples from all affected family members, as well as their first-degree relatives. White blood cells from living persons with an IA will be cryopreserved at Cornell Institute for Medical Research for future immortalization of cells lines as indicated. 3. Identification of unruptured IAs by obtaining MRAs in selected asymptomatic siblings (of affected individuals). 4. Completion of a 10 cM genome series in persons with IAs, as well as the spouses and children of persons with an IA who are deceased. We will perform finer mapping of chromosomal regions with suggestive evidence of linkage in the genome screen. 5. Performance of a nonparametric (allele sharing) linkage analysis, including relevant environmental factors such as smoking, to identify chromosomal regions linked to IA. Reconstruction of the genotypes of deceased affected family members will be performed. Identification of individuals who are genetically at high risk for the development of IAs would enable targeted and effective screening/prevention/treatment strategies to reduce the substantial mortality and morbidity associated with this devastating type of stroke. Only a multidisciplinary, collaborative effort to identify, accrue, and genotype FIA families will be successful in identifying sufficient high-risk families to characterize the genetic basis of IA.

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

- **Project Title: FGF-SILYL-HEPARIN CEREBRAL ANEURYSM COILS**

Principal Investigator & Institution: Zamora, Paul O.; Biosurface Engineering Technologies Suite 3119 College Park, Md 20742

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

Summary: (provided by applicant): Cerebral aneurysms can be life threatening and because the blood vessel is weak they are subject to rupture. Platinum coils are currently used as an experimental treatment for inoperable cerebral aneurysms and function by inducing thrombosis within the aneurysm. The metal/thrombus fills the aneurysm, thereby restoring a more normal blood flow in the blood vessel. Currently used coils do not stimulate tissue in-growth into the aneurysm or blood vessel wall, thereby leaving the vessel wall weakened and with a continued susceptibility to rupture. We propose improving aneurysm coils by coating a modified, proprietary heparin onto the surface, and then using the affinity of heparin to further complex basic fibroblast growth factor (FGF-2). The coating is simple and cost-effective as it is performed using adsorption and affinity techniques. The FGF will encourage local cell migration and proliferation resulting in a strengthening of the aneurysm wall and a filling of the aneurysm with

cellular material. Our initial studies suggest that the heparin can be modified to alter the rate of release from a substrate, a factor that could help control the bioavailability in vivo. The Phase I studies will develop the coated coils and perform initial animal evaluations.

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

- **Project Title: FLOW DIVERTORS TO CURE CEREBRAL ANEURYSMS**

Principal Investigator & Institution: Lieber, Baruch B.; Professor; Biomedical Engineering; University of Miami Coral Gables Box 248293 Coral Gables, FL 33134

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

Summary: (provided by applicant): Stroke is the most common life-threatening neurological disease and the third leading cause of death in the United States. One fourth of the deaths from cerebrovascular disease in the United States arise from hemorrhage and stroke associated with rupture of intracranial aneurysms. The endovascular treatment for intracranial aneurysms that is gradually replacing conventional surgery has focused on the intra-aneurysmal deposition of occlusive materials with no regard for the pathology of the disease. Our hypothesis is that the hemodynamics in the parent artery/aneurysm complex can be altered by the minimally invasive implantation of a flow diverter in the parent vessel. Scaffolding by the diverter initiates parent artery/aneurysm remodeling, leading to a cure of the lesion. The design parameters, i.e., axial and radial distensibility, filament diameter, pore size, and the material composition of the flow diverter will have to be tailored to the local hemodynamics for a permanent occlusion of the aneurysm, yet preventing vessel injury, acute thrombosis, or delayed stenosis inside the bioimplant. We propose to identify the optimal design of a flow diverter for endovascular bypass of intracranial aneurysms through two sequential but complementary approaches. In the first approach, vascular replicas of experimental aneurysm models in rabbit will be used in vitro to optimize the interaction between the flow diverter and the vascular hemodynamics. Thereafter, the most promising designs will be selected for implantation in an aneurysm model in rabbit to elucidate the remodeling of the vasculature in response to the implanted flow diverter. High spatio-temporal resolution data acquired from the bench top experiments will be correlated with the limited amount of data that can be obtained in vivo. The postmortem histopathological analysis of the in vivo data will provide definitive conclusions to observations made angiographically in vivo. The tasks will be accomplished through the following specific aims: 1) To construct elastomer replicas of the rabbit aneurysm model for bench top investigation using a mock circulation loop; 2) To evaluate the influence of the design parameters of the flow diverter on intra-aneurysmal flow in the elastomer replicas; 3(a) To construct elastase-induced bifurcation aneurysm model in rabbit; (b) To implant the optimized flow diverters in the rabbit aneurysm model and quantify indices of local hemodynamic changes by the diverter; and 4) To evaluate the efficacy of the optimized flow diverters in parent artery remodeling and aneurysm exclusion.

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

- **Project Title: GENETIC AND TISSUE ENGINEERING FOR ANEURYSMS**

Principal Investigator & Institution: Kallmes, David F.; Mayo Clinic Coll of Medicine, Rochester 200 1St St Sw Rochester, Mn 55905

Timing: Fiscal Year 2002; Project Start 30-SEP-2002; Project End 31-JUL-2005

Summary: (provided by applicant): The long term goal of this research program is to improve care of patients harboring cerebral (brain) aneurysms by combining genetic and

tissue engineering with modern medical device technology. Cerebral aneurysms represent an important clinical problem, with rupture-induced morbidity and mortality affecting 30,000 patients per year in the US. The need for highly invasive, open brain surgery for treatment of such aneurysms has been partially reduced by development of platinum microcoils; these coils can be placed through small, flexible microcatheters into brain aneurysms, avoiding open surgery. Unfortunately, these microcoils fail to induce in vivo cellular proliferation and matrix deposition that would lead to permanent occlusion of aneurysms. Regrowth of aneurysms after microcoil therapy remains common with current technologies. In this proposal we will address this important clinical problem through a genetic and tissue engineering approach. We will enhance the ability of microcoils to induce cellular proliferation within aneurysm cavities by using such coils as carriers of fibroblast allografts. Further, through in vitro gene transfer techniques, we will enhance the ability of implanted cellular allografts to synthesize and secrete collagen, which will serve to reinforce the aneurysm cavity. Last, we will improve this genetic and tissue engineering approach to aneurysm therapy by use of new, minimally inflammatory "empty" adenoviruses. Our research program cross-cuts basic science and technology and represents a highly focused approach aimed at a persistent, well-defined clinical problem. Successful implementation of this research program will advance the field of genetic and tissue engineering and will improve the care of patients harboring life-threatening cerebral aneurysms.

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

- **Project Title: GENETIC STUDIES OF ANEURYSMAL SUBARACHNOID HEMORRHAGE**

Principal Investigator & Institution: Alberts, Mark J.; Professor; Neurology; Northwestern University Office of Sponsored Research Chicago, IL 60611

Timing: Fiscal Year 2002; Project Start 01-SEP-1999; Project End 30-JUN-2004

Summary: Stroke is the third leading cause of death and the leading cause of disability among adults. Recent studies have highlighted the importance of genetic factors in the etiology of several types of stroke. In particular, genetic epidemiologic and molecular genetic studies support the importance of genetic factors in the pathogenesis of familial intracranial aneurysms (IAs) and subarachnoid hemorrhage (SAH). The overall goal of this patient-oriented project is to advance the study of genetic factors responsible for familial IAs and SAH. The primary hypothesis is that specific mutations or susceptibility loci contribute to the development of familial IAs and SAH. Due to the paucity of families with multiple living affecteds having IAs or SAH, a candidate gene approach will be utilized initially. We will focus on genes involved in the metabolism of elastin, based on its importance in vascular integrity and prior studies showing altered elastin, elastase, and elastase inhibitors in patients with IAs and SAH. When adequate family resources are ascertained, genetic linkage studies will be performed. The identification of mutations or genetic susceptibility loci for familial IA/SAH will greatly influence the care of such patients as well as aid the screening and treatment of at-risk asymptomatic family members. This project has a major focus on patient-oriented research. The principal investigator will be involved in the diagnosis and ascertainment of families with IA/SAH. Asymptomatic at-risk family members will be counseled about the need to undergo screening for unruptured IAs using non-invasive techniques such as magnetic resonance angiography and CT angiography. The laboratory based research will focus on screening candidate genes using PCR, SSCP and DNA sequencing techniques. This research project combined with the PI's background and expertise

provide a wide range of patient-oriented mentorship opportunities in clinical and genetic research.

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

- **Project Title: HEMODYNAMIC INTERVENTION OF INTRACRANIAL ANEURYSMS**

Principal Investigator & Institution: Meng, Hui; Mechanical and Aerospace Engr; State University of New York at Buffalo Suite 211 Ub Commons Buffalo, Ny 14228

Timing: Fiscal Year 2004; Project Start 01-FEB-2004; Project End 31-JAN-2009

Summary: (provided by applicant): Hemodynamic intervention is a promising endovascular treatment for intracranial aneurysms. However, little is known about hemodynamic and biological responses of realistic aneurysms to such intervention. Understanding the interaction between the blood flow dynamics and biological response is vital to improving the success of aneurysm treatments. We hypothesize that disruption of impacting flow will induce favorable aneurysmal wall remodeling and thrombotic occlusion of intracranial aneurysms. We combine an in vivo rabbit model and imaged-based computational fluid dynamics approach to test this hypothesis by addressing the following Specific Aims: 1) to quantify the hemodynamic effects of stenting in realistic aneurysm geometries; 2) to determine the effects of reduced wall shear stress on aneurysm growth; 3) to determine the effect of reduced wall shear stress on vascular remodeling factors; and 4) to develop endovascular prostheses to modify intra-aneurysmal flow into a thrombogenic environment characterized by recirculation zones and long particle residence time. Scientific Significance: Quantitative understanding of the hemodynamic factors that induce favorable changes in the aneurysm pathology will help develop more effective treatment paradigms. The overall goal of this Award is for a well-established quantitative scientist and engineer in the area of fluid mechanics to make a career transition to a quantitative biomedical researcher with expertise in bioengineering, quantitative vascular biology, and transitional research on cerebrovascular disease and therapy. A multi-faceted plan is proposed to train in areas of translational neurovascular intervention, integrative cerebrovascular biology and medical imaging.

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

- **Project Title: HEMODYNAMIC STRESS IN BRAIN VASCULAR MALFORMATIONS**

Principal Investigator & Institution: Young, William L.; Associate Professor; Anesthesia & Perioperative Care; University of California San Francisco 500 Parnassus Ave San Francisco, Ca 941222747

Timing: Fiscal Year 2002; Project Start 01-APR-1999; Project End 31-MAR-2005

Summary: This project represents continuing collaboration between clinical and basic scientists to characterize the biophysical forces acting on arterial lesions. The modeling tools have been developed to the point where they can characterize the biophysical forces acting on giant cerebral fusiform aneurysms. Left untreated, giant aneurysms can continue to enlarge over the life of the patient. The risk of death or devastating morbidity approaches 85% over 5 years. To slow growth, the feeding artery is often occluded in the hope that it decreases hemodynamic stress. However, because local wall shear stress and pressure cannot be measured directly, quantitative data is lacking. We will test the primary hypothesis that treatments that decrease shear stress and pressure on the aneurysm wall slows the growth of giant aneurysms. Theoretical predictions of

altered hemodynamics will be correlated to experimental values. The methods will include theoretical computational modeling, based on experimental characterization of the aneurysm by MRA, velocity encoded MRI, and CT. Computational patient-specific models will be developed from measured geometry and inlet flow. Data will be retrieved from 15 consecutive patients (5/year) to quantify vascular structure and hemodynamics. About half of the patients will be treated by proximal artery occlusion and half left untreated at the discretion of the surgeon, based on best clinical practices. Aim I: Validating computational model assessment of velocity from MRI data: Aneurysm geometry and inlet flow derived from in vivo imaging prior to intervention will be reproduced in three representative physical models, and the velocity field will be measured and compared to simulations. We hypothesize that the velocity predicted by simulation will be in agreement with measurements in the physical model. Aim II: Theoretical prediction of changes in shear stress and pressure due to treatment: To stimulate aneurysms that had undergone surgical treatment, patient-specific computational models will be modified by simulating occlusion in a proximal feeding artery. The predicted change in flow will be correlated to the change in flow measured by MRI. Aim II: Associating aneurysms growth to biophysical forces: Shear stress and pressure estimated in untreated and treated aneurysms will be compared to measured aneurysm growth. We hypothesize that a change in aneurysm volume will be directly correlated with shear stress and pressure on the wall. The significance of the work is that patient-specific models can predict the result of surgical intervention, and provide clinicians with the ability evaluate emerging methods to treat aneurysms (e.g., stents, coiling).

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

- **Project Title: HYPOTHERMIA DURING INTRACRANIAL ANEURYSM SURGERY**

Principal Investigator & Institution: Todd, Michael M.; Anesthesia; University of Iowa Iowa City, Ia 52242

Timing: Fiscal Year 2002; Project Start 05-SEP-1999; Project End 31-MAY-2004

Summary: Aneurysmal subarachnoid hemorrhage (SAH) remains a major cause of morbidity and mortality. Since the incidence peaks in mid-life, and since many survivors are permanently damaged, the human and economic costs are immense. Much of the death and disability is the acute and delayed result of blood in the subarachnoid space (e.g. vasospasm). However, an unknown - but we believe substantial - fraction of the adverse outcomes are a complication of surgery performed to obliterate the source of bleeding; as many as 25 percent of patients who undergo craniotomy for aneurysm clipping will have a new neurologic deficit when examined 12-24hrs postoperatively. This danger is well known, and almost all surgical teams utilize some method to protect patients during surgery, including barbiturates, etomidate, steroids, mannitol or varying degrees of hypothermia. Unfortunately, in spite of the popularity of such interventions, none has ever been systematically tested in humans (other than deep hypothermia and circulatory arrest), and none are known to provide any benefit at all. Of the aforementioned therapies, we believe the best laboratory evidence supports the use of hypothermia. Our goal, therefore, is to perform a prospective, randomized clinical trial to evaluate the safety and efficacy of intraoperative hypothermia ($t=33$ degrees C) as a means of reducing early and long-term postoperative neurologic morbidity following surgery for clipping of intracranial aneurysm. Control patients will remain normothermic during and after surgery; in hypothermic patients, body temperature will be normalized as quickly as possible after the aneurysm clip is in place. All other aspects of pre- and postoperative care will be

managed routinely. We hypothesize that hypothermia, even when limited to the intraoperative period, will result in an improvement in neurologic outcome as measured by Glasgow Outcome Scale at 3months following surgery, and will also result in more rapid improvement during the first postoperative week.

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

- **Project Title: INTERVENTIONAL APPLICATION OF SHAPE MEMORY POLYMER FOAM**

Principal Investigator & Institution: Metzger, Melodie F.; Sierra Interventions, Llc 2308 Woolsey St, #1 Berkeley, Ca 94705

Timing: Fiscal Year 2003; Project Start 16-JUN-2003; Project End 30-JUN-2004

Summary: (provided by applicant): We propose to develop novel shape memory polymer (SMP) foams that have unique mechanical characteristics particularly well suited for biomedical applications. Specifically, it is our hypothesis that the polymer shape memory effect can be enhanced by structuring SMPs into open cell foams, thus creating novel actuator materials with unique combinations of extremely high recoverable strain, low recovery force, and low energy consumption for actuation. Further, we propose to apply basic work on SMP foam actuator structure/property relationships to an aneurysm/AVM occlusion device. Such a device should significantly improve aneurysm/AVM cure rates and reduce complications due to relative ease and speed of delivery, ability to pre-shape the device to match the aneurysm/AVM geometry, ability to fill and seal the aneurysm/AVM volumes, dramatic reduction in mechanical stiffness relative to solid polymer occlusions and metal coils, and enhanced biocompatibility due to material chemistry and microporous structure. The long-term goal of this research is to deliver clinical prototype devices that can begin FDA clinical trials. The primary deliverables and locations for the work for the Phase I study are 1. Establish a foam process for SMP 2. Measure and document SMP foam structure and thermo mechanical properties. 3. Fabricate foam actuator delivery system. 4. Demonstrated SMP foam device actuation in vascular model with flow.

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

- **Project Title: MYOCARDIAL ISCHEMIA AND VASOSPASM IN ANEURYSMAL SAH**

Principal Investigator & Institution: Horowitz, Michael B.; Neurological Surgery; University of Pittsburgh at Pittsburgh 350 Thackeray Hall Pittsburgh, Pa 15260

Timing: Fiscal Year 2004; Project Start 01-APR-2004; Project End 31-MAR-2008

Summary: (provided by applicant): Myocardial dysfunction within the first five days following aneurysmal subarachnoid hemorrhage (SAH) includes dysrhythmia, ischemia and "neurogenic stunned myocardium." A subset of patients has elevated troponin I levels indicative of myocardial ischemia and infarct. However, the true incidence of myocardial ischemia in this population is unknown in that ischemic episodes are short-lived, undetected, or deadly. This application will prospectively evaluate the incidence of myocardial ischemia and infarct in the SAH population and determine whether the presence of myocardial ischemia significantly increases the risk of symptomatic vasospasm (SV), a major complication following SAH. The central hypothesis of this application is that a catecholamine surge (norepinephrine (NE) epinephrine (EPI)) immediately after SAH provides a common mechanism associated with both vasospasm of the myocardial and cerebral vessels that increases the risk for secondary myocardial and cerebral ischemia and infarct. The specific aims are to: 1) determine the association

between the magnitude of the catecholamine release (NE, EPI) the occurrence of myocardial ischemia and infarct (as detected by ECG arrhythmias (ST changes and T wave inversion), decreased ventricular function; elevated CB-K, CPK, and cTnI levels)) and 2) determine whether the presence of myocardial ischemia and infarct within the first 5 days after SAH increases the risk of SV within 14 days following an SAH. A prospective, longitudinal, within-subject between-group repeated measure design will be used in that all subjects will undergo serial sampling of serum (NE, EPI, cardiac enzymes) concurrent with intense neurophysiologic monitoring, daily bedside portable echocardiography screening and clinical examinations in order to detect the presence of the outcomes of myocardial infarct and ischemia and SV.

