Chapter 8: Bloodborne Pathogens, Universal Precautions, and Wound Care

Pathogens

- Pathogens-germs that get into the body and cause an infection.
  - Bacteria-one celled organism that causes infection.
  - Viruses-an organism that depends on other organisms to live and reproduce; it is difficult to kill.

How are ANY infectious diseases spread?

- Direct contact with an infected person
- Indirect contact through an insect or animal, through contaminated soil or water, or through an inanimate object, such as an eating utensil or toothbrush

How can pathogens (germs) enter the body?

- Penetration of the skin or direct contact
- Inhalation through the mouth or nose
- Ingestion of contaminated food or water

Bloodborne Pathogens

- Bloodborne Pathogens-germs that may be present in human blood and other fluids (cerebrospinal fluid, semen, vaginal secretion, and synovial fluid), can potentially cause disease!
- Most significant pathogens are HBV (Hepatitis B Virus) and HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immunodeficiency Syndrome).
- Others that exist are hepatitis A, C, D,and E.

- Healthcare facility must be maintained as clean and sterile to prevent spread of disease and infection
- Must take precautions to minimize risk
- Coaches must be aware of potential dangers associated with exposure to blood or other infectious materials
- Must take whatever measures to prevent contamination

OSHA

- OSHA (Occupational Safety and Health Administration)- federal agency that establishes standards for employer to follow that govern occupational exposure to blood-borne pathogens.
- Developed to protect healthcare provider and patient.

Activity

- Find a group of three:
- Look up your profession to answer these questions
  - What OSHA training should your profession get? (go to the OSHA website to look it up)
  - What makes their job unsafe?
  - What pathogens are they exposed to?
  - What is protective gear they should wear?

ALWAYS FOLLOW:

- Standard Precautions-safety measures taken to prevent exposure to blood or body fluids.

- Universal Precautions-a set of precautions that considers blood and body fluids of ALL patients INFECTIOUS!

Hepatitis B Virus (HBV)

- Major cause of viral infection, resulting in swelling, soreness, loss of normal liver function
- Signs and symptoms
  - Flu-like symptoms include fatigue, weakness, nausea, abdominal pain, headache, fever, and possibly jaundice
  - Possible that individual will not exhibit signs and symptoms
  - Can be unknowingly transferred

Jaundice-yellowing of the skin, eyes, nails, etc.

PREVENTION of HBV

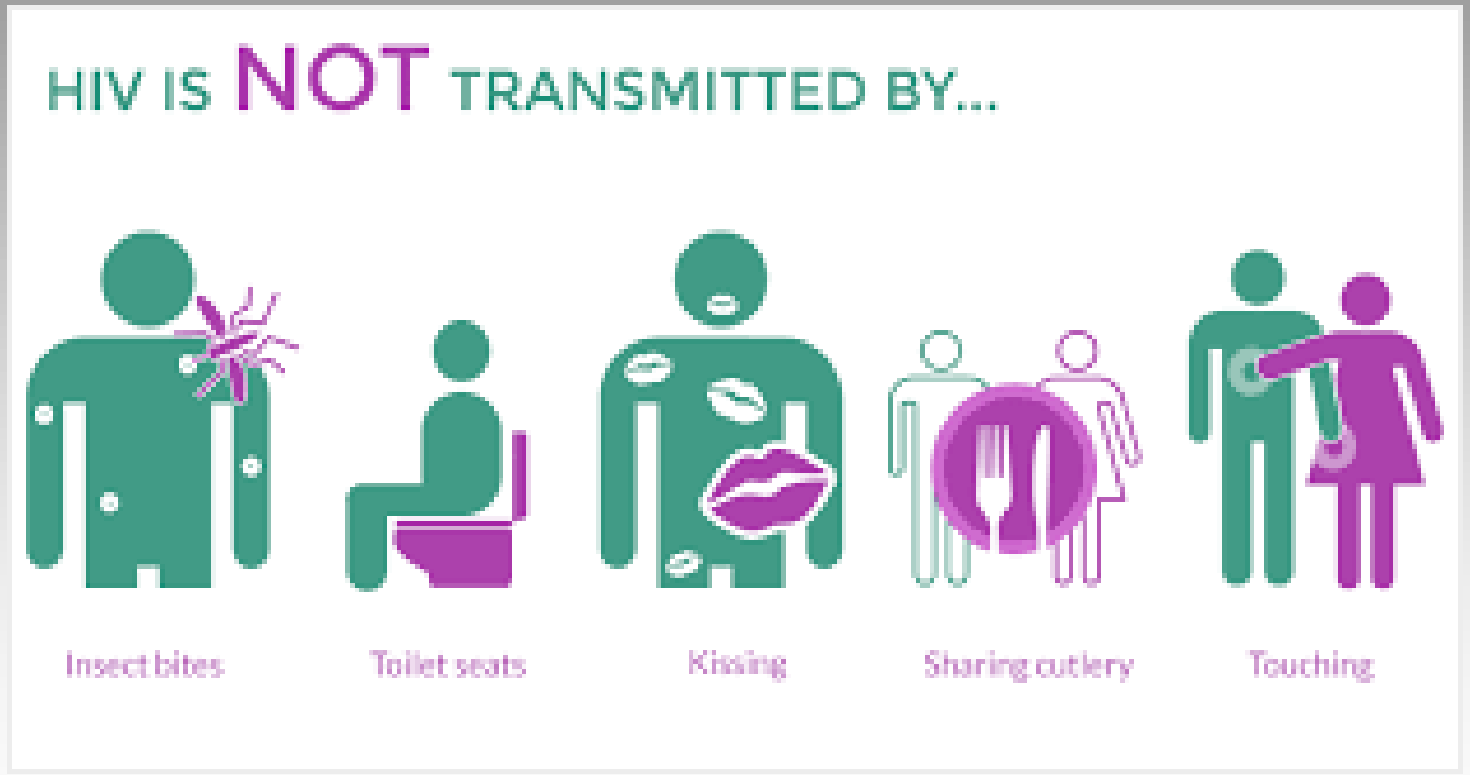
- Good personal hygiene and avoiding high risk activities
- Proceed with caution as HBV can survive in blood and fluids, in dried blood, and on contaminated surfaces for at least 1 week
- Vaccination against HBV should be encouraged.
  - It is a series of 3 shots…over a 6 month period.
- Athletic trainers and allied health professionals should be vaccinated

