Postexposure Evaluation and Follow-up

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CE Credits: 1 hour
Intended Audience: Dentists, Dental Hygienists, Dental Assistants, Dental Students, Dental Hygiene Students, Dental Assistant Students
Date Course Online: 09/01/2015
Last Revision Date: 08/31/2020
Course Expiration Date: 08/30/2023
Cost: Free
Method: Self-instructional
AGD Subject Code(s): 148

Online Course: *www.dentalcare.com/en-us/professional-education/ce-courses/ce472*

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Please Note:

- This course may not satisfy individual state requirements on CDC/Infection Control. Please check with your State Board to verify.
- **Iowa Dental Professionals:** This course complies with the Iowa Dental Board for recertification in the area of infection control standards, as established by the Centers for Disease Control and Prevention (CDC).

Conflict of Interest Disclosure Statement

- Dr. Huber has done consulting work for Procter & Gamble and serves on the dentalcare.com Advisory Board.
- Dr. Terézhalmy has done consulting work for Procter & Gamble and has served on the dentalcare.com Advisory Board.

Introduction

Participants in this course will be introduced to the concept of postexposure management of healthcare personnel and will be provided evidence-based guidance on the importance of prompt wound care, reporting, and evaluation of occupational exposures to pathogenic organisms, the timely initiation of postexposure prophylaxis, and the implementation of postexposure follow-up strategies in order to prevent infection and the development of disease.

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Overview

Participants in this course will be introduced to the concept of postexposure management of healthcare personnel and will be provided evidence-based guidance on the importance of prompt wound care, reporting, and evaluation of occupational exposures to pathogenic organisms, the timely initiation of postexposure prophylaxis, and the implementation of postexposure follow-up strategies in order to prevent infection and the development of disease.

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Discuss the concept of postexposure prophylaxis.
- Discuss elements of a successful postexposure response to an occupational exposure.
- Demonstrate familiarity with strategies for postexposure prophylaxis (PEP) following exposure to blood and potentially infectious material (OPIM).
- Initiate in a timely manner the cascading steps in response to an occupational exposure.

Introduction

Adherence to the principles of Standard and Transmission-based Precautions is the best means to minimize occupational exposure to blood and other potentially infectious material (OPIM).[1-3] However, occupational exposures still occur. Healthcare facilities should have the organizational infrastructure that promotes a seamless response following such events to facilitate timely access (during all working hours) of exposed healthcare personnel (HCP) to physicians familiar with strategies to prevent postexposure healthcare-associated infections (HAIs).

The term HCP refers to all paid and unpaid persons working in healthcare settings who have the potential for exposure to blood and other potentially infectious material (OPIM).[4] HCP include, but are not limited to, emergency medical service personnel, dental personnel, laboratory personnel, nurses, nursing assistants, physicians, technicians, therapists, pharmacists, students and trainees, and persons not directly involved in patient care but potentially exposed to blood and OPIM (e.g., clerical, dietary, housekeeping, security, maintenance, and volunteer personnel).

An exposure that might place HCP at risk for HAIs is defined as an event that results in the transfer of pathogenic organisms from a source to a host by contact transmission, i.e., direct or indirect contact transmission; or respiratory transmission, i.e., inhalation of droplets or droplet nuclei (airborne transmission).[2,3] Droplets and droplet nuclei are generated

when people talk, breath, cough, or sneeze; or when water is converted to a fine mist by medical/dental devices, such as high-speed handpieces, ultrasonic instruments, or by lasers and electrosurgical units.[2,3]

Pathogenic organisms associated with HAIs may be the result of person-to-person transmission, but contaminated patient-care items and environmental sources are also implicated.[1-3] Source persons may be patients, other HCP, visitors to the healthcare facility, and household members. A source person may have acute infection or may be transiently or chronically colonized by pathogenic organisms. It is also of importance to recognize the source person with an acute or chronic infection may be asymptomatic.

All HCP should be familiar with postexposure management strategies such as procedures for proper wound care and prompt reporting of an exposure. Postexposure evaluation, initiation of postexposure prophylaxis (PEP), and postexposure follow-up is to be performed by a physician familiar with strategies to prevent postexposure HAIs.[4] PEP is any preventive medical treatment (e.g., administration of vaccines, immune globulins, or antibacterial agents) started in a timely manner after exposure to a pathogenic virus or bacteria in order to prevent infection and the development of disease.

