Infectious Disease Awareness

The Power to Excel

SKU 4150
To the Instructor

Introduction

This Instructor Guide is designed using the best practices of adult education to help you organize and deliver interactive training. This design was developed with the input of Laborer Instructors across North America and adult educational experts.

This guide is intended for use with the appropriate Participant Guide and handouts to deliver training. The Lesson Plan provides a step-by-step guide on the most appropriate way to deliver this curriculum.

While the logistics of your training location may necessitate slight changes to classroom or hands-on activities, these changes should be kept to a minimum so that the training is delivered as intended.

A Note About Teaching Methods

The teaching methods suggested in the Lesson Plans promote active learning. These methods are designed to work with all types of learners. By following the suggested Lesson Plans, participants will be involved in problem-solving and group activities that build on their existing knowledge and skills and promote learning by doing. The Instructor Guide is designed to help you facilitate this type of learning and teaching.

A Note About English Language Learners

For laborers in the process of learning the English language (English language learners, or ELLs) who are at an intermediate level or above, the active learning strategies suggested in the Lesson Plan will help them to participate successfully in your training. While active learning benefits all adults, ELLs in particular can benefit from these strategies.
Components of the Instructor Guide

Preparing for Delivery and Lesson Overview

Everything you need for the classroom part of this course can be found in the Preparing for Delivery and Lesson Overview sections. Exercises, videos, A/V equipment – it’s all here.

Lesson Plans

Lesson Plan teaching notes present information for you on how to best organize the class. This will include what participants should do and what you should do to help them meet the learning objectives. Additional instructional materials, timelines, and special points of emphasis are also noted.

Handouts, Instructional Tools, and Hands-On Exercises

Instructions for classroom and hands-on exercises are included in the Lesson Plans. If the exercise requires a handout for participants to respond to and/or write on, the exercise is on a handout. Handouts and Instructional Tools are in printable files available at www.liunat raining.org/affiliateservices/instructionalmaterials provided by LIUNA Training. The Lesson Plan identifies each handout, when to distribute it, and how to conduct the exercise. An answer key, if applicable, is also provided with the Lesson Plan. For hands-on exercises, the Lesson Plan also identifies any tools or equipment required.

PowerPoint Slides

If a lesson has an accompanying presentation in PowerPoint format, the Lesson Plan identifies each slide and when to display it. The files for each PowerPoint slide can be found at www.liunat raining.org/affiliateservices/instructionalmaterials.
Components of the Instructor Guide (continued)

Performance Measurement

Most Lesson Plans will have a Performance Measurement Checklist for evaluating and documenting a participant’s performance during classroom or hands-on activities. Your copies of the Performance Measurement Checklists are provided in the Lesson Plans. Printable files to distribute to participants are provided at www.liunatraining.org/affiliateservices/instructionalmaterials.

Glossary and Resources

A Glossary of frequently used terms and abbreviations is available for participants. This includes all terms that are defined in the sidebars of the Participant Guide. A Resources list with links to organizations and articles that participants may find useful for further research on the topic is also available. Instructors should photocopy the Glossary and Resources and distribute them to participants. These documents are available at www.liunatraining.org/affiliateservices/instructionalmaterials.

Video Presentations

All video presentations are included on the LIUNA Training Videos Series application, available from LIUNA Training.

Exams

Details regarding written exams to evaluate participant’s knowledge including description, time range, and minimum passing scores are provided following the appropriate chapter and/or course. Printable files of exams to distribute to participants are provided at www.liunatraining.org/affiliateservices/instructionalmaterials.
Infectious Disease Awareness
Preparing for Delivery

Preparing for Delivery

Time
The *Infectious Disease Awareness* course is approximately 4 hours of classroom training.

Follow the Lesson Plan for a guide to scheduling this course. Time allotments for specific topics are provided within the plan. You may devote more time to classroom and hands-on activities as needed, as the plan reflects the minimum suggested time allotments.

Staffing
The maximum participant – instructor ratio is 25:1.
During classroom activities, the recommended participant – instructor ratio is 10:1.
During hands-on activities, the recommended participant – instructor ratio is 5:1.

Materials Needed
For this course, you will need the following:

- A copy of the Infectious Disease Awareness Participant Guide (PG)
- A flip chart or whiteboard and markers
- A computer and projector or monitor

The table on the following page lists the materials needed for this lesson.
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<th>Handouts</th>
</tr>
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<td>Slides 1 to 2</td>
<td>Infectious Disease Awareness Pre-test</td>
</tr>
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<td>Exercise 1: Infectious Diseases and Routes of Transmission (40 min.)</td>
<td>Slides 3 to 9</td>
<td>HO 1: What are Infectious Diseases?</td>
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<td></td>
<td>HO 2: Routes of Disease Transmission</td>
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<td>Slides 10 to 12</td>
<td>HO 3: Recent and Historic Disease Outbreaks</td>
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<td>Exercise 3: Categories of Infectious Diseases (15 min.)</td>
<td>Slides 13 to 18</td>
<td>HO 4: Categories of Infectious Diseases</td>
</tr>
<tr>
<td>Exercise 4: Exposure, Risk, and Precautions (40 min.)</td>
<td>Slides 19 to 22</td>
<td>HO 5: Exposure, Risk, and Precautions</td>
</tr>
<tr>
<td>Exercise 5: Controls, Decontamination, and Disinfection (40 min.)</td>
<td>Slides 23 to 26</td>
<td>HO 6: Controls, Decontamination, and Disinfection</td>
</tr>
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<td>Exercise 6: Regulations, Guidelines, and Standards (15 min.)</td>
<td>Slides 27 to 28</td>
<td>HO 7: Regulations, Guidelines, and Standards</td>
</tr>
<tr>
<td>Exercise 7: Psychosocial Hazards (15 min.)</td>
<td>Slides 29 to 31</td>
<td></td>
</tr>
<tr>
<td>Summary (15 min.)</td>
<td>Slides 32 to 35</td>
<td>Things to Remember</td>
</tr>
<tr>
<td>Exam (30 min.)</td>
<td></td>
<td>Infectious Disease Awareness Post Exam</td>
</tr>
</tbody>
</table>
Welcome participants and introduce yourself to the class.