Human Immunodeficiency Virus (HIV)

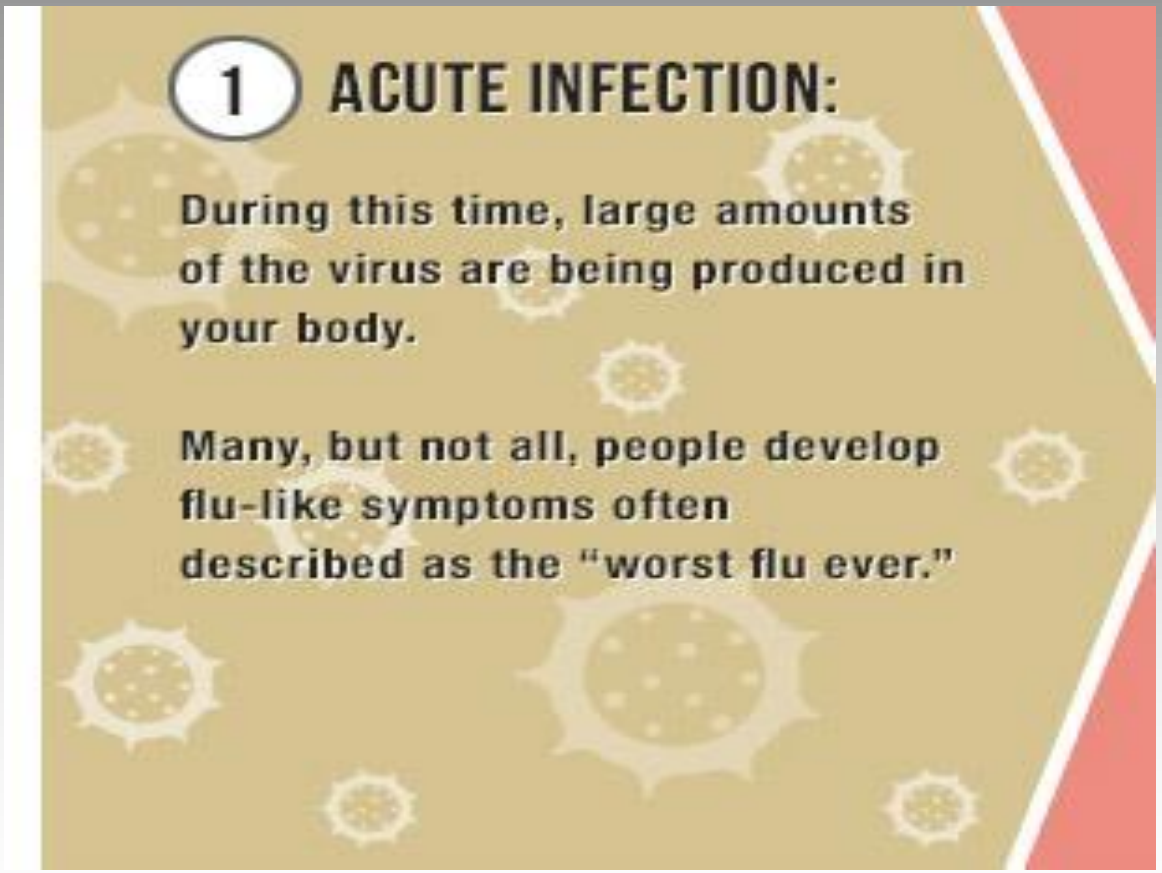
- A retrovirus that combines with host cell
- Virus that has potential to destroy the immune system
- According to World Health Organization, 42 million people are living with HIV/AIDS!

How can you get HIV?