Healthcare-associated Exposure to Bloodborne Pathogens

An exposure that might place HCP at risk for HAIs with bloodborne pathogens (i.e., infection with hepatitis B, hepatitis C, or human immunodeficiency viruses) is defined as a (1) percutaneous injury (e.g., needlesticks or cuts with sharp objects), (2) direct contact of ocular, nasal, or oral mucous membranes, or (3) direct contact of nonintact skin (e.g., dermatitis, or chapped or abraded skin) with blood and OPIM.[4]

Percutaneous wounds and nonintact skin that have been in contact with blood or OPIM should be washed with soap and water; mucous membranes should be flushed with water.[5] Using antiseptics (e.g., chlorhexidine) for wound care or expressing fluid by squeezing the wound have not been shown to reduce the risk for infection. Injecting antiseptics or disinfectants into the wound and the application of caustic agents (e.g., bleach) is not recommended.

PEP intended to prevent HAIs is most effective when administered as soon after an exposure as possible (ideally within hours). Consequently, immediately after wound care, the exposure must be reported to the Office Infection Control Officer and the circumstances of the incident documented in accordance with all federal and state mandates.[1,2,4] The report must include the date and time of exposure and details of the event (Box A).

Following an exposure to blood and OPIM, the potential to transmit HBV, HCV, and HIV will depend on the type of body fluid involved and the route and severity of the exposure.[4] Exposures to blood and OPIM through percutaneous injuries (i.e., needlesticks or other penetrating sharps-related events) or through direct contact with mucous membrane are situations that pose the greatest risk of bloodborne pathogen transmission in oral healthcare settings.

Exposure to a blood-filled hollow needle or visibly bloody instruments and other medical/dental devices suggests a higher risk than exposure to a needle that was used for administering an injection, e.g., a local anesthetic. Skin exposure to blood and OPIM, when the integrity of the skin is compromised (e.g., dermatitis, abrasion, or open wound), may potentially result in a healthcare-associated infection.

If the exposure incident was related to a human bite, possible exposure of both the person bitten and the person who inflicted the bite must be considered, especially if the bite resulted in bleeding. In addition, any direct contact (i.e., personal protective equipment was not used or was ineffective in protecting skin or mucous membranes) with concentrated HBV, HCV, or HIV in a research laboratory is considered a significant exposure incident.

The next step in data collection relates to the exposure source. The person whose blood or

Box A. Recommendations for the Content of an Occupational Exposure Report.[4]

- Date and time of exposure
- Details of the procedure being performed
    - Where and how the exposure occurred
    - If related to a sharp device, the type and brand of device
    - How and when in the course of handling the device the exposure occurred
- Details of the exposure
    - Type and amount of source material
        - Blood
        - OPIM
        - Direct contact with concentrated virus (research laboratory)
- Type of exposure
    - Percutaneous injury
        - Depth of injury
        - Whether blood or OPIM was injected
    - Mucous membrane exposure
        - Estimated volume of blood or OPIM
    - Nonintact skin exposure
        - Condition of the skin (e.g., chapped, abraded, open wound)
    - Bites resulting in blood exposure to either person involved

OPIM is the source of an occupational exposure should be evaluated for HBV, HCV, and HIV infection (Box B). Information already available in the chart of the source person at the time of exposure (e.g., medical history and/or laboratory test results) or other information obtained from the source person might provide clues to potential infection with a bloodborne pathogen.

If the infectious status of the source person is unknown, he/she should be informed of the incident and after obtaining informed consent (in accordance with applicable state and local laws) should be tested for serologic evidence of HBV, HCV, and HIV infection. A source person determined to be infected with HBV, HCV, or HIV should be referred for medical treatment and counseling. Confidentiality of the source person must be maintained at all times.

If the source of blood or OPIM is unknown, information about where and under what circumstances the exposure occurred should be assessed. An important consideration is the prevalence of HBV, HCV, or HIV in the population from which the contaminated source material is derived. An exposure related to a community where injection-drug use is prevalent would present a higher risk for transmission than one related to a nursing home for the elderly.

Ideally, within 2 hours of exposure to a bloodborne pathogen, exposed HCP should undergo postexposure evaluation by an expert consultant (a physician knowledgeable about occupational transmission and one who can deal with the many concerns of an exposed person). Exposed HCP should present for the evaluation with (1) the incident report, (2) all available information about the source person, and (3) his/her OSHA-mandated medical record maintained by the employer (Box C).[1-3]

Hepatitis B Virus (HBV)

The need for PEP should be evaluated immediately after HCP experience any percutaneous, ocular, mucous-membrane or nonintact skin exposure to blood and OPIM. Unvaccinated or incompletely vaccinated HCP exposed to a HBsAg-positive source person

Box B. Information to be Obtained From or About the Exposure Source.[4]

- Infectious status of the source person
    - History of HBV, HCV, or HIV infection
    - Laboratory test results
        - Hepatitis B surface antigen (HBsAg)
        - Anti-hepatitis C antibody
        - Anti-HIV antibody
            1. If the source person is HIV-infected
                i. Stage of disease
                ii. History of antiretroviral therapy
                iii. Viral load
                iv. Antiretroviral resistance information