Display Slide 1. Explain that the four-hour Infectious Disease Awareness course serves as a foundation for workers who may need to understand the issues surrounding working in an environment where infectious disease or diseases are known or suspected to be present. Explain that this course will help them to learn about these issues, and that a separate, 40-hour Infectious Disease Operations course provides more in-depth instruction for these topics, as well as opportunities for hands-on practice.

Display Slide 2. Explain that participants will first take a short pre-test, which will assess their prior knowledge about working around infectious diseases, and help guide their learning experiences throughout the course.

Distribute a copy of the Pre-Test to each participant. Tell them they will have 5 minutes to complete the test. Explain that participants will have the opportunity to compare their pre-test results against their final test at the end of the course.
Exercise 1: Infectious Diseases and Routes of Transmission

**Display** Slides 3–4 to present the exercise objectives to the class. (You may also want to refer participants to where the objectives are listed at the beginning of the Participant Guide.) At the end of this exercise, participants will be able to:

**Objectives**

1. Define *infectious disease*.
2. List at least five occupations that are at risk from infectious disease exposure.
3. Describe the primary routes of transmission for infectious diseases.

**Open** the lesson by asking participants to shout out names of any infectious diseases they know. Note their answers on a piece of flip chart paper and post it. On a separate piece of flip chart paper, have participants list the types of occupations that may expose workers to infectious diseases.

**Display** Slide 5 and compare the list of occupations with the list of ones that participants created.

**Explain** that next, participants will work together to come up with a definition for the term *infectious diseases*.

**Display** Slide 6 and distribute Handout 1: *What are Infectious Diseases?* Tell participants to work in groups to create a definition for infectious disease by filling in the blanks with the words in the box. (Note that participants should not use their PG for this activity.)

**Display** Slide 7 to show the definition for *infectious diseases* from the PG. Check the group's definitions to see if they match. (See the answer key on the following pages.)

**Return** to the list of diseases that participants came up with at the beginning of the lesson. Ask, “Are all infectious diseases transmitted in the same way? How are these diseases transmitted?” Note answers on the flip chart paper together with the diseases.

**Display** Slide 8. Explain that these terms represent different categories for how infectious diseases are transmitted to people. Ask participants if they can briefly say or guess what the terms mean as they relate to transmission of disease. Explain that understanding how diseases are transmitted is key to knowing how to protect oneself on an infectious disease worksite.

**Distribute** Handout 2: *Routes of Disease Transmission*. Assign one of the routes of transmission on the handout to each participant (some routes will be assigned to more
Exercise 1: Infectious Diseases and Routes of Transmission (continued)

than one participant). Tell them to find the information for the number they’ve been assigned and note it on their handout. Share with them that they can find information they need in the PG on pages 4 to 6.

**Have** participants take turns reading the answers to their questions aloud, and tell participants to fill in the rest of the answers on their handout as they listen. Review the answers to the handout with the class. (See the answer key on the following pages.)

**Display** Slide 9. Say, ”The risk of getting ill from an infectious disease depends on the opportunity for exposure – for example, what type of contact workers may have with the host or object that contains or carries the pathogen – but it also depends on a couple of other factors.” Ask participants to read the information on the slide and to try and come up with the missing words. Participants may refer to PG pages 4 to 6 as a reference. After a minute, ask pairs or groups to shout out their ideas. Click through the slide to reveal the answers. (Each click reveals one answer.)

**Answer** any additional questions that may have come up in the completion of the lesson.

**Conclude** by telling participants that different diseases have different routes of transmission, and that employers have a responsibility to ensure that they provide workers with the right training and protection for working around any type of infectious diseases.
Handout 1
What Are Infectious Diseases?

Instructions: Create a definition for infectious diseases. Use these words.

<table>
<thead>
<tr>
<th>bacteria</th>
<th>disorders</th>
<th>infections</th>
<th>parasites</th>
</tr>
</thead>
<tbody>
<tr>
<td>biological agents</td>
<td>fungi</td>
<td>multiply</td>
<td>pathogens</td>
</tr>
<tr>
<td>body</td>
<td>illnesses</td>
<td>organisms</td>
<td>viruses</td>
</tr>
</tbody>
</table>

Infectious diseases are ______ illnesses ______ infections ______, or other health ______ disorders ______ that are caused by organisms that enter the ______ body ______ and ______ multiply ______. These small ______ organisms ______ (microorganisms) include ______ bacteria ______, ______ viruses ______, ______ fungi ______, and ______ parasites ______. They may also be called ______ pathogens ______ or ______ biological ______ agents ______.
**Instructions:** Fill in the chart with information about routes of disease transmission.

<table>
<thead>
<tr>
<th>Route of Transmission</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Direct contact</td>
<td>A susceptible person physically contacts an infected person and transfers the organism.</td>
<td>Ebola</td>
</tr>
<tr>
<td>2. Indirect contact</td>
<td>Transmission occurs when an individual touches a contaminated surface and then becomes infected by touching his or her mouth, eyes, or nose.</td>
<td>Influenza</td>
</tr>
<tr>
<td>3. Airborne</td>
<td>Transmission occurs through droplets or aerosols. When they are inhaled by a susceptible individual, they enter the respiratory tract and can cause infection.</td>
<td>Tuberculosis, Whooping cough</td>
</tr>
<tr>
<td>4. Vector-borne</td>
<td>Carried by another species; “vector” usually refers to an insect, and transmission occurs via a bite from the vector.</td>
<td>Zika, West Nile virus</td>
</tr>
<tr>
<td>5. Non-contact vehicle transmission</td>
<td>Infection spreads from a contaminated source to the individual. Often the contaminant is ingested.</td>
<td>E. coli, Salmonella</td>
</tr>
<tr>
<td>6. Bloodborne</td>
<td>From contact with an infected person’s blood or sometimes other body fluids. Contaminated needle sticks often transmit these diseases.</td>
<td>HIV, hepatitis B</td>
</tr>
</tbody>
</table>
Exercise 2: Recent or Frequent Disease Outbreaks

15 Minutes

Open the lesson by displaying Slides 10 and 11. Ask participants to look at the list of diseases, and briefly mention what they already know about each. List their ideas on the board.