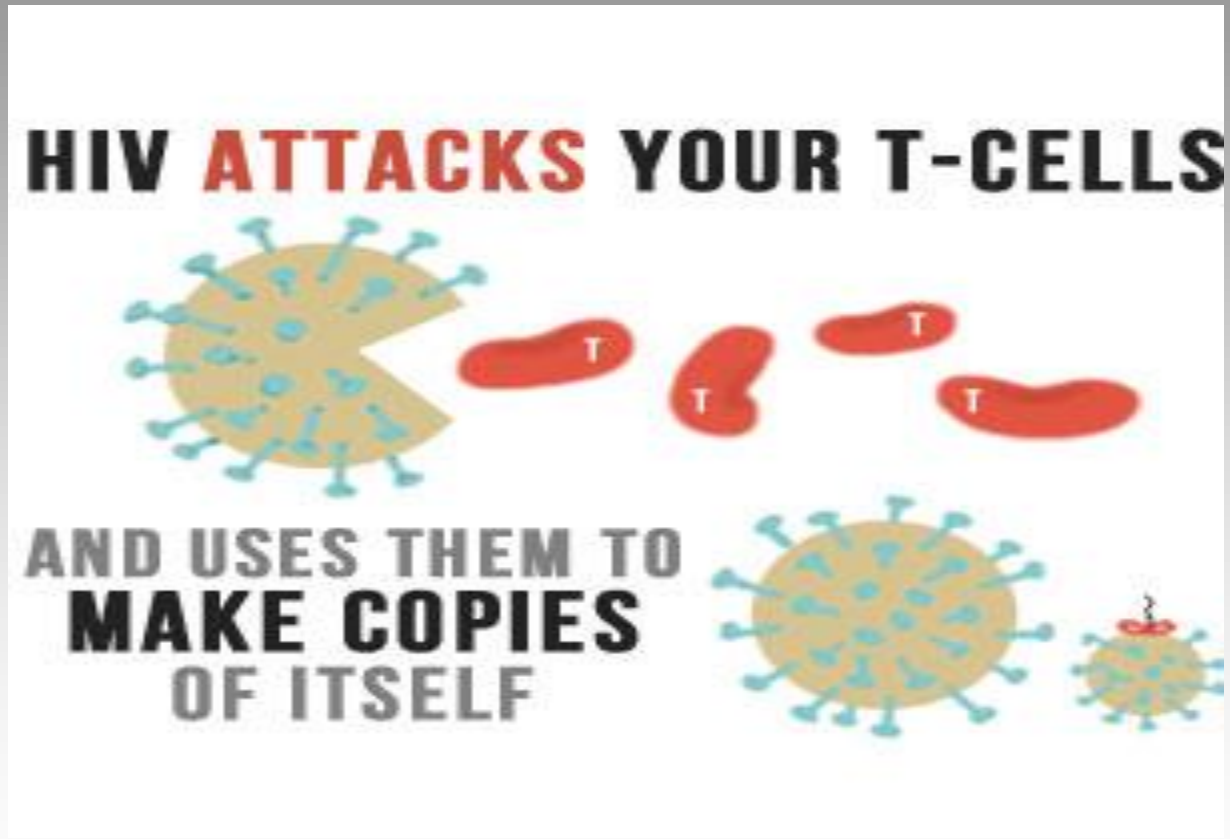
You CANNOT get HIV…..



How HIV develops….



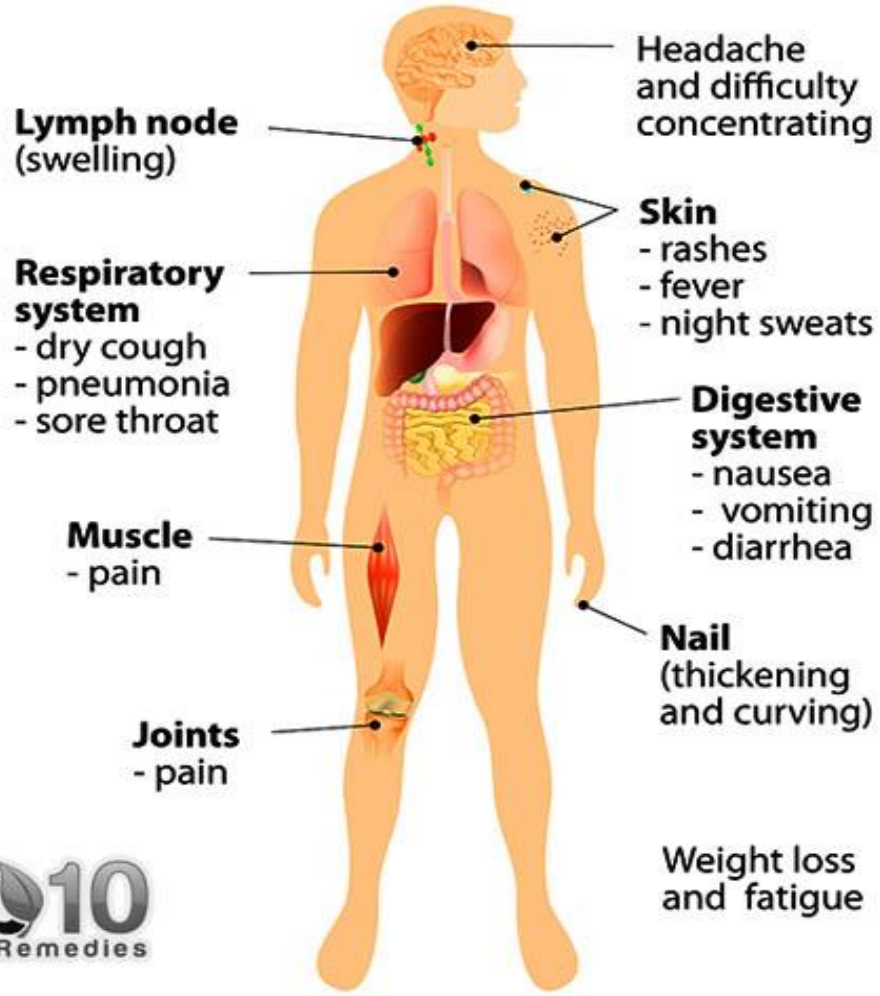
HIV attacks White Blood Cells- T and B cells



