Self-Instructional Packet (SIP)

Advanced Infection Prevention and Control

Training Modules
Learning Objectives

Module One – Introduction to Infection Prevention and Control
After completing Module One, the learner will be able to:
1. Explain the role of Infection Prevention and Control in DBHDD hospitals.
2. Define the term pathogen and explain what constitutes an infection.
3. Define the term healthcare associated infection (HAI) and explain the difference between these and community associated infections (CAIs).
4. Explain the potential impact on hospitalized individuals and hospital employees who contract healthcare associated infections.
5. Define the term colonization and explain the difference between colonization and infection.
6. Define the term asymptomatic infection and list two examples of pathogens that can result in asymptomatic infections in some individuals.
7. Define the term carrier and explain the infection risk that carriers bring to hospitalized individuals and hospital employees.
8. List five of the typical signs and symptoms of infections and describe the responsibility hospital employees have to report any of these signs.
9. Name two multi-drug resistant organisms (MDROs) that are tracked at DBHDD hospitals and explain why these pathogens pose a significant health risk to hospitalized individuals.
10. Name two bloodborne pathogens (BBPs) that are tracked at DBHDD hospitals and explain how these infections are typically transmitted.
11. Define the term true exposure and describe what action DBHDD hospital employees must take when a true exposure occurs.

Module Two – The Chain of Infection
After completing Module Two, the learner will be able to:
1. Explain the “Chain of Infection” and list at least three of the six essential elements or links in this chain.
2. Discuss at least three examples where the potential for the spread of infections exists at DBHDD hospitals and other healthcare facilities (HCFs).
3. Explain some of the actions and precautions taken by hospital and other healthcare facility (HCF) employees that can help break the chain of infection.

Module Three – Standard Precautions
After completing Module Three, the learner will be able to:
1. Explain the basic principles of Standard Precautions and when they should be used.
2. Explain the importance of hand hygiene in the prevention of healthcare associated infections (HAIs) and discuss proper hand hygiene techniques.
3. Explain the importance of Personal Protective Equipment (PPE) in the prevention of healthcare associated infections (HAIs).
4. List at least three examples of Personal Protective Equipment (PPE) used in DBHDD hospitals.
5. Define the term “Sharps” and can list at least two examples of sharps that can be encountered in DBHDD hospitals.
6. Explain why the handling and disposal of sharps are so important.
7. Discuss how sharps can be safely handled and explain the proper disposal method for sharps.
8. Explain what constitutes contaminated waste and the proper disposal method.
9. Explain the importance of adult immunizations in the prevention of healthcare associated infections (HAIs).
10. List at least two examples of adult immunizations that are available to individuals and employees in DBHDD hospitals.

Module Four – Transmission-Based Precautions
After completing Module Four, the learner will be able to:
1. Define the term “Transmission-Based Precautions” and explain the general indication for these groups of precautions.
2. Define the term “Contact Precautions” and explain when and how they are used.
3. Define the term “Droplet Precautions” and explain when and how they are used.
4. Define the term “Airborne Precautions” and explain when and how they are used.
5. Name at least one pathogen that was presented in this module for which Contact Precautions are indicated.
6. Name at least one pathogen that was presented in this module for which Droplet Precautions are indicated.
7. Name at least one pathogen that was presented in this module for which Airborne Precautions are indicated.

Module Five – Selected Pathogens
After completing Module Five, the learner will be able to:
1. Define the term “Bloodborne Pathogens” (BBPs) and name at least two examples of bloodborne pathogens presented in this module.
2. Name the infection control precautions indicated for bloodborne pathogens (BBPs).
3. Define the term “Contact Transmitted Pathogens” and name at least two contact transmitted pathogens presented in this module.
4. Name the infection control precautions indicated for contact transmitted pathogens.
5. Define the term “Droplet Transmitted Pathogens” and name at least two droplet transmitted pathogens presented in this module.
6. Name the infection control precautions indicated for droplet transmitted pathogens.
7. Define the term “Airborne Pathogens” and name at least two airborne pathogens presented in this module.
8. Name the infection control precautions indicated for airborne transmitted pathogens.
9. Explain the difference between tuberculosis (TB) infection and tuberculosis (TB) disease.
1) Introduction

A) Infection Prevention and Control (IPC) is the specialized discipline comprised of highly trained professionals that are concerned with preventing the spread of infection in hospitals and other healthcare facilities (HCFs). These professionals working in DBHDD hospitals are involved in a variety of activities, including but not limited to:

1) Developing and implementing an overall Infection Prevention and Control Plan for each hospital along with Exposure Control Plans for bloodborne pathogens (BBPs), multi-drug resistant organisms (MDROs), and Tuberculosis (TB).
2) Conducting infection surveillance, performing outbreak investigations, and managing infectious outbreaks.
3) Conducting infection prevention and control rounds, monitoring hospital employee hand hygiene practices, and assisting with infection and prevention control (IPC) training.
4) Reviewing sterilization, disinfection, and aseptic techniques performed by hospital employees.
5) Assisting with immunization programs for individuals and hospital employees.

2) Terminology

A) Microorganisms are tiny living entities that are only visible under a microscope. The infection or disease causing varieties are the pathogenic microorganisms and are often referred to as pathogens. Although pathogens may belong to any one of the five classes of microorganisms, (Bacteria, Viruses, Protozoa, Fungi, and Rickettsia), surveillance has shown that most infections that are identified in DBHDD hospitals are caused by bacteria and viruses. Perhaps the most significant of these for individuals and hospital employees are the multi-drug resistant organisms (MDROs) and the bloodborne pathogens (BBPs).

B) Infection is the invasion of pathogens into blood and other body tissues where they flourish and proliferate. Infection usually results in cellular death and tissue damage that can be localized or widespread. For example, infections such as skin boils usually cause only localized tissue damage; whereas infections such as tuberculosis (TB) usually cause widespread tissue damage and can affect entire body systems and functions. The infections that affect entire body systems and functions are usually referred to as infectious disease; however to simplify the terminology in these modules, the term infection will be used when referring to both localized infections and more widespread disease processes.

C) Healthcare Associated Infections (HAIs) are infections that are contracted in hospitals and other healthcare facilities (HCFs). For example, an infection that is contracted prior to admission, but is not clinically evident until days after admission, would not be considered a healthcare associated infection (HAI). However, an
infection that is contracted prior to discharge, but is not clinically evident until days after discharge, would be considered a healthcare associated infection (HAI).

The impact of healthcare associated infections (HAIs) can be very serious, for example;

1) A healthcare associated infection (HAI) that is contracted by a hospitalized individual can result in extended hospitalization, additional medical procedures and healthcare costs, a reduced quality of life, and in some instances death.

