THE OFFICIAL PATIENT'S SOURCEBOOK *on*

PERTUSSIS

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Dedication

To the healthcare professionals dedicating their time and efforts to the study of pertussis.

Acknowledgements

The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this sourcebook which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which directly or indirectly are dedicated to pertussis. All of the *Official Patient's Sourcebooks* 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 sourcebook. 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 LaRochelle for her excellent editorial support.

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- The Official Patient's Sourcebook on Group A Streptococcus
- The Official Patient's Sourcebook on Group B Streptococcus
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- The Official Patient's Sourcebook on Helicobacter Pylori Infections
- The Official Patient's Sourcebook on Histoplasmosis
- The Official Patient's Sourcebook on Invasive Candidiasis
- The Official Patient's Sourcebook on Legionellosis
- The Official Patient's Sourcebook on Leptospirosis
- The Official Patient's Sourcebook on Leptospirosis Infection in Pets
- The Official Patient's Sourcebook on Listeriosis
- The Official Patient's Sourcebook on Melioidosis
- The Official Patient's Sourcebook on Meningitis
- The Official Patient's Sourcebook on Mycobacterium Avium Complex

- The Official Patient's Sourcebook on Mycoplasma Pneumoniae
- The Official Patient's Sourcebook on Nocardiosis
- The Official Patient's Sourcebook on Oropharyngeal Candidiasis
- The Official Patient's Sourcebook on Other Mycobacterium Species
- The Official Patient's Sourcebook on Pneumonia among Children in Developing Countries
- The Official Patient's Sourcebook on Psittacosis
- The Official Patient's Sourcebook on Salmonella Enteritidis Infection
- The Official Patient's Sourcebook on Salmonellosis
- The Official Patient's Sourcebook on Shigellosis
- The Official Patient's Sourcebook on Sporotrichosis
- The Official Patient's Sourcebook on Streptococcus Pneumoniae Disease
- The Official Patient's Sourcebook on Toxic Shock Syndrome
- The Official Patient's Sourcebook on Trachoma
- The Official Patient's Sourcebook on Travelers Diarrhea
- The Official Patient's Sourcebook on Typhoid Fever
- The Official Patient's Sourcebook on Unexplained Deaths & Critical Illnesses
- The Official Patient's Sourcebook on Urinary Tract Infections
- The Official Patient's Sourcebook on Vibrio Parahaemolyticus
- The Official Patient's Sourcebook on Vibrio Vulnificus
- The Official Patient's Sourcebook on Yersiniosis

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INTRODUCTION

Overview

Dr. C. Everett Koop, former U.S. Surgeon General, once said, "The best prescription is knowledge."[1] The Agency for Healthcare Research and Quality (AHRQ) of the National Institutes of Health (NIH) echoes this view and recommends that every patient incorporate education into the treatment process. According to the AHRQ:

> Finding out more about your condition is a good place to start. By contacting groups that support your condition, visiting your local library, and searching on the Internet, you can find good information to help guide your treatment decisions. Some information may be hard to find—especially if you don't know where to look.[2]

As the AHRQ mentions, finding the right information is not an obvious task. Though many physicians and public officials had thought that the emergence of the Internet would do much to assist patients in obtaining reliable information, 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.[3]

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[1] Quotation from **http://www.drkoop.com**.
[2] The Agency for Healthcare Research and Quality (AHRQ): **http://www.ahcpr.gov/consumer/diaginfo.htm**.
[3] From the NIH, National Cancer Institute (NCI): **http://cancertrials.nci.nih.gov/beyond/evaluating.html**.

Since the late 1990s, physicians have seen a general increase in patient Internet usage rates. Patients frequently enter their doctor's offices with printed Web pages of home remedies in the guise of latest medical research. This scenario is so common that doctors often spend more time dispelling misleading information than guiding patients through sound therapies. *The Official Patient's Sourcebook on Pertussis* has been created for patients who have decided to make education and research an integral part of the treatment process. The pages that follow will tell you where and how to look for information covering virtually all topics related to pertussis, from the essentials to the most advanced areas of research.

The title of this book includes the word "official." This reflects the fact that the sourcebook draws from public, academic, government, and peer-reviewed research. Selected readings from various agencies are reproduced to give you some of the latest official information available to date on pertussis.

Given patients' increasing sophistication in using the Internet, abundant references to reliable Internet-based resources are provided throughout this sourcebook. Where possible, guidance is provided on how to obtain free-of-charge, primary research results as well as more detailed information via the Internet. E-book and electronic versions of this sourcebook are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). Hard copy users of this sourcebook can type cited Web addresses directly into their browsers to obtain access to the corresponding sites. Since we are working with ICON Health Publications, hard copy *Sourcebooks* are frequently updated and printed on demand to ensure that the information provided is current.

In addition to extensive references accessible via the Internet, every chapter presents a "Vocabulary Builder." Many health guides offer glossaries of technical or uncommon terms in an appendix. In editing this sourcebook, we have decided to place a smaller glossary within each chapter that covers terms used in that chapter. Given the technical nature of some chapters, you may need to revisit many sections. Building one's vocabulary of medical terms in such a gradual manner has been shown to improve the learning process.

We must emphasize that no sourcebook on pertussis should affirm that a specific diagnostic procedure or treatment discussed in a research study, patent, or doctoral dissertation is "correct" or your best option. This sourcebook is no exception. Each patient is unique. Deciding on appropriate

options is always up to the patient in consultation with their physician and healthcare providers.

Organization

This sourcebook is organized into three parts. Part I explores basic techniques to researching pertussis (e.g. finding guidelines on diagnosis, treatments, and prognosis), followed by a number of topics, including information on how to get in touch with organizations, associations, or other patient networks dedicated to pertussis. It also gives you sources of information that can help you find a doctor in your local area specializing in treating pertussis. Collectively, the material presented in Part I is a complete primer on basic research topics for patients with pertussis.

Part II moves on to advanced research dedicated to pertussis. Part II is intended for those willing to invest many hours of hard work and study. It is here that we direct you to the latest scientific and applied research on pertussis. When possible, contact names, links via the Internet, and summaries are provided. It is in Part II where the vocabulary process becomes important as authors publishing advanced research frequently use highly specialized language. In general, every attempt is made to recommend "free-to-use" options.

Part III provides appendices of useful background reading for all patients with pertussis or related disorders. The appendices are dedicated to more pragmatic issues faced by many patients with pertussis. Accessing materials via medical libraries may be the only option for some readers, so a guide is provided for finding local medical libraries which are open to the public. Part III, therefore, focuses on advice that goes beyond the biological and scientific issues facing patients with pertussis.

Scope

While this sourcebook covers pertussis, your doctor, research publications, and specialists may refer to your condition using a variety of terms. Therefore, you should understand that pertussis is often considered a synonym or a condition closely related to the following:

- Whooping Cough

In addition to synonyms and related conditions, physicians may refer to pertussis using certain coding systems. The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) is the most commonly used system of classification for the world's illnesses. Your physician may use this coding system as an administrative or tracking tool. The following classification is commonly used for pertussis:[4]

- 033 whooping cough
- 033.9 pertussis

For the purposes of this sourcebook, we have attempted to be as inclusive as possible, looking for official information for all of the synonyms relevant to pertussis. You may find it useful to refer to synonyms when accessing databases or interacting with healthcare professionals and medical librarians.

Moving Forward

Since the 1980s, the world has seen a proliferation of healthcare guides covering most illnesses. Some are written by patients or their family members. These generally take a layperson's approach to understanding and coping with an illness or disorder. They can be uplifting, encouraging, and highly supportive. Other guides are authored by physicians or other healthcare providers who have a more clinical outlook. Each of these two styles of guide has its purpose and can be quite useful.

As editors, we have chosen a third route. We have chosen to expose you to as many sources of official and peer-reviewed information as practical, for the purpose of educating you about basic and advanced knowledge as recognized by medical science today. You can think of this sourcebook as your personal Internet age reference librarian.

Why "Internet age"? All too often, patients diagnosed with pertussis will log on to the Internet, type words into a search engine, and receive several Web site listings which are mostly irrelevant or redundant. These patients are left to wonder where the relevant information is, and how to obtain it. Since only the smallest fraction of information dealing with pertussis is even indexed in

[4] This list is based on the official version of the World Health Organization's 9th Revision, International Classification of Diseases (ICD-9). According to the National Technical Information Service, "ICD-9CM extensions, interpretations, modifications, addenda, or errata other than those approved by the U.S. Public Health Service and the Health Care Financing Administration are not to be considered official and should not be utilized. Continuous maintenance of the ICD-9-CM is the responsibility of the federal government."

search engines, a non-systematic approach often leads to frustration and disappointment. With this sourcebook, we hope to direct you to the information you need that you would not likely find using popular Web directories. Beyond Web listings, in many cases we will reproduce brief summaries or abstracts of available reference materials. These abstracts often contain distilled information on topics of discussion.

While we focus on the more scientific aspects of pertussis, there is, of course, the emotional side to consider. Later in the sourcebook, we provide a chapter dedicated to helping you find peer groups and associations that can provide additional support beyond research produced by medical science. We hope that the choices we have made give you the most options available in moving forward. In this way, we wish you the best in your efforts to incorporate this educational approach into your treatment plan.

The Editors

PART I: THE ESSENTIALS

ABOUT PART I

Part I has been edited to give you access to what we feel are "the essentials" on pertussis. The essentials of a disease typically include the definition or description of the disease, a discussion of who it affects, the signs or symptoms associated with the disease, tests or diagnostic procedures that might be specific to the disease, and treatments for the disease. Your doctor or healthcare provider may have already explained the essentials of pertussis to you or even given you a pamphlet or brochure describing pertussis. Now you are searching for more in-depth information. As editors, we have decided, nevertheless, to include a discussion on where to find essential information that can complement what your doctor has already told you. In this section we recommend a process, not a particular Web site or reference book. The process ensures that, as you search the Web, you gain background information in such a way as to maximize your understanding.

CHAPTER 1. THE ESSENTIALS ON PERTUSSIS: GUIDELINES

Overview

Official agencies, as well as federally-funded institutions supported by national grants, frequently publish a variety of guidelines on pertussis. 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. The great advantage of guidelines over other sources is that they are often written with the patient in mind. Since new guidelines on pertussis 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.

The National Institutes of Health (NIH)[5]

The National Institutes of Health (NIH) is the first place to search for relatively current patient guidelines and fact sheets on pertussis. Originally founded in 1887, the NIH is one of the world's foremost medical research centers and the federal focal point for medical research in the United States. At any given time, the NIH supports some 35,000 research grants at universities, medical schools, and other research and training institutions, both nationally and internationally. The rosters of those who have conducted research or who have received NIH support over the years include the world's most illustrious scientists and physicians. Among them are 97 scientists who have won the Nobel Prize for achievement in medicine.

[5] Adapted from the NIH: **http://www.nih.gov/about/NIHoverview.html**.

There is no guarantee that any one Institute will have a guideline on a specific disease, though the National Institutes of Health collectively publish over 600 guidelines for both common and rare diseases. The best way to access NIH guidelines is via the Internet. Although the NIH is organized into many different Institutes and Offices, the following is a list of key Web sites where you are most likely to find NIH clinical guidelines and publications dealing with pertussis and associated conditions:

- Office of the Director (OD); guidelines consolidated across agencies available at **http://www.nih.gov/health/consumer/conkey.htm**
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines available at **http://www.nlm.nih.gov/medlineplus/healthtopics.html**
- National Institute of Allergy and Infectious Diseases (NIAID); guidelines available at **http://www.niaid.nih.gov/publications/**
- Centers for Disease Control and Prevention: various fact sheets on infectious diseases at **http://www.cdc.gov/health/diseases.htm**

Among the above, the National Institute of Allergy and Infectious Diseases (NIAID) is particularly noteworthy. The mission of the NIAID is to provide support for scientists conducting research aimed at developing better ways to diagnose, treat, and prevent the many infectious, immunologic and allergic diseases that afflict people worldwide.[6] The NIAID is composed of four extramural divisions: the Division of AIDS; the Division of Allergy, Immunology and Transplantation; the Division of Microbiology and Infectious Diseases; and the Division of Extramural Activities. In addition, NIAID scientists conduct intramural research in laboratories located in Bethesda, Rockville and Frederick, Maryland, and in Hamilton, Montana. The following patient guideline was recently published by the NIAID on pertussis.

Pertussis: Technical Notes

The Division of Bacterial and Mycotic Diseases of the CDC publishes summary information on pertussis for use by healthcare professionals and physicians. The information is presented in the form of notes. The notes are written in a rather technical language. A few medical expressions are particularly noteworthy. "Clinical features" generally cover the signs and

[6] This paragraph has been adapted from the NIAID: **http://www.niaid.nih.gov/facts/overview.htm**. "Adapted" signifies that a passage has been reproduced exactly or slightly edited for this book.

symptoms of pertussis that can help the doctor with diagnosis. It may also include a discussion of the cause or "etiology" of pertussis. "Etiologic agent" signifies the particular organism, typically written in Latin, which causes or is associated with pertussis. "Reservoir" indicates the habitat or living environment of the organism. "Incidence" describes the number of people that are diagnosed with pertussis within a given population. "Sequelae" includes any related health consequences or secondary pathological conditions and diseases that may result from pertussis. "Transmission" describes how a disease spreads. "Risk Groups" are people who are most likely to be diagnosed with pertussis. "Surveillance" describes how pertussis is monitored by government officials across the population. "Challenges" and "Opportunities" are issues or areas where officials think progress might be made in understanding or combating pertussis in the future. The notes that follow were recently published by the CDC.[7]

Clinical Features

Highly communicable, vaccine-preventable disease that lasts for many weeks and is typically manifested in children with paroxysmal spasms of severe coughing, whooping, and posttussive vomiting.

Etiologic Agent

Bordetella pertussis, a gram-negative coccobacillus.

Incidence

This disease results in high morbidity and mortality in many countries every year. In the United States, 5000-7000 cases are reported each year. Incidence of pertussis has increased steadily since the 1980s. The highest incidence since 1967 (2.9/100,000) was reported in 1996, when 7796 cases of pertussis were reported.

[7] Adapted from The Centers for Disease Control and Prevention (CDC): **http://www.cdc.gov/ncidod/dbmd/diseaseinfo/pertussis_t.htm**.

Complications

Major complications are most common among infants and young children and include hypoxia, apnea, pneumonia, seizures, encephalopathy, and malnutrition. Young children can die from pertussis; in the United States 5-10 children die every year. Most deaths occur among unvaccinated children or children too young to be vaccinated.

Transmission

Occurs through direct contact with discharges from respiratory mucous membranes of infected persons.

Risk Groups

Children who are too young to be fully vaccinated and those who have not completed the primary vaccination series are at highest risk for severe illness. Like measles, pertussis is highly contagious with up to 90% of susceptible household contacts developing clinical disease following exposure to an index case. Adolescents and adults become susceptible when immunity wanes.

Surveillance

National reporting through the National Electronic Telecommunications System for Surveillance (NETSS) and through several Enhanced Surveillance Sites throughout the United States.

Trends

Pertussis is an endemic illness. In the United States epidemics occur every 3-5 years. The most recent epidemic occurred in 1996. Overall increase in cases since 1990, with disproportionate increase in adolescents and adults.

Challenges

Understanding pertussis pathogenesis and immunity; protecting infants from severe pertussis; control of pertussis outbreaks; diagnosing pertussis in a timely, accurate, and standardized fashion; understanding the true burden of disease in different age and socioeconomic groups; evaluating the impact of a licensed pertussis vaccine in persons > 14 years of age; evaluating the impact of acellular vaccines on prevention programs; and determining the prevalence of erythromycin-resistant B. pertussis.

Opportunities

Characterize strains using newly developed molecular typing methods (e.g., pulsed-field gel electrophoresis and gene-sequencing analysis) to elucidate epidemiology and virulence factors, examine isolates for antimicrobial susceptibility and to identify resistance mechanisms; study transmission of pertussis within populations (e.g., how adults/adolescents transmit the organism to others); study efficacy of acellular pertussis vaccines among persons > 14 years of age; study effectiveness of acellular pertussis vaccines to control outbreaks; apply/evaluate new diagnostic tests.

Additional Technical Information

Morbidity and Mortality Weekly Report (MMWR) Articles

- CDC. Combination Vaccines for Childhood Immunization, MMWR Vol 48, No RR05;1 05/14/1999: **http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/rr4805a1.htm**
- CDC. Pertussis Vaccination: Use of Acellular Pertussis Vaccines Among ... MMWR Vol 46, No RR07;001 03/28/1997: **http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00048610.htm**
- CDC. Diphtheria, Tetanus, and Pertussis: Recommendations for Vaccine Use MMWR Vol 40, No RR10;001 08/08/1991: **http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00041645.htm**

Links

- ACIP recommendations: **http://www.cdc.gov/nip/publications/acip-list.htm**

- NIP's Manual for the surveillance for vaccine preventable diseases: **http://www.cdc.gov/nip/publications/acip-list.htm**

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More Guideline Sources

The guideline above on pertussis is only one example of the kind of material that you can find online and free of charge. The remainder of this chapter will direct you to other sources which either publish or can help you find additional guidelines on topics related to pertussis. Many of the guidelines listed below address topics that may be of particular relevance to your specific situation or of special interest to only some patients with pertussis. 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.

Topic Pages: MEDLINEplus

For patients wishing to go beyond guidelines published by specific Institutes of the NIH, 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." You can think of a health topic page as a guide to patient guides. 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.

If you do not find topics of interest when browsing health topic pages, then you can choose to use the advanced search utility of MEDLINEplus at the following: **http://www.nlm.nih.gov/medlineplus/advancedsearch.html**. This utility is similar to the NIH Search Utility, with the exception that it only includes material linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The Combined Health Information Database (CHID)

CHID Online is a reference tool that maintains a database directory of thousands of journal articles and patient education guidelines on pertussis and related conditions. One of the advantages of CHID over other sources is that it offers summaries that describe the guidelines available, including contact information and pricing. CHID's general Web site is **http://chid.nih.gov/**. To search this database, go to **http://chid.nih.gov/detail/detail.html**. In particular, you can use the advanced search options to look up pamphlets, reports, brochures, and information kits. The following was recently posted in this archive:

- **Diphtheria, tetanus, and pertussis: What you need to know**

  Source: Elk Grove Village, IL: American Academy of Pediatrics. 1992. 13 pp.

  Contact: Available from Publications Department, American Academy of Pediatrics, 141 Northwest Point Boulevard, P.O. Box 927, Elk Grove Village, IL 60009-0927. Telephone: (847) 228-5005 or (800) 433-9016 / fax: (847) 228-5097 / e-mail: ksanabria@aap.org / Web site: http://www.aap.org. $15.00 for 100 copies, members; $20.00, nonmembers. Minimum order: 100 copies.

  Summary: This pamphlet from the Centers for Disease Control and Prevention has been reprinted by the American Academy of Pediatrics. It gives parents information they need to know before their child is vaccinated. It tells about the diseases diphtheria, tetanus, and pertussis,

the benefits and risks of vaccines, when a child should routinely get vaccines, when the child should delay getting or not get the vaccine, and what to look for and do after the shot.

- **Important facts all parents should know about immunizing their children against pertussis**

  Source: Wayne, NJ: Lederle-Praxis Biologicals. 1991. 6 pp.

  Contact: Available from Lederle Laboratories, One Cyanamid Plaza, Wayne, NJ 07470. Telephone: (800) 533-3753 or (201) 831-2000. Available at no charge.

  Summary: The pamphlet describes pertussis, also known as whooping cough. It addresses some of the more common questions asked by parents about the disease and the vaccine against it.

The National Guideline Clearinghouse™

The National Guideline Clearinghouse™ offers hundreds of evidence-based clinical practice guidelines published in the United States and other countries. You can search their site located at **http://www.guideline.gov** by using the keyword "pertussis" or synonyms. The following was recently posted:

- **(1) Pertussis vaccination: use of acellular pertussis vaccines among infants and young children. (2) Use of diphtheria toxoid-tetanus toxoid-acellular pertussis vaccine as a five-dose series**

  Source: Centers for Disease Control and Prevention.; 1997 March 28 (updated 2000 Nov); 25 pages; 8 pages

  http://www.guideline.gov/FRAMESETS/guideline_fs.asp?guideline=000060&sSearch_string=pertussis

Healthfinder™

Healthfinder™ is an additional source sponsored by the U.S. Department of Health and Human Services which offers links to hundreds of other sites that contain healthcare information. This Web site is located at **http://www.healthfinder.gov**. Again, keyword searches can be used to find guidelines. The following was recently found in this database:

- **Vaccine Information Statements - Centers for Disease Control and Prevention**

  Summary: This web site provides links to general information on a variety of vaccines for the general public including chickenpox, diphtheria, HIB, measles, mumps, pertussis, polio, rubella, hepatitis and

  Source: National Immunization Program, Centers for Disease Control and Prevention

  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=366

The NIH Search Utility

After browsing the references listed at the beginning of this chapter, you may want to explore the NIH Search Utility. This 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 pertussis. 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 that often link to government sites are available to the public. 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**
- drkoop.com®: **http://www.drkoop.com/conditions/ency/index.html**
- 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**

Vocabulary Builder

The material in this chapter may have contained a number of unfamiliar words. The following Vocabulary Builder introduces you to terms used in this chapter that have not been covered in the previous chapter:

Antimicrobial: Killing microorganisms, or suppressing their multiplication or growth. [EU]

Apnea: A transient absence of spontaneous respiration. [NIH]

Bordetella: A genus of gram-negative, aerobic bacteria whose cells are minute coccobacilli. It consists of both parasitic and pathogenic species. [NIH]

Diphtheria: A localized infection of mucous membranes or skin caused by toxigenic strains of corynebacterium diphtheriae. It is characterized by the presence of a pseudomembrane at the site of infection. Diphtheria Toxin, produced by C. diphtheriae, can cause myocarditis, polyneuritis, and other systemic toxic effects. [NIH]

Electrophoresis: An electrochemical process in which macromolecules or colloidal particles with a net electric charge migrate in a solution under the influence of an electric current. [NIH]

Encephalopathy: Any degenerative disease of the brain. [EU]

Endemic: Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

Epidemic: Occurring suddenly in numbers clearly in excess of normal expectancy; said especially of infectious diseases but applied also to any disease, injury, or other health-related event occurring in such outbreaks. [EU]

Erythromycin: A bacteriostatic antibiotic substance produced by Streptomyces erythreus. Erythromycin A is considered its major active component. In sensitive organisms, it inhibits protein synthesis by binding to 50S ribosomal subunits. This binding process inhibits peptidyl transferase activity and interferes with translocation of amino acids during translation and assembly of proteins. [NIH]

Hepatitis: Inflammation of the liver. [EU]

Hypoxia: Reduction of oxygen supply to tissue below physiological levels

despite adequate perfusion of the tissue by blood. [EU]

Immunity: The condition of being immune; the protection against infectious disease conferred either by the immune response generated by immunization or previous infection or by other nonimmunologic factors (innate i.). [EU]

Immunization: The induction of immunity. [EU]

Membrane: A thin layer of tissue which covers a surface, lines a cavity or divides a space or organ. [EU]

Microbiology: The study of microorganisms such as fungi, bacteria, algae, archaea, and viruses. [NIH]

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

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

Paroxysmal: Recurring in paroxysms (= spasms or seizures). [EU]

Pediatrics: A medical specialty concerned with maintaining health and providing medical care to children from birth to adolescence. [NIH]

Pneumonia: Inflammation of the lungs with consolidation. [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]

Rubella: An acute, usually benign, infectious disease caused by a togavirus and most often affecting children and nonimmune young adults, in which the virus enters the respiratory tract via droplet nuclei and spreads to the lymphatic system. It is characterized by a slight cold, sore throat, and fever, followed by enlargement of the postauricular, suboccipital, and cervical lymph nodes, and the appearances of a fine pink rash that begins on the head and spreads to become generalized. Called also German measles, roetln, röteln, and three-day measles, and rubeola in French and Spanish. [EU]

Seizures: Clinical or subclinical disturbances of cortical function due to a sudden, abnormal, excessive, and disorganized discharge of brain cells. Clinical manifestations include abnormal motor, sensory and psychic phenomena. Recurrent seizures are usually referred to as EPILEPSY or "seizure disorder." [NIH]

Tetanus: A disease caused by tetanospasmin, a powerful protein toxin produced by clostridium tetani. Tetanus usually occurs after an acute injury, such as a puncture wound or laceration. Generalized tetanus, the most common form, is characterized by tetanic muscular contractions and hyperreflexia. Localized tetanus presents itself as a mild condition with manifestations restricted to muscles near the wound. It may progress to the

generalized form. [NIH]

Transplantation: The grafting of tissues taken from the patient's own body or from another. [EU]

Vaccination: The introduction of vaccine into the body for the purpose of inducing immunity. Coined originally to apply to the injection of smallpox vaccine, the term has come to mean any immunizing procedure in which vaccine is injected. [EU]

Vaccine: A suspension of attenuated or killed microorganisms (bacteria, viruses, or rickettsiae), administered for the prevention, amelioration or treatment of infectious diseases. [EU]

Virulence: The degree of pathogenicity within a group or species of microorganisms or viruses as indicated by case fatality rates and/or the ability of the organism to invade the tissues of the host. [NIH]

CHAPTER 2. SEEKING GUIDANCE

Overview

Some patients are comforted by the knowledge that a number of organizations dedicate their resources to helping people with pertussis. These associations can become invaluable sources of information and advice. Many associations offer aftercare support, financial assistance, and other important services. Furthermore, healthcare research has shown that support groups often help people to better cope with their conditions.[8] In addition to support groups, your physician can be a valuable source of guidance and support. Therefore, finding a physician that can work with your unique situation is a very important aspect of your care.

In this chapter, we direct you to resources that can help you find patient organizations and medical specialists. We begin by describing how to find associations and peer groups that can help you better understand and cope with pertussis. The chapter ends with a discussion on how to find a doctor that is right for you.

Associations and Pertussis

As mentioned by the Agency for Healthcare Research and Quality, sometimes the emotional side of an illness can be as taxing as the physical side.[9] You may have fears or feel overwhelmed by your situation. Everyone has different ways of dealing with disease or physical injury. Your attitude, your expectations, and how well you cope with your condition can all

[8] Churches, synagogues, and other houses of worship might also have groups that can offer you the social support you need.

[9] This section has been adapted from **http://www.ahcpr.gov/consumer/diaginf5.htm**.

influence your well-being. This is true for both minor conditions and serious illnesses. For example, a study on female breast cancer survivors revealed that women who participated in support groups lived longer and experienced better quality of life when compared with women who did not participate. In the support group, women learned coping skills and had the opportunity to share their feelings with other women in the same situation.

In addition to associations or groups that your doctor might recommend, we suggest that you consider the following list (if there is a fee for an association, you may want to check with your insurance provider to find out if the cost will be covered):

- **Immunization Action Coalition/Hepatitis B Coalition**

  Address: Immunization Action Coalition/Hepatitis B Coalition 1573 Selby Avenue, St. Paul, MN 55104

  Telephone: (651) 647- 9009

  Fax: (651) 647-9131

  Email: admin@immunize.org

  Web Site: http://www.immunize.org

  Background: The Immunization Action Coalition/Hepatitis B Coalition (IAC) is a nonprofit organization dedicated to boosting immunization rates and promoting Hepatitis B vaccinations. Established in 1990, the Immunization Action Coalition promotes physician, community, and family awareness of and responsibility for appropriate immunization of all people of all ages against all vaccine-preventable diseases. The Hepatitis B Coalition, a program of the Immunization Action Coalition, promotes Hepatitis B vaccination for all infants, children, and adolescents. Hepatitis B is one of several viral agents that cause inflammation of the liver known as 'hepatitis' or 'diffuse hepatocellular inflammatory disease.' Hepatitis B is characterized by fever, nausea, vomiting, and persistent yellowing of the skin, mucous membranes, and whites of the eyes (jaundice). The IAC's educational materials include a newsletter, brochures, and audiovisual aids. IAC also maintains a web site on the Internet at http://www.immunize.org.

  Relevant area(s) of interest: Diphtheria, Pertussis

Finding More Associations

There are a number of directories that list additional medical associations that you may find useful. While not all of these directories will provide

different information than what is listed above, by consulting all of them, you will have nearly exhausted all sources for patient associations.

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 pertussis. 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.

DIRLINE

A comprehensive source of information on associations is the DIRLINE database maintained by the National Library of Medicine. The database comprises some 10,000 records of organizations, research centers, and government institutes and associations which primarily focus on health and biomedicine. DIRLINE is available via the Internet at the following Web site: **http://dirline.nlm.nih.gov/**. Simply type in "pertussis" (or a synonym) or the name of a topic, and the site will list information contained in the database on all relevant organizations.

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 "pertussis". 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." By making these selections and typing in "pertussis" (or synonyms) into the "For these words:" box, you will only receive results on organizations dealing with pertussis. You should check back periodically with this database since it is updated every 3 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 specific diseases. You can access this database at the following Web site: **http://www.rarediseases.org/cgi-bin/nord/searchpage**. Select the option called "Organizational Database (ODB)" and type "pertussis" (or a synonym) in the search box.

Online Support Groups

In addition to support groups, commercial Internet service providers offer forums and chat rooms for people with different illnesses and conditions. WebMD®, for example, offers such a service at their Web site: **http://boards.webmd.com/roundtable**. These online self-help communities can help you connect with a network of people whose concerns are similar to yours. Online support groups are places where people can talk informally. If you read about a novel approach, consult with your doctor or other healthcare providers, as the treatments or discoveries you hear about may not be scientifically proven to be safe and effective.

Finding Doctors

One of the most important aspects of your treatment will be the relationship between you and your doctor or specialist. All patients with pertussis must go through the process of selecting a physician. While this process will vary from person to person, the Agency for Healthcare Research and Quality makes a number of suggestions, including the following:[10]

- If you are in a managed care plan, check the plan's list of doctors first.
- Ask doctors or other health professionals who work with doctors, such as hospital nurses, for referrals.
- Call a hospital's doctor referral service, but keep in mind that these services usually refer you to doctors on staff at that particular hospital. The services do not have information on the quality of care that these doctors provide.

[10] This section is adapted from the AHRQ: **www.ahrq.gov/consumer/qntascii/qntdr.htm**.

- Some local medical societies offer lists of member doctors. Again, these lists do not have information on the quality of care that these doctors provide.

Additional steps you can take to locate doctors include the following:

- Check with the associations listed earlier in this chapter.
- Information on doctors in some states is available on the Internet at **http://www.docboard.org**. This Web site is run by "Administrators in Medicine," a group of state medical board directors.
- The American Board of Medical Specialties can tell you if your doctor is board certified. "Certified" means that the doctor has completed a training program in a specialty and has passed an exam, or "board," to assess his or her knowledge, skills, and experience to provide quality patient care in that specialty. Primary care doctors may also be certified as specialists. The AMBS Web site is located at **http://www.abms.org/newsearch.asp**.[11] You can also contact the ABMS by phone at 1-866-ASK-ABMS.
- You can call the American Medical Association (AMA) at 800-665-2882 for information on training, specialties, and board certification for many licensed doctors in the United States. This information also can be found in "Physician Select" at the AMA's Web site: **http://www.ama-assn.org/aps/amahg.htm**.

If the previous sources did not meet your needs, you may want to log on to the Web site of the National Organization for Rare Disorders (NORD) at **http://www.rarediseases.org/**. NORD maintains a database of doctors with expertise in various rare diseases. The Metabolic Information Network (MIN), 800-945-2188, also maintains a database of physicians with expertise in various metabolic diseases.

[11] While board certification is a good measure of a doctor's knowledge, it is possible to receive quality care from doctors who are not board certified.

Selecting Your Doctor[12]

When you have compiled a list of prospective doctors, call each of their offices. First, ask if the doctor accepts your health insurance plan and if he or she is taking new patients. If the doctor is not covered by your plan, ask yourself if you are prepared to pay the extra costs. The next step is to schedule a visit with your chosen physician. During the first visit you will have the opportunity to evaluate your doctor and to find out if you feel comfortable with him or her. Ask yourself, did the doctor:

- Give me a chance to ask questions about pertussis?
- Really listen to my questions?
- Answer in terms I understood?
- Show respect for me?
- Ask me questions?
- Make me feel comfortable?
- Address the health problem(s) I came with?
- Ask me my preferences about different kinds of treatments for pertussis?
- Spend enough time with me?

Trust your instincts when deciding if the doctor is right for you. But remember, it might take time for the relationship to develop. It takes more than one visit for you and your doctor to get to know each other.

Working with Your Doctor[13]

Research has shown that patients who have good relationships with their doctors tend to be more satisfied with their care and have better results. Here are some tips to help you and your doctor become partners:

- You know important things about your symptoms and your health history. Tell your doctor what you think he or she needs to know.
- It is important to tell your doctor personal information, even if it makes you feel embarrassed or uncomfortable.

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[12] This section has been adapted from the AHRQ: **www.ahrq.gov/consumer/qntascii/qntdr.htm**.
[13] This section has been adapted from the AHRQ: **www.ahrq.gov/consumer/qntascii/qntdr.htm**.

- Bring a "health history" list with you (and keep it up to date).
- Always bring any medications you are currently taking with you to the appointment, or you can bring a list of your medications including dosage and frequency information. Talk about any allergies or reactions you have had to your medications.
- Tell your doctor about any natural or alternative medicines you are taking.
- Bring other medical information, such as x-ray films, test results, and medical records.
- Ask questions. If you don't, your doctor will assume that you understood everything that was said.
- Write down your questions before your visit. List the most important ones first to make sure that they are addressed.
- Consider bringing a friend with you to the appointment to help you ask questions. This person can also help you understand and/or remember the answers.
- Ask your doctor to draw pictures if you think that this would help you understand.
- Take notes. Some doctors do not mind if you bring a tape recorder to help you remember things, but always ask first.
- Let your doctor know if you need more time. If there is not time that day, perhaps you can speak to a nurse or physician assistant on staff or schedule a telephone appointment.
- Take information home. Ask for written instructions. Your doctor may also have brochures and audio and videotapes that can help you.
- After leaving the doctor's office, take responsibility for your care. If you have questions, call. If your symptoms get worse or if you have problems with your medication, call. If you had tests and do not hear from your doctor, call for your test results. If your doctor recommended that you have certain tests, schedule an appointment to get them done. If your doctor said you should see an additional specialist, make an appointment.

By following these steps, you will enhance the relationship you will have with your physician.

Broader Health-Related Resources

In addition to the references above, the NIH has set up guidance Web sites that can help patients find healthcare professionals. These include:[14]

- Caregivers:
  http://www.nlm.nih.gov/medlineplus/caregivers.html
- Choosing a Doctor or Healthcare Service:
  http://www.nlm.nih.gov/medlineplus/choosingadoctororhealthcareservice.html
- Hospitals and Health Facilities:
  http://www.nlm.nih.gov/medlineplus/healthfacilities.html

Vocabulary Builder

The following vocabulary builder provides definitions of words used in this chapter that have not been defined in previous chapters:

Hepatocellular: Pertaining to or affecting liver cells. [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]

Jaundice: A clinical manifestation of hyperbilirubinemia, consisting of deposition of bile pigments in the skin, resulting in a yellowish staining of the skin and mucous membranes. [NIH]

Nausea: An unpleasant sensation, vaguely referred to the epigastrium and abdomen, and often culminating in vomiting. [EU]

[14] You can access this information at:
http://www.nlm.nih.gov/medlineplus/healthsystem.html.

CHAPTER 3. CLINICAL TRIALS AND PERTUSSIS

Overview

Very few medical conditions have a single treatment. The basic treatment guidelines that your physician has discussed with you, or those that you have found using the techniques discussed in Chapter 1, may provide you with all that you will require. For some patients, current treatments can be enhanced with new or innovative techniques currently under investigation. In this chapter, we will describe how clinical trials work and show you how to keep informed of trials concerning pertussis.

What Is a Clinical Trial?[15]

Clinical trials involve the participation of people in medical research. Most medical research begins with studies in test tubes and on animals. Treatments that show promise in these early studies may then be tried with people. The only sure way to find out whether a new treatment is safe, effective, and better than other treatments for pertussis is to try it on patients in a clinical trial.

[15] The discussion in this chapter has been adapted from the NIH and the NEI: **www.nei.nih.gov/netrials/ctivr.htm**.

What Kinds of Clinical Trials Are There?

Clinical trials are carried out in three phases:

- **Phase I.** Researchers first conduct Phase I trials with small numbers of patients and healthy volunteers. If the new treatment is a medication, researchers also try to determine how much of it can be given safely.
- **Phase II.** Researchers conduct Phase II trials in small numbers of patients to find out the effect of a new treatment on pertussis.
- **Phase III.** Finally, researchers conduct Phase III trials to find out how new treatments for pertussis compare with standard treatments already being used. Phase III trials also help to determine if new treatments have any side effects. These trials--which may involve hundreds, perhaps thousands, of people--can also compare new treatments with no treatment.

How Is a Clinical Trial Conducted?

Various organizations support clinical trials at medical centers, hospitals, universities, and doctors' offices across the United States. The "principal investigator" is the researcher in charge of the study at each facility participating in the clinical trial. Most clinical trial researchers are medical doctors, academic researchers, and specialists. The "clinic coordinator" knows all about how the study works and makes all the arrangements for your visits.

All doctors and researchers who take part in the study on pertussis carefully follow a detailed treatment plan called a protocol. This plan fully explains how the doctors will treat you in the study. The "protocol" ensures that all patients are treated in the same way, no matter where they receive care.

Clinical trials are controlled. This means that researchers compare the effects of the new treatment with those of the standard treatment. In some cases, when no standard treatment exists, the new treatment is compared with no treatment. Patients who receive the new treatment are in the treatment group. Patients who receive a standard treatment or no treatment are in the "control" group. In some clinical trials, patients in the treatment group get a new medication while those in the control group get a placebo. A placebo is a harmless substance, a "dummy" pill, that has no effect on pertussis. In other clinical trials, where a new surgery or device (not a medicine) is being tested, patients in the control group may receive a "sham treatment." This

treatment, like a placebo, has no effect on pertussis and does not harm patients.

Researchers assign patients "randomly" to the treatment or control group. This is like flipping a coin to decide which patients are in each group. If you choose to participate in a clinical trial, you will not know which group you will be appointed to. The chance of any patient getting the new treatment is about 50 percent. You cannot request to receive the new treatment instead of the placebo or sham treatment. Often, you will not know until the study is over whether you have been in the treatment group or the control group. This is called a "masked" study. In some trials, neither doctors nor patients know who is getting which treatment. This is called a "double masked" study. These types of trials help to ensure that the perceptions of the patients or doctors will not affect the study results.

Natural History Studies

Unlike clinical trials in which patient volunteers may receive new treatments, natural history studies provide important information to researchers on how pertussis develops over time. A natural history study follows patient volunteers to see how factors such as age, sex, race, or family history might make some people more or less at risk for pertussis. A natural history study may also tell researchers if diet, lifestyle, or occupation affects how a disease or disorder develops and progresses. Results from these studies provide information that helps answer questions such as: How fast will a disease or disorder usually progress? How bad will the condition become? Will treatment be needed?

What Is Expected of Patients in a Clinical Trial?

Not everyone can take part in a clinical trial for a specific disease or disorder. Each study enrolls patients with certain features or eligibility criteria. These criteria may include the type and stage of disease or disorder, as well as, the age and previous treatment history of the patient. You or your doctor can contact the sponsoring organization to find out more about specific clinical trials and their eligibility criteria. If you are interested in joining a clinical trial, your doctor must contact one of the trial's investigators and provide details about your diagnosis and medical history.

If you participate in a clinical trial, you may be required to have a number of medical tests. You may also need to take medications and/or undergo

surgery. Depending upon the treatment and the examination procedure, you may be required to receive inpatient hospital care. Or, you may have to return to the medical facility for follow-up examinations. These exams help find out how well the treatment is working. Follow-up studies can take months or years. However, the success of the clinical trial often depends on learning what happens to patients over a long period of time. Only patients who continue to return for follow-up examinations can provide this important long-term information.

Recent Trials on Pertussis

The National Institutes of Health and other organizations sponsor trials on various diseases and disorders. Because funding for research goes to the medical areas that show promising research opportunities, it is not possible for the NIH or others to sponsor clinical trials for every disease and disorder at all times. The following lists recent trials dedicated to pertussis.[16] If the trial listed by the NIH is still recruiting, you may be eligible. If it is no longer recruiting or has been completed, then you can contact the sponsors to learn more about the study and, if published, the results. Further information on the trial is available at the Web site indicated. Please note that some trials may no longer be recruiting patients or are otherwise closed. Before contacting sponsors of a clinical trial, consult with your physician who can help you determine if you might benefit from participation.

- **Pneumococcal Vaccine and Routine Pediatric Immunizations in HIV-Infected Children Receiving Anti-HIV Drugs**

  Condition(s): HIV Infections; Hepatitis B; Measles; Pneumococcal Infections; Pertussis

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Institute of Allergy and Infectious Diseases (NIAID)

  Purpose - Excerpt: The purpose of this study is to determine if 2 doses of Pneumococcal Conjugate Vaccine (PCV) followed by 1 dose of Pneumococcal Polysaccharide Vaccine (PPV) in HIV-infected children on anti-HIV therapy is helpful and safe in fighting pneumococcal infections in this group of children. This study will also look at the protection provided by childhood vaccination against measles, pertussis, and hepatitis B virus. Pneumococcal infections are the most common AIDS-related infection in HIV-infected children. PCV may help reduce the chances of HIV-infected children getting pneumococcal infections. This study will look at whether pneumococcal vaccines are safe and effective

[16] These are listed at **www.ClinicalTrials.gov**.

in HIV-infected children receiving HAART. It will look at whether HIV-infected children are protected by childhood vaccines received previously and if more doses are safe and improve protection.

Study Type: Interventional

Contact(s): see Web site below

Web Site:
http://clinicaltrials.gov/ct/gui/show/NCT00013871;jsessionid=9187D1F1C5B148E56401B005A482F7A5

- **Intravenous Pertussis Immune Globulin in Patients with Severe Childhood Pertussis Infection**

  Condition(s): Pertussis; Whooping Cough

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): FDA Office of Orphan Products Development; IWK Grace Health Centre

  Purpose - Excerpt: Objectives: Assess the efficacy of a single infusion of a high titer pertussis immune globulin for the treatment of severe pertussis in children.