Explain that one of the reasons for having a course such as this one is in response to different types of disease outbreaks in the past, but another reason is that new diseases are always emerging, and in some cases, may even be weaponized for use in biological attacks.

Display Slide 12 to present the exercise objectives to the class. At the end of this exercise, participants will be able to:

**Objective**

4. Describe three infectious diseases, their symptoms, and how they are transmitted.

Distribute Handout 3: *Recent or Frequent Disease Outbreaks*. Divide the class into small groups and assign each group 1–2 diseases listed on the handout. Tell each group to write down information about the history, symptoms, and route(s) of transmission for the assigned disease(s) on their handout. Participants may look at PG pages 7 to 10 as a reference.

Have participants (individually or in groups) read their answers aloud. Tell other participants to listen and fill in the rest of the items in their handout.

Review the answers with the class. (See the answer key on the following page.) Answer any questions that may have come up in the completion of the handout.

Conclude by telling participants that a number of different government agencies are working constantly to research new trends in infectious diseases, and to ensure that there are guidelines for protecting workers against exposure.
## Handout 3: Recent or Frequent Disease Outbreaks

**Instructions:** Fill in the chart with information about the diseases.

<table>
<thead>
<tr>
<th>Disease</th>
<th>History</th>
<th>Symptoms</th>
<th>Route(s) of Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>The first documented case was in 1959 in the Congo. As of 2011, over 60 million people were affected and 25 million had died.</td>
<td>Flu-like symptoms, rapid weight loss, night sweats, extreme exhaustion, swollen lymph glands, prolonged diarrhea, sores on the mouth, anus, or genitals, pneumonia, skin blotsches, memory loss, depression</td>
<td>Bloodborne pathogen</td>
</tr>
<tr>
<td>Influenza</td>
<td>Various flu outbreaks have had worldwide impacts. Many different strains of the influenza virus continue to cause outbreaks every year. Some are more serious than others.</td>
<td>Fever, chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue, vomiting, diarrhea</td>
<td>Direct contact, contact with an infected object, inhalation of infected aerosol</td>
</tr>
<tr>
<td>E. Coli</td>
<td>Escherichia coli are bacteria found in the environment, foods, and intestines of people and animals.</td>
<td>Diarrhea, urinary tract infection, respiratory illness, pneumonia, severe cramps, vomiting</td>
<td>Contaminated food</td>
</tr>
</tbody>
</table>
### Handout 3
Recent or Frequent Disease Outbreaks

<table>
<thead>
<tr>
<th>Disease</th>
<th>History</th>
<th>Symptoms</th>
<th>Route(s) of Transmission</th>
</tr>
</thead>
</table>
| SARS    | SARS began in China in 2002 and spread to 37 countries worldwide through airplane travel. SARS demonstrated how quickly viruses spread in a world interconnected by international travel. | Fever  
Dry cough  
Shortness of breath  
Headache  
Muscle aches  
Sore throat  
Fatigue  
Diarrhea | Droplets expelled from an infected person's cough or sneeze and then breathed in by others; indirectly from contact with infected surfaces. |
| Ebola   | The 2014 Ebola outbreak was the largest Ebola outbreak in history and the first in West Africa. The fatality rate is around 50 percent. | Fever  
Muscle pain Headache  
Sore throat  
Nausea  
Vomiting  
Diarrhea  
Impaired organ function | Direct contact with blood, secretions, organs, or other body fluids of infected individuals. |
| Zika    | In 2016, Zika outbreaks occurred in South and Central America, the Caribbean, and in areas of Miami-Dade County, Florida. To date over 5,000 cases have been reported in the United States, most by travelers returning from affected areas outside the U.S. | Mild fever  
Rash  
Joint/muscle pain  
Headache | Spread primarily through the bite of an infected mosquito, or can also be sexually transmitted. |
Exercise 3: Categories of Infectious Diseases

**Objective**

5. Describe the NIAID Category A, B, and C priority pathogens/agents.

**Display** Slide 15. Open the lesson by asking participants to say (or guess) what the acronyms stand for. Click through the slide to reveal the answers. (Each click reveals one answer.)

**Display** Slides 16 and 17. Pause on each slide and briefly present the information about the roles of the CDC and NIH. Explain that the National Institute of Allergy and Infectious Diseases (NIAID) is part of the NIH, and that NIH, CDC, OSHA, and other government agencies often collaborate to help promote better understanding of and safe work practices around various infectious diseases.

**Display** Slide 18. Explain that NIAID groups infectious diseases into three different priority categories. Categories A, B, and C refer to the severity of the disease, with Category A as the most dangerous. A fourth category, *Emerging Diseases*, includes diseases that are starting to appear or reappear in a population. Upon further review, these diseases may be put into one of the three priority categories.

**Distribute** Handout 4: *Categories of Infectious Diseases*. Read the instructions aloud. Ask, “What are you going to do in this activity?” (Write A, B, C, or E next to each piece of information.) Have participants work in pairs to complete the handout. Tell participants to refer to PG pages 10 to 13 as a reference.

**Review** the answers with the class. Answer any additional questions that may have come up in the completion of the handout. (See the answer key on the following page.)

**Conclude** by explaining that in many situations where workers are asked to do cleanup of an infected area, the category of the pathogen(s) may determine what type of controls are used to work safely to handle, store, or transport infected waste and effectively disinfect worksites.
Handout 4: Categories of Infectious Diseases

Instructions: Write the correct letter next to each piece of information. Write A for Category A, B for Category B, C for Category C, or E for Emerging Diseases.