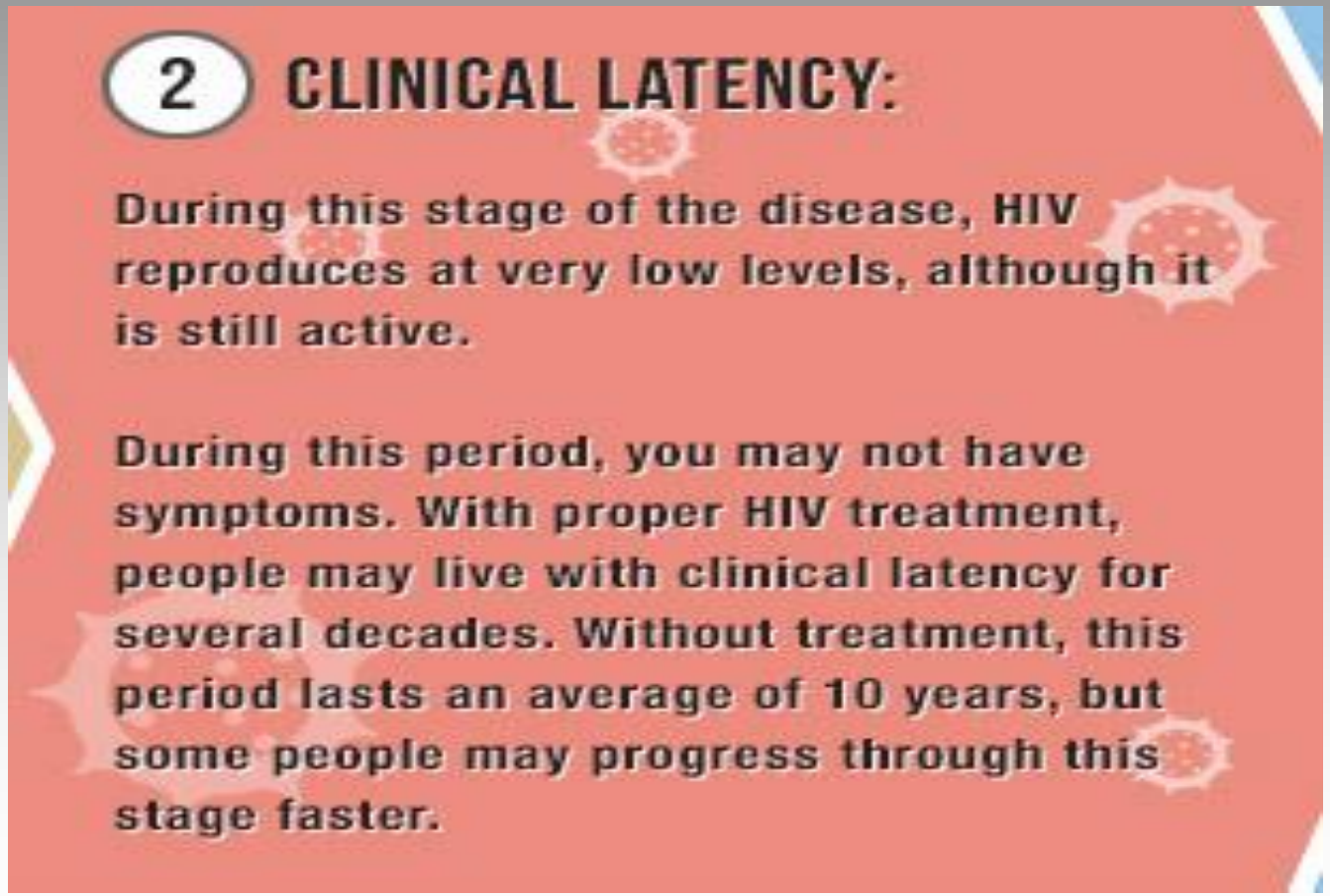
Signs and Symptoms of HIV

- Transmitted by infected blood or other fluids
- If concerned, GET TESTED……Antibodies can be detected in blood tests within 1 year of exposure
- A person may have “flu-like symptoms”
- May go for 8-10 years before signs and symptoms develop

Symptoms Of HIV Infection



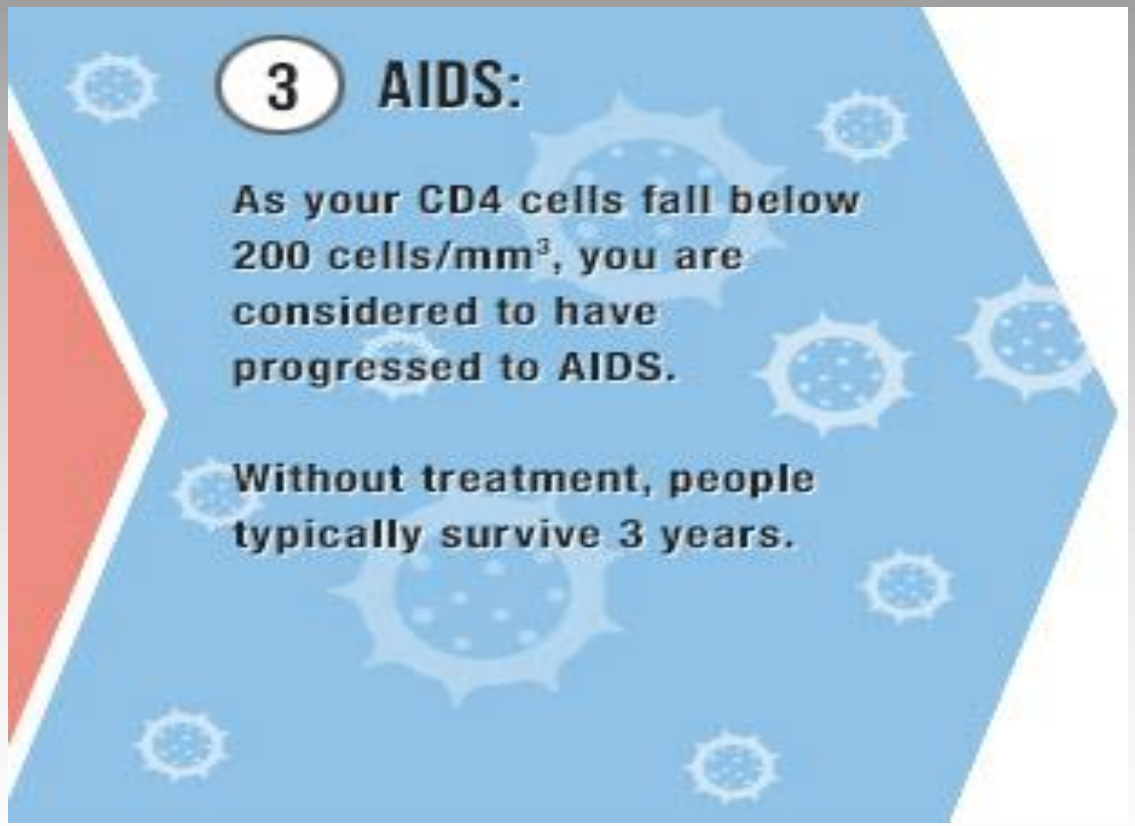
As HIV develops…..

