

Chapter 1: Introduction to Infectious Diseases

Chapter 1

Introduction to Infectious Diseases

Chapter 1: Introduction to Infectious Diseases

1

Preparing for Delivery

Time

The *Introduction to Infectious Diseases* chapter is approximately 4 hours and 30 minutes 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 chapter, you will need the following:



- A copy of the Infectious Disease Operations 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.

Chapter 1: Introduction to Infectious Diseases

Preparing for Delivery (continued)

Chapter 1: Introduction to Infectious Diseases

Lesson Overview	Media 	Handouts 
Introduction, Pre-test, and Chapter Objectives (50 min.)	<i>Slides 1 to 6</i>	<i>Infectious Disease Operations Pre-test</i>
Exercise 1: Infectious Diseases and Routes of Transmission (70 min.)	<i>Slides 7 to 11</i>	<i>HO 1: Routes of Disease Transmission</i>
Exercise 2: Recent and Historic Disease Outbreaks (40 min.)	<i>Slides 12 to 13</i>	<i>HO 2: Recent and Historic Disease Outbreaks</i>
Exercise 3: Categories of Infectious Diseases (30 min.)	<i>Slides 14 to 19</i>	<i>HO 3: Categories of Infectious Diseases</i>
Exercise 4: Exposure, Risk, and Controls (70 min.)	<i>Slides 20 to 22</i>	<i>HO 4: Exposure, Risk, and Controls</i>
Summary (10 min.)	<i>Slides 5 to 6</i>	<i>Chapter 1: Things to Remember</i>

Introduction, Pre-test, and Chapter Objectives

Introduction, Pre-test, and Chapter Objectives



50
Minutes

Welcome participants and introduce yourself to the class.

Display Slide 1. Explain that the *Infectious Disease Operations* course serves as a foundation for workers who may need to work 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 and practice tasks that will assist them to work safely in the presence of a variety of types of infectious diseases.

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 10 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.

Collect the tests and display Slide 3. Have participants read and choose the correct answers to the sentences on the slide. (It's OK to guess!) Tell them to talk with other participants and find at least one person who agrees with their answer for each sentence.

Instructor Note: *This activity can be used as an ice-breaker if participants don't already know each other. You may wish to adapt the activity by asking them to find 2–3 different people who agree with each of their answers and write down their names.*

While participants are discussing their answers to the sentences on the slide, score the pre-tests against the answer key.

Display Slide 4 to reveal the answers. Ask if participants were surprised by any of the information.

Explain that the first chapter in this course will provide some background information on infectious diseases.

Display Slides 5–6 to present the chapter objectives to the class. (You may also want to refer participants to where the objectives are listed at the beginning of Chapter 1 in the Participant Guide.) At the end of this chapter, participants will be able to:

1. Define *infectious disease*.
2. Describe the primary routes of transmission for infectious diseases.
3. Name an example of a recent or historic outbreak of an infectious disease.



SL 1 to 6



Infectious Disease
Operations Pre-test



PG: 1–1 to 1–18

Chapter 1: Introduction to Infectious Diseases

Introduction, Pre-Test, and Chapter Objectives (continued)

4. List at least three infectious diseases, their symptoms, and how they are transmitted.
5. Describe the NIAID Category A, B, and C priority pathogens/agents.
6. List occupations that are at risk from infectious disease exposure.
7. Define *biosafety*.
8. Explain the key elements in assessing risks for occupational exposure to infectious diseases.

Invite questions about the objectives.

Exercise 1: Infectious Diseases and Routes of Transmission

Exercise 1: Infectious Diseases and Routes of Transmission

 70
Minutes

Objectives

1. Define *infectious disease*.
2. Describe the primary routes of transmission for infectious diseases.

Display Slide 7. 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. Explain that they are going to work together to come up with a definition for the term *infectious disease*.

Display Slide 8. Tell participants to work in groups to create a definition for infectious disease, and that their definition should use as many of the entries as possible from the list of terms on the slide. Let them know that their definitions may contain more than one sentence. (Note that participants should not use their PG for this activity.)

Have each group write their definition on a piece of flip chart paper and post it for the class. (Tell them to underline the terms from Slide 8 in their definitions in a different color.)

Display Slide 9 to show the definition for *infectious disease* from the PG (the definition is on PG page 1–3). Discuss the similarities and differences between the groups' definitions and the one on Slide 9.

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 10. 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 1: *Routes of Disease Transmission*. Assign one of the routes of transmission on the handout to each participant (some routes will be assigned to more than one participant). Tell them to find the information for the number they've been assigned, write it on a piece of flip chart paper, and post it on the wall. (Tell participants to write only the key pieces of information about their assigned topic.) Share with them that they can find information they need in the PG on pages 1–4 to 1–6.

Have participants walk around the class, read the pieces of flip chart paper, and fill out the



SL 7 to 11



Flip Chart



PG: 1–1 to 1–15



HO 1: Routes of
Disease Transmission

Chapter 1: Introduction to Infectious Diseases

Exercise 1: Infectious Diseases and Routes of Transmission (continued)

rest of the spaces in their handout. Review the answers to the handout with the class. (See the Handout 1 answer key on the following page.)