1. **C** Could be engineered for mass dissemination in the future because of availability.
2. **A** Can be easily disseminated or transmitted from person to person.
3. **B** Include mosquito-borne viruses such as West Nile virus and Eastern equine encephalitis (EEE) virus.
4. **A** Result in high mortality rates and have the potential for major public health impact.
5. **C** Include tuberculosis (TB), seasonal influenza virus, yellow fever, and SARS.
6. **A** Require special action for public health preparedness.
7. **B** Result in moderate morbidity (illness) rates and low mortality rates.
8. **E** Have newly appeared in a population or have existed but are rapidly increasing in incidence or geographic range.
9. **A** Cannot be transported without special permission unless the virus is inactivated.
10. **B** Are moderately easy to disseminate.
11. **A** Include Ebola and other viral hemorrhagic fevers.
12. **E** Include diseases such as rubeola (measles), polio virus, and Zika virus.
13. **B** Require CDC’s diagnostic capacity and enhanced disease surveillance.
14. **A** Might cause public panic and social disruption.
15. **B** Include bacteria such as E. coli and salmonella.
16. **C** Are easy to produce and disseminate.
Exercise 4: Exposure, Risk, and Precautions

**Objectives**

6. Explain what to do if you are exposed to blood or other body fluids.
7. Define *biosafety*.
8. Explain the importance of using Standard Precautions and Expanded Precautions when working around infectious diseases.
9. Explain and give an example of airborne, droplet, and contact precautions.

**Open** the lesson by asking, “What factors may contribute to coming up with a plan for working around infectious diseases?” Give participants one minute to work in pairs or groups to make lists of their own. After time is up, ask pairs or groups to share their lists. Note their answers on the board.

**Display** Slide 21. Compare the lists that the class generated with the information listed on the slide. Explain that every jobsite is different, and that different types of controls are needed to work safely around different types of diseases.

**Display** Slide 22. Explain that facilities such as medical laboratories have established protocols for biosafety. Have participants read the definition for biosafety and ask them what types of issues labs may consider in establishing these protocols. (Answers: type of pathogen, work tasks, primary barriers and safety equipment needed, and the type of facilities where the work is performed.)

**Explain** that certain OSHA standards, such as those for bloodborne pathogens, respiratory protection, and PPE require exposure assessments, but that risk assessments for infectious diseases sites should include other criteria, depending on the type of tasks and the type of pathogens involved.

**Distribute** Handout 5: *Exposure, Risk, and Precautions*. Have participants work in groups to complete the handout. Tell them to use PG pages 13 to 15 as a reference. (You may wish to divide the questions up and assign 1–2 questions to each group. Also, if time permits, you can have groups write their answers on flip charts and post them around the room. Then have the groups do a gallery walk to find the answers to the questions they were not assigned to.)
Exercise 4: Exposure, Risk, and Precautions (continued)

**Have** a volunteer from each group read their answers to each question. Ask participants to offer additional information or different answers, if any. Answer any questions that may have come up in the completion of the handout.

**Conclude** by saying that each worksite requires its own site-specific assessment, and that different types of controls may be used. Since outbreaks of infectious diseases can sometimes occur quickly and the specific details about exposures may not be known, or not be measurable in a short amount of time, many sites may require a higher level of protection to ensure that workers’ safety.
Handout 5
Exposure, Risk, and Precautions

Instructions: Write answers to the questions.

1. What should a worker do if he or she is exposed to blood or bodily fluids?
   At work, if an employee is exposed, he or she should:
   • flush the area with running water;
   • wash the area with plenty of warm water and soap;
   • report the incident to the appropriate staff member (supervisor, human resources, health and safety specialist, staff medical personnel);
   • record the incident; and
   • seek medical advice.

2. What processes should happen when a potential risk from infectious disease is identified?
   First the employer should conduct a risk assessment. Then they should develop an exposure control plan. This plan helps ensure procedures are in place to protect all employees who have potential contact with infectious agents.

3. What are the five main steps in the process of completing a risk assessment?
   Step 1: Identify hazards.
   Step 2: Decide who may be harmed, and how.
   Step 3: Assess the risks and take action.
   Step 4: Record the findings.
   Step 5: Review the risk assessment.
4. What types of issues are considered in putting together an appropriate list of controls for infectious diseases after a risk assessment has been completed?
   - Likelihood of exposure
   - Consequences of exposure
   - Have exposures occurred?
   - Routes of exposure?
   - Does exposure result from specific job duties?
   - How do Standard Precautions or Expanded Precautions apply? How does the Hierarchy of Controls apply?

5. What are Standard Precautions?
   Standard Precautions reduce the risk of disease transmission. While Standard Precautions were designed with the healthcare setting in mind, workers in other settings who may be at risk of infectious disease exposure should observe these precautions as well. The main practices include:
   - hand hygiene;
   - respiratory hygiene/cough etiquette;
   - gloving;
   - mouth, nose, eye (face) protection;
   - gowns/protective clothing;
   - appropriate handling of laundry; and
   - environmental cleaning.

6. What are Expanded Precautions?
   Expanded Precautions are used when Standard Precautions do not provide enough protection from, or control of, an infectious disease. They are used when dealing with highly transmissible or epidemiologically important pathogens.
   Expanded Precautions relate to the main routes of transmission:
   - Airborne Precautions: Include special precautions such as personal respiratory protection and special air handling and ventilation are needed to minimize the spread of the disease.
   - Droplet Precautions: Include use of surgical masks or face shields when in close proximity to the infected person.
   - Contact Precautions: Masks, gowns, and gloves are typically used to reduce contact transmission risks. Use of disinfectants and decontamination procedures minimize the risk of spreading the infection.
Exercise 5: Controls, Decontamination, and Disinfection

Display Slides 23 to 24 and present the exercise objectives to the class. At the end of this exercise, participants will be able to:

Objectives

10. Define Hierarchy of Controls and give an example of each of the following controls: engineering, administrative, and PPE.
11. Identify types of PPE for working safely around infectious diseases.
12. Explain the importance of proper donning and doffing of PPE.
13. Explain the role of decontamination after working in areas contaminated by infectious pathogens.
14. Explain the role of disinfection when working around infectious diseases.

Tell participants that you will now talk about different types of controls for the specific hazards posed by infectious diseases.

Ask participants, “What is the Hierarchy of Controls?” Invite a volunteer to come to the board, or to a flip chart, and draw/list the Hierarchy of Controls (elimination/substitution, engineering controls, administration controls, and PPE).

