DOWNLOAD PDF THE INFECTIOUS DISEASES

Chapter 1 : FastStats - Infectious Disease

The infectious disease hub contains articles on HIV, AIDS, tuberculosis, vaccines, and global health.

Pathophysiology[edit] There is a general chain of events that applies to infections. Each of the links must be present in a chronological order for an infection to develop. Understanding these steps helps health care workers target the infection and prevent it from occurring in the first place. Infection begins when an organism successfully enters the body, grows and multiplies. This is referred to as colonization. Most humans are not easily infected. Those who are weak, sick, malnourished, have cancer or are diabetic have increased susceptibility to chronic or persistent infections. Individuals who have a suppressed immune system are particularly susceptible to opportunistic infections. Entrance to the host at host-pathogen interface , generally occurs through the mucosa in orifices like the oral cavity , nose, eyes, genitalia, anus, or the microbe can enter through open wounds. While a few organisms can grow at the initial site of entry, many migrate and cause systemic infection in different organs. Some pathogens grow within the host cells intracellular whereas others grow freely in bodily fluids. Wound colonization refers to nonreplicating microorganisms within the wound, while in infected wounds, replicating organisms exist and tissue is injured. All multicellular organisms are colonized to some degree by extrinsic organisms, and the vast majority of these exist in either a mutualistic or commensal relationship with the host. An example of the former is the anaerobic bacteria species, which colonizes the mammalian colon , and an example of the latter are the various species of staphylococcus that exist on human skin. Neither of these colonizations are considered infections. The difference between an infection and a colonization is often only a matter of circumstance. Non-pathogenic organisms can become pathogenic given specific conditions, and even the most virulent organism requires certain circumstances to cause a compromising infection. Some colonizing bacteria, such as Corynebacteria sp. The variables involved in the outcome of a host becoming inoculated by a pathogen and the ultimate outcome include: An interesting fact that gas chromatographyâ€”mass spectrometry , 16S ribosomal RNA analysis, omics , and other advanced technologies have made more apparent to humans in recent decades is that microbial colonization is very common even in environments that humans think of as being nearly sterile. Because it is normal to have bacterial colonization, it is difficult to know which chronic wounds can be classified as infected and how much risk of progression exists. Despite the huge number of wounds seen in clinical practice, there are limited quality data for evaluated symptoms and signs. Microorganisms can cause tissue damage by releasing a variety of toxins or destructive enzymes. For example, Clostridium tetani releases a toxin that paralyzes muscles, and staphylococcus releases toxins that produce shock and sepsis. Not all infectious agents cause disease in all hosts. The prion causing mad cow disease and Creutzfeldtâ€”Jakob disease invariably kills all animals and people that are infected. Persistent infections occur because the body is unable to clear the organism after the initial infection. Persistent infections are characterized by the continual presence of the infectious organism, often as latent infection with occasional recurrent relapses of active infection. There are some viruses that can maintain a persistent infection by infecting different cells of the body. Some viruses once acquired never leave the body. A typical example is the herpes virus, which tends to hide in nerves and become reactivated when specific circumstances arise. Persistent infections cause millions of deaths globally each year. Transmission medicine For infecting organisms to survive and repeat the infection cycle in other hosts, they or their progeny must leave an existing reservoir and cause infection elsewhere. Infection transmission can take place via many potential routes: Droplet contact, also known as the respiratory route, and the resultant infection can be termed airborne disease. If an infected person coughs or sneezes on another person the microorganisms, suspended in warm, moist droplets, may enter the body through the nose, mouth or eye surfaces. Fecal-oral transmission, wherein foodstuffs or water become contaminated by people not washing their hands before preparing food, or untreated sewage being released into a drinking water supply and the people who eat and drink them become infected. Common fecal-oral transmitted pathogens include Vibrio cholerae , Giardia species, rotaviruses , Entameba histolytica , Escherichia coli , and tape worms. Sexual transmission, with the resulting disease being called sexually transmitted disease Oral transmission,

