Prevention of Transmissible Infections in the Perioperative Practice Setting



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STUDY GUIDE

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IN THE PERIOPERATIVE PRACTICE SETTING"

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TABLE OF CONTENTS

OVERVIEW

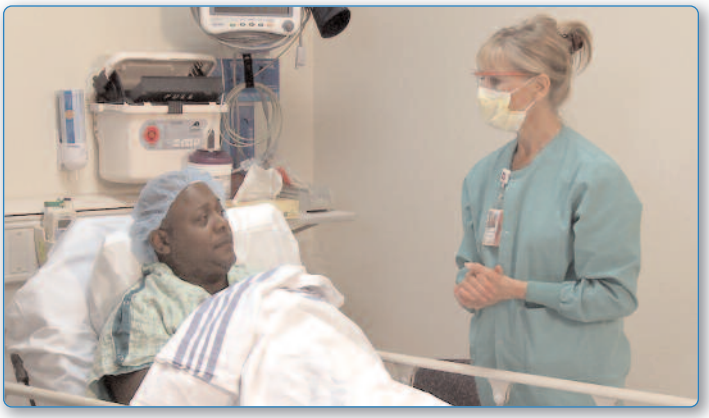
The content of this study guide is in accordance with the latest AORN "Recommended Practices for Prevention of Transmissible Infections in the Perioperative Practice Setting" and the evidence-based guidelines from the Centers for Disease Control and Prevention (CDC). All study guide content was current at the time of publication. Always consult the latest evidence-based guidelines for the most current infection prevention information.

OBJECTIVES

Upon completion of this activity, the learner will be able to:

- Identify the role of infection transmission in the development of health care-associated infections (HAIs).
- Explain basic HAI prevention techniques.
- Understand the methods used to determine immunity as a result of immunization for preventing vaccine-preventable diseases.
- Discuss the types of precautions used in the health care setting to minimize the risk of infection transmission.
- Describe the role of evidence-based practices in HAI prevention and reducing exposure risks for the perioperative nurse.

INTRODUCTION



Protecting patients and the surgical team from disease transmission is challenging because of the evolving nature of microorganisms. Thus, perioperative registered nurses should be proficient in techniques that protect both patients and health care providers from infection and exposure to infectious materials. Infection transmission to health care workers can result in lost workdays and even necessitate permanent exclusion of personnel from their direct patient care duties. Transmission of infectious diseases to patients can increase length of stay and the cost of health care.

HEALTH CARE-ASSOCIATED INFECTIONS

Health care-associated infections account for more than 2 million infections and 100,000 deaths annually in US hospitals alone. Surgical site infections account for 14% to 16% of all HAIs.[1]

In an effort to eliminate HAIs, the US Department of Health and Human Services issued its National Action Plan to Prevent Healthcare-Associated Infections: Roadmap to Elimination in April 2012.[2] As part of this national initiative, the Centers for Medicare & Medicaid Services (CMS) has developed a no tolerance approach to reimbursement for patient costs associated with HAIs and offers financial incentives to facilities that eliminate HAIs. The National Action Plan requires health care facilities accepting CMS funding to report selected HAI data to the National Healthcare Safety Network (NHSN) for increased transparency of quality data.[2] Rather than placing the burden of HAI costs on taxpayers, CMS uses HAI data from NHSN to calculate financial incentives for participating health care facilities. In addition to the incentive system, CMS expanded the value-based purchasing program to deny payment for selected HAIs. When a patient's medical record contains language that indicates the patient developed an HAI, the coder assigns a numerical code for the specific HAI, such as surgical site infection (SSI) after an orthopedic procedure. As part of value-based purchasing, CMS auditors use the HAI codes to determine payment and health care facilities do not receive reimbursement for costs associated with HAIs.

Many states also have legislation for mandatory HAI reporting to NHSN. This reporting assists state health departments with targeting surveillance on facilities with infection rates that are greater than the national average. Many states are also publicizing HAI data for increased transparency of the state of health care to the consumers. The effect of decreased funding to health care facilities remains largely unknown. Many facilities have increased efforts for infection prevention and control to approach zero HAIs.

To confound the health care financial climate, legislation gives health care providers uncertainty in planning for the future of health care costs and reimbursements. For example, the Patient Protection and Affordable Care Act is a major regulatory overhaul of the US health care system that will have a large effect on the cost of health care.[3]

TECHNIQUES FOR PREVENTING DISEASE TRANSMISSION

More importantly than the financial impact of HAIs, the potential for mortality from HAIs is paramount for understanding infection transmission and implementing evidence-based practices to prevent their occurrence. According to the CDC, there are three principle elements required for an infection to occur:

- a source or reservoir,
- a susceptible host with a portal of entry that would receive the infectious agent, and
- a method of transmission.