2) A healthcare associated infection (HAI) that is contracted by a hospital employee can result in missed work, lost wages, medical expenses, hospitalization, a reduced quality of life, and in some instances death.

For these reasons, DBHDD hospitals are committed to the control and prevention of healthcare associated infections (HAIs).

For Additional Information regarding Healthcare Associated Infections, go to; http://cdc.gov/hai/

D) **Community Associated Infections (CAIs)** are infections that are contracted in community settings rather than hospital or other healthcare facilities (HCFs).

E) **Asymptomatic Infections** are infections that exhibit little or no visible signs or symptoms; although medical testing will usually reveal the presence of infection. At first, the typical signs and symptoms of infection may be present; however, over time they can diminish and almost completely disappear. For example, hepatitis B (HBV) and hepatitis C (HCV) can become asymptomatic infections in some individuals.

F) **Colonization** is the presence of pathogens residing superficially at one or more body sites without invasion, cell death, or tissue damage. Like those with asymptomatic infections, people with colonized pathogens do not show any signs or symptoms.

While colonization is not technically an infection, colonized pathogens do present a serious infection risk. This is true because colonized pathogens can readily spread, and given the opportunity, can develop into full blown infections at any time.

Pathogens such as Methicillin Resistant Staphylococcus Aureus (MRSA), Vancomycin Resistant Enterococcus (VRE), and Clostridium difficile (C. diff) are notorious for colonizing the elderly residing in nursing homes and other long-term care facilities (LTCFs).

G) **Carrier** is the collective term used to describe; 1) persons with asymptomatic infections, and 2) persons who are colonized with pathogens.

These people present a special challenge in hospitals and other healthcare facilities (HCFs) because they can spread infections to others without anyone knowing that they “carry” pathogens.

For this reason, it is important for doctors and nurses working in DBHDD hospitals to identify these individuals as soon as possible.
3) Signs and Symptoms of Infection
   A) People with infections usually present with signs and symptoms that reflect the type of pathogen, its virulence, and the infected individual’s overall medical status. For example, a person with serious underlying medical conditions will often present with more severe signs and symptoms than an otherwise healthy person with the same infection. Given this variability, the typical signs and symptoms of infection include:
   1) Elevated temperature and chills
   2) Inflammation with redness, warmth, and pain at the infection site
   3) Cough and chest congestion
   4) Drainage from wounds, eyes, ears, and nose
   5) Fatigue, disorientation, and confusion
   6) Poor appetite, nausea, vomiting, and diarrhea

   Note: It is extremely important for DBHDD hospital employees to be familiar with these signs and symptoms and report any possible infections to their supervisors.

4) Multi-Drug Resistant Organisms (MDROs)
   A) Multi-Drug Resistant Organisms (MDROs) are pathogens that have become resistant to many of the antibiotic medications that were effective in the past. Although multi-drug resistant organisms (MDROs) are typically no more infectious or virulent than the non-resistant varieties, they are a serious threat because the antibiotic resistance can make them very difficult to treat.
   B) Multi-Drug Resistant Organisms (MDROs) are increasingly responsible for serious infections in hospitals and other healthcare facilities (HCFs) nationwide. For example, Methicillin Resistant Staphylococcus Aureus (MRSA) and Vancomycin Resistant Enterococcus (VRE) are two notable examples of MDROs that are spreading in hospitals at an alarming rate each year.
   C) Multi-Drug Resistant Organisms (MDROs) can be transmitted in the following manner;
   1) Directly to others through person to person contact
   2) Directly through contact with contaminated feces and urine
   3) Indirectly through contact with environmental objects such as counter tops, medical equipment, instruments, bandages, and other patient care items that have been contaminated by these pathogens

   Note: Additional information about these infections is covered in Module Five

5) Bloodborne Pathogens (BBPs)
   A) Bloodborne Pathogens (BBPs) are found in the blood/body fluids of infected individuals. Hepatitis B, Hepatitis C, and Acquired Immunodeficiency Syndrome (AIDS), are notable examples of serious infections caused by bloodborne pathogens.
   B) Bloodborne Pathogens (BBPs) are not transmitted through casual contact. Instead, they are spread by contact of contaminated blood/body fluids from one person with mucous membranes or areas of non-intact skin (e.g., skin lesions, surgical wounds,
cuts, scrapes, and severely chapped skin) of another person. This type of contact is referred to as a “True Exposure”.

6) Basics of a True Exposure

A) True Exposure
   1) True Exposures are serious events and require prompt medical evaluations. In some situations, prophylactic medications may be indicated to prevent the spread of certain infections caused by bloodborne pathogens (BBPs).

B) Other Potentially Infectious Material (OPIM)
   1) The term “blood/OPIM” is occasionally used in some literature rather than the term “blood/body fluids”. These two mean essentially the same and will be used interchangeably in these modules. The following table is a comprehensive list of blood/body fluids (blood/OPIM):

<table>
<thead>
<tr>
<th>All body fluids where it is difficult or impossible to differentiate between body fluids</th>
<th>Culture media or other solutions containing bloodborne pathogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amniotic fluid</td>
<td>Pericardial fluid</td>
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<tr>
<td>Any body fluid visibly contaminated with blood</td>
<td>Peritoneal fluid</td>
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<tr>
<td>Any unfixed tissue or organ (other than intact skin) from a human (living or dead)</td>
<td>Cells, tissue, or organ cultures containing bloodborne pathogens</td>
</tr>
<tr>
<td>Blood, organs, or other tissues from experimental animals infected with bloodborne pathogens</td>
<td>Saliva in dental procedures (whether or not there is visible blood present)</td>
</tr>
<tr>
<td>Pleural fluid</td>
<td>Semen</td>
</tr>
<tr>
<td>Synovial fluid</td>
<td>Vaginal secretions</td>
</tr>
<tr>
<td>Cerebral spinal fluid</td>
<td>Blood</td>
</tr>
</tbody>
</table>

C) The following are examples of true exposures:
   1) A puncture of the skin with a used needle, lancet, or other potentially contaminated sharp item
   2) A splash or spray or other transmission of blood/body fluids (blood/OPIM) into the eyes, mouth, or nose
   3) Transfer of blood/body fluids (blood/OPIM) into an open wound, an oozing lesion, dermatitis, rash, or other area where there is significant breakdown of the skin integrity
   4) Touching contaminated blood/body fluids (blood/OPIM) or items contaminated by blood/body fluids (blood/OPIM), then touching areas of non-intact skin or mucous membranes, before performing proper hand hygiene
   5) A human bite that penetrates the skin
   6) Sexual contact (vaginal, rectal, or oral)

7) True Exposure Protocol

A) DBHDD hospital employees are required to notify their supervisors immediately when a true exposure (or possible true exposure) has occurred.
B) A strict protocol (unique to the specific hospital) must be followed since only a limited window of opportunity is available if prophylactic medication is indicated.