Display Slide 25 to check the answers. Ask, “Which controls are the most effective?” (Elimination and substitution.) “Why does this generally not apply to an infectious disease site?” (If diseases are already known to be present on a site, elimination/substitution isn’t an option. This generally applies to use of chemicals on a site, not the presence of biological agents.) “Why is PPE at the bottom of the list?” (PPE should be a last resort, after all other types of controls have been put into place.)

Divide the class into two groups. Draw a T-chart on the board with two headings: Engineering Controls and Administrative Controls. Say, “First we’re going to talk about Engineering and Administrative controls. We’ll move on to PPE in the next part of the exercise.”

Assign each group one of the two topics. Say, “In your group, try to come up with a list of examples of these types of controls for working around infectious diseases.” Have each group come up with a list of controls for each of these areas. Tell participants to look at PG pages 19 to 22 as a reference. When they’re finished, have groups post their lists on the wall.

Ask the class to shout out any additional items that they feel are missing on the lists, and add them to each list. When discussing engineering controls, point out the term
biocontainment, and make sure that participants understand the meaning of this term. (The physical containment of highly pathogenic organisms.)

**Review** by asking, “What is the purpose of the engineering and administrative controls that we just discussed?” (To prevent exposure of workers to harmful pathogens.) Then ask, “How might PPE play a role in preventing exposure?” Have participants talk about their answers in pairs and then share their information with the class. Note their ideas on the board. (Suggested answer: PPE should provide protection from the different routes of transmission for the pathogens that are present.)

**Display** Slide 26. Ask participants to name the types of PPE they can see in the image. (Protective suits, full-face APRs, and nitrile gloves.) Ask, “What other types of PPE might a worker need to wear in an environment like this?” Note answers on the board. Next, write the terms **decontamination** and **disinfection** on the board. Ask the class if anyone can explain the difference between the two terms. Note answers on the board. Explain that in the next activity, participants will learn more about what types of PPE are used, as well as the roles of decontamination and disinfection in infectious disease settings.

**Distribute** Handout 6: *Controls, Decontamination, and Disinfection*. Read the directions aloud. Divide the class into two groups and have each group prepare their presentation notes. Have participants write notes for their presentations on sheets of flip chart paper. Tell participants to look at PG pages 27 to 28 as a reference. (As an option, you can split the class into six individuals/groups/pairs and assign each one question to present to the class.)

**Have** the two groups post their notes and take turns presenting the information. Tell the other group to listen and to fill in the answers to those questions on their handouts. (See the answer key on the following page.)

**Check** the answers with the class. Answer any questions that may have come up in the completion of the handout. Note that there are OSHA standards that require certain types of PPE/training for working around infectious diseases, and that this will be covered in more detail in the next exercise.

**Conclude** by reiterating that exposure control plans must be site-specific, and that in cases where there aren’t adequate resources for testing for the presence of infectious agents, the rule is that employers should err on the side of greater protection than may be deemed necessary. This may affect the types of PPE used, as well as the techniques and materials used in decontamination and disinfection of surfaces on a jobsite.
Group 1: PPE for Infectious Diseases

Instructions: Answer the questions and prepare to present the information to the class.

1. What are key considerations for selecting PPE?

   Considerations for selecting PPE for workers at risk of infectious disease exposure include:
   - Type of anticipated exposure: For example, workers may be exposed through splashes or sprays, blood, body fluids, or other contaminated liquids that might penetrate regular clothing or get into mucous membranes.
   - Durability and appropriateness of the PPE for the task: This will affect, for example, whether an apron, gown, or full protective suit is selected for PPE. It is also important to know if the protective clothing needs to be fluid resistant, fluid proof, or neither. For cleaning/disinfecting tasks, the type of cleaning products used will impact PPE selection.
   - Fit: PPE must fit the individual user. Poorly fitted respirators will allow contaminants to enter.

2. What types of PPE are used for working safely around infectious diseases?

   - Gloves: Usually nitrile or vinyl.
   - Protective clothing: A hooded fiber suit (such as Tyvek®) and an outer suit constructed of durable viral penetration-resistant material.
   - Face shields: May be worn over certain respirators to protect the face from splashed or sprayed substances.
   - Respirators: Half-face or full-face APR, PAPR, or SCBA.

3. Why are there specific procedures in place for donning and doffing PPE in an infectious disease environment?

   Workers must don (put on) and use PPE properly to achieve the intended protection and minimize the risk of infection. Workers should doff (remove) PPE in a way that avoids self-contamination. This includes using a checklist, as well as a trained observer/trained observer’s assistant.
Group 2: Decontamination and Disinfection

Instructions: Answer the questions and prepare to present the information to the class.

4. What does decontamination mean? How does decontamination occur in infectious disease settings?
   Decontamination is the process of removing contaminants (infectious agents) that have accumulated on people who have worked in a contaminated or likely contaminated environment.
   Decontamination occurs in stages or steps with a defined order that must be followed to ensure the maximum protection and minimum spread of disease. It begins when a worker exits the contaminated area and ends once the worker goes through the proper stages/steps and enters the clean area. A worker should never cross back and forth among the stages/steps because doing so may spread contamination.

5. What does disinfection mean? How is disinfection used in infectious disease settings?
   Disinfection is a process that eliminates most or all infectious organisms from objects and surfaces. Usually liquid chemicals are used as disinfectants. These may include certain alcohol-based hand cleaners and bleach solutions.
   The particular disinfectant used and how often disinfection occurs depends on the location, type of surface, type of soiling, type of infectious agent, and what task is performed. The employer’s written schedule for cleaning and disinfection should identify these specifics on a task-by-task basis.

6. What are the steps involved in a disinfection process?
   A sample disinfection protocol includes these steps:
   1. Remove all visible debris, especially organic material.
   2. Wash the area or item with water and detergent.
   3. Thoroughly rinse the cleaned area to remove any detergent residue.
   4. Allow the area to dry completely.
   5. Apply the appropriate disinfectant.
   6. Allow the proper contact time (usually at least 10 minutes).
   7. Thoroughly rinse and allow the area or item to dry.
Exercise 6: Regulations, Guidelines, and Standards

**Display** Slides 27 to 28 and present the exercise objective to the class. At the end of this exercise, participants will be able to:

**Objective**

15. Identify two government standards related to working around infectious diseases.

**Open** the lesson by asking participants about the OSHA standards that they have learned about in previous OSHA-related courses or other training, either in class or on the job. Explain that there is no single OSHA standard for infectious diseases, but that OSHA is considering creating a new standard for infectious diseases targeted at workers in healthcare and other high-risk environments.