Efforts to reduce infection transmission and the development of HAIs should revolve around these principle elements. Evidence-based practice guidelines for infection prevention provide scientific support for HAI prevention strategies.

Techniques for preventing disease transmission in perioperative settings include:

- implementing standard and transmission-based isolation precautions;
- controlling the transmission of HAIs;
- offering health care workers immunizations against vaccine-preventable diseases;
- managing job-related exposures to infectious diseases and personnel illness;

- educating personnel about infection prevention and control measures;
- maintaining documentation for HAIs, exposure incidents, and personnel vaccination records;
- developing policies and procedures for control of disease transmission in collaboration with infection prevention and employee health personnel; and
- participating in quality improvement activities to monitor and prevent infections.

AORN recognizes that there are numerous types of settings in which perioperative nurses practice, which include not only the traditional OR setting, but also ambulatory surgery units, physician's offices, cardiac catheterization suites, endoscopy suites, and other areas where operative or other invasive procedures may be performed. Each of these environments presents unique hazards to patients for acquiring HAIs. As such, each facility should develop and implement a formal infection prevention and control plan and policy to mitigate the risk for HAI transmission.

Standard Isolation Precautions

AORN recommends that health care workers use standard isolation precautions when caring for all patients in the perioperative setting. In 1877, the first isolation precautions published in the United States recommended placing patients with infectious diseases in separate facilities.[4] Since that time, increased understanding of the mechanisms of disease transmission and its prevention has fostered the continuing evolution of accepted isolation precautions. Today, the Healthcare Infection Control Practices Advisory Committee (HICPAC) 2007 Guidelines for Isolation Precautions are the prevailing US standard of care for standard and transmission-based precautions.

Standard isolation precautions are the primary strategy for reducing HAIs by reducing the risk of transmission of pathogenic microorganisms, regardless of the source. Their implementation protects patients and health care workers from exposure to the following: blood, all body fluids, secretions, and excretions *except sweat*, whether or not they contain visible blood, nonintact skin, and mucous membranes.

In addition to standard isolation precautions, which are applicable across all phases of care, applications of further precautions are needed to maintain the integrity of the sterile field and thereby prevent disease transmission. The *AORN Recommended Practices for Sterile Technique* provide detailed guidance regarding aseptic practices.[5]

Perioperative team members should follow standard isolation precautions to prevent pathogen transmission during *all* invasive procedures. Standard isolation precautions constitute the primary strategy for minimizing personnel and patient exposure to disease-causing microorganisms. Depending on the degree of risk of exposure to blood, body fluids, secretions, and excretions, standard isolation precautions and related aseptic practices may include the use of:

- hand hygiene practices,
- personal protective equipment (PPE),
- environmental controls,
- respiratory hygiene and cough etiquette,
- safe injection practices, and
- safe textile and laundry handling practices.

Hand Hygiene

The World Health Organization identifies hand hygiene as the single most important intervention to reduce the transmission of infections.[6] Health care providers should adhere to either the CDC or World Health Organization guidelines for hand hygiene in health care settings. Health care providers should use traditional soap and water or a facility-approved, alcohol-based hand rub, which is available in gel, foam, or wipes, with alcohol concentrations from 60% to 90%.

Certain microorganisms, such as *Clostridium difficile*, require a modified approach to hand hygiene. Because of the spore-forming nature of this particular pathogen, health care providers should wash their hands with soap and water as opposed to traditional alcohol-based hand rubs.

Personal Protective Equipment

Health care providers should consider all patients as potentially infectious to ensure consistency in the use of precautions such as gloves and other PPE. The use of PPE

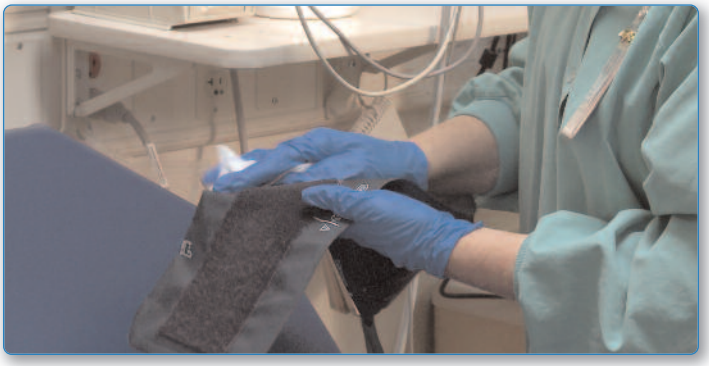
protects health care providers' mucous membranes, airway, skin, and clothing from coming into contact with blood, body fluids, and other potentially infectious materials (OPIM).