Note: Employees working in DBHDD hospitals receive classroom instruction regarding the specific True Exposure Protocol for the hospital in which they work.
Module One – Competency Exam

<table>
<thead>
<tr>
<th></th>
<th>Infection Prevention &amp; Control</th>
<th></th>
<th>Infection</th>
<th></th>
<th>Healthcare Associated Infection (HAI)</th>
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<tr>
<td>A</td>
<td>D</td>
<td>B</td>
<td>E</td>
<td>C</td>
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<tr>
<td></td>
<td>Asymptomatic Infection</td>
<td></td>
<td>Carriers</td>
<td></td>
<td>Multi-Drug Resistant Organism (MDRO)</td>
</tr>
<tr>
<td>G</td>
<td>True Exposure</td>
<td>H</td>
<td>Colonization</td>
<td></td>
<td>Bloodborne Pathogens (BBPs)</td>
</tr>
</tbody>
</table>

Select the best match from the choices above (each choice is used only once)

1. Invasion of body tissues by pathogens where they are able to flourish and multiply
2. Contracted while receiving care in a hospital or other healthcare facility (HCF)
3. Pathogens living at one or more sites w/o invasion, cell death, or tissue damage
4. Pathogen that is no longer sensitive to antibiotics that were effective in the past
5. HIV, HBV, and HCV
6. An infection with little or no outward clinical signs or symptoms
7. Concerned with preventing the spread of infection within healthcare facilities
8. The blood/body fluids (blood/OPIM) from one person contacts a mucous membrane or skin laceration of another person
9. Persons that are colonized and those that have asymptomatic infections

True or False

10. Most healthcare associated infections (HAIs) at DBHDD hospital facilities are caused by bacteria and viruses
11. MRSA and VRE are examples of multi-drug resistant organisms (MDROs)
12. A person contracts an infection while in a hospital and becomes ill after discharge. This would not be considered a healthcare associated infection (HAI).

Multiple Choice (select the best answer)

13. Which of the following is not a typical sign or symptom of infection?
   a. Elevated temperature and chills
   b. Nausea, vomiting, and diarrhea
   c. Inflammation with redness, warmth, and pain at the affected site
   d. Hyperactivity
   e. Drainage from the affected site
14. Which of the following is not a true exposure?
   a. Contaminated needle stick
   b. Sexual contact
   c. Human bite that breaks the skin
   d. Contaminated blood contacting intact skin
15. Infection Prevention and Control is involved with:
   a. Prevention
   b. Surveillance
   c. Outbreak investigation
   d. Outbreak management
   e. None of the above
   f. a, b, c, and d
16. What is the potential impact for hospitalized individuals contracting a healthcare associated infection?
   a. Extended hospitalization
   b. Additional medical procedures
   c. Increased healthcare costs
   d. Decreased quality of life
   e. Death
   f. All of the above
MODULE TWO – The Chain of Infection

1) Introduction
   A) The Chain of Infection refers to the process by which infections spread and proliferate. They are able to do so as long as six essential elements (or links) are present. Figure 1 illustrates these links and the cyclic nature of this process.

![Figure 1: Infection Cycle]

2) The Links in the Chain of Infection
   A) The following is a description of the six essential links that are necessary for infections to spread and proliferate:
      1) An Infectious Agent or pathogen.
      2) A Reservoir or location where pathogens can inhabit, such as people, environmental surfaces, medical equipment, food, and water.
      3) A Portal of Exit or outlet through which pathogens can exit the reservoir; such as through blood/ body fluids, respiratory droplets/ particles, secretions, and excretions.
      4) A Mode of Transmission or means by which pathogens can travel to a potential host; such as by direct and indirect contact, respiratory droplets, and airborne particles.
      5) A Portal of Entry through which pathogens can enter the blood stream or other tissues of a potential host; such as broken skin, mucous membranes, the respiratory tract, and the gastrointestinal (GI) tract.
      6) A Susceptible Host or person who is lacking the resistance to defeat the invading pathogens; such as those with suppressed immune systems, those...
recovering from surgery or major burn injuries, and those with chronic illnesses such as diabetes.

3) Potential for Healthcare Associated Infections (HAIs)

A) The risk of contracting healthcare associated infections (HAIs) is ever present in many hospitals and other healthcare facilities (HCFs). Unfortunately this is true because the elements or links that are necessary for infections to spread and proliferate are often present. For example; many hospitals and other healthcare facilities (HCFs);
1) Harbor indigenous pathogens that can serve as the “Infectious Agent”.
2) Serve people who are colonized by pathogens or suffer from chronic infections that can serve as the “Reservoir”.
3) Provide intimate and at times invasive procedures that can serve as the “Portal of Exit” if proper technique is not followed.
4) Have physical limitations that can serve as the “Mode of Transmission”. For example:
   (a) People served are often in close proximity, sometimes having two or more individuals sharing the same room and breathing the same potentially contaminated air.
   (b) People served often share restrooms and bathing areas that can spread infections if not properly cleaned and disinfected.
   (c) People served often share a laundry service that can spread infections if contaminated items are not properly handled and sanitized.
5) Serve people having compromised skin integrity that can serve as the “Portal of Entry”. For example:
   (a) Persons with surgical wounds
   (b) Persons with major burn injuries
   (c) Persons with areas of non-intact skin such as those with:
      (i) Decubitus ulcers
      (ii) Indwelling catheters
      (iii) Enteral feeding tubes
      (iv) Tracheotomies
6) Serve people who have compromised resistance to infectious agents that can serve as the Susceptible Host. For example:
   (a) The elderly
   (b) Persons with chronic illness such as diabetes, liver disease, and chronic cardiopulmonary disease
   (c) Persons with suppressed immune systems such as those caused by Acquired Immunodeficiency Syndrome (AIDS), some malignant diseases, radiation treatments, and certain drug therapies.

4) Breaking the Chain of Infection

A) Breaking the chain of infection requires a concerted team effort. Figure 2 illustrates a strategy based on science and epidemiology that can help prevent healthcare associated infections (HAIs) when applied correctly and consistently. Additional
information regarding this strategy, including Standard and Transmission-Based Precautions, is covered in later modules.