  Phase(s): Phase III

  Study Type: Interventional

  Contact(s): Scott A. Halperin 902-428-8141. Study chairs or principal investigators: Scott A. Halperin, Study Chair; IWK Grace Health Centre

  Web Site:
  http://clinicaltrials.gov/ct/gui/show/NCT00004422;jsessionid=9187D1F1C5B148E56401B005A482F7A5

- **Phase III Randomized, Double-Blind, Placebo-Controlled Study of Acellular and Whole-Cell Pertussis Vaccines**

  Condition(s): Pertussis

  Study Status: This study is completed.

  Sponsor(s): National Institute of Allergy and Infectious Diseases (NIAID); Istituto Superiore di Sanita

  Purpose - Excerpt: Objectives: I. Compare the efficacy of 2 acellular pertussis vaccines vs. whole-cell pertussis vaccine vs. placebo in infants living in Italy. II. Compare the relative protection of each of the acellular vaccines vs. the whole-cell vaccine vs. laboratory-confirmed pertussis. III. Assess the relative efficacy of the acellular vaccines with respect to one another. IV. Assess the immunogenicity of acellular vs. whole-cell

vaccines in the study population. V. Compare the frequency of adverse events with each vaccine. VI. Compare the frequency of adverse events attributable to the pertussis component in each of the 3 vaccines. VII. Assess alternative laboratory diagnostic techniques for pertussis in estimating vaccine efficacy, i.e., mucosal immune response, DNA probes, or antibody response to other components of the organism. VIII. Assess the relative efficacy estimates of each vaccine, using clinical criteria to compare the relative incidence rates in each vaccine group.

Phase(s): Phase III

Study Type: Interventional

Contact(s): Donato Greco . Study chairs or principal investigators: Donato Greco, Study Chair; Istituto Superiore di Sanita

Web Site:
http://clinicaltrials.gov/ct/gui/show/NCT00004800;jsessionid=9187D1F1C5B148E56401B005A482F7A5

Benefits and Risks[17]

What Are the Benefits of Participating in a Clinical Trial?

If you are interested in a clinical trial, it is important to realize that your participation can bring many benefits to you and society at large:

- A new treatment could be more effective than the current treatment for pertussis. Although only half of the participants in a clinical trial receive the experimental treatment, if the new treatment is proved to be more effective and safer than the current treatment, then those patients who did not receive the new treatment during the clinical trial may be among the first to benefit from it when the study is over.
- If the treatment is effective, then it may improve health or prevent diseases or disorders.
- Clinical trial patients receive the highest quality of medical care. Experts watch them closely during the study and may continue to follow them after the study is over.
- People who take part in trials contribute to scientific discoveries that may help other people with pertussis. In cases where certain diseases or

[17] This section has been adapted from ClinicalTrials.gov, a service of the National Institutes of Health:
http://www.clinicaltrials.gov/ct/gui/c/a1r/info/whatis?JServSessionIdzone_ct=9jmun6f291.

disorders run in families, your participation may lead to better care or prevention for your family members.

The Informed Consent

Once you agree to take part in a clinical trial, you will be asked to sign an "informed consent." This document explains a clinical trial's risks and benefits, the researcher's expectations of you, and your rights as a patient.

What Are the Risks?

Clinical trials may involve risks as well as benefits. Whether or not a new treatment will work cannot be known ahead of time. There is always a chance that a new treatment may not work better than a standard treatment. There is also the possibility that it may be harmful. The treatment you receive may cause side effects that are serious enough to require medical attention.

How Is Patient Safety Protected?

Clinical trials can raise fears of the unknown. Understanding the safeguards that protect patients can ease some of these fears. Before a clinical trial begins, researchers must get approval from their hospital's Institutional Review Board (IRB), an advisory group that makes sure a clinical trial is designed to protect patient safety. During a clinical trial, doctors will closely watch you to see if the treatment is working and if you are experiencing any side effects. All the results are carefully recorded and reviewed. In many cases, experts from the Data and Safety Monitoring Committee carefully monitor each clinical trial and can recommend that a study be stopped at any time. You will only be asked to take part in a clinical trial as a volunteer giving informed consent.

What Are a Patient's Rights in a Clinical Trial?

If you are eligible for a clinical trial, you will be given information to help you decide whether or not you want to participate. As a patient, you have the right to:

- Information on all known risks and benefits of the treatments in the study.

- Know how the researchers plan to carry out the study, for how long, and where.
- Know what is expected of you.
- Know any costs involved for you or your insurance provider.
- Know before any of your medical or personal information is shared with other researchers involved in the clinical trial.
- Talk openly with doctors and ask any questions.

After you join a clinical trial, you have the right to:

- Leave the study at any time. Participation is strictly voluntary. However, you should not enroll if you do not plan to complete the study.
- Receive any new information about the new treatment.
- Continue to ask questions and get answers.
- Maintain your privacy. Your name will not appear in any reports based on the study.
- Know whether you participated in the treatment group or the control group (once the study has been completed).

What about Costs?

In some clinical trials, the research facility pays for treatment costs and other associated expenses. You or your insurance provider may have to pay for costs that are considered standard care. These things may include inpatient hospital care, laboratory and other tests, and medical procedures. You also may need to pay for travel between your home and the clinic. You should find out about costs before committing to participation in the trial. If you have health insurance, find out exactly what it will cover. If you don't have health insurance, or if your insurance company will not cover your costs, talk to the clinic staff about other options for covering the cost of your care.

What Questions Should You Ask before Deciding to Join a Clinical Trial?

Questions you should ask when thinking about joining a clinical trial include the following:

- What is the purpose of the clinical trial?

- What are the standard treatments for pertussis? Why do researchers think the new treatment may be better? What is likely to happen to me with or without the new treatment?
- What tests and treatments will I need? Will I need surgery? Medication? Hospitalization?
- How long will the treatment last? How often will I have to come back for follow-up exams?
- What are the treatment's possible benefits to my condition? What are the short- and long-term risks? What are the possible side effects?
- Will the treatment be uncomfortable? Will it make me feel sick? If so, for how long?
- How will my health be monitored?
- Where will I need to go for the clinical trial? How will I get there?
- How much will it cost to be in the study? What costs are covered by the study? How much will my health insurance cover?
- Will I be able to see my own doctor? Who will be in charge of my care?
- Will taking part in the study affect my daily life? Do I have time to participate?
- How do I feel about taking part in a clinical trial? Are there family members or friends who may benefit from my contributions to new medical knowledge?

Keeping Current on Clinical Trials

Various government agencies maintain databases on trials. The U.S. National Institutes of Health, through the National Library of Medicine, has developed ClinicalTrials.gov to provide patients, family members, and physicians with current information about clinical research across the broadest number of diseases and conditions.

The site was launched in February 2000 and currently contains approximately 5,700 clinical studies in over 59,000 locations worldwide, with most studies being conducted in the United States. ClinicalTrials.gov receives about 2 million hits per month and hosts approximately 5,400 visitors daily. To access this database, simply go to their Web site (**www.clinicaltrials.gov**) and search by "pertussis" (or synonyms).

While ClinicalTrials.gov is the most comprehensive listing of NIH-supported clinical trials available, not all trials are in the database. The database is updated regularly, so clinical trials are continually being added. The following is a list of specialty databases affiliated with the National Institutes of Health that offer additional information on trials:

- For clinical studies at the Warren Grant Magnuson Clinical Center located in Bethesda, Maryland, visit their Web site: **http://clinicalstudies.info.nih.gov/**
- For clinical studies conducted at the Bayview Campus in Baltimore, Maryland, visit their Web site: **http://www.jhbmc.jhu.edu/studies/index.html**
- For trials on infectious, immune, and allergic diseases, visit the site of the National Institute of Allergy and Infectious Diseases: **http://www.niaid.nih.gov/clintrials/**

General References

The following references describe clinical trials and experimental medical research. They have been selected to ensure that they are likely to be available from your local or online bookseller or university medical library. These references are usually written for healthcare professionals, so you may consider consulting with a librarian or bookseller who might recommend a particular reference. The following includes some of the most readily available references (sorted alphabetically by title; hyperlinks provide rankings, information and reviews at Amazon.com):

- **A Guide to Patient Recruitment : Today's Best Practices & Proven Strategies** by Diana L. Anderson; Paperback - 350 pages (2001), CenterWatch, Inc.; ISBN: 1930624115; **http://www.amazon.com/exec/obidos/ASIN/1930624115/icongroupinterna**
- **A Step-By-Step Guide to Clinical Trials** by Marilyn Mulay, R.N., M.S., OCN; Spiral-bound - 143 pages Spiral edition (2001), Jones & Bartlett Pub; ISBN: 0763715697; **http://www.amazon.com/exec/obidos/ASIN/0763715697/icongroupinterna**
- **The CenterWatch Directory of Drugs in Clinical Trials** by CenterWatch; Paperback - 656 pages (2000), CenterWatch, Inc.; ISBN: 0967302935; **http://www.amazon.com/exec/obidos/ASIN/0967302935/icongroupinterna**
- **The Complete Guide to Informed Consent in Clinical Trials** by Terry Hartnett (Editor); Paperback - 164 pages (2000), PharmSource Information

Services, Inc.; ISBN: 0970153309;
http://www.amazon.com/exec/obidos/ASIN/0970153309/icongroupinterna

- **Dictionary for Clinical Trials** by Simon Day; Paperback - 228 pages (1999), John Wiley & Sons; ISBN: 0471985961;
http://www.amazon.com/exec/obidos/ASIN/0471985961/icongroupinterna
- **Extending Medicare Reimbursement in Clinical Trials** by Institute of Medicine Staff (Editor), et al; Paperback 1st edition (2000), National Academy Press; ISBN: 0309068886;
http://www.amazon.com/exec/obidos/ASIN/0309068886/icongroupinterna
- **Handbook of Clinical Trials** by Marcus Flather (Editor); Paperback (2001), Remedica Pub Ltd; ISBN: 1901346293;
http://www.amazon.com/exec/obidos/ASIN/1901346293/icongroupinterna

Vocabulary Builder

The following vocabulary builder gives definitions of words used in this chapter that have not been defined in previous chapters:

Antibody: An immunoglobulin molecule that has a specific amino acid sequence by virtue of which it interacts only with the antigen that induced its synthesis in cells of the lymphoid series (especially plasma cells), or with antigen closely related to it. Antibodies are classified according to their ode of action as agglutinins, bacteriolysins, haemolysins, opsonins, precipitins, etc. [EU]

Atypical: Irregular; not conformable to the type; in microbiology, applied specifically to strains of unusual type. [EU]

Infusion: The therapeutic introduction of a fluid other than blood, as saline solution, solution, into a vein. [EU]

Intravenous: Within a vein or veins. [EU]

Subclinical: Without clinical manifestations; said of the early stage(s) of an infection or other disease or abnormality before symptoms and signs become apparent or detectable by clinical examination or laboratory tests, or of a very mild form of an infection or other disease or abnormality. [EU]

PART II: ADDITIONAL RESOURCES AND ADVANCED MATERIAL

ABOUT PART II

In Part II, we introduce you to additional resources and advanced research on pertussis. All too often, patients who conduct their own research are overwhelmed by the difficulty in finding and organizing information. The purpose of the following chapters is to provide you an organized and structured format to help you find additional information resources on pertussis. In Part II, as in Part I, our objective is not to interpret the latest advances on pertussis or render an opinion. Rather, our goal is to give you access to original research and to increase your awareness of sources you may not have already considered. In this way, you will come across the advanced materials often referred to in pamphlets, books, or other general works. Once again, some of this material is technical in nature, so consultation with a professional familiar with pertussis is suggested.

CHAPTER 4. STUDIES ON PERTUSSIS

Overview

Every year, academic studies are published on pertussis or related conditions. Broadly speaking, there are two types of studies. The first are peer reviewed. Generally, the content of these studies has been reviewed by scientists or physicians. Peer-reviewed studies are typically published in scientific journals and are usually available at medical libraries. The second type of studies is non-peer reviewed. These works include summary articles that do not use or report scientific results. These often appear in the popular press, newsletters, or similar periodicals.

In this chapter, we will show you how to locate peer-reviewed references and studies on pertussis. We will begin by discussing research that has been summarized and is free to view by the public via the Internet. We then show you how to generate a bibliography on pertussis and teach you how to keep current on new studies as they are published or undertaken by the scientific community.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and pertussis, you will need to use the advanced search options. First, go to **http://chid.nih.gov/index.html**. From there, select the "Detailed Search" option (or go directly to that page with the following hyperlink: **http://chid.nih.gov/detail/detail.html**). The trick in extracting studies is found in the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the

format option "Journal Article." At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display "whole records." We recommend that you type in "pertussis" (or synonyms) into the "For these words:" box. Consider using the option "anywhere in record" to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the "Search in these fields" drop box. The following is a sample of what you can expect from this type of search:

- **Evaluation of a Follow-up System in a County Health Department's Immunization Clinic**

  Source: American Journal of Preventive Medicine. 7(1):24-28, January/February 1991.

  Summary: A study designed and evaluated a pilot followup system for local health departments that obtain vaccine purchased and supplied by the Washington Health Department. The study had two main goals: (1) Design an easy and cost effective system, and (2) evaluate its effectiveness at increasing compliance levels among clients of the local health department. The system used two mailed reminders to enhance client compliance. The study cohort consisted of 393 children under five years of age who received their first or second diphtheria, pertussis, polio, and tetanus (DTP) immunization series from the main clinic of the Snodhomish Health District. Findings revealed that the use of postcard reminders increased the compliance rate following the mailing in the intervention group by 3.9 percent. Over half of the respondents (52 percent) in the control group and 28 percent in the intervention group reported that transportation barriers and clinic problems prevented their return. 4 tables, 9 references.

- **Warning: Your Classroom May Be Dangerous to Your Health**

  Source: Teacher. 95(6):20-34, February 1978.

  Summary: Because there are 20 million American children under 15 years of age who have not been completely immunized against polio, measles, rubella, mumps, diphtheria, pertussis, and tetanus, President Carter asked the Department of Health, Education, and Welfare in April 1977 to begin an intensive effort to immunize all children against childhood diseases. Schools were chosen as immunization sites because they have the respect of the community, access to immunization records, and facilities and qualifications to immunize 90 percent of the children in the country by October 1, 1979. An exemplary program in Alaska was begun by an order from the State Department of Health and Social Services requiring that all children attending school be immunized for diphtheria,

pertussis, tetanus, polio, measles, and rubella. Although 8 percent of the State's schoolchildren were denied entrance into school on the deadline date, all but 0.1 percent received the required immunizations during the next month. School systems in Detroit, Michigan, Kansas City, Missouri, and Worcester, Massachusetts, have mounted similar efforts. Schools must be prepared to send immunization consent forms home to parents and provide sites for immunization clinics. State departments of education will soon receive materials outlining the national program.

Federally-Funded Research on Pertussis

The U.S. Government supports a variety of research studies relating to pertussis and associated conditions. These studies are tracked by the Office of Extramural Research at the National Institutes of Health.[18] 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. Visit the CRISP Web site at **http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket**. You can perform targeted searches by various criteria including geography, date, as well as topics related to pertussis and related conditions.

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 pertussis and related conditions. In some cases, therefore, it may be difficult to understand how some basic or fundamental research could eventually translate into medical practice. The following sample is typical of the type of information found when searching the CRISP database for pertussis:

- **Project Title: Acellular Pertussis Vaccine Efficacy in Adolescents and Adults**

  Principal Investigator & Institution: Mink, Chris A.; ; Harbor-Ucla Research & Educ Inst at Harbor-Ucla Medical Center Torrance, Ca 90502

  Timing: Fiscal Year 2000

  Summary: To evaluate in adolescents and adults the safety, immunogenicity and efficacy of an acellular pertussis vaccine and to

[18] 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).

characterize the epidemiology and clinical spectrum of pertussis infection. The premise for this study is that asymptomatic mildly symptomatic and classic B Pertussis infections are common in adolescents and adults, and this population may serve as a resevoir for childhood infection.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Adherence of Bordetella Pertussis to Cells**

  Principal Investigator & Institution: Tuomanen, Elaine I.; Chair; St. Jude Children's Research Hospital 332 N Lauderdale St Memphis, Tn 38105

  Timing: Fiscal Year 2000; Project Start 5-SEP-1991; Project End 0-JUN-2001

  Summary: (Adapted from the applicant's abstract): Bordetella pertussis is an important pathogen of children and is also increasingly recognized in adults worldwide. Current pertussis vaccines do not prevent colonization, a prerequisite for eradication of disease. The understanding of the biology of the adherence interactions between Bordetella and human cells to be derived from this project can provide a rationale to improve this deficit in the vaccine. The substantial beneficial health impact of the diphtheria-pertussis-tetanus vaccine is achieved at the cost of the toxicity of the controversial pertussis component. This proposal examines the molecular mimicry used by B. pertussis to establish colonization of cilia and leukocytes with particular emphasis on the ability of B. pertussis adhesins to generate antibodies cross reactive with human cells. This aspect of the study addresses research needs identified by the Institute of Medicine to promote an understanding of the biologic basis of adverse events associated with pertussis disease and immunization. Pertussis toxin and filamentous hemagglutinin (FHA) are two antigenic bacterial surface proteins that act as adhesins. In the last 3 years, the minimum active domains of pertussis toxin and FHA that recognize cilia and macrophages, regions that are key to new subcomponent vaccines, have been defined. A profound structural and functional mimicry between these bacterial adhesins and the human adhesion molecules critical to leukocyte trafficking were then discovered. This renewal will dissect the domains of FHA that mimic the eukaryotic systems of complement fixation, coagulation and leukocyte trafficking. The molecular mechanism by which FHA co-opts these three natural host defense systems will be defined in detail. Finally, FHA-derived peptides from regions of mimicry will be assessed as possible therapeutic candidates to inhibit the undesirable triggering of the complement, coagulation and integrin systems of leukocyte recruitment during inflammation in bacterial infections. A further aim of this project relates

to the implications of this molecular mimicry. Preliminary evidence strongly suggests that one domain of FHA mimics a new brain-specific receptor for leukocyte transmigration. This receptor will be cloned, sequenced and functionally characterized for its role in normal leukocyte trafficking to brain and its ability to participate in enhancing blood-brain barrier permeability.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Bordetella Pertussis and Monocyte Integrin Receptors**

  Principal Investigator & Institution: Relman, David A.; Assistant Professor; Medicine; Stanford University Stanford, Ca 94305

  Timing: Fiscal Year 2000; Project Start 1-MAR-1997; Project End 8-FEB-2002

  Summary: B. pertussis, the causative agent of whooping cough, is estimated to cause 600,000 deaths annually on a worldwide basis. Adherence and intoxication are the key elements of the interactions between B. pertussis and the human host. Filamentous hemagglutinin (FHA) is the dominant adhesin for this organism and a component of most acellular pertussis vaccines. It mediates attachment to a variety of host cells, including monocytes and macrophages. Recognition of FHA by leukocytes involves at least two integrin receptors: the complement 3 receptor (CR3) and the leukocyte response integrin (LRI). Recent data indicate that FHA induces signaling events in monocytes through LRI that enhance FHA recognition by CR3, and that FHA is necessary for B. pertussis inhibition of monocyte-dependent T- cell proliferative responses to antigen. Thus, the interactions between FHA and leukocyte integrins are proposed to be significant for two reasons: 1) FHA-mediated attachment of B. pertussis to monocytes may facilitate bacterial colonization, as well as modify host cellular immune responses; and 2) FHA can be used to study the binding and signaling capabilities of leukocyte integrins. The broad, long-term objectives of this application are to understand the mechanisms and implications of bacterial-integrin interactions. The more immediate goals of this proposal are to characterize FHA as a ligand for CR3 and LRI, to examine signaling molecules associated with FHA receptor ligation, and to examine the consequences of these interactions for B. pertussis pathogenesis. The specific aims of this proposal are: 1) To map the FHA domain(s) recognized by the complement receptor CR3. 2) To characterize signaling mechanisms associated with FHA-induced upregulated CR3 binding activity. 3) To examine the effect of B. pertussis binding on the topological distribution of monocyte integrin receptors and associated

signaling molecules. 4) To examine B. pertussis inhibition of antigen-dependent T- cell proliferation.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Characterization of the Pertussis Toxin Secretion Operon**

  Principal Investigator & Institution: Weiss, Alison A.; Professor; Mol Gentc, Biochem/Microbiol; University of Cincinnati 2624 Clifton Ave Cincinnati, Oh 45221

  Timing: Fiscal Year 2000; Project Start 1-JUL-1986; Project End 0-JUN-2001

  Summary: (Adapted from the applicant's abstract): Whooping cough remains a worldwide problem. In developing nations an estimated 60 million cases occur annually, resulting in over half a million deaths. The disease is controlled in the United States by the use of the whole-cell pertussis vaccine, however, a high failure rate was noted in recent epidemics. Both whole cell and acellular-component vaccines give only short term protection from disease, and little protection from infection. Bordetella pertussis, the bacterium that causes whooping cough produces many toxins and virulence factors, the most important of which is pertussis toxin. Pertussis toxin, not growth of the bacteria in the respiratory tract is thought to cause the severe disease manifestations of whooping cough. In the previous granting period we discovered an operon of eight genes (called ptl for Pertussis Toxin Liberation) that promotes the secretion of assembled pertussis toxin across the outer membrane of B. pertussis. In this grant the applicant proposes to elucidate the molecular mechanism of pertussis toxin secretion using a genetic and biochemical approach. The applicant proposes to: 1. Examine the role of disulfide bond formation during pertussis toxin maturation. The application has shown that newly synthesized pertussis toxin subunits first appear covalently bound to other proteins via intermolecular disulfide bonds, suggesting that the subunits must be extracted from these complexes before assembly and secretion can occur. 2. Polyclonal antibodies, prepared from fusion proteins will be used to determine the cellular location of the Ptl proteins using immunofluorescent microscopy. 3. Mutants deficient in each Ptl protein will be generated to determine the phenotype. 4. Protein-protein interactions between the Ptl proteins and pertussis toxin will be characterized. This work has important implications in development of novel therapeutic strategies. Conventional antimicrobial therapy requires that the agent have a selective toxicity to the microorganism and not the human hosts, for example the bacterial cell wall has no human counterpart and is the target of penicillins and beta-lactam antibiotics.

The applicant believes that observations could lead to development of a new class of antimicrobial agents that will be targeted against a subset of bacteria, in this case, Gram-negative bacteria which secrete toxic factors. The applicant has already shown that B. pertussis strains with mutations in the ptl pathway are reduced in virulence. It seems likely that a therapeutic, including a vaccine, directed against this pathway would also result in less severe disease.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Efficacy Trial of an Acellular Pertussis Vaccine**

  Principal Investigator & Institution: Greco, Donato; ; Istituto Superiore Di Sanita Rome,

  Timing: Fiscal Year 2000; Project Start 1-APR-1992; Project End 0-JUN-2000

  Summary: The purpose of this contract is to conduct a double-blind randomized trial to determine the efficacy of one or more acellular pertussis vaccines. Clinical trials of acellular pertussis vaccines are a top development priority for NIAID and for the PHS. NIAID has been delegated the authority by Congress to conduct efficacy trials in cooperation with the National Vaccine Program Office (NVPO) which has augmented NIAID appropriated funds. A coordinated Phase I/II clinical trial (funded by NIAID) evaluating 13 candidate acellular pertussis vaccines for safety and immunogenicity was completed in June of 1991. The data collected from this trial was used as a basis for recommending seven vaccines to be used in the efficacy trial. Two of the seven vaccines were selected by Sweden to test in field trial to be conducted by the National Bacteriological Laboratory and two acellular vaccines were selected by the Instituto Superiore di Sanita to be tested in a field trial in Italy. The phase III trial, which has been Congressionally mandated, will be performed at a site outside the United States and will address many of the issues that were left unanswered in the efficacy trial performed in Sweden (1987-1989). Sites were developed in Canada, Italy and Sweden following a Part I award September 30, 1990 in response to RFP 90-30. Part II proposals were submitted by the three above mentioned offerors and based on an ad hoc scientific review, the National Bacteriological Laboratory was awarded a contract for the Part II, efficacy trial on September 30, 1991. Since the award of the contract to Sweden, funds have become available to the US government to support a second acellular pertussis efficacy trial. On February 11, 1992, Dalhousie University, Halifax, Nova Scotia officially withdrew their proposal from consideration for funding under RFP 90-30 stating that they had been unable to identify an industry partner to co- fund a pertussis vaccine

efficacy trial. The Instituto Superiore di Sanita had identified two manufacturers willing to co-fund a trial in Italy and; therefore, a second award will be awarded. The study will involve one year of recruitment followed by up to two years of surveillance and monitoring for disease. Assuming normal circumstances, data on vaccine efficacy should be available in early 1996. Once safety and efficacy is demonstrated for one or more of these acellular vaccines, licensure for use in infants and children should follow quickly within the United States.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Evaluate Acellular Pertussis Vaccine in Adolescents and Adults**

  Principal Investigator & Institution: Decker, Michael D.; ; Vanderbilt University 2101 W End Ave Nashville, Tn 37240

  Timing: Fiscal Year 2000

  Summary: Acellular pertussis vaccine administered to vaccine study subjects protects adolescents and adults from pertussis illness to a significantly greater extent than does hepatitis-A vaccine administered to similar randomized controls. We have been successful in keeping with our time schedule for recruiting, enrolling and follow up. The GCRC volunteer database has helped well with this. We will be continuing this time course.

  Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Iron Acquisition in Bordetella Pertussis**

  Principal Investigator & Institution: Armstrong, Sandra K.; Microbiology; University of Minnesota Twin Cities Twin Cities Minneapolis, Mn 55455

  Timing: Fiscal Year 2000; Project Start 1-AUG-1991; Project End 1-AUG-2002

  Summary: (Adapted from the applicant's abstract): Certain bacterial pathogens have been found to possess multiple redundant iron acquisition systems that may be activated in response to iron limiting growth conditions in the host. Bordetella pertussis and B. bronchiseptica are Gram-negative bacterial pathogens that colonize the respiratory mucosal epithelia of humans and nonhuman mammals. These organisms can accumulate iron supplied by their native macrocyclic dihydroxamate siderophore, alcaligin, as well as siderophores produced by other microbial species. Additionally, in vitro growth stimulation by the host iron-containing compounds heme, hemoglobin, lactoferrin, and transferrin has been reported for these Bordetella spp. From this range of potential iron sources available to support Bordetella growth in the host,

it is unknown which are the effective sources during the stages of infection. However, conservation of the alcaligin siderophore system from the evolutionarily-related Alcaligenes genus to the strictly human pathogen B. pertussis suggests that this means of iron retrieval is important for survival in the host. The goal of this research project is to identify and characterize the mechanisms regulating the in vitro and in vivo expression of iron acquisition systems of B. pertussis and to evaluate the importance of the native siderophore alcaligin in virulence. The specific aims of the proposal are to 1) elucidate the mechanism of gene regulation by alcaligin, 2) characterize the function of AlcR, a putative transcriptional regulator, and 3) evaluate the importance of AlcR and alcaligin for virulence. The factors controlling the expression of the alcaligin biosynthesis operon will be characterized. The mechanisms by which alcaligin and the putative transcriptional regulator AlcR govern the expression of alc genes and other known iron acquisition systems will be examined in detail and the established role of the Fur repressor evaluated in the context of that model system. Virulence of alcaligin biosynthesis and regulatory mutants will be evaluated in appropriate models of infection. These studies will provide the framework for analysis of the coordinated bacterial response to iron starvation in the host environment and will lead to greater understanding of B. pertussis physiology and pathogenesis.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Pertussis Clinical Trial (Part 2)**

  Principal Investigator & Institution: Olin, Patrick; ; National Bacteriological Laboratory S-105 21 Stockholm,

  Timing: Fiscal Year 1998; Project Start 5-SEP-1991; Project End 0-SEP-2003

  Summary: The purpose of this contract is to conduct a double-blind randomized trial to determine the efficacy of one or more acellular pertussis vaccines. Clinical trials of acellular pertussis vaccines are a top development priority for NIAID and for the PHS. NIAID has been delegated the authority to conduct efficacy trials for the National Vaccine Program (NVP), administrative locus of pertussis vaccine initiatives for the PHS, which will provide NIAID appropriated funds. A coordinated Phase I/II clinical trial (funded by NIAID) evaluating 13 candidate acellular pertussis vaccines for safety and immunogenicity was completed in June of 1991. The data collected from this trial will be used as a basis for recommending vaccine(s) to be used in the efficacy trial. The phase III trial, which has been Congressionally mandated, will be performed at a site outside the United States and will address many of the issues that were left unanswered in the efficacy trial performed in

Sweden (1987-1989). Currently, sites have been developed in Canada, Italy and Sweden and final site(s) selection will be made by the US Government by September 1991. The study will involve up to two years of recruitment followed by two years of surveillance and monitoring for disease. Assuming normal circumstances, data on vaccine efficacy should be available in early 1996. Once safety and efficacy is demonstrated for one or more of these acellular vaccines, licensure for use in infants and children should follow quickly within the United States.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Pertussis Toxin and Effects of Psychostimulant Drugs**

  Principal Investigator & Institution: Uretsky, Norman J.; None; Ohio State University 1800 Cannon Dr, Rm 1210 Columbus, Oh 43210

  Timing: Fiscal Year 2000; Project Start 5-FEB-1998; Project End 1-DEC-2001

  Summary: (Applicant's Abstract) Abnormal activity of meso-limbic dopamine neurons has been implicated in the development of psychological dependence to psychostimulant drugs, such as amphetamine and cocaine, and in the etiology of schizophrenia. One model of altered excitability of meso-limbic dopamine neurons is produced following the administration of pertussis toxin into the ventral segmental area of rats. After this treatment, animals exhibit a marked enhancement in spontaneous locomotor activity and the behavioral activation produced by psychostimulant drugs. The hypothesis to be tested is that the enhanced spontaneous locomotor activity and responses to drugs result from abnormally large responses to dopamine in the nucleus accumbens. Thus, any stimulus, such as exposure to a novel environment, that causes DA release in the nuc1eus accumbens will elicit exaggerated response in this model. On a biochemical level, it is proposed that the changes in behavior after pertussis toxin are associated with enhanced responses of neurons in the nucleus accumbens to D1 receptor activation, an effect that may be mediated by an enhanced protein kinase A activity. The specific aims are 1) To determine the role of environmental novelty in the increased spontaneous locomotion and sensitivity to amphetamine produced by pertussis toxin administration into the ventral segmental area; 2) determine the importance of the VTA and sites within the VTA as targets for PTX in increasing spontaneous locomotor activity and the stimulant effects of amphetamine and apomorphine; 3) To determine whether D1 receptor mediated events are enhanced and are associated with a change in the functional relationship between D1 and D2 receptors in the nucleus accumbens of pertussis toxin-treated rats; 4) To determine the specificity of changes in

neurotransmitter activity in the nucleus accumbens in pertussis toxin-treated rats; 5) To determine if neural changes associated with pertussis toxin also occur at sites downstream from the nucleus accumbens; and 6) To determine wether there is a relationship between the decrease in functional Gi/Go proteins in the ventral segmental area or possibly the nucleus accumbens and the increased spontaneous locomotion and enhanced responses to drugs in pertussis toxin-treated animals.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Pertussis Toxin Trafficking and Processing in Cells**

  Principal Investigator & Institution: Carbonetti, Nicholas H.; Associate Professor; Microbiology and Immunology; University of Maryland Balt Prof School Professional Schools Baltimore, Md 21201

  Timing: Fiscal Year 2001; Project Start 1-JUL-2001; Project End 1-MAY-2006

  Summary: (provided by the applicant):The short-term goal of this project is to understand the trafficking and activation of pertussis toxin (PT) within mammalian cells. Bordetella pertussis colonizes the human respiratory tract and causes the disease pertussis (whooping cough). Several systemic symptoms accompany this disease, even though B. pertussis is not thought to invade beyond the respiratory tract. Instead these symptoms are thought to be due to the action of PT, an exotoxin produced by B. pertussis. PT is an ADP ribosyltransferase that modifies several heterotrimeric G proteins, causing a wide range of effects on signaling in mammalian cells. How PT is transported within mammalian cells to arrive at its target proteins in an active form is largely unknown. In addition, how PT is transported from the respiratory tract to systemic sites is completely unknown. Understanding the mechanisms utilized by this complex toxin to achieve these effects will provide key information on the cell biology of PT and will help to provide a groundwork for studies to elucidate the role of this toxin in B. pertussis infection and disease. In addition, this information may allow development of therapeutics to combat the effects of the toxin and may also allow improvement of existing pertussis vaccines that include PT or development of novel vaccine molecules using PT as a intracellular delivery vector. We have preliminary data indicating that (i) PT may undergo retrograde intracellular trafficking through the Golgi apparatus and endoplasmic reticulum (ER) en route to its cytosolic target proteins, (ii) that proteolytic processing of the active Si subunit of cell-associated PT occurs and may be important for its activity, and (iii) that there is apparent transcytosis of active PT across intact polarized epithelial cells in culture. Therefore the specific aims of this proposal are to investigate

the trafficking, processing and transcytosis of PT in mammalian cells and the key features of this toxin that mediate these events.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Pertussis, Diphtheria, Cholera Toxins-Inhibitor Design**

  Principal Investigator & Institution: Schramm, Vern L.; Professor & Chairman; Biochemistry; Yeshiva University 500 W 185Th St New York, Ny 10033

  Timing: Fiscal Year 2000; Project Start 1-JUL-1993; Project End 1-JAN-2004

  Summary: This research program addresses two major and current problems in infectious disease using novel technology. Toxin-directed transition state inhibitors offer a new approach to prevent the damage of bacterial exotoxins to human tissues. Antibiotic resistance is a global problem in infectious disease. Tissue- protective toxin inhibitors could act as antibiotics which are not expected to elicit resistance in the causitive organisms. The experimental approach is to use the frontier method of enzymatic transition state analysis and to apply it to the action of bacterial exotoxins. ADP-ribosylating bacterial exotoxins catalyze the covalent modification of GTP-binding proteins. Cholera, diphtheria and pertussis toxins ADP-ribosylate Gsalpha, eukaryotic elongation factor 2, and Gialpha proteins, respectively. Transition state analysis of bacterial ADP-ribosylating exotoxins will be used to design transition state inhibitors against cholera, diphtheria, pertussis and related exotoxins. Transition-state inhibitors against bacterial exotoxins are expected to protect against the exotoxins and thus ameliorate the damage caused in these childhood and endemic diseases. Transition state structure is determined by measuring kinetic isotope effects with NAD+ substrate labeled in all of the atomic positions expected to undergo bonding changes as bonds are broken and made at the enzyme-stabilized transition state. The ADP- ribosylated G-protein is analyzed for the isotopic discrimination of the incorporated ADP-ribose. The isotope effects are then corrected to reveal the full chemical expression of intrinsic isotope effects. An atomic model of all atoms at least two bonds from the reaction center is constructed which is constrained by the values of the kinetic isotope effects. Semiemperical and ab initio methods are used to complete the structure of the transition state molecules, with constraints at every step to comply with the experimental kinetic isotope effects. Transition state structures are mapped using the molecular electrostatic potential surface at the van der Waals radius and compared to that of the substrate. The relationship provides predictive value for transition state inhibitor design. Molecules with electronic similarity close

to that of the transition state are synthesized and tested as transition state inhibitors. These procedures have resulted in the discovery of novel transition state inhibitors for several simple enzymatic reactions. The goal of this work is to extend transition state inhibitor design to the complex reactions catalyzed by bacterial ADP-ribosylating toxins.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Pilot--Cloning/Sequencing of Calmodulin like Protein from Bordetella Pertussis**

  Principal Investigator & Institution: Dominguez, Delfina C.; ; University of Texas El Paso El Paso, Tx 79968

  Timing: Fiscal Year 2000

  Summary: Bordetella pertussis, the causative agent of whooping cough, secrets multiple toxins which are presumed to be the cause of the systemic symptoms of the disease. Investigations on B. pertussis have shown that the bacterium produces an adenylate cyclase toxin which is activated by eukaryotic calmodulin. This adenylate cyclase toxin is one of the major virulence factors with B. pertussis. It is believed that the pathogenic mechanism involves the activation of the bacterial adenylate cyclase toxin by the host calmodulin causing over-production of cyclic-AMP in the host leading to alterations in cellular metabolism. Recently, biochemical experimentation has presented evidence of the existence of a calmodulin-like protein within B. pertussis and other bacteria. The purpose of this research is to elucidate the molecular details involved in the pathogenesis of B. pertussis infection. The proposed research will study the calmodulin-like protein present in B. pertussis by a) analyzing the chemical, physical and immunological properties of this protein, b) preparing oligonucleotide probes using the highly conserved region from residues 8-23 (which is identical in all calmodulins) to clone the gene, c) sequencing the cloned calmodulin gene and, d) evaluating the effects of this calmodulin on B. pertussis adenylate cyclase toxin. The long term goal of the research is to develop a more effective vaccine and to uncover novel developments towards the understanding of mechanisms of disease.

  Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Bordetella Cyclase-Presentation and Secretion**

  Principal Investigator & Institution: Zaretzky, Franca R.; Internal Medicine; University of Virginia Charlottesville Box 400195 Charlottesville, Va 22904

  Timing: Fiscal Year 2001; Project Start 1-MAR-2001

Summary: (provided by the applicant): The objective of this project is to gain a better understanding of the surface presentation and mechanism of secretion of adenylate cyclase toxin (ACT), an essential virulence determinant of Bordetella pertussis. In contrast to other repeats-in-toxin (RTX) family members that are secreted to the extracellular milieu, ACT remains associated with the outer membrane of B. pertussis. Years of investigation of ACT in this laboratory and others have lead to novel discoveries regarding the structure and mechanism of action of this fascinating toxin. In order to understand completely the involvement of ACT in the virulence of B. pertussis, however, it will be necessary to study the activities of ACT in the context of B. pertussis organisms. The first Specific Aim of this proposal is to determine the orientation of ACT on the surface of B. pertussis and the role of specific domains of ACT on the ability of whole bacteria to intoxicate target cells. Specific Aim II is to examine the mechanism by which ACT is secreted, yet retained on the surface of B. pertussis. A variety of cellular and molecular biological approaches will be employed to accomplish these Aims. Information obtained from the experiments described in the Specific Aims proposed herein will begin to bridge the gap between our present knowledge of how soluble ACT exerts its biological effects on target cells and the mechanism of action of ACT associated with live B. pertussis, the location from which it acts during infection.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Regulation of Phospholipase C**

  Principal Investigator & Institution: Harden, T Kendall.; Professor; Pharmacology; University of North Carolina Chapel Hill Box 2688, 910 Raleigh Rd Chapel Hill, Nc 27515

  Timing: Fiscal Year 2000; Project Start 1-APR-1981; Project End 1-MAR-2003

  Summary: A broad range of hormones, neurotransmitters, growth factors, and other stimuli produce their physiological effects by stimulation of inositol lipid breakdown. This response for most receptors involves activation of a G-protein, which in turn activates phospholipase C (PLC). The long- term goal of this research is to identify the component proteins of this signalling pathway and to delineate the molecular details of their receptor-promoted interaction. In the previous funding period this laboratory used the turkey erythrocyte as a model system to identify and purify a G-protein-regulated PLC and used this enzyme in a reconstitution assay to purify its activating G-protein, Galpha(11). The full range of effector PLCs activated by Galpha(11), by other members of the Gq class of G-proteins, and by pertussis toxin-sensitive G-proteins

has not been delineated. As such, PLC-(Beta(1), PLC-(Beta(2), PLC-(Beta(3), and potentially other G-protein-regulated PLCs will be purified and the specificity of their activation by G(alpha(11) and G(alpha)(g) will be determined with native and recombinant proteins. The possibility that one or more of the PLC isoenzymes is activated by pertussis toxin-sensitive G-proteins will be examined by reconstitution with recombinant G(alpha(i1), G(alpha(i2, G(alpha(i3, and G(alpha(0). This laboratory recently has observed that G-protein-Beta/gamma-subunits activate the avian G-protein-regulated PLC. This work will be extended to determine whether other PLC-(Beta) class isoenzymes are regulated directly by (Beta/gamma-subunits, to establish the specificity of activation by (Beta/gamma) dimers of defined composition made from various (Beta)- and gamma-subunits, and to establish the relative activities of (alpha)- versus (Beta/gamma)-subunits for each isoenzyme. The components of the pertussis toxin-sensitive inositol lipid signalling cascade will be identified in HT29 human carcinoma cells. The PLC involved in pertussis toxin-sensitive purinergic receptor regulation of inositol lipid signalling will be purified, and the G-protein will be identified by receptor-promoted in situ labelling with [32P] azidoanilido GTP and immunoprecipitation. The relative contribution of alpha-versus Beta/gamma-subunits to activation of the involved PLC in the pertussis toxin-sensitive pathway of HT29 cells will be established. The molecular details of activation of the avian G-protein-regulated PLC by G(alpha11) and by G-protein Beta/gamma-subunits will be defined using model lipid monolayers of various composition at an air water interface. This and other knowledge accrued for G(alpha11) and the G-protein-regulated PLC of avian erythrocytes will be used to delineate the molecular basis of the heterologous desensitization of the inositol lipid signalling pathway that occurs during exposure of these cells to various stimuli. Completion of the work described in this proposal should considerably extend knowledge of the identify, specificity, and mechanism of interaction of the component proteins of the receptor-regulated inositol lipid signalling pathway.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

E-Journals: PubMed Central[19]

PubMed Central (PMC) is a digital archive of life sciences journal literature developed and managed by the National Center for Biotechnology

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

Information (NCBI) at the U.S. National Library of Medicine (NLM).[20] Access to this growing archive of e-journals is free and unrestricted.[21] To search, go to **http://www.pubmedcentral.nih.gov/index.html#search**, and type "pertussis" (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for pertussis in the PubMed Central database:

- **A Simplified Method for Testing Bordetella pertussis for Resistance to Erythromycin and Other Antimicrobial Agents** by Bertha C. Hill, Carolyn N. Baker, and Fred C. Tenover; 2000 March http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=86361&rendertype=external
- **A Trace Component of Ginseng that Inhibits Ca2+ Channels through a Pertussis Toxin-Sensitive G Protein** by S Nah, H Park, and EW McCleskey; 1995 September 12 http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=41042
- **Adhesion of Bordetella pertussis to Eukaryotic Cells Requires a Time-Dependent Export and Maturation of Filamentous Hemagglutinin** by B Arico, S Nuti, V Scarlato, and R Rappuoli; 1993 October 1 http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=47531
- **Analysis with a Combination of Macrorestriction Endonucleases Reveals a High Degree of Polymorphism among Bordetella pertussis Isolates in Eastern France** by G. Prevost, F. I. S. Freitas, P. Stoessel, O. Meunier, M. Haubensack, H. Monteil, and J. M. Scheftel; 1999 April http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88650&rendertype=external
- **Anti-viral protection conferred by recombinant adenylate cyclase toxins from Bordetella pertussis carrying a CD8 + T cell epitope from lymphocytic choriomeningitis virus** by M. F. Saron, C. Fayolle, P. Sebo, D. Ladant, A. Ullmann, and C. Leclerc; 1997 April 1 http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=20366

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

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

- **Autogenous Regulation of the Bordetella Pertussis bvgABC Operon** by CR Roy, JF Miller, and S Falkow; 1990 May 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=53983
- **Autophosphorylation and Phosphotransfer in the Bordetella pertussis BvgAS Signal Transduction Cascade** by MA Uhl and JF Miller; 1994 February 1
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=43114
- **Bordetella pertussis Tracheal Cytotoxin and Other Muramyl Peptides: Distinct Structure-Activity Relationships for Respiratory Epithelial Cytopathology** by KE Luker, JL Collier, EW Kolodziej, GR Marshall, and WE Goldman; 1993 March 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=46087
- **Characterization of a Metabotropic Glutamate Receptor: Direct Negative Coupling to Adenylyl Cyclase and Involvement of a Pertussis Toxin-Sensitive G Protein** by L Prezeau, O Manzoni, V Homburger, F Sladeczek, K Curry, and J Bockaert; 1992 September 1
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=49851
- **Charge-dependent translocation of Bordetella pertussis adenylate cyclase toxin into eukaryotic cells: Implication for the in vivo delivery of CD8 + T cell epitopes into antigen-presenting cells** by G. Karimova, C. Fayolle, S. Gmira, A. Ullmann, C. Leclerc, and D. Ladant; 1998 October 13
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=22865
- **Comparison of PCR, Culture, and Direct Fluorescent-Antibody Testing for Detection of Bordetella pertussis** by Mike J. Loeffelholz, Curt J. Thompson, Karla S. Long, and Mary J. R. Gilchrist; 1999 September
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=85400&rendertype=external
- **Coupling of a Purified Goldfish Brain Kainate Receptor with a Pertussis Toxin-Sensitive G Protein** by CJ Ziegra, JM Willard, and RE Oswald; 1992 May 1
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=49028

- **Detection of Bordetella holmesii Using Bordetella pertussis IS481 PCR Assay** by Mike J. Loeffelholz, Curt J. Thompson, Karla S. Long, and Mary J. R. Gilchrist; 2000 January
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88756&rendertype=external
- **Epithelial Autotoxicity of Nitric Oxide: Role in the Respiratory Cytopathology of Pertussis** by LN Heiss, JR Lancaster, Jr, JA Corbett, and WE Goldman; 1994 January 4
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=42928
- **Fimbrial Typing of Bordetella pertussis Isolates: Agglutination with Polyclonal and Monoclonal Antibodies** by D. K. L. Xing, S. Ramakrishnan, P. Newland, and M. J. Corbel; 2001 November
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88524&rendertype=external
- **Fimbrial Typing of Bordetella pertussis Isolates: Agglutination with Polyclonal and Monoclonal Antisera** by N. Guiso, C. H. Wirsing von Konig, C. Becker, and H. Hallander; 2001 April
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88005&rendertype=external
- **From the Cover:The transcriptional responses of respiratory epithelial cells to Bordetella pertussis reveal host defensive and pathogen counter-defensive strategies** by Christopher E. Belcher, Jorg Drenkow, Bettina Kehoe, Thomas R. Gingeras, Nancy McNamara, Hassan Lemjabbar, Carol Basbaum, and David A. Relman; 2000 December 5
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=17664
- **Gonadotrophin-Releasing Hormone Receptor Agonist-Mediated Down-Regulation of Gq[alpha]/G11[alpha] (Pertussis Toxin-Insensitive) G Proteins in [alpha]T3-1 Gonadotroph Cells Reflects Increased G Protein Turnover but not Alterations in mRNA Levels** by BH Shah, DJ MacEwan, and G Milligan; 1995 March 14
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=42387
- **Induction of Mucosal Immune Responses against a Heterologous Antigen Fused to Filamentous Hemagglutinin after Intranasal Immunization with Recombinant Bordetella pertussis** by G Renauld-Mongenie, N Mielcarek, J Cornette, A Schacht, A Capron, G Riveau, and C Locht; 1996 July 23
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=38854

- **Interaction of the Pertussis Toxin Peptide Containing Residues 30-42 with DR1 and the T-Cell Receptors of 12 Human T-Cell Clones** by MTD Magistris, AD Tommaso, M Domenighini, S Censini, A Tagliabue, JR Oksenberg, L Steinman, AK Judd, D O'Sullivan, and R Rappuoli; 1992 April 1
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=48789
- **Locus Controlling Bordetella pertussis-Induced Histamine Sensitization (Bphs), an Autoimmune Disease-Susceptibility Gene, Maps Distal to T-Cell Receptor [beta]-Chain Gene on Mouse Chromosome 6** by JD Sudweeks, JA Todd, EP Blankenhorn, BB Wardell, SR Woodward, ND Meeker, SS Estes, and C Teuscher; 1993 April 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=46369
- **Membrane Localization of the Pertussis Toxin-Sensitive G-Protein Subunits [alpha]i-2 and [alpha]i-3 and Expression of a Metallothionein-[alpha]i-2 Fusion Gene in LLC-PK1 Cells** by L Ercolani, JL Stow, JF Boyle, EJ Holtzman, H Lin, JR Grove, and DA Ausiello; 1990 June 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=54171
- **Modulation of Adenylate Cyclase Toxin Production as Bordetella pertussis Enters Human Macrophages** by HR Masure; 1992 July 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=49533
- **Molecular Characterization of an Operon Required for Pertussis Toxin Secretion** by AA Weiss, FD Johnson, and DL Burns; 1993 April 1
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=46218
- **Nested Duplex PCR To Detect Bordetella pertussis and Bordetella parapertussis and Its Application in Diagnosis of Pertussis in Nonmetropolitan Southeast Queensland, Australia** by D. J. Farrell, G. Daggard, and T. K. S. Mukkur; 1999 March
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=84487&rendertype=external
- **Pertactin, an Arg-Gly-Asp-Containing Bordetella pertussis Surface Protein That Promotes Adherence of Mammalian Cells** by E Leininger, M Roberts, JG Kenimer, IG Charles, N Fairweather, P Novotny, and MJ Brennan; 1991 January 15
  http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=50807

- **Pertussis Toxin has Eukaryotic-Like Carbohydrate Recognition Domains** by K Saukkonen, WN Burnette, VL Mar, HR Masure, and EI Tuomanen; 1992 January 1
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=48187
- **Pertussis Toxin-Sensitive Activation of p21ras by G Protein-Coupled Receptor Agonists in Fibroblasts** by EJ van Corven, PL Hordijk, RH Medema, JL Bos, and WH Moolenaar; 1993 February 15
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=45851
- **Pertussis Toxin-Sensitive G Proteins are Transported Toward Synaptic Terminals by Fast Axonal Transport** by SS Vogel, GJ Chin, JH Schwartz, and TS Reese; 1991 March 1
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=51107
- **Pertussis vaccination and wheezing illnesses in young children: prospective cohort study** by John Henderson, Kate North, Mancell Griffiths, Ian Harvey, Jean Golding, and the Avon Longitudinal Study of Pregnancy and Childhood Team; 1999 May 1
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=27852
- **Polymorphism in the Pertussis Toxin Promoter Region Affecting the DNA-Based Diagnosis of Bordetella Infection** by Malin Nygren, Elisabet Reizenstein, Mostafa Ronaghi, and Joakim Lundeberg; 2000 January
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=86018&rendertype=external
- **Polymorphism of Bordetella pertussis Isolates Circulating for the Last 10 Years in France, Where a Single Effective Whole-Cell Vaccine Has Been Used for More than 30 Years** by Christian Weber, Caroline Boursaux-Eude, Gilberte Coralie, Valerie Caro, and Nicole Guiso; 2001 December
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88555&rendertype=external
- **Positive Transcriptional Feedback at the Bvg Locus Controls Expression of Virulence Factors in Bordetella pertussis** by V Scarlato, A Prugnola, B Arico, and R Rappuoli; 1990 September 1
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=54615
- **Protective Immunogenicity of Two Synthetic Peptides Selected From the Amino Acid Sequence of Bordetella pertussis Toxin Subunit S1** by

P Askelof, K Rodmalm, G Wrangsell, U Larsson, SB Svenson, JL Cowell, A Unden, and T Bartfai; 1990 February 15
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=53472

- **Rapid-Cycle PCR Method To Detect Bordetella pertussis That Fulfills All Consensus Recommendations for Use of PCR in Diagnosis of Pertussis** by D. J. Farrell, M. McKeon, G. Daggard, M. J. Loeffelholz, C. J. Thompson, and T. K. S. Mukkur; 2000 December
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=87627&rendertype=external
- **Rate of recurrent collapse after vaccination with whole cell pertussis vaccine: follow up study** by Patricia E Vermeer-de Bondt, Jerry Labadie, and Hans C Rumke; 1998 March 21
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=28493
- **Real-Time PCR Assay Targeting IS481 of Bordetella pertussis and Molecular Basis for Detecting Bordetella holmesii** by Udo Reischl, Norbert Lehn, Gary N. Sanden, and Mike J. Loeffelholz; 2001 May
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=88058&rendertype=external
- **Recovery of Bordetella holmesii from Patients with Pertussis-Like Symptoms: Use of Pulsed-Field Gel Electrophoresis To Characterize Circulating Strains** by Eyob Mazengia, Ellen A. Silva, Joseph A. Peppe, Ralph Timperi, and Harvey George; 2000 June
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=86794&rendertype=external
- **Specificity and Sensitivity of High Levels of Immunoglobulin G Antibodies against Pertussis Toxin in a Single Serum Sample for Diagnosis of Infection with Bordetella pertussis** by H. E. de Melker, F. G. A. Versteegh, M. A. E. Conyn-van Spaendonck, L. H. Elvers, G. A. M. Berbers, A. van der Zee, and J. F. P. Schellekens; 2000 February
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=86208&rendertype=external
- **Targeted Mutations that Ablate Either the Adenylate Cyclase or Hemolysin Function of the Bifunctional cyaA Toxin of Bordetella pertussis Abolish Virulence** by MK Gross, DC Au, AL Smith, and DR Storm; 1992 June 1
http://www.pubmedcentral.nih.gov/articlerender.fcgi?rendertype=abstract&artid=49195
- **The role of members of the pertussis toxin-sensitive family of G proteins in coupling receptors to the activation of the G protein-gated**

inwardly rectifying potassium channel by Joanne Louise Leaney and Andrew Tinker; 2000 May 9
http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=25883

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. 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 the public.[22] 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 pertussis, simply go to the PubMed Web site at **www.ncbi.nlm.nih.gov/pubmed**. Type "pertussis" (or synonyms) into the search box, and click "Go." The following is the type of output you can expect from PubMed for "pertussis" (hyperlinks lead to article summaries):

- **A trace component of ginseng that inhibits Ca2+ channels through a pertussis toxin-sensitive G protein.**
  Author(s): Nah SY, Park HJ, McCleskey EW.
  Source: Proceedings of the National Academy of Sciences of the United States of America. 1995 September 12; 92(19): 8739-43.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7568008&dopt=Abstract

- **Adenine nucleotides directly stimulate pertussis toxin.**
  Author(s): Lim LK, Sekura RD, Kaslow HR.
  Source: The Journal of Biological Chemistry. 1985 March 10; 260(5): 2585-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2982826&dopt=Abstract

[22] 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.

- **Changes in the acoustic startle response and prepulse inhibition of acoustic startle in rats after local injection of pertussis toxin into the ventral tegmental area.**
  Author(s): Zhang J, Engel JA, Hjorth S, Svensson L.
  Source: Psychopharmacology. 1995 May; 119(1): 71-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7675952&dopt=Abstract

- **Disruption of Bordetella pertussis in the Ribi cell fractionator. 2. Effect of different suspending media.**
  Author(s): Hollinger E, Wardlaw AC.
  Source: Canadian Journal of Microbiology. 1971 September; 17(9): 1195-202. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=4107161&dopt=Abstract

- **Effects of diphtheria-tetanus-pertussis or tetanus vaccination on allergies and allergy-related respiratory symptoms among children and adolescents in the United States.**
  Author(s): Hurwitz EL, Morgenstern H.
  Source: Journal of Manipulative and Physiological Therapeutics. 2000 February; 23(2): 81-90.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10714532&dopt=Abstract

- **Growth and siderophore production by Bordetella pertussis under iron-restricted conditions.**
  Author(s): Gorringe AR, Woods G, Robinson A.
  Source: Fems Microbiology Letters. 1990 January 1; 54(1-3): 101-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2138989&dopt=Abstract

- **Individual and community risks of measles and pertussis associated with personal exemptions to immunization.**
  Author(s): Feikin DR, Lezotte DC, Hamman RF, Salmon DA, Chen RT, Hoffman RE.
  Source: Jama : the Journal of the American Medical Association. 2000 December 27; 284(24): 3145-50.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11135778&dopt=Abstract

- **Involvement of pertussis toxin sensitive G-proteins in conditioned fear-potentiated startle: possible involvement of the amygdala.**
  Author(s): Melia KR, Falls WA, Davis M.
  Source: Brain Research. 1992 July 3; 584(1-2): 141-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1515934&dopt=Abstract

- **Local massage after vaccination enhances the immunogenicity of diphtheria-tetanus-pertussis vaccine.**
  Author(s): Hsu CY, Huang LM, Lee CY, Lin TY, Lee PI, Chen JM.
  Source: The Pediatric Infectious Disease Journal. 1995 July; 14(7): 567-72.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7567283&dopt=Abstract

- **On the mechanism of the adjuvant effect of Bordetella pertussis vaccine.**
  Author(s): Reed CE, Benner M, Lockey SD, Enta T, Makino S, Carr RH.
  Source: The Journal of Allergy and Clinical Immunology. 1972 March; 49(3): 174-82. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=5011091&dopt=Abstract

- **Pertussis outbreaks in groups claiming religious exemptions to vaccinations.**
  Author(s): Etkind P, Lett SM, Macdonald PD, Silva E, Peppe J.
  Source: Am J Dis Child. 1992 February; 146(2): 173-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1733146&dopt=Abstract

Vocabulary Builder

Acetylglucosamine: The N-acetyl derivative of glucosamine. [NIH]

Adjuvant: A substance which aids another, such as an auxiliary remedy; in immunology, nonspecific stimulator (e.g., BCG vaccine) of the immune response. [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]

Alcaligenes: A genus of gram-negative, aerobic, motile bacteria that occur in water and soil. Some are common inhabitants of the intestinal tract of

vertebrates. These bacteria occasionally cause opportunistic infections in humans. [NIH]

Allergen: A antigenic substance capable of producing immediate-type hypersensitivity (allergy). [EU]

Amphetamine: A powerful central nervous system stimulant and sympathomimetic. Amphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulation of release of monamines, and inhibiting monoamine oxidase. Amphetamine is also a drug of abuse and a psychotomimetic. The l- and the d,l-forms are included here. The l-form has less central nervous system activity but stronger cardiovascular effects. The d-form is dextroamphetamine. [NIH]

Amygdala: Almond-shaped group of basal nuclei anterior to the inferior horn of the lateral ventricle of the brain, within the temporal lobe. The amygdala is part of the limbic system. [NIH]

Anesthesiology: A specialty concerned with the study of anesthetics and anesthesia. [NIH]

Antibiotic: A chemical substance produced by a microorganism which has the capacity, in dilute solutions, to inhibit the growth of or to kill other microorganisms. Antibiotics that are sufficiently nontoxic to the host are used as chemotherapeutic agents in the treatment of infectious diseases of man, animals and plants. [EU]

Antigen: Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of that response, that is, with specific antibody or specifically sensitized T-lymphocytes, or both. Antigens may be soluble substances, such as toxins and foreign proteins, or particulate, such as bacteria and tissue cells; however, only the portion of the protein or polysaccharide molecule known as the antigenic determinant (q.v.) combines with antibody or a specific receptor on a lymphocyte. Abbreviated Ag. [EU]

Apomorphine: A derivative of morphine that is a dopamine D2 agonist. It is a powerful emetic and has been used for that effect in acute poisoning. It has also been used in the diagnosis and treatment of parkinsonism, but its adverse effects limit its use. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Asymptomatic: Showing or causing no symptoms. [EU]

Atopic: Pertaining to an atopen or to atopy; allergic. [EU]

Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

Biosynthesis: The building up of a chemical compound in the physiologic

processes of a living organism. [EU]

Calmodulin: A heat-stable, low-molecular-weight activator protein found mainly in the brain and heart. The binding of calcium ions to this protein allows this protein to bind to cyclic nucleotide phosphodiesterases and to adenyl cyclase with subsequent activation. Thereby this protein modulates cyclic AMP and cyclic GMP levels. [NIH]

Carbohydrate: An aldehyde or ketone derivative of a polyhydric alcohol, particularly of the pentahydric and hexahydric alcohols. They are so named because the hydrogen and oxygen are usually in the proportion to form water, (CH2O)n. The most important carbohydrates are the starches, sugars, celluloses, and gums. They are classified into mono-, di-, tri-, poly- and heterosaccharides. [EU]

Carcinoma: A malignant new growth made up of epithelial cells tending to infiltrate the surrounding tissues and give rise to metastases. [EU]

Catechin: Extracted from Uncaria gambier, Acacia catechu and other plants; it stabilizes collagen and is therefore used in tanning and dyeing; it prevents capillary fragility and abnormal permeability, but was formerly used as an antidiarrheal. [NIH]

Cholera: An acute diarrheal disease endemic in India and Southeast Asia whose causative agent is vibrio cholerae. This condition can lead to severe dehydration in a matter of hours unless quickly treated. [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]

Cocaine: An alkaloid ester extracted from the leaves of plants including coca. It is a local anesthetic and vasoconstrictor and is clinically used for that purpose, particularly in the eye, ear, nose, and throat. It also has powerful central nervous system effects similar to the amphetamines and is a drug of abuse. Cocaine, like amphetamines, acts by multiple mechanisms on brain catecholaminergic neurons; the mechanism of its reinforcing effects is thought to involve inhibition of dopamine uptake. [NIH]

Colitis: Inflammation of the colon. [EU]

Collapse: 1. a state of extreme prostration and depression, with failure of circulation. 2. abnormal falling in of the walls of any part of organ. [EU]

Desensitization: The prevention or reduction of immediate hypersensitivity reactions by administration of graded doses of allergen; called also hyposensitization and immunotherapy. [EU]

Dexmedetomidine: A selective inhibitor of receptors, adrenergic alpha-2 that has analgesic and sedative properties. Medetomidine is the other racemic form. [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]

Eczema: A pruritic papulovesicular dermatitis occurring as a reaction to many endogenous and exogenous agents, characterized in the acute stage by erythema, edema associated with a serous exudate between the cells of the epidermis (spongiosis) and an inflammatory infiltrate in the dermis, oozing and vesiculation, and crusting and scaling; and in the more chronic stages by lichenification or thickening or both, signs of excoriations, and hyperpigmentation or hypopigmentation or both. Atopic dermatitis is the most common type of dermatitis. Called also eczematous dermatitis. [EU]

Endocrinology: A subspecialty of internal medicine concerned with the metabolism, physiology, and disorders of the endocrine system. [NIH]

Endonucleases: Enzymes that catalyze the hydrolysis of the internal bonds and thereby the formation of polynucleotides or oligonucleotides from ribo- or deoxyribonucleotide chains. EC 3.1.-. [NIH]

Enzyme: A protein molecule that catalyses chemical reactions of other substances without itself being destroyed or altered upon completion of the reactions. Enzymes are classified according to the recommendations of the Nomenclature Committee of the International Union of Biochemistry. Each enzyme is assigned a recommended name and an Enzyme Commission (EC) number. They are divided into six main groups; oxidoreductases, transferases, hydrolases, lyases, isomerases, and ligases. [EU]

Epitopes: Sites on an antigen that interact with specific antibodies. [NIH]

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

Exotoxins: Toxins produced, especially by bacterial or fungal cells, and released into the culture medium or environment. [NIH]

Extracellular: Outside a cell or cells. [EU]

Febrile: Pertaining to or characterized by fever. [EU]

Fibrosis: The formation of fibrous tissue; fibroid or fibrous degeneration [EU]

Fistula: An abnormal passage or communication, usually between two internal organs, or leading from an internal organ to the surface of the body; frequently designated according to the organs or parts with which it communicates, as anovaginal, brochocutaneous, hepatopleural, pulmonoperitoneal, rectovaginal, urethrovaginal, and the like. Such

passages are frequently created experimentally for the purpose of obtaining body secretions for physiologic study. [EU]

Ginseng: An araliaceous genus of plants that contains a number of pharmacologically active agents used as stimulants, sedatives, and tonics, especially in traditional medicine. [NIH]

Glycoproteins: Conjugated protein-carbohydrate compounds including mucins, mucoid, and amyloid glycoproteins. [NIH]

Haemophilus: A genus of pasteurellaceae that consists of several species occurring in animals and humans. Its organisms are described as gram-negative, facultatively anaerobic, coccobacillus or rod-shaped, and nonmotile. [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]

Hormones: Chemical substances having a specific regulatory effect on the activity of a certain organ or organs. The term was originally applied to substances secreted by various endocrine glands and transported in the bloodstream to the target organs. It is sometimes extended to include those substances that are not produced by the endocrine glands but that have similar effects. [NIH]

Hypersensitivity: A state of altered reactivity in which the body reacts with an exaggerated immune response to a foreign substance. Hypersensitivity reactions are classified as immediate or delayed, types I and IV, respectively, in the Gell and Coombs classification (q.v.) of immune responses. [EU]

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

Intoxication: Poisoning, the state of being poisoned. [EU]

Intrinsic: Situated entirely within or pertaining exclusively to a part. [EU]

Isoenzymes: One of various structurally related forms of an enzyme, each having the same mechanism but with differing chemical, physical, or immunological characteristics. [NIH]

Kinetic: Pertaining to or producing motion. [EU]

Lectins: Protein or glycoprotein substances, usually of plant origin, that bind to sugar moieties in cell walls or membranes and thereby change the physiology of the membrane to cause agglutination, mitosis, or other biochemical changes in the cell. [NIH]

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

Limbic: Pertaining to a limbus, or margin; forming a border around. [EU]

Lipid: Any of a heterogeneous group of flats and fatlike substances

characterized by being water-insoluble and being extractable by nonpolar (or fat) solvents such as alcohol, ether, chloroform, benzene, etc. All contain as a major constituent aliphatic hydrocarbons. The lipids, which are easily stored in the body, serve as a source of fuel, are an important constituent of cell structure, and serve other biological functions. Lipids may be considered to include fatty acids, neutral fats, waxes, and steroids. Compound lipids comprise the glycolipids, lipoproteins, and phospholipids. [EU]

Localization: 1. the determination of the site or place of any process or lesion. 2. restriction to a circumscribed or limited area. 3. prelocalization. [EU]

Lymphadenopathy: Disease of the lymph nodes. [EU]

Lymphocytic: Pertaining to, characterized by, or of the nature of lymphocytes. [EU]

Lymphocytosis: Excess of normal lymphocytes in the blood or in any effusion. [NIH]

Microorganism: A microscopic organism; those of medical interest include bacteria, viruses, fungi and protozoa. [EU]

Microscopy: The application of microscope magnification to the study of materials that cannot be properly seen by the unaided eye. [NIH]

Monocytes: Large, phagocytic mononuclear leukocytes produced in the vertebrate bone marrow and released into the blood; contain a large, oval or somewhat indented nucleus surrounded by voluminous cytoplasm and numerous organelles. [NIH]

Neural: 1. pertaining to a nerve or to the nerves. 2. situated in the region of the spinal axis, as the neutral arch. [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neurotransmitter: Any of a group of substances that are released on excitation from the axon terminal of a presynaptic neuron of the central or peripheral nervous system and travel across the synaptic cleft to either excite or inhibit the target cell. Among the many substances that have the properties of a neurotransmitter are acetylcholine, norepinephrine, epinephrine, dopamine, glycine, y-aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Operon: The genetic unit consisting of a feedback system under the control of an operator gene, in which a structural gene transcribes its message in the form of mRNA upon blockade of a repressor produced by a regulator gene. Included here is the attenuator site of bacterial operons where transcription termination is regulated. [NIH]

Otitis: Inflammation of the ear, which may be marked by pain, fever,

abnormalities of hearing, hearing loss, tinnitus, and vertigo. [EU]

Perennial: Lasting through the year of for several years. [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]

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]

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]

Psychopharmacology: The study of the effects of drugs on mental and behavioral activity. [NIH]

Receptor: 1. a molecular structure within a cell or on the surface characterized by (1) selective binding of a specific substance and (2) a specific physiologic effect that accompanies the binding, e.g., cell-surface receptors for peptide hormones, neurotransmitters, antigens, complement fragments, and immunoglobulins and cytoplasmic receptors for steroid hormones. 2. a sensory nerve terminal that responds to stimuli of various kinds. [EU]

Recombinant: 1. a cell or an individual with a new combination of genes not found together in either parent; usually applied to linked genes. [EU]

Reconstitution: 1. a type of regeneration in which a new organ forms by the rearrangement of tissues rather than from new formation at an injured surface. 2. the restoration to original form of a substance previously altered for preservation and storage, as the restoration to a liquid state of blood serum or plasma that has been dried and stored. [EU]

Rectal: Pertaining to the rectum (= distal portion of the large intestine). [EU]

Retrograde: 1. moving backward or against the usual direction of flow. 2. degenerating, deteriorating, or catabolic. [EU]

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

Schizophrenia: A severe emotional disorder of psychotic depth characteristically marked by a retreat from reality with delusion formation, hallucinations, emotional disharmony, and regressive behavior. [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]

Serum: The clear portion of any body fluid; the clear fluid moistening serous membranes. 2. blood serum; the clear liquid that separates from blood on clotting. 3. immune serum; blood serum from an immunized animal used for passive immunization; an antiserum; antitoxin, or antivenin. [EU]

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]

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]

Stramonium: One of the very toxic Solanaceae, Datura stramonium, also called thornapple and jimsonweed. It contains the same alkaloids as in Belladonna and causes toxicity to cattle and other grazers. [NIH]

Substrate: A substance upon which an enzyme acts. [EU]

Synaptic: Pertaining to or affecting a synapse (= site of functional apposition between neurons, at which an impulse is transmitted from one neuron to another by electrical or chemical means); pertaining to synapsis (= pairing off in point-for-point association of homologous chromosomes from the male and female pronuclei during the early prophase of meiosis). [EU]

Systemic: Pertaining to or affecting the body as a whole. [EU]

Tonsillitis: Inflammation of the tonsils, especially the palatine tonsils. [EU]

Toxicity: The quality of being poisonous, especially the degree of virulence of a toxic microbe or of a poison. [EU]

Toxicology: The science concerned with the detection, chemical composition, and pharmacologic action of toxic substances or poisons and the treatment and prevention of toxic manifestations. [NIH]

Toxin: A poison; frequently used to refer specifically to a protein produced by some higher plants, certain animals, and pathogenic bacteria, which is highly toxic for other living organisms. Such substances are differentiated from the simple chemical poisons and the vegetable alkaloids by their high molecular weight and antigenicity. [EU]

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]

Urticaria: Pathology: a transient condition of the skin, usually caused by an allergic reaction, characterized by pale or reddened irregular, elevated patches and severe itching; hives. [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]

CHAPTER 5. PATENTS ON PERTUSSIS

Overview

You can learn about innovations relating to pertussis by reading recent patents and patent applications. 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.[23] 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 to patients with pertussis 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 to patients with pertussis. 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.

[23]Adapted from The U. S. Patent and Trademark Office:
http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm.

Patents on Pertussis

By performing a patent search focusing on pertussis, 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. The following is an example of the type of information that you can expect to obtain from a patent search on pertussis:

- **Isolation and expression of DNA sequence encoding the five subunits of Bordetella pertussis toxin**

  Inventor(s): Rappuoli; Rino (Quercegrossa-Monteriggioni, IT), Nicosia; Alfredo (Siena, IT), Arico; Maria Beatrice (Quercegrossa, IT)

  Assignee(s): Chiron S.p.A. (Siena, IT)

  Patent Number: 6,350,612

  Date filed: December 26, 1990

  Abstract: Cloning and sequencing of the Eco RI fragment of B. pertussis chromosomal DNA with 4696 base pairs, containing the genes which code for the five subunits of the pertussis toxin. A hybrid plasmid containing the DNA fragment or its further fragments and a micro-organism transformed by the hybrid plasmid and capable of expressing the cloned DNA fragment or further fragments thereof by synthesis of the pertussis toxin or one or more subunits of the pertussis toxin. The pertussis toxin or one or more subunits of the pertussis toxin so obtained are useful for the preparation of vaccines and diagnostic kits.

  Excerpt(s): The present invention relates to a cloned and sequenced ECO RI fragment of Bordetella pertussis chromosomal DNA containing the genes which code for the five subunits of the pertussis toxin, useful for the preparation of the pertussis toxin or of one or more subunits of the pertussis toxin. ... The present invention also relates to a hybrid plasmid containing the cloned and sequenced DNA fragment or further fragments thereof and to a micro-organism transformed by the hybrid plasmid and capable of expressing the cloned DNA fragment or further fragments thereof by synthesis of the pertussis toxin or one or more subunits of the pertussis toxin. ... The invention also concerns a method for the preparation of the pertussis toxin or one or more subunits of the pertussis

toxin which includes the growth of the micro-organism transformed by the hybrid plasmid in a suitable culture medium.

Web site: http://www.delphion.com/details?pn=US06350612__

- **Amplification and detection of Bordetella pertussis**

  Inventor(s): Wood; Janet L. (Perryville, MD), Hellyer; Tobin J. (Owings Mills, MD)

  Assignee(s): Becton, Dickinson and Company (Franklin Lakes, NJ)

  Patent Number: 6,261,785

  Date filed: July 27, 2000

  Abstract: Amplification primers and methods for specific amplification and detection of a pertussis toxin promoter target are disclosed. The primer-target binding sequences are useful for amplification and detection of Bordetella pertussis target in a variety of amplification and detection reactions.

  Excerpt(s): The present invention relates to methods for determining the presence or absence of Bordetella pertussis from respiratory samples or other patient specimens, cultures, or environmental samples. The method involves using nucleic acid primers to amplify specifically a pertussis toxin promoter (ptx) target, preferably using one of the techniques of Strand Displacement Amplification (SDA), thermophilic Strand Displacement Amplification (tSDA) or fluorescent real time tSDA. ... B. pertussis causes whooping cough (pertussis) in humans. Of the several toxins produced by B. pertussis, the pertussis toxin constitutes the main virulence factor as described by A. Weiss, et al. (1984. J. infect. Dis., 150:219-222). Although other members of the genus Bordetellae (B. parapertussis, B. bronchiseptica) contain the pertussis toxin operon, the toxin is not expressed in these species due to mutations in the promoter region (C. Locht, et al., 1986, Science, 232:1258-1264). With appropriate primer design, these mutations confer specificity to the amplification and detection of B. pertussis DNA. ... Nucleic acid amplification is a powerful technology, which allows rapid detection of specific target sequences. It is therefore a promising technology for the rapid detection and identification of B. pertussis. Examples of identification of B. pertussis using PCR to amplify a variety of genes including sequences of the pertussis toxin promoter gene were reviewed by M. Muller, et al. (1997. Clin. Microbiol. 35, 10:2435-3443). Other examples of the specific identification of B. pertussis using PCR to amplify sequences within the pertussis toxin promoter gene were described by D. Furuya, et al. (1999. Immunopharmacol. Immunotoxicol. 21(1):55-63), D. Farrell, et al. (1999.

Abstr. No. 1569. pg. 225. 39.sup.th ICAAC Meet.), T. Ross, et al. (2000. Abstr. No. C-175 pg. 170 100.sup.th Gen. Meet. Am. Soc. Microbiol), and U. Heininger, et al. (2000. Pediatrics 105(3):E31). The oligonucleotide primers of the present invention are applicable to nucleic acid amplification and detection of B. pertussis.

Web site: http://www.delphion.com/details?pn=US06261785__

- **Method of separating protective components of Bordetella pertussis**

  Inventor(s): Suehara; Akihiro (Yamaguchi, JP), Yamamoto; Eiji (Yamaguchi, JP), Fujii; Shigeo (Yamaguchi, JP)

  Assignee(s): Takeda Chemical Industries, Ltd. (Osaka, JP)

  Patent Number: 6,051,240

  Date filed: October 13, 1995

  Abstract: To provide a method of efficiently separate protective components of Bordetella pertussis. On the basis of differences in adsorbability to calcium phosphate gel formed by adding calcium ions to a Bordetella pertussis culture in the presence of excess phosphate ions, protective components of Bordetella pertussis are separated from the Bordetella pertussis culture. Traditionally, protective components of Bordetella pertussis have been separated using different purification methods for the respective components. According to the present invention, the use of the same means of purification for all subject components makes it possible to purify each component with high efficiency and high recovery rate, an aspect very advantageous for industrial production. It is also possible to efficiently produce an improved purified pertussis component vaccine comprising an effective combination of pertussis filamentous hemagglutinin (FHA), pertactin (PRN, 69K-OMP), pertussis fimbriae (FIM) and pertussis toxin (PT).

  Excerpt(s): The present invention relates to a method of separating protective components of Bordetella pertussis. The pertussis component vaccine can be produced by suitably mixing the protective components separated by the method of the present invention. ... Vaccines are widely used to prevent communicable diseases. Pertussis, a communicable respiratory disease caused by infection with Bordetella pertussis, is likely to severely affect patients, especially infants, due to apneic cough with occasional spasm. To cope with this disease, it has been common practice to use whole cultured cells of Bordetella pertussis after inactivation (inactivated vaccine). However, localized reactions at the site of vaccination and side reactions, such as fever, have been reported, creating a social urge to solve this problem. To solve this problem, there

have been a large number of attempts of using protective components separated from Bordetella pertussis as vaccine. For example, acellular pertussis vaccine (ACP vaccine), prepared by extracting protective proteins, such as pertussis toxin (PT), pertussis filamentous hemagglutinin (FHA), pertactin (PRN, 69K-OMP) and pertussis fimbriae (FIM), from Bordetella pertussis cells, and removing endotoxin (ET), is being into practical application, but is not fully satisfactory, due to the drawbacks described below. ... Pertussis toxin (PT), pertussis filamentous hemagglutinin (FHA), pertactin (PRN, 69K-OMP) and pertussis fimbriae (FIM), all protective components of Bordetella pertussis already in practical application with validated efficacy, are separated by respective methods.

Web site: http://www.delphion.com/details?pn=US06051240__

- **Filamentous hemagglutinin of B. pertussis**

  Inventor(s): Relman; David A. (785 Roble, No. 5, Menlo Park, CA 94025), Domenighini; Mario (via Fiorentina 1, 53100 Siena, IT), Rappuoli; Rino (via Calamandrei 37, Quercegrossa, 53100 Siena, IT), Falkow; Stanley (8 Longspur, Portola Valley, CA 94025)

  Assignee(s): none reported

  Patent Number: 6,036,960

  Date filed: September 1, 1994

  Abstract: Nucleic acid and protein compositions are provided from B. pertussis which may find use in diagnosis, prevention and therapy of whooping cough. Particularly, an open reading frame encoding filamentous hemagglutinin precursors provided, with the intact protein for the filamentous hemagglutinin portion thereof, can be expressed in a wide variety of hosts, for use in the production of antibodies, for immunodiagnosis or therapy, or as vaccines for prophylactic purposes.

  Excerpt(s): This invention relates to the gene encoding filamentous hemagglutinin of B. pertussis, the protein product and the use of the gene and the product for developing vaccines by genetic engineering techniques. ... Bordetella pertussis is a small gram negative bacillus found only in humans. It is the etiologic agent of the childhood disease whooping cough, also known as pertussis. In susceptible individuals, the disease may progress to a serious paroxysmal phase. Violent and spasmodic coughing occurs, with the patient being subject to secondary injury from the hypoxia and convulsions attendant with the coughing paroxysms. Secondary infections, encephalopathy and death may occur. The discrete molecular moiety that has been associated with the severe

effects in the paroxysmal stage of the disease is pertussis toxin (PTX). PTX has been reported under a variety of names, including lymphocytosis promoting factor, histamine sensitizing factor and islet-activating protein. ... Another protein, filamentous hemagglutinin (FHA) is a surface associated protein expressed by B. pertussis under the control of a trans-acting vir locus. FHA, while poorly characterized, is thought to act as a major adhesion and immunodominant antigen in the course of human infection. This protein appears as a heterogeneous collection of polypeptide species on sodium dodecylsulfate-polyacrylamide gel electrophoreses, ranging from approximately 60 to 220 kDa (kilodaltons). It is likely that most of the smaller, commonly seen protein gel bands represent degradation products of a dominant 220 kDa species. Electron microscopy of this protein reveals a filamentous structure with dimensions of 2 nm by 40-100 nm.

Web site: http://www.delphion.com/details?pn=US06036960__

- **Bordetella pertussis and Bordetella parapertussis strains**

  Inventor(s): Gueirard; Pascale (Meudon la Foret, FR), Guiso; Nicole (Paris, FR)

  Assignee(s): Institut Pasteur (Paris, FR)

  Patent Number: 6,030,625

  Date filed: April 23, 1998

  Abstract: An immunogenic composition, characterized in that it comprises an adenyl cyclase-hemolysin (Ac-Hly) protein, or an immunogenic portion of this AC-Hly, of a strain of Bordetella chosen from B. pertussis, B. parapertussis or B. bronchiseptica, and in that it comprises, in addition, a bacterial extract containing the expression products of the vrg genes of a strain of Bordetella chosen from B. pertussis, B. parapertussis or B. bronchiseptica, or a portion of these expression products which is sufficient to induce an immune response in a host to which the extract might be administered.

  Excerpt(s): The genus Bordetella comprises four species Bordetella pertussis, Bordetella parapertussis, Bordetella bronchiseptica and Bordetella avium. ... The bordetellae are Gram-negative coccobacilli responsible for respiratory infections. Bordetella pertussis and Bordetella parapertussis, agents of whooping cough, are strictly human pathogens. Bordetella bronchiseptica is pathogenic for various mammals, and more rarely for man, and, in distinction to B. pertussis and B. parapertussis, is capable of surviving outside the host. Bordetella avium is pathogenic only for birds. ... The whooping cough vaccine in current use is a cellular

vaccine composed of heat-inactivated bacterial suspensions of B. pertussis (mixture of two strains differing in the expression of agglutinogens). This vaccine is generally used in combined form with purified diphtheria and tetanus fractions, the hemophilus and the inactivated polio viral component. Vaccination consists of three injections at one-month intervals from the age of two months and an injection at 18 months. No other booster injection is performed thereafter.

Web site: http://www.delphion.com/details?pn=US06030625__

- **Anti-viral treatment with pertussis toxin B oligomer**

  Inventor(s): Bukrinsky; Michael (Glenwood Landing, NY), Alfano; Massimo (Floral Park, NY)

  Assignee(s): The Picower Institute for Medical Research (Manhasset, NY)

  Patent Number: 6,019,979

  Date filed: August 15, 1997

  Abstract: There is disclosed a method for anti-viral therapy treatment with the Pertussis toxin beta subunit oligomer, wherein the oligomer is composed of from two to ten subunits of PTX selected from the group consisting of S2, S3, S4, S5, and combinations thereof.

  Excerpt(s): The present invention provides a method for anti-viral therapy treatment with the Pertussis toxin beta subunit. ... Pertussis toxin (PTX) is a 105,700 Dalton polypeptide that has both an alpha subunit and a beta subunit (PTBS). Pertussis toxin (PTX), a heterohexameric protein released by Bordetella Pertussis, exhibits diverse biological activities, mediated mostly by the A-subunit (A-promoter) which inactivates signaling pathways of members of the G.sub.i -G.sub.0 and G.sub.t -protein family. Binding to the receptor and internalization of the toxin is mediated by the B-oligomer. The hexamer is composed of one S1 subunit having a molecular weight of 28 kDa, one S2 subunit having a molecular weight of 23 kDa, one S3 subunit having a molecular weight of 22 kDa, two S4 subunits having a molecular weight of 11.7 kDa, and one S5 subunit having a molecular weight of 9.3 kDa. The S1 examers constitute the active A promoter, and an oligomer composed of one each of the S2, S3, and S5 subunits plus two S4 subunits constitute the B-oligomer that is the binding region. (Ui, Pertussis Toxin as a Probe of Receptor Coupling to Inositol Lipid Metabolism. Phosphoinositides and Receptor Mechanism, pp 163-195. Alan R. Liss, Inc., 1986). In addition, the D1 oligomer is composed of one each of the S2 and S4 subunits and can bind to a p43 PTX receptor, and a D2-oligomer is composed of one each of the S3 and S4 subunits and can bind to a p70 PTX receptor (Wong and Rosoff

"Pharmacology of Pertussis Toxin B" Can. J. Physiol. Pharmacol. 74:559-566, 1996). ... The A-promoter is released from the holotoxin molecule as a result of an allosteric effect of intracellular ATP. Specifically, intracellular ATP binds to the S3 subunit of the B-oligomer. The active center of ADP-rybosil transferase, unmasked in the released A-promoter molecule, can interact with intracellular reduced glutathione, which cleavages disulfide bonds essential for enzymatic activity (Ui, Pertussis Toxin as a Probe of Receptor Coupling to Inositol Lipid Metabolism. Phosphoinositides and Receptor Mechanism, pp 163-195. Alan R. Liss, Inc., 1986). The A-subunit possesses adenine diphosphate (ADP) ribosyltransferase activity, which catalizes ADP-ribosylation of G-proteins, leading to their dissociation from receptors and uncoupling of corresponding signal transduction events. Due to this feature, PTX has become a very useful pharmacological tool for the identification of G proteins in the plasma membrane.