AORN recommends that perioperative personnel wear PPE when exposure to blood or OPIM is anticipated. The Occupational Safety and Health Administration (OSHA) requires all employers to provide appropriate PPE to health care providers, including perioperative nurses, to reduce the risk of skin and mucous membrane exposure to blood and body fluids or OPIM. Perioperative nurses should wear a gown and gloves when hand contact with blood or OPIM is likely to occur, which can include performing basic vascular access or catheter insertion procedures; coming into contact with contaminated patients or environmental surfaces; or touching contaminated patient care items.

Health care workers should wear fluid-resistant attire during any activities that may generate splashes, splatters, sprays, or aerosols of blood or OPIM. Appropriate attire can include gloves, gowns, and respiratory and eye protection. Some PPE, such as a respirator like the N95, requires special fitting to ensure an adequate protective seal.

Environmental Controls

Health care providers should perform environmental cleaning and disinfection because surfaces in patient care areas are reservoirs for infectious agents. Clinical studies have shown the ability of various microorganisms to survive on environmental surfaces from days to months in some cases.[7,8]



Noncritical items are those that contact intact skin only, such as blood pressure cuffs, stethoscopes, and computer keyboards. These items should be carefully cleaned and disinfected with a minimum of a low-level disinfectant, between patients and when visibly soiled.

Respiratory Hygiene And Cough Etiquette

Many pathogens are transmitted via the airborne or droplet route. All persons should practice respiratory hygiene and cough etiquette. According to the CDC, health care providers, patients, and their family members should

- cover the mouth and nose with a tissue when coughing,
- dispose of used tissues quickly, and
- perform hand hygiene immediately after coming into contact with respiratory secretions.

In addition, health care providers should separate patients with a respiratory infection from others, and ensure that patients with respiratory infections wear a surgical mask if appropriate.

Safe Injection Practices

There have been recent outbreaks of HIV and hepatitis associated with improper injection practices. The CDC has a campaign to address unsafe injection practices, the basic premise of which is to use one syringe and needle one time and then promptly discard both the needle and syringe. Health care providers should also follow special precautions when using multidose vials. Process monitoring for the use of multidose vials is a key component of an infection control program. Institutions should ensure that they are adequately meeting all regulatory, public reporting, and accreditation guidelines regarding process monitoring.

Textiles And Laundry

Used linens that are soiled with blood, body fluids, secretions, and/or excretions should be handled, transported, and processed in a manner that prevents these items from coming in contact with skin and mucous membranes or from contaminating clothing. Methods of handling, transporting, and processing should prevent transfer of microorganisms from used linens to patients and the environment.

Transmission-Based Isolation Precautions

Health care providers should use transmission-based isolation precautions in addition to standard isolation precautions when patients are known or suspected to be infected or colonized with epidemiologically important pathogens that can be transmitted by airborne, droplet, or contact routes. Transmission-based isolation precautions include contact precautions, droplet precautions, and airborne precautions.

Contact Precautions

AORN recommends that perioperative team members use contact precautions when providing care to patients who are known or suspected to be infected or colonized with microorganisms that are transmitted by direct or indirect contact. Many infectious pathogens are transmitted after contact, mostly through contaminated hands or environmental surfaces.

PPE. Health care providers should wear the appropriate PPE, including a gown and gloves, as part of contact precautions. Health care providers are prime sources for contamination and transmission of disease among patients and themselves, and thus should take special precautions to reduce the risk for transmission. Anesthesia care providers maintain close contact with patients and therefore should wear a gown and gloves when caring for patients who require contact precautions. Other unscrubbed personnel should wear a gown and gloves when anticipating contact with the patient or contaminated surfaces. Scrubbed personnel caring for patients under contact precautions, who are wearing an impervious surgical gown and sterile gloves, do not need any additional isolation attire for contact precautions because the surgical gown and gloves are adequate substitutes for an isolation gown and non-sterile gloves.

Patient transport. Because infected and colonized patients move through the perioperative areas, perioperative team members should take special precautions during patient transport to minimize the risk for infection transmission. In addition to using PPE appropriately (e.g., gloves, isolation gown), perioperative nurses should avoid touching

environmental surfaces and equipment with contaminated hands or items. For transport, health care providers should use a clean sheet to cover a patient who requires contact precautions. The health care worker who accompanies the patient should clean the handles of the stretcher used for transport, remove his or her PPE (gown, gloves), place clean PPE (gown, gloves) on a clean surface of the transport stretcher, transport the patient to his or her destination, and don the clean PPE (gown, gloves) before patient contact.

