Maintaining Transmission-Based Isolation Precautions

Infection control

- Health care workers deal with many diseases and disorders
  - Some are communicable
    - caused by an organism that can be transmitted easily
- Transmission-based isolation precautions- Required for Communicable Diseases
  - Method or technique for caring for a patient with a communicable disease
- Standard precautions do not eliminate need for specific transmission-based isolation precautions

Ways Communicable Diseases Spread

1. Direct contact with patients
2. Contact with dirty Linen, equipment, and supplies
3. Contact with blood, body fluids

Transmission-Based Isolation Precautions - used to limit contact with pathogenic organisms

- Help prevent spread of disease
- Protect everyone
- type used for prevention depends on:
  - what organism is causing the disease
  - the way the organism is transmitted
  - whether the pathogen is antibiotic resistant or not
- PPE is used

Terms used in transmission-based isolation (TBI)

1. contaminated or dirty
    a. items that contain disease producing organisms
        i. can not be touched without PPE
        ii. PPE becomes contaminated after the patients care
            1. outside of PPE is considered contaminated
2. Clean
    a. items that do not contain disease producing organisms
        i. have minimal chance of spreading disease
        ii. must try to prevent contamination of these items
            1. inside of gloves and PPE are considered clean

Classifications of Precautions

- Standard
- Airborne
- Droplet
- contact

- Facilities are given a list of infection/conditions that shows the type and duration of precautions needed for each specific disease
  - follow the list suggestions to determine the transmission-base isolation and specific precautions

Standard Precautions

- Used for all patients
- patient is placed in a private room if they contaminate the environment or does not maintain appropriate hygiene

- All healthcare workers should be informed of these and follow recommendations when to where PPE

Airborne Precautions

- used for patient known to be or are suspected to be infected with pathogens transmitted through the air
  - rubella(measles),varicella (chicken pox), TB
- use standard precautions at all times
- Patients in private room with door closed
- Air from that room should be filtered before being circulated through the building
- Everyone must wear respiratory protection that will not allow outside air in
- People susceptible to measles or chickenpox should not enter the room
- Should not be move from room

Droplet Precautions

- for patient who are or thought to be infected with pathogens transmitted through large particle droplets expelled through coughing, sneezing,etc
  - meningitis, pneumonia
- Use Standard precautions at all times
- Patients placed in private room
  - if room is not available a distance of 3 feet should separate the infected patient from others
    - masks worn when within the 3 feet zone

Contact Precautions

- Used for patient who are or may have a disease that spreads rapidly through direct or indirect contact
  - Skin infections that are highly contagious
- Use standard precautions at all times
- Patient in private room
  - If room is not available they can be placed in a room with someone who has the same disease
- Gloves worn when entering room
  - Removed in the room before leaving and hands washed
- Gowns worn when contact with patient is possible
- Room and items in room need to be cleaned and disinfected daily

Protective or reverse isolation

- Method used to protect certain patients from organisms present in the environment
  - Immunocompromised patients, or patients whose body defense can not protect them
    - Malnourished patients, bone marrow transplant patients, chemo or radiation patients
  - Precautions vary depending on the patients condition
    - Use standard precautions at all times
    - Room cleaned and disinfected before patient enters
      - Frequent disinfectants happen throughout stay
    - Anyone who enters room needs to wear sterile attire
    - Air purifier may be used

Summary

- Exact procedure vary by facility
  - Some convert reg. patient rooms
  - Some use special isolation unit rooms
  - Some use disposable supplies
  - Some use nondisposable and disinfect and sterilize supplies
- Basic principles remain the same in all facilities and are directed toward preventing the spread of disease

Bioterrorism

Infection control

http://digital.films.com.ezproxy.nwtc.edu:2048/PortalViewVideo.aspx?JW=1&xtid=40572

Bioterrorism

- Use of microorganisms, or biologic agents, as weapons to infect humans, animal, and plants
- Used throughout history
- Major concern today is that biologic agents will be used not only in wars but also against unsuspecting civilians