Box C. Content of an OSHA-mandated Medical Record.[1-3]

- Vaccination status
  - Dates of vaccinations (where appropriate or available)
  - Evidence of immunity (where applicable or available)
  - Documentation related to the individual's inability to receive the vaccinations mandated or highly recommended
  - A signed copy of the mandatory hepatitis B vaccination declaration (if applicable)
- A copy of all previous exposure reports (if applicable)

should receive HBV PEP as soon as possible (preferably within 24 hours) after exposure.[5] The HBIG and the first dose of the HepB vaccine (if indicated) can be administered simultaneously at separate sites (HepB vaccine should always be administered in the deltoid muscle).

Expert counseling is recommended for susceptible HCP exposed to the HBV, especially in cases of known or suspected pregnancy, breastfeeding, or serious medical illnesses. Additional information should be provided on any special precautions to prevent secondary transmission of the HBV during the follow-up period, current information on how to modify sexual practices and strategies to prevent pregnancy, and on donating blood, plasma, organs, tissue, or semen.[4]

No modifications of patient-care responsibilities are necessary based solely on an exposure to HBV-positive blood or OPIM.[4] If an exposed person becomes acutely infected with the HBV, the person should be evaluated according to published recommendations for infected healthcare providers. Those who are chronically infected with the HBV should ensure adherence to the principles of Standard and Transmission-based Precautions and all other recommendations.[6,7]

Hepatitis C Virus (HCV)

Immune globulin (IG) and antiviral agents are not recommended for PEP after exposure to HCV-positive blood or OPIM.[4] In addition, no guidelines exist for the prevention of acute HCV infection. However, data indicate that antiviral therapy might be beneficial when initiated early in the course of an acute HCV infection.[4] Recommendations for postexposure evaluation and follow-up are intended to achieve early diagnosis of HCV infection.

Expert counseling is recommended for HCP exposed to the HCV, especially in cases of known or suspected pregnancy, breastfeeding, or serious medical illnesses. Additional information should be provided on any special precautions to prevent secondary transmission of the HCV during the follow-up period, current information on how to modify sexual practices and strategies to prevent pregnancy, and on donating blood, plasma, organs, tissue, or semen.[4]

No modifications of patient-care responsibilities are necessary based solely on an exposure to HCV-positive blood or OPIM.[4] If an exposed person becomes acutely infected with the HCV, the person should be evaluated according to published recommendations for infected healthcare providers. Those who

are chronically infected with the HCV should ensure adherence to the principles of Standard and Transmission-based Precautions and all other recommendations.[6,7]

Human Immunodeficiency Virus (HIV)

U.S. Public Health Service (PHS) guidelines emphasize the importance of strict adherence to (1) the principles of Standard Precautions, (2) prompt reporting of an exposure (3) expert management of occupational exposures, (4) adherence to the recommended HIV PEP regimen, and (5) follow-up of exposed HCP including careful monitoring for adverse events related to PEP and for virologic, immunologic, and serologic signs of infection.[8]

If the infectious status of the exposure source is unknown, he/she should be tested for serologic evidence of HIV infection. If the source person is seronegative, baseline testing and further follow-up of exposed HCP normally is not necessary. If the exposure source is unknown, the likelihood of exposure to a source at high risk is based on a determination of the risk or prevalence of HIV infection among patients in the exposure setting.

Following occupational exposure to HIV PEP is to be initiated within 72 hours (ideally within hours) of exposure.[8] Initiation of PEP should not be delayed while awaiting test results. If PEP is initiated and the source person is later determined to be HIV negative, PEP should be discontinued, and no further follow-up testing is indicated for expose HCP.

Expert counseling is recommended for those exposed to the HIV, especially in cases of known or suspected pregnancy, breastfeeding, or serious medical illnesses. Those offered PEP should be provided information about possible drug toxicities and drug-drug interactions. Additional guidance should be given on how to prevent sexual transmission of HIV and about donating blood, plasma, organs, tissue, or semen during the follow-up period.

The patient-care responsibilities do not need to be modified based solely on an HIV exposure; however, they should be advised to seek medical evaluation for any acute illness that occurs during the follow-up period, especially within the first 6 to 12 weeks after exposure when most HIV-exposed persons are expected to seroconvert. If HIV seroconversion is detected, the person should be evaluated according to published recommendations for infected HCP.[6,7]

Healthcare-associated Exposure to Measles, Mumps, or Rubella Viruses

If measles, mumps, or rubella exposure occurs in a healthcare setting, all case-patient contacts should be evaluated immediately for presumptive evidence of measles, mumps, or rubella immunity.[9-11] Persons are considered immune only if they have documentation of:

1. physician-diagnosed measles, mumps, or rubella infection
   or
2. laboratory evidence of measles, mumps, or rubella immunity
   or
3. appropriate vaccination against measles, mumps, and rubella
   or
4. birth before 1957.