If contact with the patient during transport is unavoidable (e.g., critically ill, combative, pediatric patient), the health care worker should wear PPE during transport and have a perioperative assistant navigate the transport route (e.g., open doors, press elevator buttons).

Health care providers should follow the latest evidence-based guidance for patient transport from the CDC's *Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006*.[9] In addition, health care personnel should place a sign on the transport vehicle indicating the patient's isolation status. Because the transport stretcher may need to be left unattended in the corridor outside the OR, a sign can communicate appropriate precautions with perioperative team members who may need to prepare the stretcher for the next patient transport, thus reducing the transmission of infections by proper isolation of patient care items.

Droplet Precautions

AORN recommends that perioperative team members use droplet precautions throughout the perioperative environment when providing care to patients who are known or suspected to be infected with microorganisms that can be transmitted by large droplets. Droplets can travel distances up to several feet, which can result in disease transmission.

PPE. Health care providers should wear the appropriate PPE as part of droplet precautions, including mask, gown, and gloves. PPE protects the health care provider's most vulnerable areas, such as mucous membranes, airways, and skin, from coming into contact with potential infectious materials. Personnel should wear a gown and gloves when anticipating contact with the patient or contaminated surfaces. The use of masks prevents the transmission of large droplets such as influenza. Health care providers should wear masks correctly (i.e., covering the nose and mouth) and change the mask at the first sign of failing, such as when moisture is visible, because the moisture can compromise the mask and other PPE. In addition, the perioperative nurse should ensure that all patients with respiratory infections be kept at least 3 feet away from other patients.

Patient transport. For transport, health care providers should cover the patient who requires droplet precautions with a clean sheet and place an isolation mask on the patient, if clinically appropriate, to minimize the dispersal of droplets. If the patient has an artificial airway (e.g., endotracheal tube, tracheostomy), the patient is not a candidate for wearing a mask. The health care worker who accompanies the patient should clean the handles of the stretcher for transport, remove PPE (except mask), place clean PPE (gown, gloves) on the clean transport stretcher, transport the patient to his or her destination, and don PPE (gown, gloves) before patient contact. If contact with the patient during transport is unavoidable (e.g., critically ill, combative, pediatric patient), the health care provider should wear PPE during transport and have a perioperative assistant navigate the transport route (e.g., open doors, press elevator buttons). In addition, health care personnel should place a sign on the transport vehicle indicating the patient's isolation status. Because the transport stretcher may need to be left unattended in the corridor outside the OR, a sign can communicate appropriate precautions with perioperative team members who may need to prepare the stretcher for the next patient transport, thus reducing the transmission of infections by proper isolation of patient care items.

Airborne Precautions

AORN recommends that perioperative team members follow airborne precautions when providing care to patients who are known or suspected to be infected with microorganisms that can be transmitted by the airborne route. Airborne transmission

can occur when airborne droplet nuclei or small particles that contain infectious agents remain infective over time and distance. Examples of these types of diseases include Tuberculosis (TB), Varicella zoster, and rubeola. Special airborne precautions should be taken in the OR when treating a patient who requires airborne precautions, including PPE, respiratory protection, and environmental and administrative controls. Examples of administrative controls are training, education, and TB management programs. Examples of environmental controls are use of high-efficiency particulate air (HEPA) filters and proper cleaning of equipment.

PPE. Health care providers should wear the appropriate PPE as part of droplet precautions, including N95 respirator, gown, and gloves. Health care providers should wear an N95 respirator when treating a patient who requires airborne precautions. Certain infectious agents, such as norovirus, influenza, or rhinovirus, cannot travel long distances, and therefore wearing a surgical mask is sufficient.

Patient transport. For transport, health care providers should cover the patient who requires droplet precautions with a clean sheet and place an isolation mask (not N95 respirator) on the patient, if clinically appropriate, to minimize the dispersal of airborne particles. If the patient has an artificial airway (e.g., endotracheal tube, tracheostomy), the patient is not a candidate for wearing a mask. The health care provider who accompanies the patient should clean the handles of the transport stretcher, remove PPE (except mask), place clean PPE (gown, gloves) on the clean transport stretcher, transport the patient to his or her destination, and don PPE (gown, gloves) before patient contact. If contact with the patient during transport is unavoidable (e.g., critically ill, combative, pediatric patient), the health care worker should wear PPE during transport and have a perioperative assistant navigate the transport route (e.g., open doors, press elevator buttons). In addition, health care personnel should place a sign on the transport vehicle indicating the patient's isolation status. Because the transport stretcher may need to be left unattended in the corridor outside the OR, a sign can communicate appropriate precautions with perioperative team members who may need to prepare the stretcher for the next patient transport, thus reducing the transmission of infections by proper isolation of patient care items.

