

Bloodborne Infectious Diseases

Dr. Kaya Sürer

Near East University Faculty of Medicine
Infectious Diseases and Clinical Microbiology

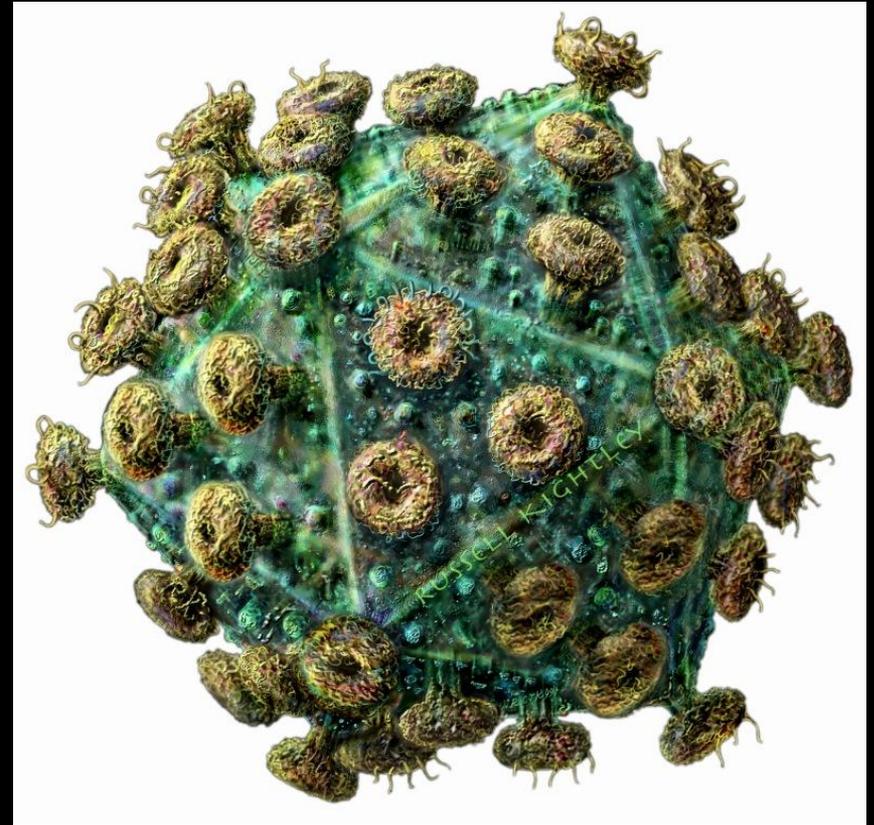
Bloodborne Pathogens



h a e m a t o l o g y

Bloodborne pathogens

- Pathogenic organisms present in human blood that can cause disease in humans.
- Examples of bloodborne diseases:
 - Human Immunodeficiency Virus (HIV)
 - Hepatitis B
 - Hepatitis C



Why do you need to know about Blood Borne Pathogens ?



Two Reasons

- For your own safety and protection
- The government mandates annual update training for anyone at risk of coming into contact with blood, or body fluids

General Considerations

- **Treat all body fluids as if they were infected.**
- **Follow Standard Precautions to ensure occupational safety**
- **Update training at least annually to maintain occupational safety**



Potentially Infectious Bodily Fluids

- Examples of Potentially infectious body fluids include
 - Blood
 - Semen
 - Spinal fluid
 - Fecal Matter
 - Any body fluid that is visibly contaminated with blood
- **Common Modes of accidental transmission**
 - Accidental puncture
 - Contact between broken skin and infected body fluids
 - Contact between mucous membranes and infected body fluids

Potentially Infectious Bodily Fluids

Body Fluids

- Semen
- Vaginal Secretions
- Cerebrospinal Fluid
- Pleural Fluid
- Peritoneal Fluid
- Pericardial Fluid
- Amniotic Fluid

Body Fluid Visible Contaminated With Blood

- Saliva from dental procedures
- Skin, tissue, cell cultures
- Saliva, vomit, and urine contaminated with blood

Bodily Fluids

- *NOT included:
 - Vomit
 - Urine
 - Feces
 - Sweat
 - Tears
 - Spit
 - *Unless visually contaminated with blood

Modes of Transmission

- BBP's can enter your system through:
 - **OPEN SORES**
 - **CUTS**
 - **ABRASIONS**
 - **ACNE**
 - **SUNBURNS or BLISTERS**
- BBP's may also be transmitted through mucous membranes of the:
 - **EYES**
 - **NOSE**
 - **MOUTH**

Modes of Transmission

- Accidental Puncture with contaminated needles, broken glass, or any other sharp object that can pierce skin
- Contact between broken or damaged skin and infected bodily fluids
- Exposure of infected bodily fluids to eyes, mouth, or nose
- Indirect transmission such as touching a contaminated object to your eyes, mouth, or nose.