Diseases that are transmitted primarily by oral means may be caught through direct oral contact such as kissing , or by indirect contact such as by sharing a drinking glass or a cigarette. It can occur when the mother gets an infection as an intercurrent disease in pregnancy. Iatrogenic transmission, due to medical procedures such as injection or transplantation of infected material. Culex mosquitos Culex quinquefasciatus shown are biological vectors that transmit West Nile Virus. Vector-borne transmission, transmitted by a vector , which is an organism that does not cause disease itself but that transmits infection by conveying pathogens from one host to another. Diagnosis[edit] Diagnosis of infectious disease sometimes involves identifying an infectious agent either directly or indirectly. In practice most minor infectious diseases such as warts , cutaneous abscesses , respiratory system infections and diarrheal diseases are diagnosed by their clinical presentation and treated without knowledge of the specific causative agent. Conclusions about the cause of the disease are based upon the likelihood that a patient came in contact with a particular agent, the presence of a microbe in a community, and other epidemiological considerations. Given sufficient effort, all known infectious agents can be specifically identified. The benefits of identification, however, are often greatly outweighed by the cost, as often there is no specific treatment, the cause is obvious, or the outcome of an infection is benign. Diagnosis of infectious disease is nearly always initiated by medical history and physical examination. More detailed identification techniques involve the culture of infectious agents isolated from a patient. Culture allows identification of infectious organisms by examining their microscopic features, by detecting the presence of substances produced by pathogens, and by directly identifying an organism by its genotype. The images are useful in detection of, for example, a bone abscess or a spongiform encephalopathy produced by a prion. Symptomatic diagnostics[edit] The diagnosis is aided by the presenting symptoms in any individual with an infectious disease, yet it usually needs additional diagnostic techniques to confirm the suspicion. Some signs are specifically characteristic and indicative of a disease and are called pathognomonic signs; but these are rare. Not all infections are symptomatic. Microbiological culture is a principal tool used to diagnose infectious disease. In a microbial culture, a growth medium is provided for a specific agent. A sample taken from potentially diseased tissue or fluid is then tested for the presence of an infectious agent able to grow within that medium. Most pathogenic bacteria are easily grown on nutrient agar , a form of solid medium that supplies carbohydrates and proteins necessary for growth of a bacterium , along with copious amounts of water. A single bacterium will grow into a visible mound on the surface of the plate called a colony , which may be separated from other colonies or melded together into a "lawn". The size, color, shape and form of a colony is characteristic of the bacterial species, its specific genetic makeup its strain , and the environment that supports its growth. Other ingredients are often added to the plate to aid in identification. Plates may contain substances that permit the growth of some bacteria and not others, or that change color in response to certain bacteria and not others. Bacteriological plates such as these are commonly used in the clinical identification of infectious bacterium. Microbial culture may also be used in the identification of viruses: In the case of viral identification, a region of dead cells results from viral growth, and is called a "plaque". Eukaryotic parasites may also be grown in culture as a means of identifying a particular agent. In the absence of suitable plate culture techniques, some microbes require culture within live animals. Bacteria such as Mycobacterium leprae and Treponema pallidum can be grown in animals, although serological and microscopic techniques make the use of live animals unnecessary. Viruses are also usually identified using alternatives to growth in culture or animals. Some viruses may be grown in embryonated eggs. Another useful identification method is Xenodiagnosis, or the use of a vector to support the growth of an infectious agent. Chagas disease is the most significant example, because it is difficult to directly demonstrate the presence of the causative agent, Trypanosoma cruzi in a patient, which therefore makes it difficult to definitively make a diagnosis. In this case, xenodiagnosis involves the use of the vector of the Chagas agent T. The bug is later inspected for growth of T. Microscopy[edit] Another principal tool in the diagnosis of infectious disease is microscopy. Virtually all of the culture techniques discussed above rely, at some point, on microscopic examination for definitive identification of the infectious agent. Microscopy may be carried out with simple instruments, such as the compound light microscope , or with instruments as complex as an electron microscope. Samples obtained from patients may be viewed directly under the light microscope, and can often rapidly lead to identification.

Microscopy is often also used in conjunction with biochemical staining techniques, and can be made exquisitely specific when used in combination with antibody based techniques. For example, the use of antibodies made artificially fluorescent fluorescently labeled antibodies can be directed to bind to and identify a specific antigens present on a pathogen. A fluorescence microscope is then used to detect fluorescently labeled antibodies bound to internalized antigens within clinical samples or cultured cells. This technique is especially useful in the diagnosis of viral diseases, where the light microscope is incapable of identifying a virus directly. Other microscopic procedures may also aid in identifying infectious agents. Almost all cells readily stain with a number of basic dyes due to the electrostatic attraction between negatively charged cellular molecules and the positive charge on the dye. A cell is normally transparent under a microscope, and using a stain increases the contrast of a cell with its background. Staining a cell with a dye such as Giemsa stain or crystal violet allows a microscopist to describe its size, shape, internal and external components and its associations with other cells. The response of bacteria to different staining procedures is used in the taxonomic classification of microbes as well. Two methods, the Gram stain and the acid-fast stain, are the standard approaches used to classify bacteria and to diagnosis of disease. The Gram stain identifies the bacterial groups Firmicutes and Actinobacteria , both of which contain many significant human pathogens. The acid-fast staining procedure identifies the Actinobacterial genera Mycobacterium and Nocardia. Biochemical tests[edit] Biochemical tests used in the identification of infectious agents include the detection of metabolic or enzymatic products characteristic of a particular infectious agent. Since bacteria ferment carbohydrates in patterns characteristic of their genus and species , the detection of fermentation products is commonly used in bacterial identification. Acids , alcohols and gases are usually detected in these tests when bacteria are grown in selective liquid or solid media. The isolation of enzymes from infected tissue can also provide the basis of a biochemical diagnosis of an infectious disease. For example, humans can make neither RNA replicases nor reverse transcriptase , and the presence of these enzymes are characteristic of specific types of viral infections. The ability of the viral protein hemagglutinin to bind red blood cells together into a detectable matrix may also be characterized as a biochemical test for viral infection, although strictly speaking hemagglutinin is not an enzyme and has no metabolic function. Serological methods are highly sensitive, specific and often extremely rapid tests used to identify microorganisms. These tests are based upon the ability of an antibody to bind specifically to an antigen.