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

- **Project Title: NEW POLYMER CEREBRAL ANEURYSM FILLER DEVICE**

Principal Investigator & Institution: Lee, Jeffrey A.; Neurovasx, Inc. 2355 Polaris Ln N, Ste 116 Plymouth, Mn 55447

Timing: Fiscal Year 2003; Project Start 30-SEP-2001; Project End 30-NOV-2004

Summary: (provided by applicant): Hemorrhagic stroke following aneurysmal rupture represents 15% to 30% of all strokes, with greater than 40,000 deaths per year attributed to acute aneurysmal rupture in the United States alone. Additionally, another 28,000 to 36,000 acutely ruptured aneurysms are treated per year in the U.S. The incidence of an intracranial aneurysm in the general population has been estimated to be between 1.5% to 8%. Current treatment options for **cerebral aneurysm** fall into two categories: surgical and interventional. Surgical procedures involve a long, delicate operation that has significant risk and a long period of postoperative rehabilitation and critical care. Recently, with the advent of neuro-interventional devices such as the Guglielmi detachable platinum coils (GDCs), a new endovascular modality for the treatment of cerebral aneurysms has become available. Our goal is to develop an endovascularly placed polymer aneurysm filler technology for treatment of aneurysms that is designed to address the shortcomings of interventional aneurysm treatment with platinum coils. We are developing a polymer filler material to be delivered in much the same way that a metallic coil is implanted. We anticipate that a packing density of at least 70% can be achieved. This substantially greater filling capability combined with the polymeric surface and surface-coating technologies will allow for permanent healing at the neck of the aneurysm.

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- **Project Title: PATHOPHYSIOLOGY OF CHRONIC CEREBRAL VASOSPASM**

Principal Investigator & Institution: Macdonald, Robert Loughlin.; Associate Professor; Surgery; University of Chicago 5801 S Ellis Ave Chicago, Il 60637

Timing: Fiscal Year 2002; Project Start 01-APR-1988; Project End 31-MAY-2006

Summary: (provided by applicant): We are investigating cerebral vasospasm which is an important cause of cerebral ischemia after subarachnoid hemorrhage (SAH). The long-term objective of this grant is to determine the mechanism of vasospasm after SAH and to thereby develop treatments that will prevent and/or reverse it. We have shown that hemoglobin causes vasospasm and that vasospasm is associated with impaired arterial relaxation. One mechanism of hemoglobin-induced vasospasm may be the binding and removal of nitric oxide (NO). We have used electron paramagnetic resonance (EPR) spectroscopy to detect nitrosyl hemoglobin in the subarachnoid space after SAH, proving that this mechanism occurs. We will therefore test the hypothesis that there is

an NO-reversible component of vasospasm by: 1) defining the extent to which vasospasm is reversible with NO donors in a monkey model of SAH; 2) measuring heme-NO adducts (nitrosyl hemoglobin) by EPR spectroscopy in clots removed from the subarachnoid space of monkeys at different times after SAH; 3) quantifying NO in the perivascular space at different times after SAH in monkeys; and 4) defining the time course of changes in and the immunohistochemical locations of the 3 isoforms of NOS in cerebral arteries and perivascular blood clot after SAH in monkeys. Second, because vasospasm does not seem to be completely preventable by NO donors, we will investigate mechanisms of NO-independent vasospasm by: 1) measuring protein kinase G messenger ribonucleic acid, protein and activity during the time course of vasospasm in monkeys; and 2) assessing calcium sensitivity of monkey cerebral arteries during the time course of vasospasm. In a rat model, we will assess the contribution of other downstream effectors of NO-induced relaxation by: 1) assessing potassium channel function during vasospasm (calcium-activated potassium channel density, single channel conductance, and open probability will be assessed using whole cell and single channel patch clamp recordings of isolated vasospastic rat cerebrovascular smooth muscle cells); and 2) measuring whole cell calcium currents during vasospasm in rats because assessment of potassium channel function requires knowledge of intracellular calcium and because smooth muscle calcium homeostasis may be altered during vasospasm after SAH.

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

- **Project Title: RADIOGRAPHIC GUIDANCE OF NEW CEREBRAL ANEURYSM STENT**

Principal Investigator & Institution: Rudin, Stephen; Professor; Radiology; State University of New York at Buffalo Suite 211 Ub Commons Buffalo, Ny 14228

Timing: Fiscal Year 2004; Project Start 15-APR-2004; Project End 31-MAR-2008

Summary: (provided by applicant): The limitations of radiographic visualization and the lack of consideration of the influence of stent deployment on details of blood flow have limited stent design to forms which are uniform and circularly symmetric. Yet some of the most important potential applications of stents such as in the treatment of aneurysms are inherently non-uniform and non-symmetric in nature. In this project, the design of innovative asymmetric stents and their deployment enabled by guidance with new high resolution x-ray image detectors are investigated. In particular, the limitations and accuracy in localizing the rotational orientation as well as the longitudinal distance of small asymmetric devices delivered by catheters within the vasculature under radiographic guidance are explored for the first time. This new capability for accurate localization will allow the implementation of new devices such as asymmetric, variable porosity stents for treatment of cerebral aneurysms by modifying aneurysm blood flow characteristics. To optimize the new stent design, flow reduction in aneurysms needed to induce thrombosis will be explored. Also details of flow and flow modification will be investigated using advanced theoretical and experimental methods. It is expected that this new capability should enable more rapid treatment of aneurysms with less chance of hemorrhage and decreased possibility for recurrence compared with existing procedures and additionally readily enable treatment of wide-necked and giant cerebral aneurysms for the first time.

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- **Project Title: THE ELECTROCARDIOGRAM IN SUBARACHNOID HEMORRHAGE**

Principal Investigator & Institution: Sommargren, Claire E.; Physiological Nursing; University of California San Francisco 500 Parnassus Ave San Francisco, Ca 941222747

Timing: Fiscal Year 2002; Project Start 24-SEP-2001; Project End 15-JUN-2003

Summary: A two-year program of training and research is proposed to study the frequency, characteristics, and clinical significance of electrocardiographic (ECG) abnormalities that occur during the acute phase of subarachnoid hemorrhage (SAH). SAH is a serious neurological disorder in which ECG abnormalities have been reported in patients without pre-existing cardiac disease. All prior investigations of this phenomenon were limited by incomplete ECG data obtained from either a single or daily 10-second ECG tracing or a single-lead rhythm strip. The proposed study will, for the first time, utilize newer computer assisted ECG technologies to collect continuous 12-lead ECG information during the entire intensive care period. The specific aims of the study will be to: 1) describe the types of ECG waveform abnormalities that occur in patients with SAH; 2) describe the frequency, duration, reversibility, and timing in the clinical course of these abnormalities; 3) investigate the relationship between ECG abnormalities and demographic, neurological, clinical, and outcomes variables; 4) explore which demographic, neurological, or clinical variables may predict the occurrence of ECG abnormalities; and 5) investigate which ECG abnormalities may predict unfavorable patient outcomes. A long-term goal of the applicant's program of research is the development of a risk-stratification tool, based on ECG abnormalities, for patients with SAH.

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

- **Project Title: THE GENETIC BASIS OF INTRACRANIAL ANEURYSMS**

Principal Investigator & Institution: Kim, Dong H.; Neurosurgery; University of Texas Hlth Sci Ctr Houston Box 20036 Houston, Tx 77225

Timing: Fiscal Year 2002; Project Start 15-FEB-2002; Project End 31-JAN-2007

Summary: PROPOSAL (Adapted from the applicant's abstract): The rupture of intracranial aneurysms leads to hemorrhage in over 30,000 Americans annually, with mortality and morbidity exceeding 75%. Because these lesions can be repaired prophylactically, an understanding of the pathogenetic mechanisms and early identification would be of tremendous benefit. But the etiology of cerebral aneurysms remains unclear. The investigators propose to define the risk factors, incidence of familial aggregation, and patterns of inheritance in patients with cerebral aneurysms. They will pay particular attention to the ethnic background, and establish a blood and tissue bank for molecular analyses. They plan to utilize the large number of patients currently treated at the UTH, to identify 500 patients with cerebral aneurysms and 50 affected families that can be studied in a detailed and consistent manner. A strength of their patient population is the ethnic diversity of those treated: 41% Caucasian, 24% African-American, 26% Hispanic, and 9% Asian. Their hypothesis is that different ethnic groups will have different risk factors, patterns of familial aggregation, and inheritance of cerebral aneurysms. The following are their specific aims: 1) to compare the incidence of familial aneurysms in patients of different ethnic backgrounds and to establish the patterns of inheritance; 2) to compare the risk factors for **cerebral aneurysm** in patients with different ethnic backgrounds; and 3) to establish a blood and tissue sample bank for linkage and molecular analyses.

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

- **Project Title: THE OPTIMAL MANAGEMENT OF CEREBRAL ANEURYSMS**

Principal Investigator & Institution: King, Joseph T.; Neurological Surgery; University of Pittsburgh at Pittsburgh 350 Thackeray Hall Pittsburgh, Pa 15260

Timing: Fiscal Year 2002; Project Start 19-MAY-2000; Project End 31-MAR-2005

Summary: (Adapted From The Applicant's Abstract): The 1-5% prevalence of cerebral aneurysms implies that 2,000,000 to 10,000,000 adults in the United States may harbor an intracranial aneurysm. Each year 21,000 of these individuals suffer a subarachnoid hemorrhage, resulting in significant morbidity, mortality, and expense. Neurosurgeons make final decisions regarding operative intervention for aneurysm patients. While there is a growing body of data on the natural history, management, and outcomes of cerebral aneurysms, the components of neurosurgical decision-making for aneurysm patients are poorly understood. My long-term objective is to establish a research career targeted at improving neurosurgical decision-making and outcomes in patients with cerebrovascular disease. My immediate goal is to develop a decision analytic and cost-effectiveness computer simulation model to evaluate the outcomes of neurosurgical decisions in patients with cerebral aneurysmsal disease. The study plan includes mentoring by Dr. Mark Roberts (a nationally recognized expert in decision sciences), one-on-one tutorials with a group of supporting advisors, course work, seminars, and directed readings. The specific aims of this proposal are: (1) Construct a computer simulation decision analytic model to examine optimal neurosurgical decision-making in patients with cerebral aneurysms, and (2) Use the computer simulation model to perform a cost effectiveness analysis to optimize societal resource allocation during the management of aneurysm patients. The research component will accomplish these aims via primary collection of patient preference and economic data, secondary data analysis, and mathematical modeling techniques. The proposal will update and greatly expand the my preliminary model to incorporate both unruptured and ruptured aneurysms, actual patient preferences for various outcome states, disease severity-adjustment, recent advances in the understanding of aneurysm natural history, the evolution of treatment technologies, and more detailed economic data. In addition, I will expand my skills and expertise in formal decision sciences and cost-effectiveness analysis through mentored sessions, specific courses, seminars, directed readings, and research work. This proposal builds on my training in neurosurgery and epidemiology and on my current research. The study and research plan should lay the foundation for sustained career development. At the conclusion of this award, I will have gained the experience and research skills to independently investigate and improve neurosurgical decision-making and outcomes in patients with cerebrovascular disease.

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

- **Project Title: UNRUPTURED INTRACRANIAL ANEURYSMS: NEUROLOGIC OUTCOME**

Principal Investigator & Institution: Torner, James C.; Professor and Head; Epidemiology; University of Iowa Iowa City, Ia 52242

Timing: Fiscal Year 2004; Project Start 15-MAR-2004; Project End 28-FEB-2008

Summary: (provided by applicant): Unruptured Intracranial Aneurysms (UIA) constitute a significant public health problem in the United States, which is growing in magnitude. The economic and social implications of optimizing clinical practice in this area are striking, given the considerable and escalating frequency with which UIAs are now detected in the population. The prevention of unnecessary death and disability related to UIA depends to a large degree upon a better understanding of the natural

history of these lesions, as well as the short- and long-term benefits and risks associated with their repair. The current proposal represents a continuation of the prospective component of the International Study of Unruptured Intracranial Aneurysms (ISUIA). Its primary objectives center around defining the long-term risks of UIA rupture and other UIA natural history outcomes, risk factors associated with these natural history outcomes, long-term outcomes associated with endovascular and surgical repair of these lesions, and predictors of good and poor treatment outcomes. The first two phases of ISUIA have provided substantial and unique information regarding short-term prospective natural history and treatment outcomes, and have established that short-term prospective natural history rupture rates are different than retrospective natural history rupture rates. The current proposal utilizes the large ISUIA cohort of patients established over the past ten years to provide vital long-term clinical information, which would otherwise be unobtainable. The current proposal involves the follow-up of living cases with UIA among the 4,060 cases in the prospective cohort, including 1,692 cases in the unoperated cohort and 2,368 cases in the cohort, which had UIA repair. The additional follow-up will allow the estimation of ten-year hemorrhage rates, and other outcome measures beyond the currently available five-year rates. It will also provide critical information on the long-term durability and effectiveness of endovascular and surgical treatment procedures, which are important in making clinical decisions regarding optimal management. Primary analyses will examine neurologic outcome, specifically fatal and non-fatal intracranial hemorrhagic strokes, secondary to aneurismal rupture and morbidity/mortality following UIA treatment. Secondary analyses will examine other aneurismal complications, such as ischemic stroke and death from all causes, including retreatment, durability of treatment, and functional endpoints, including Rankin, Barthel, and SF36 scores.

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

- **Project Title: UNRUPTURED INTRACRANIAL ANEURYSMS--NEUROLOGICAL OUTCOME**

Principal Investigator & Institution: Wiebers, David O.; Mayo Clinic Coll of Medicine, Rochester 200 1St St Sw Rochester, Mn 55905

Timing: Fiscal Year 2002; Project Start 19-SEP-1991; Project End 31-AUG-2003

Summary: Unruptured intracranial aneurysms (UIA) constitute a significant public health problem in the United States (which is growing in magnitude). The prevention of hemorrhagic stroke in patients with UIA may be possible with a better understanding of the natural history of these lesions as well as the short and long-term benefits and risks associated with their repair. The current proposal represents a continuation of the first phase of the International Study of Unruptured Intracranial Aneurysms (ISUIA). Its primary objectives are to 1) define a critical aneurysm size above which there is a significant risk of future rupture among patients with UIA and no history of subarachnoid hemorrhage (SAH); 2) compare the risk of future rupture of UIA, disability, and death among patients with and without a history of prior SAH from a different source and to determine whether or not the risk of future rupture varies directly with aneurysmal size among patients with a history of prior SAH; and 3) define the surgical and endovascular morbidity and mortality involved with repair of UIA across a broad spectrum of populations, surgeons, and interventional neuroradiologists with special reference to the size and location of the aneurysm, history of SAH from another source, and other confounding variables such as age and associated medical conditions. The current proposal involves the prospective entry and follow-up of 2400 new cases with UIA (3500 total cases were entered in Phase I), and the continued follow-

up of living cases with UIA entered to date at the 53 participating centers. The primary analysis will examine neurologic outcome, specifically, fatal and non-fatal intracranial hemorrhagic stroke secondary to aneurysmal rupture. Secondary analyses will examine other aneurysmal complications such as ischemic stroke and death from all causes. The prognostic significance of several independent clinical and radiological variables with respect to stroke due to aneurysmal rupture and mortality will also be analyzed using a Cox proportional hazards model. In addition, extensive planning has been undertaken to establish a molecular genetics component to this study to identify specific genetic defects predisposing the development and rupture of intracranial aneurysms. Funding for this component will be requested via a separate proposal submitted as a supplement to the current application.

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

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.³ 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 cerebral aneurysm, simply go to the PubMed Web site at <http://www.ncbi.nlm.nih.gov/pubmed>. Type "cerebral aneurysm" (or synonyms) into the search box, and click "Go." The following is the type of output you can expect from PubMed for cerebral aneurysm (hyperlinks lead to article summaries):

- **A case of cerebral aneurysm associated with an anomalous middle cerebral artery.**
Author(s): Shigemori M, Shirahama M, Kawaba T, Tokutomi T, Hara K.
Source: Kurume Med J. 1981; 28(1): 87-9. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7321518
- **A case of cerebral aneurysm associated with complex partial seizures.**
Author(s): Tanaka K, Hirayama K, Hattori H, Matsuoka O, Sakamoto H, Hakuba A, Murata R.
Source: Brain & Development. 1994 May-June; 16(3): 233-7.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7943610

³ 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 case of polycystic disease of the liver and the kidney associated with cerebral aneurysm and fulminant hepatitis.**
Author(s): Iwamura K, Itakura M.
Source: Tokai J Exp Clin Med. 1980 July; 5(3): 339-49.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7222124
- **A comparative study of performance characteristics of cerebral aneurysm clips.**
Author(s): Fink CL, Flandry RE, Pratt RA, Early CB.
Source: Surgical Neurology. 1979 March; 11(3): 179-86.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=473010
- **A large middle cerebral aneurysm presenting as a bizarre vascular malformation.**
Author(s): Cantu RC, LeMay M.
Source: The British Journal of Radiology. 1966 April; 39(460): 317-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5910095
- **A long-term follow-up study in direct cerebral aneurysm surgery.**
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http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14520544
- **Vanishing cerebral aneurysm in serial angiography.**
Author(s): Moritake K, Handa H, Ohtsuka S, Hashimoto N.
Source: Surgical Neurology. 1981 July; 16(1): 36-40.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7280970
- **Vasodilators during cerebral aneurysm surgery.**
Author(s): Abe K.
Source: Canadian Journal of Anaesthesia = Journal Canadien D'anesthesie. 1993 August; 40(8): 775-90. Review.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8403162
- **Venous infarction resulting from sacrifice of a bridging vein during clipping of a cerebral aneurysm: preoperative evaluation using three-dimensional computed tomography angiography--case report.**
Author(s): Suzuki Y, Endo T, Ikeda H, Ikeda Y, Matsumoto K.
Source: Neurol Med Chir (Tokyo). 2003 November; 43(11): 550-4.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14705322
- **Visualization of cerebral aneurysm on Tc-99m HMPAO brain perfusion scintigram for brain death.**
Author(s): Shah R, Miron S, Sodee DB.
Source: Clinical Nuclear Medicine. 1994 May; 19(5): 457-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8039324

CHAPTER 2. NUTRITION AND CEREBRAL ANEURYSM

Overview

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

Finding Nutrition Studies on Cerebral Aneurysm

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.⁴ 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 "cerebral aneurysm" (or synonyms) into the search box, and click "Go." To narrow the search, you can also select the "Title" field.