Engineering Controls

- Engineering Controls: controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogen hazard from the workplace.

Occupational Exposure Departments/Areas

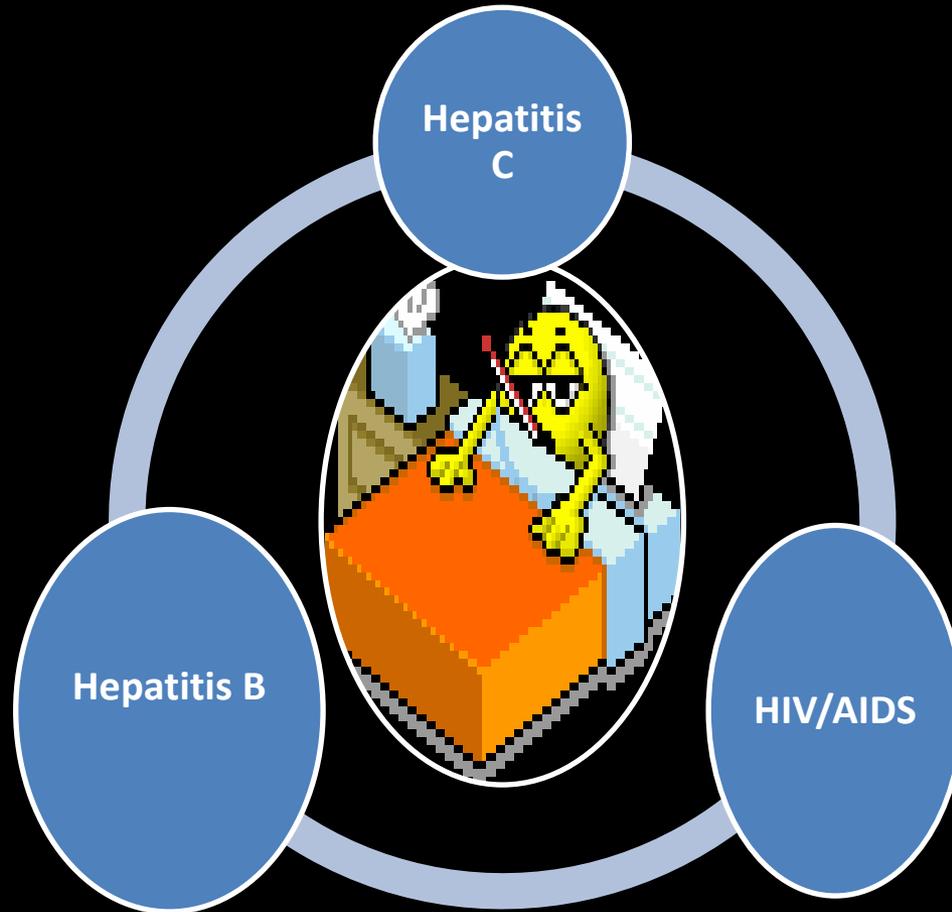
- Separation into two categories based upon risk
 - Category 1 – employees who, through the course of their delegated work activities, are reasonably expected to come into contact with blood or other potentially infectious material.
 - Category 2 – employees who may periodically or infrequently come into contact with blood or other potentially infectious material during the performance of their delegated work activities.

Universal Precautions

Prevention Strategy:

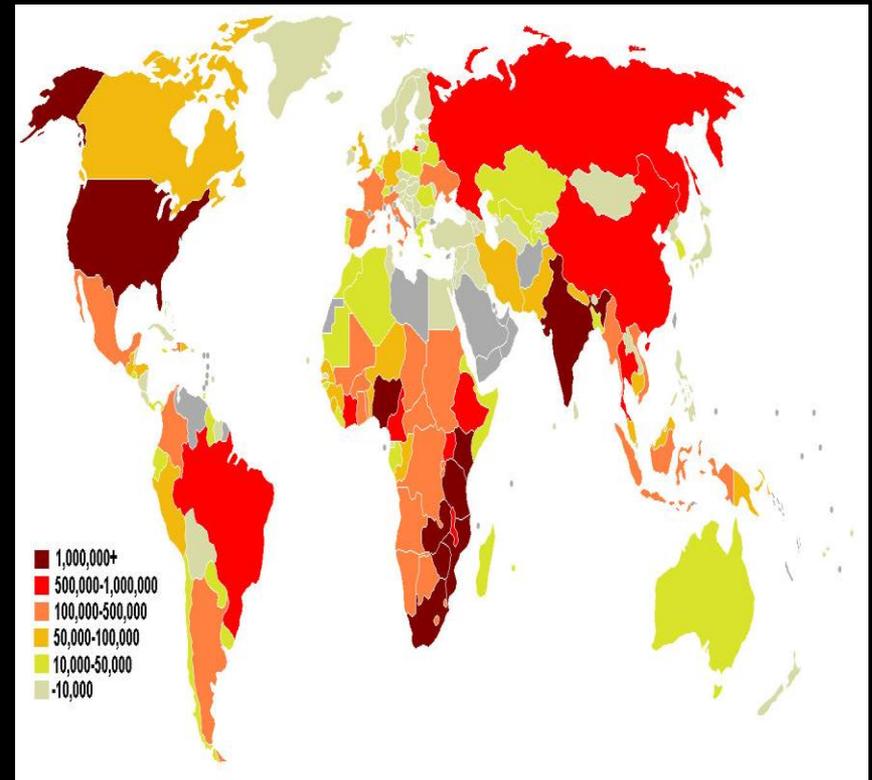
- Assume all blood and other “potentially infectious materials” are infectious

The big three



HIV

- Over 27 million AIDS-related deaths since 1980
- 42 million people are living with HIV/AIDS
- 3 million annual AIDS-related deaths
- Sub-Saharan Africa most affected
- Fast growing rates in China, India, Indonesia, Russia, Western Europe and Central Asia
- 25 million children will be orphans by 2010 because of AIDS



HIV

- 1 million people in USA have HIV/AIDS
- Approximately 11 of every 1,000 adults (ages 15 to 49) are HIV Infected 24-27% undiagnosed and unaware of their HIV infection
- Women are the fastest growing group to be infected with HIV
- **More than 15,000 infections each day.**

HIV

Outcome of infection with the virus varies:

- Some have no symptoms.
- Some have less severe symptoms than those with AIDS.
- AIDS results from destruction of the immune system which allows diseases to threaten life or health.

HIV

- HIV is the virus that leads to AIDS
- HIV depletes the immune system
- HIV does not survive well outside the body
- There is still no vaccine available
- **NOT spread by saliva, sweat, spit, tears**
- HIV is spread when infected blood, semen, vaginal fluids, or breast milk gets into the bloodstream:
 - Sexual contact
 - Sharing needles
 - Pregnancy, childbirth and breastfeeding
- Workplace exposure to blood/ body fluids

You Cannot “Catch” HIV:

- Through the air
- Through casual, everyday contact
 - (sharing bathrooms, kitchens, etc.)
- Through nonsexual social situations
- Through insects or mosquitoes
- Through urine, feces, nasal secretions, sputum, vomitus, saliva, sweat or tears from an infected person

Symptoms of HIV Infection

- May have some “flu-like” symptoms within a month after exposure
 - Fevers, chills, night sweats and rashes, sore muscles and joints, swollen lymph glands
 - 7 – 10 years later symptoms appear
 - Skin rashes, fatigue, slight weight loss, night sweats, chronic diarrhea, thrush in the mouth
- Symptoms last more than a few days and may continue for several weeks

AIDS

Having an
Opportunistic
Infection

Means

AIDS

Acquired

- develops after contact with virus

Immune

- a weakening of the immune system

Deficiency

- a group of symptoms that collectively indicate or
- characterize a disease

AIDS

- Development of opportunistic infections that do not usually infect people with a healthy immune system
- The signs and symptoms depend on the type of infection
 - Swollen lymph glands in the neck, underarm, and groin area
 - Recurrent fever
 - Persistent headaches and night sweats
 - Constant fatigue
 - Persistent diarrhea
- Without treatment, a person could die from a simple infection.
- Treatment does not cure the infection
- Treatment delays the progression of AIDS and improves the quality of life

What Personal Behaviors/Practices Put You at Risk ?