Biologic agents

- Many microorganisms cause disease only a few are considered ideal for bioterrorism
- Characteristic for IDEAL status
  - Cheap and available
  - Spreads through the air (wind, ventilation and then inhaled) or though digestion
  - Survives sunlight, drying and heat
  - Causes death or severe disability
  - Easily transmitted
  - Difficult to prevent and has not effective treatment

Major Bioterrorism agents

- Smallpox
  - Highly contagious caused by variola virus
  - Vaccine protects from SOME forms of small pox
  - Can be fatal
  - Up to 1970's people were vaccinated
    - After many years of no reported cases vaccination stopped
  - With a threat of smallpox the government started a new vaccination program
    - For first responders. police, fire fighters, health care personal

- Anthrax
  - Caused by spores of bacterium called bacillus anthraci
    - Highly resistant to destruction, can live in soil for years
    - Grazing animals eat soil and become infected
  - Humans affected 3 ways
    - Cutaneous- exposure through the skin
    - Gastrointestinal- eating undercooked or raw infected meat
    - Pulmonary- inhaling spores
      - Cutaneous and Gastrointestinal anthrax is treated with antibiotics, some victims die
      - Inhaled anthrax cause death in 80% of victims
  - Vaccine is available
    - Military has a vaccination program

- Plague
  - Caused by bacterium called Yersinia pestis
  - Transmitted through infected flea bites
  - Enters body through breaks in the skin, or contact with tissues of infected animal
    - Rats, rock squirrels, prairie dogs, and chipmunks are most common source in U.S.
  - If not treated immediately with antibiotics it spreads to blood and lungs and cause death
  - No vaccine in U.S.

- Botulism
  - Paralytic illness caused by nerve toxin produced by bacterium called Clostridium Botulinum
  - Types
    - Caused by eating foods that contain toxin
    - Caused by its presence in a wound or injury to skin
    - Occurs in infants who eat the spores, which then grow in the intestine and release toxin
  - Rapidly cause muscle paralysis
  - If not treated with antitoxin, paralysis spreads to respiratory muscle and causes death

- Tularemia
  - Caused by bacterium called Francisella Tularensis
  - Found in animals (rats, rabbits, insects, ticks)
  - Ways Humans get disease
    - Being bitten by infected animal or insect
    - Eating contaminated food
    - Drinking contaminated water
    - Breathing in the bacteria
  - Causes death if not treated with correct antibiotic
  - FDA is reviewing a vaccine but not yet approved in U.S.

- Filoviruses
  - Cause diseases that cause severe fever
  - 2 filoviruses
    - Ebola virus
    - Marburg virus
  - Source still being researched
    - Believed to be spread by animals such as bats
  - Spread rapidly from person to person through bodily fluid contact
  - NO effective treatment 50-90% of affected individuals die

- Many others pathogenic microorganisms can be used
- Health care workers need to be aware of the threat of infection with a biologic agent

Preparing for Bioterrorism

- And attack could cause an epidemic and public health emergency
- Put a MAJOR stress on Health care facilities
- Bioterrorism Act of 2002
  - Comprehensive plan against bioterrorism to increase security in the U.S.
- Involves all levels of government

Major aspects of preparing for a bioterrorism attack

- Surveillance to detect early indication of an attack
- Notification of public when situation is detected
- Strict infection control measures
- Funding to study potential threats and create solutions
- Strict guidelines for purchasing and transporting pathogenic microorganisms
- Mass immunizations for those most at risk

Major aspects of preparing for a bioterrorism attack

- Increased protection of food and water supplies
- Training personnel to properly diagnose and treat infectious diseases
- Establish emergency management policies
- Criminal investigation of possible threats
- Improve facilities to deal with attack (more space, renovating space)
- Improving communication so info is transmitted quickly and efficiently

Summary

- All Health care workers must constantly be on alert to the threat of bioterrorism
- It is very likely an attack could occur
- Careful preparation and thorough training can limit the effect of the attack and save lives