⁴ 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 information is typical of that found when using the “Full IBIDS Database” to search for “cerebral aneurysm” (or a synonym):

- **Spontaneous saccular cerebral aneurysm in a rat.**
Author(s): Freie Universitat Berlin, Institut fur Neuropathologie, Federal Republic of Germany.
Source: Kim, C Cervos Navarro, J Acta-Neurochir-(Wien). 1991; 109(1-2): 63-5 0001-6268

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>

CHAPTER 3. ALTERNATIVE MEDICINE AND CEREBRAL ANEURYSM

Overview

In this chapter, we will begin by introducing you to official information sources on complementary and alternative medicine (CAM) relating to cerebral aneurysm. 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 cerebral aneurysm 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 "cerebral aneurysm" (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 cerebral aneurysm:

- **A randomized controlled trial of high-dose intravenous nicardipine in aneurysmal subarachnoid hemorrhage. A report of the Cooperative Aneurysm Study.**
 Author(s): Haley EC Jr, Kassell NF, Torner JC.
 Source: Journal of Neurosurgery. 1993 April; 78(4): 537-47.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8450326
- **Acute intracranial hemorrhage caused by acupuncture.**
 Author(s): Choo DC, Yue G.
 Source: Headache. 2000 May; 40(5): 397-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10849036

- **Acute onset of painful ophthalmoplegia following chiropractic manipulation of the neck. Initial sign of intracranial aneurysm.**
 Author(s): Simnad VI.
 Source: The Western Journal of Medicine. 1997 March; 166(3): 207-10.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9143201

- **Aneurysm of the cervical internal carotid artery following chiropractic manipulation.**
 Author(s): Murthy JM, Naidu KV.
 Source: Journal of Neurology, Neurosurgery, and Psychiatry. 1988 September; 51(9): 1237-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3225611

- **Brain scans in autopsy proved cases of intracerebral hemorrhage.**
 Author(s): Sharma SM, Quinn JL 2nd.
 Source: Archives of Neurology. 1973 April; 28(4): 270-1.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4631768

- **Cardiac resuscitation following two hours of cardiac massage and 42 countershocks.**
 Author(s): Stept WJ, Safar P.
 Source: Anesthesiology. 1966 January-February; 27(1): 97-100.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5901131

- **Carotid dissection.**
 Author(s): Janati A.
 Source: Neurology. 1996 August; 47(2): 610-1.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8757059

- **Cure of intracranial aneurysm without use of blood transfusion.**
 Author(s): Posnikoff J.
 Source: Calif Med. 1967 February; 106(2): 124-7. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6044291

- **Dissection of the internal carotid artery after chiropractic manipulation of the neck.**
 Author(s): Peters M, Bohl J, Thomke F, Kallen KJ, Mahlzahn K, Wandel E, Meyer zum Buschenfelde KH.
 Source: Neurology. 1995 December; 45(12): 2284-6.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8848211

- **Dose-escalation study of intravenous nicardipine in patients with aneurysmal subarachnoid hemorrhage.**
 Author(s): Flamm ES, Adams HP Jr, Beck DW, Pinto RS, Marler JR, Walker MD, Godersky JC, Loftus CM, Biller J, Boarini DJ, et al.

Source: Journal of Neurosurgery. 1988 March; 68(3): 393-400.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3343611

- **Emotional disturbance and subarachnoid haemorrhage.**
 Author(s): Penrose R, Storey P.
 Source: Psychotherapy and Psychosomatics. 1970; 18(1): 321-5.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=5520672

- **Hyperbaric oxygen as an adjunct to acute revascularization of the brain.**
 Author(s): Kapp JP.
 Source: Surgical Neurology. 1979 December; 12(6): 457-61.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=534562

- **Hyperbaric oxygen therapy adjunctive to mild hypertensive hypervolemia for symptomatic vasospasm.**
 Author(s): Kohshi K, Yokota A, Konda N, Munaka M, Yasukouchi H.
 Source: Neurol Med Chir (Tokyo). 1993 February; 33(2): 92-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7682672

- **I have my voice. Interview by Laurence Dopson.**
 Author(s): Law D.
 Source: Nurs Times. 1988 November 23-29; 84(47): 62-3. No Abstract Available.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3211797

- **Identification of a serum gelatinase associated with the occurrence of cerebral aneurysms as pro-matrix metalloproteinase-2.**
 Author(s): Todor DR, Lewis I, Bruno G, Chyatte D.
 Source: Stroke; a Journal of Cerebral Circulation. 1998 August; 29(8): 1580-3.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9707196

- **Impairment of the visuo-spatial sketch pad.**
 Author(s): Hanley JR, Young AW, Pearson NA.
 Source: The Quarterly Journal of Experimental Psychology. A, Human Experimental Psychology. 1991 February; 43(1): 101-25.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2017570

- **Intra-arterial infusion of papaverine combined with intravenous administration of high-dose nicardipine for cerebral vasospasm.**
 Author(s): Yoshimura S, Tsukahara T, Hashimoto N, Kazekawa K, Kobayashi A.
 Source: Acta Neurochirurgica. 1995; 135(3-4): 186-90.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8748812

- **Ischemic stroke secondary to vertebral and carotid artery dissection following chiropractic manipulation of the cervical spine.**
Author(s): Turgut M.
Source: Neurosurgical Review. 2002 August; 25(4): 267.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12206133
- **Re: "Acute intracranial hemorrhage caused by acupuncture" (Choo DC, Yue G. Headache. 2000;40:397-398.).**
Author(s): Sohn RS.
Source: Headache. 2001 March; 41(3): 328-9.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11264701
- **Risk factors and precipitating neck movements causing vertebrobasilar artery dissection after cervical trauma and spinal manipulation.**
Author(s): Haldeman S, Kohlbeck FJ, McGregor M.
Source: Spine. 1999 April 15; 24(8): 785-94. Review.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10222530
- **Stroke after chiropractic manipulation as a result of extracranial postero-inferior cerebellar artery dissection.**
Author(s): Sedat J, Dib M, Mahagne MH, Lonjon M, Paquis P.
Source: Journal of Manipulative and Physiological Therapeutics. 2002 November-December; 25(9): 588-90.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12466778
- **Vascular extracellular matrix remodeling in cerebral aneurysms.**
Author(s): Bruno G, Todor R, Lewis I, Chyatte D.
Source: Journal of Neurosurgery. 1998 September; 89(3): 431-40.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9724118

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/

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 CEREBRAL ANEURYSM

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.⁵ 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 "cerebral aneurysm" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on cerebral aneurysm, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Cerebral Aneurysm

By performing a patent search focusing on cerebral aneurysm, 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 will tell you how to obtain this information later in the chapter.

⁵Adapted from the United States Patent and Trademark Office:
<http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm>.

The following is an example of the type of information that you can expect to obtain from a patent search on cerebral aneurysm:

- **Aneurysm clip**

Inventor(s): Guy; Jack J. (Sunnyvale, CA), Maughan; P. Kevin (Sanibel, FL), Schmidt; Ferenc J. (Bryn Mawr, PA)

Assignee(s): Intermar, Inc. (Upper Marlboro, MD)

Patent Number: 4,765,335

Date filed: May 6, 1987

Abstract: An improved **cerebral aneurysm** clip fabricated from titanium or titanium alloys and utilizing a guide member consisting of a straight wire-like bridging guide secured across a U-shaped bend formed in one or both of the two cross arms of the aneurysm clip. The aneurysm clip is fabricated from a single, elongated resilient member of titanium or titanium alloy coiled at an intermediate portion to form a coil spring for normally urging the clamping arms of the clip together in a resilient manner. The clip further consists of two forearm sections extending outwardly and away from the coil spring in the direction of the clamping arms of the clip with the forearm sections terminating in inwardly bent first elbow portions that support respective cross arm sections. The cross arm sections extend from the respective first elbow portions in mutually crossing and slidably engaging relationship with each other and terminate in second inwardly bent elbow portions that support the respective clamping arms of the aneurysm clip. Because the clip is fabricated from titanium or titanium alloys, it can be readily color coded by a simple and safe electrolytic oxidation technique capable of providing a passivating oxide layer of different color for coding purposes for different sizes and shapes of clips being manufactured.

Excerpt(s): This invention relates to an improved aneurysm clip (clamp) for permanently or temporarily isolating an aneurysm from the artery to which it is attached. A **cerebral aneurysm** clip (clamp) is a surgical instrument for clamping the base part of a **cerebral aneurysm** to either temporarily or permanently isolate the latter from the cerebral artery. For this purpose, the aneurysm clip must be able to maintain the clamping pressure with high reliability as long as desired without causing injury to the wall of the blood vessel to which it is attached. Such injury could be caused by shearing action resulting from improper alignment of the jaws of the clip, or by improper magnitude of pressure, or by introduction of foreign material trapped in the cracks and crevices of a poorly constructed clip, or by the electromagnetic properties of clips made of improperly chosen materials used in their construction. There are a number of different kinds of **cerebral aneurysm** clips available in the art today; however, these are made of improperly chosen materials which interfere with important diagnostic techniques such as magnetic resonance imaging (MRI or NMR) due to haloing caused by the magnetic materials. 1. The clamping pressure of the jaws of the clip must be sufficient for isolating a **cerebral aneurysm**, but not so great that it could damage the wall of the blood vessel to which it is attached whether used in a permanent implant or in a temporary implant application mode.

Web site: http://www.delphion.com/details?pn=US04765335__

- **Cerebral aneurysm clip**

Inventor(s): Nemoto; Gunji (Matsudo, JP), Sugita; Keiichiro (Nagoya, JP)

Assignee(s): Mizuho Ika Kogyo Kabushiki Kaisha (Tokyo, JP)

Patent Number: 4,360,023

Date filed: March 22, 1977

Abstract: A metal wire guide member consisting of two leg portions and a straight guide portion connecting the two leg portions is secured to a cerebral aneurysm clip with clamping jaws which are opened and closed by operating resilient arms supporting the jaws, in such a manner that the leg portions are fixedly embedded in the proximal portion of one of the jaws and in the supporting arm of the same jaw, respectively, and the straight guide portion is in pressing sliding contact with the other arm to guide the same along and press the same against the one arm whereby the jaws are correctly engaged with each other.

Excerpt(s): This invention relates to an improvement of **cerebral aneurysm** clamps or clips. Several types of **cerebral aneurysm** clips are known in the art. It is true that these conventional **cerebral aneurysm** clips have their own specific features. However, they do not satisfy all the conditions required for their use. The **cerebral aneurysm** clip is a surgical instrument for clamping the base part of a **cerebral aneurysm** to permanently isolate the latter from the cerebral artery, and therefore it must be able to continuously maintain its clamping state with high reliability.

Web site: http://www.delphion.com/details?pn=US04360023__

- **Cerebral aneurysm clip**

Inventor(s): Fujita; Shigekiyo (8-22, kitashinzaike 1-Chome, Himeji, Hyogo, JP), Hiraiwa; Hiromitsu (Aichi, JP), Kuno; Hiroaki (Aichi, JP), Kurushima; Toyokazu (Aichi, JP)

Assignee(s): Fujita; Shigekiyo (Himeji, JP), Inax Corporation (Tokoname, JP)

Patent Number: 4,943,298

Date filed: June 2, 1989

Abstract: A **cerebral aneurysm** clip composed of blade parts capable of clipping the root of a lump of **cerebral aneurysm** and a spring part of imparting a clipping force to the said blade parts, which is characterized in that the said blade parts are made of a synthetic resin or ceramic.

Excerpt(s): The present invention relates to a cerebral aneurysm clip and, in particular, to that which may apply to a patient with no trouble in X-ray CT (computed tomography) or NMR (nuclear magnetic resonance)-CT examination. Cerebral aneurysm is caused by expansion of the artery of a brain in the form of a lump, and when it is broken, it would cause subarachnoid hemorrhage or the like serious condition to endanger the life. Prior to the surgical operation on the **cerebral aneurysm**, the existence thereof is first ascertained by X-ray CT or NMR-CT as cerebral angiography, and thereafter the root part of the lump is clipped with a particular metal clip which is called a **cerebral aneurysm** clip whereby the surgical operation is finished. After the operation, the clip used is kept in the brain as it is.

Web site: http://www.delphion.com/details?pn=US04943298__

- **Surgical clip**

Inventor(s): Sasaoka; Satoshi (Tokyo, JP), Segawa; Hiromu (Fujinomiya, JP)

Assignee(s): Mizuho Ika Kogyo Kabushiki Kaisha (Tokyo, JP)

Patent Number: 5,312,426

Date filed: March 12, 1993

Abstract: A **cerebral aneurysm** clip used for clamping an intercerebral blood vessel during a surgical operation. The clip has a pair of opposite clamping blades or arms for clamping a blood vessel, semi-circular engagement portions integrally connected to the proximal ends of the clamping arms, and a resilient wire portion integrally connecting the two engagement portions for exerting a resilient clamping force to the clamping arms via the engagement portions. The clamping arms are opened and closed by manipulating forceps which has at its tip engagement protrusions engaging the engagement portions from the inside. In order to prevent a blood vessel from passing excessively beyond the region between the opposite clamping arms, a U-shaped wire element is attached to the clip. The wire element has a transverse section passed through and across the proximal ends of the clamping arms for preventing ingress of the blood vessel into the space between the engagement portions. The wire element has also a pair of connecting sections connecting the ends of the transverse section with the resilient portion of the clip. The connecting sections prevent a blood vessel from being caught by the resilient portion.

Excerpt(s): The present invention relates to a surgical clip and, more particularly, to a clip for clamping a blood vessel to blockade, for example, a **cerebral aneurysm** in a surgical operation. A **cerebral aneurysm** clip is a surgical instrument for clamping the base part of a **cerebral aneurysm** to isolate the latter from the cerebral artery. A typical **cerebral aneurysm** clip comprises a coiled intermediate portion and a pair of arms integrally extending therefrom in substantially the same direction to form opposite clamping jaws for clamping a blood vessel, as disclosed in U.S. Pat. No. 4,360,023 to Sugita et al. A **cerebral aneurysm** can be formed at a variety of positions in intercerebral blood vessels, and an access to a position where the aneurysm exists must be made through an extremely narrow space. In order to enable such an access to the aneurysm, a combination of a clip and forceps was proposed in Japanese Patent Publication No. Hei 4-68943.

Web site: http://www.delphion.com/details?pn=US05312426__

- **Sustained-release vasodilator**

Inventor(s): Oda; Yoshifumi (Kohchiken, JP)

Assignee(s): Chisso Corporation (Osaka, JP)

Patent Number: 4,555,398

Date filed: September 22, 1983

Abstract: A vasodilator product having a sustained releasing function is produced by mixing and kneading an atoxic agent having vasodilating activity with a setting or thermoplastic resin and then molding them to form the molded product. Further, the vasodilator can be molded integrally together with a medical device to be implanted into a human body. These vasodilators can be used not only for an operation of **cerebral**

aneurysm, but also for drainage and vasodilator after microvascular anastomosis and endarterectomy.

Excerpt(s): This invention relates to a sustained-release vasodilator. More particularly, this invention relates to the novel vasodilator which is made to be of the sustained-release type by mixing an atoxic agent having vasodilating activity with a setting or thermoplastic resin and molding them. The number of deaths caused by cerebrovascular diseases ranks second amongst the causes of deaths, and reached about 160 thousand persons per year in 1981. Among them intracerebral hemorrhage forms about 20% thereof, and subarachnoid hemorrhage forms about 10%. Particularly, subarachnoid hemorrhage occurs frequently in men of ages of from the forties to fifties. 72 Percent of subarachnoid hemorrhage is caused by **cerebral aneurysm**, and curing of it is carried out by a surgical operation. The surgical operation is, however, accompanied with late cerebral vasospasm at the frequency of from 30 to 50%. Prognosis of the disease complicated with such the cerebral vasospasm is not satisfactorily, and about half of the patients may have some deficit. Further, there are many cases in which **cerebral aneurysm** is found out several days after paroxysm and in which the level of consciousness is not good so that the operation is delayed after a certain waiting period because of fear as to complication of cerebrovascular vasospasm due to the operation. In such cases, patients may die frequently by re-rupture during the waiting period. Although the cause of the late cerebrovascular vasospasm accompanied with subarachnoid hemorrhage has been said to be induced by the decomposed substance of hematid, the precise mechanism subsequent the said decomposition of it has not been made clear sufficiently. As curing methods thereof, conservative treatments were tried such as those of removing coagulated clot of subarachnoid space till the opposite side, by using the large quantity of steroid, phenoxybenzamine, or by using intentional hypertension therapy by means of dopamine jointly. However, none of these has succeeded in attaining an effective result. On the other hand, papaverine hydrochloride is known to be a strong cerebrovascular vasodilator and to increase cerebrovascular bloodflow upon dosing. It has, however, the disadvantage that its half-life is short due to its easily-decomposing property in liver and that in the case of peroral administration the decomposition occurs particularly quickly. Intravenous injection is ineffective for improving cerebral bloodflow because of causing hypertension due to expansion of total peripharia vessel. Large quantity systemic administration has the danger of A-V block formation and fear of side-effects such as nausea, anoreria, constipation, vertigo, headache and perspiration, etc. As to administration by intra-arterial injection, there is a large danger of embolization. Under such conditions, curing of late cerebrovascular vasospasm by administration of papaverine hydrochloride has not been sufficiently effective. (On the other hand, transient but clear remission of vasospasm is noticed by applying papaverine hydrochloride to the exposed vessel during an operation.) No complete remedy which has sure curing effect, and long lasting period of its effectiveness has been known hitherto as to the curing of late cerebrovascular vasospasm accompanied with subarachnoid hemorrhage. The inventor has studied about the effective remedies for late cerebrovascular vasospasm variously to conclude that the long-lasting sustained release type of vasodilator is effective for solving the problem. That is, an agent which is made to be a sustained-release type by mixing an atoxic agent having vasodilating activity with a setting or thermoplastic resin and then set-molding or molding them is found to be effective as the vasodilator for the delayed cerebrovascular diseases.

Web site: http://www.delphion.com/details?pn=US04555398__

Patent Applications on Cerebral Aneurysm

As of December 2000, U.S. patent applications are open to public viewing.⁶ 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 cerebral aneurysm:

- **Medical device for intrathecal cerebral cooling and methods of use**

Inventor(s): Barbut, Denise R.; (New York, NY), Heinemann, Mark-Hein; (New York, NY), Patterson, Russel H.; (New York, NY)

Correspondence: Lyon & Lyon Llp; 633 West Fifth Street; Suite 4700; Los Angeles; CA; 90071; US

Patent Application Number: 20020091356

Date filed: March 5, 2002

Abstract: The invention provides a medical device having two elongate catheters, a pump, and a refrigeration system. Each catheter has a proximal end, a distal end, a lumen therebetween and communicating with a distal port. The proximal ends of the catheters are connected to the pump and the refrigeration system. The distal ends are adapted for insertion into the subarachnoid space. The cerebral spinal fluid is aspirated from the first catheter to the pump, cooled to below body temperature, and returned to the second catheter. The flow rate of the cerebral spinal fluid is adjusted according the CSF pressure and temperature. Also described are methods of using the devices in treating patients suffering from neurologic complications that arise as a result of inadequate cerebral perfusion, such as cardiac arrest, cardiac failure, low cardiac output states, stroke, head injury, **cerebral aneurysm** surgery, open and closed cardiac surgery and aortic surgery.