- Sexual contact with an infected person
- Sharing infected needles
- Infected woman to her child at birth
- Blood transfusion*

***The blood supply is thoroughly screened so that the risk of infection from transfusion is extremely small.**

Blood



The single most prominent source of HIV in the occupational setting



HIV

- **Protect yourself from HIV on the job by avoiding contact with blood and potentially infectious body fluids that can transmit the virus**
- **HIV cannot live in a dry environment for more than a few hours**

Workers May Be Exposed Through:

- Needle stick
 - **0.3% following needle stick contaminated with blood from a known infected person**
- Mucous membranes of the eyes, nose or mouth
- Broken or non-intact skin

Hepatitis B

- A virus that infects the liver
- HBV can survive outside the body at room temperature for over **7 Days**
- HBV is more easily spread than HIV
- 90% of adults contracting the disease recover fully and develop immunity
- Up to 10% of adults contracting the disease become carriers
- Infected blood and body fluids
- In infected persons, HBV can be found in:
 - Blood, Body tissue, Saliva, Semen
 - Vaginal secretions, Urine, Breast milk
- Puncture wounds from sharps
- Contaminated body fluids entering:
 - An opening or break in the skin
 - Splashing into mucous membranes – eyes, nose, mouth
- Unprotected sex, Intravenous drug use, Blood transfusions

Hepatitis B Vaccine

- **The vaccine is given in a three dose series**
 - Dose #1 – Initial dose
 - Dose #2 – 30 days after dose #1
 - Dose #3 – 5 months after dose #2
- **The vaccine is administered in the deltoid muscle in the upper arm**



Side Effects of the Hepatitis B Vaccine

- The vaccine is usually well tolerated.
- If side effects are experienced, contact:
 - Your medical provider
- Vaccine Adverse Event Reporting System
 - Ministry of Health
- **Do not take the vaccine if:**
 - You are allergic to yeast
 - You are pregnant or planning to become pregnant within the year
 - You are ill (cold, flu, or on medication) on your appointment date
 - You are in doubt due to other medical issues, concerns or complications (see your Physician)

What Occupational Exposures Put a Worker at Risk for HBV Infection ?

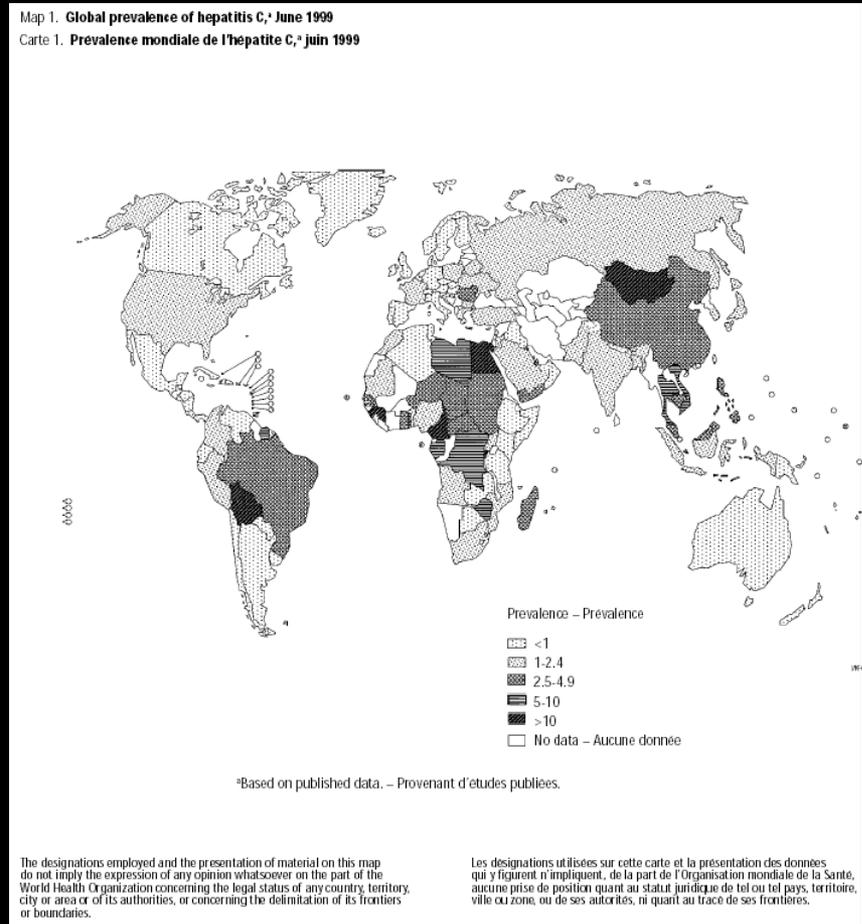
Contact with blood or potentially infectious body fluids through:

- Needle stick
- Broken or non-intact skin
- Mucous membranes of eyes, nose and mouth

Saliva injected through a human bite can also transmit HBV.