Web site: http://www.delphion.com/details?pn=US06019979__

- **Pertussis toxoid made by reacting pertussis toxin with the nitrating agent TNM**

  Inventor(s): Winberry; Larry K. (Brockton, MA)

  Assignee(s): Massachusetts Health and Research Institute (Boston, MA)

  Patent Number: 5,989,564

  Date filed: September 12, 1991

  Abstract: A toxoid of pertussis toxin in which the pertussis toxin is modified essentially only at one or more tyrosine residues, as by the use of a nitrating agent such as tetranitromethane or by recombinant DNA techniques; a vaccine including the toxoid; and methods of preparing the toxoid and the vaccine.

  Excerpt(s): Whooping-cough is a severe, highly contagious respiratory disease resulting from infection with the bacterium Bordetella pertussis. At the present time there is no fully effective treatment, the disease is associated with substantial morbidity and mortality, and is widespread throughout the world. Whooping-cough is particularly severe in infants. ... Pertussis vaccine composed of killed cells has been playing a role in the reduction of whooping cough for more than 40 years throughout the world. At the same time, however, it is one of the most rejected of vaccines because of its adverse reactions. It is now time that the whole-cell vaccine be replaced by a more defined vaccine that is composed of specific components and is able to have its protective potency evaluated by means of purified reference protective antigens or antibodies. In

Japan, a pertussis vaccine in use since 1981 has had some adverse effects reduced by removal of the endotoxin from a fraction of culture supernatant of Bordetella pertussis phase I cells and inactivation of some of the toxicity with Formalin. The main components of the vaccine are formalinized pertussis toxin (PT) and filamentous hemagglutinin (FHA). Now we understand that PT is the most potent antigen and FHA is a helpful protective antigen and that their antibodies play an important role in protecting mice from infection and disease caused by the pathogen. ... The S1 subunit is one of the few proteins that does not contain lysine residues. This observation has important implications for the development of a new vaccine against pertussis, since normally for vaccine preparation, bacterial toxins are detoxified with chemicals that react mainly with lysine residues. Accordingly, we have observed that the detoxification of PT requires more severe conditions that those used for the other bacterial toxins and that following treatment with glutaraldehyde, S2, S3, S4 and S5 are crosslinked and form aggregates of high molecular weight, while S1 retains its original size.

Web site: http://www.delphion.com/details?pn=US05989564__

- **Pertussis toxin induced lymphocytosis**

  Inventor(s): Pauza, Jr.; C. David (Madison, WI)

  Assignee(s): Wisconsin Alumni Research Foundation (Madison, WI)

  Patent Number: 5,888,726

  Date filed: April 23, 1997

  Abstract: The present invention involves HIV evaluation and AIDS treatment by eliciting lymphocytosis with pertussis toxin in order to reveal the sequestered HIV or SIV in the lymph tissues enabling HIV infection analysis, viral quantification and treatment. The lymphocytosis itself causes an alleviation of the AIDS symptoms and a reduction in the viral load. The present invention could also be used in conjunction with a large variety of adjunct therapies.

  Excerpt(s): It has been found that the administration of pertussis toxin (PTx) in an amount of between 1 .mu.g/kg to about 50 .mu.g/kg induces lymphocytosis and alters the activity of secondary lymphoid tissue. Central to this approach is the question of whether the lymph nodes and lymphocytes are important to fight disease or whether in the case of AIDS they act as a substrate for the immunodeficiency virus. ... A third object of this invention is to provide a treatment for HIV infection and/or AIDS related symptoms. This HIV or AIDS treatment may be used by the administration of pertussis toxin itself or as a preconditioner in

conjunction with other treatments. ... Pertussis (PTx) is derived from Bordetella pertussis (whooping cough bacterium). PTx is a hexamer of 5 dissimilar subunits, combined molecular weight is approximately 117,000 Daltons. PTx is in the class of "A-B toxins", which includes cholera and diphtheria toxins. PTx consists of two functionally distinct components, one binds to the cell membrane, the other enters the cell where it exhibits its enzymatic actions.

Web site: http://www.delphion.com/details?pn=US05888726__

- **Efficacious vaccines against Bordetella pertussis comprising a combination of individually purified pertussis antigens**

  Inventor(s): Eckhardt; Thomas G. (New Windsor, NY), Gotto; John W. (Suffern, NY), McClintock; David K. (Ramsey, NJ), Scott; Jane V. (Chappaqua, NY)

  Assignee(s): American Cyanamid Company (Madison, NJ)

  Patent Number: 5,885,587

  Date filed: May 22, 1995

  Abstract: This invention is directed to a vaccine for the prevention of disease caused by Bordetella pertussis which comprises the pertussis antigens filamentous hemagglutinin, detoxified lymphocytosis promoting factor and a 69 kilodalton outer membrane protein, where said antigens are individually purified prior to being combined to form the vaccine. The invention is further directed to pertussis vaccines where the antigens are combined in any ratio, including ratios not possible in whole cell or co-purified acellular pertussis vaccines. The pertussis antigens may be further combined with other individually purified pertussis antigens, pertussis structural components, adjuvants, stabilizers and non-pertussis vaccine components.

  Excerpt(s): This invention relates to vaccines efficacious against Bordetella pertussis which are prepared by individually purifying specific pertussis antigens which are then combined to form the vaccine. In addition, the vaccine may contain pertussis structural components and non-pertussis vaccine components. ... The bacterium Bordetella pertussis is the causative agent of pertussis or whooping cough, a serious and potentially fatal infectious disease of the upper respiratory tract. Pertussis vaccines currently used contain chemically inactivated whole cells of B. pertussis. More recently, acellular pertussis vaccines were developed which are based on material obtained by chemical and physical fractionation of B. pertussis cultures. ... Whole cell vaccines contain the antigenic components necessary to provide protection from pertussis

disease and their efficacy in humans is generally well accepted. However, whole cell vaccines also contain components which are not required for protection. Some of these components, such as endotoxin, have been implicated in undesired effects which may occur coincident with pertussis immunization (Bibliography 1).

Web site: http://www.delphion.com/details?pn=US05885587__

- **Acellular pertussis vaccines and methods of preparing thereof**

  Inventor(s): Fahim; Raafat E. F. (524 Ceremonial Drive, Mississauga, Ontario, CA), Vose; John R. (54 bis Route de Paris, 69260 Charbonnieres-les-Bains , Ontario, FR), Thipphawong; John (45 Carlton Street Apt. 602, Toronto, Ontario, CA), Barreto; Luis (53 Crooked Stick Crescent, Concord, Ontario, CA), Jackson; Gail E. D. (10 Annette Gate, Richmond Hill, Ontario, CA), Tan; Larry U. L. (2424 Folkway Drive, Mississauga, Ontario, CA), Herbert; Andrew (199 Upper Canada Drive, North York, Ontario, CA), Klein; Michel H. (16 Munro Boulevard, Willowdale, Ontario, CA)

  Assignee(s): none reported

  Patent Number: 5,877,298

  Date filed: May 4, 1995

  Abstract: A fimbrial agglutinogen preparation is prepared from a bordetella strain, particularly a B. pertussis strain, by a multiple step procedure involving extraction of the fimbrial agglutinogens from cell paste and concentrating and purifying the extracted material. The fimbrial agglutinogen preparation may be used to prepare acellular pertussis vaccines with other pertussis antigens, including pertussis toxin or toxoid thereof, the 69 kDa protein and filamentous hemagglutinin and other Bordetella antigens.

  Excerpt(s): The present invention relates to acellular pertussis vaccines, components thereof, and their preparation. ... Whooping cough or pertussis is a severe, highly contagious upper respiratory tract infection caused by Bordetella pertussis. The World Health Organization estimates that there are 60 million cases of pertussis per year and 0.5 to 1 million associated deaths (ref. 1. Throughout this specification, various references are referred to in parenthesis to more fully describe the state of the art to which this invention pertains. Full bibliographic information for each citation is found at the end of the specification, immediately following the claims. The disclosures of these references are hereby incorporated by reference into the present disclosure). In unvaccinated populations, a pertussis incidence rate as high as 80% has been observed in children

under 5 years old (ref. 2). Although pertussis is generally considered to be a childhood disease, there is increasing evidence of clinical and asymptomatic disease in adolescents and adults (refs. 3, 4 and 5). ... The introduction of whole-cell vaccines composed of chemically- and heat-inactivated B. pertussis organisms in the 1940's was responsible for a dramatic reduction in the incidence of whooping cough caused by B. pertussis. The efficacy rates for whole-cell vaccines have been estimated at up to 95% depending on case definition (ref. 6). While infection with B. pertussis confers life-long immunity, there is increasing evidence for waning protection after immunization with whole-cell vaccines (ref. 3). Several reports citing a relationship between whole-cell pertussis vaccination, reactogenicity and serious side-effects led to a decline in vaccine acceptance and consequent renewed epidemics (ref. 7). More recently defined component pertussis vaccines have been developed.

Web site: http://www.delphion.com/details?pn=US05877298__

- **Pharmaceutical compositions for the treatment of autoimmune diseases comprising the B-oligomer of pertussis toxin or its subunits**

  Inventor(s): Ben-Nun; Avraham (Yavne, IL)

  Assignee(s): Yeda Research and Development Co. Ltd. (Rehovot, IL)

  Patent Number: 5,858,965

  Date filed: July 30, 1997

  Abstract: The invention provides the use of a protein selected from the B-oligomer of pertussis toxin, an individual subunit S2, S3, S4 or S5 thereof, or a combination of the subunits, for the preparation of pharmaceutical compositions comprising them for the treatment of autoimmune diseases.

  Excerpt(s): The present invention is generally in the field of agents that may be used for the treatment of autoimmune diseases, and more particularly relates to pharmaceutical compositions comprising the B-oligomer of pertussis toxin or one of its subunits S2, S3, S4 or S5, or combinations thereof, useful for protection against autoimmune diseases. ... The gram-negative bacterium Bordetella pertussis (B. pertussis), the causative agent of whooping cough, produces several virulence factors. Pertussis toxin (PT), the major virulence component of B. pertussis, appears to contain an important epitope that leads to the formation of antibodies capable of protecting against the disease. Therefore, PT has been extensively investigated with regard to its possible use in preparing vaccines for whooping cough (Black et al., 1988). ... Pertussis toxin is a 105-kDa hexameric protein composed of five distinct non-covalently linked polypeprides designated (in the order of decreasing molecular

weight) S1-S5.PT can be divided into two distinct functional units, the enzymatically active toxic A-protomer, consisting of a single polypeptide (S1), and the pentameric B-oligomer (S2, S3, two copies of S4, and S5, i.e. molar ratiol:1:2:1). The B-oligomer is responsible for binding of the toxin to the surface of eukaryotic target cells. The two S4 polypeptides form two distinct heterodimers with S2 and S3, which are in turn held together by S5 (see review by Gierschik, 1992).

Web site: http://www.delphion.com/details?pn=US05858965__

- **Genes for the export of pertussis holotoxin**

  Inventor(s): Baker; Steven M. (Rochester, NY), Deich; Robert A. (Rochester, NY)

  Assignee(s): American Cyanamid Company (Parsippany, NJ)

  Patent Number: 5,643,747

  Date filed: March 31, 1994

  Abstract: The invention relates to a cloned region of the Bordetella pertussis genome located 3' of the ptx operon encoding factors required for expression, assembly and secretion of pertussis holotoxin. Methods for obtaining increased levels of holotoxin production using homologous and heterologous hosts are also described.

  Excerpt(s): Bordetella pertussis is the primary causative agent of pertussis, or whooping cough, an acute infection of the respiratory tract. Pertussis occurs worldwide and is most severe when it infects unimmunized infants. Currently available vaccines (whole cell and partially purified acellular) are believed to have approximately 80-90% efficacy in the first few years after immunization. Effective immunization declines, in the case of whole cell vaccines, to almost no efficacy by 12 years postimmunization. The duration of protection provided by the acellular vaccine is unknown. The currently available vaccines are accompanied by a number of adverse reactions, some of which are severe or life-threatening. These severe reactions can include high fever, seizures, a shock-like hypo responsive state, encephalopathy and severe allergic reactions. In addition, individuals completely immunized with these vaccines can still develop pertussis. A purified component vaccine specific to the pertussis holotoxin would be useful for developing specific immunity to B. pertussis while minimizing potential adverse side effects caused by the currently available complex whole-cell or partially purified acellular vaccines. ... One of the limitations of a purified component B. Pertussis vaccine is the time and expense involved in the growth and processing of large fermentor volumes of B. pertussis required to obtain

sufficient amounts of pertussis holotoxin (PT) or mutated forms of the toxin protein, known as cross reactive materials or CRMs. Several investigators have attempted to overcome this limitation by over expression of PT using either homologous expression systems in B. pertussis , or in closely related B. parapertussis or B. bronchiseptica species (Lee, C. K. et al., Infect. Immun. 57:1413-1418 (1989)), or by utilizing heterologous expression systems such as E. coli or B. subtilis (Burnette, W. N. et al., Bio/Technology 699-705 (1988); Locht, C. and J. M. Keith, Science 232:1258-1264 (1986); Nicosia, A., et al., Proc. Natl. Acad. Sci. USA 83:4631 (1986)). Unfortunately, these efforts have failed to provide any system capable of consistently yielding amounts of PT holotoxin significantly greater than the amount obtained from cultures of wild type B. pertussis. ... The present invention is based upon the identification of a cloned region of the B. pertussis genome. This includes a purified or partially purified nucleic acid sequence comprising an approximately 8 kb region of the B. pertussis genome, defined herein as the pts region, located immediately 3' (downstream) of the B. pertussis ptx operon. This cloned region encodes factors required for efficient expression and secretion of pertussis holotoxin. The nucleic acid sequence comprises at least six genes, designated ptsAB (SEQ ID NO: 2), ptsC (SEQ ID NO: 4), ptsD (SEQ ID NO: 6), ptsE (SEQ ID NO: 8), ptsF (SEQ ID NO: 10) and ptsG (SEQ ID NO: 12), (encoding polypeptides SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO:11 and SEQ ID NO: 13, respectively) consisting essentially of the nucleotide sequence as shown in and SEQ ID NO: 1. Nucleic acid sequences complementary to all or a portion of the sequence described by SEQ ID NO: 1 and nucleic acid sequences which hybridize under stringent conditions to all or a portion of the sequence described by SEQ ID NO: 1 or its complement are also embraced by the present invention.

Web site: http://www.delphion.com/details?pn=US05643747__

- **Cloning and sequencing of the gene which codes for a new pilinic subunit of bordella pertussis**

  Inventor(s): Pedroni; Paola (Milan, IT), Riboli; Barbara (Cremona, IT), De Ferra; Francesca (Milan, IT), Grandi; Guido (Milan, IT), Toma; Salvatore (Milan, IT), Arico ; Beatrice (Quercegrossa-Siena, IT), Rappuoli; Rino (Quercegrossa-Siena, IT)

  Assignee(s): Sclavo S.p.A. (Siena, IT), Eniricerche S.p.A. (Milan, IT)

  Patent Number: 5,622,706

  Date filed: November 4, 1994

Abstract: The cloning and sequencing of the gene which codes for a new pilinic subunit of Bordetella pertussis are described. The aminoacid sequence of the mature subunit, deduced from its necleotide sequence, is similar but not identical to that of the known pilins 2, 3 and 6. Polypeptides having the aminoacid sequence of the mature pilinic subunit or of regions thereof are particularly useful for the development of synthetic acellular vaccines against pertussis.

Excerpt(s): The present invention relates to the cloning and sequencing of the gene which codes for a new proteinaceous subunit of the pili of Bordetella pertussis. ... Pertussis is a disease of the respiratory tract caused by Bordetalla pertussis (B. pertussis), a microorganism which is transmitted from a sick person to a susceptible healthy individual during the catarrhal and convulsive stage. ... Pertussis may cause convulsions, brain damage and sometimes death, particularly in infants and in newborn babies without maternal anti-pertussis antibodies. An effective vaccine against the disease is therefore particularly desirable.

Web site: http://www.delphion.com/details?pn=US05622706__

- **Cloning of the gene which codes for the pilinic subunit fim3 of Bordetella pertussis**

  Inventor(s): Cuzzoni; Anna (Pavia, IT), Riboli; Barbara (Cremona, IT), Pedroni; Paola (Milan, IT), De Ferra; Francesca (San Donato Mil., IT), Grandi; Guido (Segrate, IT)

  Assignee(s): Eniricerche S.P.A. (Milan, IT)

  Patent Number: 5,525,489

  Date filed: March 9, 1993

  Abstract: A cloned DNA fragment of Bordetella pertussis including the gene which codes for the pilinic subunit fim3, vectors which contain it and microorganisms transformed by the vectors.The protein and peptides corresponding to at least one epitope of the gene which codes for the pilinic subunit fim3 are particularly useful for the development of acellular anti-pertussis vaccines.In addition, a strain of Bordetella modified by a recombinant replication or genome-integration vector containing the cloned DNA fragment or the gene or a fraction thereof is particularly suitable for the development of a cellular anti-pertussis vaccine.

  Excerpt(s): The present invention relates to the cloned and sequenced gene which codes for the pilinic subunit fim3 of Bordetella pertussis or a peptide corresponding to at least one epitope thereof, the cloned DNA

fragment of Bordetella pertussis including the gene, vectors containing it, microorganisms transformed by the vectors and their use for the development of a vaccine effective against pertussis. ... Pertussis is a disease of the respiratory tract caused by Bordetella pertussis (B.pertussis), a microorganism which is transmitted from a sick person to a susceptible healthy individual during the catarrhal and convulsive stage (the virulent stage or Stage I). ... Pertussis may cause convulsions, brain damage and sometimes death, particularly in infants and newborn babies without maternal anti-pertussis antibodies; an effective anti-pertussis vaccine is therefore particularly desirable.

Web site: http://www.delphion.com/details?pn=US05525489__

Patent Applications on Pertussis

As of December 2000, U.S. patent applications are open to public viewing.[24] 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 pertussis:

- **Purification of a pertussis outer membrane protein**

  Inventor(s): Jackson, Gail ; (Richmond Hill, CA), Fahim, Raafat ; (Mississauga, CA), Tan, Larry ; (Mississauga, CA), Chong, Pele ; (Richmond Hill, CA), Voss, John ; (Aurora, CA), Klein, Michel ; (Willowdale, CA)

  Correspondence: Michael S. Greenfield; McDonnell Boehnen Hulbert & Berghoff; 32nd Floor; 300 S. Wacker Drive; Chicago; IL; 60606; US

  Patent Application Number: 20010051163

  Date filed: June 25, 2001

  Abstract: Pertactin (formerly 69 kDa protein) is recovered in stable biologically pure form having no detectable adenylate cyclase activity from fermentation broth from the fermentation of Bordetella pertussis as well as from the cells. The broth is processed to selectively remove pertussis toxin (PT) and filamentous haemagglutinin (FHA), the pertactin is precipitated by ammonium sulphate and the precipitate is dissolved in buffer at pH 6.0 to 8.5, the solution then is passed through hydroxyapatite and Q-Sepharose.RTM. chromatograph columns before final ultrafiltration. Cells are extracted with urea and the extract ultrafiltered and diafiltered. The pertactin is precipitated from the extract

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

and the precipitate processed as above. In a variation, the broth is contacted with ammonium sulphate to precipitate pertactin, PT and FHA, the precipitate is dissolved and the PT and FHA selectively removed, before the solution is passed to the chromatograph columns.

Excerpt(s): The present invention relates to a novel process for the purification of an outer membrane protein of Bordetella pertussis, having a molecular weight of approximately 69,000 Daltons, formerly called the 69kDa protein and now called pertactin, and obtained from the fermentation broth and cellular extracts of the said organism. The protein obtained by the process is to be used in a "component" vaccine to protect against the disease of whooping cough. ... The disease of whooping cough or pertussis is a result of infection by Bordetella pertussis, and is a serious and debilitating human disease particularly in young children. For the last fifty years the disease has been controlled through large-scale immunization programmes. The current licensed vaccine in North America is a "whole cell" vaccine prepared by growing the organism in fermentors and then treating the resulting B. pertussis cells with chemical agents, such as formaldehyde, to kill the organism and inactivate toxic proteins. The cells are resuspended and then used directly or in combination with other antigens. This vaccine, although highly efficacious, has been associated with clinical symptoms that include fever, local reactions, high-pitched crying and convulsions. Despite the fact that there is no proven relation between these symptoms and the vaccine, there has been decreased public acceptance of this vaccine and in a number of countries, e.g. Japan, Sweden and the U.K., decreased immunization has led to outbreaks of the disease. The need for a more defined vaccine has been recognized and considerable effort has been directed by several manufacturers and researchers towards the development of an efficacious pertussis vaccine that consists of a small number of highly purified proteins. This vaccine has been termed a component vaccine. ... This search has been hampered by a lack of information on the mechanism of pathogenesis of B. pertussis. Many virulence associated factors, such as pertussis toxin (PT), also known as lymphocytosis promoting factor (LPF), filamentous haemagglutinin (FHA), adenylate cyclase, lipopolysaccharide, agglutinogens and other outer membrane proteins have been suggested for inclusion in an "acellularl" vaccine, which is less defined than the component vaccine. Much of the work on acellular vaccines has concentrated on a PT-based vaccine. Results of a recent clinical trial have indicated that a vaccine consisting entirely of PT-toxoid only partially protected children from the infection. A PT/FHA combination showed slightly higher efficacy but this was still lower than that obtained for the whole-cell vaccine.

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

- **Acellular pertussis vaccine with diphthriae-and tetanus-toxoids**

  Inventor(s): Florent, Patrick ; (Brussels, BE), Stephenne, Jean ; (Rixensart, BE), Vandecasserie, Christian ; (Lasne, BE)

  Correspondence: GLAXOSMITHKLINE; Corporate Intellectual Property - UW2220; P.O. Box 1539; King of Prussia; PA; 19406-0939; US

  Patent Application Number: 20010014331

  Date filed: April 6, 2001

  Abstract: This invention relates to a diphtheria, tetanus and pertussis vaccine comprising a low dose of each of diphtheria toxoid (D), tetanus toxoid (T), pertussis toxin (PT), filamentous haemagglutinin (FHA) and pertactin (69K). The vaccine maintains an ability to prevent pertussis while showing exceptionally low reactogenicity. Combination vaccines comprising additional antigens are also provided.

  Excerpt(s): The present invention relates to new vaccine formulations, comprising a low dose of the 69 kda outer membrane protein of Bordetella pertussis (hereinafter termed `69 K` or `69 K antigen` or pertactin, disclosed in European Patent 0 162 639. Recombinant 69 K (P69) has been described by N F Fairweather et al, Symposium On Pertussis (Bethesda), Sep. 26-28 1990). The invention in particular relates to a vaccine comprising more than one antigen, especially a multivalent vaccine, that is: a vaccine for the amelioration or treatment of more than one disease state, in which a low dose of 69 K is present. The present invention also relates to the production and use of such vaccines in medicine. ... It is known that 69 K is an important component of acellular pertussis vaccines (Pa vaccines) for the effective prevention of pertussis. ... A study on the dose responses of 5 acellular pertussis vaccines in healthy adults was published by the US National Institutes of Health (NIH) in May 1996 by Keitel, W. et al.

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

- **Acellular Pertussis Vaccines and Methods of Preparation Thereof**

  Inventor(S): Vose, John R ; (Tassin La Demi-Lune, Fr), Fahim, Raafat E F ; (Ontario, Ca), Jackson, Gail E D ; (Ontario, Ca), Tan, Larry U L ; (Ontario, Ca), Herbert, Andrew ; (East York, Ca), Boux, Leslie ; (Quebec, Ca), Barreto, Luis ; (Ontario, Ca), Thipphawong, John ; (Mountain View, Ca), Klein, Michel H ; (Ontario, Ca)

  Correspondence: Michael I Stewart; Sim & Mcburney; 330 University Avenue; 6th Floor; Ontario; M5g1r7; Ca

  Patent Application Number: 20010009666

  Date filed: June 9, 1998

  Abstract: Acellular pertussis vaccines comprise purified toxin or toxoid thereof, filamentous haemagglutinin, pertactin and fimbrial agglutinogens formulated to confer protection to at least 70% of members of an at-risk population. The fimbrial agglutinogens may be prepared from a Bordetella strain, particularly a B. pertussis strain, by a multiple step procedure involving extraction of the fimbrial agglutinogens from cell paste and concentrating and purifying the extracted material.

  Excerpt(s): The present invention relates to acellular pertussis vaccines, components thereof, and their preparation. ... Whooping cough or pertussis is a severe, highly contagious upper respiratory tract infection caused by Bordetella pertussis. The World Health Organization estimates that there are 60 million cases of pertussis per year and 0.5 to 1 million associated deaths (ref. 1. Throughout this specification., various references are referred to in parenthesis to more fully describe the state of the art to which this invention pertains. Full bibliographic information for each citation is found at the end of the specification, immediately following the claims. The disclosures of these references are hereby incorporated by reference into the present disclosure) In unvaccinated populations, a pertussis incidence rate as high as 80% has been observed in children under 5 years old (ref. 2). Although pertussis is generally considered to be a childhood disease, there is increasing evidence of clinical and asymptomatic disease in adolescents and adults (refs. 3, 4 and 5). ... The introduction of whole-cell vaccines composed of chemically- and heat-inactivated B. pertussis organisms in the 1940's was responsible for a dramatic reduction in the incidence of whooping cough caused by B. pertussis. The efficacy rates for whole-cell vaccines have been estimated at up to 95% depending on case definition (ref. 6) . While infection with B. pertussis confers life-long immunity, there is increasing evidence for waning protection after immunization with whole-cell vaccines (ref. 3). Several reports citing a relationship between whole-cell pertussis vaccination, reactogenicity and serious side-effects led to a

decline in vaccine acceptance and consequent renewed epidemics (ref. 7). More recently defined component pertussis vaccines have been developed.

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 pertussis, you can access the U.S. Patent Office archive via the Internet at no cost to you. This archive is available at the following Web address: **http://www.uspto.gov/main/patents.htm**. Under "Services," click on "Search Patents." You will see two broad options: (1) Patent Grants, and (2) Patent Applications. To see a list of granted patents, perform the following steps: Under "Patent Grants," click "Quick Search." Then, type "pertussis" (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 pertussis. You can also use this procedure to view pending patent applications concerning pertussis. Simply go back to the following Web address: **http://www.uspto.gov/main/patents.htm**. Under "Services," click on "Search Patents." Select "Quick Search" under "Patent Applications." Then proceed with the steps listed above.

Vocabulary Builder

Chromosomal: Pertaining to chromosomes. [EU]

Convulsion: A violent involuntary contraction or series of contractions of the voluntary muscles. [EU]

Detoxification: Treatment designed to free an addict from his drug habit. [EU]

Extraction: The process or act of pulling or drawing out. [EU]

Fermentation: An enzyme-induced chemical change in organic compounds that takes place in the absence of oxygen. The change usually results in the production of ethanol or lactic acid, and the production of energy. [NIH]

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]

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

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]

Spasmodic: Of the nature of a spasm. [EU]

Tetranitromethane: Corrosive oxidant, explosive; additive to diesel and rocket fuels; causes skin and lung irritation; proposed war gas. A useful reagent for studying the modification of specific amino acids, particularly tyrosine residues in proteins. Has also been used for studying carbanion formation and for detecting the presence of double bonds in organic compounds. [NIH]

Toxoids: Preparations of pathogenic organisms or their derivatives made nontoxic and intended for active immunologic prophylaxis. They include deactivated toxins. [NIH]

CHAPTER 6. BOOKS ON PERTUSSIS

Overview

This chapter provides bibliographic book references relating to pertussis. You have many options to locate books on pertussis. The simplest method is to go to your local bookseller and inquire about titles that they have in stock or can special order for you. Some patients, however, feel uncomfortable approaching their local booksellers and prefer online sources (e.g. **www.amazon.com** and **www.bn.com**). In addition to online booksellers, excellent sources for book titles on pertussis include the Combined Health Information Database and the National Library of Medicine. Once you have found a title that interests you, visit your local public or medical library to see if it is available for loan.

Book Summaries: Federal Agencies

The Combined Health Information Database collects various book abstracts from a variety of healthcare institutions and federal agencies. To access these summaries, go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. You will need to use the "Detailed Search" option. To find book summaries, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer. For the format option, select "Monograph/Book." Now type "pertussis" (or synonyms) into the "For these words:" box. You will only receive results on books. You should check back periodically with this database which is updated every 3 months. The following is a typical result when searching for books on pertussis:

- **The Edge of Discovery**

  Contact: US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, 31 Center Dr MSC 2520, Bethesda, MD, 20892-2520, (301) 496-5717, http://www.niaid.nih.gov.

  Summary: This monograph presents information about intramural and extramural programs conducted by the National Institute of Allergy and Infectious Diseases (NIAID). It presents highlights of research projects in immunology; allergy and asthma; Acquired immunodeficiency syndrome (AIDS); Human immunodeficiency virus (HIV), including treatment programs and epidemiology; and other Sexually transmitted diseases (STD's). Development of new vaccines for pertussis, meningitis, and hepatitis B is described, as is antiviral drug research and international collaborations in malaria and other parasite research.

- **Disease Prevention: Health Facts**

  Source: Santa Cruz, CA, ETR Associates, 90 p., 1994.

  Contact: ETR Associates, P.O. Box 1830, Santa Cruz, CA 95061. (800) 321-4407.

  Summary: Disease Prevention: Health Facts, a book in the Health Facts series, presents issues of concern surrounding disease prevention. Its purpose is to provide background information for educators as they teach young people about health. Section one, Influences on Health and Disease, discusses the definition of disease; what risk means; and primary, secondary, and tertiary prevention. Section two, Infectious Disease, highlights the infection cycle, natural defenses, and the immune response. It discusses the importance of immunization and the diseases prevented by immunization, including (1) diphtheria, (2) tetanus, (3) pertussis, (4) influenza, (5) pneumococcal pneumonia, (6) measles, (7) rubella, (8) mumps, and (9) hepatitis B. Section three, Lifestyle Choices and Chronic Disease, lists the components of a healthy lifestyle and explains how lifestyle can help prevent certain chronic diseases such as heart disease, cancer, stroke and chronic obstructive pulmonary disease. Section four, Other Noninfectious Diseases, discusses heredity, environment, autoimmune diseases, and diseases with unknown causes. Autoimmune diseases include multiple sclerosis, rheumatoid arthritis, and systemic lupus erythematosus. Section five, Mental Illness, explains the four general categories of mental illness: (1) Schizophrenia, (2) mood disorders, (3) borderline personality disorder, and (4) anxiety disorders. Categories of practitioners who can provide help for people with mental illness include (1) psychiatrists, (2) clinical psychologists, (3) clinical or

psychiatric social workers, (4) psychiatric nurses, (5) mental health counselors, and (6) marriage and family counselors. A glossary and list of resources are provided.

- **Adverse events associated with childhood vaccines: Evidence bearing on causality**

  Source: Washington, DC: National Academy Press. 1994. 480 pp.

  Contact: Available from National Academy Press, 2101 Constitution Avenue, N.W., Lockbox 285, Washington, DC 20002 / Web site: http://www.nap.edu. $49.95 plus $4.00 shipping and handling; prepayment required by check, money order, or credit card; purchase orders accepted.

  Summary: This report sponsored by the Institute of Medicine discusses adverse effects subsequent to immunizations from vaccines other than the pertussis and rubella vaccine. It is a followup to an initial report published in 1991 which reviewed possible adverse consequences of pertussis and rubella vaccines. The report of the Vaccine Safety Committee concluded that their evidence was insufficient to either reject or accept a causal relationship between a vaccine and an adverse effect.

Book Summaries: Online Booksellers

Commercial Internet-based booksellers, such as Amazon.com and Barnes & Noble.com, offer summaries which have been supplied by each title's publisher. Some summaries also include customer reviews. Your local bookseller may have access to in-house and commercial databases that index all published books (e.g. Books in Print®). The following have been recently listed with online booksellers as relating to pertussis (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- **A Shot in the Dark: Why the P in the Dpt Vaccination May Be Hazardous to Your Child's Health** by Harris L. Coulter, Barbara Loe Fisher; ISBN: 089529463X; http://www.amazon.com/exec/obidos/ASIN/089529463X/icongroupinterna
- **Adverse Effects of Pertussis and Rubella Vaccines** by Christopher P. Howson (Editor), et al (1991); ISBN: 0309044995; http://www.amazon.com/exec/obidos/ASIN/0309044995/icongroupinterna
- **Bordetella pertussis : immunological and other biological activities** by John J. Munoz; ISBN: 0824765079;

http://www.amazon.com/exec/obidos/ASIN/0824765079/icongroupinterna

- **Pathogenesis and Immunity in Pertussis** by Roger Parton (Photographer), A. C. Wardlaw (Photographer) (1988); ISBN: 0471918202; http://www.amazon.com/exec/obidos/ASIN/0471918202/icongroupinterna
- **Pertussis (Developments in Biological Standardization, Vol 61)** by C. R. Manclark, W. Hennessen (Editor); ISBN: 3805542100; http://www.amazon.com/exec/obidos/ASIN/3805542100/icongroupinterna
- **Pertussis Toxin** by Ronald D. Sekura, et al; ISBN: 0126354804; http://www.amazon.com/exec/obidos/ASIN/0126354804/icongroupinterna
- **Pertussis Vaccine Trials: Istituto Superiore Di Sanita, Rome, Italy October 30-November 1, 1995 (Developments in Biological Standardization, 89)** by Fred Brown (Editor) (1997); ISBN: 3805564813; http://www.amazon.com/exec/obidos/ASIN/3805564813/icongroupinterna
- **Pertussis: Evaluation and Research on Acellular Pertussis Vaccines: Proceedings (Developments in Biological Standardization, Vol. 73)** by Y. Sato, et al; ISBN: 3805554575; http://www.amazon.com/exec/obidos/ASIN/3805554575/icongroupinterna
- **Ring and the Fire Stories from Wagner's Nibelung Ope** by C. R. Bulla; ISBN: 0690702523; http://www.amazon.com/exec/obidos/ASIN/0690702523/icongroupinterna

The National Library of Medicine Book Index

The National Library of Medicine at the National Institutes of Health has a massive database of books published on healthcare and biomedicine. Go to the following Internet site, **http://locatorplus.gov/**, and then select "Search LOCATORplus." Once you are in the search area, simply type "pertussis" (or synonyms) into the search box, and select "books only." From there, results can be sorted by publication date, author, or relevance. The following was recently catalogued by the National Library of Medicine:[25]

[25] In addition to LOCATORPlus, in collaboration with authors and publishers, the National Center for Biotechnology Information (NCBI) is adapting biomedical books for the Web. The

- **Acelluvax: social acceptance and economic impact of a recombinant vaccine.** Author: CERISS, Centro per l'educazione, la ricerca, e l'informazione su scienza e società, FhG-ISI, Fraunhofer-Institut für Systemtechnik und Innovationsforschung, [and] Directorate-G; Year: 1998; Luxembourg: Office for Official Publications of the European Communities, c1998; ISBN: 9282839354 (alk. paper)
- **Adverse effects of pertussis and rubella vaccines: a report of the Committee to Review the Adverse Consequences of Pertussis and Rubella Vaccines.** Author: Christopher P. Howson, Cynthia J. Howe, and Harvey V. Fineberg, editors; Division of Health Promotion and; Year: 1991; Washington, D.C.: National Academy Press 1991; ISBN: 0309044995 http://www.amazon.com/exec/obidos/ASIN/0309044995/icongroupinterna
- **Bordetella pertussis: immunological and other biological activities.** Author: J. J. Munoz, R. K. Bergman; Year: 1977; New York: Dekker, c1977; ISBN: 0824765079 http://www.amazon.com/exec/obidos/ASIN/0824765079/icongroupinterna
- **Collaborative study on test systems to assess toxicity of whole cell pertussis vaccine.** Author: I. van Straaten-van de Kappelle ... [et al.]; Year: 1995; Bilthoven, Netherlands: National Institute of Public Health and Environmental Protection, [1995]
- **Epidemiology of pertussis and pertussis immunization in the United Kingdom and the United States: a comparative study.** Author: James D. Cherry; Year: 1984; Chicago: Year Book Medical Publishers, c1984
- **Informal consultation on the control of pertussis with whole cell and acellular vaccines: Geneva, 18-19 May 1998.** Author: Clarke, John H. (John Henry), 1852-1931; Year: 1999; Geneva: Dept. of Vaccines and Other Biologicals, World Health Organization , 1999
- **International Symposium on Pertussis, Evaluation and Research on Acellular Pertussis Vaccines: proceedings of a symposium supported by the National Institute of Health, Tokyo, and the International Association of Biological Standardization: held at the.** Author:

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books may be accessed in two ways: (1) by searching directly using any search term or phrase (in the same way as the bibliographic database PubMed), or (2) by following the links to PubMed abstracts. Each PubMed abstract has a "Books" button that displays a facsimile of the abstract in which some phrases are hypertext links. These phrases are also found in the books available at NCBI. Click on hyperlinked results in the list of books in which the phrase is found. Currently, the majority of the links are between the books and PubMed. In the future, more links will be created between the books and other types of information, such as gene and protein sequences and macromolecular structures. See **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books.**

International Symposium on Pertussis, Evaluation, and Research on Acellular Pertussis Vaccines (1990: Teijin Institute of Education and Training); Year: 1991; Basel; New York: Karger, c1991; ISBN: 3805554575 http://www.amazon.com/exec/obidos/ASIN/3805554575/icongroupinterna

- **International Symposium on Pertussis.** Author: Charles R. Manclark, James C. Hill, editors; Year: 1979; Bethesda, Md.: U. S. Dept. of Health, Education, and Welfare, Public Health Service, National Institutes of Health; Washington: for sale by the Supt. of Docs., U. S. Govt. Print. Off., [1979?]
- **Paediatric surveillance of pertussis in the Netherlands in 1998.** Author: H.E. de Melker ... [et al.]; Year: 2000; Bilthoven, Netherlands: RIVM National Institute of Public Health and the Environment, [2000]
- **Pathogenesis and immunity in pertussis.** Author: edited by Alastair C. Wardlaw and Roger Parton; Year: 1988; Chichester; New York: Wiley, c1988; ISBN: 0471918202 http://www.amazon.com/exec/obidos/ASIN/0471918202/icongroupinterna
- **Peckham report: national immunisation study: factors influencing immunisation uptake in childhood.** Author: Coulter, Harris L. (Harris Livermore), 1932-; Year: 1989; London: Dept. of Paediatric Epidemiology, Institute of Child Health; Horsham, West Sussex: Action Research for the Crippled Child, c1989; ISBN: 090093137X
- **Pertussis: a critical appraisal = Kinkhoest: een beoordeling.** Author: Health Council of the Netherlands, Standing Committee on Infectious Diseases and Immunology; Year: 1997; Rijswijk [Netherlands]: The Council, [1997]; ISBN: 9055491683
- **Pertussis: description and evaluation based on surveillance data of 1997 and 1998.** Author: S.E. Neppelenbroek ... [et al.]; Year: 1999; Bilthoven, Netherlands: National Institute of Public Health and the Environment, [1999]
- **Pertussis Serological Potency Test collaborative study to evaluate the replacement of the Mouse Protection Test.** Author: A.A.J. van der Ark ... [et al.]; Year: 1999; Bilthoven: RIVM, [1999]
- **Pertussis surveillance: a global meeting: Geneva, 16-18 October 2000.** ; Year: 2001; Geneva: World Health Organization, Dept. of Vaccines and Biologicals, 2001
- **Pertussis toxin.** Author: edited by Ronald D. Sekura, Joel Moss, Martha Vaughan; Year: 1985; Orlando: Academic Press, 1985; ISBN: 0126354804 (alk. paper)

http://www.amazon.com/exec/obidos/ASIN/0126354804/icongroupinterna

- **Pertussis vaccine trials: Istituto Superiore di Sanità, Rome, Italy, October 30-November 1, 1995.** Author: volume editors, Fred Brown ... [et al.]; Year: 1997; Basel; New York: Karger, 1997; ISBN: 3805564813 http://www.amazon.com/exec/obidos/ASIN/3805564813/icongroupinterna
- **Proceedings: Symposium on Stability and Effectiveness of Measles, Poliomyelitis and Pertussis Vaccines: 28 & 29 September 1976.** Author: organized by Yugoslav Academy of Sciences and Arts and Institute of Immunology: editor, Drago Iki´c; Year: 1976; Zagreb: The Academy, 1976
- **Proceedings of the Fourth International Symposium on Pertussis: a joint meeting of the International Association of Biological Standardization and the World Health Organization, held at the executive board room of the World Health Organization, Geneva, S.** Author: International Symposium on Pertussis (4th: 1984: Geneva, Switzerland); Year: 1985; Basel; New York: Karger, c1985; ISBN: 3805542100 (pbk.) http://www.amazon.com/exec/obidos/ASIN/3805542100/icongroupinterna
- **Proceedings of the Sixth International Symposium on Pertussis, Jack Masur Auditorium, Warren Grant Magnuson Clinical Center, National Institutes of Health, Bethesda, Maryland, September 26-28, 1990.** Author: sponsored by Center for Biologics Evaluation and Resear; Year: 1990; Bethesda, Md.: Dept. of Health and Human Services, United States Public Health Service, Food and Drug Administration, 1990
- **Randomised controlled study with whole-cell or acellular pertussis vaccines in combination with regular DT-IPV vaccine and a new poliomyelitis (IPV-Vero) component in children 4 years of age in the Netherlands.** Author: G.A.M. Berbers ... [et al.]; Year: 1999; Bilthoven: RIVM, [1999]
- **Task force report on pertussis: hearing before the committee on Labor and Human Resources, United States Senate, Ninety-eighth Congress, first session on examination of the task force report on the vaccine pertussis, July 22, 1983.** Author: United States. Congress. Senate. Committee on Labor and Human Resources; Year: 1983; Washington: U.S. G.P.O., 1983
- **Vaccination and behavioral disorders: a review of the controversy.** Author: Greg Wilson; Year: 2000; Lismore, NSW: Tuntable Creek Pub., c2000; ISBN: 0646399411

- **Whooping-cough cured with pertussin [microform]: its homoeopathic nosode.** Author: by John Henry Clarke; Year: 1906; London, England: Homoeopathic Pub. Co., 1906

Chapters on Pertussis

Frequently, pertussis will be discussed within a book, perhaps within a specific chapter. In order to find chapters that are specifically dealing with pertussis, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and pertussis using the "Detailed Search" option. Go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find book chapters, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Book Chapter." By making these selections and typing in "pertussis" (or synonyms) into the "For these words:" box, you will only receive results on chapters in books. The following is a typical result when searching for book chapters on pertussis:

- **Routine Medical Care and Epilepsy**

  Source: in Seizures and Epilepsy in Childhood: A Guide for Parents. (Second Edition). Freeman, J.M.; Vining, E.; Pillas, D.J. Baltimore, MD, Johns Hopkins University Press, pp. 277-279, 1997.