Airborne infection isolation room. For airborne isolation patients, health care providers should use an airborne isolation room with negative pressure if possible. These rooms minimize risk to staff members and other patients. For a patient who requires these precautions, the perioperative nurse should consider scheduling the procedure as the last case of the day, performing the procedure in an OR with the necessary environmental controls (negative pressure, portable HEPA filter), and performing the procedure with the minimum number of personnel required to minimize unnecessary exposure. A single-use disposable filter should be placed between the anesthesia circuit and the patient's airway. After intubation and extubation of the patient, the OR doors should remain closed until adequate time has passed to allow the air handling system to clean 99% of airborne particles from the air.

CONTROLLING TRANSMISSION OF HAIs

AORN recommends that perioperative personnel take additional actions during surgery to prevent infections. Infections known to occur during the surgical process include SSIs and multidrug-resistant organism (MDRO) infections. Perioperative nurses should carefully consult the latest guidance for prevention from the CDC, Association for Professionals in Infection Control and Epidemiology, the Infectious Diseases Society of America, and the Society for Healthcare Epidemiology of America.

Surgical Site Infection

The CDC and other organizations have identified several basic techniques to prevent SSI, which include:

- performing proper environmental cleaning,
- using appropriate barriers and surgical attire,
- ensuring proper and adequate sterilization procedures,
- minimizing traffic in the OR during procedures,
- using antimicrobial prophylaxis,
- using proper skin antisepsis and hand hygiene, and
- using proper sterile technique.

Multidrug-Resistant Organisms (MDROs)

Multidrug-resistant organisms are microorganisms, mostly bacteria, that are resistant to one or more classes of antimicrobial agents. Although organisms may only be resistant to one class of antimicrobials, many MDROs are resistant to most available agents. In the health care setting,

MDROs present a cause for concern when the organism is prevalent in the facility, because treatment options are often extremely limited. Infections from MDROs that are acquired in the health care setting can increase length of stay, costs, and mortality. To prevent and control MDROs, the CDC has identified several key strategies:

- seek administrative support for initiatives to reduce MDROs,
- fully utilize contact isolation precautions,
- perform proper hand hygiene,
- manage invasive catheters,
- quickly diagnose and treat infectious etiologies,
- perform environmental cleaning and disinfection,
- prevent antimicrobial resistance via antimicrobial stewardship,
- use active surveillance cultures as necessary, and
- educate staff and patients about their role in preventing MDROs.

OCCUPATIONAL HEALTH

Immunizations

AORN recommends providing immunizations to health care providers to protect them against epidemiologically important pathogens. The CDC Advisory Committee on Immunization Practices (ACIP) issues regular updated guidance on the appropriate vaccinations for both patients and health care providers based on emerging clinical evidence. Vaccinations play a critical role in preventing disease acquisition and transmission.

The CDC Advisory Committee on Immunization Practices recommends vaccinations for health care providers that fall into two unique categories.

1. The first category includes those diseases for which routine vaccination or documentation of immunity is recommended because of risks in the workplace. These conditions include hepatitis B, seasonal influenza, measles, mumps, rubella, pertussis, and varicella. For example, OSHA mandates immunizations for hepatitis B.
2. The second category pertains to exposures. For example, a nurse caring for a patient with meningitis should receive the vaccine for meningitis in addition to more commonly recommended vaccines.

Certain vaccinations require annual boosters (e.g., influenza), so careful monitoring should take place to ensure that all health care providers employed at the facility, including perioperative nurses, are properly vaccinated unless contraindicated. Some vaccinations (e.g., hepatitis B) require testing to ensure continued immunity, which can be determined through a titer blood test. Additional vaccinations may be required if the titer results demonstrate the vaccine has lost substantial efficacy.

Illness And Exposures

Perioperative personnel who are exposed to or infected with infectious diseases are responsible for reporting their status to the appropriate authority within the facility. The personnel health service staff members are responsible for promptly diagnosing and managing reported job-related illnesses and for providing appropriate post-exposure prophylaxis after job-related exposures. Occasionally, this may require that the staff member be temporarily or permanently excluded from duty.

Testing. Personnel who participate in invasive procedures are encouraged to undergo voluntary testing for HIV, hepatitis B, and hepatitis C antibodies, with informed consent and appropriate counseling. Personnel should know their status related to these diseases. Health care providers who are seropositive should modify their participation in exposure-prone procedures except in extreme emergencies, and should disclose their positive status to the appropriate health care facility authority. Health care facilities should support

employees who are seropositive in their endeavors to remain employed as long as their health status does not impair performance or pose risks to patients.

