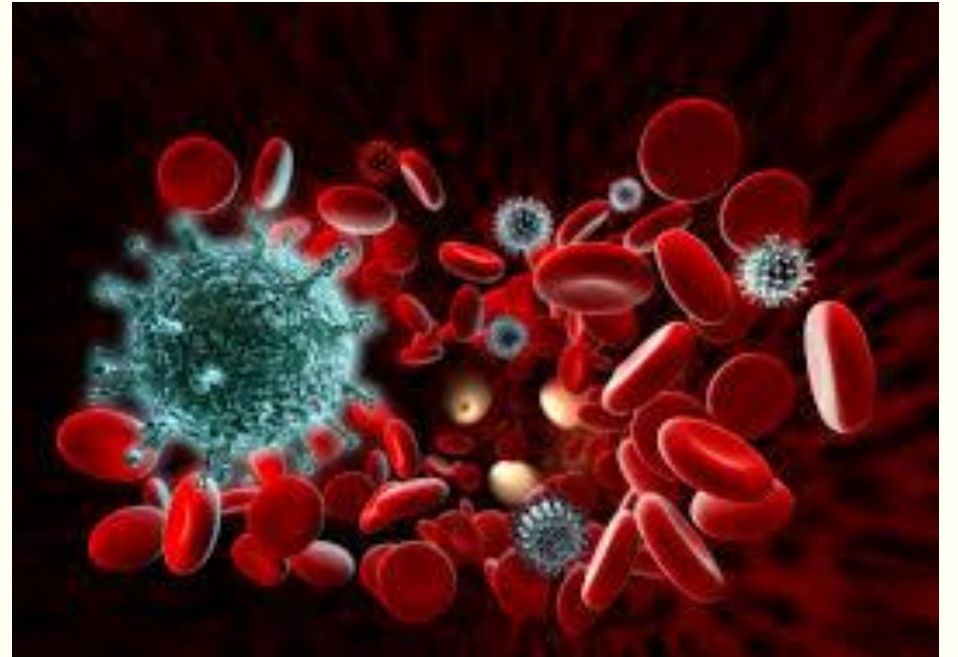


# BLOODBORNE PATHOGENS AND INFECTION CONTROL

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# Learning Objectives:

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- Professional responsibilities outlined for monitoring infection control practices and interventions for compliance and safety.
- Chain of infection
- Engineering vs. environmental controls, and work practice controls
- Identify barriers and Personal Protective Equipment (PPE) for protection from exposure to potentially infectious materials
- Review the cleaning, disinfection and sterilization methods to ensure patient safety
- Identify strategies for prevention of transmission of bloodborne pathogens and other communicable diseases through healthcare workers, including discussion of Sepsis (symptoms, risks, causes)

# Core Elements

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- Adherence to most updated and scientifically proven methods of infection control and monitor the people for whom we are responsible
- Apply the current infection control principles as appropriate for the specific work environment.
- Minimize the chance for transmission of pathogens to the patients and healthcare workers.
- Proper selection of barriers and/or PPE for preventing contact with potentially infected materials
- Creation and maintenance of a safe environment of patient care through use of infection control practices and principles for disinfection, sterilization and cleaning.
- Prevention and Management of infectious or communicable diseases in healthcare workers.