Hepatitis C

- HCV was identified in 1989
- One of the most common causes of chronic liver disease, cirrhosis and cancer
- ~ four million people affected in USA – with 180,000 new infections annually
- 8,000-10,000 HCV annual deaths in USA
- Globally ~ 170 million chronic infections

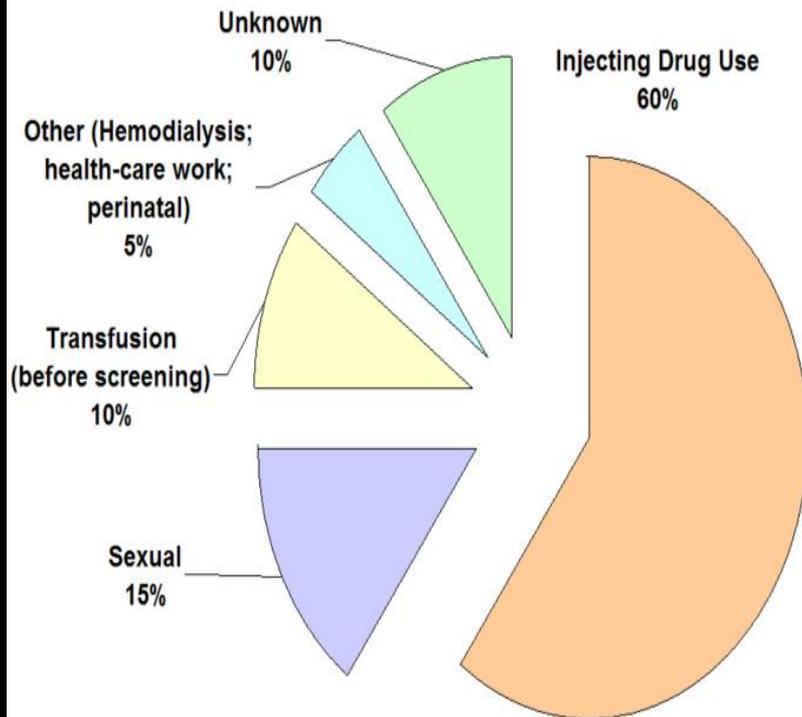


Hepatitis C

- Most commonly occurs in people who have:
 - received blood transfusions before 1992
 - shared needles
 - had tattoos
 - had body piercing
- Risk of sexual transmission appears to be small
- No evidence that it can be transmitted by casual contact, through foods, or by coughing or sneezing
- Transmission from mother to child appears to be uncommon

Hepatitis C

Sources of Infection for Persons with Hepatitis C



SYMPTOMS

- Appetite loss
- Fatigue
- Nausea
- Vomiting
- Vague stomach pain
- Muscle and joint pain
- Jaundice (yellowing of skin, yellowing of the whites of the eyes, dark urine)

How Can You Protect Yourself Against Bloodborne Infections ?

- If you perform tasks that put you in contact with blood, or other potentially infectious body fluids, you should be vaccinated against HBV.
- Practice Body Substance Isolation (BSI) if blood or other potentially infectious fluids are present.
- Have Personal Protective Equipment (PPE) readily available.

Universal Precautions

- Consider *everything* **contagious**
- Personal Protective Equipment (PPE)
 - MUST be provided *free of charge*

Contaminated Equipment

- If possible, use as much disposable equipment as possible.
- Reusable equipment should be decontaminated with a germicidal solution as soon as possible.
- Consider patient's clothing / belongings as contaminated if soiled.

Needles & Sharps Disposal

- **Needles should not be recapped or manipulated by hand.**
- **Disposable blades and other sharps should be placed in a puncture-resistant container.**
- **Puncture-resistant containers should be readily available at all times.**
- **Scissors, glass, lancets should be considered.**

Hand Washing

- Wash hands upon arrival at hospital or returning to quarters.
- Use utility or designated sink -- not the food preparation area.
- Wash thoroughly with soap & water or germicidal cleanser.
- Antiseptic hand cleaners should be available for special situations.

