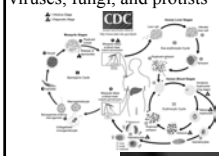
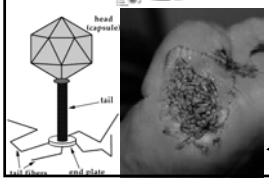
Chapter 19 Fighting Disease

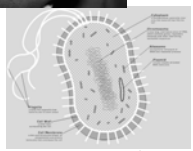
These big socks work as an added barrier for 1st line defense.

Section 1 Infectious Disease

- Pathogens = organisms that cause disease/illness – infectious diseases can be spread from one organism to another – caused by bacteria, viruses, fungi, and protists

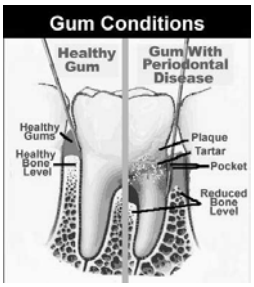






Maggots eating up resistant bacteria

- bacteria = one celled – cause things like ear infections, food poisoning, acne, TB – some invade cells while others produce toxins that damage the cells (Tetanus)

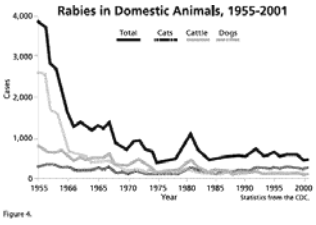


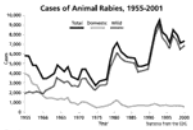
Periodontal disease is a chronic bacterial infection that affects the gums and bone supporting the teeth. Gum disease, untreated can become very serious, causing teeth to become loose or fall out.

-Virus – smaller than bacteria – need a host cell to take over and use it to make more viruses – ex. Cold, flu, HIV

- Fungi and Protists – fungi ex. Mold, yeast – Protist ex. Malaria

- Pathogens may be spread person to person, contaminated object, animal bite or by the environment DEPENDING ON THE PATHOGEN -

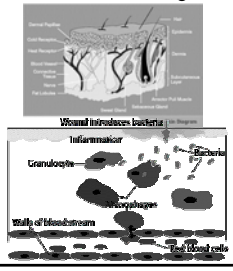


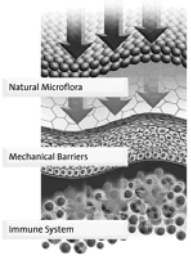


Section 2 The Body's Defenses

1st line of defense are barriers

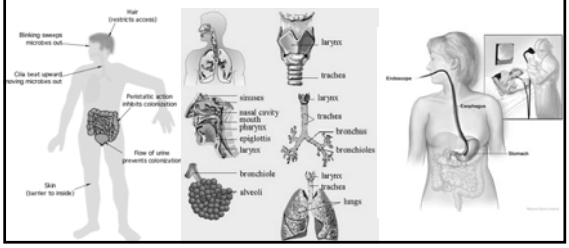
Skin – is a barrier of cells (alive and dead) – can enter through a cut or opening in the skin – some pathogens can enter through the pores in the skin or be absorbed through the skin –



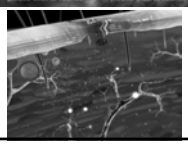


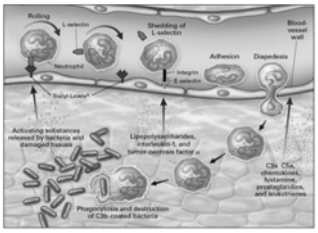
Breathing Passages – include nose, pharynx, trachea, and bronchi – hair, cilia, and mucus work together to trap pathogens entering through your respiratory system – body can force pathogens out by sneezing or coughing

Mouth and Stomach – chemicals found in saliva to help kill pathogens – stomach acid can kill pathogens you swallow



- if pathogen gets past barriers and begins damaging cells chemicals get released that trigger the inflammatory response = second line of defense – white blood cells attach the pathogen – also called body's general defense – many types of white blood cells – phagocytes work by engulfing pathogen and breaking it down

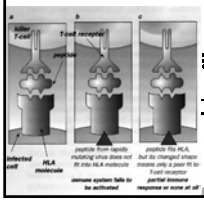


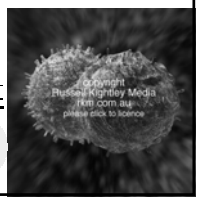


– during inflammation blood vessels widen to allow more blood to area – fluid leaks out of the blood vessel making the area red, warm and swollen – fever happens by the body warming itself up to kill pathogens that can not live at higher temperatures

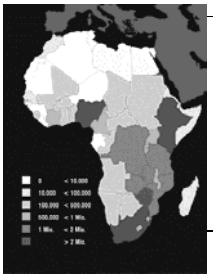
Figure 1. Bilateral parotid gland swelling in HIV infection.