**Susceptible Host**  
- Immunosuppression  
- Diabetes – Recent surgery  
- Cardiopathy – Major Burns

**Infectious Agent**  
- Bacteria - Viruses  
- Fungi – Protozoa  
- Rickettsia

**Reservoir**  
- People – Equipment  
- Food - Water

**Portal of Entry**  
- Mucous membrane  
- GI tract - Broken skin  
- Respiratory tract

**Portal of Exit**  
- Excretions - Secretions  
- Droplets - Particles  
- Body Fluids

**Mode of Transmission**  
- Contact – Airborne  
- Droplet - Bloodborne

**Infection Cycle**

**Figure 2**

- Rapid ID and elimination of pathogens  
- Employee Health/ Screen  
- Environmental sanitation  
- Sterilization/ Disinfection

- The use of proper:  
  - Attire (PPE)  
  - Hand hygiene  
  - Cough/ Sneeze Etiquette  
  - Sharps and Waste Management

- Recognize high risk patients  
- Treatment of underlying illness  
- HBV vaccine and other adult immunizations

- Aseptic Technique including:  
  - Catheter care  
  - Wound care  
  - Trach care

- Aseptic Technique including:  
  - Catheter care  
  - Wound care  
  - Trach care

- The use of proper:  
  - Attire (PPE)  
  - Hand hygiene  
  - Cough/ Sneeze Etiquette  
  - Sharps and Waste Management

- Standard Precautions  
- Transmission-Based Precautions  
- Proper sterilization/ disinfection  
- Proper hand hygiene
Module Two – Competency Exam

<table>
<thead>
<tr>
<th></th>
<th>Mode of Transmission</th>
<th></th>
<th>Reservoir</th>
<th></th>
<th>Portal of Exit</th>
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<tbody>
<tr>
<td>A</td>
<td></td>
<td>B</td>
<td></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Portal of Entry</td>
<td>E</td>
<td>Susceptible Host</td>
<td>F</td>
<td>Infectious Agent</td>
</tr>
</tbody>
</table>

Select the best match from the choices above (each choice is used only once)

___ 1. Outlet through which pathogens can leave a reservoir
___ 2. A place where pathogens can inhabit
___ 3. A person who is lacking the resistance to defeat invading pathogens
___ 4. Pathogenic microorganisms
___ 5. Means by which pathogens can travel to a potential host
___ 6. Inlet through which pathogens can enter the tissues of a potential host

True or False

___ 7. Fortunately for infection control professionals, the necessary elements for the spread of infection are not readily available in most hospitals and other healthcare facilities (HCFs)
___ 8. Standard Precautions and Transmission-Based Precautions are intended to help stop the spread of infections in hospitals and other healthcare facilities (HCFs)
___ 9. The elderly who are in poor health are at increased risk of contracting an infection
___ 10. A recent surgery can make a person more resistant to infection

Multiple Choice (select the best answer)

___ 11. Which of the following conditions does not place an individual at increased risk of contracting an infection?
   a. Decubitus ulcers
   b. Indwelling catheters
   c. Type AB blood (the universal infection fighter)
   d. Feeding tubes
   e. Surgical wounds

___ 12. Which of the following medical conditions and/or treatments can compromise a person’s immune system, making them more at risk of contracting an infection?
   a. AIDS
   b. Radiation treatments
   c. Chemotherapy
   d. a and b
   e. a, b, and c

___ 13. Which of the following is not a necessary element or link in the Chain of Infection?
   a. Portal of Entry
   b. Susceptible Host
   c. Cellar door
   d. Reservoir
   e. Mode of Transmission
MODULE THREE – Standard Precautions

1) Introduction
   A) Standard Precautions are a set of infection control practices used to prevent the spread of infections caused by the transfer of blood/body fluids (blood/OPIM) of one person to a mucous membrane or area of non-intact skin of another person. Standard Precautions are based on the principle that all blood/body fluids (blood/OPIM) are contaminated and should be handled as if they were infectious.
   B) Employees working in DBHDD hospitals are required to use standard precautions with all hospitalized individuals, (regardless of diagnosis or risk of infection), when performing tasks where contact with blood/body fluids (blood/OPIM) may occur; including, invasive procedures, physical examinations, suctioning, wound care, catheter care, and perineal care.
   C) With standard precautions, hospital employees are expected to:
      1) Practice proper hand hygiene
      2) Use proper Personal Protective Equipment (PPE)
      3) Practice safe handling and disposal of contaminated sharp items (sharps)
      4) Properly dispose of contaminated waste
      5) Comply with adult immunization recommendations

2) Hand Hygiene
   A) Proper hand hygiene is considered by many to be the number one defense against the spread of infection. Acceptable hand hygiene methods include the use of plain (or anti-bacterial) soap and warm water for at least 15 seconds, as well as the use of alcohol based waterless hand sanitizers (alcohol based hand rubs) until the material evaporates.
   B) In general, when hands are not visibly soiled, alcohol based hand rubs are the preferred method of hand hygiene when providing health care to individuals. However, alcohol based hand rubs are not recommended where spore forming bacteria such as Clostridium difficile (C diff) are present, and therefore hand washing with soap and water is the preferred method to decontaminate hands in these situations.
   C) Hand hygiene is performed
      1) Before and after contact with an individual
      2) Immediately after;
         (a) Touching blood/body fluids (blood/OPIM)
         (b) Touching contaminated items (even when gloves are worn during contact)
         (c) Removing gloves
         (d) Touching objects and medical equipment in the immediate vicinity of care for an individual
      3) When moving from contaminated body sites to clean body sites during healthcare procedures
      4) Before eating
      5) After using the restroom
6) After coughing or sneezing (as part of proper respiratory hygiene).

For additional information regarding proper hand hygiene in healthcare settings, go to; http://www.cdc.gov/handhygiene

3) **Personal Protective Equipment (PPE)**

A) Personal Protective Equipment (PPE) is worn by hospital employees to act as barriers between potentially contaminated body substances and the employee’s skin and mucous membranes. Items of personal protective equipment (PPE) that are commonly used in DBHDD hospitals, and their indications are listed below:

1) Gloves - Use gloves when touching mucous membranes, areas of non-intact skin, and blood/body fluids (blood/OPIM). Also use when touching environmental items that may be contaminated by these, including examination room surfaces, medical equipment, and soiled linen.

2) Masks - Wear a mask or face shield to protect mucous membranes of the nose and mouth during patient care activities and other procedures that are likely to generate splashes or sprays of blood/body fluids (blood/OPIM).

3) Protective eyewear or face shields - Wear eye protection or a face shield to protect mucous membranes of the eyes during patient care activities and other procedures that are likely to generate splashes or sprays of blood/body fluids (blood/OPIM).

4) Gowns - Wear a gown to protect skin and prevent soiling of clothing during patient care activities and other procedures that are likely to generate splashes or sprays of blood/body fluids (blood/OPIM).

5) Disposable resuscitation equipment - Use disposable (one-time use) mouthpieces, resuscitation bags, or other ventilation devices instead of mouth to mouth resuscitation techniques during CPR and Rescue Breathing.

B) Remove PPE immediately after use and wash hands. It is important to remove PPE in the proper order to prevent contamination of skin or clothing.

1) If PPE or other disposable items are saturated with blood/body fluids (blood/OPIM) such that fluid may be poured, squeezed, or dripped from the item, discard the PPE into a contaminated waste receptacle. PPE that is not saturated may be placed directly in routine trash.

