Self-Instructional Packet (SIP)

Advanced Infection Prevention and Control

Training Module 1
Intro to Infection Prevention Control
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 infections (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 can 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.
MODULE ONE – Introduction to Infection Prevention and Control

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>
</tr>
<tr>
<td>Any body fluid visibly contaminated with blood</td>
<td>Peritoneal fluid</td>
</tr>
<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>A</th>
<th>Infection Prevention &amp; Control</th>
<th>B</th>
<th>Infection</th>
<th>C</th>
<th>Healthcare Associated Infection (HAI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Asymptomatic Infection</td>
<td>E</td>
<td>Carriers</td>
<td>F</td>
<td>Multi-Drug Resistant Organism (MDRO)</td>
</tr>
<tr>
<td>G</td>
<td>True Exposure</td>
<td>H</td>
<td>Colonization</td>
<td>I</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