Measles

The measles virus is transmitted from person-to-person primarily by direct contact with respiratory secretions or by inhalation of airborne droplets generated by coughing or sneezing. Exposed HCP without evidence of immunity to the measles virus should be offered the MMR vaccine and an intramuscular dose of immune globulin (IG).12 Available data suggests that the live measles vaccine, if administered within 72 hours of exposure, will prevent or modify the disease. Exposed HCP should be closely monitored for sign(s) of illness.

Mumps

The mumps virus is transmitted from person-to-person primarily by direct contact with saliva or by inhalation of airborne droplets generated by coughing or sneezing. Exposed HCP without evidence of immunity to the mumps virus should be offered the MMR vaccine.[12] However, antibodies develop slowly to the mumps component of the vaccine to provide effective prophylaxis after exposure and IG is

not routinely recommended for postexposure prophylaxis for mumps. Exposed HCP should be closely monitored for sign(s) of illness.

Rubella (German measles)
The rubella virus is transmitted from person-to-person primarily by direct contact with respiratory secretions or by inhalation of airborne droplets generated by coughing or sneezing. There is no evidence that postexposure vaccination is effective in preventing rubella infection. IG administered within 72 hours of exposure might reduce the risk (infants with congenital rubella have been born to women who received IG shortly after exposure).[12] Exposed HCP should be closely monitored for sign(s) of illness.

Healthcare-associated Exposure to the Herpes Simplex Virus (HSV)

The HSV is transmitted from person-to-person primarily by direct contact with vesicular fluid and contaminated saliva; less frequently, by touching freshly contaminated articles and environmental surfaces. There is no PEP available. When a person with probable or confirmed herpetic infection visits an oral healthcare facility, elective and routine care should be deferred until lesion resolution. When rendering necessary emergency care, strict adherence to the principles of Standard and Transmission-based Precautions is the best means to minimize occupational exposure.[2,3] Exposed HCP should be closely monitored for sign(s) of infection.

Healthcare-associated Exposure to the Varicella-Zoster Virus (VZV)

The VZV is transmitted from person-to-person primarily by direct contact with vesicular fluid; inhalation of droplet nuclei from infected respiratory secretions; and less frequently, by contact with freshly contaminated articles and environmental surfaces. If VZV exposure occurs in a healthcare setting, all case-patient contacts should be evaluated immediately for presumptive evidence of immunity.[13] Persons are considered immune only if they have documentation of:

1. physician-diagnosed varicella (chickenpox)
   or
2. physician-diagnosed herpes zoster
   or
3. laboratory evidence of VZV immunity
   or
4. age-appropriate vaccination against the VZV.

All susceptible HCP exposed to the VZV should receive PEP with two subcutaneous doses (4-8 weeks apart) of the varicella-zoster vaccine (*Varivax*) as soon as possible, but ideally no later than 120 hours of an exposure.[12] HCP who have received the vaccine more than 5 days after the exposure should be excluded from duty for 8-21 days after exposure.[12]

Susceptible HCP exposed to the VZV for whom the vaccine is contraindicated should be administered varicella-zoster immunoglobulin (VZIG) no later than 96 hours of an exposure.[12] This recommendation also applies to women exposed to the VZV at any stage of pregnancy. The VZIG product currently used in the United States is *VariZIG*™.

Healthcare-associated Exposure to the Human Papilloma Virus (HPV)

The HPV is transmitted from person-to-person primarily by direct contact through cuts, small tears, or abrasions in skin or mucous membranes. While vaccines are available for active immunization of HPV-susceptible individuals, there is no recommendation for PEP.[12] When a person with probable or confirmed HPV infection visits an oral healthcare facility, strict adherence to the principles of Standard and Transmission-based Precautions is the best means to minimize occupational exposure.[2,3] Exposed HCP should be monitored for sign(s) of infection.

Healthcare-associated Exposure to Influenza Viruses

Influenza viruses are transmitted from person-to-person primarily by inhalation of airborne droplets generated by coughing or sneezing; less frequently by contact with freshly contaminated articles and environmental surfaces. It is strongly recommended that HCP be vaccinated annually. Antiviral drugs for PEP can be administered to unvaccinated HCP (1) during outbreaks of influenza, (2) following exposure to a person with influenza,

or (3) after exposure to a strain against which vaccination is not protective.[12]

PEP with either oseltamivir or zanamivir, 1 dose daily for 10 days, is effective if initiated before the onset of illness.[12] However, following healthcare-associated exposures, watchful waiting and early treatment (when signs and symptoms of infection appear) is preferred to PEP. Treatment consists of 1 dose twice daily for 5 days with either oseltamivir or zanamivir. These antiviral agents appear to be effective against both influenza A and B viruses.