Excerpt(s): This is a continuation of U.S. application Ser. No. 09/823,168, filed Mar. 29, 2001, which is a continuation of U.S. application Ser. No. 09/287,969, filed Apr. 7, 1999, which is a continuation-in-part of U.S. application Ser. No. 09/260,370, filed Mar. 1, 1999, now abandoned, the contents of each are expressly incorporated herein by reference in their entirety. The present invention generally relates to medical devices useful in reducing and preventing spinal injury in patients with spinal trauma or patients undergoing aortic surgery. More specifically, the invention provides devices for insertion into the subarachnoid space for circulating and cooling the cerebral spinal fluid below body temperature. The flow rate of the cerebral spinal fluid is variably adjusted according to the pressure and temperature, respectively measured by a manometer and thermometer. Spinal ischemia resulting in neurological complications occurs in patients sustaining a traumatic injury to the spinal cord or patients undergoing aortic surgery. Spinal cord injury can be classified as penetrating or blunt. In penetrating injuries, such as stab wound or gun shot wound to the spinal cord, complete severing of the spinal cord can occur, resulting in total muscular paralysis and loss of sensation below the level of injury. This condition of flaccid paralysis and suppression of all reflex activity following immediately upon transection of the spinal cord and involving all segments below the lesion is referred to as spinal shock. In most cases, reflex activity returns within 1 to 6 weeks from the onset of the spinal shock. Once transection of the spinal cord has occurred, peripheral reinnervation by the nervous system does not occur.

⁶ This has been a common practice outside the United States prior to December 2000.

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 cerebral aneurysm, 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 "cerebral aneurysm" (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 cerebral aneurysm.

You can also use this procedure to view pending patent applications concerning cerebral aneurysm. 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. PERIODICALS AND NEWS ON CEREBRAL ANEURYSM

Overview

In this chapter, we suggest a number of news sources and present various periodicals that cover cerebral aneurysm.

News Services and Press Releases

One of the simplest ways of tracking press releases on cerebral aneurysm 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 “cerebral aneurysm” (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 cerebral aneurysm. 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 “cerebral aneurysm” (or synonyms). The following was recently listed in this archive for cerebral aneurysm:

- **MicroVentions receives US, EU approval for cerebral aneurysm treatment**
Source: Reuters Industry Breifing
Date: March 04, 2002

- **GeNeuron licenses Cordis products to create cerebral aneurysm treatment**
Source: Reuters Industry Briefing
Date: November 06, 2000
- **Misdiagnosis of Symptomatic Cerebral Aneurysm Found Common**
Source: Reuters Medical News
Date: September 16, 1996
- **New Treatment Protocol Controls Bleeding Following Ruptured Cerebral Aneurysm In Poor Surgical Candidates**
Source: Reuters Medical News
Date: October 16, 1995

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/alphaneews_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 "cerebral aneurysm" (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 "cerebral aneurysm" (or synonyms). If you know the name of a company that is relevant to cerebral aneurysm, 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 “cerebral aneurysm” (or synonyms).

Academic Periodicals covering Cerebral Aneurysm

Numerous periodicals are currently indexed within the National Library of Medicine’s PubMed database that are known to publish articles relating to cerebral aneurysm. In addition to these sources, you can search for articles covering cerebral aneurysm 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 6. 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 cerebral aneurysm. 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 Pharmacopeia 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).

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/>.

PDRhealth

The PDRhealth 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. PDRhealth can be searched by brand name, generic name, or indication. It features multiple drug interactions reports. Search PDRhealth 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 cerebral aneurysm 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 "cerebral aneurysm" (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 cerebral aneurysm:

- **Poloxamer 188**
http://www.rarediseases.org/nord/search/nodd_full?code=844

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 Institute⁷:

- 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/>

⁷ 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.⁸ 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:⁹

- **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

⁸ Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINEplus (<http://medlineplus.gov/> or <http://www.nlm.nih.gov/medlineplus/databases.html>).

⁹ 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 Gateway¹⁰

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.¹¹ To use the NLM Gateway, simply go to the search site at <http://gateway.nlm.nih.gov/gw/Cmd>. Type "cerebral aneurysm" (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	14456
Books / Periodicals / Audio Visual	110
Consumer Health	623
Meeting Abstracts	8
Other Collections	24
Total	15221

HSTAT¹²

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.¹³ 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.¹⁴ Simply search by "cerebral aneurysm" (or synonyms) at the following Web site: <http://text.nlm.nih.gov>.

¹⁰ Adapted from NLM: <http://gateway.nlm.nih.gov/gw/Cmd?Overview.x>.

¹¹ 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).

¹² Adapted from HSTAT: <http://www.nlm.nih.gov/pubs/factsheets/hstat.html>.

¹³ The HSTAT URL is <http://hstat.nlm.nih.gov/>.

¹⁴ 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 Biologists¹⁵

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.¹⁶ 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.¹⁷ 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/Coffeekbreak/>.

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/clinweb/>.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see <http://www.mwsearch.com/>.

¹⁵ Adapted from <http://www.ncbi.nlm.nih.gov/Coffeekbreak/Archive/FAQ.html>.

¹⁶ 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.

¹⁷ 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 cerebral aneurysm 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 cerebral aneurysm. 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 cerebral aneurysm. 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 “cerebral aneurysm”:

Aneurysms

<http://www.nlm.nih.gov/medlineplus/aneurysms.html>

Cerebral Palsy

<http://www.nlm.nih.gov/medlineplus/cerebralpalsy.html>

Circulatory Disorders

<http://www.nlm.nih.gov/medlineplus/circulatorydisorders.html>

Head and Brain Injuries

<http://www.nlm.nih.gov/medlineplus/headandbraininjuries.html>

Stroke

<http://www.nlm.nih.gov/medlineplus/stroke.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 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 cerebral aneurysm. 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

Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to cerebral aneurysm. By consulting all of associations listed in this chapter, you will have nearly exhausted all sources for patient associations concerned with cerebral aneurysm.

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 cerebral aneurysm. 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 "cerebral aneurysm" (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 "cerebral aneurysm". 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 "cerebral aneurysm" (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 "cerebral aneurysm" (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.¹⁸

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

¹⁸ 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)¹⁹:

- **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/>

¹⁹ 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.lsuhscc.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, Worcester), <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 Resource 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://nmlm.gov/>
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), <http://nmlm.gov/members/>

- **Nevada:** Health Science Library, West Charleston Library (Las Vegas-Clark County Library District, Las Vegas), http://www.lvcld.org/special_collections/medical/index.htm
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library, Hanover), http://www.dartmouth.edu/~biomed/resources.html#conshealth.html#
- **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.shscars.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). The NIH suggests the following Web sites in the ADAM Medical Encyclopedia when searching for information on cerebral aneurysm:

- **Basic Guidelines for Cerebral Aneurysm**

Cerebral aneurysm

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/001414.htm>

- **Signs & Symptoms for Cerebral Aneurysm**

Changes in mental status

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003205.htm>

Decreased sensation

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003206.htm>

Eye lid drooping

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003035.htm>

Headache

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003024.htm>

Headaches

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003024.htm>

Lethargic

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm>

Loss of sensation

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003206.htm>

Muscle weakness

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003174.htm>

Nausea

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003117.htm>

Numbness

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003206.htm>

Paralysis

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003190.htm>

Seizures

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003200.htm>

Sleepy

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003208.htm>

Speech impairment

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003204.htm>

Stiff neck

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003261.htm>

Stuporous

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003202.htm>

Swelling

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003103.htm>

Vomiting

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003117.htm>

Weakness

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003174.htm>

- **Diagnostics and Tests for Cerebral Aneurysm**

ALT

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003473.htm>

Angiography

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003327.htm>

Cerebral angiography

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003799.htm>

CSF (cerebrospinal fluid) examination

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003625.htm>

CT

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003330.htm>

CT scan of the head

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003786.htm>

EEG

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003931.htm>

Electroencephalogram

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003931.htm>

MRI

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003335.htm>

MRI of the head

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003791.htm>

- **Surgery and Procedures for Cerebral Aneurysm**

Brain surgery

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/003018.htm>

- **Background Topics for Cerebral Aneurysm**

Bleeding

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/000045.htm>

Incidence

Web site: <http://www.nlm.nih.gov/medlineplus/ency/article/002387.htm>

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>

CEREBRAL ANEURYSM 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]

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]

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]

Actin: Essential component of the cell skeleton. [NIH]

Adenine: A purine base and a fundamental unit of adenine nucleotides. [NIH]

Adenocarcinoma: A malignant epithelial tumor with a glandular organization. [NIH]

Adenoma: A benign 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]

Adjustment: The dynamic process wherein the thoughts, feelings, behavior, and biophysiological mechanisms of the individual continually change to adjust to the environment. [NIH]

Adrenal Medulla: The inner part of the adrenal gland; it synthesizes, stores and releases catecholamines. [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]

Adsorption: The condensation of gases, liquids, or dissolved substances on the surfaces of solids. It includes adsorptive phenomena of bacteria and viruses as well as of tissues treated with exogenous drugs and chemicals. [NIH]

Adsorptive: It captures volatile compounds by binding them to agents such as activated carbon or adsorptive resins. [NIH]

Adverse Effect: An unwanted side effect of treatment. [NIH]

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]

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]

Algorithms: A procedure consisting of a sequence of algebraic formulas and/or logical steps to calculate or determine a given task. [NIH]

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]

Allografts: A graft of tissue obtained from the body of another animal of the same species but with genotype differing from that of the recipient; tissue graft from a donor of one genotype to a host of another genotype with host and donor being members of the same species. [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]

Amine: An organic compound containing nitrogen; any member of a group of chemical compounds formed from ammonia by replacement of one or more of the hydrogen atoms by organic (hydrocarbon) radicals. The amines are distinguished as primary, secondary, and tertiary, according to whether one, two, or three hydrogen atoms are replaced. The amines include allylamine, amylamine, ethylamine, methylamine, phenylamine, propylamine, and many other compounds. [EU]

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]

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]

Amnesia: Lack or loss of memory; inability to remember past experiences. [EU]

Anal: Having to do with the anus, which is the posterior opening of the large bowel. [NIH]

Anastomosis: A procedure to connect healthy sections of tubular structures in the body after the diseased portion has been surgically removed. [NIH]

Anatomical: Pertaining to anatomy, or to the structure of the organism. [EU]

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]

Angina: Chest pain that originates in the heart. [NIH]

Anginal: Pertaining to or characteristic of angina. [EU]

Angiography: Radiography of blood vessels after injection of a contrast medium. [NIH]

Angioplasty: Endovascular reconstruction of an artery, which may include the removal of atheromatous plaque and/or the endothelial lining as well as simple dilatation. These are procedures performed by catheterization. When reconstruction of an artery is performed surgically, it is called endarterectomy. [NIH]

Angiotensinogen: An alpha-globulin of which a fragment of 14 amino acids is converted by renin to angiotensin I, the inactive precursor of angiotensin II. It is a member of the serpin superfamily. [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]

Anterior Cerebral Artery: Artery formed by the bifurcation of the internal carotid artery. Branches of the anterior cerebral artery supply the caudate nucleus, internal capsule, putamen, septal nuclei, gyrus cinguli, and surfaces of the frontal lobe and parietal lobe. [NIH]

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]

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]

Anticoagulant: A drug that helps prevent blood clots from forming. Also called a blood thinner. [NIH]

Antifibrinolytic: Inhibiting fibrinolysis. [EU]

Antifibrinolytic Agents: Agents that prevent fibrinolysis or lysis of a blood clot or thrombus. Several endogenous antiplasmins are known. The drugs are used to control massive hemorrhage and in other coagulation disorders. [NIH]

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]

Antihypertensive: An agent that reduces high blood pressure. [EU]

Antineoplastic: Inhibiting or preventing the development of neoplasms, checking the maturation and proliferation of malignant cells. [EU]

Antineoplastic Agents: Substances that inhibit or prevent the proliferation of neoplasms. [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, α -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]

Anus: The opening of the rectum to the outside of the body. [NIH]

Aorta: The main trunk of the systemic arteries. [NIH]

Aortic Coarctation: Narrowing of the lumen of the aorta, caused by deformity of the aortic media. [NIH]

Aplasia: Lack of development of an organ or tissue, or of the cellular products from an organ or tissue. [EU]

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]

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]

Arteriovenous: Both arterial and venous; pertaining to or affecting an artery and a vein. [EU]

Arteriovenous Fistula: An abnormal communication between an artery and a vein. [NIH]

Arteritis: Inflammation of an artery. [NIH]

Artery: Vessel-carrying blood from the heart to various parts of the body. [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, pharynx, larynx, 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]

Atherectomy: Endovascular procedure in which atheromatous plaque is excised by a cutting or rotating catheter. It differs from balloon and laser angioplasty procedures which enlarge vessels by dilation but frequently do not remove much plaque. If the plaque is removed by

surgical excision under general anesthesia rather than by an endovascular procedure through a catheter, it is called endarterectomy. [NIH]

Atoxic: Not poisonous; not due to a poison. [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]

Autopsy: Postmortem examination of the body. [NIH]

Axillary: Pertaining to the armpit area, including the lymph nodes that are located there. [NIH]

Axillary Vein: The venous trunk of the upper limb; a continuation of the basilar and brachial veins running from the lower border of the teres major muscle to the outer border of the first rib where it becomes the subclavian vein. [NIH]

Bacteremia: The presence of viable bacteria circulating in the blood. Fever, chills, tachycardia, and tachypnea are common acute manifestations of bacteremia. The majority of cases are seen in already hospitalized patients, most of whom have underlying diseases or procedures which render their bloodstreams susceptible to invasion. [NIH]

Bacteria: Unicellular prokaryotic microorganisms which generally possess rigid cell walls, multiply by cell division, and exhibit three principal forms: round or coccial, rodlike or bacillary, and spiral or spirochetal. [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]

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]

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]

Bioavailability: The degree to which a drug or other substance becomes available to the target tissue after administration. [EU]

Bioengineering: The application of engineering principles to the solution of biological problems, for example, remote-handling devices, life-support systems, controls, and displays. [NIH]

Biological Transport: The movement of materials (including biochemical substances and drugs) across cell membranes and epithelial layers, usually by passive diffusion. [NIH]

Biomechanics: The study of the application of mechanical laws and the action of forces to living structures. [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]

Bladder: The organ that stores urine. [NIH]

Blood Coagulation: The process of the interaction of blood coagulation factors that results in an insoluble fibrin clot. [NIH]

Blood Flow Velocity: A value equal to the total volume flow divided by the cross-sectional area of the vascular bed. [NIH]

Blood Glucose: Glucose in blood. [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 transfusion: The administration of blood or blood products into a blood vessel. [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 Volume: Volume of circulating blood. It is the sum of the plasma volume and erythrocyte volume. [NIH]

Body Fluids: Liquid components of living organisms. [NIH]

Bone Cements: Adhesives used to fix prosthetic devices to bones and to cement bone to bone in difficult fractures. Synthetic resins are commonly used as cements. A mixture of monocalcium phosphate, monohydrate, alpha-tricalcium phosphate, and calcium carbonate with a sodium phosphate solution is also a useful bone paste. [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]

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 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]

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]

Bypass: A surgical procedure in which the doctor creates a new pathway for the flow of body fluids. [NIH]

Caesarean section: A surgical incision through the abdominal and uterine walls in order to deliver a baby. [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]

Capsules: Hard or soft soluble containers used for the oral administration of medicine. [NIH]

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]

Carcinogenic: Producing carcinoma. [EU]

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]

Cardiac Output: The volume of blood passing through the heart per unit of time. It is usually expressed as liters (volume) per minute so as not to be confused with stroke volume (volume per beat). [NIH]

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]

Cardiovascular: Having to do with the heart and blood vessels. [NIH]

Cardiovascular System: The heart and the blood vessels by which blood is pumped and circulated through the body. [NIH]

Carotid Arteries: Either of the two principal arteries on both sides of the neck that supply blood to the head and neck; each divides into two branches, the internal carotid artery and the external carotid artery. [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]

Case series: A group or series of case reports involving patients who were given similar treatment. Reports of case series usually contain detailed information about the individual patients. This includes demographic information (for example, age, gender, ethnic origin) and information on diagnosis, treatment, response to treatment, and follow-up after treatment. [NIH]

Catecholamine: A group of chemical substances manufactured by the adrenal medulla and secreted during physiological stress. [NIH]

Catheter: A flexible tube used to deliver fluids into or withdraw fluids from the body. [NIH]

Catheterization: Use or insertion of a tubular device into a duct, blood vessel, hollow organ, or body cavity for injecting or withdrawing fluids for diagnostic or therapeutic purposes. It differs from intubation in that the tube here is used to restore or maintain patency in obstructions. [NIH]

Caudal: Denoting a position more toward the cauda, or tail, than some specified point of reference; same as inferior, in human anatomy. [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 Adhesion: Adherence of cells to surfaces or to other 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 Division: The fission of a cell. [NIH]

Cell Physiology: Characteristics and physiological processes of cells from cell division to cell death. [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 Angiography: Radiography of the vascular system of the brain after injection of a contrast medium. [NIH]

Cerebral Arteries: The arteries supplying the cerebral cortex. [NIH]

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 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]

Cerebrospinal Fluid Pressure: Manometric pressure of the cerebrospinal fluid as measured by lumbar, cerebroventricular, or cisternal puncture. Within the cranial cavity it is called intracranial pressure. [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]

Cesarean Section: Extraction of the fetus by means of abdominal hysterotomy. [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]

Chiropractic: A system of treating bodily disorders by manipulation of the spine and other parts, based on the belief that the cause is the abnormal functioning of a nerve. [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]

Chondrocytes: Polymorphic cells that form cartilage. [NIH]

Choriocarcinoma: A malignant tumor of trophoblastic epithelium characterized by secretion of large amounts of chorionic gonadotropin. It usually originates from chorionic products of conception (i.e., hydatidiform mole, normal pregnancy, or following abortion), but can originate in a teratoma of the testis, mediastinum, or pineal gland. [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]

Ciliary: Inflammation or infection of the glands of the margins of the eyelids. [NIH]

Clamp: A u-shaped steel rod used with a pin or wire for skeletal traction in the treatment of certain fractures. [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]

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]

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]

Complete remission: The disappearance of all signs of cancer. Also called a complete response. [NIH]

Compress: A plug used to occlude an orifice in the control of bleeding, or to mop up secretions; an absorbent pad. [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]

Computer Simulation: Computer-based representation of physical systems and phenomena such as chemical processes. [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]

Conception: The onset of pregnancy, marked by implantation of the blastocyst; the formation of a viable zygote. [EU]

Conduction: The transfer of sound waves, heat, nervous impulses, or electricity. [EU]

Confounding: Extraneous variables resulting in outcome effects that obscure or exaggerate the "true" effect of an intervention. [NIH]

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]

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]

Contrast Media: Substances used in radiography that allow visualization of certain tissues. [NIH]

Contrast medium: A substance that is introduced into or around a structure and, because of the difference in absorption of x-rays by the contrast medium and the surrounding tissues, allows radiographic visualization of the structure. [EU]