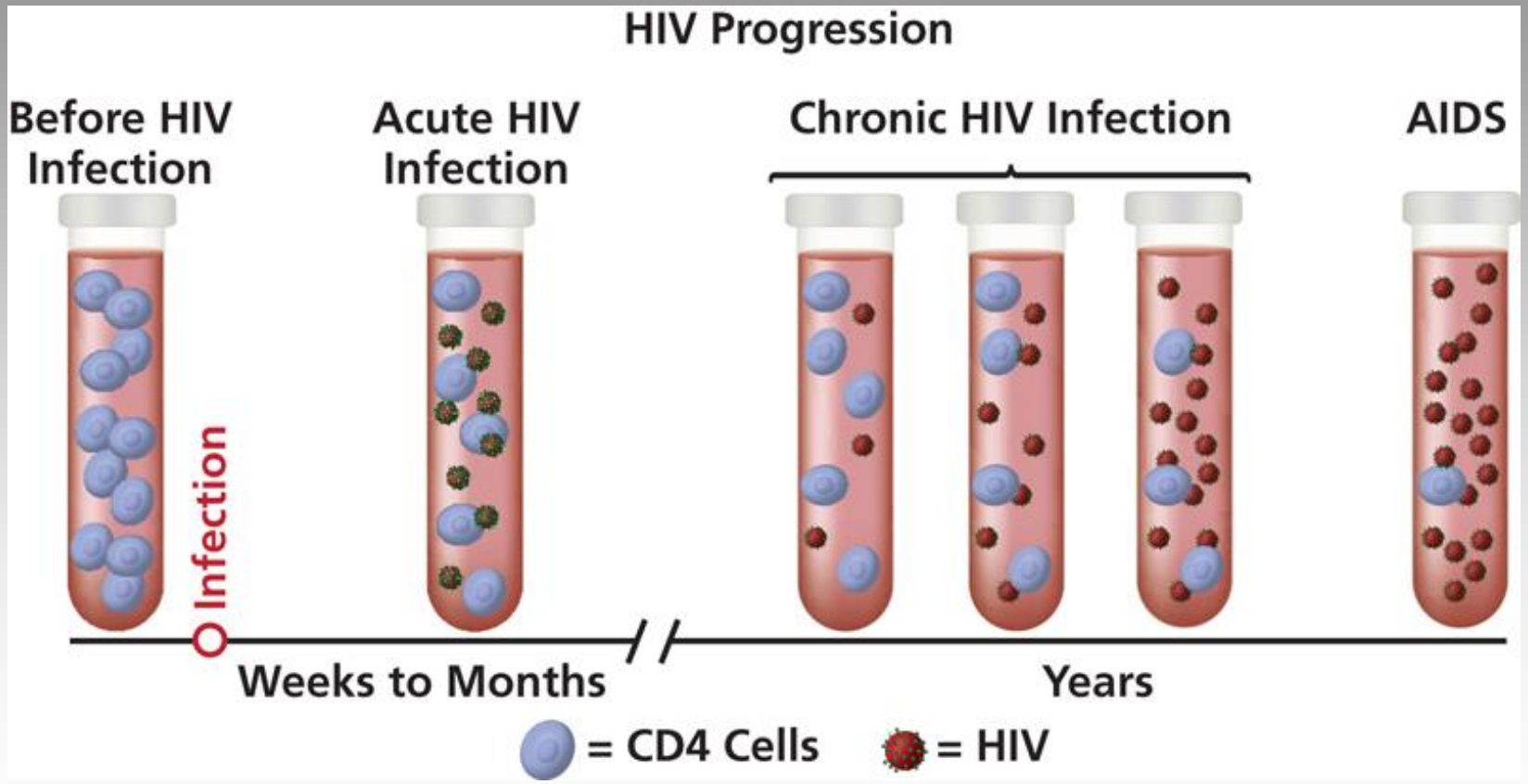


Acquired Immunodeficiency Syndrome (AIDS)

- No protection against the simplest infection
- Positive test for HIV cannot predict when the individual will show symptoms of AIDS
- After contracting AIDS, people generally die w/in 3 years of symptoms developing

HIV may turn into AIDS!