For additional information regarding proper donning & removal of PPE, go to; http://www.cdc.gov/HAI/pdfs/ppe/ppeposter148.pdf

4) **Needle Stick and other Sharps Injury Prevention**

A) DBHDD hospitals are required to see that employees use sharps with engineered safety devices as they become commercially available (e.g., needleless IV systems, retractable scalpel blades, retractable lancets, and self-sheathing syringes).

B) Used needles, lancets, razors, and other potentially contaminated sharps are placed in a sharps container immediately after use. Needles are not to be recapped, bent, cut,
removed from the syringe or tube holder, or otherwise manipulated. Note: There is an exception in dentistry that will not be discussed in this module.

5) **Cleaning and Disinfection**
   A) Individual care areas, common waiting areas, and other areas where potentially contaminated surfaces or objects are frequently touched by individuals and hospital employees (e.g., doorknobs, sinks, toilets, other surfaces, etc.) are cleaned routinely with the disinfectant that has been approved by the hospital for this purpose.
   B) Housekeeping surfaces such as floors and walls do not need to be disinfected unless visibly soiled with blood/body fluids (blood/OPIM). They may be routinely cleaned with a detergent only or a detergent/disinfectant product.
   C) Most disinfectants are not effective in the presence of dirt and organic matter, therefore cleaning must occur prior to disinfection.
   D) Some pathogens such as norovirus and Clostridium difficile (C. diff) are not inactivated by many of the commercial disinfectants that are routinely used. In situations where contamination with these pathogens is suspected, and the disinfectant does not inactivate these pathogens (as stated on the product label), a bleach solution (1:10) is recommended for disinfecting contaminated surfaces and items.
   E) Some items used in the care of the individual may be damaged or destroyed by certain disinfectants. Maintain these items isolated in a closed plastic bag and consult with the manufacturer of the item before applying disinfectants.

6) **Respiratory Hygiene (Cough and Sneeze Etiquette)**
   A) Proper respiratory hygiene helps to avoid the spread of respiratory secretions that can transmit respiratory disease. Although not intended to prevent the spread of bloodborne pathogens, respiratory hygiene is discussed in this module as good hygiene practice.
   B) Elements of respiratory hygiene and cough etiquette include:
      1) Covering the nose/mouth with a tissue when coughing or sneezing or using the crook or bend of the elbow to contain respiratory droplets
      2) Using tissues to contain respiratory secretions and discarding into the nearest waste receptacle after use. (In general, tissues need not be discarded into contaminated waste receptacles)
      3) Performing hand hygiene immediately after contact with respiratory secretions and contaminated objects/materials
      4) Considering having hospitalized individuals with signs and symptoms of respiratory illness wear a mask when in common areas
      5) Ensuring that hospital employees with signs and symptoms of respiratory illness either do not come to work or consider having them wear a mask when providing care to individuals and in all common areas
      6) Ensuring that tissues, waste receptacles, and alcohol based hand sanitizers are readily available for use
7) Placing cough etiquette signs in prominent locations including the entrance to buildings

For additional information regarding proper respiratory hygiene, go to;
http://www.cdc.gov/flu/protect/covercough.htm

7) Contaminated Waste Disposal
A) Contaminated waste can spread infection if not handled properly.
B) Used sharp items are disposed of in sharps containers that are lockable, puncture resistant, leak-proof, closable, and labeled with the biohazard symbol and are red in color. Sharps containers are replaced when filled up to the indicated “full” line and/or when they are 2/3rds full.
C) Other used disposable items (items that are saturated with blood/body fluids [blood/OPIM] such that fluid can be poured or squeezed from the item or dried fluid is flaking from the item) are discarded into contaminated waste receptacles that are closable, puncture resistant, and leak-proof. These receptacles must be properly labeled with a biohazard symbol and/or are red in color. Such items may include used bandages, personal protective equipment (PPE) and other disposable supplies.

8) Safe Injection Practices
A) Outbreaks of hepatitis B and hepatitis C infections in US ambulatory care facilities have prompted the need to re-emphasize safe injection practices. All DBHDD hospital employees who give injections must strictly adhere to the Centers for Disease Control and Prevention (CDC) recommendations for safe injections which include:
1) Use of a new needle and syringe every time a medication vial or IV bag is accessed
2) Use of a new needle and syringe with each injection of an individual
3) Use of medication vials for one individual only, whenever possible

For additional information regarding safe injection practices, go to;
http://www.cdc.gov/injectionsafety

9) Adult Immunizations
A) Hospitalized individuals and hospital employees are encouraged to receive immunizations that are recommended based on age, health, and other risk factors. Immunizations that may be helpful in reducing the number of susceptible hosts include:
1) Influenza
2) Pneumococcal Pneumonia
3) Hepatitis B
4) Zoster
5) Tetanus, Diphtheria, Pertussis (Td/ Tdap)
6) Varicella Zoster
7) MMR (measles, mumps, rubella)
For additional information regarding adult immunizations, go to; 
http://www.vaccineinformation.org/

10) Hospital Specific Training

A) DBHDD hospitals follow Bloodborne Pathogen (BBP) Exposure Control Plans that are reviewed and updated at least annually. These are unique to each hospital and employees receive classroom instruction regarding the specific Bloodborne Pathogen Exposure Control Plan for the hospital in which they work. Included in this instruction is:
   1) A discussion of Engineering and Work Practice Controls
   2) The Hepatitis B immunization program for employees
   3) The True Exposure Protocol

B) Time is set aside during the classroom instruction for employee questions covering any of the covered topics including, but not limited to;
   1) The Bloodborne Pathogen Exposure Control Plan
   2) Engineering and Work Practice Controls
   3) The Hepatitis B immunization program for employees
   4) The True Exposure Protocol
   5) Standard Precautions
   6) Adult Immunizations
Module Three – Competency Exam

Select the best match from the choices above (each choice is used only once)

1. Clothing and other devices worn to provide a barrier between the hospital employee and blood/OPIM
2. Encouraged for hospitalized individuals and hospital employees when recommended based on immune status, age, health, other risk factors
3. Worn to protect the mucus membranes of the nose and mouth from blood/OPIM
4. Used during CPR as an alternative to mouth to mouth technique
5. Puncture resistant plastic container designed for disposal of items used during healthcare procedures that are sharp and capable of causing a contaminating injury
6. Precautions used by DBHDD hospital employees to combat the risk of healthcare associated infection (HAIs) transmitted by bloodborne pathogens (BBPs)