Convulsions: A general term referring to sudden and often violent motor activity of cerebral

or brainstem origin. Convulsions may also occur in the absence of an electrical cerebral discharge (e.g., in response to hypotension). [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 Arteriosclerosis: Thickening and loss of elasticity of the coronary arteries. [NIH]

Coronary Artery Bypass: Surgical therapy of ischemic coronary artery disease achieved by grafting a section of saphenous vein, internal mammary artery, or other substitute between the aorta and the obstructed coronary artery distal to the obstructive lesion. [NIH]

Coronary Thrombosis: Presence of a thrombus in a coronary artery, often causing a myocardial infarction. [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]

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]

Critical Care: Health care provided to a critically ill patient during a medical emergency or crisis. [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]

Cyst: A sac or capsule filled with fluid. [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]

Cytoskeleton: The network of filaments, tubules, and interconnecting filamentous bridges which give shape, structure, and organization to the cytoplasm. [NIH]

De novo: In cancer, the first occurrence of cancer in the body. [NIH]

Decarboxylation: The removal of a carboxyl group, usually in the form of carbon dioxide, from a chemical compound. [NIH]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

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]

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]

Deoxyribonucleic: A polymer of subunits called deoxyribonucleotides which is the primary genetic material of a cell, the material equivalent to genetic information. [NIH]

Deoxyribonucleic acid: A polymer of subunits called deoxyribonucleotides which is the primary genetic material of a cell, the material equivalent to genetic information. [NIH]

Diabetes Mellitus: A heterogeneous group of disorders that share glucose intolerance in common. [NIH]

Diagnostic procedure: A method used to identify a disease. [NIH]

Diastolic: Of or pertaining to the diastole. [EU]

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]

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]

Dilator: A device used to stretch or enlarge an opening. [NIH]

Diltiazem: A benzothiazepine derivative with vasodilating action due to its antagonism of the actions of the calcium ion in membrane functions. It is also teratogenic. [NIH]

Dimethyl: A volatile metabolite of the amino acid methionine. [NIH]

Direct: 1. Straight; in a straight line. 2. Performed immediately and without the intervention of subsidiary means. [EU]

Dissection: Cutting up of an organism for study. [NIH]

Dissociation: 1. The act of separating or state of being separated. 2. The separation of a molecule into two or more fragments (atoms, molecules, ions, or free radicals) produced by the absorption of light or thermal energy or by solvation. 3. In psychology, a defense mechanism in which a group of mental processes are segregated from the rest of a person's mental activity in order to avoid emotional distress, as in the dissociative disorders (q.v.), or in which an idea or object is segregated from its emotional significance; in the first sense it is roughly equivalent to splitting, in the second, to isolation. 4. A defect of mental integration in which one or more groups of mental processes become separated off from normal consciousness and, thus separated, function as a unitary whole. [EU]

Dissociative Disorders: Sudden temporary alterations in the normally integrative functions of consciousness. [NIH]

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]

Diuretic: A drug that increases the production of urine. [NIH]

Dizziness: An imprecise term which may refer to a sense of spatial disorientation, motion of the environment, or lightheadedness. [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]

Dorsal: 1. Pertaining to the back or to any dorsum. 2. Denoting a position more toward the back surface than some other object of reference; same as posterior in human anatomy; superior in the anatomy of quadrupeds. [EU]

Drug Interactions: The action of a drug that may affect the activity, metabolism, or toxicity of another drug. [NIH]

Duct: A tube through which body fluids pass. [NIH]

Echocardiography: Ultrasonic recording of the size, motion, and composition of the heart and surrounding tissues. The standard approach is transthoracic. [NIH]

Edema: Excessive amount of watery fluid accumulated in the intercellular spaces, most commonly present in subcutaneous tissue. [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]

Elastin: The protein that gives flexibility to tissues. [NIH]

Elective: Subject to the choice or decision of the patient or physician; applied to procedures that are advantageous to the patient but not urgent. [EU]

Electroconvulsive Therapy: Electrically induced convulsions primarily used in the treatment of severe affective disorders and schizophrenia. [NIH]

Electrolyte: A substance that dissociates into ions when fused or in solution, and thus becomes capable of conducting electricity; an ionic solute. [EU]

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]

Emboli: 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]

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]

Embolization: The blocking of an artery by a clot or foreign material. Embolization can be done as treatment to block the flow of blood to a tumor. [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]

Endarterectomy: Surgical excision, performed under general anesthesia, of the atheromatous tunica intima of an artery. When reconstruction of an artery is performed as an endovascular procedure through a catheter, it is called atherectomy. [NIH]

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]

Endogenous: Produced inside an organism or cell. The opposite is external (exogenous) production. [NIH]

Endothelial cell: The main type of cell found in the inside lining of blood vessels, lymph vessels, and the heart. [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]

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]

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]

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]

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]

Epithelial: Refers to the cells that line the internal and external surfaces of the body. [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]

Erythrocyte Volume: Volume of circulating erythrocytes. It is usually measured by radioisotope dilution technique. [NIH]

Erythrocytes: Red blood cells. Mature erythrocytes are non-nucleated, biconcave disks containing hemoglobin whose function is to transport oxygen. [NIH]

Escalation: Progressive use of more harmful drugs. [NIH]

Esophageal: Having to do with the esophagus, the muscular tube through which food passes from the throat to the stomach. [NIH]

Esophagus: The muscular tube through which food passes from the throat to the stomach. [NIH]

Ethnic Groups: A group of people with a common cultural heritage that sets them apart from others in a variety of social relationships. [NIH]

Etomidate: Imidazole derivative anesthetic and hypnotic with little effect on blood gases, ventilation, or the cardiovascular system. It has been proposed as an induction anesthetic. [NIH]

Evacuation: An emptying, as of the bowels. [EU]

Exogenous: Developed or originating outside the organism, as exogenous disease. [EU]

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]

Extrapyramidal: Outside of the pyramidal tracts. [EU]

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]

Fatty acids: A major component of fats that are used by the body for energy and tissue development. [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]

Fetus: The developing offspring from 7 to 8 weeks after conception until birth. [NIH]

Fibrin: A protein derived from fibrinogen in the presence of thrombin, which forms part of the blood clot. [NIH]

Fibrinolysis: The natural enzymatic dissolution of fibrin. [NIH]

Fibroblast Growth Factor: Peptide isolated from the pituitary gland and from the brain. It is a potent mitogen which stimulates growth of a variety of mesodermal cells including chondrocytes, granulosa, and endothelial cells. The peptide may be active in wound healing and animal limb regeneration. [NIH]

Fibromuscular Dysplasia: An idiopathic, segmental, nonatheromatous disease of the musculature of arterial walls, leading to stenosis of small and medium-sized arteries. Most commonly affected are the renal arteries; involvement of the axillary, iliac, basilar, carotid, hepatic and intracranial arteries have been reported. [NIH]

Fibronectin: An adhesive glycoprotein. One form circulates in plasma, acting as an opsonin; another is a cell-surface protein which mediates cellular adhesive interactions. [NIH]

Fibrosis: Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury. [NIH]

Filler: An inactive substance used to make a product bigger or easier to handle. For example, fillers are often used to make pills or capsules because the amount of active drug is too small to be handled conveniently. [NIH]

Fistula: Abnormal communication most commonly seen between two internal organs, or between an internal organ and the surface of the body. [NIH]

Flaccid: Weak, lax and soft. [EU]

Forearm: The part between the elbow and the wrist. [NIH]

Fossa: A cavity, depression, or pit. [NIH]

Free Radicals: Highly reactive molecules with an unsatisfied electron valence pair. Free radicals are produced in both normal and pathological processes. They are proven or suspected agents of tissue damage in a wide variety of circumstances including radiation, damage from environment chemicals, and aging. Natural and pharmacological prevention of free radical damage is being actively investigated. [NIH]

Frontal Lobe: The anterior part of the cerebral hemisphere. [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]

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]

Gastric: Having to do with the stomach. [NIH]

Gastrin: A hormone released after eating. Gastrin causes the stomach to produce more acid. [NIH]

Gastrointestinal: Refers to the stomach and intestines. [NIH]

Gelatinase A: A secreted endopeptidase homologous with interstitial collagenase, but which possesses an additional fibronectin-like domain. EC 3.4.24.24. [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]

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]

Gestational: Psychosis attributable to or occurring during pregnancy. [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]

Glioma: A cancer of the brain that comes from glial, or supportive, cells. [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]

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]

Glucuronic Acid: Derivatives of uronic acid found throughout the plant and animal kingdoms. They detoxify drugs and toxins by conjugating with them to form glucuronides in the liver which are more water-soluble metabolites that can be easily eliminated from the body. [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]

Gonadal: Pertaining to a gonad. [EU]

Gonadotropin: The water-soluble follicle stimulating substance, by some believed to originate in chorionic tissue, obtained from the serum of pregnant mares. It is used to supplement the action of estrogens. [NIH]

Governing Board: The group in which legal authority is vested for the control of health-related institutions and organizations. [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]

Graft: Healthy skin, bone, or other tissue taken from one part of the body and used to replace diseased or injured tissue removed from another part of the body. [NIH]

Grafting: The operation of transfer of tissue from one site to another. [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]

Gyrus Cinguli: One of the convolutions on the medial surface of the cerebral hemisphere. It surrounds the rostral part of the brain and interhemispheric commissure and forms part of the limbic system. [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]

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]

Haptens: Small antigenic determinants capable of eliciting an immune response only when coupled to a carrier. Haptens bind to antibodies but by themselves cannot elicit an antibody response. [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]

Hematoma: An extravasation of blood localized in an organ, space, or tissue. [NIH]

Hemodynamics: The movements of the blood and the forces involved in systemic or regional blood circulation. [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 concentration. 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]

Hemoglobin C: A commonly occurring abnormal hemoglobin in which lysine replaces a glutamic acid residue at the sixth position of the beta chains. It results in reduced plasticity of erythrocytes. [NIH]

Hemophilia: Refers to a group of hereditary disorders in which affected individuals fail to make enough of certain proteins needed to form blood clots. [NIH]

Hemorrhage: Bleeding or escape of blood from a vessel. [NIH]

Hemorrhagic stroke: A disorder involving bleeding within ischemic brain tissue. Hemorrhagic stroke occurs when blood vessels that are damaged or dead from lack of blood supply (infarcted), located within an area of infarcted brain tissue, rupture and transform an "ischemic" stroke into a hemorrhagic stroke. Ischemia is inadequate tissue oxygenation caused by reduced blood flow; infarction is tissue death resulting from ischemia. Bleeding irritates the brain tissues, causing swelling (cerebral edema). Blood collects into a mass (hematoma). Both swelling and hematoma will compress and displace brain tissue. [NIH]

Heparin: Heparinic acid. A highly acidic mucopolysaccharide formed of equal parts of sulfated D-glucosamine and D-glucuronic acid with sulfaminic bridges. The molecular weight ranges from six to twenty thousand. Heparin occurs in and is obtained from liver, lung, mast cells, etc., of vertebrates. Its function is unknown, but it is used to prevent blood clotting in vivo and vitro, in the form of many different salts. [NIH]

Hepatic: Refers to the liver. [NIH]

Hepatitis: Inflammation of the liver and liver disease involving degenerative or necrotic alterations of hepatocytes. [NIH]

Hepatocytes: The main structural component of the liver. They are specialized epithelial cells that are organized into interconnected plates called lobules. [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]

Heterogeneity: The property of one or more samples or populations which implies that they are not identical in respect of some or all of their parameters, e. g. heterogeneity of variance. [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]

Histamine: 1H-Imidazole-4-ethanamine. A depressor amine derived by enzymatic decarboxylation of histidine. It is a powerful stimulant of gastric secretion, a constrictor of bronchial smooth muscle, a vasodilator, and also a centrally acting neurotransmitter. [NIH]

Histidine: An essential amino acid important in a number of metabolic processes. It is required for the production of histamine. [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]

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 Mortality: A vital statistic measuring or recording the rate of death from any cause in hospitalized populations. [NIH]

Hydatidiform Mole: A trophoblastic disease characterized by hydrops of the mesenchymal portion of the villus. Its karyotype is paternal and usually homozygotic. The tumor is indistinguishable from chorioadenoma destruens or invasive mole (= hydatidiform mole, invasive) except by karyotype. There is no apparent relation by karyotype to choriocarcinoma. Hydatidiform refers to the presence of the hydropic state of some or all of the villi (Greek *hydatis*, a drop of 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]

Hydroxylysine: A hydroxylated derivative of the amino acid lysine that is present in certain collagens. [NIH]

Hydroxyproline: A hydroxylated form of the imino acid proline. A deficiency in ascorbic acid can result in impaired hydroxyproline formation. [NIH]

Hyperplasia: An increase in the number of cells in a tissue or organ, not due to tumor formation. It differs from hypertrophy, which is an increase in bulk without an increase in the number of cells. [NIH]

Hypertension: Persistently high arterial blood pressure. Currently accepted threshold levels

are 140 mm Hg systolic and 90 mm Hg diastolic pressure. [NIH]

Hypertrophy: General increase in bulk of a part or organ, not due to tumor formation, nor to an increase in the number of cells. [NIH]

Hypnotic: A drug that acts to induce sleep. [EU]

Hypotension: Abnormally low blood pressure. [NIH]

Hypotensive: Characterized by or causing diminished tension or pressure, as abnormally low blood pressure. [EU]

Hypothermia: Lower than normal body temperature, especially in warm-blooded animals; in man usually accidental or unintentional. [NIH]

Hypoxia: Reduction of oxygen supply to tissue below physiological levels despite adequate perfusion of the tissue by blood. [EU]

Hysterotomy: An incision in the uterus, performed through either the abdomen or the vagina. [NIH]

Idiopathic: Describes a disease of unknown cause. [NIH]

Illusion: A false interpretation of a genuine percept. [NIH]

Immunology: The study of the body's immune system. [NIH]

Impairment: In the context of health experience, an impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function. [NIH]

Implantation: The insertion or grafting into the body of biological, living, inert, or radioactive material. [EU]

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]

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]

Infancy: The period of complete dependency prior to the acquisition of competence in walking, talking, and self-feeding. [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]

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]

Infusion: A method of putting fluids, including drugs, into the bloodstream. Also called intravenous infusion. [NIH]

Inhalation: The drawing of air or other substances into the lungs. [EU]

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]

Inoperable: Not suitable to be operated upon. [EU]

Inotropic: Affecting the force or energy of muscular contractions. [EU]

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]

Intermittent: Occurring at separated intervals; having periods of cessation of activity. [EU]

Internal Capsule: White matter pathway, flanked by nuclear masses, consisting of both afferent and efferent fibers projecting between the cerebral cortex and the brainstem. It consists of three distinct parts: an anterior limb, posterior limb, and genu. [NIH]

Interstitial: Pertaining to or situated between parts or in the interspaces of a tissue. [EU]

Interstitial Collagenase: A member of the metalloproteinase family of enzymes that is principally responsible for cleaving fibrillar collagen. It can degrade interstitial collagens, types I, II and III. EC 3.4.24.7. [NIH]

Intracellular: Inside a cell. [NIH]

Intracranial Aneurysm: A saclike dilatation of the walls of a blood vessel, usually an artery. [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]

Intraoperative Period: The period during a surgical operation. [NIH]

Intrathecal: Describes the fluid-filled space between the thin layers of tissue that cover the brain and spinal cord. Drugs can be injected into the fluid or a sample of the fluid can be removed for testing. [NIH]

Intravascular: Within a vessel or vessels. [EU]

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]

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]

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]

Isoflurane: A stable, non-explosive inhalation anesthetic, relatively free from significant side effects. [NIH]

Kanamycin: Antibiotic complex produced by *Streptomyces kanamyceticus* from Japanese soil. Comprises 3 components: kanamycin A, the major component, and kanamycins B and C, the minor components. [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]

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]

Lesion: An area of abnormal tissue change. [NIH]

Lethargy: Abnormal drowsiness or stupor; a condition of indifference. [EU]

Ligaments: Shiny, flexible bands of fibrous tissue connecting together articular extremities of bones. They are pliant, tough, and inextensible. [NIH]

Ligation: Application of a ligature to tie a vessel or strangulate a part. [NIH]

Linkage: 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]

Lipping: Outgrowth of bone in liplike form at joint margin (as in degenerative arthritis). [NIH]

Liver: A large, glandular organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile. [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]

Lobe: A portion of an organ such as the liver, lung, breast, or brain. [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]

Loop: A wire usually of platinum bent at one end into a small loop (usually 4 mm inside diameter) and used in transferring microorganisms. [NIH]

Lumbar: Pertaining to the loins, the part of the back between the thorax and the pelvis. [EU]

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]

Lysine: An essential amino acid. It is often added to animal feed. [NIH]

Magnetic Resonance Angiography: Non-invasive method of vascular imaging and determination of internal anatomy without injection of contrast media or radiation exposure. The technique is used especially in cerebral angiography as well as for studies of other vascular structures. [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]

Malformation: A morphologic defect resulting from an intrinsically abnormal developmental process. [EU]

Malignant: Cancerous; a growth with a tendency to invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malignant tumor: A tumor capable of metastasizing. [NIH]

Mammary: Pertaining to the mamma, or breast. [EU]

Mammogram: An x-ray of the breast. [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]

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]

Mastication: The act and process of chewing and grinding food in the mouth. [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]

Maxillary: Pertaining to the maxilla : the irregularly shaped bone that with its fellow forms the upper jaw. [EU]

Medial: Lying near the midsagittal plane of the body; opposed to lateral. [NIH]

Mediastinum: The area between the lungs. The organs in this area include the heart and its large blood vessels, the trachea, the esophagus, the bronchi, and lymph nodes. [NIH]

Mediate: Indirect; accomplished by the aid of an intervening medium. [EU]

MEDLINE: An online database of MEDLARS, the computerized bibliographic Medical Literature Analysis and Retrieval System of the National Library of Medicine. [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]

Meningeal: Refers to the meninges, the tissue covering the brain and spinal cord. [NIH]

Meninges: The three membranes that cover and protect the brain and spinal cord. [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 Processes: Conceptual functions or thinking in all its forms. [NIH]

Meta-Analysis: A quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc., with application chiefly in the areas of research and medicine. [NIH]

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]

Metastatic: Having to do with metastasis, which is the spread of cancer from one part of the body to another. [NIH]

Microcalcifications: Tiny deposits of calcium in the breast that cannot be felt but can be detected on a mammogram. A cluster of these very small specks of calcium may indicate that cancer is present. [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]

Microorganism: An organism that can be seen only through a microscope. Microorganisms include bacteria, protozoa, algae, and fungi. Although viruses are not considered living organisms, they are sometimes classified as microorganisms. [NIH]

Middle Cerebral Artery: The largest and most complex of the cerebral arteries. Branches of the middle cerebral artery supply the insular region, motor and premotor areas, and large regions of the association cortex. [NIH]