Cleaning & Decontaminating Spills of Blood:

- Wear gloves and clean with disposable towels. Place soiled linens in a red plastic bag.
- Wear eye & face protection if splashing is a possibility.
- Wear shoe covers if amount of blood is great.

Cleaning & Decontaminating Spills of Blood:

- Decontaminate with 10:1 solution of bleach.
- Wipe area with clean towels and let air dry.
- Waste/unused cleaning solution should *only* be poured down sanitary drains. Sinks shall be disinfected after use.
- Remove contaminated items, shoe coverings, etc. and place in a red plastic bag for proper disposal
- Remove gloves last. Wash hands *after* removing gloves.



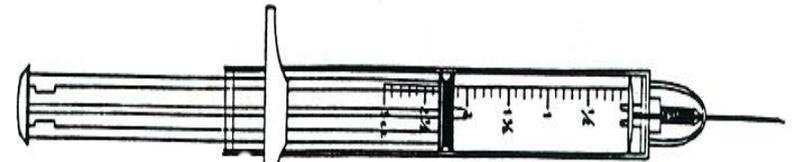
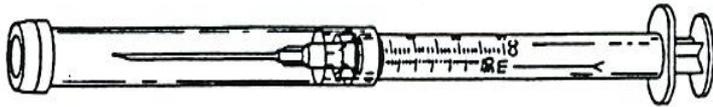
Engineering Controls

- These are methods to reduce employee exposure by isolating the hazard. Examples:
 - Sharps disposal containers
 - Self-sheathing needles
 - Safer medical devices
 - Needle less systems
 - Sharps with engineered sharps injury protections
- Contaminated needles and/or sharps must not be bent or Recapped
- Contaminated sharps must be placed in appropriate containers as soon as possible after use.
- Readily available hand washing facilities

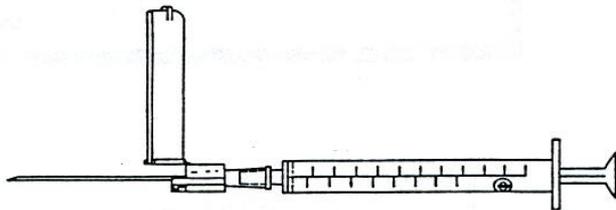
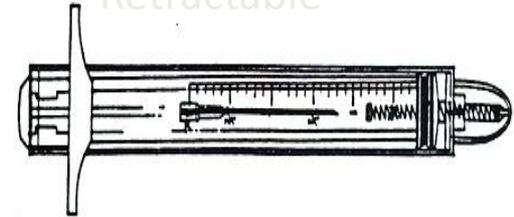
Engineering Controls



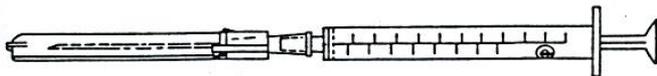
Self-Sheathing



Retractable



Attached to syringe needle



Guideline and Procedures

Pre-hospital providers should have on record their past medical history

- Tetanus
- Hepatitis B Vaccination

Guideline and Procedures

Each ambulance should have a hand washing product and surface cleaner available at all times.

- Most EPA approved germicidals OK
- 10% bleach may be substituted but some equipment could be bleach sensitive.

Guideline and Procedures

Hand Washing should be done before & after contact with patient

Gloves should be worn when there is any risk with bodily fluids

Masks, gowns and protective eyewear should be worn when there is any risk of splattering or spraying of infectious material

Guideline and Procedures

Soiled clothing – linens should be placed into leak proof bag, sealed and transported to sterilization unit

Sharps should be handled with *extreme caution*.
DO NOT RECAP, BEND or CUT USED
NEEDLES. Use appropriate puncture resistant
containers.

Guideline and Procedures

Where possible, disposable equipment should be used on all patients. Where not possible equipment should be cleaned immediately with a commercial disinfectant or bleach solution.

CPR should use appropriate protection, avoid mouth-to-mouth, clean & disinfect if not disposable.

Guideline and Procedures

Exposure to blood or body substance, should:

- Fill out “Exposure form”
- Verbal report
- Evaluation by ED within one hour
- Follow-up determined by ED in accordance with Policy
- Provider reports incident to Employer