Reporting. The facility should openly encourage reporting of employee illness and work carefully with human resources personnel to build a policy that is not punitive toward the reporting employee. Personnel who demonstrate signs and symptoms of a transmissible infection should be encouraged to report their condition promptly to their supervisor and to the occupational health service. In addition, personnel should be encouraged to report exposure incidents to their employers according to facility policy. Reporting enables employers to provide timely, confidential, and appropriate post-exposure evaluation, testing, intervention, and prophylaxis.

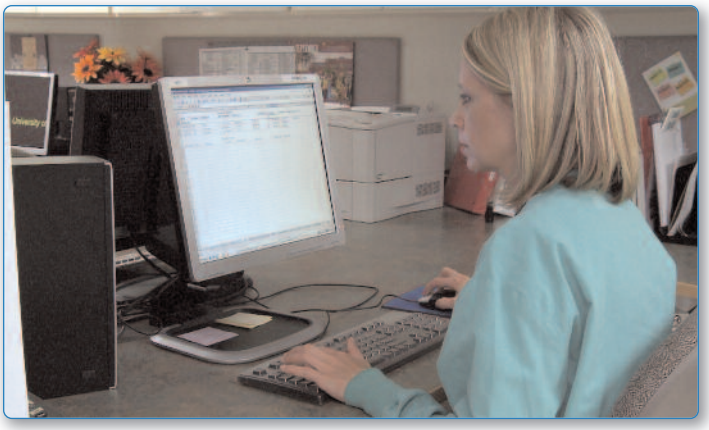
Diagnosis and management. The health care organization is responsible for implementing measures to prevent transmission of infection through diagnosis and management of job-related illnesses and post-exposure prophylaxis after job-related exposures. When a person in the health care facility is exposed to particular infectious agents (e.g., varicella, measles, TB), the organization representative responsible for handling exposures (e.g., occupational health nurse, infection preventionist) should disclose the following information to the person who is exposed:

- recommended post-exposure management,
- the risk (if known) of transmitting the infection to patients, and
- methods for preventing transmission of the infection to other persons.

When offering the exposed person prophylactic treatment with medications, vaccines, or immune globulins, the organization representative responsible for handling exposures (e.g., occupational health nurse, infection preventionist) should disclose the following information to the exposed person:

- options for prophylaxis,
- the risk (if known) of infection when treatment is not accepted,
- the degree of protection provided by the therapy, and
- the potential side effects of the therapy.

Exclusion. When determining work restrictions, the organization representative (e.g., occupational health nurse, infection preventionist) should consider the mode of transmission and the epidemiology of the disease. Table 1 lists suggested work restrictions for health care personnel exposed to or infected with selected infectious diseases.



Certain infectious conditions will require a modified work assignment to prevent transmission to other health care providers or patients, including:

- acute gastrointestinal illness,
- keratoconjunctivitis,
- pediculosis,
- scabies,
- herpes simplex,
- exudative lesions that cannot be contained and covered, and
- meningococcal infection.

AORN recommends that the activities of health care personnel with infections, exudative lesions, and nonintact skin be restricted when these activities pose a risk of transmission to patients and other health care providers. Depending on the type of infection, the perioperative nurse who is suffering from a current infection may require restricted work duty. The facility's employee health nurse, infection preventionist, or physician should assess all employees who are ill to determine whether their condition requires a modified work assignment. An organization representative (e.g., occupational health nurse, infection preventionist) should provide medical clearance to any personnel with non-intact skin or exudative lesions and those with known active infections, before the person reports to work.

Table 1. Suggested Work Restrictions for Health Care Personnel with Transmissible Infections1

Disease	Suggested Work Restriction
Conjunctivitis	Restrict from patient contact and contact with the patient environment until discharge ceases
Diphtheria	Exclude from duty until antimicrobial therapy is completed and two negative cultures are obtained (24 hours apart)
Hepatitis A	Restrict from patient contact or food handling until 7 days after onset of jaundice
Hepatitis B (when considered infectious) HIV	Restrict personnel who perform exposure-prone invasive procedures from duty until an expert review council has been consulted; review state regulations
Hepatitis C	No recommendations; refer to facility and state regulations
Herpes simplex, hand (herpetic whitlow)	Restrict from patient contact and contact with the patient environment until lesions heal
Herpes simplex, orofacial	Evaluate the need to restrict personnel from care of high-risk patients until lesions heal
Measles, active	Exclude from duty until 7 days after the rash appears
Measles, post-exposure (susceptible personnel*)	Exclude from duty from day 5 through day 21 after last exposure and 7 days after the rash appears
Meningococcal infections	Exclude from duty until 24 hours after the start of effective therapy
Multidrug-resistant organisms	No recommendations for restriction of colonized health care workers unless the infection is epidemiologically linked to transmission within the health care facility
Pertussis, active	Exclude from duty until 5 days after the start of effective antimicrobial therapy
Pertussis, post-exposure	Asymptomatic: No restriction Symptomatic: Exclude from duty until 5 days after the start of effective antimicrobial therapy
Respiratory infections, acute	Exclude from caring for high-risk patients