Migration: The systematic movement of genes between populations of the same species, geographic race, or variety. [NIH]

Mitral Valve: The valve between the left atrium and left ventricle of the heart. [NIH]

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]

Molecular: Of, pertaining to, or composed of molecules : a very small mass of matter. [EU]

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]

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]

Musculature: The muscular apparatus of the body, or of any part of it. [EU]

Mycosis: Any disease caused by a fungus. [EU]

Mycotic: Pertaining to a mycosis; caused by fungi. [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]

Myosin: Chief protein in muscle and the main constituent of the thick filaments of muscle fibers. In conjunction with actin, it is responsible for the contraction and relaxation of muscles. [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]

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]

Neoplasia: Abnormal and uncontrolled cell growth. [NIH]

Nephropathy: Disease of the kidneys. [EU]

Nervous System: The entire nerve apparatus composed of the brain, spinal cord, nerves and ganglia. [NIH]

Neural: 1. Pertaining to a nerve or to the nerves. 2. Situated in the region of the spinal axis, as the neural arch. [EU]

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]

Neuromuscular: Pertaining to muscles and nerves. [EU]

Neuromuscular Junction: The synapse between a neuron and a muscle. [NIH]

Neurosurgery: A surgical specialty concerned with the treatment of diseases and disorders

of the brain, spinal cord, and peripheral and sympathetic nervous system. [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, γ -aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Nicardipine: 1,4-Dihydro-2,6-dimethyl-4-(3-nitrophenyl) methyl 2-(methyl(phenylmethyl)amino)-3,5-pyridinecarboxylic acid ethyl ester. A potent calcium channel blocker with marked vasodilator action. It has antihypertensive properties and is effective in the treatment of angina and coronary spasms without showing cardiodepressant effects. It has also been used in the treatment of asthma and enhances the action of specific antineoplastic agents. [NIH]

Nifedipine: A potent vasodilator agent with calcium antagonistic action. It is a useful anti-anginal agent that also lowers blood pressure. The use of nifedipine as a tocolytic is being investigated. [NIH]

Nimodipine: A calcium channel blocker with preferential cerebrovascular activity. It has marked cerebrovascular dilating effects and lowers blood pressure. [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]

Nitroglycerin: A highly volatile organic nitrate that acts as a dilator of arterial and venous smooth muscle and is used in the treatment of angina. It provides relief through improvement of the balance between myocardial oxygen supply and demand. Although total coronary blood flow is not increased, there is redistribution of blood flow in the heart when partial occlusion of coronary circulation is effected. [NIH]

Nitroprusside: (OC-6-22)-Pentakis(cyano-C)nitrosferrate(2-). A powerful vasodilator used in emergencies to lower blood pressure or to improve cardiac function. It is also an indicator for free sulfhydryl groups in proteins. [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]

Nucleus: A body of specialized protoplasm found in nearly all cells and containing the chromosomes. [NIH]

Observational study: An epidemiologic study that does not involve any intervention, experimental or otherwise. Such a study may be one in which nature is allowed to take its course, with changes in one characteristic being studied in relation to changes in other characteristics. Analytical epidemiologic methods, such as case-control and cohort study designs, are properly called observational epidemiology because the investigator is observing without intervention other than to record, classify, count, and statistically analyze results. [NIH]

Ocular: 1. Of, pertaining to, or affecting the eye. 2. Eyepiece. [EU]

Oculomotor: Cranial nerve III. It originates from the lower ventral surface of the midbrain and is classified as a motor nerve. [NIH]

Oculomotor Nerve: The 3rd cranial nerve. The oculomotor nerve sends motor fibers to the levator muscles of the eyelid and to the superior rectus, inferior rectus, and inferior oblique muscles of the eye. It also sends parasympathetic efferents (via the ciliary ganglion) to the muscles controlling pupillary constriction and accommodation. The motor fibers originate in the oculomotor nuclei of the midbrain. [NIH]

Oliguria: Clinical manifestation of the urinary system consisting of a decrease in the amount of urine secreted. [NIH]

Ophthalmoplegia: Paralysis of one or more of the ocular muscles due to disorders of the eye muscles, neuromuscular junction, supporting soft tissue, tendons, or innervation to the muscles. [NIH]

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]

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]

Optic Nerve Diseases: Conditions which produce injury or dysfunction of the second cranial or optic nerve, which is generally considered a component of the central nervous system. Damage to optic nerve fibers may occur at or near their origin in the retina, at the optic disk, or in the nerve, optic chiasm, optic tract, or lateral geniculate nuclei. Clinical manifestations may include decreased visual acuity and contrast sensitivity, impaired color vision, and an afferent pupillary defect. [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]

Osteogenesis: The histogenesis of bone including ossification. It occurs continuously but particularly in the embryo and child and during fracture repair. [NIH]

Osteogenesis Imperfecta: A collagen disorder resulting from defective biosynthesis of type I collagen and characterized by brittle, osteoporotic, and easily fractured bones. It may also present with blue sclerae, loose joints, and imperfect dentin formation. There are four major

types, I-IV. [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]

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]

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]

Papaverine: An alkaloid found in opium but not closely related to the other opium alkaloids in its structure or pharmacological actions. It is a direct-acting smooth muscle relaxant used in the treatment of impotence and as a vasodilator, especially for cerebral vasodilation. The mechanism of its pharmacological actions is not clear, but it apparently can inhibit phosphodiesterases and it may have direct actions on calcium channels. [NIH]

Paralysis: Loss of ability to move all or part of the body. [NIH]

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]

Partial remission: The shrinking, but not complete disappearance, of a tumor in response to therapy. Also called partial response. [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]

Peptide: Any compound consisting of two or more amino acids, the building blocks of proteins. Peptides are combined to make proteins. [NIH]

Percutaneous: Performed through the skin, as injection of radiopaque material in radiological examination, or the removal of tissue for biopsy accomplished by a needle. [EU]

Perforation: 1. The act of boring or piercing through a part. 2. A hole made through a part or substance. [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]

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]

Perivascular: Situated around a vessel. [EU]

Peroral: Performed through or administered through the mouth. [EU]

Perspiration: Sweating; the functional secretion of sweat. [EU]

Petechiae: Pinpoint, unraised, round red spots under the skin caused by bleeding. [NIH]

Pharmacologic: Pertaining to pharmacology or to the properties and reactions of drugs. [EU]

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]

Phenoxybenzamine: An alpha-adrenergic antagonist with long duration of action. It has been used to treat hypertension and as a peripheral vasodilator. [NIH]

Phosphorus: A non-metallic element that is found in the blood, muscles, nerves, bones, and teeth, and is a component of adenosine triphosphate (ATP; the primary energy source for the body's cells.) [NIH]

Phosphorylation: The introduction of a phosphoryl group into a compound through the formation of an ester bond between the compound and a phosphorus moiety. [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]

Pineal gland: A tiny organ located in the cerebrum that produces melatonin. Also called pineal body or pineal organ. [NIH]

Pituitary Gland: A small, unpaired gland situated in the sella turcica tissue. It is connected to the hypothalamus by a short stalk. [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; absence 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 Volume: Volume of plasma in the circulation. It is usually measured by indicator dilution techniques. [NIH]

Plasmin: A product of the lysis of plasminogen (profibrinolysin) by plasminogen activators. It is composed of two polypeptide chains, light (B) and heavy (A), with a molecular weight of 75,000. It is the major proteolytic enzyme involved in blood clot retraction or the lysis of fibrin and quickly inactivated by antiplasmins. EC 3.4.21.7. [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]

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]

Poisoning: A condition or physical state produced by the ingestion, injection or inhalation of, or exposure to a deleterious agent. [NIH]

Polycystic: An inherited disorder characterized by many grape-like clusters of fluid-filled cysts that make both kidneys larger over time. These cysts take over and destroy working kidney tissue. PKD may cause chronic renal failure and end-stage renal disease. [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]

Porosity: Condition of having pores or open spaces. This often refers to bones, bone implants, or bone cements, but can refer to the porous state of any solid substance. [NIH]

Port: An implanted device through which blood may be withdrawn and drugs may be infused without repeated needle sticks. Also called a port-a-cath. [NIH]

Port-a-cath: An implanted device through which blood may be withdrawn and drugs may be infused without repeated needle sticks. Also called a port. [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]

Postero: Amygdala region involved in sexual activity. [NIH]

Postoperative: After surgery. [NIH]

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]

Practicability: A non-standard characteristic of an analytical procedure. It is dependent on the scope of the method and is determined by requirements such as sample throughput and costs. [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]

Preclinical: Before a disease becomes clinically recognizable. [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]

Preoperative: Preceding an operation. [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]

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 antiovarian agent when administered on days 5-25 of the menstrual cycle. [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]

Proline: A non-essential amino acid that is synthesized from glutamic acid. It is an essential component of collagen and is important for proper functioning of joints and tendons. [NIH]

Propofol: A widely used anesthetic. [NIH]

Prospective Studies: Observation of a population for a sufficient number of persons over a sufficient number of years to generate incidence or mortality rates subsequent to the selection of the study group. [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 α or β indicates the configuration at C-9 (α denotes a substituent below the plane of the ring, β , above the plane). The naturally occurring PGF's have the α configuration, e.g., PGF₂ α . 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-oxoprostano-10,13-dien-1-oic acid (PGA(1)); (5Z,13E,15S)-15-hydroxy-9-oxoprostano-5,10,13-trien-1-oic acid (PGA(2)); (5Z,13E,15S,17Z)-15-hydroxy-9-oxoprostano-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]

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 Conformation: The characteristic 3-dimensional shape of a protein, including the secondary, supersecondary (motifs), tertiary (domains) and quaternary structure of the peptide chain. Quaternary protein structure describes the conformation assumed by multimeric proteins (aggregates of more than one polypeptide chain). [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]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [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]

Proximal: Nearest; closer to any point of reference; opposed to distal. [EU]

Psychic: Pertaining to the psyche or to the mind; mental. [EU]

Psychology: The science dealing with the study of mental processes and behavior in man and animals. [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]

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]

Pulmonary: Relating to the lungs. [NIH]

Pulsatile Flow: Rhythmic, intermittent propagation of a fluid through a vessel or piping system, in contrast to constant, smooth propagation, which produces laminar flow. The quality of blood flow, whether smooth (laminar) or pulsatile, is important to the integrity of the tissues being artificially perfused by various heart assist devices or in regional perfusion. [NIH]

Purpura: Purplish or brownish red discoloration, easily visible through the epidermis, caused by hemorrhage into the tissues. [NIH]

Putamen: The largest and most lateral of the basal ganglia lying between the lateral medullary lamina of the globus pallidus and the external capsule. It is part of the neostriatum and forms part of the lentiform nucleus along with the globus pallidus. [NIH]

Quaternary: 1. Fourth in order. 2. Containing four elements or groups. [EU]

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]

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]

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]

Randomized clinical trial: A study in which the participants are assigned by chance to separate groups that compare different treatments; neither the researchers nor the participants can choose which group. Using chance to assign people to groups means that the groups will be similar and that the treatments they receive can be compared objectively. At the time of the trial, it is not known which treatment is best. It is the patient's choice to be in a randomized trial. [NIH]

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]

Recurrence: The return of a sign, symptom, or disease after a remission. [NIH]

Refer: To send or direct for treatment, aid, information, de decision. [NIH]

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]

Regeneration: The natural renewal of a structure, as of a lost tissue or part. [EU]

Regimen: A treatment plan that specifies the dosage, the schedule, and the duration of treatment. [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]

Remission: A decrease in or disappearance of signs and symptoms of cancer. In partial remission, some, but not all, signs and symptoms of cancer have disappeared. In complete remission, all signs and symptoms of cancer have disappeared, although there still may be cancer in the body. [NIH]

Renal cysts: Abnormal fluid-filled sacs in the kidney that range in size from microscopic to much larger. Many simple cysts are harmless, while other types can seriously damage the kidneys. [NIH]

Renin: An enzyme which is secreted by the kidney and is formed from prorenin in plasma and kidney. The enzyme cleaves the Leu-Leu bond in angiotensinogen to generate angiotensin I. EC 3.4.23.15. (Formerly EC 3.4.99.19). [NIH]

Renovascular: Of or pertaining to the blood vessels of the kidneys. [EU]

Resection: Removal of tissue or part or all of an organ by surgery. [NIH]

Reserpine: An alkaloid found in the roots of *Rauwolfia serpentina* and *R. vomitoria*. Reserpine inhibits the uptake of norepinephrine into storage vesicles resulting in depletion of catecholamines and serotonin from central and peripheral axon terminals. It has been used as an antihypertensive and an antipsychotic as well as a research tool, but its adverse effects limit its clinical use. [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]

Resuscitation: The restoration to life or consciousness of one apparently dead; it includes such measures as artificial respiration and cardiac massage. [EU]

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]

Retreatment: The therapy of the same disease in a patient, with the same agent or procedure repeated after initial treatment, or with an additional or alternate measure or follow-up. It does not include therapy which requires more than one administration of a therapeutic agent or regimen. Retreatment is often used with reference to a different modality when the original one was inadequate, harmful, or unsuccessful. [NIH]

Retrospective: Looking back at events that have already taken place. [NIH]

Ribonucleic acid: RNA. One of the two nucleic acids found in all cells. The other is deoxyribonucleic acid (DNA). Ribonucleic acid transfers genetic information from DNA to proteins produced by the cell. [NIH]

Ribose: A pentose active in biological systems usually in its D-form. [NIH]

Risk factor: A habit, trait, condition, or genetic alteration that increases a person's chance of developing a disease. [NIH]

Risk patient: Patient who is at risk, because of his/her behaviour or because of the type of person he/she is. [EU]

Rod: A reception for vision, located in the retina. [NIH]

Rubber: A high-molecular-weight polymeric elastomer derived from the milk juice (latex) of *Hevea brasiliensis* and other trees. It is a substance that can be stretched at room temperature to atleast twice its original length and after releasing the stress, retractrapidly, and recover its original dimensions fully. Synthetic rubber is made from many different chemicals, including styrene, acrylonitrile, ethylene, propylene, and isoprene. [NIH]

Saphenous: Applied to certain structures in the leg, e. g. nerve vein. [NIH]

Saphenous Vein: The vein which drains the foot and leg. [NIH]

Saponins: Sapogenin glycosides. A type of glycoside widely distributed in plants. Each consists of a sapogenin as the aglycon moiety, and a sugar. The sapogenin may be a steroid or a triterpene and the sugar may be glucose, galactose, a pentose, or a methylpentose. Sapogenins are poisonous towards the lower forms of life and are powerful hemolytics when injected into the blood stream able to dissolve red blood cells at even extreme dilutions. [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]

Schizophrenia: A mental disorder characterized by a special type of disintegration of the personality. [NIH]

Sclerae: A circular furrow between the sclerocorneal junction and the iris. [NIH]

Scotoma: A localized defect in the visual field bordered by an area of normal vision. This occurs with a variety of eye diseases (e.g., retinal diseases and glaucoma), optic nerve diseases, and other conditions. [NIH]

Screening: Checking for disease when there are no symptoms. [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]

Sedative: 1. Allaying activity and excitement. 2. An agent that allays excitement. [EU]

Segmental: Describing or pertaining to a structure which is repeated in similar form in successive segments of an organism, or which is undergoing segmentation. [NIH]

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]

Septal: An abscess occurring at the root of the tooth on the proximal surface. [NIH]

Septal Nuclei: Neural nuclei situated in the septal region. They have afferent and cholinergic efferent connections with a variety of forebrain and brainstem areas including the hippocampus, the lateral hypothalamus, the tegmentum, and the amygdala. Included are the dorsal, lateral, medial, and triangular septal nuclei, septofimbrial nucleus, nucleus of diagonal band, nucleus of anterior commissure, and the nucleus of stria terminalis. [NIH]

Sequencing: The determination of the order of nucleotides in a DNA or RNA chain. [NIH]

Serine: A non-essential amino acid occurring in natural form as the L-isomer. It is synthesized from glycine or threonine. It is involved in the biosynthesis of purines, pyrimidines, and other amino acids. [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]

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]

Signs and Symptoms: Clinical manifestations that can be either objective when observed by a physician, or subjective when perceived by the patient. [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 graft: Skin that is moved from one part of the body to another. [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]

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]

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]

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]

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]

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]

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]

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]

Stenosis: Narrowing or stricture of a duct or canal. [EU]

Stents: Devices that provide support for tubular structures that are being anastomosed or for body cavities during skin grafting. [NIH]

Steroid: A group name for lipids that contain a hydrogenated cyclopentanoperhydrophenanthrene ring system. Some of the substances included in this group are progesterone, adrenocortical hormones, the gonadal hormones, cardiac aglycones, bile acids, sterols (such as cholesterol), toad poisons, saponins, and some of the carcinogenic hydrocarbons. [EU]

Stethoscope: An instrument used for the detection and study of sounds within the body that conveyed to the ears of the observer through rubber tubing. [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]

Stress: Forcibly exerted influence; pressure. Any condition or situation that causes strain or tension. Stress may be either physical or psychologic, or both. [NIH]

Stricture: The abnormal narrowing of a body opening. Also called stenosis. [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]

Stroke Volume: The amount of blood pumped out of the heart per beat not to be confused with cardiac output (volume/time). [NIH]

Subacute: Somewhat acute; between acute and chronic. [EU]

Subarachnoid: Situated or occurring between the arachnoid and the pia mater. [EU]

Subclavian: The direct continuation of the axillary vein at the lateral border of the first rib. It passes medially to join the internal jugular vein and form the brachiocephalic vein on each side. [NIH]

Subclavian Artery: Artery arising from the brachiocephalic trunk on the right side and from the arch of the aorta on the left side. It distributes to the neck, thoracic wall, spinal cord, brain, meninges, and upper limb. [NIH]

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]

Subiculum: A region of the hippocampus that projects to other areas of the brain. [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]

Suppression: A conscious exclusion of disapproved desire contrary with repression, in which the process of exclusion is not conscious. [NIH]

Sweat: The fluid excreted by the sweat glands. It consists of water containing sodium chloride, phosphate, urea, ammonia, and other waste products. [NIH]

Sympathetic Nervous System: The thoracolumbar division of the autonomic nervous system. Sympathetic preganglionic fibers originate in neurons of the intermediolateral column of the spinal cord and project to the paravertebral and prevertebral ganglia, which in turn project to target organs. The sympathetic nervous system mediates the body's response to stressful situations, i.e., the fight or flight reactions. It often acts reciprocally to the parasympathetic system. [NIH]

Sympathomimetic: 1. Mimicking the effects of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. 2. An agent that produces effects similar to those of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. Called also adrenergic. [EU]

Symptomatic: Having to do with symptoms, which are signs of a condition or disease. [NIH]

Systemic: Affecting the entire body. [NIH]

Systolic: Indicating the maximum arterial pressure during contraction of the left ventricle of the heart. [EU]