  Contact: Johns Hopkins University Press, 2715 North Charles Street, Baltimore, MD. 21218-4319.

  Summary: Routine Medical Care and Epilepsy, a chapter in Seizures and Epilepsy in Childhood: A Guide for Parents, discusses issues related to providing routine medical care to children with epilepsy. It discusses in a question and answer format the topics (1) whether a child can be put to sleep during dental procedures, (2) should children with epilepsy who require anesthesia for common procedures be treated differently from children without epilepsy, (3) can cold medicines and cough syrups trigger seizures, (4) are there other medications that a child with epilepsy should not take, (5) should children with epilepsy take vitamins, and (6) can children with epilepsy receive routine immunizations? The authors note that anesthetics used in dentistry and in common surgical procedures do not cause seizures. Antihistamines, decongestants, and other cold medications have been reported to reduce the seizure thresholds. Some children may be sensitive to these medications. If a child repeatedly has seizures after receiving one of these medications, then it is considered prudent not to use them. Although some stimulants

(Dexedrine, Ritalin, Cylert) that have been used to manage the hyperactivity of attention deficit disorders have been reported to cause seizures, the general consensus is that their benefits outweigh any potential risks. There is no evidence that vitamins have affects on epilepsy except in the case where a patient has a clear vitamin deficiency. Epileptic children should receive the full set of immunizations; however, some caution should be exercised when immunizing against diphtheria with diphtheria/pertussis/tetanus (DPT) since DPT may cause a fever. A seizure could occur in children who are prone to febrile seizures.

- **Prevention of Epilepsy**

  Source: in Epilepsies of Childhood. Third Edition. O'Donohoe, N.V. Oxford, England, pp. 304-309, 1994.

  Contact: Butterworth-Heinemann Ltd., Linacre House, Jordan Hill, Oxford, England OX2 8DP.

  Summary: Prevention of Epilepsy, a book chapter in Epilepsies of Childhood, Third Edition, reviews known preventable causes of epilepsy in infants and children, including genetic, prenatal, perinatal, neonatal, and infectious causes. Genetic factors can act by (1) causing the transmission of a disease, such as tuberous sclerosis or Down's syndrome, of which seizures may be a symptom; or (2) affecting a gene or several genes which appear to alter the individual's convulsive susceptibility. Prenatal infections such as rubella, cytomegalovirus infection, syphilis and toxoplasmosis can damage the brain and cause seizures. Perinatal brain damage, particularly that caused by anoxia, may be an important cause of later epilepsy, although there are few studies available to prove this point. Some studies do show that small-for-gestational age infants, infants with late obstetric complications, and those with low 5-minute Apgar scores are at risk of developing later epilepsy. Malnutrition in infancy and possibly even prenatally is linked to problems of intellectual impairment and consequently indirectly to epilepsy. Another possible cause of brain damage and seizures is infection of the central nervous system in infancy and early childhood; bacterial meningitis and parasitic infections such as cysticercosis are particularly significant. Infection is involved in causing one case in five of chronic childhood epilepsy. Other preventable causes include gastroenteritis with dehydration, head trauma, Hemophilus influenza type b, pertussis, and prolonged febrile seizures. Public health education is an important means of prevention, especially in educating adolescents about the risks of alcohol, head injury, and drug abuse. Psychological, social, and economic complications of epilepsy can be prevented through education to combat public fear and prejudice.

- **Bacterial Diseases**

  Source: in Bork, K., et al. Diseases of the Oral Mucosa and the Lips. Orlando, FL: W.B. Saunders Company. 1993. p. 123-151.

  Contact: Available from W.B. Saunders Company. Order Fulfillment, 6277 Sea Harbor Drive, Orlando, FL 32887-4430. (800) 545-2522 (individuals) or (800) 782-4479 (schools); Fax (800) 874-6418 or (407) 352-3445; http://www.wbsaunders.com. PRICE: $99.00 plus shipping and handling. ISBN: 0721640397.

  Summary: This lengthy chapter, from a textbook on diseases of the oral mucosa and the lips, discusses the etiology, clinical features, histopathology, diagnosis, and differential diagnosis for a variety of bacterial diseases that demonstrate oral manifestations. Diseases covered include impetigo, furuncle and carbuncle (deep staphylococcal infections of the hair follicle), acute bacterial cheilitis with ectropion, chancriform pyoderma, erysipelas, periodontal disease, simple gingivitis, hyperplastic or chronic gingivitis, acute necrotizing ulcerative gingivostomatitis (ANUG), noma (cancrum oris), chronic periodontitis, juvenile periodontitis, periodontal abscess, parodontal pseudocysts, dental sinus tracts, dental infection as a cause of other diseases, nonodontogenic oral abscesses, scarlet fever, diphtheria, cat-scratch disease, gonorrhea, chancroid, syphilis, congenital syphilis, yaws, tuberculosis (including lupus vulcagis), leprosy, actinomycosis, and miscellaneous bacterial infections, including anthrax, brucellosis, listeriosis, glanders, meningococcemia, granuloma inguinale, pertussis, and tularemia. Full-color photographs illustrate the chapter; references are provided for each section. 57 figures. 100 references. (AA-M).

General Home References

In addition to references for pertussis, you may want a general home medical guide that spans all aspects of home healthcare. The following list is a recent sample of such guides (sorted alphabetically by title; hyperlinks provide rankings, information, and reviews at Amazon.com):

- **The Bacteria Menace: Todays Emerging Infections and How to Protect Yourself** by Skye Weintraub; Paperback - 350 pages (May 2002), Woodland Publishing; ISBN: 1580543529; **http://www.amazon.com/exec/obidos/ASIN/1580543529/icongroupinterna**
- **Bacterial Infections** by Axel Dalhoff (Editor); Paperback (April 1999), S. Karger Publishing; ISBN: 380556841X; **http://www.amazon.com/exec/obidos/ASIN/380556841X/icongroupinterna**

- **Encyclopedia of Infectious Diseases (Encyclopedia of Infectious Diseases, 1998)** by Carol Turkington, Bonnie Ashby; Library Binding - 384 pages (September 1998), Facts on File, Inc.; ISBN: 0816035121; **http://www.amazon.com/exec/obidos/ASIN/0816035121/icongroupinterna**
- **Epidemic! The World of Infectious Disease** by Rob Desalle (Editor), American Museum of Natural History; Paperback - 246 pages, 1st edition (September 1999), New Press; ISBN: 1565845463; **http://www.amazon.com/exec/obidos/ASIN/1565845463/icongroupinterna**
- **I Know How We Fight Germs (Sam's Science)** by Kate Rowan, et al; School & Library Binding - 32 pages (January 1999), Candlewick Press; ISBN: 0763605034; **http://www.amazon.com/exec/obidos/ASIN/0763605034/icongroupinterna**
- **Outbreak Alert: Responding to the Increasing Threat of Infectious Diseases** by Jason Eberhart-Phillips, M.D.; Paperback - 292 pages (July 2000), New Harbinger Publications; ISBN: 1572242019; **http://www.amazon.com/exec/obidos/ASIN/1572242019/icongroupinterna**

Vocabulary Builder

Abscess: A localized collection of pus caused by suppuration buried in tissues, organs, or confined spaces. [EU]

Actinomycosis: Infections with bacteria of the genus actinomyces. [NIH]

Anesthesia: A state characterized by loss of feeling or sensation. This depression of nerve function is usually the result of pharmacologic action and is induced to allow performance of surgery or other painful procedures. [NIH]

Anesthetics: Agents that are capable of inducing a total or partial loss of sensation, especially tactile sensation and pain. They may act to induce general anesthesia, in which an unconscious state is achieved, or may act locally to induce numbness or lack of sensation at a targeted site. [NIH]

Anoxia: A total lack of oxygen; often used interchangeably with hypoxia to mean a reduced supply of oxygen to the tissues. [EU]

Anthrax: An infectious bacterial zoonotic disease usually acquired by ingestion of Bacillus anthracis or its spores from infected pastures by herbivores or indirectly from infected carcasses by carnivores. It is transmitted to humans usually by contact with infected animals or their discharges (agricultural a.) or with contaminated animal products (industrial a.). Anthrax is classified by primary routes of inoculation as : cutaneous, gastrointestinal, and inhalational. Called also charbon, milzbrand and

splenic fever. [EU]

Antihistamine: A drug that counteracts the action of histamine. The antihistamines are of two types. The conventional ones, as those used in allergies, block the H1 histamine receptors, whereas the others block the H2 receptors. Called also antihistaminic. [EU]

Antiviral: Destroying viruses or suppressing their replication. [EU]

Anxiety: The unpleasant emotional state consisting of psychophysiological responses to anticipation of unreal or imagined danger, ostensibly resulting from unrecognized intrapsychic conflict. Physiological concomitants include increased heart rate, altered respiration rate, sweating, trembling, weakness, and fatigue; psychological concomitants include feelings of impending danger, powerlessness, apprehension, and tension. [EU]

Brucellosis: Infection caused by bacteria of the genus brucella mainly involving the reticuloendothelial system. This condition is characterized by fever, weakness, malaise, and weight loss. [NIH]

Carbuncle: An infection of cutaneous and subcutaneous tissue that consists of a cluster of boils. Commonly, the causative agent is staphylococcus aureus. Carbuncles produce fever, leukocytosis, extreme pain, and prostration. [NIH]

Causality: The relating of causes to the effects they produce. Causes are termed necessary when they must always precede an effect and sufficient when they initiate or produce an effect. Any of several factors may be associated with the potential disease causation or outcome, including predisposing factors, enabling factors, precipitating factors, reinforcing factors, and risk factors. [NIH]

Chancroid: Acute, localized autoinoculable infectious disease usually acquired through sexual contact. Caused by haemophilus ducreyi, it occurs endemically almost worldwide, especially in tropical and subtropical countries and more commonly in seaports and urban areas than in rural areas. [NIH]

Cheilitis: Inflammation of the lips. It is of various etiologies and degrees of pathology. [NIH]

Cytomegalovirus: A genus of the family HERPESVIRIDAE, subfamily betaherpesvirinae, infecting the salivary glands, liver, spleen, lungs, eyes, and other organs, in which they produce characteristically enlarged cells with intranuclear inclusions. Infection with Cytomegalovirus is also seen as an opportunistic infection in AIDS. [NIH]

Decongestant: An agent that reduces congestion or swelling. [EU]

Dehydration: The condition that results from excessive loss of body water. Called also anhydration, deaquation and hypohydration. [EU]

Erysipelas: An acute superficial form of cellulitis involving the dermal lymphatics, usually caused by infection with group A streptococci, and chiefly characterized by a peripherally spreading hot, bright red, edematous, brawny, infiltrated, and sharply circumscribed plaque with a raised indurated border. Formerly called St. Anthony's fire. [EU]

Gastroenteritis: An acute inflammation of the lining of the stomach and intestines, characterized by anorexia, nausea, diarrhoea, abdominal pain, and weakness, which has various causes, including food poisoning due to infection with such organisms as Escherichia coli, Staphylococcus aureus, and Salmonella species; consumption of irritating food or drink; or psychological factors such as anger, stress, and fear. Called also enterogastritis. [EU]

Gingivitis: Inflammation of the gingivae. Gingivitis associated with bony changes is referred to as periodontitis. Called also oulitis and ulitis. [EU]

Glanders: A contagious disease of horses that can be transmitted to humans. It is caused by Pseudomonas mallei and characterized by ulceration of the respiratory mucosa and an eruption of nodules on the skin. [NIH]

Gonorrhea: Acute infectious disease characterized by primary invasion of the urogenital tract. The etiologic agent, neisseria gonorrhoeae, was isolated by Neisser in 1879. [NIH]

Granuloma: A relatively small nodular inflammatory lesion containing grouped mononuclear phagocytes, caused by infectious and noninfectious agents. [NIH]

Heredity: 1. the genetic transmission of a particular quality or trait from parent to offspring. 2. the genetic constitution of an individual. [EU]

Impetigo: A common superficial bacterial infection caused by staphylococcus aureus or group A beta-hemolytic streptococci. Characteristics include pustular lesions that rupture and discharge a thin, amber-colored fluid that dries and forms a crust. This condition is commonly located on the face, especially about the mouth and nose. [NIH]

Leprosy: A chronic granulomatous infection caused by mycobacterium leprae. The granulomatous lesions are manifested in the skin, the mucous membranes, and the peripheral nerves. Two polar or principal types are lepromatous and tuberculoid. [NIH]

Lupus: A form of cutaneous tuberculosis. It is seen predominantly in women and typically involves the nasal, buccal, and conjunctival mucosa. [NIH]

Microbiological: Pertaining to microbiology : the science that deals with microorganisms, including algae, bacteria, fungi, protozoa and viruses. [EU]

Neonatal: Pertaining to the first four weeks after birth. [EU]

Parasitic: Pertaining to, of the nature of, or caused by a parasite. [EU]

Perinatal: Pertaining to or occurring in the period shortly before and after birth; variously defined as beginning with completion of the twentieth to twenty-eighth week of gestation and ending 7 to 28 days after birth. [EU]

Prejudice: A preconceived judgment made without adequate evidence and not easily alterable by presentation of contrary evidence. [NIH]

Prenatal: Existing or occurring before birth, with reference to the fetus. [EU]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Pulmonary: Pertaining to the lungs. [EU]

Pyoderma: Any purulent skin disease. Called also pyodermia. [EU]

Rheumatoid: Resembling rheumatism. [EU]

Sclerosis: A induration, or hardening; especially hardening of a part from inflammation and in diseases of the interstitial substance. The term is used chiefly for such a hardening of the nervous system due to hyperplasia of the connective tissue or to designate hardening of the blood vessels. [EU]

Syphilis: A contagious venereal disease caused by the spirochete treponema pallidum. [NIH]

Toxoplasmosis: An acute or chronic, widespread disease of animals and humans caused by the obligate intracellular protozoon Toxoplasma gondii, transmitted by oocysts containing the pathogen in the feces of cats (the definitive host), usually by contaminated soil, direct exposure to infected feces, tissue cysts in infected meat, or tachyzoites (proliferating forms) in blood. [EU]

Tuberculosis: Any of the infectious diseases of man and other animals caused by species of mycobacterium. [NIH]

Tularemia: A plague-like disease of rodents, transmissible to man. It is caused by francisella tularensis and is characterized by fever, chills, headache, backache, and weakness. [NIH]

Yaws: A systemic non-venereal infection of the tropics caused by Treponema pallidum subspecies pertenue. [NIH]

CHAPTER 7. MULTIMEDIA ON PERTUSSIS

Overview

Information on pertussis can come in a variety of formats. Among multimedia sources, video productions, slides, audiotapes, and computer databases are often available. In this chapter, we show you how to keep current on multimedia sources of information on pertussis. We start with sources that have been summarized by federal agencies, and then show you how to find bibliographic information catalogued by the National Library of Medicine. If you see an interesting item, visit your local medical library to check on the availability of the title.

Bibliography: Multimedia on Pertussis

The National Library of Medicine is a rich source of information on healthcare-related multimedia productions including slides, computer software, and databases. To access the multimedia database, go to the following Web site: **http://locatorplus.gov/**. Select "Search LOCATORplus." Once in the search area, simply type in pertussis (or synonyms). Then, in the option box provided below the search box, select "Audiovisuals and Computer Files." From there, you can choose to sort results by publication date, author, or relevance. The following multimedia has been indexed on pertussis. For more information, follow the hyperlink indicated:

- **Identification of Bordetella pertussis.** Source: Center for Disease Control, Bureau of Laboratories, Laboratory Training and Consultation Division; Year: 1979; Format: Slide; [Atlanta, Ga.]: The Center, [1979]
- **Immunization against infectious diseases.** Source: produced with the support of Lederle Laboratories Division, American Cyanamid

Company; originally prepared by the Department of Pediatrics and Communicable Diseases, University of Michigan Medic; Year: 1966; Format: Motion picture; United States: Fordel Films, [1966?]

- **Immunizations : what you should know.** Source: Cambridge Educational; Year: 1994; Format: Videorecording; [Charleston, WV]: Cambridge Research Group: Motion Masters, c1994
- **Modern immunization procedures.** Source: Video Digest, inc; Year: 1972; Format: Motion picture; Cincinnati, Ohio: Video Digest, c1972
- **Neurological complications of vaccinations.** Source: [presented by] Marshfield Clinic, Saint Joseph's Hospital [and] Marshfield Medical Research Foundation; Year: 1989; Format: Videorecording; Marshfield, WI: Marshfield Regional Video Network, [1989]
- **New developments in immunizations.** Source: with Irving J. Olshin; Year: 1986; Format: Videorecording; Secaucus, N.J.: Network for Continuing Medical Education, 1986
- **Update on pertussis : the disease and vaccine.** Source: presented by the Department of Pediatrics, Emory University, School of Medicine; Year: 1986; Format: Videorecording; Atlanta, Ga.: The University, 1986
- **Whooping cough.** Source: a presentation of Films for the Humanities & Sciences; produced in cooperation with the Pediatric Infectious Diseases Society; ITV, Information Television Network; Year: 1998; Format: Videorecording; Princeton, N.J.: Films for the Humanities & Sciences, c1998

Vocabulary Builder

Hematology: A subspecialty of internal medicine concerned with morphology, physiology, and pathology of the blood and blood-forming tissues. [NIH]

Mononucleosis: The presence of an abnormally large number of mononuclear leucocytes (monocytes) in the blood. The term is often used alone to refer to infectious mononucleosis. [EU]

CHAPTER 8. PHYSICIAN GUIDELINES AND DATABASES

Overview

Doctors and medical researchers rely on a number of information sources to help patients with their conditions. Many will subscribe to journals or newsletters published by their professional associations or refer to specialized textbooks or clinical guides published for the medical profession. In this chapter, we focus on databases and Internet-based guidelines created or written for this professional audience.

NIH Guidelines

For the more common diseases, The National Institutes of Health publish guidelines that are frequently consulted by physicians. Publications are typically written by one or more of the various NIH Institutes. For physician guidelines, commonly referred to as "clinical" or "professional" guidelines, you can visit the following Institutes:

- 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 Institute of Allergy and Infectious Diseases (NIAID); guidelines available at **http://www.niaid.nih.gov/publications/**

- Centers for Disease Control and Prevention; various fact sheets on infectious diseases available at **http://www.cdc.gov/health/diseases.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.[26] 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:[27]

- **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**

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[26] Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINE*plus* (**http://medlineplus.gov/** or **http://www.nlm.nih.gov/medlineplus/databases.html**).

[27] See **http://www.nlm.nih.gov/databases/databases.html**.

- **Cancer Information:** Access to caner-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**
- **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**

While all of the above references may be of interest to physicians who study and treat pertussis, the following are particularly noteworthy.

The Combined Health Information Database

A comprehensive source of information on clinical guidelines written for professionals is the Combined Health Information Database. You will need to limit your search to "Brochure/Pamphlet," "Fact Sheet," or "Information Package" and pertussis using the "Detailed Search" option. Go directly to the following hyperlink: **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 the publication date, select "All Years," select your preferred language, and the format option "Fact Sheet." By making these selections and typing "pertussis" (or synonyms) into the "For

these words:" box above, you will only receive results on fact sheets dealing with pertussis. The following is a sample result:

- **What Parents Should Know About Infant Immunization. [Lo Que los Padres Deben Saber Sobre las Vacunas de Su Bebe]**

  Source: Washington, DC: National Coalition of Hispanic Health and Human Services Organizations (COSSHMO). 1998. 6 p.

  Contact: Available from National Coalition of Hispanic Health and Human Services Organizations (COSSHMO). 1501 Sixteenth Street, NW, Washington, DC 20036. (202) 387-5000. Website: www.cossmho.org. PRICE: $2.00 each for 1-24 copies for members; $3.00 each for 1-24 copies for nonmembers; larger bulk discounts available.

  Summary: This bilingual brochure presented in English and Spanish reviews the recommended immunization program for infants and children. Vaccines, also called immunizations or shots, protect children against certain diseases. There are 10 diseases that can be prevented with vaccines: hepatitis B, diphtheria, tetanus, pertussis, hemophilus influenza b, polio, measles, mumps, rubella (German measles), and varicella (chickenpox). The brochure answers common questions about vaccinating children, including the safety of the vaccines, where to take a child to be vaccinated, cost considerations, how to obtain good medical care even if English is not one's first language, how to compare vaccinations obtained in other countries with the ones given in the United States, and the importance of maintaining accurate vaccination records. The brochure is accompanied by an immunization record card, which helps parents keep track of the child's vaccinations. Also provided is the most recent recommended immunization schedule and the National Hispanic Immunization Hotline number (800-232-0233).

- **Immunization dose counter. (2nd ed.)**

  Source: Bryn Mawr, PA: Pennsylvania Chapter, American Academy of Pediatrics. 1994. 2 pp.

  Contact: Available from American Academy of Pediatrics, Pennsylvania Chapter, Dayton Building, Suite 220, 610 Old Lancaster Road, Bryn Mawr, PA 19010-3809. Telephone: (800) 243-2357 in Pennsylvania or (215) 520- 9125. $0.50.

  Summary: This pamphlet provides health care professionals or parents with guidelines on the schedule and types of vaccines which children should receive. These include diphtheria, tetanus and pertussis (DTP); polio; Haemophilus b conjugate (Hib); measles, mumps and rubella (MMR); and hepatitis B. Two recommended regimens of vaccines are

given: for children whose first vaccination was given on time, and for those whose first vaccinations occurred late, i.e., later than one year of age. The content of this folder was reviewed by the Centers for Disease Control and the American Academy of Pediatrics.

- **Parents guide to childhood immunization. (Rev.)**

  Source: Atlanta, GA: National Immunization Program, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. 1993. 39 pp.

  Contact: Available from Centers for Disease Control and Prevention, National Immunization Program, 1600 Clifton Road, N.E., Atlanta, GA 30333. Telephone: (404) 639-8614 / fax: (404) 639-8828. Available at no charge.

  Summary: This booklet for parents gives basic information about eight childhood diseases and the vaccines that can prevent them. The diseases are diphtheria, tetanus, pertussis, polio, measles, mumps, rubella, and haemophilus influenzae type B. A recommended schedule of immunizations is included. Previous editions of this booklet were produced by the Division of Immunization, Center for Prevention Services, Centers for Disease Control.

- **Shots for tots**

  Source: South Deerfield, MA: Channing L. Bete Company. 1991. 15 pp.

  Contact: Available from Channing L. Bete Company, 200 State Road, South Deerfield, MA 01373-0200. Telephone: (800) 628-7733 / fax: (800) 499- 6464. Price varies by series and quantity ordered. Contact publisher for catalog and price list.

  Summary: One in a series of Canning L. Bete Co.'s Scriptographic booklets, this booklet gives information for parents on the importance of immunizations for children and on eight diseases that immunizations provide protection against: polio, measles, rubella, diphtheria, pertussis, tetanus, mumps, and Hib disease.

- **Be Wise, Immunize!: Vaccinate on Time**

  Source: Cleveland, OH: Learning Curve of Weingart Design. 199x. [2 p.].

  Contact: Available from Learning Curve of Weingart Design. 4614 Prospect Avenue, Number 421, Cleveland, OH 44103-4314. (800) 795-9295. Fax (216) 881-7177. Website: www.learningcurve1.com. PRICE: $10.00 for a pack of 100; single copies are not available.

Summary: This oversized bookmark lists the latest recommendations for pediatric immunizations from the Centers for Disease Control (CDC). The bookmark reminds parents that getting the shots (vaccinations) and getting all of them, is one of the most important things they can do for their babies. The front of the bookmark lists the age and recommended immunizations. The reverse side lists each of the immunizations and briefly notes what each one covers. Included are vaccines against hepatitis B, which causes liver damage; Hib (haemophilus influenzae b), which causes brain infection and brain damage; DTP or DTaP, which protects against diphtheria (serious breathing problems that can lead to paralysis and heart failure), pertussis (whooping cough), and tetanus (causes painful muscle spasms leading to lockjaw); polio (OPV), a disease that can paralyze arms and legs; MMR, measles, mumps, and rubella (rubella is German measles, a more serious form of measles that can lead to birth defects in babies); and varicella, or chicken pox. The schedule printed on the front of the bookmark is recommended by the American Academy of Pediatrics and the American Academy of Family Physicians.

The NLM Gateway[28]

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.[29] One target audience for the Gateway is the Internet user who is new to NLM's online resources and does not know what information is available or how best to search for it. This audience may include physicians and other healthcare providers, researchers, librarians, students, and, increasingly, patients, their families, and the public.[30] To use the NLM Gateway, simply go to the search site at

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[28] Adapted from NLM: **http://gateway.nlm.nih.gov/gw/Cmd?Overview.x**.

[29] 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).

[30] Other users may find the Gateway useful for an overall search of NLM's information resources. Some searchers may locate what they need immediately, while others will utilize the Gateway as an adjunct tool to other NLM search services such as PubMed® and MEDLINEplus®. The Gateway connects users with multiple NLM retrieval systems while also providing a search interface for its own collections. These collections include various types of information that do not logically belong in PubMed, LOCATORplus, or other established NLM retrieval systems (e.g., meeting announcements and pre-1966 journal citations). The Gateway will provide access to the information found in an increasing number of NLM retrieval systems in several phases.

http://gateway.nlm.nih.gov/gw/Cmd. Type "pertussis" (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	344704
Books / Periodicals / Audio Visual	2564
Consumer Health	292
Meeting Abstracts	3093
Other Collections	100
Total	350753

HSTAT[31]

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.[32] HSTAT's audience includes healthcare providers, health service researchers, policy makers, insurance companies, consumers, and the information professionals who serve these groups. HSTAT provides access to a wide variety of publications, including 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.[33] Simply search by "pertussis" (or synonyms) at the following Web site: **http://text.nlm.nih.gov**.

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[31] Adapted from HSTAT: **http://www.nlm.nih.gov/pubs/factsheets/hstat.html**.

[32] The HSTAT URL is **http://hstat.nlm.nih.gov/**.

[33] Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's *Guide to Clinical Preventive Services*; the independent, nonfederal Task Force on Community Services *Guide to Community Preventive Services*; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.

Coffee Break: Tutorials for Biologists[34]

Some patients may wish to have access to 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. To this end, we recommend "Coffee Break," 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.[35] 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.[36] This site has new articles every few weeks, so it can be considered an online magazine of sorts, and intended for general background information. You can access the Coffee Break Web site at the following hyperlink: **http://www.ncbi.nlm.nih.gov/Coffeebreak/**.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are a few examples that may interest you:

- **CliniWeb International:** Index and table of contents to selected clinical information on the Internet; see **http://www.ohsu.edu/cliniweb/**.
- **Image Engine:** Multimedia electronic medical record system that integrates a wide range of digitized clinical images with textual data stored in the University of Pittsburgh Medical Center's MARS electronic medical record system; see the following Web site: **http://www.cml.upmc.edu/cml/imageengine/imageEngine.html**.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see **http://www.mwsearch.com/**.
- **MedWeaver:** Prototype system that allows users to search differential diagnoses for any list of signs and symptoms, to search medical

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[34] Adapted from **http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html**.

[35] 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.

[36] 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.

literature, and to explore relevant Web sites; see **http://www.med.virginia.edu/~wmd4n/medweaver.html**.

- **Metaphrase:** Middleware component intended for use by both caregivers and medical records personnel. It converts the informal language generally used by caregivers into terms from formal, controlled vocabularies; see the following Web site: **http://www.lexical.com/Metaphrase.html**.

The Genome Project and Pertussis

With all the discussion in the press about the Human Genome Project, it is only natural that physicians, researchers, and patients want to know about how human genes relate to pertussis. In the following section, we will discuss databases and references used by physicians and scientists who work in this area.

Online Mendelian Inheritance in Man (OMIM)

The Online Mendelian Inheritance in Man (OMIM) database is a catalog of human genes and genetic disorders authored and edited by Dr. Victor A. McKusick and his colleagues at Johns Hopkins and elsewhere. OMIM was developed for the World Wide Web by the National Center for Biotechnology Information (NCBI).[37] The database contains textual information, pictures, and reference information. It also contains copious links to NCBI's Entrez database of MEDLINE articles and sequence information.

To search the database, go to **http://www.ncbi.nlm.nih.gov/Omim/searchomim.html**. Type "pertussis" (or synonyms) in the search box, and click "Submit Search." If too many results appear, you can narrow the search by adding the word "clinical." Each report will have additional links to related research and databases. By following these links, especially the link titled "Database Links," you will be exposed to numerous specialized databases that are largely used by the scientific community. These databases are overly technical and seldom used

[37] Adapted from **http://www.ncbi.nlm.nih.gov/**. Established in 1988 as a national resource for molecular biology information, NCBI creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information--all for the better understanding of molecular processes affecting human health and disease.

by the general public, but offer an abundance of information. The following is an example of the results you can obtain from the OMIM for pertussis:

- **Adp-ribosyltransferase 1**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?601625
- **Alzheimer Disease, Familial, Type 4**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?600759
- **Bronchiectasis**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?211400
- **Chemokine (c) Xc Receptor 1**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?600552
- **Chemokine (c-c) Receptor 2**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?601267
- **Chemokine (c-c) Receptor 6**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?601835
- **Chemokine (c-x3-c) Receptor 1**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?601470
- **Chiari Malformation Type I**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?118420
- **Defensin, Beta, 2**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?602215
- **Endothelial Differentiation Gene 2**
  Web site: http://www.ncbi.nlm.nih.gov/htbin-post/Omim/dispmim?602282

Genes and Disease (NCBI - Map)

The Genes and Disease database is produced by the National Center for Biotechnology Information of the National Library of Medicine at the

National Institutes of Health. This Web site categorizes each disorder by the system of the body associated with it. Go to **http://www.ncbi.nlm.nih.gov/disease/**, and browse the system pages to have a full view of important conditions linked to human genes. Since this site is regularly updated, you may wish to re-visit it from time to time. The following systems and associated disorders are addressed:

- **Immune System:** Fights invaders.
  Examples: Asthma, autoimmune polyglandular syndrome, Crohn's disease, DiGeorge syndrome, familial Mediterranean fever, immunodeficiency with Hyper-IgM, severe combined immunodeficiency.
  Web site: **http://www.ncbi.nlm.nih.gov/disease/Immune.html**
- **Nervous System:** Mind and body.
  Examples: Alzheimer disease, Amyotrophic lateral sclerosis, Angelman syndrome, Charcot-Marie-Tooth disease, epilepsy, essential tremor, Fragile X syndrome, Friedreich's ataxia, Huntington disease, Niemann-Pick disease, Parkinson disease, Prader-Willi syndrome, Rett syndrome, Spinocerebellar atrophy, Williams syndrome.
  Web site: **http://www.ncbi.nlm.nih.gov/disease/Brain.html**
- **Signals:** Cellular messages.
  Examples: Ataxia telangiectasia, Baldness, Cockayne syndrome, Glaucoma, SRY: sex determination, Tuberous sclerosis, Waardenburg syndrome, Werner syndrome.
  Web site: **http://www.ncbi.nlm.nih.gov/disease/Signals.html**
- **Transporters:** Pumps and channels.
  Examples: Cystic Fibrosis, deafness, diastrophic dysplasia, Hemophilia A, long-QT syndrome, Menkes syndrome, Pendred syndrome, polycystic kidney disease, sickle cell anemia, Wilson's disease, Zellweger syndrome.
  Web site: **http://www.ncbi.nlm.nih.gov/disease/Transporters.html**

Entrez

Entrez is a search and retrieval system that integrates several linked databases at the National Center for Biotechnology Information (NCBI). These databases include nucleotide sequences, protein sequences, macromolecular structures, whole genomes, and MEDLINE through PubMed. Entrez provides access to the following databases:

- **PubMed:** Biomedical literature (PubMed),
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed**

- **Nucleotide Sequence Database (Genbank):**
  Web site:
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Nucleotide
- **Protein Sequence Database:**
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Protein**
- **Structure:** Three-dimensional macromolecular structures,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Structure**
- **Genome:** Complete genome assemblies,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Genome**
- **PopSet:** Population study data sets,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Popset**
- **OMIM:** Online Mendelian Inheritance in Man,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=OMIM**
- **Taxonomy:** Organisms in GenBank,
  Web site:
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Taxonomy
- **Books:** Online books,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=books**
- **ProbeSet:** Gene Expression Omnibus (GEO),
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=geo**
- **3D Domains:** Domains from Entrez Structure,
  Web site: **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=geo**
- **NCBI's Protein Sequence Information Survey Results:**
  Web site: **http://www.ncbi.nlm.nih.gov/About/proteinsurvey/**

To access the Entrez system at the National Center for Biotechnology Information, go to **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=search&DB=genome**, and then select the database that you would like to search. The databases available are listed in the drop box next to "Search." In the box next to "for," enter "pertussis" (or synonyms) and click "Go."

Jablonski's Multiple Congenital Anomaly/Mental Retardation (MCA/MR) Syndromes Database[38]

This online resource can be quite useful. It has been developed to facilitate the identification and differentiation of syndromic entities. Special attention is given to the type of information that is usually limited or completely omitted in existing reference sources due to space limitations of the printed form.

At the following Web site you can also search across syndromes using an alphabetical index: **http://www.nlm.nih.gov/mesh/jablonski/syndrome_toc/toc_a.html.** You can search by keywords at this Web site: **http://www.nlm.nih.gov/mesh/jablonski/syndrome_db.html**.

The Genome Database[39]

Established at Johns Hopkins University in Baltimore, Maryland in 1990, the Genome Database (GDB) is the official central repository for genomic mapping data resulting from the Human Genome Initiative. In the spring of 1999, the Bioinformatics Supercomputing Centre (BiSC) at the Hospital for Sick Children in Toronto, Ontario assumed the management of GDB. The Human Genome Initiative is a worldwide research effort focusing on structural analysis of human DNA to determine the location and sequence of the estimated 100,000 human genes. In support of this project, GDB stores and curates data generated by researchers worldwide who are engaged in the mapping effort of the Human Genome Project (HGP). GDB's mission is to provide scientists with an encyclopedia of the human genome which is continually revised and updated to reflect the current state of scientific knowledge. Although GDB has historically focused on gene mapping, its focus will broaden as the Genome Project moves from mapping to sequence, and finally, to functional analysis.

To access the GDB, simply go to the following hyperlink: **http://www.gdb.org/**. Search "All Biological Data" by "Keyword." Type "pertussis" (or synonyms) into the search box, and review the results. If more than one word is used in the search box, then separate each one with the word "and" or "or" (using "or" might be useful when using synonyms).

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[38] Adapted from the National Library of Medicine:
http://www.nlm.nih.gov/mesh/jablonski/about_syndrome.html.
[39] Adapted from the Genome Database:
http://gdbwww.gdb.org/gdb/aboutGDB.html#mission.

This database is extremely technical as it was created for specialists. The articles are the results which are the most accessible to non-professionals and often listed under the heading "Citations." The contact names are also accessible to non-professionals.

Specialized References

The following books are specialized references written for professionals interested in pertussis (sorted alphabetically by title, hyperlinks provide rankings, information, and reviews at Amazon.com):

- **2002 Pocket Book of Infectious Disease Therapy** by John G. Bartlett; Paperback - 348 pages, 11th edition (November 15, 2001), Lippincott, Williams & Wilkins Publishers; ISBN: 0781734320; **http://www.amazon.com/exec/obidos/ASIN/0781734320/icongroupinterna**
- **Bacterial Infections of Humans: Epidemiology and Control** by Alfred S. Evans (Editor), et al; Hardcover - 887 pages, 3rd edition (July 15, 1998), Plenum Publishing Corporation; ISBN: 0306453207; **http://www.amazon.com/exec/obidos/ASIN/0306453207/icongroupinterna**
- **Cellular Microbiology : Bacteria-Host Interactions in Health and Disease** by Brian Henderson, et al; Hardcover - 478 pages (May 28, 1999), John Wiley & Sons; ISBN: 047198678X; **http://www.amazon.com/exec/obidos/ASIN/047198678X/icongroupinterna**
- **The Comprehensive Sourcebook of Bacterial Protein Toxins** by Joseph E. Alouf (Editor), John H. Freer (Editor); Hardcover - 718 pages, 2nd edition (August 15, 1999), Academic Press; ISBN: 0120530759; **http://www.amazon.com/exec/obidos/ASIN/0120530759/icongroupinterna**
- **Current Diagnosis & Treatment in Infectious Diseases** by Walter R. Wilson (Editor), et al; Paperback - 985 pages, 1st edition (June 22, 2001), McGraw-Hill Professional Publishing; ISBN: 0838514944; **http://www.amazon.com/exec/obidos/ASIN/0838514944/icongroupinterna**
- **Hunter's Tropical Medicine and Emerging Infectious Diseases** by George W. Hunter (Editor), et al; Hardcover - 1192 pages, 8th edition (January 15, 2000), W B Saunders Co; ISBN: 0721662234; **http://www.amazon.com/exec/obidos/ASIN/0721662234/icongroupinterna**
- **Infectious Disease** by Barbara Bannister, et al; Paperback - 506 pages, 2nd edition (August 15, 2000), Blackwell Science Inc.; ISBN: 0632053194; **http://www.amazon.com/exec/obidos/ASIN/0632053194/icongroupinterna**
- **Infectious Disease Epidemiology: Theory and Practice** by Kenrad E. Nelson, et al; Hardcover - 600 pages (May 2000), Aspen Publishers, Inc.;

ISBN: 083421766X;
http://www.amazon.com/exec/obidos/ASIN/083421766X/icongroupinterna

- **Laboratory Diagnosis of Bacterial Infections (Infectious Disease and Therapy, Vol 26)** by Nevio Cimolai (Editor); Hardcover (August 2001), Marcel Dekker; ISBN: 0824705890;
http://www.amazon.com/exec/obidos/ASIN/0824705890/icongroupinterna
- **Mandell, Douglas, and Bennett's Principles & Practice of Infectious Diseases (2 Vol. Set)** by Gerald L. Mandell (Editor), et al; Hardcover - 3263 pages, 5th edition (June 15, 2000), Churchill Livingstone; ISBN: 044307593X;
http://www.amazon.com/exec/obidos/ASIN/044307593X/icongroupinterna
- **Molecular Bacteriology: Protocols and Clinical Applications** by Neil Woodford (Editor), Alan Johnson (Editor); Hardcover - 682 pages, 1st edition (June 15, 1998), Humana Press; ISBN: 0896034984;
http://www.amazon.com/exec/obidos/ASIN/0896034984/icongroupinterna
- **Molecular Epidemiology of Infectious Diseases** by R. C. Andrew Thompson; Hardcover - 326 pages, 1st edition (October 15, 2000), Edward Arnold; ISBN: 0340759097;
http://www.amazon.com/exec/obidos/ASIN/0340759097/icongroupinterna
- **Persistent Bacterial Infections** by James P. Nataro (Editor), et al; Hardcover (June 2000), American Society for Microbiology; ISBN: 1555811590;
http://www.amazon.com/exec/obidos/ASIN/1555811590/icongroupinterna

Vocabulary Builder

Bronchiectasis: Chronic dilatation of the bronchi marked by fetid breath and paroxysmal coughing, with the expectoration of mucopurulent matter. It may effect the tube uniformly (cylindric b.), or occur in irregular pockets (sacculated b.) or the dilated tubes may have terminal bulbous enlargements (fusiform b.). [EU]

Paralysis: Loss or impairment of motor function in a part due to lesion of the neural or muscular mechanism; also by analogy, impairment of sensory function (sensory paralysis). In addition to the types named below, paralysis is further distinguished as traumatic, syphilitic, toxic, etc., according to its cause; or as obturator, ulnar, etc., according to the nerve part, or muscle specially affected. [EU]

Varicella: Chicken pox. [EU]

CHAPTER 9. DISSERTATIONS ON PERTUSSIS

Overview

University researchers are active in studying almost all known diseases. The result of research is often published in the form of Doctoral or Master's dissertations. You should understand, therefore, that applied diagnostic procedures and/or therapies can take many years to develop after the thesis that proposed the new technique or approach was written.

In this chapter, we will give you a bibliography on recent dissertations relating to pertussis. You can read about these in more detail using the Internet or your local medical library. We will also provide you with information on how to use the Internet to stay current on dissertations.