**Ask** participants which current OSHA standards are likely to be applicable to work in infectious disease environments. Note their answers on the board. Explain that in the next exercise, participants are going to look at these standards, as well as other agencies and groups that provide guidelines and standards for working around infectious diseases.

**Distribute** Handout 7: *Regulations, Guidelines, and Standards*. Have participants complete the handout individually or in pairs. Give them a few minutes to search for and fill in the missing words in the descriptions. Tell them they can use pages 28 to 32 of the PG as a reference if needed.

**Check** the answers to the handout with the class. (See the answer key on the following page.) Answer any questions that may have come up in the completion of the handout.

**Conclude** by saying that employers are responsible for making sure that workers are adequately trained in all standards that are relevant to their work situation, and that on infectious disease worksites, there may be several that apply.
Handout 7
Regulations, Guidelines, and Standards

Instructions: Fill in the missing words.

   Places requirements on employers whose workers have occupational exposure to ________ blood ________
or other potentially infectious materials (OPIM).

   Requires employers to provide PPE, to conduct an assessment to determine the need for PPE, and to provide
   training, including how to properly ________ don ________ and ________ doff ________.

   When respirators are required, employers must develop a written program that details
   respirator ________ selection ________, types of respirators, fit-testing, medical evaluations, maintenance and
   care, training/retraining, and evaluation.

   Regulates ________ hazardous ________ ________ waste ________ operations and emergency response
   work in the United States. Spills of infectious material are also covered by the standard’s requirements.

5. General Duty Clause (Sec. 5(a)(1)) of the Occupational Safety & Health Act:
   This requires employers to furnish each employee with a place of employment that is free from recognized hazards
   that are causing, or are likely to cause, death or serious physical ________ harm ________ to employees.

   Requires employer compliance when workers use certain ________ chemicals ________ for cleaning,
decontamination, and disinfection, including labeling, Safety Data Sheets (SDS), and training.

7. Centers for Disease Control and Prevention (CDC):
   A federal agency that works to investigate, identify, prevent, and control ________ disease ________.
8. National Institute for Occupational Safety and Health (NIOSH):
   A federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and _________________.

9. State plans:
   Most states have their own worker health and safety laws and agencies. Some states have ________________ stricter requirements than federal regulations.

10. Cal-OSHA Aerosol Transmissible Diseases (ATD) Standard:
    Only required in California, but is the only standard that requires covered employers to develop a comprehensive ________________ control plan for ATDs.

11. Interim Planning Guidance for Handling Category A Solid Waste:
    A consolidated overview of regulations that provides information and guidance on the proper management and ________________ of these waste materials.

12. Medical screening and surveillance:
    The Bloodborne Pathogens Standard requires that an employer offer the hepatitis B ________________ vaccine, and the HAZWOPER Standard requires a ________________ medical exam as well as emergency/exposure examinations.
Exercise 7: Psychosocial Hazards

Display Slides 29 to 30 and present the exercise objectives to the class. At the end of this exercise, participants will be able to:

Objectives

16. Define psychosocial hazard.
17. List at least five symptoms of stress.
18. Give at least two actions employers can take to address issues of concern for personnel working around infectious diseases.
19. Give at least two actions workers can take to manage stress from working in environments that pose a risk of infectious disease.

Write the term psychosocial hazard on the board. Open the lesson by asking, “What are psychosocial hazards?” Give participants one minute to work in pairs or groups to list examples of their own. After time is up, ask pairs or groups to share their examples. Note their answers on the board.

Explain that psychosocial hazards affect the workers’ emotional or psychological well-being. These hazards are often linked to workplace stress, absenteeism, difficulties at home, and even workplace violence. Ask, “How might working in an infectious disease environment present psychosocial hazards to workers?” (Suggested answers: Workers may feel stress from a fear of exposure to a deadly disease, or be part of a response team where they may have to deal with violent sights, such as the aftermath of a disease outbreak or a natural disaster.)

Display Slide 31. Ask, “If workers feel these types of symptoms, are they easy to remedy? What kinds of things can they do to if they feel these types of stress?” Note answers on the board.

Divide the class into two groups. Have each group take a piece of flip chart paper. Tell Group 1 to make a list of things that an employer can do to help workers who are experiencing stress from working around infectious diseases. Tell Group 2 to make a list of things that an employee can do for himself or herself to manage stress in this type of environment. Tell them they can use pages 32 to 34 of the PG as a reference if needed.

Have the two groups post their lists take turns presenting them to the class. Ask if anyone can add other ideas to either list. Answer any questions that may have come up in the completion of the activity.
Exercise 7: Psychosocial Hazards (continued)

**Conclude** by saying that stress can be mentally, emotionally, or physically harmful if not managed or treated properly, and that employers have a responsibility to ensure that workers have access to the tools they need to deal with this type of hazard.
Summary

Distribute *Things to Remember.*

**Explain** that the *Things to Remember* document is a take-home list of information that can be used for reference or for self-study. Note that this document provides information about the learning objectives and may be used as a study guide for the end-of-course assessment.

**Display** Slides 33 to 35 and briefly review the objectives with the class. Review the information on the *Things to Remember* handout for each objective. Ask participants if they are comfortable with their knowledge about, or ability to do, each of the objectives, or if they need review or additional support on any of the items listed.

**Redistribute** the pre-test that they took earlier and review the answers.

**Ask** the participants if they have any questions regarding any other topics of the course.

**Address** any questions or concerns.

**Instructor Note:** *It is now time for them to take the course post-test.*
1. Infectious diseases are illnesses, infections, or other health disorders which are caused by organisms that enter the body and multiply. These small organisms (microorganisms) include bacteria, viruses, fungi, and parasites. They may also be called pathogens or biological agents.