Tachycardia: Excessive rapidity in the action of the heart, usually with a heart rate above 100 beats per minute. [NIH]

Tachypnea: Rapid breathing. [NIH]

Telangiectasia: The permanent enlargement of blood vessels, causing redness in the skin or mucous membranes. [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]

Teratogenic: Tending to produce anomalies of formation, or teratism (= anomaly of formation or development : condition of a monster). [EU]

Teratoma: A type of germ cell tumor that may contain several different types of tissue, such as hair, muscle, and bone. Teratomas occur most often in the ovaries in women, the testicles in men, and the tailbone in children. Not all teratomas are malignant. [NIH]

Testis: Either of the paired male reproductive glands that produce the male germ cells and the male hormones. [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]

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]

Thrombin: An enzyme formed from prothrombin that converts fibrinogen to fibrin. (Dorland, 27th ed) EC 3.4.21.5. [NIH]

Thrombocytes: Blood cells that help prevent bleeding by causing blood clots to form. Also called platelets. [NIH]

Thrombomodulin: A cell surface glycoprotein of endothelial cells that binds thrombin and

serves as a cofactor in the activation of protein C and its regulation of blood coagulation. [NIH]

Thrombosis: The formation or presence of a blood clot inside a blood vessel. [NIH]

Tissue: A group or layer of cells that are alike in type and work together to perform a specific function. [NIH]

Tissue Plasminogen Activator: A proteolytic enzyme in the serine protease family found in many tissues which converts plasminogen to plasmin. It has fibrin-binding activity and is immunologically different from urinary plasminogen activator. The primary sequence, composed of 527 amino acids, is identical in both the naturally occurring and synthetic proteases. EC 3.4.21.68. [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]

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]

Toxins: Specific, characterizable, poisonous chemicals, often proteins, with specific biological properties, including immunogenicity, produced by microbes, higher plants, or animals. [NIH]

Traction: The act of pulling. [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]

Translational: The cleavage of signal sequence that directs the passage of the protein through a cell or organelle membrane. [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]

Treatment Outcome: Evaluation undertaken to assess the results or consequences of management and procedures used in combating disease in order to determine the efficacy, effectiveness, safety, practicability, etc., of these interventions in individual cases or series. [NIH]

Trigeminal: Cranial nerve V. It is sensory for the eyeball, the conjunctiva, the eyebrow, the skin of face and scalp, the teeth, the mucous membranes in the mouth and nose, and is motor to the muscles of mastication. [NIH]

Tropomyosin: A protein found in the thin filaments of muscle fibers. It inhibits contraction of the muscle unless its position is modified by troponin. [NIH]

Troponin: One of the minor protein components of skeletal muscle. Its function is to serve as the calcium-binding component in the troponin-tropomyosin B-actin-myosin complex by conferring calcium sensitivity to the cross-linked actin and myosin filaments. [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]

Tuberous Sclerosis: A rare congenital disease in which the essential pathology is the appearance of multiple tumors in the cerebrum and in other organs, such as the heart or kidneys. [NIH]

Tunica: A rather vague term to denote the lining coat of hollow organs, tubes, or cavities. [NIH]

Tunica Intima: The innermost coat of blood vessels, consisting of a thin lining of endothelial cells longitudinally oriented and continuous with the endothelium of capillaries on the one hand and the endocardium of the heart on the other. [NIH]

Tyrosine: A non-essential amino acid. In animals it is synthesized from phenylalanine. It is also the precursor of epinephrine, thyroid hormones, and melanin. [NIH]

Ultrasonography: The visualization of deep structures of the body by recording the reflections of echoes of pulses of ultrasonic waves directed into the tissues. Use of ultrasound for imaging or diagnostic purposes employs frequencies ranging from 1.6 to 10 megahertz. [NIH]

Urinary: Having to do with urine or the organs of the body that produce and get rid of urine. [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]

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]

Vascular: Pertaining to blood vessels or indicative of a copious blood supply. [EU]

Vasoconstriction: Narrowing of the blood vessels without anatomic change, for which constriction, pathologic is used. [NIH]

Vasodilation: Physiological dilation of the blood vessels without anatomic change. For dilation with anatomic change, dilatation, pathologic or aneurysm (or specific aneurysm) is used. [NIH]

Vasodilator: An agent that widens blood vessels. [NIH]

Vein: Vessel-carrying blood from various parts of the body to the heart. [NIH]

Venous: Of or pertaining to the veins. [EU]

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]

Ventricular Function: The hemodynamic and electrophysiological action of the ventricles. [NIH]

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]

Vertebral: Of or pertaining to a vertebra. [EU]

Vertebral Artery: The first branch of the subclavian artery with distribution to muscles of the neck, vertebrae, spinal cord, cerebellum and interior of the cerebrum. [NIH]

Vertigo: An illusion of movement; a sensation as if the external world were revolving around the patient (objective vertigo) or as if he himself were revolving in space (subjective vertigo). The term is sometimes erroneously used to mean any form of dizziness. [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]

Viruses: Minute infectious agents whose genomes are composed of DNA or RNA, but not both. They are characterized by a lack of independent metabolism and the inability to replicate outside living host cells. [NIH]

Visual field: The entire area that can be seen when the eye is forward, including peripheral vision. [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]

Wound Healing: Restoration of integrity to traumatized tissue. [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]

Zymogen: Inactive form of an enzyme which can then be converted to the active form, usually by excision of a polypeptide, e. g. trypsinogen is the zymogen of trypsin. [NIH]

INDEX

A

- Abdomen, 111, 116, 131, 133, 148
 Abdominal, 111, 117, 119
 Abscess, 37, 111, 146
 Acceptor, 111, 139
 Accommodation, 111, 138
 Acetylcholine, 111, 137
 Actin, 111, 136, 151
 Adenine, 111
 Adenocarcinoma, 47, 111
 Adenoma, 23, 32, 111
 Adenosine, 31, 33, 36, 111, 140
 Adjustment, 17, 111
 Adrenal Medulla, 111, 118, 125, 137
 Adrenergic, 111, 114, 123, 125, 140, 149
 Adsorption, 8, 111
 Adsorptive, 111
 Adverse Effect, 111, 144, 147
 Afferent, 21, 111, 132, 138, 146
 Affinity, 8, 111, 112, 147
 Agonist, 112, 123
 Algorithms, 112, 116
 Alkaline, 112, 117
 Alkaloid, 112, 139, 144
 Allografts, 10, 112
 Alternative medicine, 82, 112
 Amine, 112, 130
 Amino Acids, 112, 113, 139, 141, 143, 146, 150
 Amnesia, 7, 112
 Anal, 17, 112
 Anastomosis, 23, 77, 112
 Anatomical, 4, 6, 112, 115, 119, 131
 Anesthesia, 4, 11, 12, 22, 26, 31, 33, 35, 36, 41, 56, 59, 112, 113, 115, 124
 Anesthetics, 112, 115, 125
 Angina, 113, 137
 Anginal, 113, 137
 Angiography, 10, 21, 31, 42, 44, 49, 52, 54, 58, 59, 60, 61, 108, 109, 113
 Angioplasty, 4, 7, 113, 114
 Angiotensinogen, 113, 144
 Antagonism, 113, 123
 Anterior Cerebral Artery, 23, 113, 118
 Antibacterial, 113, 147
 Antibiotic, 113, 133, 147
 Antibody, 112, 113, 120, 128, 130, 131, 147
 Anticoagulant, 29, 113, 142
 Antifibrinolytic, 34, 113
 Antifibrinolytic Agents, 34, 113
 Antigen, 112, 113, 120, 130, 131
 Antihypertensive, 113, 137, 144
 Antineoplastic, 113, 137
 Antineoplastic Agents, 113, 137
 Antipsychotic, 114, 144
 Anus, 112, 114
 Aorta, 32, 52, 114, 117, 122, 148, 152
 Aortic Coarctation, 33, 114
 Aplasia, 28, 114
 Aqueous, 114, 115, 122
 Arachidonic Acid, 114, 142
 Arginine, 114, 137
 Arterial, 6, 11, 14, 36, 37, 44, 69, 77, 114, 118, 126, 130, 137, 142, 149
 Arteries, 5, 6, 15, 24, 28, 114, 116, 117, 118, 122, 126, 133, 136
 Arterioles, 114, 116, 136
 Arteriovenous, 7, 23, 24, 25, 37, 51, 52, 114
 Arteriovenous Fistula, 7, 114
 Arteritis, 28, 114
 Asymptomatic, 8, 10, 21, 24, 51, 114
 Ataxia, 114, 130
 Atherectomy, 114, 124
 Atoxic, 76, 77, 115
 Atrium, 115, 117, 135, 151
 Autopsy, 68, 115
 Axillary, 115, 126, 148
 Axillary Vein, 115, 148
B
 Bacteremia, 37, 115
 Bacteria, 111, 113, 115, 124, 126, 135, 147, 151
 Barbiturate, 31, 56, 115
 Base, 6, 74, 75, 76, 111, 115, 133, 149
 Basement Membrane, 115, 126
 Benign, 111, 115, 116, 127, 128
 Bile, 115, 133, 148
 Bioavailability, 9, 115
 Bioengineering, 5, 11, 92, 115
 Biological Transport, 115, 123
 Biomechanics, 5, 115
 Biopsy, 115, 139
 Biosynthesis, 114, 116, 138, 146
 Biotechnology, 19, 82, 93, 116
 Bladder, 116, 131, 136, 151
 Blood Coagulation, 116, 117, 150

- Blood Flow Velocity, 35, 56, 57, 116
 Blood Glucose, 116, 129
 Blood pressure, 25, 113, 116, 130, 131, 136, 137, 147
 Blood transfusion, 68, 116
 Blood Volume, 36, 116
 Body Fluids, 116, 117, 124, 147
 Bone Cements, 116, 141
 Bone scan, 116, 145
 Bowel, 112, 116
 Bradykinin, 116, 137
 Brain Neoplasms, 116, 130
 Bronchi, 116, 117, 125, 134
 Bronchial, 117, 130
 Bypass, 9, 25, 26, 39, 117
- C**
- Caesarean section, 21, 117
 Calcification, 5, 117
 Calcium, 15, 116, 117, 120, 123, 134, 135, 137, 139, 151
 Calcium Channels, 117, 139
 Capsules, 117, 126, 127
 Carbon Dioxide, 36, 50, 56, 117, 122, 145
 Carcinogenic, 117, 148
 Carcinoma, 38, 117
 Cardiac, 14, 16, 32, 40, 68, 78, 117, 124, 125, 136, 137, 145, 148
 Cardiac arrest, 32, 78, 117
 Cardiac Output, 78, 117, 148
 Cardiopulmonary, 39, 56, 59, 117
 Cardiopulmonary Bypass, 39, 56, 59, 117
 Cardiovascular, 5, 26, 117, 125, 146
 Cardiovascular System, 117, 125
 Carotid Arteries, 28, 117
 Case series, 118, 119
 Catecholamine, 13, 118, 123
 Catheter, 78, 114, 118, 124
 Catheterization, 113, 118
 Caudal, 118, 141
 Cause of Death, 9, 10, 118
 Cell Adhesion, 5, 118
 Cell Death, 118, 136
 Cell Division, 115, 118, 140
 Cell Physiology, 5, 118
 Central Nervous System, 111, 116, 117, 118, 127, 128, 130, 138, 146
 Central Nervous System Infections, 118, 128, 130
 Cerebellar, 24, 28, 38, 55, 70, 114, 118
 Cerebellum, 116, 118, 152
 Cerebral Angiography, 51, 75, 118, 134
 Cerebral Arteries, 15, 118, 135
 Cerebral Cortex, 114, 118, 132
 Cerebral Infarction, 118, 130
 Cerebrospinal, 33, 57, 109, 118, 119, 130, 146
 Cerebrospinal fluid, 33, 57, 109, 119, 130, 146
 Cerebrospinal Fluid Pressure, 57, 119
 Cerebrovascular, 9, 11, 15, 17, 50, 55, 77, 119, 137
 Cerebrum, 118, 119, 140, 151, 152
 Cervical, 38, 49, 68, 70, 119
 Cervix, 119
 Cesarean Section, 32, 119
 Chin, 119, 135
 Chiropractic, 68, 70, 119
 Cholesterol, 115, 119, 148
 Chondrocytes, 119, 126
 Choriocarcinoma, 47, 119, 130
 Chromosomal, 8, 119
 Chromosome, 119, 133
 Chronic, 22, 119, 125, 131, 133, 141, 148
 Chronic renal, 22, 119, 141
 Ciliary, 119, 138
 Clamp, 15, 74, 119
 Clinical study, 6, 119
 Clinical trial, 3, 13, 93, 119, 143, 144
 Cloning, 116, 120
 Coagulation, 113, 116, 120
 Collagen, 6, 10, 115, 120, 126, 132, 134, 138, 140, 142
 Complement, 120
 Complementary and alternative medicine, 67, 71, 120
 Complementary medicine, 67, 120
 Complete remission, 120, 144
 Compress, 121, 129
 Computational Biology, 93, 121
 Computed tomography, 31, 61, 75, 121, 145
 Computer Simulation, 17, 121
 Computerized axial tomography, 121, 146
 Computerized tomography, 34, 60, 121
 Conception, 119, 121, 126
 Conduction, 27, 43, 121
 Confounding, 18, 121
 Conjunctiva, 121, 150
 Connective Tissue, 120, 121, 126, 127, 134
 Consciousness, 77, 121, 123, 145
 Constipation, 77, 114, 121
 Constriction, 121, 132, 138, 151
 Continuum, 5, 121
 Contraindications, ii, 121

- Contrast Media, 121, 134
 Contrast medium, 113, 118, 121
 Convulsions, 115, 121, 124
 Coronary, 32, 122, 136, 137
 Coronary Arteriosclerosis, 122, 136
 Coronary Artery Bypass, 32, 122
 Coronary Thrombosis, 122, 136
 Cortex, 122, 125, 135, 141
 Cortical, 34, 122, 146
 Cranial, 118, 119, 122, 128, 132, 138, 139, 150
 Craniocerebral Trauma, 122, 128, 130
 Craniotomy, 6, 12, 122
 Critical Care, 14, 40, 122
 Curative, 122, 149
 Cyclic, 122, 128, 137, 142
 Cyst, 20, 54, 122
 Cytokine, 4, 122
 Cytoplasm, 122
 Cytoskeleton, 5, 122
- D**
- De novo, 33, 122
 Decarboxylation, 122, 130
 Degenerative, 122, 129, 133
 Delusions, 122, 143
 Dentate Gyrus, 122, 130
 Deoxyribonucleic, 123, 145
 Deoxyribonucleic acid, 123, 145
 Diabetes Mellitus, 123, 129
 Diagnostic procedure, 73, 82, 123
 Diastolic, 123, 131
 Diffusion, 58, 115, 123
 Digestion, 115, 116, 123, 133, 148
 Dilation, 114, 116, 123, 130, 151
 Dilator, 123, 137
 Diltiazem, 35, 123
 Dimethyl, 123, 137
 Direct, iii, 20, 34, 123, 139, 144, 148
 Dissection, 38, 68, 70, 123
 Dissociation, 7, 112, 123
 Dissociative Disorders, 123
 Distal, 28, 39, 78, 122, 123, 143
 Diuretic, 58, 123, 134, 147
 Dizziness, 123, 152
 Dopamine, 77, 114, 123, 137
 Dorsal, 124, 141, 146
 Drug Interactions, 86, 124
 Duct, 118, 124, 148
- E**
- Echocardiography, 14, 124
 Edema, 124, 129, 132, 133
 Efficacy, 9, 12, 124, 150
 Elastin, 10, 120, 124, 126
 Elective, 54, 124
 Electroconvulsive Therapy, 25, 124
 Electrolyte, 124, 141, 147
 Electrons, 115, 124, 132, 139, 143
 Emboli, 5, 29, 37, 44, 50, 51, 52, 54, 58, 59, 77, 124
 Embolism, 40, 124
 Embolization, 5, 29, 37, 44, 50, 51, 52, 54, 58, 59, 77, 124
 Embolus, 124, 131
 Embryo, 124, 131, 138
 Endarterectomy, 77, 113, 115, 124
 Endocarditis, 42, 43, 124
 Endocardium, 124, 151
 Endogenous, 113, 123, 125
 Endothelial cell, 124, 125, 126, 149, 151
 Endothelium, 125, 137, 151
 Endothelium-derived, 125, 137
 End-stage renal, 119, 125, 141
 Entorhinal Cortex, 125, 130
 Environmental Health, 92, 94, 125
 Enzymatic, 117, 120, 125, 126, 130, 145
 Enzyme, 42, 125, 128, 140, 142, 143, 144, 149, 150, 152
 Epidermis, 125, 143
 Epinephrine, 13, 111, 123, 125, 137, 151
 Epithelial, 111, 115, 125, 129
 Epithelium, 115, 119, 125
 Erythrocyte Volume, 116, 125
 Erythrocytes, 125, 129
 Escalation, 68, 125
 Esophageal, 7, 125
 Esophagus, 125, 134, 148
 Ethnic Groups, 16, 125
 Etomidate, 12, 125
 Evacuation, 121, 125
 Exogenous, 111, 125, 126
 Extracellular, 5, 70, 121, 126, 134, 135, 147
 Extracellular Matrix, 5, 70, 121, 126, 134
 Extracellular Matrix Proteins, 126, 134
 Extracellular Space, 126, 135
 Extrapyrmidal, 114, 123, 126
- F**
- Family Planning, 93, 126
 Fat, 114, 124, 126
 Fatty acids, 126, 142
 Feces, 121, 126
 Femoral, 117, 126
 Femoral Artery, 117, 126
 Fetus, 119, 126, 151
 Fibrin, 116, 126, 140, 149, 150