Healthcare-associated Exposure to SARS-CoV-2 Virus

The COVID-19 pandemic is caused by the novel **SARS-CoV-2** virus. SARS-CoV-2 is transmitted from person-to-person primarily by inhalation of airborne droplets or nuclei generated by coughing or sneezing; less frequently by contact with freshly contaminated articles and environmental surfaces.[14] There currently exist no vaccine or PEP for SARS-CoV-2. On April 30, 2020 the CDC updated interim guidance addressing return to work criteria for HCP with confirmed or suspected COVID-19, summarized as follows:

For symptomatic HCP with suspected or confirmed COVID-19, exclude from work until:

- At least 3 days (72 hours) have passed since recovery defined as resolution of fever without the use of fever-reducing medications **and** improvement in respiratory symptoms (e.g., cough, shortness of breath); **and**,
- At least 10 days have passed *since symptoms first appeared*.[15]

OR

- Resolution of fever without the use of fever-reducing medications **and**
- Improvement in respiratory symptoms (e.g., cough, shortness of breath), **and**
- Negative results of an FDA Emergency Use Authorized COVID-19 molecular assay for detection of SARS-CoV-2 RNA from at least two consecutive respiratory specimens collected ≥24 hours apart (total of two negative specimens.[15]

For HCP with laboratory-confirmed COVID-19 who have not had any symptoms, exclude from work until:

- 10 days have passed since the date of their first positive COVID-19 diagnostic test assuming they have not subsequently developed symptoms since their positive test. If they develop symptoms, then the *symptom-based* or *test-based strategy* should be used. Note, because symptoms cannot be used to gauge where these individuals are in the course of their illness, it is possible that the duration of viral shedding could be longer or shorter than 10 days after their first positive test.[15]

OR

- Negative results of an FDA Emergency Use Authorized COVID-19 molecular assay for detection of SARS-CoV-2 RNA from at least two consecutive respiratory specimens collected ≥24 hours apart (total of two negative specimens). Note, because of the absence of symptoms, it is not possible to gauge where these individuals are in the course of their illness.[15]

An infectious disease expert should be consulted in when making return to work decisions for HCP who might remain infectious longer than 10 days (e.g., severely immunocompromised).

Healthcare-associated Exposure to *Mycobacterium tuberculosis* (MBT)

HCP should obtain a baseline tuberculin skin test (TST), preferably a two-step TST, at the beginning of employment.[16] A positive TST indicates prior exposure to MBT. An exposed person may develop latent TB infection (LTBI). Immunocompetent patients with LTBI have a 10% life-time risk to develop tuberculosis (TB). Those with LTBI are asymptomatic and are non-infectious. Following reexposure, HCP with LTBI require no further testing or PEP.

HCP with a negative TST, in case of unprotected occupational exposure, are susceptible to infection. MBT is transmitted from person-to-person primarily by inhalation

of droplets and droplet nuclei generated by talking, coughing, or sneezing. As soon as possible after an exposure to a patient with TB disease, a TST or a blood assay for *Mycobacterium tuberculosis* (BAMT) should be done on HCP known to have had negative results on previous testing.[16]

HCP with a previously negative TST or BAMT who subsequently have a positive TST result (a reaction ≥5 mm) or a positive BAMT result should be evaluated for treatment of LTBI. Treatment of LTBI, which should be initiated after the possibility of TB disease has been excluded, greatly reduces the risk of TB disease. The four treatment regimens include isoniazid (6 months), isoniazid (9 months), isoniazid and rifapentine (3 months), or rifampin (4 months).[17]

Healthcare-associated Exposure to *Clostridium tetani, Corynebacterium diphtheriae,* and *Bordetella pertussis*

Four trivalent vaccines are available to prevent diphtheria, tetanus, and pertussis: DTaP, DT, Tdap, and Td.[18] The upper-case letters "D," "T," and "P" denote full-strength doses of diphtheria, tetanus toxoid and pertussis, respectively. The lower-case letters "d" and "p" denote reduced doses of diphtheria and pertussis used in the adolescent/adult-formulations. The "a" in DTaP and Tdap stands for "acellular," i.e., the pertussis component of the vaccine contains only a part of the organism. Vaccinated HCP should receive a booster dose of Td (or Tdap) every 10 years.