Disease	Suggested Work Restriction
Rubella, active	Exclude from duty until 5 days after the rash appears
Rubella, post-exposure (susceptible personnel*)	Exclude from duty from day 7 after the first exposure through day 21 after the last exposure
Scabies	Restrict from patient contact until the personnel is cleared by a medical evaluation after treatment
Tuberculosis, active	Exclude from duty until proven noninfectious
Varicella, active	Exclude from duty until all crusts are dry
Varicella, post-exposure (susceptible personnel*)	Exclude from duty from day 10 after the first exposure through day 21 after the last exposure (day 28 if VZIG** was given)
Varicella-zoster (shingles), post-exposure (susceptible personnel*)	Exclude from duty from day 10 after the first exposure through day 21 after the last exposure (day 28 if VZIG** was given)

* Susceptible personnel are either not vaccinated against disease, vaccination status is unknown, and/or antibody titer to disease is negative.

** Varicella Zoster Immune Globulin (VZIG)

1. Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchmann SD. Guideline for infection control in healthcare personnel, 1998. Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol.* 1998;19(6):407-463.

EDUCATION AND COMPETENCY VALIDATION

AORN recommends that perioperative personnel receive initial and ongoing education and competency validation for appropriate prevention measures for transmissible infections and MDROs. The perioperative nurse should consult with the facility's infection preventionist to develop, maintain, and annually update facility-specific policies and procedures.

Staff members should receive annual training regarding the appropriate application of isolation precautions, particularly contact precautions. Numerous evidence-based prevention methodologies are available for new hire orientation and annual competency validation, including the following:

- appropriate use of standard, contact, droplet, and airborne precautions;
- appropriate use of PPE, such as gloves, masks, and eye protection;
- appropriate use of standard, contact, droplet, and airborne precautions;
- compliance with the OSHA Bloodborne Pathogens Standard[10];
- appropriate use of disinfectants and cleaning products; and
- implementation of evidence-based guidelines for the prevention of SSIs, catheter-associated urinary tract infections, catheter-associated bloodstream infections, and MDROs.

DOCUMENTATION

AORN recommends that documentation reflect activities related to infection prevention. Documentation is one of the most critical components for ensuring patient and clinician safety. Documentation, a professional medicolegal standard, also serves as a basis for monitoring compliance, measuring performance, logging exposure incidents, and maintaining employee records. An example of a documentation activity that relates to infection prevention is documentation of the patient's wound class. AORN has developed a Surgical Wound Classification Decision Tree that is helpful in determining appropriate wound classes for surgical patients.

Vaccination records are another example of documentation related to infection prevention. The CDC publishes guidance on the recommended vaccinations for health care providers. The employer should maintain and regularly review employee vaccination records. The vaccination record should include:

- the type of vaccine given;
- the date on which the vaccine was given;
- the lot number and manufacturer;
- any adverse reactions;
- the location on the body where the vaccine was administered;
- the name, address, and title of the person who administered the vaccine; and
- documentation that the appropriate CDC vaccination information statement was provided to the employee who received the vaccination.

There are several conditions, including occupational exposure from a needlestick or blood exposure that must be reported to ensure compliance with the OSHA Bloodborne Pathogens Standard. The Occupational Safety and Health Administration requires that training records for blood-borne pathogens be kept for three years. These records must include the dates of training, the content of the training, names and qualifications of the trainers, and names and jobs of those trained. Sharps logs must also be kept and include the type and brand of device involved in a sharps injury, the department or work area where the exposure incident occurred, and an explanation of how the incident occurred. The employer must keep the exposure incident records for the length of the health care provider's employment plus 30 years.

POLICIES AND PROCEDURES

AORN recommends that organizations develop policies and procedures for the prevention and control of transmissible infections and MDROs, review the documents periodically, revise as necessary, and have the documents readily available within the practice setting. Health care policies and procedures should outline processes for initial education, training, ongoing competency evaluation, and annual review for all infection prevention and control issues. Facilities must also take into account the specific issues associated with a health care provider who may have infections, non-intact skin, and exudative lesions.