Some HIV patients develop lesions on their skin--- Kaposis Sarcoma

- Management
  - No vaccine for HIV
  - No cure even though drug therapy is available
    - Antiviral drugs are used to manage symptoms
    - Slows replication of virus and improves survival rate

- Prevention
  - Abstinence from risky behavior
  - Avoid exposure to blood and body fluid
  - Abide by universal precautions

Facts on HIV/AIDS from www.aids.gov

- More than 1.2 million people in the United States are living with HIV infection, and almost 1 in 7 (14%) are unaware of their infection.
- Gay, bisexual, and other men who have sex with men are most seriously affected by HIV.
- By race, blacks/African Americans face the most severe burden of HIV.

Bloodborne Pathogens in Athletics

- Chance of transmitting HIV among athletes is low
- Minimal risk of on-field transmission
- Some sports have potentially higher risk for transmission because of close contact and exposure to bodily fluids
  - Martial arts, wrestling, boxing

Policy Regulation

- Athletes are subject to procedures and policies relative to transmission of bloodborne pathogen
- A number of sport professional organizations have established policies to prevent transmission
- Organizations have also developed educational programs concerning prevention, and medical assistance

- Institutions should take responsibility to educate student athletes
- At high school level, parents should also be educated
- Make athletes aware that greatest risk is involved in off-field activities
- Athletic trainer should take responsibility of educating and informing student athletic trainers of exposure and control policies
- Institutions should implement policies concerning bloodborne pathogens
- Follow universal precautions mandated by OSHA

HIV and Athletic Participation

- No definitive answer as to whether asymptomatic HIV carriers should participate in sport
  - Bodily fluid contact should be avoided
  - Avoid exhaustive exercise that may lead to susceptibility to infection
- American with Disabilities Act says athletes infected cannot be discriminated against and may only be excluded with medically sound basis
  - Must be based on objective medical evidence and must take into consideration risk to patient and other participants, and means to reduce risk

Testing Athletes for HIV

- Should not be used as screening tool
- Mandatory testing may not be allowed due to legal reasons
- Testing should be secondary to education
- Athletes engaged in risky behavior should undergo voluntary anonymous testing for HIV
- Multiple tests are available to test for antibodies for HIV proteins

- Detectable antibodies may appear from 3 month to 1 year following exposure
  - Testing should occur at 6 weeks, 3 months, and 1 year
- Many states have enacted laws that protect confidentiality of HIV infected person
  - Athletic trainer should be familiar with state laws, and maintain confidentiality and anonymity of testing

Universal Precautions in Athletic Environment

- OSHA (Occupational Safety and Health Administration) established standards for employer to follow that govern occupational exposure to blood-borne pathogens
- Developed to protect healthcare provider and patient
- All sports programs should have exposure control plan
  - Include counseling, education, volunteer testing, and management of bodily fluids

Preventing the SPREAD of BBP

- Preparing the Athlete
  - Prior to participation, all open wounds and lesions should be covered with dressing that will not allow for transmission
- When Bleeding Occurs
  - Athletes with active bleeding must be removed from participation and returned when deemed safe
  - Bloody uniform must be removed or cleaned to remove infectivity (hydrogen peroxide)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Those in direct contact with blood and body fluids must use appropriate PPE:
  - Latex gloves, gowns, aprons, masks and shields, eye protection, disposable mouthpieces for resuscitation
- Hands and skin surfaces coming into contact with blood and body fluids should be washed immediately with soap and water (antigermicidal agent)
- Hands should be washed between patients

More Supplies and Equipment

- Must also have chlorine bleach, antiseptics, proper receptacles for soiled equipment and uniforms, wound care supplies, and sharps container
- Biohazard warning labels, orange or red
- Red bags or containers should be used for potentially infectious material.

Clean up Procedures

- Disinfectant
  - Contaminated surfaces should be clean immediately with solution of 1:10 ratio approved disinfectant (bleach) to water
- Dispose of Sharps Properly
  - Sharps include: Needles, razorblades, and scalpels
  - Use extreme care in handling and disposing all sharps
  - Do not recap, bend needles, or remove from syringe
  - Scissors and tweezers should be sterilized and disinfected regularly

PROTECTING YOU!

- Protecting the Health Care Professional
  - HBV vaccine
  - Follow OSHA guidelines
  - Abide by Universal and Standard Precautions
  - Practice good sanitary habits---wash hands!!!!
- Protecting the Athlete From Exposure
  - Use mouthpieces in high-risk sports
  - Shower immediately after practice or competition
  - Athletes should be immunized against HBV

Post-exposure Procedures

- If exposure to blood or body fluid occurs:
  - Report it to a supervisor
  - A confidential medical evaluation that documents exposure route, identification of source/individual, blood test, counseling and evaluation of reported illness will occur