True or False

7. Standard Precautions is based on the principle that all body substances may be contaminated and should be handled as if they were infectious
8. Standard Precautions should be used with all hospitalized individuals, regardless of diagnosis or risk of infection, when contact with body substances may occur
9. Proper hand hygiene is the number one defense against the spread of infection
10. Any waste receptacle can be used for contaminated waste disposal as long as everyone knows what it is being used for
11. Nurses may recap syringe needles as long as they are extra careful not to get stuck
12. Sharps containers should be replaced when they are ½ full
13. It is not necessary to wash your hands or use waterless hand sanitizer after removing gloves unless a glove has a visible hole or tear
14. Proper handwashing requires a person to thoroughly scrub all surfaces of both hands and wrists for at least 15 seconds

Multiple Choice (select the best answer)

15. Which of the following items is not considered personal protective equipment for healthcare workers?
   a. Masks  c. Disposable resuscitation equipment
   b. Gloves  d. Reflective safety vests

16. Which of the following items need not be disposed of in a Sharps container?
   a. Used syringe needles  c. Used bandages
   b. Used razor blades  d. Used scalpel blades

17. Under Standard Precautions, which of the following are considered potentially infectious body substances?
   a. All body fluids including blood & blood products  d. All of the above
   b. All mucous membranes and intact skin  e. a and c
   c. All body excretions and secretions (except sweat)
MODULE FOUR – Transmission-Based Precautions

1) Introduction
   A) Transmission-Based Precautions are a set of infection control practices used to prevent the spread of infections that can be acquired by routes that are not blocked by Standard Precautions alone. Pathogens in this category include, but are not limited to;
   1) Tuberculosis (TB)
   2) Seasonal influenza
   3) Common Cold
   4) Multi-Drug Resistant Organisms (MDROs) such as;
      (a) Methicillin resistant staph aureus (MRSA)
      (b) Vancomycin resistant Enterococcus (VRE)
      (c) Clostridium difficile (C.diff)
   B) Transmission-Based Precautions are indicated anytime a hospitalized individual is diagnosed with (or suspected of having) one of these infections; and should be used in addition to Standard Precautions. They include;
   1) Contact Precautions
   2) Droplet Precautions
   3) Airborne Precautions

2) Contact Precautions
   A) Contact Precautions are indicated when caring for individuals known, or suspected of having, infections spread by direct or indirect contact.
   1) Examples of pathogens causing infections transmitted in this manner include:
      (a) C. diff
      (b) MRSA
      (c) VRE
   B) Protocol for Contact Precautions:
      1) Place precautionary signage or other hospital defined mechanisms to notify persons entering the room/area of the precautions that are in-place
      2) Perform hand hygiene upon entering the room and put on gloves
      3) Wear gowns and face shields if:
         (a) Clothing may contact the individual or potentially contaminated environmental surfaces
         (b) The individual is incontinent, has diarrhea, an ileostomy, colostomy or wound drainage
         (c) Spray, splash, or spatter of blood/body fluids are anticipated
      4) Remove all PPE and perform hand hygiene before leaving the room (Note: Once prepared to leave, avoid touching the individual or any items or surfaces that may be contaminated)
      5) Clean and disinfect all re-usable items taken into the individual’s room before removing them from the room. Discard disposable items at the point of use.
3) **Droplet Precautions**

A) Droplet Precautions are indicated when caring for individuals with known or suspected infections spread by contaminated droplets such as those that can be generated when an infected individual coughs, sneezes, or laughs.

1) Examples of pathogens causing infections transmitted in this manner include:
   a) Seasonal Influenza
   b) Non-Aspiration Pneumonia
   c) Common Cold
   d) Pertussis
   e) Meningococcal Disease

B) Protocol for Droplet Precautions:

1) Place precautionary signage or other hospital defined mechanisms to notify persons entering the room/area of the precautions that are in-place.

2) If a private room is not available, an individual infected with the same organism (and no other organism), may share the room (cohort).

3) If a private room or cohort is not available, all other individuals must maintain a distance of at least 3 feet (6 feet in the case of small pox) from the infected individual(s).

4) Masks must be worn when entering the room and when approaching within 3 feet (6 feet in the case of small pox) of infected individuals.

5) Transport must be restricted unless absolutely necessary, and when necessary, respiratory protection such as a face mask must be placed on the individual.

4) **Airborne Precautions**

A) Airborne Precautions are indicated when caring for individuals known or suspected of having infections carried by contaminated airborne particles.

1) Examples of pathogens causing infections transmitted in this manner include:
   a) Tuberculosis
   b) Measles
   c) Chickenpox
   d) Severe Acute Respiratory Syndrome (SARS)

B) Protocol for Airborne Precautions:

1) Airborne Precautions require the use of negative pressure rooms. DBHDD hospitals do not have these rooms; therefore, any individual with known or suspected infections spread by contaminated airborne particles must be transported immediately to a facility that can provide this level of isolation.

2) Special notification and respiratory protection must be provided when transporting one of these individuals including placement of a standard surgical mask on the individual and use of disposable N95 masks or N95 respirators by transport staff.

3) Until transportation arrives, suspect individuals should wear a standard surgical mask and be isolated from others as much as possible. In addition, disposable
N95 masks or N95 respirators should be worn by those who must attend to the individual.

I. Hospital Specific Training

A. DBHDD hospitals follow Multi-Drug Resistant Organism (MDRO) Exposure Control Plans and Tuberculosis (TB) Exposure Control Plans that are reviewed and updated at least annually. These are unique to each hospital and employees receive classroom instruction regarding these exposure control plans for the hospitals in which they work.

B. Time is set aside during the classroom instruction for employee questions covering any of the covered topics including, but not limited to:
   i. The MDRO Exposure Control Plan
   ii. The TB Exposure Control Plan
   iii. Contact Precautions
   iv. Droplet Precautions
   v. Airborne Precautions
Module Four – Competency Exam

Select the best match from the choices above (each choice is used only once)

___ 1. Two individuals with the same infection sharing a room
___ 2. Infection that can be transmitted by contact with contaminated clothing or linen
___ 3. Precautions used by DBHDD hospital employees to combat the risk of healthcare associated infection (HAIs) whose transmission is not blocked by Standard Precautions alone
___ 4. One of the Transmission-Based Precautions used with pathogens such as C. diff, VRE, and MRSA
___ 5. One of the Transmission-Based Precautions used with pathogens such as tuberculosis and chickenpox
___ 6. One of the Transmission-Based Precautions used with pathogens such as influenza and pneumonia
___ 7. An infection that requires a private room with monitored negative air pressure

True or False

___ 8. Transmission-Based Precautions are based on the principle that some infections can be transmitted by routes that are not blocked by Standard Precautions alone
___ 9. Transmission-Based Precautions should be used with any hospitalized individual that is diagnosed with (or suspected of having) any infection
___ 10. N95 masks and N95 respirators are recommended when providing healthcare services for hospitalized individuals with active tuberculosis
___ 11. Whenever possible, it is important to remove all personal protective equipment and perform hand hygiene before leaving a room where “Contact Precautions” are in force