# Bloodborne Pathogens

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- Bloodborne pathogens are pathogenic microorganisms present in human blood that can lead to disease.
- BBP of primary concern:
  - Hepatitis B
  - Hepatitis A
  - HIV
- There are other BBP
- Caused by viruses or bacteria
- Circulate in blood at some phase, and are capable of being transmitted
- Most are rare in the US
  - Zika
  - Ebola
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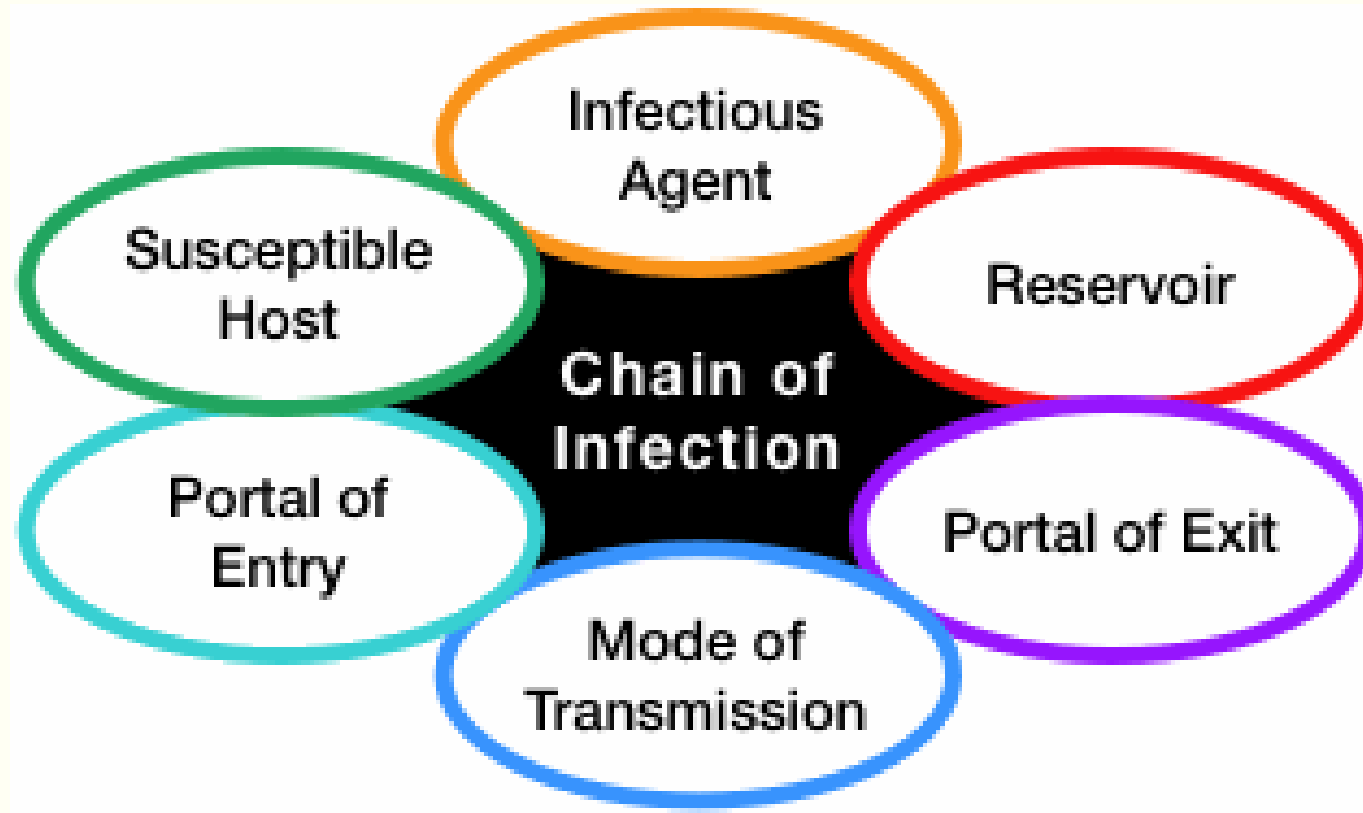
# Other Infectious Agents

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- Along with bloodborne pathogens, there are other infectious agents:
  - **Viruses:** intracellular parasites that can only reproduce in a living cell
    - They enter the body and can live for years
    - Some cause illness quickly
      - COVID-19, influenza
    - Some remain undetected
      - HIV, Hep B, Hep C
  - **Bacteria:** single celled organisms
    - Takes thousands to cause disease
    - *Staph, strep, e.coli*
  - **Fungi:** only a few cause disease in humans
    - Commonly affect skin, nails, subcutaneous tissues
    - *Candida:* yeast infections
    - *Pneumocystis carinii:* can be life threatening to those with HIV/AIDS related illness
  - **Protozoa:** single or multi-celled organisms larger than bacteria
    - Direct contact or indirect contact through an arthropod