QUALITY IMPROVEMENT

AORN recommends that perioperative team members participate in a variety of quality improvement activities to monitor and improve the prevention of infections and MDROs. Quality assurance and performance improvement programs are necessary to advance the science of perioperative practice and for the prevention of transmissible infections.

Process monitoring is a key component of an infection prevention and control program. Hand hygiene compliance and Surgical Care Improvement Project (SCIP) measures are examples of routinely tracked processes in the perioperative setting. Institutions should ensure that they are adequately meeting all regulatory, public reporting, and accreditation guidelines regarding process monitoring. Surgical site infection surveillance is a critical component in quality improvement for the prevention of HAIs. The CDC's NHSN has developed specific criteria for the classification and reporting of SSI.

Recently, several studies have identified the need for routine monitoring of environmental cleaning and disinfection.[11] There is certainly promise of new technology for monitoring of environmental cleaning, such as adenosine triphosphate monitoring.

SUMMARY

Protecting patients and health care personnel from transmissible infections continues to be a challenge in today's rapidly changing health care environment. Newly recognized pathogens and well-know organisms that have become resistant to current treatment modalities have added to this challenge. Preventing transmissible infections is a priority in the perioperative environment as perioperative nurses strive to give patients the best care possible and protect them from harm.

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POST-TEST
PREVENTION OF TRANSMISSIBLE INFECTIONS IN THE PERIOPERATIVE PRACTICE SETTING

Multiple choice. Please choose the word or phrase that best completes the following statements.

1. Which of the following is a potential reservoir for infection transmission in the perioperative setting?
   a. Ventilator humidifier
   b. OR table
   c. Safety strap
   d. All of the above

2. Which surgical patient is MOST likely to develop a hospital-associated infection?
   a. 30-year-old, healthy patient undergoing knee arthroscopy
   b. 4-year-old patient with leukemia undergoing port placement
   c. 75-year-old patient with asthma undergoing bladder cystoscopy
   d. 64-year-old patient with diabetes undergoing craniotomy

3. Hand hygiene is the best method to
   a. prevent the transmission of infections.
   b. increase compliance with standard precautions.
   c. develop immunity against transmissible infections.
   d. improve patient satisfaction.

4. What is the primary strategy for reducing hospital-associated infections?
   a. Hand hygiene
   b. Environmental controls
   c. Standard precautions
   d. Wearing personal protective equipment

5. How does the perioperative nurse determine what constitutes proper isolation precautions for a particular patient?
   a. Follow the physician's orders
   b. Consider the infection source and transmission qualities of the organism
   c. Collaborate with the infection preventionist
   d. All of the above

6. Which of the following statements is TRUE for the health care provider treating a patient who requires contact isolation?
   a. Wear an isolation gown, gloves, and N95 respirator
   b. Wear an isolation gown, gloves, and mask
   c. Wear an isolation gown and gloves for all patient contact
   d. Wear an isolation gown and gloves only if contact with body fluids is expected

7. Which personal protective equipment should a perioperative team member wear to care for a patient who requires droplet precautions?
   a. Isolation gown, gloves, and isolation mask
   b. Isolation gown, gloves, and N95 respirator
   c. Isolation gown and gloves only
   d. Surgical gown, gloves, and surgical mask
   e. Either A or D

8. What action is NOT effective for minimizing transmission of tuberculosis (TB) in the OR when caring for a patient with active TB?
   a. Perform surgery in an airborne infection isolation room or use a portable high-efficiency particulate air (HEPA) filter to achieve negative pressure during the procedure.
   b. Schedule the surgery as last case of the day.
   c. Have filters available for the anesthesiologist to place on the patient's airway.
   d. Leave the OR immediately after intubation and extubation.

9. Which blood test determines adequate immunization to a vaccine-preventable illness?
   a. Titer
   b. Antigen
   c. Antibody
   d. Serum

10. How can health care providers BEST protect themselves from contracting pertussis?
    a. Being vaccinated
    b. Using proper cough etiquette
    c. Following respiratory hygiene practices
    d. Following airborne precautions

11. Which bloodborne pathogen is vaccine preventable?
    a. HIV
    b. Hepatitis B
    c. Hepatitis C
    d. None of the above

12. What method can be used to improve the prevention of health care-associated infections?
    a. Environmental cleaning
    b. Safe injection practices
    c. Process monitoring
    d. Policies and procedures

POST-TEST ANSWERS

PREVENTION OF TRANSMISSIBLE INFECTIONS IN THE PERIOPERATIVE PRACTICE SETTING

1. d
2. b
3. a
4. c
5. d
6. c
7. e
8. d
9. a
10. a
11. b
12. d