- Fibrinolysis, 113, 126
 Fibroblast Growth Factor, 8, 126
 Fibromuscular Dysplasia, 31, 126
 Fibronectin, 126, 127
 Fibrosis, 33, 126
 Filler, 14, 126
 Fistula, 51, 127
 Flaccid, 78, 127
 Forearm, 74, 116, 127
 Fossa, 58, 118, 127
 Free Radicals, 123, 127
 Frontal Lobe, 113, 118, 127
- G**
- Ganglia, 111, 114, 116, 127, 136, 139, 143, 149
 Ganglion, 127, 138
 Gas, 117, 123, 127, 130, 137, 151
 Gastric, 127, 130
 Gastrin, 127, 130
 Gastrointestinal, 39, 116, 125, 127, 146, 148
 Gelatinase A, 69, 127
 Gene, 5, 10, 116, 127, 140
 Gene Expression, 5, 127
 Genetics, 19, 24, 127
 Genotype, 8, 112, 127, 140
 Gestational, 47, 127
 Gland, 111, 127, 134, 140, 146, 148
 Glioma, 49, 127
 Glomerular, 127, 134
 Glomerular Filtration Rate, 127, 134
 Glucose, 116, 123, 127, 129, 145, 147
 Glucuronic Acid, 128, 129
 Glutamic Acid, 128, 129, 137, 142
 Gonadal, 128, 148
 Gonadotropin, 119, 128
 Governing Board, 128, 141
 Grade, 4, 128
 Grading, 32, 128
 Graft, 112, 128
 Grafting, 32, 122, 128, 131
 Guanylate Cyclase, 128, 137
 Gyrus Cinguli, 113, 128
- H**
- Haematoma, 128
 Haemorrhage, 47, 55, 60, 61, 69, 128
 Half-Life, 77, 128
 Haptens, 112, 128
 Headache, 29, 58, 60, 67, 70, 77, 107, 128, 129, 130
 Headache Disorders, 128, 129
 Hematoma, 129
 Hemodynamics, 9, 12, 33, 36, 129
 Hemoglobin, 14, 125, 129
 Hemoglobin C, 14, 129
 Hemophilia, 33, 129
 Hemorrhagic stroke, 14, 18, 129
 Heparin, 8, 129
 Hepatic, 33, 126, 129
 Hepatitis, 20, 129
 Hepatocytes, 129
 Hereditary, 39, 129
 Heredity, 127, 129
 Heterogeneity, 112, 129
 Hippocampus, 7, 122, 129, 146, 148
 Histamine, 56, 114, 130
 Histidine, 130
 Homeostasis, 15, 130
 Homogeneous, 121, 130
 Homologous, 127, 130
 Hormone, 58, 125, 127, 130, 141
 Hospital Mortality, 51, 130
 Hydatidiform Mole, 119, 130
 Hydrocephalus, 45, 48, 130, 132
 Hydrogen, 111, 112, 115, 126, 130, 136, 139
 Hydroxylysine, 120, 130
 Hydroxyproline, 120, 130
 Hyperplasia, 28, 130
 Hypertension, 22, 31, 35, 41, 46, 77, 130, 132, 140
 Hypertrophy, 130, 131
 Hypnotic, 115, 125, 131
 Hypotension, 26, 31, 33, 34, 36, 41, 42, 43, 57, 114, 122, 131
 Hypotensive, 26, 57, 131
 Hypothermia, 6, 12, 31, 131
 Hypoxia, 25, 131
 Hysterotomy, 119, 131
- I**
- Idiopathic, 22, 53, 126, 131
 Illusion, 131, 152
 Immunology, 112, 131
 Impairment, 7, 69, 108, 114, 131, 135, 143
 Implantation, 9, 121, 131
 Impotence, 131, 139
 In situ, 5, 131
 In vitro, 5, 6, 9, 10, 131
 In vivo, 5, 6, 9, 10, 11, 12, 129, 131, 135
 Incision, 117, 131, 132
 Incontinence, 130, 131
 Induction, 114, 125, 131
 Infancy, 44, 59, 131
 Infarction, 38, 40, 61, 118, 129, 131
 Infection, 38, 119, 131, 134, 148
 Inflammation, 114, 119, 126, 129, 132, 140

Infusion, 69, 132, 150
 Inhalation, 132, 133, 141
 Innervation, 132, 138
 Inoperable, 8, 132
 Inotropic, 123, 132
 Intensive Care, 16, 59, 132
 Intermittent, 42, 132, 143
 Internal Capsule, 113, 132
 Interstitial, 126, 127, 132
 Interstitial Collagenase, 127, 132
 Intracellular, 15, 131, 132, 137, 141, 142
 Intracranial Aneurysm, 5, 6, 8, 9, 10, 11, 12, 14, 16, 17, 18, 68, 132
 Intracranial Hemorrhages, 130, 132
 Intracranial Hypertension, 128, 130, 132
 Intraoperative Period, 13, 132
 Intrathecal, 78, 132
 Intravascular, 5, 132
 Intravenous, 59, 67, 68, 69, 77, 132
 Intrinsic, 112, 115, 132
 Invasive, 9, 10, 36, 130, 132, 134
 Involuntary, 132, 136, 144, 147
 Ions, 115, 117, 123, 124, 130, 132
 Ischemia, 13, 14, 34, 39, 78, 129, 132
 Ischemic stroke, 18, 19, 70, 133
 Isoflurane, 26, 42, 133
K
 Kanamycin, 45, 133
 Kb, 92, 133
 Kidney Disease, 24, 49, 54, 92, 133
 Kidney Failure, 125, 133, 134
L
 Lesion, 9, 78, 122, 133
 Lethargy, 130, 133
 Ligaments, 122, 133
 Ligation, 43, 133
 Linkage, 8, 10, 16, 133
 Lipping, 32, 133
 Liver, 20, 54, 77, 111, 114, 115, 126, 128, 129, 133, 145
 Liver scan, 133, 145
 Lobe, 39, 118, 133
 Localization, 5, 15, 57, 61, 133
 Localized, 111, 128, 129, 131, 133, 140, 146
 Loop, 9, 133
 Lumbar, 119, 133
 Lymph, 115, 119, 125, 134
 Lymph node, 115, 119, 134
 Lymphatic, 125, 131, 134
 Lysine, 129, 130, 134

M
 Magnetic Resonance Angiography, 10, 47, 51, 53, 134
 Magnetic Resonance Imaging, 74, 134, 146
 Malformation, 20, 24, 25, 37, 42, 51, 52, 134
 Malignant, 111, 113, 116, 119, 134, 149
 Malignant tumor, 119, 134
 Mammary, 122, 134
 Mammogram, 117, 134, 135
 Manic, 114, 134, 143
 Manic-depressive psychosis, 134, 143
 Mannitol, 12, 36, 134
 Mastication, 134, 150
 Matrix metalloproteinase, 69, 134
 Maxillary, 20, 134
 Medial, 7, 128, 134, 146
 Mediastinum, 119, 134
 Mediate, 123, 134
 MEDLINE, 93, 135
 Membrane, 5, 117, 120, 121, 123, 135, 150
 Memory, 7, 13, 112, 135
 Meningeal, 24, 135
 Meninges, 118, 122, 135, 148
 Mental, iv, 3, 57, 92, 94, 107, 118, 119, 123, 135, 143, 146
 Mental Disorders, 135, 143
 Mental Health, iv, 3, 92, 94, 135, 143
 Mental Processes, 123, 135, 143
 Meta-Analysis, 29, 51, 135
 Metastasis, 134, 135
 Metastatic, 38, 47, 116, 135
 Microcalcifications, 117, 135
 Microdialysis, 25, 135
 Microorganism, 135, 152
 Middle Cerebral Artery, 19, 135
 Migration, 8, 135
 Mitral Valve, 43, 135
 Modeling, 7, 11, 17, 135
 Modification, 15, 135
 Molecular, 4, 5, 10, 16, 19, 93, 95, 116, 121, 122, 129, 135, 140, 145
 Molecule, 113, 115, 120, 123, 125, 135, 139, 144
 Monitor, 26, 136, 137
 Motion Sickness, 136
 Motor nerve, 136, 138
 Musculature, 126, 136
 Mycosis, 136
 Mycotic, 20, 42, 43, 136
 Myocardial infarction, 29, 122, 136
 Myocardial Ischemia, 13, 136
 Myocardium, 13, 136

Myosin, 136, 151

N

Nausea, 77, 108, 114, 136

Necrosis, 118, 131, 136

Neoplasia, 27, 136

Nephropathy, 133, 136

Nervous System, 39, 53, 78, 111, 118, 136, 139, 149

Neural, 111, 136, 146

Neurogenic, 13, 136

Neurologic, 12, 18, 19, 78, 130, 136

Neuromuscular, 111, 136, 138

Neuromuscular Junction, 111, 136, 138

Neurotransmitter, 111, 116, 123, 128, 130, 137, 148

Nicardipine, 35, 56, 67, 68, 69, 137

Nifedipine, 52, 137

Nimodipine, 57, 137

Nitric Oxide, 14, 50, 137

Nitroglycerin, 26, 137

Nitroprusside, 26, 33, 137

Norepinephrine, 13, 111, 123, 137, 144

Nuclear, 61, 75, 124, 127, 132, 136, 137

Nuclei, 124, 134, 137, 138, 146

Nucleic acid, 137, 145

Nucleus, 113, 114, 122, 138, 143, 146

O

Observational study, 28, 138

Ocular, 138

Oculomotor, 33, 138

Oculomotor Nerve, 33, 138

Oliguria, 133, 134, 138

Ophthalmoplegia, 41, 68, 138

Opium, 138, 139

Optic Nerve, 138, 146

Optic Nerve Diseases, 138, 146

Osmolarity, 134, 138

Ossification, 138

Osteogenesis, 55, 138

Osteogenesis Imperfecta, 55, 138

Oxidation, 74, 111, 139

Oxygenation, 129, 139

Oxygenator, 117, 139

P

Palliative, 139, 149

Palsy, 33, 98, 139

Papaverine, 69, 77, 138, 139

Paralysis, 4, 78, 108, 138, 139

Parietal, 113, 139

Parietal Lobe, 113, 139

Partial remission, 139, 144

Particle, 11, 139, 147

Patch, 15, 139

Pathologic, 115, 122, 139, 145, 151

Peptide, 126, 139, 141, 142, 143

Percutaneous, 7, 139

Perforation, 60, 139

Perfusion, 61, 78, 131, 139, 143

Peripheral Nervous System, 137, 139, 148

Perivascular, 15, 139

Peroral, 77, 140

Perspiration, 77, 140

Petechiae, 128, 140

Pharmacologic, 112, 128, 140, 150

Phenotype, 5, 140

Phenoxybenzamine, 77, 140

Phosphorus, 117, 140

Phosphorylation, 5, 140

Physiologic, 112, 116, 128, 140, 142, 144, 145

Pineal gland, 119, 140

Pituitary Gland, 126, 140

Plants, 112, 117, 128, 137, 140, 145, 150

Plaque, 113, 114, 140

Plasma, 56, 116, 126, 127, 129, 133, 140, 144

Plasma Volume, 116, 140

Plasmin, 140, 150

Plasticity, 129, 140

Platelet Aggregation, 137, 140

Platelets, 59, 137, 140, 146, 149

Pneumonia, 121, 140

Poisoning, 136, 141

Polycystic, 20, 24, 49, 53, 54, 141

Polypeptide, 120, 140, 141, 142, 152

Porosity, 15, 141

Port, 78, 141

Port-a-cath, 141

Posterior, 6, 24, 37, 48, 55, 58, 112, 114, 118, 124, 132, 141

Postero, 70, 141

Postoperative, 12, 14, 43, 49, 141

Potassium, 15, 141

Practicability, 141, 150

Practice Guidelines, 94, 141

Preclinical, 5, 141

Precursor, 113, 114, 123, 125, 137, 141, 151

Preoperative, 49, 61, 141

Prevalence, 17, 46, 51, 141

Probe, 135, 141

Progesterone, 141, 148

Progressive, 119, 125, 136, 141

Projection, 137, 138, 142

Proline, 120, 130, 142

- Propofol, 59, 142
 Prospective Studies, 41, 142
 Prospective study, 42, 142
 Prostaglandin, 26, 36, 43, 50, 142
 Prostaglandins A, 142
 Protease, 142, 150
 Protein C, 5, 142, 151
 Protein Conformation, 5, 142
 Protein S, 116, 142
 Proteins, 112, 113, 120, 126, 129, 134, 136, 137, 139, 140, 142, 143, 145, 146, 150
 Proteolytic, 120, 140, 143, 150
 Protocol, 6, 82, 143
 Proximal, 12, 58, 75, 76, 78, 123, 143, 146
 Psychic, 135, 143, 146
 Psychology, 7, 69, 123, 143
 Psychosis, 39, 114, 127, 143
 Public Health, 17, 18, 94, 143
 Public Policy, 93, 143
 Pulmonary, 38, 116, 133, 143, 151
 Pulsatile Flow, 38, 58, 143
 Purpura, 53, 128, 143
 Putamen, 113, 143
- Q**
 Quaternary, 142, 143
- R**
 Race, 135, 143
 Radiation, 50, 127, 134, 143, 146, 152
 Radioactive, 116, 128, 130, 131, 133, 137, 143, 146
 Radiological, 19, 139, 143
 Radiology, 4, 15, 20, 144
 Randomized, 4, 6, 12, 67, 124, 144
 Randomized clinical trial, 12, 144
 Reality Testing, 143, 144
 Receptor, 113, 123, 144, 146
 Recurrence, 15, 20, 51, 134, 144
 Refer, 1, 120, 123, 133, 141, 143, 144
 Reflex, 78, 144
 Refraction, 144, 147
 Regeneration, 6, 126, 144
 Regimen, 124, 144, 145
 Relaxant, 139, 144
 Reliability, 74, 75, 144
 Remission, 77, 134, 144
 Renal cysts, 30, 144
 Renin, 33, 113, 144
 Renovascular, 31, 144
 Resection, 22, 144
 Reserpine, 45, 144
 Resorption, 130, 145
 Respiration, 117, 136, 145
 Resuscitation, 68, 145
 Retinal, 138, 145, 146
 Retreatment, 18, 145
 Retrospective, 18, 51, 145
 Ribonucleic acid, 15, 145
 Ribose, 111, 145
 Risk factor, 16, 18, 70, 142, 145
 Risk patient, 48, 145
 Rod, 119, 145
 Rubber, 145, 148
- S**
 Saphenous, 122, 145
 Saphenous Vein, 122, 145
 Saponins, 145, 148
 Scans, 68, 145
 Schizophrenia, 124, 146
 Sclerae, 138, 146
 Scotoma, 43, 146
 Screening, 8, 10, 14, 54, 119, 146
 Secretion, 45, 58, 119, 130, 140, 146
 Sedative, 115, 146
 Segmental, 126, 146
 Seizures, 19, 108, 146
 Septal, 113, 146
 Septal Nuclei, 113, 146
 Sequencing, 10, 146
 Serine, 146, 150
 Serotonin, 114, 137, 144, 146, 151
 Serum, 14, 69, 120, 128, 146
 Shock, 78, 146, 150
 Shunt, 45, 146
 Side effect, 85, 87, 111, 114, 133, 147, 150
 Signs and Symptoms, 144, 147
 Skeletal, 119, 147, 151
 Skeleton, 111, 142, 147
 Skin graft, 147, 148
 Skull, 59, 122, 147, 149
 Small intestine, 130, 147, 152
 Smooth muscle, 15, 130, 137, 139, 147, 148
 Sodium, 26, 33, 116, 147, 149
 Sorbitol, 134, 147
 Sound wave, 121, 147
 Spasm, 48, 147
 Specialist, 53, 99, 123, 147
 Species, 112, 125, 135, 143, 147, 150
 Specificity, 112, 117, 147
 Spectrum, 18, 147
 Spinal cord, 78, 118, 119, 127, 132, 135, 136, 137, 139, 144, 147, 148, 149, 152
 Staging, 145, 148
 Steel, 119, 148
 Stenosis, 9, 22, 49, 126, 148

- Stents, 12, 15, 148
Steroid, 77, 145, 148
Stethoscope, 37, 148
Stimulant, 130, 148
Stimulus, 132, 144, 148, 149
Stomach, 111, 125, 127, 130, 136, 147, 148
Stress, 11, 57, 118, 136, 145, 148
Stricture, 148
Stroke, 8, 9, 10, 19, 30, 35, 37, 38, 39, 46, 50, 51, 59, 69, 70, 78, 92, 98, 117, 129, 133, 148
Stroke Volume, 117, 148
Subacute, 131, 148
Subclavian, 38, 115, 148, 152
Subclavian Artery, 148, 152
Subclinical, 131, 146, 148
Subiculum, 130, 148
Substance P, 146, 148
Substrate, 5, 9, 149
Suppression, 59, 78, 149
Sweat, 140, 149
Sympathetic Nervous System, 137, 149
Sympathomimetic, 123, 125, 137, 149
Symptomatic, 13, 22, 46, 69, 82, 149
Systemic, 77, 114, 116, 125, 129, 131, 132, 149
Systolic, 131, 149
- T**
Tachycardia, 115, 149
Tachypnea, 115, 149
Telangiectasia, 39, 149
Temporal, 7, 9, 129, 130, 149
Teratogenic, 123, 149
Teratoma, 119, 149
Testis, 119, 149
Therapeutics, 5, 70, 86, 149
Thermal, 123, 149
Threshold, 130, 149
Thrombin, 126, 140, 142, 149
Thrombocytes, 140, 149
Thrombomodulin, 142, 149
Thrombosis, 6, 8, 9, 15, 30, 39, 40, 47, 52, 55, 142, 148, 150
Tissue Plasminogen Activator, 60, 150
Tomography, 150
Torsion, 131, 150
Toxic, iv, 150
Toxicity, 124, 150
Toxicology, 94, 150
Toxins, 113, 117, 128, 131, 150
Traction, 119, 150
Transfection, 116, 150
- Transfusion, 150
Translational, 11, 150
Transmitter, 111, 123, 137, 150
Transplantation, 119, 150
Trauma, 70, 78, 136, 150
Treatment Outcome, 18, 35, 150
Trigeminal, 49, 150
Tropomyosin, 150, 151
Troponin, 13, 150, 151
Tryptophan, 120, 146, 151
Tuberous Sclerosis, 30, 151
Tunica, 124, 151
Tunica Intima, 124, 151
Tyrosine, 123, 151
- U**
Ultrasonography, 43, 46, 57, 151
Urinary, 130, 131, 138, 150, 151
Urine, 116, 123, 131, 138, 151
Uterus, 119, 131, 141, 151
- V**
Vaccine, 143, 151
Vascular, 5, 6, 9, 10, 11, 12, 13, 20, 34, 35, 55, 70, 116, 118, 125, 129, 131, 134, 137, 151
Vasoconstriction, 125, 151
Vasodilation, 139, 151
Vasodilator, 76, 77, 116, 123, 130, 137, 139, 140, 151
Vein, 61, 114, 115, 132, 137, 145, 148, 151
Venous, 49, 61, 114, 115, 118, 137, 142, 151
Ventilation, 125, 151
Ventral, 138, 151
Ventricle, 130, 135, 149, 151, 152
Ventricular, 14, 48, 130, 152
Ventricular Function, 14, 152
Venules, 116, 152
Vertebrae, 147, 152
Vertebral, 25, 70, 152
Vertebral Artery, 25, 152
Vertigo, 77, 152
Veterinary Medicine, 93, 152
Villi, 130, 152
Viruses, 111, 135, 151, 152
Visual field, 146, 152
Vitro, 4, 129, 152
Vivo, 5, 6, 9, 152
- W**
Wound Healing, 126, 134, 152
- X**
X-ray, 15, 75, 121, 134, 137, 144, 146, 152
- Y**
Yeasts, 140, 152

z

Zymogen, 142, 152