Dissertations on Pertussis

ProQuest Digital Dissertations is the largest archive of academic dissertations available. From this archive, we have compiled the following list covering dissertations devoted to pertussis. You will see that the information provided includes the dissertation's title, its author, and the author's institution. To read more about the following, simply use the Internet address indicated. The following covers recent dissertations dealing with pertussis:

- **A Comparative Study of Solid and Solution Phase Antigen-antibody Binding Assays Using Pertussis Toxin As a Model** by Westholm, Florence Amelia; Phd from Illinois Institute of Technology, 2001, 409 pages
  http://wwwlib.umi.com/dissertations/fullcit/3010141
- **An Exploratory Study of Prenatal Class Participants' Attitudes towards Pertussis and the Dpt Vaccine** by Vorpahl, David Paul, Edd from Gonzaga University, 1984, 136 pages
  http://wwwlib.umi.com/dissertations/fullcit/8510980
- **Antigenic Variation in Bordetella Pertussis** by Lewandowski, Anna Zofia; Msc from University of Alberta (canada), 2001, 135 pages
  http://wwwlib.umi.com/dissertations/fullcit/MQ60480
- **Antigen-specific Ige Suppression Induced by Immunization with Dinitrophenyl-bordetella Pertussis Mediated Through Interferon-gamma** by Hagen, Michael; Phd from The University of Western Ontario (canada), 1989
  http://wwwlib.umi.com/dissertations/fullcit/NL51720
- **Characterization of the Complement Resistance Mechanism of Bordetella Pertussis** by Barnes, Michael; Phd from University of Cincinnati, 2001, 119 pages
  http://wwwlib.umi.com/dissertations/fullcit/3022014
- **Immunochemical Studies on the Phase Variations of Bordetella Pertussis** by Aprile, Marie A; Phd from University of Toronto (canada), 1971
  http://wwwlib.umi.com/dissertations/fullcit/NK11531
- **Is1002-associated Rflp Fingerprinting of Bordetella Pertussis Clinical Isolates, As a Means of Strain Typing and Epidemiological Analysis** by Carter, Bradley Robert; Msc from Queen's University at Kingston (canada), 2001, 105 pages
  http://wwwlib.umi.com/dissertations/fullcit/MQ59367
- **Modulation of the Ige Response by Dnp-coupled Bordetella Pertussis** by Essani, Naeem Akhtar; Phd from The University of Western Ontario (canada), 1984
  http://wwwlib.umi.com/dissertations/fullcit/NK58712
- **Oligomerization of Adenylate Cyclase Toxin from Bordetella Pertussis** by Lee, Sang-jin; Phd from University of Virginia, 2001, 168 pages
  http://wwwlib.umi.com/dissertations/fullcit/3000152

Keeping Current

As previously mentioned, an effective way to stay current on dissertations dedicated to pertussis is to use the database called *ProQuest Digital Dissertations* via the Internet, located at the following Web address: **http;//wwwlib.umi.com/dissertations.** The site allows you to freely access the last two years of citations and abstracts. Ask your medical librarian if the library has full and unlimited access to this database. From the library, you should be able to do more complete searches than with the limited 2-year access available to the general public.

Vocabulary Builder

Epidemiological: Relating to, or involving epidemiology. [EU]

PART III. APPENDICES

ABOUT PART III

Part III is a collection of appendices on general medical topics which may be of interest to patients with pertussis and related conditions.

APPENDIX A. RESEARCHING YOUR MEDICATIONS

Overview

There are a number of sources available on new or existing medications which could be prescribed to patients with pertussis. While a number of hard copy or CD-Rom resources are available to patients and physicians for research purposes, a more flexible method is to use Internet-based databases. In this chapter, we will begin with a general overview of medications. We will then proceed to outline official recommendations on how you should view your medications. You may also want to research medications that you are currently taking for other conditions as they may interact with medications for pertussis. Research can give you information on the side effects, interactions, and limitations of prescription drugs used in the treatment of pertussis. Broadly speaking, there are two sources of information on approved medications: public sources and private sources. We will emphasize free-to-use public sources.

Your Medications: The Basics[40]

The Agency for Health Care Research and Quality has published extremely useful guidelines on how you can best participate in the medication aspects of pertussis. Taking medicines is not always as simple as swallowing a pill. It can involve many steps and decisions each day. The AHCRQ recommends that patients with pertussis take part in treatment decisions. Do not be afraid to ask questions and talk about your concerns. By taking a moment to ask questions early, you may avoid problems later. Here are some points to cover each time a new medicine is prescribed**:**

- Ask about all parts of your treatment, including diet changes, exercise, and medicines.
- Ask about the risks and benefits of each medicine or other treatment you might receive.
- Ask how often you or your doctor will check for side effects from a given medication.

Do not hesitate to ask what is important to you about your medicines. You may want a medicine with the fewest side effects, or the fewest doses to take each day. You may care most about cost, or how the medicine might affect how you live or work. Or, you may want the medicine your doctor believes will work the best. Telling your doctor will help him or her select the best treatment for you.

Do not be afraid to "bother" your doctor with your concerns and questions about medications for pertussis. You can also talk to a nurse or a pharmacist. They can help you better understand your treatment plan. Feel free to bring a friend or family member with you when you visit your doctor. Talking over your options with someone you trust can help you make better choices, especially if you are not feeling well. Specifically, ask your doctor the following:

- The name of the medicine and what it is supposed to do.
- How and when to take the medicine, how much to take, and for how long.
- What food, drinks, other medicines, or activities you should avoid while taking the medicine.
- What side effects the medicine may have, and what to do if they occur.
- If you can get a refill, and how often.

[40] This section is adapted from AHCRQ: **http://www.ahcpr.gov/consumer/ncpiebro.htm**.

- About any terms or directions you do not understand.
- What to do if you miss a dose.
- If there is written information you can take home (most pharmacies have information sheets on your prescription medicines; some even offer large-print or Spanish versions).

Do not forget to tell your doctor about all the medicines you are currently taking (not just those for pertussis). This includes prescription medicines and the medicines that you buy over the counter. Then your doctor can avoid giving you a new medicine that may not work well with the medications you take now. When talking to your doctor, you may wish to prepare a list of medicines you currently take, the reason you take them, and how you take them. Be sure to include the following information for each:

- Name of medicine
- Reason taken
- Dosage
- Time(s) of day

Also include any over-the-counter medicines, such as:

- Laxatives
- Diet pills
- Vitamins
- Cold medicine
- Aspirin or other pain, headache, or fever medicine
- Cough medicine
- Allergy relief medicine
- Antacids
- Sleeping pills
- Others (include names)

Learning More about Your Medications

Because of historical investments by various organizations and the emergence of the Internet, it has become rather simple to learn about the medications your doctor has recommended for pertussis. 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 **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.[41]

While the FDA database is rather large and difficult to navigate, the Phamacopeia is both user-friendly and free to use. It covers more than 9,000 prescription and over-the-counter medications. To access this database, simply type the following hyperlink into your Web browser: **http://www.nlm.nih.gov/medlineplus/druginformation.html**. To view examples of a given medication (brand names, category, description, preparation, proper use, precautions, side effects, etc.), simply follow the hyperlinks indicated within the United States Pharmacopoeia (USP). It is important to read the disclaimer by the USP (**http://www.nlm.nih.gov/medlineplus/drugdisclaimer.html**) before using the information provided.

Of course, we as editors cannot be certain as to what medications you are taking. Therefore, we have compiled a list of medications associated with the treatment of pertussis. Once again, due to space limitations, we only list a sample of medications and provide hyperlinks to ample documentation (e.g. typical dosage, side effects, drug-interaction risks, etc.). The following drugs have been mentioned in the Pharmacopeia and other sources as being potentially applicable to pertussis:

Diphtheria and Tetanus Toxoids and Pertussis Vaccine Adsorbed

- **Systemic - U.S. Brands:** Acel-Imune; Certiva; Infanrix; Tripedia
  http://www.nlm.nih.gov/medlineplus/druginfo/diphtheriaandtetanustoxoidsand202201.html

http://www.nlm.nih.gov/medlineplus/druginfo/diphtheriaandtetanustoxoidsand202911.html

[41] Though cumbersome, the FDA database can be freely browsed at the following site: **www.fda.gov/cder/da/da.htm**.

- **Systemic - U.S. Brands:** Tetramune
  http://www.nlm.nih.gov/medlineplus/druginfo/diphtheriaandtetanustoxoidsand202911.html

Erythromycin

- **Ophthalmic - U.S. Brands:** Ilotycin
  http://www.nlm.nih.gov/medlineplus/druginfo/erythromycinophthalmic202220.html

Influenza Virus Vaccine

- **Systemic - U.S. Brands:** FluShield; Fluvirin; Fluzone
  http://www.nlm.nih.gov/medlineplus/druginfo/influenzavirusvaccinesystemic202297.html

Tetanus Toxoid

- **Systemic - U.S. Brands:**
  http://www.nlm.nih.gov/medlineplus/druginfo/influenzavirusvaccinesystemic202297.html

Trimethoprim

- **Systemic - U.S. Brands:** Proloprim; Trimpex
  http://www.nlm.nih.gov/medlineplus/druginfo/trimethoprimsystemic202579.html

Vancomycin

- **Oral - U.S. Brands:** Vancocin
  http://www.nlm.nih.gov/medlineplus/druginfo/vancomycinoral202589.html
- **Systemic - U.S. Brands:** Vancocin
  http://www.nlm.nih.gov/medlineplus/druginfo/vancomycinsystemic202590.html

Commercial Databases

In addition to the medications listed in the USP above, a number of commercial sites are available by subscription to physicians and their institutions. You may be able to access these sources from your local medical library or your doctor's office.

Reuters Health Drug Database

The Reuters Health Drug Database can be searched by keyword at the hyperlink: **http://www.reutershealth.com/frame2/drug.html**. The following medications are listed in the Reuters' database as associated with pertussis (including those with contraindications):[42]

- **a2zindex**
  http://www.reutershealth.com/atoz/html/a2zindex.htm
- **Diphtheria Tetanus Toxoids Acellular Pertussis Vaccine (DTaP)**
  http://www.reutershealth.com/atoz/html/Diphtheria_Tetanus_Toxoids_Acellular_Pertussis_Vaccine_(DTaP).htm
- **Diphtheria Tetanus Toxoids Whole-Cell Pertussis Vaccine (DTwP)**
  http://www.reutershealth.com/atoz/html/Diphtheria_Tetanus_Toxoids_Whole-Cell_Pertussis_Vaccine_(DTwP).htm
- **Erythromycin**
  http://www.reutershealth.com/atoz/html/Erythromycin.htm
- **Influenza Virus Vaccine 2000**
  http://www.reutershealth.com/atoz/html/Influenza_Virus_Vaccine_2000.htm
- **Influenza Virus Vaccine 2001**
  http://www.reutershealth.com/atoz/html/Influenza_Virus_Vaccine_2001.htm

Mosby's GenRx

Mosby's GenRx 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. Information can be obtained at the following hyperlink: **http://www.genrx.com/Mosby/PhyGenRx/group.html**.

Physicians Desk Reference

The Physicians Desk Reference database (also available in CD-Rom and book format) is a full-text drug database. The database is searchable by brand name, generic name or by indication. It features multiple drug interactions

[42] Adapted from *A to Z Drug Facts* by Facts and Comparisons.

reports. Information can be obtained at the following hyperlink: **http://physician.pdr.net/physician/templates/en/acl/psuser_t.htm**.

Other Web Sites

A number of additional Web sites discuss drug information. As an example, you may like to look at **www.drugs.com** which 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. which allows users to download articles on various drugs and therapeutics for a nominal fee: **http://www.medletter.com/**.

Contraindications and Interactions (Hidden Dangers)

Some of the medications mentioned in the previous discussions can be problematic for patients with pertussis--not because they are used in the treatment process, but because of contraindications, or side effects. Medications with contraindications are those that could react with drugs used to treat pertussis or potentially create deleterious side effects in patients with pertussis. You should ask your physician about any contraindications, especially as these might apply to other medications that you may be taking for common ailments.

Drug-drug interactions occur when two or more drugs react with each other. This drug-drug interaction may cause you to experience an unexpected side effect. Drug interactions may make your medications less effective, cause unexpected side effects, or increase the action of a particular drug. Some drug interactions can even be harmful to you.

Be sure to read the label every time you use a nonprescription or prescription drug, and take the time to learn about drug interactions. These precautions may be critical to your health. You can reduce the risk of potentially harmful drug interactions and side effects with a little bit of knowledge and common sense.

Drug labels contain important information about ingredients, uses, warnings, and directions which you should take the time to read and understand. Labels also include warnings about possible drug interactions. Further, drug labels may change as new information becomes available. This is why it's especially important to read the label every time you use a medication. When your doctor prescribes a new drug, discuss all over-the-

counter and prescription medications, dietary supplements, vitamins, botanicals, minerals and herbals you take as well as the foods you eat. Ask your pharmacist for the package insert for each prescription drug you take. The package insert provides more information about potential drug interactions.

A Final Warning

At some point, you may hear of alternative medications from friends, relatives, or in the news media. Advertisements may suggest that certain alternative drugs can produce positive results for patients with pertussis. Exercise caution--some of these drugs may have fraudulent claims, and others may actually hurt you. The Food and Drug Administration (FDA) is the official U.S. agency charged with discovering which medications are likely to improve the health of patients with pertussis. The FDA warns patients to watch out for[43]:

- Secret formulas (real scientists share what they know)
- Amazing breakthroughs or miracle cures (real breakthroughs don't happen very often; when they do, real scientists do not call them amazing or miracles)
- Quick, painless, or guaranteed cures
- If it sounds too good to be true, it probably isn't true.

If you have any questions about any kind of 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**.

General References

In addition to the resources provided earlier in this chapter, the following general references describe medications (sorted alphabetically by title; hyperlinks provide rankings, information and reviews at Amazon.com):

- **Drug Interactions in Infectious Diseases (Infectious Disease)** by Stephen C. Piscitelli (Editor), et al; Hardcover - 372 pages (September 2000),

[43] This section has been adapted from **http://www.fda.gov/opacom/lowlit/medfraud.html**.

Humana Press; ISBN: 0896037509;
http://www.amazon.com/exec/obidos/ASIN/0896037509/icongroupinterna

- **Management of Antimicrobials in Infectious Diseases: Impact of Antibiotic Resistance** by Arch G. Mainous, Ph.D. (Editor), et al; Hardcover - 350 pages, 1st edition (January 15, 2001), Humana Press; ISBN: 0896038211;
http://www.amazon.com/exec/obidos/ASIN/0896038211/icongroupinterna
- **Manual of Antibiotics and Infectious Diseases: Treatment and Prevention** by John E. Conte; Paperback - 755 pages, 9th edition (December 15, 2001), Lippincott, Williams & Wilkins Publishers; ISBN: 0781723167;
http://www.amazon.com/exec/obidos/ASIN/0781723167/icongroupinterna

Vocabulary Builder

The following vocabulary builder gives definitions of words used in this chapter that have not been defined in previous chapters:

Ophthalmic: Pertaining to the eye. [EU]

Vancomycin: Antibacterial obtained from Streptomyces orientalis. It is a glycopeptide related to ristocetin that inhibits bacterial cell wall assembly and is toxic to kidneys and the inner ear. [NIH]

APPENDIX B. RESEARCHING ALTERNATIVE MEDICINE

Overview

Complementary and alternative medicine (CAM) is one of the most contentious aspects of modern medical practice. You may have heard of these treatments on the radio or on television. Maybe you have seen articles written about these treatments in magazines, newspapers, or books. Perhaps your friends or doctor have mentioned alternatives.

In this chapter, we will begin by giving you a broad perspective on complementary and alternative therapies. Next, we will introduce you to official information sources on CAM relating to pertussis. Finally, at the conclusion of this chapter, we will provide a list of readings on pertussis from various authors. We will begin, however, with the National Center for Complementary and Alternative Medicine's (NCCAM) overview of complementary and alternative medicine.

What Is CAM?[44]

Complementary and alternative medicine (CAM) covers a broad range of healing philosophies, approaches, and therapies. Generally, it is defined as those treatments and healthcare practices which are not taught in medical schools, used in hospitals, or reimbursed by medical insurance companies. Many CAM therapies are termed "holistic," which generally means that the healthcare practitioner considers the whole person, including physical, mental, emotional, and spiritual health. Some of these therapies are also known as "preventive," which means that the practitioner educates and

[44] Adapted from the NCCAM: **http://nccam.nih.gov/nccam/fcp/faq/index.html#what-is**.

treats the person to prevent health problems from arising, rather than treating symptoms after problems have occurred.

People use CAM treatments and therapies in a variety of ways. Therapies are used alone (often referred to as alternative), in combination with other alternative therapies, or in addition to conventional treatment (sometimes referred to as complementary). Complementary and alternative medicine, or "integrative medicine," includes a broad range of healing philosophies, approaches, and therapies. Some approaches are consistent with physiological principles of Western medicine, while others constitute healing systems with non-Western origins. While some therapies are far outside the realm of accepted Western medical theory and practice, others are becoming established in mainstream medicine.

Complementary and alternative therapies are used in an effort to prevent illness, reduce stress, prevent or reduce side effects and symptoms, or control or cure disease. Some commonly used methods of complementary or alternative therapy include mind/body control interventions such as visualization and relaxation, manual healing including acupressure and massage, homeopathy, vitamins or herbal products, and acupuncture.

What Are the Domains of Alternative Medicine?[45]

The list of CAM practices changes continually. The reason being is that these new practices and therapies are often proved to be safe and effective, and therefore become generally accepted as "mainstream" healthcare practices. Today, CAM practices may be grouped within five major domains: (1) alternative medical systems, (2) mind-body interventions, (3) biologically-based treatments, (4) manipulative and body-based methods, and (5) energy therapies. The individual systems and treatments comprising these categories are too numerous to list in this sourcebook. Thus, only limited examples are provided within each.

Alternative Medical Systems

Alternative medical systems involve complete systems of theory and practice that have evolved independent of, and often prior to, conventional biomedical approaches. Many are traditional systems of medicine that are

[45] Adapted from the NCCAM: **http://nccam.nih.gov/nccam/fcp/classify/index.html**.

practiced by individual cultures throughout the world, including a number of venerable Asian approaches.

Traditional oriental medicine emphasizes the balance or disturbances of qi (pronounced chi) or vital energy in health and disease, respectively. Traditional oriental medicine consists of a group of techniques and methods including acupuncture, herbal medicine, oriental massage, and qi gong (a form of energy therapy). Acupuncture involves stimulating specific anatomic points in the body for therapeutic purposes, usually by puncturing the skin with a thin needle.

Ayurveda is India's traditional system of medicine. Ayurvedic medicine (meaning "science of life") is a comprehensive system of medicine that places equal emphasis on body, mind, and spirit. Ayurveda strives to restore the innate harmony of the individual. Some of the primary Ayurvedic treatments include diet, exercise, meditation, herbs, massage, exposure to sunlight, and controlled breathing.

Other traditional healing systems have been developed by the world's indigenous populations. These populations include Native American, Aboriginal, African, Middle Eastern, Tibetan, and Central and South American cultures. Homeopathy and naturopathy are also examples of complete alternative medicine systems.

Homeopathic medicine is an unconventional Western system that is based on the principle that "like cures like," i.e., that the same substance that in large doses produces the symptoms of an illness, in very minute doses cures it. Homeopathic health practitioners believe that the more dilute the remedy, the greater its potency. Therefore, they use small doses of specially prepared plant extracts and minerals to stimulate the body's defense mechanisms and healing processes in order to treat illness.

Naturopathic medicine is based on the theory that disease is a manifestation of alterations in the processes by which the body naturally heals itself and emphasizes health restoration rather than disease treatment. Naturopathic physicians employ an array of healing practices, including the following: diet and clinical nutrition, homeopathy, acupuncture, herbal medicine, hydrotherapy (the use of water in a range of temperatures and methods of applications), spinal and soft-tissue manipulation, physical therapies (such as those involving electrical currents, ultrasound, and light), therapeutic counseling, and pharmacology.

Mind-Body Interventions

Mind-body interventions employ a variety of techniques designed to facilitate the mind's capacity to affect bodily function and symptoms. Only a select group of mind-body interventions having well-documented theoretical foundations are considered CAM. For example, patient education and cognitive-behavioral approaches are now considered "mainstream." On the other hand, complementary and alternative medicine includes meditation, certain uses of hypnosis, dance, music, and art therapy, as well as prayer and mental healing.

Biological-Based Therapies

This category of CAM includes natural and biological-based practices, interventions, and products, many of which overlap with conventional medicine's use of dietary supplements. This category includes herbal, special dietary, orthomolecular, and individual biological therapies.

Herbal therapy employs an individual herb or a mixture of herbs for healing purposes. An herb is a plant or plant part that produces and contains chemical substances that act upon the body. Special diet therapies, such as those proposed by Drs. Atkins, Ornish, Pritikin, and Weil, are believed to prevent and/or control illness as well as promote health. Orthomolecular therapies aim to treat disease with varying concentrations of chemicals such as magnesium, melatonin, and mega-doses of vitamins. Biological therapies include, for example, the use of laetrile and shark cartilage to treat cancer and the use of bee pollen to treat autoimmune and inflammatory diseases.

Manipulative and Body-Based Methods

This category includes methods that are based on manipulation and/or movement of the body. For example, chiropractors focus on the relationship between structure and function, primarily pertaining to the spine, and how that relationship affects the preservation and restoration of health. Chiropractors use manipulative therapy as an integral treatment tool.

In contrast, osteopaths place particular emphasis on the musculoskeletal system and practice osteopathic manipulation. Osteopaths believe that all of the body's systems work together and that disturbances in one system may have an impact upon function elsewhere in the body. Massage therapists manipulate the soft tissues of the body to normalize those tissues.

Energy Therapies

Energy therapies focus on energy fields originating within the body (biofields) or those from other sources (electromagnetic fields). Biofield therapies are intended to affect energy fields (the existence of which is not yet experimentally proven) that surround and penetrate the human body. Some forms of energy therapy manipulate biofields by applying pressure and/or manipulating the body by placing the hands in or through these fields. Examples include Qi gong, Reiki and Therapeutic Touch.

Qi gong is a component of traditional oriental medicine that combines movement, meditation, and regulation of breathing to enhance the flow of vital energy (qi) in the body, improve blood circulation, and enhance immune function. Reiki, the Japanese word representing Universal Life Energy, is based on the belief that, by channeling spiritual energy through the practitioner, the spirit is healed and, in turn, heals the physical body. Therapeutic Touch is derived from the ancient technique of "laying-on of hands." It is based on the premises that the therapist's healing force affects the patient's recovery and that healing is promoted when the body's energies are in balance. By passing their hands over the patient, these healers identify energy imbalances.

Bioelectromagnetic-based therapies involve the unconventional use of electromagnetic fields to treat illnesses or manage pain. These therapies are often used to treat asthma, cancer, and migraine headaches. Types of electromagnetic fields which are manipulated in these therapies include pulsed fields, magnetic fields, and alternating current or direct current fields.

Can Alternatives Affect My Treatment?

A critical issue in pursuing complementary alternatives mentioned thus far is the risk that these might have undesirable interactions with your medical treatment. It becomes all the more important to speak with your doctor who can offer advice on the use of alternatives. Official sources confirm this view. Though written for women, we find that the National Women's Health Information Center's advice on pursuing alternative medicine is appropriate for patients of both genders and all ages.[46]

[46] Adapted from **http://www.4woman.gov/faq/alternative.htm**.

Is It Okay to Want Both Traditional and Alternative or Complementary Medicine?

Should you wish to explore non-traditional types of treatment, be sure to discuss all issues concerning treatments and therapies with your healthcare provider, whether a physician or practitioner of complementary and alternative medicine. Competent healthcare management requires knowledge of both conventional and alternative therapies you are taking for the practitioner to have a complete picture of your treatment plan.

The decision to use complementary and alternative treatments is an important one. Consider before selecting an alternative therapy, the safety and effectiveness of the therapy or treatment, the expertise and qualifications of the healthcare practitioner, and the quality of delivery. These topics should be considered when selecting any practitioner or therapy.

Finding CAM References on Pertussis

Having read the previous discussion, you may be wondering which complementary or alternative treatments might be appropriate for pertussis. For the remainder of this chapter, we will direct you to a number of official sources which can assist you in researching studies and publications. Some of these articles are rather technical, so some patience may be required.

The Combined Health Information Database

For a targeted search, The Combined Health Information Database is a bibliographic database produced by health-related agencies of the Federal Government (mostly from the National Institutes of Health). This database is updated four times a year at the end of January, April, July, and October. Check the titles, summaries, and availability of CAM-related information by using the "Simple Search" option at the following Web site: **http://chid.nih.gov/simple/simple.html**. In the drop box at the top, select "Complementary and Alternative Medicine." Then type "pertussis" (or synonyms) in the second search box. We recommend that you select 100 "documents per page" and to check the "whole records" options. The following was extracted using this technique:

- **Efficacy of Pertussis Vaccines Consisted of Antigens Detoxified With Tea-Leaf Catechins**

  Source: Vaccine. 19(9-10): 1204-1210. 2001.

Summary: This journal article examines the ability of tea-leaf catechins to detoxify the biologically active components of pertussis vaccines. Filamentous hemagglutinin and pertussis toxin (PT) were detoxified by the catechins at an extraordinarily lower concentration than that of formalin. The sera from mice immunized by the catechin-treated antigens recognized not only catechin-treated but also untreated antigens. Furthermore, catechin-treated PT induced the antibody to neutralize PT activity in the sera of the immunized mice. Pertussis vaccines were prepared, including antigens detoxified by the treatment of catechins, and intraperitoneally injected into mice. Protection against 'Bordetella pertussis' infection was shown in mice immunized with the vaccines prepared by treatment with catechins. These data suggest that catechins may be effective toxoiding agents for preparing a pertussis vaccine. The article has 6 figures, 2 tables, and 14 references. (AA-M).

- **Local Massage After Vaccination Enhances the Immunogenicity of Diphtheria-Tetanus-Pertussis Vaccine**

  Source: Pediatric Infectious Disease Journal. 14(7): 567-572. July 1995.

  Summary: This journal article reports the effect of local massage on adverse reactions and immunogenicity of diphtheria-tetanus-pertussis (DTP) vaccine. A total of 327 infants receiving a DTP vaccination were randomly assigned to massage (n=175) and nonmassage (n=152) groups. Infants in the massage group received local massage for 1 minute over the injection site immediately after DTP inoculation. Parents recorded the infants' rectal temperatures and adverse reactions over the next 7 days. In addition, antibody production was measured at 2, 6, 7, 18, and 19 months of age in 124 infants. The results showed that local pain and fever occurred more frequently in the massage group. However, the extra febrile episodes from massage were mostly low grade, and no increase in the rates of high fever were found. Compared with controls, infants in the massage group developed significantly higher titers of antibodies against filamentous hemagglutinin at 6 and 7 months of age; pertussis toxin at 6, 7, 18, and 19 months; and diphtheria toxoid at 6 and 7 months. The results suggest that local massage is associated with enhanced immunogenicity but more mild fever and pain after DTP vaccination. The article has 2 figures, 2 tables, and 26 references.

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 allow patients to search for articles that specifically relate to pertussis and complementary medicine. To search the database, go to the following Web site: **www.nlm.nih.gov/nccam/camonpubmed.html**. Select "CAM on PubMed." Enter "pertussis" (or synonyms) into the search box. Click "Go." The following references provide information on particular aspects of complementary and alternative medicine (CAM) that are related to pertussis:

- **"Antiwhooping cough potentialities of the flesh of an Indian bird Acridotherus tristis".**
  Author(s): Rathore HS, Swarup.
  Source: Indian J Med Sci. 1978 March-April; 32(3-4): 40. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=569641&dopt=Abstract

- **"I hardly cried when I got my shot!" Influencing children's reports about a visit to their pediatrician.**
  Author(s): Bruck M, Ceci SJ, Francoeur E, Barr R.
  Source: Child Development. 1995 February; 66(1): 193-208.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7497825&dopt=Abstract

- **A trace component of ginseng that inhibits Ca2+ channels through a pertussis toxin-sensitive G protein.**
  Author(s): Nah SY, Park HJ, McCleskey EW.
  Source: Proceedings of the National Academy of Sciences of the United States of America. 1995 September 12; 92(19): 8739-43.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7568008&dopt=Abstract

- **Adenine nucleotides directly stimulate pertussis toxin.**
  Author(s): Lim LK, Sekura RD, Kaslow HR.
  Source: The Journal of Biological Chemistry. 1985 March 10; 260(5): 2585-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2982826&dopt=Abstract

- **Changes in the acoustic startle response and prepulse inhibition of acoustic startle in rats after local injection of pertussis toxin into the ventral tegmental area.**
  Author(s): Zhang J, Engel JA, Hjorth S, Svensson L.

Source: Psychopharmacology. 1995 May; 119(1): 71-8.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7675952&dopt=Abstract

- **Characterisation of a novel airway late phase model in the sensitized guinea pig which uses silica and Bordetella pertussis as adjuvant for sensitization.**
  Author(s): Heuer HO, Wenz B, Jennewein HM, Urich K.
  Source: European Journal of Pharmacology. 1996 December 19; 317(2-3): 361-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8997622&dopt=Abstract

- **Datura stramonium agglutinin released histamine from rat peritoneal mast cells that was inhibited by pertussis toxin, haptenic sugar and N-acetylglucosamine-specific lectins: involvement of glycoproteins with N-acetylglucosamine residues.**
  Author(s): Matsuda K, Aoki J, Uchida MK, Suzuki-Nishimura T.
  Source: Jpn J Pharmacol. 1994 October; 66(2): 195-204.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7532733&dopt=Abstract

- **Disruption of Bordetella pertussis in the Ribi cell fractionator. 2. Effect of different suspending media.**
  Author(s): Hollinger E, Wardlaw AC.
  Source: Canadian Journal of Microbiology. 1971 September; 17(9): 1195-202. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=4107161&dopt=Abstract

- **Effects of diphtheria-tetanus-pertussis or tetanus vaccination on allergies and allergy-related respiratory symptoms among children and adolescents in the United States.**
  Author(s): Hurwitz EL, Morgenstern H.
  Source: Journal of Manipulative and Physiological Therapeutics. 2000 February; 23(2): 81-90.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10714532&dopt=Abstract

- **Folk cures for whooping cough.**
  Author(s): Yates E.

Source: Nurs Mirror. 1978 January 26; 146(4): 18. No Abstract Available.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=341092&dopt=Abstract

- **Galanin inhibits glucagon-like peptide-1 secretion through pertussis toxin-sensitive G protein and ATP-dependent potassium channels in rat ileal L-cells.**
  Author(s): Saifia S, Chevrier AM, Bosshard A, Cuber JC, Chayvialle JA, Abello J.
  Source: The Journal of Endocrinology. 1998 April; 157(1): 33-41.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9614355&dopt=Abstract

- **Growth and siderophore production by Bordetella pertussis under iron-restricted conditions.**
  Author(s): Gorringe AR, Woods G, Robinson A.
  Source: Fems Microbiology Letters. 1990 January 1; 54(1-3): 101-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2138989&dopt=Abstract

- **Guanosine 5'-O-(3-thiotriphosphate) reduces ADP-ribosylation of the inhibitory guanine nucleotide-binding regulatory protein of adenylyl cyclase (Ni) by pertussis toxin without causing dissociation of the subunits of Ni. Evidence of existence of heterotrimeric pt+ and pt- conformations of Ni.**
  Author(s): Mattera R, Codina J, Sekura RD, Birnbaumer L.
  Source: The Journal of Biological Chemistry. 1987 August 15; 262(23): 11247-51.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=3112155&dopt=Abstract

- **Individual and community risks of measles and pertussis associated with personal exemptions to immunization.**
  Author(s): Feikin DR, Lezotte DC, Hamman RF, Salmon DA, Chen RT, Hoffman RE.
  Source: Jama : the Journal of the American Medical Association. 2000 December 27; 284(24): 3145-50.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11135778&dopt=Abstract

- **Involvement of pertussis toxin sensitive G-proteins in conditioned fear-potentiated startle: possible involvement of the amygdala.**
  Author(s): Melia KR, Falls WA, Davis M.
  Source: Brain Research. 1992 July 3; 584(1-2): 141-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1515934&dopt=Abstract

- **Lithium does not alter ADP-ribosylation of Gi/Go catalyzed by pertussis toxin in rat brain.**
  Author(s): Odagaki Y, Koyama T, Yamashita I.
  Source: Pharmacology & Toxicology. 1991 November; 69(5): 355-60.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1803347&dopt=Abstract

- **Local massage after vaccination enhances the immunogenicity of diphtheria-tetanus-pertussis vaccine.**
  Author(s): Hsu CY, Huang LM, Lee CY, Lin TY, Lee PI, Chen JM.
  Source: The Pediatric Infectious Disease Journal. 1995 July; 14(7): 567-72.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7567283&dopt=Abstract

- **On the mechanism of the adjuvant effect of Bordetella pertussis vaccine.**
  Author(s): Reed CE, Benner M, Lockey SD, Enta T, Makino S, Carr RH.
  Source: The Journal of Allergy and Clinical Immunology. 1972 March; 49(3): 174-82. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=5011091&dopt=Abstract

- **Pertussis outbreaks in groups claiming religious exemptions to vaccinations.**
  Author(s): Etkind P, Lett SM, Macdonald PD, Silva E, Peppe J.
  Source: Am J Dis Child. 1992 February; 146(2): 173-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1733146&dopt=Abstract

- **Pertussis toxin and 4-aminopyridine differentially affect the hypnotic-anesthetic action of dexmedetomidine and pentobarbital.**
  Author(s): Doze VA, Chen BX, Tinklenberg JA, Segal IS, Maze M.

Source: Anesthesiology. 1990 August; 73(2): 304-7.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1974396&dopt=Abstract

- **Pertussis toxin stimulates hypersensitivity and enhances nerve-mediated antigen uptake in rat intestine.**
  Author(s): Kosecka U, Marshall JS, Crowe SE, Bienenstock J, Perdue MH.
  Source: The American Journal of Physiology. 1994 November; 267(5 Pt 1): G745-53.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7977735&dopt=Abstract

- **Signaling mechanisms of pertussis toxin-induced myelomonocytic cell adhesion: role of tyrosine phosphorylation.**
  Author(s): Wong WS, Luk JM.
  Source: Biochemical and Biophysical Research Communications. 1997 July 18; 236(2): 479-82.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9240464&dopt=Abstract

- **The effect of pertussis adjuvant on antibody production: the need for thymus-dependent lymphocytes.**
  Author(s): Hay FC, Torrigiani G.
  Source: European Journal of Immunology. 1973 October; 3(10): 657-9. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=4358109&dopt=Abstract

- **Use of cyclodextrin as an agent to induce excretion of Bordetella pertussis antigens.**
  Author(s): Hozbor D, Rodriguez ME, Yantorno O.
  Source: Fems Immunology and Medical Microbiology. 1994 August; 9(2): 117-24.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7804162&dopt=Abstract

- **Use of glutamic acid to supplement fluid medium for cultivation of Bordetella pertussis.**
  Author(s): Lane AG.

Source: Appl Microbiol. 1970 March; 19(3): 512-20. No Abstract Available. http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=4314842&dopt=Abstract

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.thedacare.org/healthnotes/**
- Open Directory Project: **http://dmoz.org/Health/Alternative/**
- TPN.com: **http://www.tnp.com/**
- Yahoo.com: **http://dir.yahoo.com/Health/Alternative_Medicine/**
- WebMD®Health: **http://my.webmd.com/drugs_and_herbs**
- WellNet: **http://www.wellnet.ca/herbsa-c.htm**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,,00.html**

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

- **General Overview**

Allergic Reaction, Anaphylaxis
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Anaphylaxiscc.html

Anaphylaxis
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Anaphylaxiscc.html

Asthma
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Concern/Asthma.htm

Bronchitis
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Concern/Bronchitis.htm

Cough
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Concern/Cough.htm

Cough, Whooping
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

Pertussis
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/InteractiveMedicine/ConsLookups/Uses/pertussis.html

Pertussis
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

Pyloric Stenosis
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/PyloricStenosiscc.html

Rubella
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Rubellacc.html

Whooping Cough
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

- **Chinese Medicine**

Baibu
Alternative names: Stemona Root; Radix Stemonae
Source: Chinese Materia Medica
Hyperlink: http://www.newcenturynutrition.com/

Lusika Wan
Alternative names: Lusika Pills
Source: Pharmacopoeia Commission of the Ministry of Health, People's Republic of China
Hyperlink: http://www.newcenturynutrition.com/cgi-local/patent_herbs_db/db.cgi?db=default&Chinese=Lusika%20Wan&mh=10&sb=---&view_records=View+Records

- **Herbs and Supplements**

Anise
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsa-c.htm

Arctium
Alternative names: Burdock, Gobo; Arctium lappa L.
Source: Alternative Medicine Foundation, Inc.; www.amfoundation.org
Hyperlink: http://www.herbmed.org/

Elecampane
Alternative names: Inula helenium
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Herb/Elecampane.htm

Elecampane
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsd-f.htm

Eucalyptus
Alternative names: Eucalyptus globulus
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Herb/Eucalyptus.htm

Grindelia
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsg-i.htm

Horehound
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsg-i.htm

Ivy Leaf
Alternative names: Hedera helix
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink:
http://www.thedacare.org/healthnotes/Herb/Ivy_Leaf.htm

Jamaica Dogwood
Alternative names: Piscidia erythrina, Piscidia piscipula
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink:
http://www.drkoop.com/interactivemedicine/ConsHerbs/JamaicaDogwoodch.html

Lobelia
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsj-l.htm

Ma Huang
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsm-o.htm

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

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

Piscidia erythrina
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsHerbs/JamaicaDogwoodch.html

Piscidia piscipula
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink: http://www.drkoop.com/interactivemedicine/ConsHerbs/JamaicaDogwoodch.html

Red Clover
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsp-r.htm

Skunk Cabbage
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbss-v.htm

Sundew
Alternative names: Drosera rotundifolia, Drosera ramentacea, Drosera intermedia, Drosera anglica
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Herb/Sundew.htm

Thyme
Alternative names: Thymus vulgaris
Source: Healthnotes, Inc.; www.healthnotes.com
Hyperlink: http://www.thedacare.org/healthnotes/Herb/Thyme.htm

Thyme
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbss-v.htm

Wild Cherry Bark
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca
Hyperlink: http://www.wellnet.ca/herbsw-z.htm

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: **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. The following additional references describe, in broad terms, alternative and complementary medicine (sorted alphabetically by title; hyperlinks provide rankings, information, and reviews at Amazon.com):

- **Herbal Antibiotics : Natural Alternatives for Treating Drug-Resistant Bacteria (Storey Medicinal Herb Guide)** by Stephen Harrod Buhner; Paperback - 128 pages (September 1999), Storey Books; ISBN: 1580171486; **http://www.amazon.com/exec/obidos/ASIN/1580171486/icongroupinterna**
- **Natural Alternatives to Antibiotics** by John McKenna; Paperback - 176 pages (November 1998), Avery Penguin Putnam; ISBN: 0895298392; **http://www.amazon.com/exec/obidos/ASIN/0895298392/icongroupinterna**
- **Alternative Medicine for Dummies** by James Dillard (Author); Audio Cassette, Abridged edition (1998), Harper Audio; ISBN: 0694520659; **http://www.amazon.com/exec/obidos/ASIN/0694520659/icongroupinterna**
- **Complementary and Alternative Medicine Secrets** by W. Kohatsu (Editor); Hardcover (2001), Hanley & Belfus; ISBN: 1560534400; **http://www.amazon.com/exec/obidos/ASIN/1560534400/icongroupinterna**
- **Dictionary of Alternative Medicine** by J. C. Segen; Paperback-2nd edition (2001), Appleton & Lange; ISBN: 0838516211; **http://www.amazon.com/exec/obidos/ASIN/0838516211/icongroupinterna**
- **Eat, Drink, and Be Healthy: The Harvard Medical School Guide to Healthy Eating** by Walter C. Willett, MD, et al; Hardcover - 352 pages (2001), Simon & Schuster; ISBN: 0684863375; **http://www.amazon.com/exec/obidos/ASIN/0684863375/icongroupinterna**
- **Encyclopedia of Natural Medicine, Revised 2nd Edition** by Michael T. Murray, Joseph E. Pizzorno; Paperback - 960 pages, 2nd Rev edition (1997),

Prima Publishing; ISBN: 0761511571;
http://www.amazon.com/exec/obidos/ASIN/0761511571/icongroupinterna

- **Integrative Medicine: An Introduction to the Art & Science of Healing** by Andrew Weil (Author); Audio Cassette, Unabridged edition (2001), Sounds True; ISBN: 1564558541;
http://www.amazon.com/exec/obidos/ASIN/1564558541/icongroupinterna
- **New Encyclopedia of Herbs & Their Uses** by Deni Bown; Hardcover - 448 pages, Revised edition (2001), DK Publishing; ISBN: 078948031X;
http://www.amazon.com/exec/obidos/ASIN/078948031X/icongroupinterna
- **Textbook of Complementary and Alternative Medicine** by Wayne B. Jonas; Hardcover (2003), Lippincott, Williams & Wilkins; ISBN: 0683044370;
http://www.amazon.com/exec/obidos/ASIN/0683044370/icongroupinterna

For additional information on complementary and alternative medicine, ask your doctor or write to:

National Institutes of Health
National Center for Complementary and Alternative Medicine Clearinghouse
P. O. Box 8218
Silver Spring, MD 20907-8218

Vocabulary Builder

The following vocabulary builder gives definitions of words used in this chapter that have not been defined in previous chapters:

Anaphylaxis: An acute hypersensitivity reaction due to exposure to a previously encountered antigen. The reaction may include rapidly progressing urticaria, respiratory distress, vascular collapse, systemic shock, and death. [NIH]

Anthropology: The science devoted to the comparative study of man. [NIH]

Antitumour: Counteracting tumour formation. [EU]

Bronchitis: Inflammation of one or more bronchi. [EU]

Erythrina: A genus of leguminous shrubs or trees, mainly tropical, yielding certain alkaloids, lectins, and other useful compounds. [NIH]

Eucalyptus: A genus of Australian trees of the Myrtaceae family that yields gums, oils, and resins which are used as flavoring agents, astringents, and

aromatics, and formerly to treat diarrhea, asthma, bronchitis, and respiratory tract infections. [NIH]

Immunotherapy: Manipulation of the host's immune system in treatment of disease. It includes both active and passive immunization as well as immunosuppressive therapy to prevent graft rejection. [NIH]

Leukaemia: An acute or chronic disease of unknown cause in man and other warm-blooded animals that involves the blood-forming organs, is characterized by an abnormal increase in the number of leucocytes in the tissues of the body with or without a corresponding increase of those in the circulating blood, and is classified according of the type leucocyte most prominently involved. [EU]

Mobilization: The process of making a fixed part or stored substance mobile, as by separating a part from surrounding structures to make it accessible for an operative procedure or by causing release into the circulation for body use of a substance stored in the body. [EU]

Neutrophil: Having an affinity for neutral dyes. [EU]

Oocytes: Female germ cells in stages between the prophase of the first maturation division and the completion of the second maturation division. [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]

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

Xenopus: An aquatic genus of the family, Pipidae, occurring in Africa and distinguished by having black horny claws on three inner hind toes. [NIH]

APPENDIX C. RESEARCHING NUTRITION

Overview

Since the time of Hippocrates, doctors have understood the importance of diet and nutrition to patients' health and well-being. Since then, they have accumulated an impressive archive of studies and knowledge dedicated to this subject. Based on their experience, doctors and healthcare providers may recommend particular dietary supplements to patients with pertussis. Any dietary recommendation is based on a patient's age, body mass, gender, lifestyle, eating habits, food preferences, and health condition. It is therefore likely that different patients with pertussis may be given different recommendations. Some recommendations may be directly related to pertussis, while others may be more related to the patient's general health. These recommendations, themselves, may differ from what official sources recommend for the average person.