# Chain of Infection

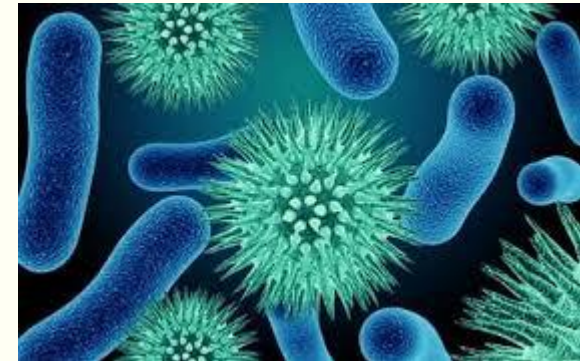
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# Infectious Agent (Pathogen)

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- Organism capable of causing disease
  - Bloodborne pathogens
  - Bacteria
  - Fungus
  - Virus
  - Protozoa



# Reservoir

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- Any person, animal, arthropod, plant, soil, or substance that can the causative agent (pathogen) can live and multiply in
  - People (respiratory droplets, feces)
  - Soil
  - Food
  - Water
  - Insects
  - Animals
  - Contaminated surfaces



# Portal of Exit

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- How the pathogen leaves the reservoir
  - Breaks in the skin
  - Blood and body fluids
  - Sneezing
  - Coughing
  - Hospital equipment

# Mode of Transmission

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- How the pathogen is spread
- **Direct Contact:** person to person
- **Indirect Contact:** Spread by an inanimate go-between
  - Patient care equipment
  - Eating utensils
  - Tissues
  - Doorknobs
  - Soiled laundry
- **Droplet:** spread through droplets created when a person coughs, sneezes, speaks, or sings
  - Travel 3 feet before falling to the ground
    - Influenza
    - Whooping cough
    - Some bacterial meningitis

# Mode of Transmission

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- **Airborne:** respiratory droplets evaporate, leaving behind the droplet nuclei that are small enough to remain suspended in air
  - TB
  - Measles
  - Chicken pox
- **Vector-Borne:** animal, insect, parasite transports pathogen from reservoir to host
  - This occurs when the vector injects saliva under the skin or deposits eggs or feces into the skin
  - Malaria, West Nile Virus (Mosquitoes)
  - Lyme Disease, Anaplasmosis, Babesiosis (Ticks)
  - Hantavirus (rodents)

# Portal of Entry

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- How a pathogen enters the host
  - Mouth
  - Nose
  - Eyes
  - Rashes
  - Cuts
  - Needle sticks
  - Wounds
  - IV sites

# Susceptible Host

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- Person lacking resistance to the pathogen
- Most susceptible include those with decreased immunity:
  - Elderly
  - Very young
  - Immunocompromised
  - People who are tired or under high stress
  - Those undergoing steroid therapy
  - People who are already ill

# Common Vehicle

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- Contaminated material, product, or substance that serves as a mode of transmission between 2 or more susceptible hosts
  - Diseases spread by common vehicles usually have a slow, steady increase in cases until the source of infection or mode of transmission is controlled
    - Common vehicles include:
      - Food
      - Medication
      - Water
      - Blood supply used in transfusions

# Controlling Exposures

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- Standard Precautions: a set of infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, bodily fluids, non-intact skin (including rashes), and mucous membranes
- Include the following elements:
  - Hand hygiene
  - Respiratory hygiene / cough etiquette
  - Sharps safety (engineering and work practice controls)
  - Safe injections practices
  - Sterile instruments and devices
  - Clean and disinfected environmental surfaces

# Hand Hygiene

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- Alcohol-based sanitizers preferable for cleaning hands in most clinical settings
  - Rub hands together, covering all surfaces, until they feel dry
  - Should take about 20 seconds
- Wash hands with soap and water when visibly soiled, before eating, and after using the restroom
  - Rub hands vigorously for 15-20 seconds, covering all surfaces of the hands and fingers