Multiple Choice (select the best answer)

___ 12. Which of the following is not usually transmitted by contaminated droplets?
   a. MRSA
   b. Pneumonia
   c. Influenza
   d. Common Cold
   e. All of the above
   f. None of the above

___ 13. Which of the following is not usually transmitted by airborne particles?
   a. Tuberculosis
   b. Measles
   c. VRE
   d. Chickenpox
   e. All of the above
   f. None of the above

___ 14. Which of the following is usually transmitted by direct and indirect contact?
   a. C. diff
   b. MRSA
   c. VRE
   d. All of the above
   e. None of the above
   f. b and c
MODULE FIVE – Selected Pathogens

1) Bloodborne Pathogens

A) Human Immunodeficiency Virus (HIV)
   HIV is a bloodborne pathogen that attacks the body’s immune system, thereby reducing an individual’s ability to fight infection.
   1) Transmission
      (a) HIV is transmitted by way of a true exposure. (See Module One for information relating to true exposures)
   2) Recommended Infection Control Precautions
      (a) Standard Precautions
   3) Typical Signs and Symptoms include:
      (a) Fatigue, shortness of breath, and swollen lymph nodes
      (b) Unexplained weight loss, fevers, and night sweats
      (c) Rashes, other skin lesions, and unusual oral lesions such as red/white spots

B) Acquired Immunodeficiency Syndrome (AIDS)
   AIDS is an advanced stage of HIV infection. The diagnosis requires the presence of at least one opportunistic infection. An opportunistic infection is caused by pathogens that might not normally infect an individual, but are given the “opportunity” to do so because of the compromised immune system. Two examples of opportunistic infections common to AIDS patients are Pneumocystis Pneumonia that is caused by a yeast-like fungus and Kaposi’s sarcoma that is caused by a virus. Infections such as tuberculosis (TB) are also considered opportunistic infections when making an AIDS diagnosis.
   1) Transmission
      (a) HIV is transmitted by way of a true exposure. (See Module One for information relating to true exposures)
   2) Recommended Infection Control Precautions
      (a) Standard Precautions
      (b) Any transmission based precaution that is indicated as a result of the opportunistic infection(s) that are present. For example, Airborne Precautions would be indicated if an individual with AIDS contracts tuberculosis (TB).
   3) Typical Signs and Symptoms include:
      (a) The signs and symptoms listed for HIV; plus
      (b) Those that are exhibited by the opportunistic infection(s) that is present.

C) Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV)
   HBV and HCV are bloodborne pathogens that attack the liver and can cause both acute and chronic infections.
   1) Transmission
      (a) HBV and HCV are transmitted by way of true exposure. (See Module One for information relating to true exposures)
2) Recommended Infection Control Precautions
   (a) Standard Precautions

3) Typical Signs and Symptoms include:
   (a) Abdominal pain, loss of appetite, nausea, vomiting, and fever
   (b) Dark urine and jaundice (yellowing of the skin and white area of the eyes)

2) Contact Transmitted Pathogens
   A) Methicillin-Resistant Staphylococcus Aureus (MRSA)
      MRSA is the antibiotic resistant variety of staph aureus bacteria that has become a
      major health-risk for individuals in hospitals and other healthcare facilities (HCFs).
      Among the elderly and those in poor health, MRSA can produce potentially life-
      threatening infections involving skin, surgical wounds, bones, joints, heart valves, and
      the bloodstream. Although typically no more infectious or virulent than the antibiotic
      sensitive variety, persons contracting MRSA infections have a much poorer prognosis
      because MRSA is much more difficult to treat.
      1) Risk Factors
         (a) Antibiotic exposure
         (b) Advanced age
         (c) Serious underlying medical conditions
         (d) A long-term stay in a healthcare facility (HCF)
      2) Transmission
         (a) MRSA is typically spread by direct contact with infected or colonized skin
             lesions and indirectly through contact with environmental objects that have
             been contaminated by MRSA such as medical equipment, clothing, linens,
             used bandages, and other used individual care items.
      3) Infection and Colonization
         (a) Persons with MRSA infection will test positive for the organism at the
             affected site and will show signs and symptoms of illness.
         (b) Persons with MRSA colonization will test positive for the organism at the
             affected site but will not show any signs of illness.
      4) Recommended Infection Control Precautions
         (a) Standard Precautions plus Contact Precautions
         (b) Note: Individuals residing in long-term care facilities (LTCFs) who are
             colonized with MRSA may not require Contact Precautions. The decision
             should be made on a case by case basis. Consult with your infection control
             nurse (ICN).
      5) Typical Signs and Symptoms
         (a) Are usually specific to the site of infection, for example:
             (i) Skin infections usually occur at sites of visible skin trauma and areas
                 covered by hair such as the back of the neck, groin, and armpits. They
                 usually start as small red bumps resembling pimples, boils, or spider
                 bites. The infection site usually exhibits redness, warmth, and
                 tenderness. There may be pus or other drainage and the individual
may have a fever. Skin infections can quickly progress into deep, painful abscesses that require surgical drainage.

(ii) Wound infections usually exhibit redness, warmth, and tenderness at the wound. There may be pus or other drainage and the individual may have a fever.

(iii) Systemic infections such as those of the bloodstream and lungs will have significant signs and symptoms characteristic of the type of infection.

B) Vancomycin Resistant Enterococci (VRE)

VRE is the antibiotic resistant variety of enterococcal bacteria that has become a major health-risk for individuals in hospitals and other healthcare facilities (HCFs). Normally, enterococci bacteria populate the gastrointestinal and female urogenital tracts without causing any harm; however, the elderly or those in very poor health can develop very serious infections from these bacteria. And when the antibiotic resistant variety (VRE) is responsible, the prognosis is often poor. Although typically no more infectious or virulent than the antibiotic sensitive variety, VRE is much more difficult to treat. As a result, the elderly and those in very poor health can develop potentially life-threatening VRE infections involving the gastrointestinal tract, the female urogenital tract, surgical wounds, chronic lesions, and the bloodstream.

1) Risk Factors
   (a) Antibiotic exposure
   (b) Advanced age
   (c) Serious underlying medical conditions
   (d) A long-term stay in a healthcare facility (HCF)

2) Transmission
   (a) VRE is usually spread directly by contact with an infection site and indirectly by contact with environmental surfaces, linens, clothing, patient care items, and medical equipment that have been contaminated. Common sources of contamination for these objects depend upon the infection site and may include urine, feces, wounds, lesions, and blood.

3) Infection and Colonization
   (a) Persons with VRE infection will test positive for the organism at the affected site and will show signs and symptoms of illness.
   (b) Persons with VRE colonization will test positive for the organism at the affected site but will not show any signs of illness.