Display Slide 11. 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 try to come up with the missing words. Participants may refer to PG pages 1-2 to 1-5 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: Routes of Disease Transmission



Handout 1 Routes of Disease Transmission

Instructions: Fill in the chart with information about routes of disease transmission.

Route of Transmission	Definition	Examples
1. Direct contact	A susceptible person physically contacts an infected person and transfers the organism.	Ebola Influenza virus Infectious mononucleosis Chlamydia
2. Indirect contact	Transmission occurs when an individual touches a contaminated surface and then becomes infected by touching his or her mouth, eyes, or nose.	Influenza Norwalk, rhinovirus Gram-positive bacteria Gram-negative bacteria
3. Airborne	Transmission occurs through droplets or aerosols. When they are inhaled by a susceptible individual, they enter the respiratory tract and can cause infection.	Tuberculosis Whooping cough Measles Chicken pox
4. Vector-borne	Carried by another species; "vector" usually refers to an insect, and transmission occurs via a bite from the vector.	Zika West Nile Virus Lyme disease Hantavirus
5. Non-contact vehicle transmission	Infection spreads from a contaminated source to the individual. Often the contaminant is ingested.	E. Coli Salmonella Cyanide poisoning of Tylenol
6. Bloodborne	From contact with an infected person's blood or sometimes other body fluids. These diseases are often transmitted by contaminated needle sticks.	HIV Hepatitis B

Infectious Disease Operations

Chapter 1: Introduction to Infectious Diseases

Exercise 2: Recent and Historic Disease Outbreaks



40
Minutes

Exercise 2: Recent and Historic Disease Outbreaks

Objectives



SL 12 to 13

3. Name an example of a recent or historic outbreak of an infectious disease.
4. List at least three infectious diseases, their symptoms, and how they are transmitted.

Open the lesson by displaying Slides 12 and 13. Ask participants to look at the list of diseases, and briefly say what they already know about each. List their ideas on the board.



HO 2: Recent and Historic
Disease Outbreaks

Explain that one of the reasons for having a course like 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, they may even be weaponized for use in biological attacks.

Distribute Handout 2: *Recent and Historic Disease Outbreaks*. Divide the class into small groups and assign each group 1–2 diseases listed on the handout. Tell each group to write information about the history, symptoms, and route(s) of transmission for their assigned disease(s) on their handout. Participants may look at PG pages 1–6 to 1–10 as a reference.



PG: 1–6 to 1–10

Have participants (or 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 2: Recent and Historic Disease Outbreaks



Handout 2 Recent and Historic Disease Outbreaks

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

Disease	History	Symptoms	Route(s) of Transmission
Bubonic plague	The plague in the 14th century was so devastating that some estimate nearly half of the European population was wiped out in four years.	Chills High fever Muscle cramps Seizures Gland swelling Gangrene	Vector-transmitted disease, usually through fleas
1918 Spanish flu	This influenza pandemic spread quickly around the world, and was helped by the movement of troops engaged in World War I.	Fever/chills Cough Sore throat Runny or stuffy nose Muscle or body aches Headaches Fatigue Vomiting Diarrhea	Direct contact Contact with an infected object Inhalation of infected aerosols
HIV/AIDS	The first documented case was in 1959 in the Congo. As of 2011, over 60 million people were affected and 25 million had died.	Flu-like symptoms Rapid weight loss Night sweats Extreme exhaustion Swollen lymph glands Prolonged diarrhea Sores on the mouth, anus, or genitals Pneumonia Skin blotches Memory loss Depression	Bloodborne pathogen
Cholera	This disease affects millions of people each year, killing over a hundred thousand. An example of the impact of harmful organisms transmitted by eating food or drinking water contaminated with the cholera bacterium.	Diarrhea Vomiting Leg cramps Loss of body fluids	Ingestion

Chapter 1: Introduction to Infectious Diseases

Handout 2: Recent and Historic Disease Outbreaks (continued)



Handout 2

Recent and Historic Disease Outbreaks

Disease	History	Symptoms	Route(s) of Transmission
E. coli	Escherichia coli are bacteria found in the environment, foods, and intestines of people and animals.	Diarrhea Urinary tract infection Respiratory illness Pneumonia Severe cramps Vomiting	Contaminated food
SARS	SARS started in China in 2002 and spread to 37 countries worldwide through airplane travel. SARS demonstrated how quickly viruses spread in a world that is 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 be sexually transmitted

Exercise 3: Categories of Infectious Diseases

Exercise 3: Categories of Infectious Diseases

 30
Minutes

Objective

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

Display Slides 14 and 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 3: *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 1–10 to 1–12 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.)