In this chapter we will begin by briefly reviewing the essentials of diet and nutrition that will broadly frame more detailed discussions of pertussis. We will then show you how to find studies dedicated specifically to nutrition and pertussis.

Food and Nutrition: General Principles

What Are Essential Foods?

Food is generally viewed by official sources as consisting of six basic elements: (1) fluids, (2) carbohydrates, (3) protein, (4) fats, (5) vitamins, and (6) minerals. Consuming a combination of these elements is considered to be a healthy diet:

- **Fluids** are essential to human life as 80-percent of the body is composed of water. Water is lost via urination, sweating, diarrhea, vomiting, diuretics (drugs that increase urination), caffeine, and physical exertion.
- **Carbohydrates** are the main source for human energy (thermoregulation) and the bulk of typical diets. They are mostly classified as being either simple or complex. Simple carbohydrates include sugars which are often consumed in the form of cookies, candies, or cakes. Complex carbohydrates consist of starches and dietary fibers. Starches are consumed in the form of pastas, breads, potatoes, rice, and other foods. Soluble fibers can be eaten in the form of certain vegetables, fruits, oats, and legumes. Insoluble fibers include brown rice, whole grains, certain fruits, wheat bran and legumes.
- **Proteins** are eaten to build and repair human tissues. Some foods that are high in protein are also high in fat and calories. Food sources for protein include nuts, meat, fish, cheese, and other dairy products.
- **Fats** are consumed for both energy and the absorption of certain vitamins. There are many types of fats, with many general publications recommending the intake of unsaturated fats or those low in cholesterol.

Vitamins and minerals are fundamental to human health, growth, and, in some cases, disease prevention. Most are consumed in your diet (exceptions being vitamins K and D which are produced by intestinal bacteria and sunlight on the skin, respectively). Each vitamin and mineral plays a different role in health. The following outlines essential vitamins:

- **Vitamin A** is important to the health of your eyes, hair, bones, and skin; sources of vitamin A include foods such as eggs, carrots, and cantaloupe.
- **Vitamin B^1**, also known as thiamine, is important for your nervous system and energy production; food sources for thiamine include meat, peas, fortified cereals, bread, and whole grains.
- **Vitamin B^2**, also known as riboflavin, is important for your nervous system and muscles, but is also involved in the release of proteins from

nutrients; food sources for riboflavin include dairy products, leafy vegetables, meat, and eggs.

- **Vitamin B^3**, also known as niacin, is important for healthy skin and helps the body use energy; food sources for niacin include peas, peanuts, fish, and whole grains
- **Vitamin B^6**, also known as pyridoxine, is important for the regulation of cells in the nervous system and is vital for blood formation; food sources for pyridoxine include bananas, whole grains, meat, and fish.
- **Vitamin B^{12}** is vital for a healthy nervous system and for the growth of red blood cells in bone marrow; food sources for vitamin B12 include yeast, milk, fish, eggs, and meat.
- **Vitamin C** allows the body's immune system to fight various diseases, strengthens body tissue, and improves the body's use of iron; food sources for vitamin C include a wide variety of fruits and vegetables.
- **Vitamin D** helps the body absorb calcium which strengthens bones and teeth; food sources for vitamin D include oily fish and dairy products.
- **Vitamin E** can help protect certain organs and tissues from various degenerative diseases; food sources for vitamin E include margarine, vegetables, eggs, and fish.
- **Vitamin K** is essential for bone formation and blood clotting; common food sources for vitamin K include leafy green vegetables.
- **Folic Acid** maintains healthy cells and blood and, when taken by a pregnant woman, can prevent her fetus from developing neural tube defects; food sources for folic acid include nuts, fortified breads, leafy green vegetables, and whole grains.

It should be noted that one can overdose on certain vitamins which become toxic if consumed in excess (e.g. vitamin A, D, E and K).
Like vitamins, minerals are chemicals that are required by the body to remain in good health. Because the human body does not manufacture these chemicals internally, we obtain them from food and other dietary sources. The more important minerals include:

- **Calcium** is needed for healthy bones, teeth, and muscles, but also helps the nervous system function; food sources for calcium include dry beans, peas, eggs, and dairy products.
- **Chromium** is helpful in regulating sugar levels in blood; food sources for chromium include egg yolks, raw sugar, cheese, nuts, beets, whole grains, and meat.

- **Fluoride** is used by the body to help prevent tooth decay and to reinforce bone strength; sources of fluoride include drinking water and certain brands of toothpaste.
- **Iodine** helps regulate the body's use of energy by synthesizing into the hormone thyroxine; food sources include leafy green vegetables, nuts, egg yolks, and red meat.
- **Iron** helps maintain muscles and the formation of red blood cells and certain proteins; food sources for iron include meat, dairy products, eggs, and leafy green vegetables.
- **Magnesium** is important for the production of DNA, as well as for healthy teeth, bones, muscles, and nerves; food sources for magnesium include dried fruit, dark green vegetables, nuts, and seafood.
- **Phosphorous** is used by the body to work with calcium to form bones and teeth; food sources for phosphorous include eggs, meat, cereals, and dairy products.
- **Selenium** primarily helps maintain normal heart and liver functions; food sources for selenium include wholegrain cereals, fish, meat, and dairy products.
- **Zinc** helps wounds heal, the formation of sperm, and encourage rapid growth and energy; food sources include dried beans, shellfish, eggs, and nuts.

The United States government periodically publishes recommended diets and consumption levels of the various elements of food. Again, your doctor may encourage deviations from the average official recommendation based on your specific condition. To learn more about basic dietary guidelines, visit the Web site: **http://www.health.gov/dietaryguidelines/**. Based on these guidelines, many foods are required to list the nutrition levels on the food's packaging. Labeling Requirements are listed at the following site maintained by the Food and Drug Administration: **http://www.cfsan.fda.gov/~dms/lab-cons.html**. When interpreting these requirements, the government recommends that consumers become familiar with the following abbreviations before reading FDA literature:[47]

- **DVs (Daily Values):** A new dietary reference term that will appear on the food label. It is made up of two sets of references, DRVs and RDIs.
- **DRVs (Daily Reference Values):** A set of dietary references that applies to fat, saturated fat, cholesterol, carbohydrate, protein, fiber, sodium, and potassium.

[47] Adapted from the FDA: **http://www.fda.gov/fdac/special/foodlabel/dvs.html**.

- **RDIs (Reference Daily Intakes):** A set of dietary references based on the Recommended Dietary Allowances for essential vitamins and minerals and, in selected groups, protein. The name "RDI" replaces the term "U.S. RDA."
- **RDAs (Recommended Dietary Allowances):** A set of estimated nutrient allowances established by the National Academy of Sciences. It is updated periodically to reflect current scientific knowledge.

What Are Dietary Supplements?[48]

Dietary supplements are widely available through many commercial sources, including health food stores, grocery stores, pharmacies, and by mail. Dietary supplements are provided in many forms including tablets, capsules, powders, gel-tabs, extracts, and liquids. Historically in the United States, the most prevalent type of dietary supplement was a multivitamin/mineral tablet or capsule that was available in pharmacies, either by prescription or "over the counter." Supplements containing strictly herbal preparations were less widely available. Currently in the United States, a wide array of supplement products are available, including vitamin, mineral, other nutrients, and botanical supplements as well as ingredients and extracts of animal and plant origin.

The Office of Dietary Supplements (ODS) of the National Institutes of Health is the official agency of the United States which has the expressed goal of acquiring "new knowledge to help prevent, detect, diagnose, and treat disease and disability, from the rarest genetic disorder to the common cold."[49] According to the ODS, dietary supplements can have an important impact on the prevention and management of disease and on the maintenance of health.[50] The ODS notes that considerable research on the

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[48] This discussion has been adapted from the NIH: **http://ods.od.nih.gov/whatare/whatare.html**.

[49] Contact: The Office of 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**.

[50] Adapted from **http://ods.od.nih.gov/about/about.html**. The Dietary Supplement Health and Education Act defines dietary supplements as "a product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, mineral, amino acid, herb or other botanical; or a dietary substance for use to supplement the diet by increasing the total dietary intake; or a concentrate, metabolite, constituent, extract, or combination of any ingredient described above; and intended for ingestion in the form of a capsule, powder, softgel, or gelcap, and not represented as a conventional food or as a sole item of a meal or the diet."

effects of dietary supplements has been conducted in Asia and Europe where the use of plant products, in particular, has a long tradition. However, the overwhelming majority of supplements have not been studied scientifically. To explore the role of dietary supplements in the improvement of health care, the ODS plans, organizes, and supports conferences, workshops, and symposia on scientific topics related to dietary supplements. The ODS often works in conjunction with other NIH Institutes and Centers, other government agencies, professional organizations, and public advocacy groups.

To learn more about official information on dietary supplements, visit the ODS site at **http://ods.od.nih.gov/whatare/whatare.html**. Or contact:

The Office of 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

Finding Studies on Pertussis

The NIH maintains an office dedicated to patient nutrition and diet. 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). 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.[51] IBIDS is available to the public free of charge through the ODS Internet page: **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. We recommend that you start with the Consumer Database. While you may not

[51] 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.

find references for the topics that are of most interest to you, check back periodically as this database is frequently updated. More studies can be found by searching the Full IBIDS Database. Healthcare professionals and researchers generally use the third option, which lists peer-reviewed citations. In all cases, we suggest that you take advantage of the "Advanced Search" option that allows you to retrieve up to 100 fully explained references in a comprehensive format. Type "pertussis" (or synonyms) into the search box. To narrow the search, you can also select the "Title" field.

The following information is typical of that found when using the "Full IBIDS Database" when searching using "pertussis" (or a synonym):

- **Biphasic modulation of intracellular Ca2+ concentration by interleukin-1beta in cortical synaptosomes: involvement of a pertussis toxin-sensitive G-protein and mitogen-activated protein kinase.**
  Author(s): Department of Physiology, Trinity College, Dublin, Ireland.
  Source: Campbell, V Lynch, M A Neuroreport. 1998 June 22; 9(9): 1923-7 0959-4965
- **Differentiation of Bordetella pertussis, B. parapertussis, and B. bronchiseptica by whole-cell protein electrophoresis and fatty acid analysis.**
  Source: Vancanneyt, M. Vandamme, P. Kersters, K. Int-j-syst-bacteriol. Washington, D.C. : American Society for Microbiology. October 1995. volume 45 (4) page 843-847. 0020-7713
- **Discrimination of Bordetella parapertussis and Bordetella pertussis organisms from clinical isolates by PCR using biotin-labelled oligonucleotide probes.**
  Author(s): Kinderklinik Universitatsklinikum, Aachen, Germany. fmmueller@mail.uniwuerzburg.de
  Source: Muller, F M Heininger, U Schnitzler, N Kockelkorn, P Cloot, O Lorenz, C Haase, G Mol-Cell-Probes. 1998 August; 12(4): 213-7 0890-8508
- **Effect of pertussis toxin on insulin-induced signal transduction in rat adipocytes and soleus muscles.**
  Author(s): The Third Department of Internal Medicine, Gifu University School of Medicine, Tsukasamachi, Japan.
  Source: Kanoh, Y Ishizuka, T Morita, H Ishizawa, M Miura, A Kajita, K Kimura, M Suzuki, T Sakuma, H Yasuda, K Cell-Signal. 2000 April; 12(4): 223-32 0898-6568
- **Galanin inhibits acetylcholine release from rat cerebral cortex via a pertussis toxin-sensitive G(i)protein.**
  Author(s): CNS Drug Discovery, The R.W. Johnson Pharmaceutical Research Institute, Spring House, PA, 19477, USA. hwang2@prius.jnj.com

Source: Wang, H Y Wild, K D Shank, R P Lee, D H Neuropeptides. 1999 June; 33(3): 197-205 0143-4179

- **Opioid inhibition of adenylyl cyclase in membranes from pertussis toxin-treated NG108-15 cells.**
  Author(s): Department of Physiology and Pharmacology, Bowman Gray School of Medicine, Wake Forest University, Winston-Salem, NC 27157, USA.
  Source: Selley, D E Breivogel, C S Childers, S R J-Recept-Signal-Transduct-Res. 1998 January; 18(1): 25-49 1079-9893
- **Pertussis toxin prevents presynaptic inhibition by kainate receptors of rat hippocampal [(3)H]GABA release.**
  Author(s): Laboratory of Neurosciences, Faculty of Medicine, University of Lisbon, Av. Prof. Egas Moniz, 1649-028, Lisbon, Portugal. racunha@neurociencias.pt
  Source: Cunha, R A Malva, J O Ribeiro, J A FEBS-Lett. 2000 March 10; 469(2-3): 159-62 0014-5793
- **The enhanced antigen-specific production of cytokines induced by pertussis toxin is due to clonal expansion of T cells and not to altered effector functions of long-term memory cells.**
  Author(s): Institute of Pathology, School of Medicine, Case Western Reserve University, Cleveland, OH 44106-4943, USA.
  Source: Shive, C L Hofstetter, H Arredondo, L Shaw, C Forsthuber, T G Eur-J-Immunol. 2000 August; 30(8): 2422-31 0014-2980
- **Voltage-dependent, pertussis toxin insensitive inhibition of calcium currents by histamine in bovine adrenal chromaffin cells.**
  Author(s): Department of Neurobiology, Pharmacology and Physiology, The University of Chicago, Chicago, Illinois 60637, USA.
  Source: Currie, K P Fox, A P J-Neurophysiol. 2000 March; 83(3): 1435-42 0022-3077

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

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

- **Food and Diet**

  Bananas
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Fruit
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Meat
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Pineapple
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Tea
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Vegetables
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

  Water
  Source: Integrative Medicine Communications; www.onemedicine.com
  Hyperlink:
  http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

Wheat
Source: Integrative Medicine Communications; www.onemedicine.com
Hyperlink:
http://www.drkoop.com/interactivemedicine/ConsConditions/Pertussiscc.html

Vocabulary Builder

The following vocabulary builder defines words used in the references in this chapter that have not been defined in previous chapters:

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]

Adipocytes: Fat-storing cells found mostly in the abdominal cavity and subcutaneous tissue. Fat is usually stored in the form of tryglycerides. [NIH]

Biphasic: Having two phases; having both a sporophytic and a gametophytic phase in the life cycle. [EU]

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

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]

Cytokines: Non-antibody proteins secreted by inflammatory leukocytes and some non-leukocytic cells, that act as intercellular mediators. They differ from classical hormones in that they are produced by a number of tissue or cell types rather than by specialized glands. They generally act locally in a paracrine or autocrine rather than endocrine manner. [NIH]

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

Diarrhea: Passage of excessively liquid or excessively frequent stools. [NIH]

GABA: The most common inhibitory neurotransmitter in the central

nervous system. [NIH]

Insulin: A protein hormone secreted by beta cells of the pancreas. Insulin plays a major role in the regulation of glucose metabolism, generally promoting the cellular utilization of glucose. It is also an important regulator of protein and lipid metabolism. Insulin is used as a drug to control insulin-dependent diabetes mellitus. [NIH]

Intestinal: Pertaining to the intestine. [EU]

Iodine: A nonmetallic element of the halogen group that is represented by the atomic symbol I, atomic number 53, and atomic weight of 126.90. It is a nutritionally essential element, especially important in thyroid hormone synthesis. In solution, it has anti-infective properties and is used topically. [NIH]

Neuropeptides: Peptides released by neurons as intercellular messengers. Many neuropeptides are also hormones released by non-neuronal cells. [NIH]

Neurosciences: The scientific disciplines concerned with the embryology, anatomy, physiology, biochemistry, pharmacology, etc., of the nervous sytem. [NIH]

Niacin: Water-soluble vitamin of the B complex occurring in various animal and plant tissues. Required by the body for the formation of coenzymes NAD and NADP. Has pellagra-curative, vasodilating, and antilipemic properties. [NIH]

Presynaptic: Situated proximal to a synapse, or occurring before the synapse is crossed. [EU]

Riboflavin: Nutritional factor found in milk, eggs, malted barley, liver, kidney, heart, and leafy vegetables. The richest natural source is yeast. It occurs in the free form only in the retina of the eye, in whey, and in urine; its principal forms in tissues and cells are as FMN and FAD. [NIH]

Selenium: An element with the atomic symbol Se, atomic number 34, and atomic weight 78.96. It is an essential micronutrient for mammals and other animals but is toxic in large amounts. Selenium protects intracellular structures against oxidative damage. It is an essential component of glutathione peroxidase. [NIH]

Synaptosomes: Pinched-off nerve endings and their contents of vesicles and cytoplasm together with the attached subsynaptic area of the membrane of the post-synaptic cell. They are largely artificial structures produced by fractionation after selective centrifugation of nervous tissue homogenates. [NIH]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

APPENDIX D. FINDING MEDICAL LIBRARIES

Overview

At a medical library you can find medical texts and reference books, consumer health publications, specialty newspapers and magazines, as well as medical journals. In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Before going to the library, highlight the references mentioned in this sourcebook that you find interesting. Focus on those items that are not available via the Internet, and ask the reference librarian for help with your search. He or she may know of additional resources that could be helpful to you. Most importantly, 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. NLM's interlibrary loan services are only available to libraries. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.[52]

[52] Adapted from the NLM: **http://www.nlm.nih.gov/psd/cas/interlibrary.html**.

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 Open to the Public

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries that are generally open to the public and have reference facilities. The following is the NLM's list plus hyperlinks to each library Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of 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):[53]

- **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), **http://www.asmi.org/LIBRARY.HTM**
- **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), **http://www.humboldt1.com/~kkhic/index.html**
- **California:** Community Health Library of Los Gatos (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/**

[53] Abstracted from **http://www.nlm.nih.gov/medlineplus/libraries.html**.

- **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:** San José PlaneTree Health Library, **http://planetreesanjose.org/**
- **California:** Sutter Resource Library (Sutter Hospitals Foundation), **http://go.sutterhealth.org/comm/resc-library/sac-resources.html**
- **California:** University of California, Davis. Health Sciences Libraries
- **California:** ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System), **http://www.valleycare.com/library.html**
- **California:** Washington Community Health Resource Library (Washington Community Health Resource Library), **http://www.healthlibrary.org/**
- **Colorado:** William V. Gervasini Memorial Library (Exempla Healthcare), **http://www.exempla.org/conslib.htm**
- **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/**
- **Connecticut:** Waterbury Hospital Health Center Library (Waterbury Hospital), **http://www.waterburyhospital.com/library/consumer.shtml**
- **Delaware:** Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute), **http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm**
- **Delaware:** Lewis B. Flinn Library (Delaware Academy of Medicine), **http://www.delamed.org/chls.html**
- **Georgia:** Family Resource Library (Medical College of Georgia), **http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/frl.htm**
- **Georgia:** Health Resource Center (Medical Center of Central Georgia), **http://www.mccg.org/hrc/hrchome.asp**
- **Hawaii:** Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library), **http://hml.org/CHIS/**

- **Idaho:** DeArmond Consumer Health Library (Kootenai Medical Center), **http://www.nicon.org/DeArmond/index.htm**
- **Illinois:** Health Learning Center of Northwestern Memorial Hospital (Northwestern Memorial Hospital, Health Learning Center), **http://www.nmh.org/health_info/hlc.html**
- **Illinois:** Medical Library (OSF Saint Francis Medical Center), **http://www.osfsaintfrancis.org/general/library/**
- **Kentucky:** Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital), **http://www.centralbap.com/education/community/library.htm**
- **Kentucky:** University of Kentucky - Health Information Library (University of Kentucky, Chandler Medical Center, Health Information Library), **http://www.mc.uky.edu/PatientEd/**
- **Louisiana:** Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation), **http://www.ochsner.org/library/**
- **Louisiana:** Louisiana State University Health Sciences Center Medical Library-Shreveport, **http://lib-sh.lsuhsc.edu/**
- **Maine:** Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital), **http://www.fchn.org/fmh/lib.htm**
- **Maine:** Gerrish-True Health Sciences Library (Central Maine Medical Center), **http://www.cmmc.org/library/library.html**
- **Maine:** Hadley Parrot Health Science Library (Eastern Maine Healthcare), **http://www.emh.org/hll/hpl/guide.htm**
- **Maine:** Maine Medical Center Library (Maine Medical Center), **http://www.mmc.org/library/**
- **Maine:** Parkview Hospital, **http://www.parkviewhospital.org/communit.htm#Library**
- **Maine:** Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center), **http://www.smmc.org/services/service.php3?choice=10**
- **Maine:** Stephens Memorial Hospital Health Information Library (Western Maine Health), **http://www.wmhcc.com/hil_frame.html**
- **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), **http://www.deerlodge.mb.ca/library/libraryservices.shtml**

- **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Md., 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), **http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm**
- **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital), **http://www.nebh.org/health_lib.asp**
- **Massachusetts:** St. Luke's Hospital Health Sciences Library (St. Luke's Hospital), **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), **http://healthnet.umassmed.edu/**
- **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services), **http://www.botsfordlibrary.org/consumer.htm**
- **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers), **http://www.providence-hospital.org/library/**
- **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center), **http://www.mgh.org/center.html**
- **Michigan:** Patient Education Resouce Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center), **http://www.cancer.med.umich.edu/learn/leares.htm**
- **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information, **http://www.sladen.hfhs.org/library/consumer/index.html**
- **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center), **http://www.saintpatrick.org/chi/librarydetail.php3?ID=41**

- **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section), **http://caphis.mlanet.org/directory/index.html**
- **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, **http://nnlm.gov/**
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), **http://nnlm.gov/members/**
- **Nevada:** Health Science Library, West Charleston Library (Las Vegas Clark County Library District), **http://www.lvccld.org/special_collections/medical/index.htm**
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library), **http://www.dartmouth.edu/~biomed/resources.htmld/conshealth.htmld/**
- **New Jersey:** Consumer Health Library (Rahway Hospital), **http://www.rahwayhospital.com/library.htm**
- **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center), **http://www.englewoodhospital.com/links/index.htm**
- **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center), **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), **http://www.upstate.edu/library/hic/**
- **New York:** Health Sciences Library (Long Island Jewish Medical Center), **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:** Saint Francis Health System Patient/Family Resource Center (Saint Francis Health System), **http://www.sfh-tulsa.com/patientfamilycenter/default.asp**

- **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center), **http://www.mcmc.net/phrc/**
- **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center), **http://www.hmc.psu.edu/commhealth/**
- **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center), **http://www.geisinger.edu/education/commlib.shtml**
- **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital), **http://www.mth.org/healthwellness.html**
- **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System), **http://www.hsls.pitt.edu/chi/hhrcinfo.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), **http://www.shscares.org/services/lrc/index.asp**
- **Pennsylvania:** Medical Library (UPMC Health System), **http://www.upmc.edu/passavant/library.htm**
- **Quebec, Canada:** Medical Library (Montreal General Hospital), **http://ww2.mcgill.ca/mghlib/**
- **South Dakota:** Rapid City Regional Hospital - Health Information Center (Rapid City Regional Hospital, Health Information Center), **http://www.rcrh.org/education/LibraryResourcesConsumers.htm**
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), **http://hhw.library.tmc.edu/**
- **Texas:** Matustik Family Resource Center (Cook Children's Health Care System), **http://www.cookchildrens.com/Matustik_Library.html**
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), **http://www.kvch.com/**
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center), **http://www.swmedctr.com/Home/**

APPENDIX E. YOUR RIGHTS AND INSURANCE

Overview

Any patient with pertussis faces a series of issues related more to the healthcare industry than to the medical condition itself. This appendix covers two important topics in this regard: your rights and responsibilities as a patient, and how to get the most out of your medical insurance plan.

Your Rights as a Patient

The President's Advisory Commission on Consumer Protection and Quality in the Healthcare Industry has created the following summary of your rights as a patient.[54]

Information Disclosure

Consumers have the right to receive accurate, easily understood information. Some consumers require assistance in making informed decisions about health plans, health professionals, and healthcare facilities. Such information includes:

- ***Health plans.*** Covered benefits, cost-sharing, and procedures for resolving complaints, licensure, certification, and accreditation status, comparable measures of quality and consumer satisfaction, provider network composition, the procedures that govern access to specialists and emergency services, and care management information.

[54]Adapted from Consumer Bill of Rights and Responsibilities: **http://www.hcqualitycommission.gov/press/cbor.html#head1**.

- ***Health professionals.*** Education, board certification, and recertification, years of practice, experience performing certain procedures, and comparable measures of quality and consumer satisfaction.
- ***Healthcare facilities.*** Experience in performing certain procedures and services, accreditation status, comparable measures of quality, worker, and consumer satisfaction, and procedures for resolving complaints.
- ***Consumer assistance programs.*** Programs must be carefully structured to promote consumer confidence and to work cooperatively with health plans, providers, payers, and regulators. Desirable characteristics of such programs are sponsorship that ensures accountability to the interests of consumers and stable, adequate funding.

Choice of Providers and Plans

Consumers have the right to a choice of healthcare providers that is sufficient to ensure access to appropriate high-quality healthcare. To ensure such choice, the Commission recommends the following:

- ***Provider network adequacy.*** All health plan networks should provide access to sufficient numbers and types of providers to assure that all covered services will be accessible without unreasonable delay -- including access to emergency services 24 hours a day and 7 days a week. If a health plan has an insufficient number or type of providers to provide a covered benefit with the appropriate degree of specialization, the plan should ensure that the consumer obtains the benefit outside the network at no greater cost than if the benefit were obtained from participating providers.
- ***Women's health services.*** Women should be able to choose a qualified provider offered by a plan -- such as gynecologists, certified nurse midwives, and other qualified healthcare providers -- for the provision of covered care necessary to provide routine and preventative women's healthcare services.
- ***Access to specialists.*** Consumers with complex or serious medical conditions who require frequent specialty care should have direct access to a qualified specialist of their choice within a plan's network of providers. Authorizations, when required, should be for an adequate number of direct access visits under an approved treatment plan.
- ***Transitional care.*** Consumers who are undergoing a course of treatment for a chronic or disabling condition (or who are in the second or third trimester of a pregnancy) at the time they involuntarily change health

plans or at a time when a provider is terminated by a plan for other than cause should be able to continue seeing their current specialty providers for up to 90 days (or through completion of postpartum care) to allow for transition of care.

- ***Choice of health plans.*** Public and private group purchasers should, wherever feasible, offer consumers a choice of high-quality health insurance plans.

Access to Emergency Services

Consumers have the right to access emergency healthcare services when and where the need arises. Health plans should provide payment when a consumer presents to an emergency department with acute symptoms of sufficient severity--including severe pain--such that a "prudent layperson" could reasonably expect the absence of medical attention to result in placing that consumer's health in serious jeopardy, serious impairment to bodily functions, or serious dysfunction of any bodily organ or part.

Participation in Treatment Decisions

Consumers have the right and responsibility to fully participate in all decisions related to their healthcare. Consumers who are unable to fully participate in treatment decisions have the right to be represented by parents, guardians, family members, or other conservators. Physicians and other health professionals should:

- Provide patients with sufficient information and opportunity to decide among treatment options consistent with the informed consent process.
- Discuss all treatment options with a patient in a culturally competent manner, including the option of no treatment at all.
- Ensure that persons with disabilities have effective communications with members of the health system in making such decisions.
- Discuss all current treatments a consumer may be undergoing.
- Discuss all risks, benefits, and consequences to treatment or nontreatment.
- Give patients the opportunity to refuse treatment and to express preferences about future treatment decisions.

- Discuss the use of advance directives -- both living wills and durable powers of attorney for healthcare -- with patients and their designated family members.
- Abide by the decisions made by their patients and/or their designated representatives consistent with the informed consent process.

Health plans, health providers, and healthcare facilities should:

- Disclose to consumers factors -- such as methods of compensation, ownership of or interest in healthcare facilities, or matters of conscience -- that could influence advice or treatment decisions.
- Assure that provider contracts do not contain any so-called "gag clauses" or other contractual mechanisms that restrict healthcare providers' ability to communicate with and advise patients about medically necessary treatment options.
- Be prohibited from penalizing or seeking retribution against healthcare professionals or other health workers for advocating on behalf of their patients.

Respect and Nondiscrimination

Consumers have the right to considerate, respectful care from all members of the healthcare industry at all times and under all circumstances. An environment of mutual respect is essential to maintain a quality healthcare system. To assure that right, the Commission recommends the following:

- Consumers must not be discriminated against in the delivery of healthcare services consistent with the benefits covered in their policy, or as required by law, based on race, ethnicity, national origin, religion, sex, age, mental or physical disability, sexual orientation, genetic information, or source of payment.
- Consumers eligible for coverage under the terms and conditions of a health plan or program, or as required by law, must not be discriminated against in marketing and enrollment practices based on race, ethnicity, national origin, religion, sex, age, mental or physical disability, sexual orientation, genetic information, or source of payment.

Confidentiality of Health Information

Consumers have the right to communicate with healthcare providers in confidence and to have the confidentiality of their individually identifiable

healthcare information protected. Consumers also have the right to review and copy their own medical records and request amendments to their records.

Complaints and Appeals

Consumers have the right to a fair and efficient process for resolving differences with their health plans, healthcare providers, and the institutions that serve them, including a rigorous system of internal review and an independent system of external review. A free copy of the Patient's Bill of Rights is available from the American Hospital Association.[55]

Patient Responsibilities

Treatment is a two-way street between you and your healthcare providers. To underscore the importance of finance in modern healthcare as well as your responsibility for the financial aspects of your care, the President's Advisory Commission on Consumer Protection and Quality in the Healthcare Industry has proposed that patients understand the following "Consumer Responsibilities."[56] In a healthcare system that protects consumers' rights, it is reasonable to expect and encourage consumers to assume certain responsibilities. Greater individual involvement by the consumer in his or her care increases the likelihood of achieving the best outcome and helps support a quality-oriented, cost-conscious environment. Such responsibilities include:

- Take responsibility for maximizing healthy habits such as exercising, not smoking, and eating a healthy diet.
- Work collaboratively with healthcare providers in developing and carrying out agreed-upon treatment plans.
- Disclose relevant information and clearly communicate wants and needs.
- Use your health insurance plan's internal complaint and appeal processes to address your concerns.
- Avoid knowingly spreading disease.

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[55] To order your free copy of the Patient's Bill of Rights, telephone 312-422-3000 or visit the American Hospital Association's Web site: **http://www.aha.org**. Click on "Resource Center," go to "Search" at bottom of page, and then type in "Patient's Bill of Rights." The Patient's Bill of Rights is also available from Fax on Demand, at 312-422-2020, document number 471124.

[56] Adapted from **http://www.hcqualitycommission.gov/press/cbor.html#head1**.

- Recognize the reality of risks, the limits of the medical science, and the human fallibility of the healthcare professional.
- Be aware of a healthcare provider's obligation to be reasonably efficient and equitable in providing care to other patients and the community.
- Become knowledgeable about your health plan's coverage and options (when available) including all covered benefits, limitations, and exclusions, rules regarding use of network providers, coverage and referral rules, appropriate processes to secure additional information, and the process to appeal coverage decisions.
- Show respect for other patients and health workers.
- Make a good-faith effort to meet financial obligations.
- Abide by administrative and operational procedures of health plans, healthcare providers, and Government health benefit programs.

Choosing an Insurance Plan

There are a number of official government agencies that help consumers understand their healthcare insurance choices.[57] The U.S. Department of Labor, in particular, recommends ten ways to make your health benefits choices work best for you.[58]

1. Your options are important. There are many different types of health benefit plans. Find out which one your employer offers, then check out the plan, or plans, offered. Your employer's human resource office, the health plan administrator, or your union can provide information to help you match your needs and preferences with the available plans. The more information you have, the better your healthcare decisions will be.

2. Reviewing the benefits available. Do the plans offered cover preventive care, well-baby care, vision or dental care? Are there deductibles? Answers to these questions can help determine the out-of-pocket expenses you may face. Matching your needs and those of your family members will result in the best possible benefits. Cheapest may not always be best. Your goal is high quality health benefits.

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[57] More information about quality across programs is provided at the following AHRQ Web site:
http://www.ahrq.gov/consumer/qntascii/qnthplan.htm.

[58] Adapted from the Department of Labor:
http://www.dol.gov/dol/pwba/public/pubs/health/top10-text.html.

3. Look for quality. The quality of healthcare services varies, but quality can be measured. You should consider the quality of healthcare in deciding among the healthcare plans or options available to you. Not all health plans, doctors, hospitals and other providers give the highest quality care. Fortunately, there is quality information you can use right now to help you compare your healthcare choices. Find out how you can measure quality. Consult the U.S. Department of Health and Human Services publication "Your Guide to Choosing Quality Health Care" on the Internet at **www.ahcpr.gov/consumer**.

4. Your plan's summary plan description (SPD) provides a wealth of information. Your health plan administrator can provide you with a copy of your plan's SPD. It outlines your benefits and your legal rights under the Employee Retirement Income Security Act (ERISA), the federal law that protects your health benefits. It should contain information about the coverage of dependents, what services will require a co-pay, and the circumstances under which your employer can change or terminate a health benefits plan. Save the SPD and all other health plan brochures and documents, along with memos or correspondence from your employer relating to health benefits.

5. Assess your benefit coverage as your family status changes. Marriage, divorce, childbirth or adoption, and the death of a spouse are all life events that may signal a need to change your health benefits. You, your spouse and dependent children may be eligible for a special enrollment period under provisions of the Health Insurance Portability and Accountability Act (HIPAA). Even without life-changing events, the information provided by your employer should tell you how you can change benefits or switch plans, if more than one plan is offered. If your spouse's employer also offers a health benefits package, consider coordinating both plans for maximum coverage.

6. Changing jobs and other life events can affect your health benefits. Under the Consolidated Omnibus Budget Reconciliation Act (COBRA), you, your covered spouse, and your dependent children may be eligible to purchase extended health coverage under your employer's plan if you lose your job, change employers, get divorced, or upon occurrence of certain other events. Coverage can range from 18 to 36 months depending on your situation. COBRA applies to most employers with 20 or more workers and requires your plan to notify you of your rights. Most plans require eligible individuals to make their COBRA election within 60 days of the plan's notice. Be sure to follow up with your plan sponsor if you don't receive notice, and make sure you respond within the allotted time.

7. HIPAA can also help if you are changing jobs, particularly if you have a medical condition. HIPAA generally limits pre-existing condition exclusions to a maximum of 12 months (18 months for late enrollees). HIPAA also requires this maximum period to be reduced by the length of time you had prior "creditable coverage." You should receive a certificate documenting your prior creditable coverage from your old plan when coverage ends.

8. Plan for retirement. Before you retire, find out what health benefits, if any, extend to you and your spouse during your retirement years. Consult with your employer's human resources office, your union, the plan administrator, and check your SPD. Make sure there is no conflicting information among these sources about the benefits you will receive or the circumstances under which they can change or be eliminated. With this information in hand, you can make other important choices, like finding out if you are eligible for Medicare and Medigap insurance coverage.

9. Know how to file an appeal if your health benefits claim is denied. Understand how your plan handles grievances and where to make appeals of the plan's decisions. Keep records and copies of correspondence. Check your health benefits package and your SPD to determine who is responsible for handling problems with benefit claims. Contact PWBA for customer service assistance if you are unable to obtain a response to your complaint.

10. You can take steps to improve the quality of the healthcare and the health benefits you receive. Look for and use things like Quality Reports and Accreditation Reports whenever you can. Quality reports may contain consumer ratings -- how satisfied consumers are with the doctors in their plan, for instance-- and clinical performance measures -- how well a healthcare organization prevents and treats illness. Accreditation reports provide information on how accredited organizations meet national standards, and often include clinical performance measures. Look for these quality measures whenever possible. Consult "Your Guide to Choosing Quality Health Care" on the Internet at **www.ahcpr.gov/consumer**.

Medicare and Medicaid

Illness strikes both rich and poor families. For low-income families, Medicaid is available to defer the costs of treatment. The Health Care Financing Administration (HCFA) administers Medicare, the nation's largest health insurance program, which covers 39 million Americans. In the following pages, you will learn the basics about Medicare insurance as well as useful

contact information on how to find more in-depth information about Medicaid.[59]

Who is Eligible for Medicare?

Generally, you are eligible for Medicare if you or your spouse worked for at least 10 years in Medicare-covered employment and you are 65 years old and a citizen or permanent resident of the United States. You might also qualify for coverage if you are under age 65 but have a disability or End-Stage Renal disease (permanent kidney failure requiring dialysis or transplant). Here are some simple guidelines:

You can get Part A at age 65 without having to pay premiums if:

- You are already receiving retirement benefits from Social Security or the Railroad Retirement Board.
- You are eligible to receive Social Security or Railroad benefits but have not yet filed for them.
- You or your spouse had Medicare-covered government employment.

If you are under 65, you can get Part A without having to pay premiums if:

- You have received Social Security or Railroad Retirement Board disability benefit for 24 months.
- You are a kidney dialysis or kidney transplant patient.

Medicare has two parts:

- Part A (Hospital Insurance). Most people do not have to pay for Part A.
- Part B (Medical Insurance). Most people pay monthly for Part B.

Part A (Hospital Insurance)

Helps Pay For: Inpatient hospital care, care in critical access hospitals (small facilities that give limited outpatient and inpatient services to people in rural areas) and skilled nursing facilities, hospice care, and some home healthcare.

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[59] This section has been adapted from the Official U.S. Site for Medicare Information: **http://www.medicare.gov/Basics/Overview.asp**.

Cost: Most people get Part A automatically when they turn age 65. You do not have to pay a monthly payment called a premium for Part A because you or a spouse paid Medicare taxes while you were working.

If you (or your spouse) did not pay Medicare taxes while you were working and you are age 65 or older, you still may be able to buy Part A. If you are not sure you have Part A, look on your red, white, and blue Medicare card. It will show "Hospital Part A" on the lower left corner of the card. You can also call the Social Security Administration toll free at 1-800-772-1213 or call your local Social Security office for more information about buying Part A. If you get benefits from the Railroad Retirement Board, call your local RRB office or 1-800-808-0772. For more information, call your Fiscal Intermediary about Part A bills and services. The phone number for the Fiscal Intermediary office in your area can be obtained from the following Web site: **http://www.medicare.gov/Contacts/home.asp**.

Part B (Medical Insurance)

Helps Pay For: Doctors, services, outpatient hospital care, and some other medical services that Part A does not cover, such as the services of physical and occupational therapists, and some home healthcare. Part B helps pay for covered services and supplies when they are medically necessary.

Cost: As of 2001, you pay the Medicare Part B premium of $50.00 per month. In some cases this amount may be higher if you did not choose Part B when you first became eligible at age 65. The cost of Part B may go up 10% for each 12-month period that you were eligible for Part B but declined coverage, except in special cases. You will have to pay the extra 10% cost for the rest of your life.

Enrolling in Part B is your choice. You can sign up for Part B anytime during a 7-month period that begins 3 months before you turn 65. Visit your local Social Security office, or call the Social Security Administration at 1-800-772-1213 to sign up. If you choose to enroll in Part B, the premium is usually taken out of your monthly Social Security, Railroad Retirement, or Civil Service Retirement payment. If you do not receive any of the above payments, Medicare sends you a bill for your part B premium every 3 months. You should receive your Medicare premium bill in the mail by the 10th of the month. If you do not, call the Social Security Administration at 1-800-772-1213, or your local Social Security office. If you get benefits from the Railroad Retirement Board, call your local RRB office or 1-800-808-0772. For more information, call your Medicare carrier about bills and services. The

phone number for the Medicare carrier in your area can be found at the following Web site: **http://www.medicare.gov/Contacts/home.asp**. You may have choices in how you get your healthcare including the Original Medicare Plan, Medicare Managed Care Plans (like HMOs), and Medicare Private Fee-for-Service Plans.

Medicaid

Medicaid is a joint federal and state program that helps pay medical costs for some people with low incomes and limited resources. Medicaid programs vary from state to state. People on Medicaid may also get coverage for nursing home care and outpatient prescription drugs which are not covered by Medicare. You can find more information about Medicaid on the HCFA.gov Web site at **http://www.hcfa.gov/medicaid/medicaid.htm**.

States also have programs that pay some or all of Medicare's premiums and may also pay Medicare deductibles and coinsurance for certain people who have Medicare and a low income. To qualify, you must have:

- Part A (Hospital Insurance),
- Assets, such as bank accounts, stocks, and bonds that are not more than $4,000 for a single person, or $6,000 for a couple, and
- A monthly income that is below certain limits.

For more information on these programs, look at the Medicare Savings Programs brochure, **http://www.medicare.gov/Library/PDFNavigation/PDFInterim.asp?Language=English&Type=Pub&PubID=10126**. There are also Prescription Drug Assistance Programs available. Find information on these programs which offer discounts or free medications to individuals in need at **http://www.medicare.gov/Prescription/Home.asp**.