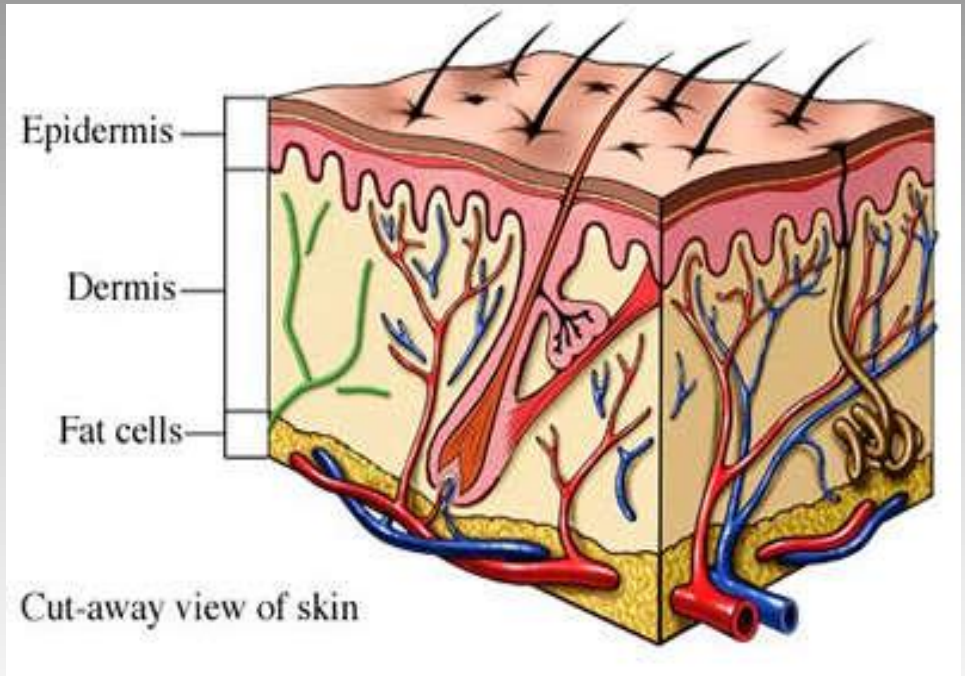
BBP Training Video

- http://www2.wcpss.net/departments/hs/bbp/training/training-review.htm

Skin Wounds

- Wound – trauma to tissues that causes a break in that tissue

- Skin has 3 layers
  1. Epidermis
  2. Dermis
  3. Hypodermis(fat)



- Wounds are either OPEN or CLOSED.

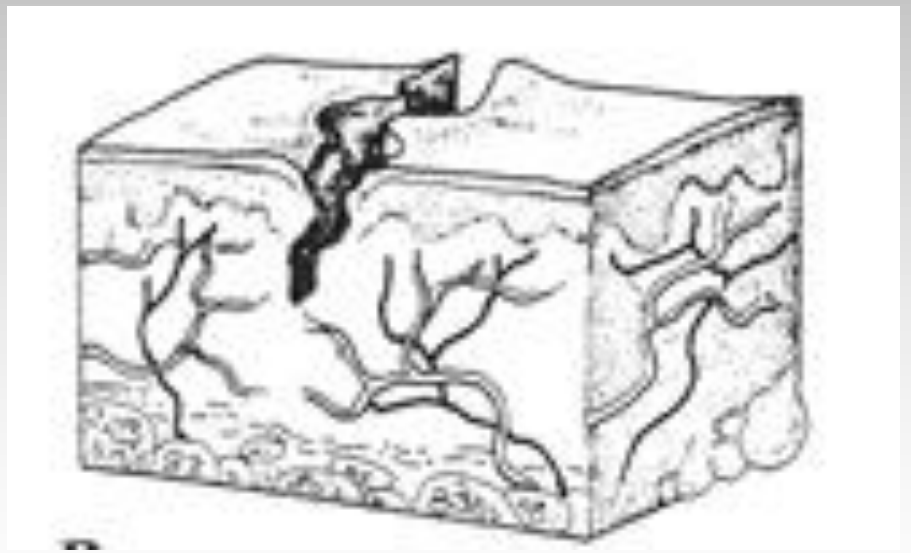
5 Types of Skin Wounds

1. Abrasions
   - Skin is scraped against a rough surface
   - Top layer of skin is worn away
   - Prone to infection – mixed with dirt and debris

Abrasions

5 Types of Skin Wounds

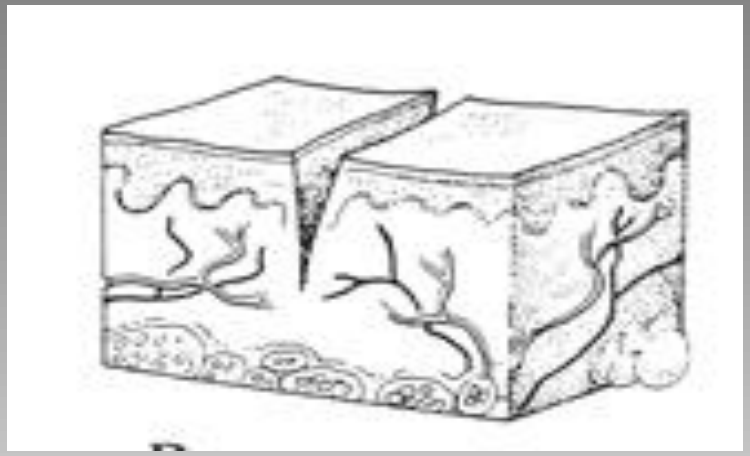
2. Lacerations
   - Sharp or pointed object tears tissues
   - Jagged or rough edge cut