Display Slide 19. Ask participants if they have ever seen or heard of an autoclave, and if they know what it is used for. Have pairs discuss their answers, and then ask volunteers to share their information with the class. Explain that an autoclave is a strong, heated container that is used for chemical reactions and other processes using high pressures and temperatures. This process results in inactivation of the Category A biological agents, meaning that they no longer pose the same level of threat to workers. Inactivated Category A material is reclassified as Category B waste.

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.



SL 14 to 19



HO 3: Categories of
Infectious Diseases



PG: 1–10 to 1–12

Chapter 1: Introduction to Infectious Diseases

Handout 3: Categories of Infectious Diseases



Handout 3

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) and seasonal influenza virus.
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 previously but which 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 rubella (German measles) and Zika virus.
13. B Are not generally capable of causing permanent disability or life-threatening or fatal disease.
14. B Require CDC's diagnostic capacity and enhanced disease surveillance.
15. A Might cause public panic and social disruption.
16. B Include bacteria such as *E. coli* and salmonella.
17. C Are easy to produce and disseminate.
18. A Include bloodborne pathogens such as HIV/AIDS, hepatitis B, and hepatitis C.
19. C Have the potential for high morbidity and mortality rates and major health impact if engineered for mass dissemination.

Infectious Disease Operations

Exercise 4: Exposure, Risk, and Controls

Exercise 4: Exposure, Risk, and Controls

 70
Minutes

Objectives

6. List occupations that are at risk from infectious disease exposure.
7. Define biosafety.
8. Explain the key elements in assessing risks for occupational exposure to infectious diseases.

Display Slide 20. Open the lesson by asking, “What types of occupations are most likely at risk for exposure to infectious diseases on the job?” 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 list of occupations that the class generated with those listed on the slide. Explain that only a few industries, such as medical laboratories and healthcare facilities, have set up regular practices specifically for working around infectious 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 4: *Exposure, Risk, and Controls*. Have participants work in groups to complete the handout. Tell them to use PG pages 1–13 to 1–18 as a reference. (You may wish to divide the questions up and assign 1–2 questions to each group.)

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.



SL 20 to 22



PG: 1–13 to 1–18



HO 4: Exposure, Risk,
and Controls



Handout 4 Exposure, Risk, and Controls

Instructions: Write answers to the questions.

1. What types of issues should be considered in an exposure assessment for an infectious disease worksite?

Occupational exposure limits

Virulence (the severity or harmfulness of a disease) Airborne or surface concentration

Infectious dose

2. What are some of the key considerations in a risk assessment with regard to sources and pathways for potential exposure to infectious diseases?

Will job tasks include potential exposure to infectious materials?

What is the proximity of workers to the contagious individual, contaminated waste, surfaces/equipment, or animals?

Will workers be at risk for exposure through contact, splash, inhalation, ingestion, or injection?

Will job tasks, work environment, fatigue, and related factors increase risk of exposure or illness?

3. What types of information about pathogens can help determine risk levels and effective controls on an infectious disease worksite?

Pathogenicity, virulence, and infectious dose

Severity of potential health effects

Environmental survivability and transmission

Potential for sprays, splashes, and aerosols generated during work-related procedures

Effectiveness of existing controls

Handout 4: Exposure, Risk, and Controls (continued)



Handout 4 Exposure, Risk, and Controls

4. 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.

5. 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?

6. What are Standard and Expanded Precautions?

Standard Precautions reduce the risk of disease transmission.

Standard Precautions are designed to reduce the risk of transmission of microorganisms, from both recognized and unrecognized sources of infection in hospitals.

Expanded Precautions are designed for patients documented or suspected to be infected with highly-transmissible or epidemiologically-important pathogens, for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals.

Chapter 1: Introduction to Infectious Diseases

Summary



10
Minutes

Summary

Distribute *Chapter 1: Things to Remember.*

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

Display Slides 5 to 6 and briefly review the chapter 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.

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

Address any questions or concerns.



Chapter 1: Things
to Remember



SL 5 to 6



PG: 1-18

Chapter 1: Things to Remember



Chapter 1: Introduction to Infectious Diseases Things to Remember

1. 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.
2. 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 in 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 talks. 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.
3. Recent or historic outbreaks of an infectious disease include: bubonic plague, 1918 Spanish flu, HIV/AIDS, cholera, E. coli, SARS, Ebola, and Zika (among others).
4. Some examples of infectious diseases, their routes of transmission, and symptoms, include the following:
 - Cholera is transmitted through ingestion; it doesn't usually spread from person to person. Its symptoms include diarrhea, vomiting, and leg cramps. Rapid loss of body fluids can lead to dehydration and shock.
 - 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. 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.
 - **Emerging Infectious Diseases:** NIAID also lists several emerging infectious diseases. These have newly appeared or have existed previously but which are rapidly increasing in incidence.

Chapter 1: Introduction to Infectious Diseases

Chapter 1: Things to Remember (continued)



Chapter 1: Introduction to Infectious Diseases

Things to Remember

6. 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.
7. Biosafety is the discipline addressing the safe handling and containment of infectious microorganisms and hazardous biological materials.
8. 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.