NORD's Medication Assistance Programs

Finally, the National Organization for Rare Disorders, Inc. (NORD) administers medication programs sponsored by humanitarian-minded pharmaceutical and biotechnology companies to help uninsured or under-insured individuals secure life-saving or life-sustaining drugs.[60] NORD

[60] Adapted from NORD: **http://www.rarediseases.org/cgi-bin/nord/progserv#patient?id=rPIzL9oD&mv_pc=30**.

programs ensure that certain vital drugs are available "to those individuals whose income is too high to qualify for Medicaid but too low to pay for their prescribed medications." The program has standards for fairness, equity, and unbiased eligibility. It currently covers some 14 programs for nine pharmaceutical companies. NORD also offers early access programs for investigational new drugs (IND) under the approved "Treatment INDs" programs of the Food and Drug Administration (FDA). In these programs, a limited number of individuals can receive investigational drugs that have yet to be approved by the FDA. These programs are generally designed for rare diseases or disorders. For more information, visit **www.rarediseases.org**.

Additional Resources

In addition to the references already listed in this chapter, you may need more information on health insurance, hospitals, or the healthcare system in general. The NIH has set up an excellent guidance Web site that addresses these and other issues. Topics include:[61]

- Health Insurance:
  http://www.nlm.nih.gov/medlineplus/healthinsurance.html
- Health Statistics:
  http://www.nlm.nih.gov/medlineplus/healthstatistics.html
- HMO and Managed Care:
  http://www.nlm.nih.gov/medlineplus/managedcare.html
- Hospice Care: **http://www.nlm.nih.gov/medlineplus/hospicecare.html**
- Medicaid: **http://www.nlm.nih.gov/medlineplus/medicaid.html**
- Medicare: **http://www.nlm.nih.gov/medlineplus/medicare.html**
- Nursing Homes and Long-term Care:
  http://www.nlm.nih.gov/medlineplus/nursinghomes.html
- Patient's Rights, Confidentiality, Informed Consent, Ombudsman Programs, Privacy and Patient Issues:
  http://www.nlm.nih.gov/medlineplus/patientissues.html
- Veteran's Health, Persian Gulf War, Gulf War Syndrome, Agent Orange:
  http://www.nlm.nih.gov/medlineplus/veteranshealth.html

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[61] You can access this information at:
http://www.nlm.nih.gov/medlineplus/healthsystem.html.

Vocabulary Builder

Cyanosis: A bluish discoloration, applied especially to such discoloration of skin and mucous membranes due to excessive concentration of reduced haemoglobin in the blood. [EU]

Emesis: Vomiting; an act of vomiting. Also used as a word termination, as in haematemesis. [EU]

Epistaxis: Nosebleed; haemorrhage from the nose. [EU]

Hemoptysis: Bronchial hemorrhage manifested with spitting of blood. [NIH]

Hernia: (he protrusion of a loop or knuckle of an organ or tissue through an abnormal opening. [EU]

Rhinorrhea: The free discharge of a thin nasal mucus. [EU]

ONLINE GLOSSARIES

The Internet provides access to a number of free-to-use medical dictionaries and glossaries. 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://www.graylab.ac.uk/omd/**
- Technology Glossary (National Library of Medicine) - Health Care Technology: **http://www.nlm.nih.gov/nichsr/ta101/ta10108.htm**
- Terms and Definitions (Office of Rare Diseases): **http://rarediseases.info.nih.gov/ord/glossary_a-e.html**

Beyond these, MEDLINEplus contains a very user-friendly encyclopedia covering every aspect of medicine (licensed from A.D.A.M., Inc.). The ADAM Medical Encyclopedia Web site address is **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)**. Topics of interest can be researched by using keywords before continuing elsewhere, as these basic definitions and concepts will be useful in more advanced areas of research. You may choose to print various pages specifically relating to pertussis and keep them on file. The NIH, in particular, suggests that patients with pertussis visit the following Web sites in the ADAM Medical Encyclopedia:

- **Basic Guidelines for Pertussis**

FTT
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/000991.htm

Pertussis
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/001561.htm

Pertussis - vaccine
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002027.htm

- **Signs & Symptoms for Pertussis**

Apnea
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003069.htm

Bluish skin
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003215.htm

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

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

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

Cough
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003072.htm

Coughing
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003072.htm

Cyanosis
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003215.htm

Diarrhea
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003126.htm

Difficulty breathing
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003075.htm

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

Epistaxis
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003106.htm

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

Fever
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003090.htm

Hemoptysis
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003073.htm

Hernia
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003100.htm

Rhinorrhea
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003051.htm

Runny nose
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003051.htm

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

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

Slight fever
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003090.htm

Spasms
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003193.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

- **Diagnostics and Tests for Pertussis**

Blood culture
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003744.htm

CBC
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003642.htm

Chest X-ray
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003804.htm

Elisa
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003332.htm

Throat swab culture
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003746.htm

White blood cell count
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003643.htm

X-ray
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/003337.htm

- **Background Topics for Pertussis**

Allergic reaction
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/000005.htm

Choking
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/000047.htm

Contraindications
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002314.htm

Diphtheria immunization (vaccine)
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002018.htm

DT vaccine
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002021.htm

DTaP vaccine
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002021.htm

Intravenous
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002383.htm

Nose bleeds
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/000020.htm

Pertussis immunization (vaccine)
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002027.htm

Respiratory
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002290.htm

Td vaccine
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002021.htm

Tetanus immunization (vaccine)
Web site:
http://www.nlm.nih.gov/medlineplus/ency/article/002031.htm

Online Dictionary Directories

The following are additional online directories compiled by the National Library of Medicine, including a number of specialized medical dictionaries and glossaries:

- 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**

PERTUSSIS GLOSSARY

The following is a complete glossary of terms used in this sourcebook. The definitions are derived from official public sources including the National Institutes of Health [NIH] and the European Union [EU]. After this glossary, we list a number of additional hardbound and electronic glossaries and dictionaries that you may wish to consult.

Abscess: A localized collection of pus caused by suppuration buried in tissues, organs, or confined spaces. [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]

Acetylglucosamine: The N-acetyl derivative of glucosamine. [NIH]

Actinomycosis: Infections with bacteria of the genus actinomyces. [NIH]

Adipocytes: Fat-storing cells found mostly in the abdominal cavity and subcutaneous tissue. Fat is usually stored in the form of tryglycerides. [NIH]

Adjuvant: A substance which aids another, such as an auxiliary remedy; in immunology, nonspecific stimulator (e.g., BCG vaccine) of the immune response. [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]

Alcaligenes: A genus of gram-negative, aerobic, motile bacteria that occur in water and soil. Some are common inhabitants of the intestinal tract of vertebrates. These bacteria occasionally cause opportunistic infections in humans. [NIH]

Allergen: A antigenic substance capable of producing immediate-type hypersensitivity (allergy). [EU]

Amphetamine: A powerful central nervous system stimulant and sympathomimetic. Amphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulation of release of monamines, and inhibiting monoamine oxidase. Amphetamine is also a drug of abuse and a psychotomimetic. The l- and the d,l-forms are included here. The l-form has less central nervous system activity but stronger cardiovascular effects. The d-form is dextroamphetamine. [NIH]

Amygdala: Almond-shaped group of basal nuclei anterior to the inferior horn of the lateral ventricle of the brain, within the temporal lobe. The amygdala is part of the limbic system. [NIH]

Anaphylaxis: An acute hypersensitivity reaction due to exposure to a previously encountered antigen. The reaction may include rapidly progressing urticaria, respiratory distress, vascular collapse, systemic shock, and death. [NIH]

Anesthesia: A state characterized by loss of feeling or sensation. This depression of nerve function is usually the result of pharmacologic action and is induced to allow performance of surgery or other painful procedures. [NIH]

Anesthesiology: A specialty concerned with the study of anesthetics and anesthesia. [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]

Anoxia: A total lack of oxygen; often used interchangeably with hypoxia to mean a reduced supply of oxygen to the tissues. [EU]

Anthrax: An infectious bacterial zoonotic disease usually acquired by ingestion of Bacillus anthracis or its spores from infected pastures by herbivores or indirectly from infected carcasses by carnivores. It is transmitted to humans usually by contact with infected animals or their discharges (agricultural a.) or with contaminated animal products (industrial a.). Anthrax is classified by primary routes of inoculation as : cutaneous, gastrointestinal, and inhalational. Called also charbon, milzbrand and splenic fever. [EU]

Anthropology: The science devoted to the comparative study of man. [NIH]

Antibiotic: A chemical substance produced by a microorganism which has the capacity, in dilute solutions, to inhibit the growth of or to kill other microorganisms. Antibiotics that are sufficiently nontoxic to the host are used as chemotherapeutic agents in the treatment of infectious diseases of man, animals and plants. [EU]

Antibody: An immunoglobulin molecule that has a specific amino acid sequence by virtue of which it interacts only with the antigen that induced its synthesis in cells of the lymphoid series (especially plasma cells), or with antigen closely related to it. Antibodies are classified according to their ode of action as agglutinins, bacteriolysins, haemolysins, opsonins, precipitins, etc. [EU]

Antigen: Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of

that response, that is, with specific antibody or specifically sensitized T-lymphocytes, or both. Antigens may be soluble substances, such as toxins and foreign proteins, or particulate, such as bacteria and tissue cells; however, only the portion of the protein or polysaccharide molecule known as the antigenic determinant (q.v.) combines with antibody or a specific receptor on a lymphocyte. Abbreviated Ag. [EU]

Antihistamine: A drug that counteracts the action of histamine. The antihistamines are of two types. The conventional ones, as those used in allergies, block the H1 histamine receptors, whereas the others block the H2 receptors. Called also antihistaminic. [EU]

Antimicrobial: Killing microorganisms, or suppressing their multiplication or growth. [EU]

Antitumour: Counteracting tumour formation. [EU]

Antiviral: Destroying viruses or suppressing their replication. [EU]

Anxiety: The unpleasant emotional state consisting of psychophysiological responses to anticipation of unreal or imagined danger, ostensibly resulting from unrecognized intrapsychic conflict. Physiological concomitants include increased heart rate, altered respiration rate, sweating, trembling, weakness, and fatigue; psychological concomitants include feelings of impending danger, powerlessness, apprehension, and tension. [EU]

Apnea: A transient absence of spontaneous respiration. [NIH]

Apomorphine: A derivative of morphine that is a dopamine D2 agonist. It is a powerful emetic and has been used for that effect in acute poisoning. It has also been used in the diagnosis and treatment of parkinsonism, but its adverse effects limit its use. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Asymptomatic: Showing or causing no symptoms. [EU]

Atopic: Pertaining to an atopen or to atopy; allergic. [EU]

Atypical: Irregular; not conformable to the type; in microbiology, applied specifically to strains of unusual type. [EU]

Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

Biosynthesis: The building up of a chemical compound in the physiologic processes of a living organism. [EU]

Biphasic: Having two phases; having both a sporophytic and a gametophytic phase in the life cycle. [EU]

Bordetella: A genus of gram-negative, aerobic bacteria whose cells are minute coccobacilli. It consists of both parasitic and pathogenic species. [NIH]

Bronchiectasis: Chronic dilatation of the bronchi marked by fetid breath and paroxysmal coughing, with the expectoration of mucopurulent matter. It may effect the tube uniformly (cylindric b.), or occur in irregular pockets (sacculated b.) or the dilated tubes may have terminal bulbous enlargements (fusiform b.). [EU]

Bronchitis: Inflammation of one or more bronchi. [EU]

Brucellosis: Infection caused by bacteria of the genus brucella mainly involving the reticuloendothelial system. This condition is characterized by fever, weakness, malaise, and weight loss. [NIH]

Calmodulin: A heat-stable, low-molecular-weight activator protein found mainly in the brain and heart. The binding of calcium ions to this protein allows this protein to bind to cyclic nucleotide phosphodiesterases and to adenyl cyclase with subsequent activation. Thereby this protein modulates cyclic AMP and cyclic GMP levels. [NIH]

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

Carbohydrate: An aldehyde or ketone derivative of a polyhydric alcohol, particularly of the pentahydric and hexahydric alcohols. They are so named because the hydrogen and oxygen are usually in the proportion to form water, (CH2O)n. The most important carbohydrates are the starches, sugars, celluloses, and gums. They are classified into mono-, di-, tri-, poly- and heterosaccharides. [EU]

Carbuncle: An infection of cutaneous and subcutaneous tissue that consists of a cluster of boils. Commonly, the causative agent is staphylococcus aureus. Carbuncles produce fever, leukocytosis, extreme pain, and prostration. [NIH]

Carcinoma: A malignant new growth made up of epithelial cells tending to infiltrate the surrounding tissues and give rise to metastases. [EU]

Catechin: Extracted from Uncaria gambier, Acacia catechu and other plants; it stabilizes collagen and is therefore used in tanning and dyeing; it prevents capillary fragility and abnormal permeability, but was formerly used as an antidiarrheal. [NIH]

Causality: The relating of causes to the effects they produce. Causes are termed necessary when they must always precede an effect and sufficient when they initiate or produce an effect. Any of several factors may be associated with the potential disease causation or outcome, including predisposing factors, enabling factors, precipitating factors, reinforcing factors, and risk factors. [NIH]

Chancroid: Acute, localized autoinoculable infectious disease usually acquired through sexual contact. Caused by haemophilus ducreyi, it occurs

endemically almost worldwide, especially in tropical and subtropical countries and more commonly in seaports and urban areas than in rural areas. [NIH]

Cheilitis: Inflammation of the lips. It is of various etiologies and degrees of pathology. [NIH]

Cholera: An acute diarrheal disease endemic in India and Southeast Asia whose causative agent is vibrio cholerae. This condition can lead to severe dehydration in a matter of hours unless quickly treated. [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]

Chromosomal: Pertaining to chromosomes. [EU]

Chronic: Persisting over a long period of time. [EU]

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]

Cocaine: An alkaloid ester extracted from the leaves of plants including coca. It is a local anesthetic and vasoconstrictor and is clinically used for that purpose, particularly in the eye, ear, nose, and throat. It also has powerful central nervous system effects similar to the amphetamines and is a drug of abuse. Cocaine, like amphetamines, acts by multiple mechanisms on brain catecholaminergic neurons; the mechanism of its reinforcing effects is thought to involve inhibition of dopamine uptake. [NIH]

Colitis: Inflammation of the colon. [EU]

Collapse: 1. a state of extreme prostration and depression, with failure of circulation. 2. abnormal falling in of the walls of any part of organ. [EU]

Convulsion: A violent involuntary contraction or series of contractions of the voluntary muscles. [EU]

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]

Cyanosis: A bluish discoloration, applied especially to such discoloration of skin and mucous membranes due to excessive concentration of reduced haemoglobin in the blood. [EU]

Cytokines: Non-antibody proteins secreted by inflammatory leukocytes and some non-leukocytic cells, that act as intercellular mediators. They differ from classical hormones in that they are produced by a number of tissue or

cell types rather than by specialized glands. They generally act locally in a paracrine or autocrine rather than endocrine manner. [NIH]

Cytomegalovirus: A genus of the family herpesviridae, subfamily betaherpesvirinae, infecting the salivary glands, liver, spleen, lungs, eyes, and other organs, in which they produce characteristically enlarged cells with intranuclear inclusions. Infection with Cytomegalovirus is also seen as an opportunistic infection in AIDS. [NIH]

Decongestant: An agent that reduces congestion or swelling. [EU]

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

Dehydration: The condition that results from excessive loss of body water. Called also anhydration, deaquation and hypohydration. [EU]

Desensitization: The prevention or reduction of immediate hypersensitivity reactions by administration of graded doses of allergen; called also hyposensitization and immunotherapy. [EU]

Detoxification: Treatment designed to free an addict from his drug habit. [EU]

Dexmedetomidine: A selective inhibitor of receptors, adrenergic alpha-2 that has analgesic and sedative properties. Medetomidine is the other racemic form. [NIH]

Diarrhea: Passage of excessively liquid or excessively frequent stools. [NIH]

Diphtheria: A localized infection of mucous membranes or skin caused by toxigenic strains of corynebacterium diphtheriae. It is characterized by the presence of a pseudomembrane at the site of infection. Diphtheria toxin, produced by C. diphtheriae, can cause myocarditis, polyneuritis, and other systemic toxic effects. [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]

Eczema: A pruritic papulovesicular dermatitis occurring as a reaction to many endogenous and exogenous agents, characterized in the acute stage by erythema, edema associated with a serous exudate between the cells of the epidermis (spongiosis) and an inflammatory infiltrate in the dermis, oozing and vesiculation, and crusting and scaling; and in the more chronic stages by lichenification or thickening or both, signs of excoriations, and hyperpigmentation or hypopigmentation or both. Atopic dermatitis is the most common type of dermatitis. Called also eczematous dermatitis. [EU]

Electrophoresis: An electrochemical process in which macromolecules or colloidal particles with a net electric charge migrate in a solution under the

influence of an electric current. [NIH]

Emesis: Vomiting; an act of vomiting. Also used as a word termination, as in haematemesis. [EU]

Encephalopathy: Any degenerative disease of the brain. [EU]

Endemic: Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

Endocrinology: A subspecialty of internal medicine concerned with the metabolism, physiology, and disorders of the endocrine system. [NIH]

Endonucleases: Enzymes that catalyze the hydrolysis of the internal bonds and thereby the formation of polynucleotides or oligonucleotides from ribo- or deoxyribonucleotide chains. EC 3.1.-. [NIH]

Enzyme: A protein molecule that catalyses chemical reactions of other substances without itself being destroyed or altered upon completion of the reactions. Enzymes are classified according to the recommendations of the Nomenclature Committee of the International Union of Biochemistry. Each enzyme is assigned a recommended name and an Enzyme Commission (EC) number. They are divided into six main groups; oxidoreductases, transferases, hydrolases, lyases, isomerases, and ligases. [EU]

Epidemic: Occurring suddenly in numbers clearly in excess of normal expectancy; said especially of infectious diseases but applied also to any disease, injury, or other health-related event occurring in such outbreaks. [EU]

Epidemiological: Relating to, or involving epidemiology. [EU]

Epistaxis: Nosebleed; haemorrhage from the nose. [EU]

Epitopes: Sites on an antigen that interact with specific antibodies. [NIH]

Erysipelas: An acute superficial form of cellulitis involving the dermal lymphatics, usually caused by infection with group A streptococci, and chiefly characterized by a peripherally spreading hot, bright red, edematous, brawny, infiltrated, and sharply circumscribed plaque with a raised indurated border. Formerly called St. Anthony's fire. [EU]

Erythrina: A genus of leguminous shrubs or trees, mainly tropical, yielding certain alkaloids, lectins, and other useful compounds. [NIH]

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

Erythromycin: A bacteriostatic antibiotic substance produced by Streptomyces erythreus. Erythromycin A is considered its major active component. In sensitive organisms, it inhibits protein synthesis by binding to 50S ribosomal subunits. This binding process inhibits peptidyl transferase activity and interferes with translocation of amino acids during translation

and assembly of proteins. [NIH]

Eucalyptus: A genus of Australian trees of the Myrtaceae family that yields gums, oils, and resins which are used as flavoring agents, astringents, and aromatics, and formerly to treat diarrhea, asthma, bronchitis, and respiratory tract infections. [NIH]

Exotoxins: Toxins produced, especially by bacterial or fungal cells, and released into the culture medium or environment. [NIH]

Extracellular: Outside a cell or cells. [EU]

Extraction: The process or act of pulling or drawing out. [EU]

Febrile: Pertaining to or characterized by fever. [EU]

Fermentation: An enzyme-induced chemical change in organic compounds that takes place in the absence of oxygen. The change usually results in the production of ethanol or lactic acid, and the production of energy. [NIH]

Fibrosis: The formation of fibrous tissue; fibroid or fibrous degeneration [EU]

Fistula: An abnormal passage or communication, usually between two internal organs, or leading from an internal organ to the surface of the body; frequently designated according to the organs or parts with which it communicates, as anovaginal, brochocutaneous, hepatopleural, pulmonoperitoneal, rectovaginal, urethrovaginal, and the like. Such passages are frequently created experimentally for the purpose of obtaining body secretions for physiologic study. [EU]

GABA: The most common inhibitory neurotransmitter in the central nervous system. [NIH]

Gastroenteritis: An acute inflammation of the lining of the stomach and intestines, characterized by anorexia, nausea, diarrhoea, abdominal pain, and weakness, which has various causes, including food poisoning due to infection with such organisms as Escherichia coli, Staphylococcus aureus, and Salmonella species; consumption of irritating food or drink; or psychological factors such as anger, stress, and fear. Called also enterogastritis. [EU]

Gingivitis: Inflammation of the gingivae. Gingivitis associated with bony changes is referred to as periodontitis. Called also oulitis and ulitis. [EU]

Ginseng: An araliaceous genus of plants that contains a number of pharmacologically active agents used as stimulants, sedatives, and tonics, especially in traditional medicine. [NIH]

Glanders: A contagious disease of horses that can be transmitted to humans. It is caused by Pseudomonas mallei and characterized by ulceration of the respiratory mucosa and an eruption of nodules on the skin. [NIH]

Glycoproteins: Conjugated protein-carbohydrate compounds including

mucins, mucoid, and amyloid glycoproteins. [NIH]

Gonorrhea: Acute infectious disease characterized by primary invasion of the urogenital tract. The etiologic agent, neisseria gonorrhoeae, was isolated by Neisser in 1879. [NIH]

Granuloma: A relatively small nodular inflammatory lesion containing grouped mononuclear phagocytes, caused by infectious and noninfectious agents. [NIH]

Haemophilus: A genus of pasteurellaceae that consists of several species occurring in animals and humans. Its organisms are described as gram-negative, facultatively anaerobic, coccobacillus or rod-shaped, and nonmotile. [NIH]

Hematology: A subspecialty of internal medicine concerned with morphology, physiology, and pathology of the blood and blood-forming tissues. [NIH]

Hemoptysis: Bronchial hemorrhage manifested with spitting of blood. [NIH]

Hepatitis: Inflammation of the liver. [EU]

Hepatocellular: Pertaining to or affecting liver cells. [EU]

Heredity: 1. the genetic transmission of a particular quality or trait from parent to offspring. 2. the genetic constitution of an individual. [EU]

Hernia: (he protrusion of a loop or knuckle of an organ or tissue through an abnormal opening. [EU]

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]

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]

Hormones: Chemical substances having a specific regulatory effect on the activity of a certain organ or organs. The term was originally applied to substances secreted by various endocrine glands and transported in the bloodstream to the target organs. It is sometimes extended to include those substances that are not produced by the endocrine glands but that have similar effects. [NIH]

Hypersensitivity: A state of altered reactivity in which the body reacts with an exaggerated immune response to a foreign substance. Hypersensitivity reactions are classified as immediate or delayed, types I and IV, respectively, in the Gell and Coombs classification (q.v.) of immune responses. [EU]

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

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

Immunity: The condition of being immune; the protection against infectious disease conferred either by the immune response generated by immunization or previous infection or by other nonimmunologic factors (innate i.). [EU]

Immunization: The induction of immunity. [EU]

Immunotherapy: Manipulation of the host's immune system in treatment of disease. It includes both active and passive immunization as well as immunosuppressive therapy to prevent graft rejection. [NIH]

Impetigo: A common superficial bacterial infection caused by staphylococcus aureus or group A beta-hemolytic streptococci. Characteristics include pustular lesions that rupture and discharge a thin, amber-colored fluid that dries and forms a crust. This condition is commonly located on the face, especially about the mouth and nose. [NIH]

Inflammation: A pathological process characterized by injury or destruction of tissues caused by a variety of cytologic and chemical reactions. It is usually manifested by typical signs of pain, heat, redness, swelling, and loss of function. [NIH]

Infusion: The therapeutic introduction of a fluid other than blood, as saline solution, solution, into a vein. [EU]

Insulin: A protein hormone secreted by beta cells of the pancreas. Insulin plays a major role in the regulation of glucose metabolism, generally promoting the cellular utilization of glucose. It is also an important regulator of protein and lipid metabolism. Insulin is used as a drug to control insulin-dependent diabetes mellitus. [NIH]

Intestinal: Pertaining to the intestine. [EU]

Intoxication: Poisoning, the state of being poisoned. [EU]

Intravenous: Within a vein or veins. [EU]

Intrinsic: Situated entirely within or pertaining exclusively to a part. [EU]

Iodine: A nonmetallic element of the halogen group that is represented by the atomic symbol I, atomic number 53, and atomic weight of 126.90. It is a nutritionally essential element, especially important in thyroid hormone synthesis. In solution, it has anti-infective properties and is used topically. [NIH]

Isoenzymes: One of various structurally related forms of an enzyme, each having the same mechanism but with differing chemical, physical, or immunological characteristics. [NIH]

Jaundice: A clinical manifestation of hyperbilirubinemia, consisting of deposition of bile pigments in the skin, resulting in a yellowish staining of

the skin and mucous membranes. [NIH]

Kinetic: Pertaining to or producing motion. [EU]

Lectins: Protein or glycoprotein substances, usually of plant origin, that bind to sugar moieties in cell walls or membranes and thereby change the physiology of the membrane to cause agglutination, mitosis, or other biochemical changes in the cell. [NIH]

Leprosy: A chronic granulomatous infection caused by mycobacterium leprae. The granulomatous lesions are manifested in the skin, the mucous membranes, and the peripheral nerves. Two polar or principal types are lepromatous and tuberculoid. [NIH]

Leukaemia: An acute or chronic disease of unknown cause in man and other warm-blooded animals that involves the blood-forming organs, is characterized by an abnormal increase in the number of leucocytes in the tissues of the body with or without a corresponding increase of those in the circulating blood, and is classified according of the type leucocyte most prominently involved. [EU]

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

Limbic: Pertaining to a limbus, or margin; forming a border around. [EU]

Lipid: Any of a heterogeneous group of flats and fatlike substances characterized by being water-insoluble and being extractable by nonpolar (or fat) solvents such as alcohol, ether, chloroform, benzene, etc. All contain as a major constituent aliphatic hydrocarbons. The lipids, which are easily stored in the body, serve as a source of fuel, are an important constituent of cell structure, and serve other biological functions. Lipids may be considered to include fatty acids, neutral fats, waxes, and steroids. Compound lipids comprise the glycolipids, lipoproteins, and phospholipids. [EU]

Localization: 1. the determination of the site or place of any process or lesion. 2. restriction to a circumscribed or limited area. 3. prelocalization. [EU]

Locomotion: Movement or the ability to move from one place or another. It can refer to humans, vertebrate or invertebrate animals, and microorganisms. [NIH]

Locomotor: Of or pertaining to locomotion; pertaining to or affecting the locomotive apparatus of the body. [EU]

Lupus: A form of cutaneous tuberculosis. It is seen predominantly in women and typically involves the nasal, buccal, and conjunctival mucosa. [NIH]

Lymphadenopathy: Disease of the lymph nodes. [EU]

Lymphocytic: Pertaining to, characterized by, or of the nature of lymphocytes. [EU]

Lymphocytosis: Excess of normal lymphocytes in the blood or in any

effusion. [NIH]

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

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

Membrane: A thin layer of tissue which covers a surface, lines a cavity or divides a space or organ. [EU]

Microbiological: Pertaining to microbiology : the science that deals with microorganisms, including algae, bacteria, fungi, protozoa and viruses. [EU]

Microbiology: The study of microorganisms such as fungi, bacteria, algae, archaea, and viruses. [NIH]

Microorganism: A microscopic organism; those of medical interest include bacteria, viruses, fungi and protozoa. [EU]

Microscopy: The application of microscope magnification to the study of materials that cannot be properly seen by the unaided eye. [NIH]

Mobilization: The process of making a fixed part or stored substance mobile, as by separating a part from surrounding structures to make it accessible for an operative procedure or by causing release into the circulation for body use of a substance stored in the body. [EU]

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

Monocytes: Large, phagocytic mononuclear leukocytes produced in the vertebrate bone marrow and released into the blood; contain a large, oval or somewhat indented nucleus surrounded by voluminous cytoplasm and numerous organelles. [NIH]

Mononucleosis: The presence of an abnormally large number of mononuclear leucocytes (monocytes) in the blood. The term is often used alone to refer to infectious mononucleosis. [EU]

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

Nausea: An unpleasant sensation, vaguely referred to the epigastrium and abdomen, and often culminating in vomiting. [EU]

Neonatal: Pertaining to the first four weeks after birth. [EU]

Neural: 1. pertaining to a nerve or to the nerves. 2. situated in the region of the spinal axis, as the neutral arch. [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neuropeptides: Peptides released by neurons as intercellular messengers. Many neuropeptides are also hormones released by non-neuronal cells. [NIH]

Neurosciences: The scientific disciplines concerned with the embryology, anatomy, physiology, biochemistry, pharmacology, etc., of the nervous sytem. [NIH]

Neurotransmitter: Any of a group of substances that are released on excitation from the axon terminal of a presynaptic neuron of the central or peripheral nervous system and travel across the synaptic cleft to either excite or inhibit the target cell. Among the many substances that have the properties of a neurotransmitter are acetylcholine, norepinephrine, epinephrine, dopamine, glycine, y-aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Neutrophil: Having an affinity for neutral dyes. [EU]

Niacin: Water-soluble vitamin of the B complex occurring in various animal and plant tissues. Required by the body for the formation of coenzymes NAD and NADP. Has pellagra-curative, vasodilating, and antilipemic properties. [NIH]

Oocytes: Female germ cells in stages between the prophase of the first maturation division and the completion of the second maturation division. [NIH]

Operon: The genetic unit consisting of a feedback system under the control of an operator gene, in which a structural gene transcribes its message in the form of mRNA upon blockade of a repressor produced by a regulator gene. Included here is the attenuator site of bacterial operons where transcription termination is regulated. [NIH]

Ophthalmic: Pertaining to the eye. [EU]

Otitis: Inflammation of the ear, which may be marked by pain, fever, abnormalities of hearing, hearing loss, tinnitus, and vertigo. [EU]

Overdose: 1. to administer an excessive dose. 2. an excessive dose. [EU]

Paralysis: Loss or impairment of motor function in a part due to lesion of the neural or muscular mechanism; also by analogy, impairment of sensory function (sensory paralysis). In addition to the types named below, paralysis is further distinguished as traumatic, syphilitic, toxic, etc., according to its cause; or as obturator, ulnar, etc., according to the nerve part, or muscle specially affected. [EU]

Parasitic: Pertaining to, of the nature of, or caused by a parasite. [EU]

Paroxysmal: Recurring in paroxysms (= spasms or seizures). [EU]

Pediatrics: A medical specialty concerned with maintaining health and providing medical care to children from birth to adolescence. [NIH]

Perennial: Lasting through the year of for several years. [EU]

Perinatal: Pertaining to or occurring in the period shortly before and after birth; variously defined as beginning with completion of the twentieth to

twenty-eighth week of gestation and ending 7 to 28 days after birth. [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]

Pneumonia: Inflammation of the lungs with consolidation. [EU]

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]

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]

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]

Prejudice: A preconceived judgment made without adequate evidence and not easily alterable by presentation of contrary evidence. [NIH]

Prenatal: Existing or occurring before birth, with reference to the fetus. [EU]

Presynaptic: Situated proximal to a synapse, or occurring before the synapse is crossed. [EU]

Prevalence: The total number of cases of a given disease in a specified population at a designated time. It is differentiated from incidence, which refers to the number of new cases in the population at a given time. [NIH]

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]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Psychopharmacology: The study of the effects of drugs on mental and behavioral activity. [NIH]

Pulmonary: Pertaining to the lungs. [EU]

Pyoderma: Any purulent skin disease. Called also pyodermia. [EU]

Receptor: 1. a molecular structure within a cell or on the surface characterized by (1) selective binding of a specific substance and (2) a specific physiologic effect that accompanies the binding, e.g., cell-surface receptors for peptide hormones, neurotransmitters, antigens, complement

fragments, and immunoglobulins and cytoplasmic receptors for steroid hormones. 2. a sensory nerve terminal that responds to stimuli of various kinds. [EU]

Recombinant: 1. a cell or an individual with a new combination of genes not found together in either parent; usually applied to linked genes. [EU]

Reconstitution: 1. a type of regeneration in which a new organ forms by the rearrangement of tissues rather than from new formation at an injured surface. 2. the restoration to original form of a substance previously altered for preservation and storage, as the restoration to a liquid state of blood serum or plasma that has been dried and stored. [EU]

Rectal: Pertaining to the rectum (= distal portion of the large intestine). [EU]

Retrograde: 1. moving backward or against the usual direction of flow. 2. degenerating, deteriorating, or catabolic. [EU]

Rheumatoid: Resembling rheumatism. [EU]

Rhinorrhea: The free discharge of a thin nasal mucus. [EU]

Riboflavin: Nutritional factor found in milk, eggs, malted barley, liver, kidney, heart, and leafy vegetables. The richest natural source is yeast. It occurs in the free form only in the retina of the eye, in whey, and in urine; its principal forms in tissues and cells are as FMN and FAD. [NIH]

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

Rubella: An acute, usually benign, infectious disease caused by a togavirus and most often affecting children and nonimmune young adults, in which the virus enters the respiratory tract via droplet nuclei and spreads to the lymphatic system. It is characterized by a slight cold, sore throat, and fever, followed by enlargement of the postauricular, suboccipital, and cervical lymph nodes, and the appearances of a fine pink rash that begins on the head and spreads to become generalized. Called also German measles, roetln, röteln, and three-day measles, and rubeola in French and Spanish. [EU]

Ruthenium: A hard, brittle, grayish-white rare earth metal with an atomic symbol Ru, atomic number 44, and atomic weight 101.07. It is used as a catalyst and hardener for platinum and palladium. [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]

Schizophrenia: A severe emotional disorder of psychotic depth characteristically marked by a retreat from reality with delusion formation, hallucinations, emotional disharmony, and regressive behavior. [NIH]

Sclerosis: A induration, or hardening; especially hardening of a part from inflammation and in diseases of the interstitial substance. The term is used chiefly for such a hardening of the nervous system due to hyperplasia of the connective tissue or to designate hardening of the blood vessels. [EU]

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]

Seizures: Clinical or subclinical disturbances of cortical function due to a sudden, abnormal, excessive, and disorganized discharge of brain cells. Clinical manifestations include abnormal motor, sensory and psychic phenomena. Recurrent seizures are usually referred to as epilepsy or "seizure disorder." [NIH]

Selenium: An element with the atomic symbol Se, atomic number 34, and atomic weight 78.96. It is an essential micronutrient for mammals and other animals but is toxic in large amounts. Selenium protects intracellular structures against oxidative damage. It is an essential component of glutathione peroxidase. [NIH]

Serum: The clear portion of any body fluid; the clear fluid moistening serous membranes. 2. blood serum; the clear liquid that separates from blood on clotting. 3. immune serum; blood serum from an immunized animal used for passive immunization; an antiserum; antitoxin, or antivenin. [EU]

Spasmodic: Of the nature of a spasm. [EU]

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]

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]

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

Stramonium: One of the very toxic Solanaceae, Datura stramonium, also called thornapple and jimsonweed. It contains the same alkaloids as in Belladonna and causes toxicity to cattle and other grazers. [NIH]

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]

Substrate: A substance upon which an enzyme acts. [EU]

Synaptic: Pertaining to or affecting a synapse (= site of functional apposition between neurons, at which an impulse is transmitted from one neuron to another by electrical or chemical means); pertaining to synapsis (= pairing off in point-for-point association of homologous chromosomes from the male and female pronuclei during the early prophase of meiosis). [EU]

Synaptosomes: Pinched-off nerve endings and their contents of vesicles and cytoplasm together with the attached subsynaptic area of the membrane of the post-synaptic cell. They are largely artificial structures produced by fractionation after selective centrifugation of nervous tissue homogenates. [NIH]

Syphilis: A contagious venereal disease caused by the spirochete treponema pallidum. [NIH]

Systemic: Pertaining to or affecting the body as a whole. [EU]

Tetanus: A disease caused by tetanospasmin, a powerful protein toxin produced by clostridium tetani. Tetanus usually occurs after an acute injury, such as a puncture wound or laceration. Generalized tetanus, the most common form, is characterized by tetanic muscular contractions and hyperreflexia. Localized tetanus presents itself as a mild condition with manifestations restricted to muscles near the wound. It may progress to the generalized form. [NIH]

Tetranitromethane: Corrosive oxidant, explosive; additive to diesel and rocket fuels; causes skin and lung irritation; proposed war gas. A useful reagent for studying the modification of specific amino acids, particularly tyrosine residues in proteins. Has also been used for studying carbanion formation and for detecting the presence of double bonds in organic compounds. [NIH]

Thermoregulation: Heat regulation. [EU]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

Tonsillitis: Inflammation of the tonsils, especially the palatine tonsils. [EU]

Toxicity: The quality of being poisonous, especially the degree of virulence of a toxic microbe or of a poison. [EU]

Toxicology: The science concerned with the detection, chemical composition, and pharmacologic action of toxic substances or poisons and the treatment and prevention of toxic manifestations. [NIH]

Toxin: A poison; frequently used to refer specifically to a protein produced by some higher plants, certain animals, and pathogenic bacteria, which is highly toxic for other living organisms. Such substances are differentiated

from the simple chemical poisons and the vegetable alkaloids by their high molecular weight and antigenicity. [EU]

Toxoids: Preparations of pathogenic organisms or their derivatives made nontoxic and intended for active immunologic prophylaxis. They include deactivated toxins. [NIH]

Toxoplasmosis: An acute or chronic, widespread disease of animals and humans caused by the obligate intracellular protozoon Toxoplasma gondii, transmitted by oocysts containing the pathogen in the feces of cats (the definitive host), usually by contaminated soil, direct exposure to infected feces, tissue cysts in infected meat, or tachyzoites (proliferating forms) in blood. [EU]

Transplantation: The grafting of tissues taken from the patient's own body or from another. [EU]

Tuberculosis: Any of the infectious diseases of man and other animals caused by species of mycobacterium. [NIH]

Tularemia: A plague-like disease of rodents, transmissible to man. It is caused by francisella tularensis and is characterized by fever, chills, headache, backache, and weakness. [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]

Urticaria: Pathology: a transient condition of the skin, usually caused by an allergic reaction, characterized by pale or reddened irregular, elevated patches and severe itching; hives. [EU]

Vaccination: The introduction of vaccine into the body for the purpose of inducing immunity. Coined originally to apply to the injection of smallpox vaccine, the term has come to mean any immunizing procedure in which vaccine is injected. [EU]

Vaccine: A suspension of attenuated or killed microorganisms (bacteria, viruses, or rickettsiae), administered for the prevention, amelioration or treatment of infectious diseases. [EU]

Vancomycin: Antibacterial obtained from Streptomyces orientalis. It is a glycopeptide related to ristocetin that inhibits bacterial cell wall assembly and is toxic to kidneys and the inner ear. [NIH]

Varicella: Chicken pox. [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]

Viral: Pertaining to, caused by, or of the nature of virus. [EU]

Virulence: The degree of pathogenicity within a group or species of microorganisms or viruses as indicated by case fatality rates and/or the ability of the organism to invade the tissues of the host. [NIH]

Xenopus: An aquatic genus of the family, Pipidae, occurring in Africa and distinguished by having black horny claws on three inner hind toes. [NIH]

Yaws: A systemic non-venereal infection of the tropics caused by Treponema pallidum subspecies pertenue. [NIH]

General Dictionaries and Glossaries

While the above glossary is essentially complete, the dictionaries listed here cover virtually all aspects of medicine, from basic words and phrases to more advanced terms (sorted alphabetically by title; hyperlinks provide rankings, information and reviews at Amazon.com):

- **Dictionary of Medical Acronymns & Abbreviations** by Stanley Jablonski (Editor), Paperback, 4th edition (2001), Lippincott Williams & Wilkins Publishers, ISBN: 1560534605, **http://www.amazon.com/exec/obidos/ASIN/1560534605/icongroupinterna**
- **Dictionary of Medical Terms : For the Nonmedical Person (Dictionary of Medical Terms for the Nonmedical Person, Ed 4)** by Mikel A. Rothenberg, M.D, et al, Paperback - 544 pages, 4th edition (2000), Barrons Educational Series, ISBN: 0764112015, **http://www.amazon.com/exec/obidos/ASIN/0764112015/icongroupinterna**
- **A Dictionary of the History of Medicine** by A. Sebastian, CD-Rom edition (2001), CRC Press-Parthenon Publishers, ISBN: 185070368X, **http://www.amazon.com/exec/obidos/ASIN/185070368X/icongroupinterna**
- **Dorland's Illustrated Medical Dictionary (Standard Version)** by Dorland, et al, Hardcover - 2088 pages, 29th edition (2000), W B Saunders Co, ISBN: 0721662544, **http://www.amazon.com/exec/obidos/ASIN/0721662544/icongroupinterna**
- **Dorland's Electronic Medical Dictionary** by Dorland, et al, Software, 29th Book & CD-Rom edition (2000), Harcourt Health Sciences, ISBN: 0721694934, **http://www.amazon.com/exec/obidos/ASIN/0721694934/icongroupinterna**

- **Dorland's Pocket Medical Dictionary (Dorland's Pocket Medical Dictionary, 26th Ed)** Hardcover - 912 pages, 26th edition (2001), W B Saunders Co, ISBN: 0721682812, **http://www.amazon.com/exec/obidos/ASIN/0721682812/icongroupinterna/103-4193558-7304618**
- **Melloni's Illustrated Medical Dictionary (Melloni's Illustrated Medical Dictionary, 4th Ed)** by Melloni, Hardcover, 4th edition (2001), CRC Press-Parthenon Publishers, ISBN: 85070094X, **http://www.amazon.com/exec/obidos/ASIN/85070094X/icongroupinterna**
- **Stedman's Electronic Medical Dictionary Version 5.0 (CD-ROM for Windows and Macintosh, Individual)** by Stedmans, CD-ROM edition (2000), Lippincott Williams & Wilkins Publishers, ISBN: 0781726328, **http://www.amazon.com/exec/obidos/ASIN/0781726328/icongroupinterna**
- **Stedman's Medical Dictionary** by Thomas Lathrop Stedman, Hardcover - 2098 pages, 27th edition (2000), Lippincott, Williams & Wilkins, ISBN: 068340007X, **http://www.amazon.com/exec/obidos/ASIN/068340007X/icongroupinterna**
- **Tabers Cyclopedic Medical Dictionary (Thumb Index)** by Donald Venes (Editor), et al, Hardcover - 2439 pages, 19th edition (2001), F A Davis Co, ISBN: 0803606540, **http://www.amazon.com/exec/obidos/ASIN/0803606540/icongroupinterna**

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