Clostridium tetani (C. tetani)

C. tetani usually enter the body through cuts or puncture wounds caused by contaminated objects. Following exposure, HCP who have not or are unsure if they have previously been vaccinated should receive PEP, i.e., a dose of Tdap as soon as feasible.[18] Exposed HCP should be monitored closely and human tetanus immune globulin (TIG), agents to control muscle spasm, and antibacterial agents should be administered at the first sign(s) of illness.[18]

Corynebacterium diphtheriae (C. diphtheriae)

C. diphtheriae is transmitted from person-to-person by direct contact with respiratory secretions or by inhalation of airborne droplets generated by coughing or sneezing.[19] HCP in close contact with patients with diphtheria should be administered PEP, i.e., a dose of diphtheria toxoid booster Td) and antibacterial agents (benzathine penicillin G or oral erythromycin).[12,19] Exposed HCP should be monitored closely and diphtheria antitoxin administered at the first sign(s) of illness.[19]

Bordetella pertussis (B. pertussis)

B. pertussis is transmitted from person-to-person by direct contact with respiratory secretions or by inhalation of airborne droplets generated by coughing or sneezing.[20] If there is an increased risk of pertussis in a healthcare setting, evidenced by documented or suspected healthcare-associated transmission of pertussis, revaccination of HCP with Tdap should be considered.[12] Revaccination may benefit individual healthcare providers.

However, there is no evidence that revaccination of HCP will prevent pertussis disease and transmission in healthcare settings. The CDC recommends that exposed HCP receive PEP, i.e., antibacterial prophylaxis within 21 days of exposure when (1) the healthcare provider is at high risk of developing severe pertussis or (2) when close contact with patients at high risk of developing severe pertussis is anticipated.[12]

Healthcare-associated Exposure to *Neisseria meningitidis (N. meningitidis)*

N. meningitidis is transmitted from person-to-person by direct contact with respiratory secretions and saliva and by inhalation of airborne droplets generated by coughing or sneezing. HCP with close or lengthy contact with a patient with meningococcal disease are considered at increased risk of infection and should receive PEP, i.e., antibacterial prophylaxis.[21] Close monitoring for respiratory depression and severe hypotension is recommended.

Healthcare-associated Exposure to *Streptococcus pneumoniae (S. pneumoniae)*

S. pneumoniae is transmitted from person-to-person by direct contact with respiratory secretions and saliva and by inhalation of

airborne droplets generated by coughing and sneezing.[22] It is uncommon for contacts to develop pneumococcal infection; hence no PEP is required. Exposed HCP should be closely monitored for sign(s) of illness.[22] Early diagnosis and treatment with an antibacterial agent is the cornerstone of treating pneumococcal infections.

Healthcare-associated Exposure to Methicillin-resistant *Staphylococcus aureus* (MRSA)

MRSA is primarily transmitted by direct contact with an infected skin lesion; less frequently by contact with contaminated articles and environmental surfaces.[23] PEP is not recommended. Exposed HCP should be monitored for skin lesions, i.e., redness, warmth, swelling, fluctuance, draining pus, fever, and pain at sites that initially may have looked like "spider bites." Incision and drainage and empirical adjunctive antibacterial coverage are the first step in treating purulent skin infections.[23]

Healthcare-associated Exposure to the Hepatitis A Virus (HAV)

The HAV is transmitted primarily by the fecal-oral route, either person-to-person, i.e., close personal contact with an infected household member or sex partner; or consumption of contaminated food or water.[24] HCP with close personal contact with HAV-infected patients should be tested for anti-HA. Anti-HA-positive HCP who have not been vaccinated previously should be administered PEP, i.e., a single dose of hepatitis A vaccine (*Vaqta* or *Havrix*) or immune globulin (IG) within 2 weeks after exposure.[24]

Basic Expectations for Safe Care

A Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care published by the CDC in 2016 includes an Infection Prevention Checklist for Dental Settings (Appendix A).[25] The Infection Prevention Checklist, Section I: Policies and Practices, Subsection I.3, provides an instrument to monitor institutional compliance with administrative requirements intended to fulfill basic expectations for Dental Health Care Personnel Safety.[23]

Summary

Primary prevention, i.e., strict adherence to the principles of Standard and Transmission-based precautions is the best means of preventing occupational exposure to blood and OPIM. When an occupational exposure does occur, immediate wound care (when applicable), prompt reporting of the incident, timely postexposure evaluation and initiation of PEP followed by expert follow-up and counseling are the cornerstones to prevent infection and the development of disease.

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: *www.dentalcare.com/en-us/professional-education/ce-courses/ce472/test*

1. All of the following statements are correct with reference to occupational exposure of healthcare personnel (HCP) EXCEPT which one?