2. Occupations that are at risk from infectious disease exposure include:
   - building maintenance;
   - healthcare;
   - humanitarian aid;
   - first responders, emergency personnel, security;
   - laboratory;
   - environmental services (cleanup and waste disposal);
   - funeral and mortuary;
   - travel (airline, rail, ship); and
   - border, customs, and quarantine workers.

3. The primary routes of transmission for infectious diseases include:
   - Direct contact: A susceptible person physically contacts an infected person and transfers the organism.
   - Indirect contact: An individual touches a contaminated surface and then becomes infected by touching his or her mouth, eyes, or nose.
   - Airborne: Transmission occurs through droplets or aerosols. With aerosols, the organism gets into the air and is breathed in by another person and can cause infection. Airborne transmission does not require face-to-face contact with an infected individual. Droplets containing infectious agents are generated when an infected person coughs, sneezes, or speaks. Transmission occurs when droplets come into contact with a person's eyes, nose, or mouth.
   - Vector-borne: Carried by another species; “vector” usually refers to an insect, and transmission occurs via a bite from the vector.
   - Non-contact vehicle transmission: Infection spreads from a contaminated source to the individual. Often the contaminant is ingested (enters through the mouth). Pathogens may be found on food or in water.
   - Bloodborne: From contact with an infected person's blood or sometimes other body fluids.

4. Some examples of infectious diseases, their routes of transmission, and symptoms, include the following:
   - E. coli has been transmitted to the general population through contaminated food, often from inadequately washed fruit and vegetables. The symptoms of E. coli infections vary for each person but often include severe stomach cramps, diarrhea (often bloody), and vomiting.
   - Ebola virus disease most commonly spreads by direct contact with blood, secretions, organs, or other body fluids of infected individuals. EVD is usually marked by fever, muscle pain, headache, and sore throat. The illness progression includes nausea, vomiting, diarrhea, and impaired organ function.
   - Zika virus disease spreads to people primarily through the bite of an infected mosquito. It can also be sexually transmitted. Symptoms of Zika include mild fever, rash, joint/muscle pain, and headache.
5. Recent or frequent outbreaks of an infectious disease include: bubonic plague, HIV/AIDS, influenza, E. coli, SARS, Ebola, and Zika (among others).

6. NIAID maintains and regularly revises a pathogen priority list, which includes three risk levels:
   - **Category A Priority Pathogens:** Organisms/biological agents that pose the highest risk to national security and public health.
   - **Category B Priority Pathogens:** The second-highest priority organisms/biological agents.
   - **Category C Priority Pathogens:** The third-highest priority, including emerging pathogens that could be engineered for mass dissemination in the future.

7. At work, if an employee is exposed to blood or bodily fluids, he or she should:
   - flush the area with running water;
   - wash the area with plenty of warm water and soap;
   - report the incident to the appropriate staff member (supervisor, human resources, health and safety specialist, staff medical personnel);
   - record the incident; and
   - seek medical advice.

8. **Biosafety** is the discipline addressing the safe handling and containment of infectious microorganisms and hazardous biological materials.

9. Key elements in assessing risks for occupational exposure to infectious diseases include:
   - Sources and pathways for potential exposure to infectious pathogens, as well as routes of transmission.
   - Characteristics of the pathogens, including pathogenicity, virulence, and infectious dose.
   - Effectiveness of existing controls, including the use of Standard and Expanded Precautions.

10. To help protect workers in infectious disease settings, biological safety experts developed Standard Precautions. For extremely high risk environments, a more stringent set of precautions, called Expanded Precautions, was developed. The implementation of these precautions will depend on the degree of risk and if the risk is well defined. In unknown situations, higher level precautions are required.

11. The main practices of Standard Precautions include:
   - hand hygiene;
   - respiratory hygiene/cough etiquett;
   - gloving;
   - mouth, nose, eye (face) protection;
   - gowns/protective clothing;
   - appropriate handling of laundry; and
   - environmental cleaning.
12. Examples of airborne, droplet, and contact precautions include:
   • **Airborne Precautions:** Include special precautions such as personal respiratory protection and special air handling and ventilation are needed to minimize the spread of the disease.
   • **Droplet Precautions:** Include use of surgical masks or face shields when in close proximity to the infected person.
   • **Contact Precautions:** Masks, gowns, and gloves are typically used to reduce contact transmission risks. Use of disinfectants and decontamination procedures minimize the risk of spreading the infection.

13. The Hierarchy of Controls identifies actions, processes, and precautions to include in an exposure control plan based upon their effectiveness, from the most effective controls (elimination or substitution of the hazard), to engineering controls, administrative controls, and finally to the least effective controls (use of personal protective equipment – PPE).

14. Below are definitions and examples of the following controls: substitution, engineering, administrative, and PPE.
   • **Elimination and Substitution:** For an existing process, major changes in equipment and procedures may be required to eliminate or substitute for a hazard. These options more often relate to chemical hazards (e.g. replacing lead-based paint with titanium white, using ultraviolet light in place of chemical cleaning products) and not to control infectious disease.
   • **Engineering Controls:** Engineering controls seek to isolate people from the hazard or remove it before it comes in contact with the worker. Isolation is an example of an engineering control. Isolation is the separation of an infected person from others. It is frequently used for infectious aerosols or airborne diseases such as tuberculosis. To prevent the spread of disease from the isolation area, engineering controls such as barriers to access and special ventilation may be used. Infectious waste usually requires special containment before disposal or transport. Infectious waste must be contained separately from other waste and handled and transported by specially trained and authorized workers. A common example of containment is the use of sharps (e.g. hypodermic needles) containers in healthcare facilities. Today many public areas (such as bathrooms in airports or restaurants for example) provide sharps containers for their patrons. However when they are not available sharps may be discarded in the trash. Workers must be aware of their surroundings when handling any waste/trash.
   • **Administrative Controls:** These are changes in the way work is done. Some examples include changing procedures or implementing new ones, employee training, and installing signs and warning labels. Administrative controls do not remove hazards. Instead they limit exposure or reduce exposure through behavior changes and hazard awareness. For example, signs warn individuals that they are entering an area that uses radiation or that contains biological hazards. Administrative controls are often used in combination with PPE. Perhaps the most effective administrative control is limiting or eliminating the amount of time that a worker spends in an environment that presents risk of infection.
   • **PPE:** Personal Protective Equipment (PPE) includes gloves, protective clothing, hardhats, safety glasses, safety footwear and respirators. PPE is frequently used where hazards are not particularly well controlled. PPE programs may be relatively inexpensive to establish, but over the long term, can be very costly to sustain. These methods for protecting workers have also proven to be less effective than other measures, requiring significant effort by the affected workers.
15. **Containment or biocontainment** is the physical containment of highly pathogenic organisms.