Lacerations

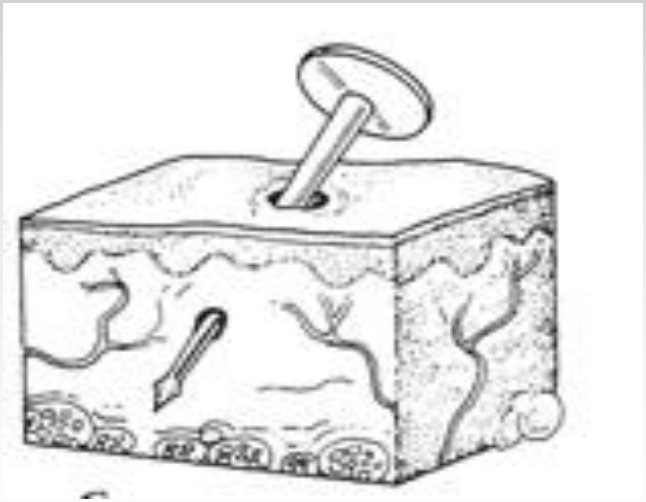
5 Types of Skin Wounds

3. Incisions
   - A cut with a smooth edge



5 Types of Skin Wounds

4. Punctures
   - An object penetrates or sticks into the skin
   - Can be fatal and cause tetanus infection
   - Nail or cleat sticking in the skin



Puncture Wound

5 Types of Skin Wounds

5. Avulsions
   - Skin is torn away causing it to hang or dangle. (Usually major bleeding with it.)
   - Sometimes tissue can be reattached

Avulsions

Immediate Care

- Decrease chance of infection
- Must be cleaned, medicated, and covered

- Clean with soap and water initially

Wound Dressings or Coverings

- Dressing should be changed daily
- If wound is draining, it must be changed often to decrease (⬇) bacteria growth
- Antibiotic ointments are recommended
- Good care will reduce inflammation

Closing a Wound

- Deep lacerations, incisions, punctures, and avulsions may require sutures, staples, stitches, or medical glue
- All deep wounds should be evaluated by a MD
- Sutures should be done as soon as possible
  - Best done within 4-6 hours of injury

Closing a Wound

- If no sutures are required, steri-strips or butterfly bandages may be used

Do you think they need to go to the doctor????

Signs of Infection

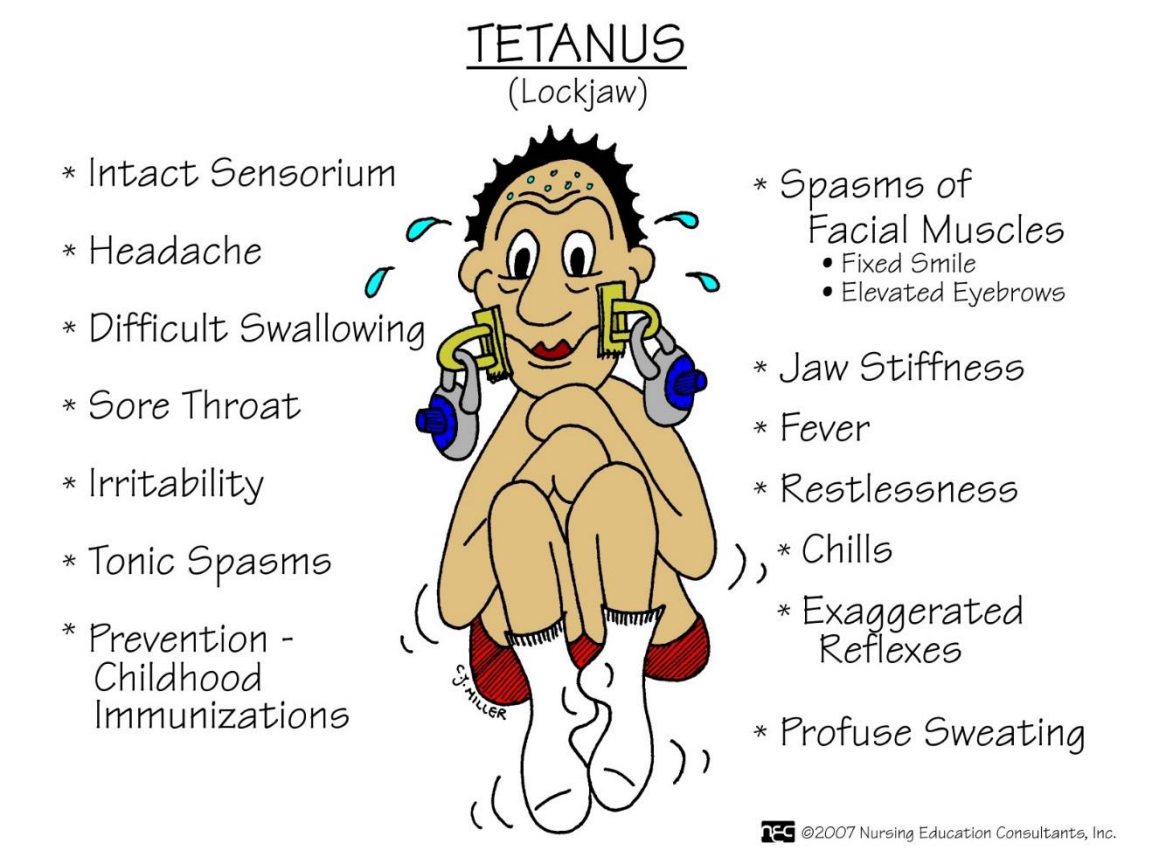
- Signs are the same as those for inflammation
- Pain, heat, redness, swelling
- Pus may form (buildup of white blood cells)
- May have a fever
- Most infections are treated by antibiotic medications

Types of Infection

- MRSA : methicillin-resistant staphylococcus aureus
  - Bacteria found on skin (type of Staph infection)
  - Resistant to antibiotics (difficult to treat)
  - Recognize early
  - Skin infections may spread and become life threatening

- Tetanus
  - Bacterial infection
  - Causes fever and convulsions (muscle spasms)
  - Often associated with puncture wounds
  - Childhood vaccine; booster shot every 10 years

Tetanus Signs and Symptoms



MRSA Infection