4) Recommended Infection Control Precautions
   (a) Standard Precautions plus Contact Precautions
   (b) Note: Individuals residing in long-term care facilities (LTCFs) who are colonized with VRE may not require Contact Precautions. The decision should be made on a case by case basis. Consult with your infection control nurse (ICN).

5) Typical Signs and Symptoms
   (a) Are usually specific to the site of infection, for example:
(i) Urinary tract infections will usually cause back pain, a burning sensation when urinating, and the need to urinate more frequently.
(ii) Wound and other chronic lesion infections will usually cause redness, warmth, and tenderness at the site. There may be pus or other drainage and the individual may have a fever.
(iii) Gastrointestinal infection will usually cause diarrhea, abdominal pain, weakness, fever, and chills.

C) Clostridium difficile (C. diff)

C. diff are bacteria that can infect or colonize the intestinal tract and are shed in feces. It can cause what is referred to as antibiotic associated diarrhea because the infection often follows antibiotic treatments for other conditions. They produce hardy spores that can survive on environmental surfaces for weeks if not cleaned and disinfected properly.

1) Risk factors
   (a) Antibiotic exposure
   (b) Advanced age
   (c) Serious underlying medical conditions
   (d) A long-term stay in a healthcare facility (HCF)

2) Transmission
   (a) C. diff is shed in feces; therefore, it can be spread directly by contact with contaminated feces and indirectly by contact with items that have been contaminated by feces that contains C. diff, such as medical equipment, soiled clothing, and linen.

3) Infection and Colonization
   (a) Persons that are infected will test positive for the organism and the toxins they produce, and will have the usual signs and symptoms of infection.
   (b) Persons that are colonized will also test positive for the organisms and the toxins they produce; however, they will not have any of the usual signs or symptoms.

4) Recommended Infection Control Precautions
   (a) Standard Precautions plus Contact Precautions
   (b) Note: Individuals residing in long-term care facilities (LTCFs) who are colonized with C. diff may not require Contact Precautions. The decision should be made on a case by case basis. Consult with your infection control nurse (ICN).

5) Typical Signs and Symptoms include:
   (a) Watery diarrhea anywhere from 3 to 15 times a day for two or more days, possibly with blood or pus in stool.
   (b) Mild to severe abdominal cramping with anywhere from mild tenderness to considerable pain.
   (c) Fever, nausea, loss of appetite, dehydration, and weight loss.
3) **Droplet Transmitted Pathogens**  
   **A) Seasonal Influenza**  
   Seasonal influenza is a virus that is typically spread by large respiratory droplets that are generated when an infected person coughs, sneezes, laughs, or talks.
   1) **Recommended Infection Control Precautions**  
      (a) Standard Precautions plus Droplet Precautions
   2) **Typical Signs and Symptoms; include:**  
      (a) Fever (often high)
      (b) Headache
      (c) Extreme fatigue
      (d) Dry cough
      (e) Sore throat
      (f) Runny or stuffy nose
      (g) Muscle aches
      (h) Stomach symptoms such as nausea, vomiting and diarrhea

4) **Airborne Pathogens**  
   **A) Tuberculosis (TB)**  
   Tuberculosis (TB) is caused by a bacterium that is transmitted by small contaminated airborne particles that are generated when a person with tuberculosis disease coughs, sneezes, laughs, or talks. Inhaling contaminated particles can result in one of two clinical presentations:
   1) **Tuberculosis (TB) Infection**  
      Persons with TB infection have the bacteria in their bodies and have positive skin tests; however, they are not sick and cannot infect others. TB Infection can progress to TB Disease over time if not properly treated.
      (a) Infection Control Precautions  
         (i) Standard Precautions
      (b) Typical Signs and Symptoms  
         (i) There are no signs or symptoms.
   2) **Tuberculosis (TB) Disease**  
      Persons with TB disease have the bacteria in their bodies, have positive skin tests, are sick, and are able to infect others. Permanent damage and even death may occur if not properly treated.
      (a) Infection Control Precautions  
         (i) Standard Precautions plus Airborne Precautions
      (b) Typical Signs and Symptoms include:
         (i) Productive cough with grey, black, or bloody sputum
         (ii) Night sweats, fever, and chills
         (iii) Chest pain and significant weight loss
Module Five – Competency Exam

Select the best match from the choices above (each choice is used only once)

1. A bloodborne pathogen that typically attacks the liver.
2. An advanced stage of HIV infection having one or more opportunistic infection.
3. An antibiotic resistant variety of the bacteria Staphylococcus Aureus.
4. A bloodborne pathogen that attacks the body’s immune system.
5. An antibiotic resistant variety of the bacteria Enterococci.
6. Bacteria that can infect or colonize the gastrointestinal tract, usually involving the elderly in nursing homes, especially following antibiotic treatments.

True or False

7. MRSA skin infections usually start as small red bumps that can be mistaken for pimples, boils, and spider bites, but can penetrate into deeper body tissues.
8. Standard Precautions and Contact Precautions are indicated when caring for persons with an active MRSA infection.
9. Standard Precautions and Contact Precautions are indicated when caring for persons with an active VRE infection.
10. VRE poses little risk to healthy individuals but can be responsible for very serious infections in the elderly and persons in poor health.
11. Risk factors for VRE include antibiotic exposure, advanced age, underlying medical conditions, long-term stays in healthcare facilities, and tobacco use.
12. C. diff is very infectious and produce hardy spores that can survive on surfaces for extended periods of time.
13. Standard Precautions and Airborne Precautions are indicated when caring for persons with an active C. diff infection.
14. An opportunistic infection is caused by pathogens that might not normally infect a person, but have the “opportunity” to do so because of a compromised immune system.

Multiple Choice (select the best answer)

15. Which of the following are common signs and symptoms of a C. diff infection?
   a. Mild to severe abdominal cramping
   b. Watery diarrhea several times a day for two or more days
   c. Fever
   d. Nausea and loss of appetite
   e. Dehydration and weight loss
   f. All of the above
   g. a and b

16. Which of the following are typical signs and symptoms of a TB Infection?
   a. Productive cough with grey, black, or bloody sputum
   b. Night sweats, fever, and chills
   c. Chest pain and weight loss
   d. All of the above
   e. None of the above

17. Which of the following are typical signs and symptoms of a TB Disease?
   a. Productive cough with grey, black, or bloody sputum
   b. Chest pain and significant weight loss
   c. Night sweats, fever, and chills
   d. All of the above
   e. None of the above

18. Which of the following are common sites for VRE infection?
   a. The gastrointestinal tract
   b. Surgical wounds/other chronic lesions
   c. The bloodstream
   d. The female urinary/genital tract
   e. All of the above
   f. a and d