16. Considerations for selecting PPE for workers at risk of infectious disease exposure include:
   - **Type of anticipated exposure:** For example, workers may be exposed through splashes or sprays, or blood, body fluids and other contaminated liquids (sewage, contaminated water, etc.) that might penetrate regular clothing or get into mucous membranes.
   - **Durability and appropriateness of the PPE for the task:** This will affect, for example, whether an apron, gown, or full protective suit is selected for PPE. It is also important to know if the protective clothing needs to be fluid resistant, fluid proof, or neither. For cleaning/disinfecting tasks, the type of cleaning products used will impact PPE selection.
   - **Fit:** PPE must fit the individual user. The employer must provide PPE in the appropriate size for the wearers. This is particularly important for respiratory protection. Poorly fitted respirators will allow contaminants to enter.

17. PPE for working safely around infectious diseases includes:
   - **Gloves:** Nonsterile gloves made of latex, nitrile, or vinyl.
   - **Protective Clothing:** Full-covering protective suits, such as Tyvek®, and full-body garments constructed of durable viral penetration-resistant material.
   - **Face Shields:** Face shields may be worn over certain respirators to protect the face from splashed or sprayed substances. Goggles can also provide barrier protection for the eyes.
   - **Respiratory Protection:** The most commonly used respirators in healthcare settings are particulate respirators, such as half-face or full-face air-purifying respirators. Powered air-purifying respirators (PAPR) may also be used. If even greater protection is needed (for example in extremely hazardous or unknown environments) the worker may need to use a respirator that provides clean air from a tank, the Self-Contained Breathing Apparatus or SCBA.

18. Workers must don (put on) and use PPE properly to achieve the intended protection and minimize the risk of infection. Workers should doff (remove) PPE in a way that avoids self-contamination. For example, avoid skin and mucous membrane contact with potentially infectious materials. Do not remove respirators in work areas where air contaminants (e.g., airborne-transmissible agents) may be present.

19. **Decontamination** is the process of removing contaminants (infectious agents) that have accumulated on people who have worked in a contaminated or likely contaminated environment. Decontamination occurs in stages or steps with a defined order that must be followed to ensure the maximum protection and minimum spread of disease.

20. **Disinfection** is a process that eliminates most or all infectious organisms from objects and surfaces. Usually liquid chemicals are used as disinfectants. These may include certain alcohol-based hand cleaners and bleach solutions. A sample disinfection protocol includes these steps:
   - Remove all visible debris, especially organic material.
   - Wash the area or item with water and detergent.
   - Thoroughly rinse the cleaned area to remove any detergent residue.
   - Allow the area to dry completely.
   - Apply the appropriate disinfectant.
   - Allow the proper contact time (usually at least 10 minutes).
   - Thoroughly rinse and allow the area or item to dry.

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**Infectious Disease Awareness**

**Things to Remember**

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**Infectious Disease Awareness**

**Things to Remember (continued)**
21. Government standards related to working around infectious diseases include:
   - Bloodborne Pathogens Standard (29 CFR 1910.1030);
   - Personal Protective Equipment (PPE) Standard (29 CFR 1910.132);
   - Respiratory Protection Standard (29 CFR 1910.134);
   - Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard (29 CFR 1910.120);
   - General Duty Clause (Sec. 5(a)(1)) of the Occupational Safety & Health Act; and

22. Some OSHA standards provide guidelines for medical screening for working around infectious diseases:
   - The Bloodborne Pathogens Standard does not require a pre-placement medical exam but requires that the employer offer the Hepatitis B vaccine.
   - The HAZWOPER Standard requires a pre-placement medical exam as well as emergency/exposure examinations or tests when a worker performs job tasks on a hazardous materials response or cleanup.
   - The Respiratory Protection Standard requires workers to fill out a respirator medical evaluation questionnaire or complete a medical exam that answers the same questions as those in the questionnaire.

23. Psychosocial hazards affect the workers' emotional or psychological well-being. They may relate to the way work is conducted and managed, the nature of the work (e.g. physical hazards, conflict, isolation, etc.) or social context (e.g. stereotypes, stigma, etc.).

24. Symptoms of stress are many and varied, but some include:
   - nausea
   - diarrhea
   - high blood pressure
   - headaches
   - sleep problems
   - difficulty concentrating
   - difficulty making decisions
   - flashbacks
   - anxiety
   - guilt
   - fear
   - grief
   - sadness
   - isolation
   - anger
   - withdrawal
   - irritability

25. Actions employers can take to address issues of concern for personnel working around infectious diseases include:
   - Involve workers in risk assessment.
   - Communicate work hazards, tasks and precautions.
   - Provide more worker control over work tasks and environment.
   - Value safety and health in the workplace.
   - Consider the interaction between working and living conditions.
   - Listen to and address worker's fears.
Actions workers can take to manage stress from working in environments that pose a risk of infectious disease include:

- Develop a “buddy” system with a co-worker. Watch out for each other.
- Take care of yourself physically by exercising regularly and eating small quantities of food frequently.
- Take frequent rest breaks.
- Drink plenty of fluids such as water and juices.
- Try to eat a variety of foods and increase your intake of complex carbohydrates (breads, whole grain muffins, granola bars, etc.).
- Whenever possible, take breaks away from the work area. Eat and drink in the cleanest area available.
- Recognize and accept what you cannot change – the chain of command, organizational structure, waiting, equipment failures, etc.
- Give yourself permission to feel bad – you are in a difficult situation.
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