Chapter 2 : Infectious Diseases - A to Z List: Department of Health

Chin J. B., ed. Control of Communicable Diseases Manual. 17th ed. APHA [American Public Health Association] Press; ISBN ; Red Book: Report of the Committee on Infectious Diseases. American Academy of Pediatrics. 28th ed. ISBN ; Centers for Disease Control and Prevention. www.nxgvision.com Retrieved on August 4,

Facts Targeting Disease What are infectious diseases? Infectious diseases are caused by microorganisms such as viruses, bacteria, fungi or parasites and can spread between individuals. What is an infectious disease? Microorganisms that cause disease are collectively called pathogens. Close up of a mosquito feeding on human blood. Shutterstock Infectious diseases are one of the leading causes of death worldwide. Many diseases become difficult to control if the infectious agents evolve resistance to commonly used drugs: For example, bacteria can accumulate mutations in their DNA or acquire new genes that allow them to survive contact with antibiotic drugs that would normally kill them. Scientists are currently searching for new approaches to treat infectious diseases, focusing on exactly how the pathogens change and drug resistance evolves. What causes an infectious disease? Viruses Viruses are tiny infectious agents that replicate only in the living cells of other organisms. Viruses can be spread in many ways including: From plant to plant by insects that feed on plant sap. For example, Potato virus Y which is spread by aphids. From animal to animal by blood-sucking insects. For example, Dengue virus which is spread by mosquitos. Spread by aerosols through coughing and sneezing. For example, influenza virus. Spread by not washing hands after going to the toilet. For example, norovirus or rotavirus. Spread by sexual contact. Spread by exposure to infected blood. For example, Hepatitis B. Viruses can often be prevented through vaccines. Bacteria Bacteria are single-celled microorganisms. Most bacteria are not harmful and some are actually beneficial. Less than one per cent of bacteria will actually make you ill. Infectious bacteria can grow, divide and spread in the body, leading to infectious disease. Some infectious bacteria give off toxins which can make some diseases more severe. Bacteria are spread in many ways including: Spread by surface and skin contact. Spread through body fluids, such as blood and saliva. For example, meningococcal disease meningitis. Antibiotics are usually given to treat severe bacterial infections. Antibiotic resistance in bacteria is a significant problem.

Chapter 3 : The Journal of Infectious Diseases | Oxford Academic

Infectious diseases are disorders caused by organisms â€" such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but under certain conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person.