A. Healthcare facilities should have the organizational infrastructure that promotes a seamless response following an occupational exposure of HCP.
B. The term HCP refers to all paid and unpaid persons working in healthcare settings who have the potential for exposure to blood and OPIM.
C. The term HCP include emergency medical service personnel, dental personnel, laboratory personnel, nurses, nursing assistants, physicians, technicians, therapists, pharmacists, and students and trainees.
D. The term HCP does not include persons not directly involved in patient care (e.g., clerical, dietary, housekeeping, security, maintenance, and volunteer personnel).

2. All of the following statements related to an exposure that might place HCP at risk for HAIs are correct EXCEPT which one? The transfer of pathogenic organisms from a source to a host may be the result of _____.

A. direct contact transmission
B. indirect contact transmission
C. respiratory transmission, i.e., inhalation of droplets or droplet nuclei (airborne transmission)
D. droplets and droplet nuclei are only generated by medical/dental devices, such as high-speed handpieces, ultrasonic instruments, or by lasers and electrosurgical units

3. All of the following statements related to a source person are correct EXCEPT which one?

A. The source person may be a patient, another HCP, a visitor to the healthcare facility, or a house-hold member.
B. A person with asymptomatic acute or chronic infections, in general, is non-infectious and does not qualify as a source person.
C. The source person may have acute infection or may be transiently or chronically colonized by pathogenic organisms.
D. The source person with an acute or chronic infection may be asymptomatic.

4. All of the following statements are correct with reference to postexposure management strategies EXCEPT which one?

A. All HCP should be familiar with postexposure management strategies such as procedures for proper wound care.
B. In a dental office, postexposure evaluation, initiation of postexposure prophylaxis (PEP), and postexposure follow-up is the responsibility of the dentist.
C. PEP is any preventive medical treatment, e.g., administration of vaccines, immune globulins, or antibacterial agents.
D. PEP started in a timely manner after exposure to a pathogenic virus or bacteria is intended to prevent infection and the development of disease.

5. An exposure that might place HCP at risk for HAIs with bloodborne pathogens (i.e., infection with hepatitis B, hepatitis C, or human immunodeficiency viruses) may include a percutaneous injury, e.g., needlestick or cut with a sharp object contaminated with blood or OPIM; direct contact of ocular, nasal, or oral mucous membranes with blood or OPIM; direct contact of nonintact skin, e.g., dermatitis, or chapped or abraded skin with blood and OPIM.

A. True
B. False

6. All of the following segments related to wound care are correct EXCEPT which one?

A. Percutaneous wounds and nonintact skin that have been in contact with blood or OPIM should be washed with soap and water.
B. Mucous membranes that have been in contact with blood or OPIM should be flushed with water.
C. Using antiseptics (e.g., chlorhexidine) for wound care or expressing fluid by squeezing the wound have been shown to reduce the risk for infection.
D. Injecting antiseptics or disinfectants into a wound and the application of caustic agents (e.g., bleach) is not recommended.

7. The content of an occupational exposure report should include the date and time of exposure and _____.

A. details of the procedures being performed
B. details of the exposure
C. type of exposure
D. history of high-risk behavior of the healthcare worker (other than occupation)

8. After exposure to a blood borne pathogen, all of the following elements regarding presentation for a post-exposure evaluation are true, EXCEPT for one. Which one is the exception?

A. Present within 2 days of the exposure incident
B. Present with the incident report
C. Present with all available information about the source person
D. Present with HCP's OSHA-mandated medical record maintained by the employer

9. All of the following statements related to HBV PEP are correct EXCEPT which one?

A. HBV PEP should be initiated as soon as possible (preferably within 24 hours) after exposure.
B. HBIG and the first dose of the HepB vaccine (if indicated) can be administered simultaneously.
C. The HepB vaccine should never be administered in the deltoid muscle.
D. Expert counseling is recommended for susceptible HCP exposed to the HBV.

10. All of the following statements related to exposure to the HCV are correct EXCEPT which one?

A. Immune globulin (IG) and antiviral agents are not recommended for PEP after exposure to HCV-positive blood or OPIM.
B. No guidelines exist for the prevention of acute HCV infection.
C. Data indicate that antiviral therapy is not beneficial even when initiated early during an acute HCV infection.
D. Recommendations for postexposure evaluation and follow-up are intended to achieve early diagnosis of HCV infection.

11. All of the following statements related to exposure to the HIV are correct EXCEPT which one? The latest U.S. Public Health Service (PHS) guidelines emphasize the importance of _____.