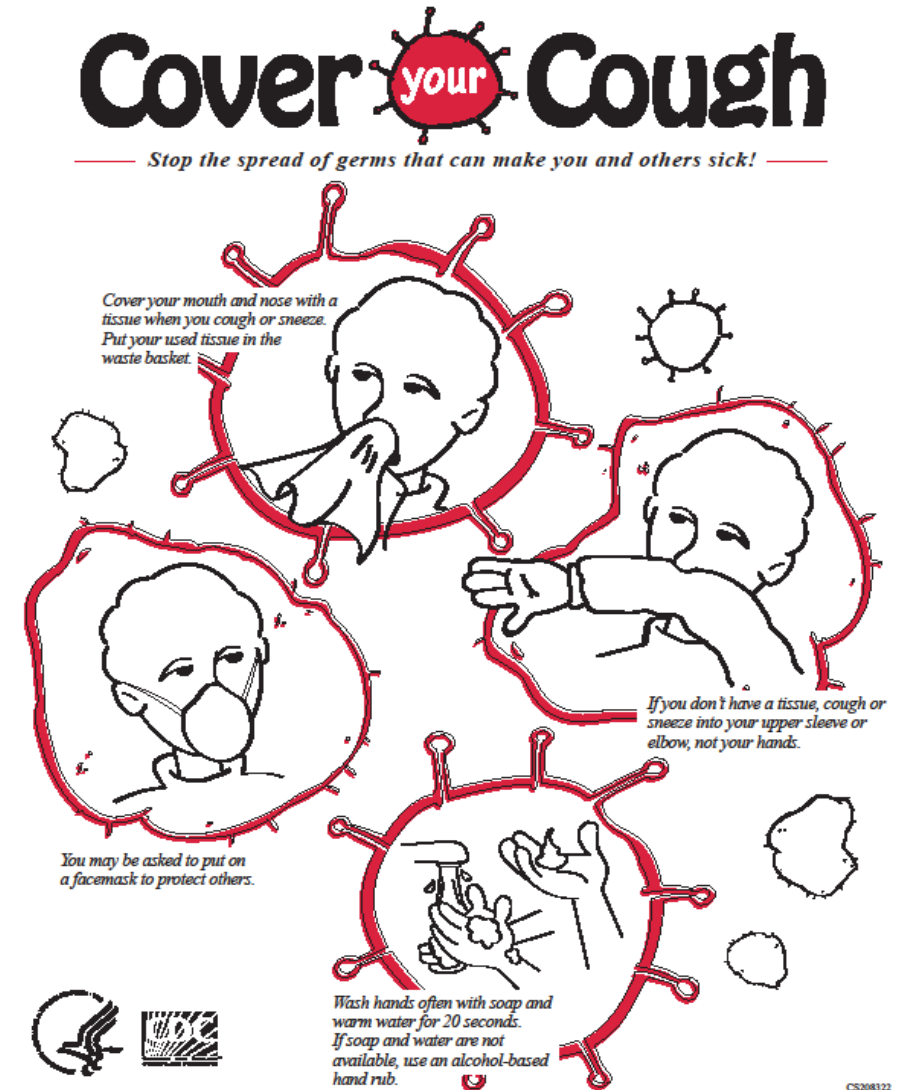
# PPE

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- Designed to protect from exposure to or contact with infectious agents
- PPE includes:
  - Gloves
  - Masks
  - Gowns
  - Protective eye covering
  - Face shields
- While using PPE, further spread of contamination can be reduced by the following:
  - Keeping hands away from the face
  - Limited the number of surfaces touched
  - Using proper hand hygiene
  - Removing PPE when leaving the work area

# Respiratory Hygiene / Cough Etiquette

- Designed to limit the transmission of pathogens spread by droplet or airborne routes
  - Cover mouth / nose while sneezing or coughing
  - Use and dispose of tissues
  - Proper hand hygiene



# Sharps Safety

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- Engineering and work-practice controls are primary methods to reduce exposures to blood and other potentially infected materials (OPIM)
- Engineering controls remove or isolate a hazard in the workplace
  - Frequently technology based
  - Self-sheathing needles, safety scalpels
  - Sharps containers
- If engineering controls are not available, work-practice controls should be used
  - Intended to reduce the risk of blood exposure by changing the way things are done
    - Not bending or breaking needles before disposing
    - Not passing unsheathed needles by hand
    - Placing all sharps into appropriate containers located close to the area being used