When to see a doctor Seek medical attention if you: Have been bitten by an animal Are having trouble breathing Have been coughing for more than a week Have severe headache with fever Experience a rash or swelling Have unexplained or prolonged fever Have sudden vision problems Causes Infectious diseases can be caused by: These one-cell organisms are responsible for illnesses such as strep throat, urinary tract infections and tuberculosis. Even smaller than bacteria, viruses cause a multitude of diseases â€" ranging from the common cold to AIDS. Other types of fungi can infect your lungs or nervous system. Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces. Direct contact An easy way to catch most infectious diseases is by coming in contact with a person or animal who has the infection. Three ways infectious diseases can be spread through direct contact are: A common way for infectious diseases to spread is through the direct transfer of bacteria, viruses or other germs from one person to another. These germs can also spread through the exchange of body fluids from sexual contact. The person who passes the germ may have no symptoms of the disease, but may simply be a carrier. Being bitten or scratched by an infected animal â€" even a pet â€" can make you sick and, in extreme circumstances, can be fatal. Handling animal waste can be hazardous, too. Mother to unborn child. A pregnant woman may pass germs that cause infectious diseases to her unborn baby. Some germs can pass through the placenta. Germs in the vagina can be transmitted to the baby during birth. Indirect contact Disease-causing organisms also can be passed by indirect contact. Many germs can linger on an inanimate object, such as a tabletop, doorknob or faucet handle. When you touch a doorknob handled by someone ill with the flu or a cold, for example, you can pick up the germs he or she left behind. If you then touch your eyes, mouth or nose before washing your hands, you may become infected. Insect bites Some germs rely on insect carriers â€" such as mosquitoes, fleas, lice or ticks â€" to move from host to host. These carriers are known as vectors. Mosquitoes can carry the malaria parasite or West Nile virus, and deer ticks may carry the bacterium that causes Lyme disease. Food contamination Another way disease-causing germs can infect you is through contaminated food and water. This mechanism of transmission allows germs to be spread to many people through a single source. This may occur if: Complications Most infectious diseases have only minor complications. But some infections â€" such as pneumonia, AIDS and meningitis â€" can become life-threatening. A few types of infections have been linked to a long-term increased risk of cancer: Human papillomavirus is linked to cervical cancer Helicobacter pylori is linked to stomach cancer and peptic ulcers Hepatitis B and C have been linked to liver cancer In addition, some infectious diseases may become silent, only to appear again in the future â€" sometimes even decades later. Prevention Infectious agents can enter your body through: Skin contact or injuries Ingestion of contaminated food or water Tick or mosquito bites Sexual contact Follow these tips to decrease your risk of infecting yourself or others: This is especially important before and after preparing food, before eating, and after using the toilet. Immunization can drastically reduce your chances of contracting many diseases. Stay home when ill. Keep counters and other kitchen surfaces clean when preparing meals. Cook foods to the proper temperature using a food thermometer to check for doneness. For ground meats, that means at least F 71 C ; for poultry, F 74 C ; and for most other meat, at least F 63 C. Always use condoms if you or your partner has a history of sexually transmitted infections or high-risk behavior. Use your own toothbrush, comb and razor. Avoid sharing drinking glasses or dining utensils. See the stories of satisfied Mayo Clinic patients.

Chapter 4 : Infectious diseases - Symptoms and causes - Mayo Clinic

Journal of Infectious Diseases Founded in , The Journal of Infectious Diseases (JID) is the premier global publication for original research on the pathogenesis, diagnosis, and treatment of infectious diseases; on the microbes that cause them; and on disorders of host immune mechanisms.

Children Summary Germs, or microbes, are found everywhere - in the air, soil, and water. There are also germs on your skin and in your body. Many of them are harmless, and some can even be helpful. But some of them can make you sick. Infectious diseases are diseases that are caused by germs. There are many different ways that you can get an infectious disease: Through direct contact with a person who is sick. This includes kissing, touching, sneezing, coughing, and sexual contact. Pregnant mothers can also pass some germs along to their babies. Through indirect contact, when you touch something that has germs on it. For example, you could get germs if someone who is sick touched a door handle, and then you touch it. Through insect or animal bites Through contaminated food, water, soil, or plants There are four main kinds of germs: Bacteria - one-celled germs that multiply quickly. They may give off toxins, which are harmful chemicals that can make you sick. Strep throat and urinary tract infections are common bacterial infections. Viruses - tiny capsules that contain genetic material. They invade your cells so that they can multiply. This can kill, damage, or change the cells and make you sick. Fungi - primitive plant-like organisms such as mushrooms, mold, mildew, and yeasts. Parasites - animals or plants that survive by living on or in other living things. Malaria is an infection caused by a parasite. Infectious diseases can cause many different symptoms. Some are so mild that you may not even notice any symptoms, while others can be life-threatening. There are treatments for some infectious diseases, but for others, such as some viruses, you can only treat your symptoms. You can take steps to prevent many infectious diseases:

Chapter 5 : What are infectious diseases? | Facts | www.nxgvision.com

Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. Zoonotic diseases are infectious diseases of animals that can cause disease when transmitted to humans.

Chapter 6 : Infectious Disease | Germs | MedlinePlus

The primary NIH organization for research on Infectious Diseases is the National Institute of Allergy and Infectious Diseases Disclaimers MedlinePlus links to health information from the National Institutes of Health and other federal government agencies.

Chapter 7 : Immunization and Infectious Diseases | Healthy People

Acute Infectious Disease Epidemiology, Center for HIV, Hepatitis, Sexually Transmitted Diseases & Tuberculosis Epidemiology, Center for Medical Examiners, State Center for the Office.

Chapter 8 : Infectious diseases | Science | The Guardian

The 5 Most Common Infectious Diseases Infectious diseases affect billions of people around the globe annually. According to WHO and the CDC, these infectious diseases are the five most common.

Chapter 9 : Diseases & Conditions | CDC

Most read in The Lancet Infectious Diseases within the past 30 days. Articles Estimates of the global, regional, and

national morbidity, mortality, and aetiologies of lower respiratory infections in countries, a systematic analysis for the Global Burden of Disease Study