A. prompt reporting of expert management of occupational exposures
B. adherence to the recommended HIV PEP regimen
C. follow-up of exposed HCP to including careful monitoring for adverse events related to PEP and for virologic, immunologic, and serologic signs of infection
D. modified patient-care responsibilities of exposed HCP based solely on evidence of HIV exposure

12. All of the following statements related to exposure to measles, mumps, or rubella are correct EXCEPT which one?

A. If measles, mumps, or rubella exposure occurs in a healthcare setting, all case-patient contacts should be evaluated immediately for presumptive evidence of measles, mumps, or rubella immunity.
B. Exposed HCP without evidence of immunity to the measles virus should be offered the MMR vaccine and an intramuscular dose of immune globulin (IG).
C. Exposed HCP without evidence of immunity should be offered the MMR vaccine; however, antibodies develop slowly to the mumps component of the vaccine to provide effective prophylaxis after exposure.
D. There is strong evidence that postexposure vaccination is effective in preventing rubella infection.

13. All of the following statements related to exposure to the varicella-zoster virus (VZV) are correct EXCEPT which one?

A. If VZV exposure occurs in a healthcare setting, all case-patient contacts should be evaluated immediately for presumptive evidence of immunity.
B. All susceptible HCP exposed to the VZV should receive PEP with two subcutaneous doses (4-8 weeks apart) of the varicella-zoster vaccine (*Varivax*).
C. Women exposed to the VZV at any stage of pregnancy should receive the varicella-zoster vaccine (Varivax) no later than 96 hours of an exposure.
D. Susceptible HCP exposed to the VZV for whom the vaccine is contraindicated should be administered varicella-zoster immunoglobulin (VZIG).

14. All of following statements related to exposure to the influenza viruses are correct EXCEPT which one?

A. It is strongly recommended that HCP be vaccinated annually.
B. An antiviral drug for PEP is recommended following healthcare-associated exposure to the influenza viruses.
C. PEP with either oseltamivir or zanamivir, 1 dose daily for 10 days, is effective if initiated before the onset of illness.
D. Watchful waiting and early treatment (when signs and symptoms of infection appear) with an antiviral agent is preferred to PEP.
E. Antiviral agents, i.e., oseltamivir and zanamivir appear to be effective against both influenza A and B viruses.

15. All of the following statements related to exposure to *Mycobacterium tuberculosis* (MBT) are correct EXCEPT which one?

A. HCP should obtain a baseline tuberculin skin test (TST), preferably a two-step TST, at the beginning of employment.
B. HCP with a negative TST, in case of unprotected occupational exposure, are susceptible to infection.
C. HCP with a previously negative TST or BAMT who subsequently have a positive TST result (a reaction ≥5 mm) or a positive BAMT result should be evaluated for treatment of LTBI.
D. An exposed person may develop latent TB infection (LTBI), which is asymptomatic but highly infectious.

16. All of the following statements are related to *Clostridium tetani*, *Corynebacterium diphtheriae*, or *Bordetella pertussis* are correct EXCEPT which one?

A. Following exposure to *C. tetan*i, no PEP is indicated; exposed HCP should be monitored closely and human tetanus immune globulin (TIG) should be administered at the first sign(s) of illness.
B. HCP in close contact with patients with diphtheria should be administered PEP, i.e., a dose of diphtheria toxoid booster Td) and antibacterial agents.
C. HCP exposed to *B. pertussis* should receive PEP, i.e., antibacterial prophylaxis within 21 days of exposure when (1) at high risk of developing severe pertussis or (2) when close contact with patients at high risk is anticipated.
D. If there is an increased risk of pertussis in a healthcare setting, evidenced by documented or suspected healthcare-associated transmission of pertussis, revaccination of HCP with Tdap should be considered.

17. HCP with close or lengthy contact with a patient with meningococcal disease are considered at increased risk of infection and should receive PEP, i.e., antibacterial prophylaxis.

A. True
B. False

18. It is common for contacts of patients with *S. pneumoniae* infection to develop pneumococcal infection; PEP with an effective antibacterial agent is recommended.

A. True
B. False

19. Which of the following statements in reference exposure to methicillin-resistant *Staphylococcus aureus* (MRSA) is incorrect?

A. MRSA is primarily transmitted by direct contact with an infected skin lesion; less frequently by contact with contaminated articles and environmental surfaces.
B. PEP is highly recommended for HCP.
C. Exposed HCP should be monitored for skin lesions.
D. Incision and drainage and adjunctive antibacterial coverage are the first step in treating purulent skin infections.

20. All of the following statements in reference to exposure to the hepatitis A virus (HAV) are correct EXCEPT which one?

A. The HAV is transmitted primarily by the fecal-oral route, either person-to-person, i.e., close personal contact with an infected household member or sex partner, or consumption of contaminated food or water.
B. HCP with close personal contact with HAV-infected patients should be tested for anti-HA.
C. Anti-HA-positive HCP who have not been vaccinated previously should be administered PEP within 24 hours after an exposure.
D. PEP may be a single dose of hepatitis A vaccine or immune globulin (IG).

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Additional Resources

- No Additional Resources Available.

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