# Safe Injection Practices

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- Prevent transmission of infectious diseases from patient to patient, or between provider and patient
- CDC now considers safe injection practices a formal part of Standard Precautions
- “One and Done” campaign is a public health effort to eliminate unsafe medical injections
- <https://www.cdc.gov/injectionsafety/one-and-only.html>



# Environmental Infection Prevention and Control

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- Work surfaces and equipment that are likely to be contaminated with pathogens must be cleaned and disinfected
- Regulated waste is disposed of in closable, leak-proof red or biohazard labeled bags or containers
- All needles and sharps are disposed of in appropriate sharps containers
- Cleaning and disinfecting:
  - Wear PPE
  - Use the appropriate disinfectant or detergent
  - Clean and disinfect all surfaces and equipment
  - Wash hands thoroughly after cleaning
  - Properly dispose of contaminated PPE and other cleaning materials

# Controlling Exposures

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- Employer's Responsibility:
  - Assess exposure risks
  - Identify and provide appropriate PPE to employees at no cost
  - Train employees on the proper use and care of PPE
  - Maintain and replace PPE
  - Review the PPE program
  - Establish and update Exposure Control Plan

# Controlling Exposures

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- Employees' Responsibility
  - Properly wear PPE
  - Attend training on PPE use
    - Proper donning and doffing
  - Yearly infection control training
  - Care for, clean, and maintain PPE
  - Notify supervisor when repair or replacement is needed

# Sepsis

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- **Sepsis is the body's extreme response to an infection.**
- It is **life-threatening** and without timely treatment it can quickly lead to tissue damage, organ failure and death
- Happens when an already present infection **in or on** you causes a chain reaction throughout your body.
- It happens when an infection isn't stopped. **Anyone** can get it and some people are at a higher risk. They are:
  - Adults 65 and older
  - People with chronic conditions (diabetes, lung disease, cancer, kidney disease)
  - People with weakened immune systems
  - Children younger than 1 year old



# Sepsis

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Most common germs that cause infections are:

- Streptococcus
- Staphylococcus aureus
- Escherichia Coli

## **Symptoms of Sepsis**

- Confusion or disorientation
- Shortness of breath
- High heart rate
- Fever or shivering, feeling very cold
- Extreme pain or discomfort
- Clammy or sweaty skin

# 4 WAYS TO GET AHEAD OF SEPSIS

**GET AHEAD**  
of SEPSIS

DOWN THE RISKS. SPOT THE SIGNS. ACT FAST.

**Infections put you and your family at risk for a life-threatening condition called sepsis.**

Sepsis is the body's extreme response to an infection. It is life-threatening, and without timely treatment, sepsis can rapidly lead to tissue damage, organ failure, and death. Sepsis happens when an infection you already have—in your skin, lungs, urinary tract or somewhere else—triggers a chain reaction throughout your body.

Anyone can get an infection, and almost any infection can lead to sepsis.

## 1 | PREVENT INFECTIONS

Talk to your doctor or nurse about steps you can take to prevent infections.



Take good care of chronic conditions



Get recommended vaccines

## 2 | PRACTICE GOOD HYGIENE

Remember to wash your hands and keep cuts clean and covered until healed.



Handwashing



Keep cuts clean and covered until healed.

## 3 | KNOW THE SYMPTOMS

Symptoms of sepsis can include any one or a combination of these:



Confusion or disorientation



Shortness of breath



High heart rate



Fever or shivering, or feeling very cold



Extreme pain or discomfort



Clammy or sweaty skin

## 4 | ACT FAST

Get medical care IMMEDIATELY if you suspect sepsis or have an infection that's not getting better or is getting worse.

Sepsis is a medical emergency. Time matters.

To learn more about sepsis and how to prevent infections, visit [www.cdc.gov/sepsis](http://www.cdc.gov/sepsis).



## Next Steps

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- After completing this presentation, please complete a brief survey at:

[https://www.surveymonkey.com/r/2020\\_BBP\\_Infection\\_Control\\_Training](https://www.surveymonkey.com/r/2020_BBP_Infection_Control_Training)

- Your Survey Monkey Registration will serve as proof of completion for this training.