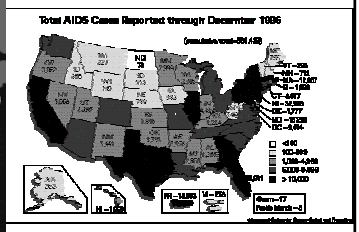
- third defense is the immune response – immune system can distinguish between different kinds of pathogens and target specific pathogens – white blood cells called lymphocytes (T cells and B cells) – T Cells (killer T – Cells) are made to kill one pathogen – have millions of different T-Cells – once a T-Cell recognizes a pathogen by its marker molecule (called Antigen) it binds to it and kill infected cells – B-Cell produce antibodies that lock into the antigen on the pathogen to clump the pathogens together, damage it, or make it easier for phagocytes to destroy – each antibody specific for the antigen on one pathogen





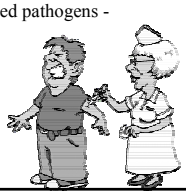
AIDS = Auto Immunodeficiency Disorder – caused when HIV destroys enough T-Cells – the virus destroys T-Cells making person sick from other pathogens = makes immune system fail – spread through body fluid (blood, fluids found in male and female reproductive fluids, breast milk) – NOT SPREAD THROUGH skin contact, sweat, or saliva

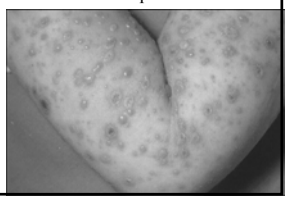




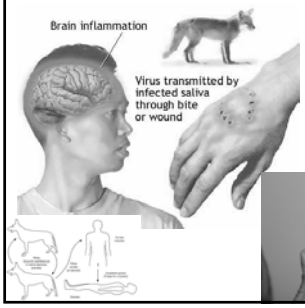
Section 3 Preventing Disease

- Immunity is the body's ability to destroy pathogens before they can cause disease – 2 types of immunity = active and passive – active immunity is when a person's own immune system produces antibodies in response to the presence of a pathogen – ex. Having had chickenpox – after having it the body keeps some of the T and B cells and can destroy the pathogen before you actually feel ill – can last for years or your life – vaccination is another example of active immunity – you never actually had the pathogen but had harmless antigens put into your system – can be given by injections or by mouth – vaccine is made up of weaken or killed pathogens -





Passive immunity = giving person the antibodies – ex. Rabies shot – usually does not last longer than a few weeks – another example is babies getting antibodies from mother in the womb or through breast milk – helps baby until the immune system can function independently

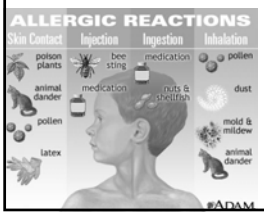


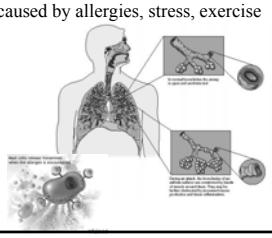
Antibiotic is a chemical that kills bacteria or slows their growth without harming body cells – does not effect viruses – overuse of antibiotics has lead to some bacteria becoming resistant to antibiotics - cold medications can temporarily alleviate symptoms but does not effect the virus – body's response to a virus is meant to slow you down because it needs rest to make you better

Section 4 Noninfectious Disease

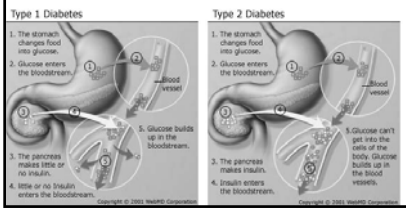
Allergies – disorder in which the immune system is overly sensitive to a foreign substance – allergen is any substance that causes an allergy – ex. Dust, mold, some foods, medicines, bee stings, etc – when lymphocytes encounter allergens they produce antibodies – these antibodies release a chemical called histamine – you may take an antihistamine to counteract

- Asthma is when respiratory passages narrow causing person to wheeze or become short of breath – can be caused by allergies, stress, exercise





- Diabetes = pancreas does not produce insulin or the body's cells can not use it properly – insulin enables the bodies cells to take in glucose from the blood – Type 1 (childhood diabetes) is treated with injections of insulin because pancreas produces little or no insulin – Type 2 (adult onset) the pancreas does not produce enough insulin or the body's cells are not responding to the insulin – usually the person is obese – can treat with diet, weight control, and exercise – effects = weight loss, feel weak, hungry all the time, tired, glucose found in urine, feel thirsty – long term effects = blindness, kidney failure, heart disease, etc.



- Cancer is cells multiplying uncontrollably, destroying healthy tissue – often form tumors = abnormal tissue mass – cancer can break away from the tumor and enter the blood or lymph system and get carried all over the body – cancer can be hereditary or from environmental factors called carcinogens – ex. Smoking, drinking, air pollution, sun exposure, etc. – treatments include surgery, radiation, medication