Introduction

Isolation is a fundamental principle of routine infection control practice that is utilized with the intent of preventing the spread of infection in health care settings. Isolation of patients with confirmed or suspected infectious diseases provides a method to reduce or prevent exposure to infectious agents among patients, health care workers, and others in the health care environment. Isolation procedures are separated into standard precautions, which apply to all patients, and transmission-based precautions, which apply to patients infected or colonized with certain pathogens. Although the general principles of standard precautions should be applied to patients in all settings, transmission-based isolation precautions may vary significantly among facilities. Thus, isolation practices may be dependent on the type of health care setting (acute-care hospital, long-term care facility, dialysis center, etc.), environmental controls (private vs. shared rooms, negative pressure rooms), organizational characteristics (staffing, availability of personal protective equipment [PPE]), local epidemiology and resistance patterns, and other issues. Transmission-based isolation precautions
may be instituted in an empirical fashion when there is concern for infection or colonization with a specific pathogen, or may be syndromic, based on the clinical presentation of the patient. This chapter will discuss various routine isolation practices and their applicability in the health care setting.

Table 7.1 Standard Precautions. Adapted from CDC Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings (2007).

<table>
<thead>
<tr>
<th>Prevention</th>
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<tbody>
<tr>
<td>Perform hand hygiene</td>
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<tr>
<td>Use of personal protective equipment (PPE) whenever there is an expectation of possible exposure to infectious material</td>
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<tr>
<td>Utilize principles of respiratory hygiene and cough etiquette</td>
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<tr>
<td>Place patients who pose a transmission risk to others in a single room if available</td>
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<tr>
<td>Develop procedures for environmental cleaning, as well as the cleaning and disinfection of patient care equipment, instruments, and devices between patient use</td>
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<tr>
<td>Handle textiles and laundry carefully to prevent the transfer of microorganisms</td>
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<tr>
<td>Follow safe injection practices and handle needles and sharp devices carefully</td>
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Standard Precautions

Standard precautions are infection control principles that are applied to all patients in all health care settings in order to decrease the risk of transmission of infectious diseases. Standard precautions are detailed in table 7.1.

Transmission-based Precautions

Transmission-based precautions include contact precautions, droplet precautions, and airborne precautions. These are utilized for patients with known or suspected communicable diseases in order to decrease the risk of transmission to health care workers and other patients.
Contact Precautions

GENERAL INDICATIONS FOR USE

The indications for the use of contact precautions are highly variable among facilities. Contact precautions are generally used for patients who are infected or colonized with multidrug-resistant organisms (MDROs) spread by direct contact or contact with fomites, the most problematic of which include vancomycin-resistant enterococci (VRE), methicillin-resistant Staphylococcus aureus (MRSA), and multidrug-resistant Enterobacteriaceae (MDR-E), such as extended spectrum beta-lactamase producing organisms and carbapenem-resistant Enterobacteriaceae. Other indications may include gastroenteritis (e.g., norovirus, Clostridioides difficile), draining wounds, parainfluenza, lice, respiratory syncytial virus (RSV), scabies, and Burkholderia cepacia in patients with cystic fibrosis.

PATIENT PLACEMENT

A single patient space or room is preferred to decrease the risk of transmission to other patients. If a single patient space is not available, cohorting patients known to have the same infection or colonizing agent can be considered, based on conditions that are associated with transmission such as incontinence or drainage that cannot be contained.

PERSONAL PROTECTIVE EQUIPMENT

Gowns and gloves should be worn when contact with the patient and the patient’s environment is expected, and removed before leaving the patient space.

LIMITING PATIENT TRANSPORT

Movement of the patient outside of the room should be limited to medical necessity. When movement is necessary, the infected or colonized part of the patient should be covered with a clean gown and cover sheet. Contaminated PPE should be removed and disposed of, and hand hygiene performed prior to transport. Clean PPE should be donned at the transport location when providing care for the patient. Adminis-
trative controls, such as alerts in the electronic medical record and signage, should be used to assist with communication about the need for transmission-based precautions.

**DEDICATE PATIENT-CARE EQUIPMENT**

If equipment cannot be dedicated, then it should be cleaned and disinfected before being used on another patient. Disposable patient care equipment should also be considered.

**CLEAN AND DISINFECT THE PATIENT’S ENVIRONMENT**

The rooms of patients on contact precautions should be cleaned and disinfected at least daily, with a focus on surfaces that are touched frequently by the patient and health care workers. Ensure that disinfectants are effective against the organism of concern by ensuring that the label includes an organism inactivation claim. Ensure that disinfectant manufacturers’ instructions for use are followed, especially as they apply to contact time and preparation. Environmental service workers should use gowns and gloves for room cleaning and disinfection.

**Droplet Precautions**

**GENERAL INDICATIONS FOR USE**

Common indications include but are not limited to *Bordetella pertussis*, influenza virus, adenovirus, rhinovirus, *Neisseria meningitidis*, and certain group A streptococcal infections.

**PATIENT PLACEMENT**

A single patient space or room is preferred to decrease the risk of transmission to other patients. If a single patient space is not available, cohorting patients known to have the same infection or colonizing agent can be considered based on conditions that are associated with transmission such as respiratory secretions that are excessive or cannot be contained. Patients should be separated by at least 6 feet with privacy curtains drawn. Immunosuppressed patients should not be cohorted with patients on droplet precautions.
PERSONAL PROTECTIVE EQUIPMENT

Don a surgical mask before entering the patient’s room or space.

LIMIT PATIENT TRANSPORT

Movement of the patient outside of the room should be limited to medical necessity. When movement is necessary, instruct the patient to wear a surgical mask and adhere to respiratory hygiene and principles of cough etiquette. Administrative controls, such as alerts in the electronic medical record and signage, should be used to assist with communication about the need for transmission-based precautions.

SOURCE CONTROL

Until appropriate patient placement and isolation is established, the patient should wear a surgical mask if medically tolerated.

Airborne Precautions

GENERAL INDICATIONS FOR USE

Common indications for airborne isolation include patients with suspected or confirmed tuberculosis, measles, chicken pox, or disseminated herpes zoster.

PATIENT PLACEMENT

Airborne infection isolation rooms (AIIRs) should be equipped with special air handling and ventilation capacity that meet the American Institute of Architects/Facility Guidelines Institute (AIA/FGI) standards for AIIRs (i.e., monitored negative pressure relative to the surrounding area, 12 air exchanges per hour for new construction and renovation and 6 air exchanges per hour for existing facilities, air exhausted directly to the outside or recirculated through HEPA filtration before return). If an appropriately engineered room is not available, the patient should be instructed to don a surgical mask and placed in a private room with the door closed until the patient is transferred to a facility with an appropriate room or returned home (if condition allows and with public health notification).
PERSONAL PROTECTIVE EQUIPMENT

Health care workers should wear a fit-tested National Institute for Occupational Safety and Health (NIOSH)–approved N95 (or higher-level) respirator when caring for patients in airborne isolation.

LIMIT PATIENT TRANSPORT

Movement of the patient outside of the room should be limited to medical necessity. When movement out of the airborne infection isolation room is necessary, a surgical mask should be placed on the patient and the patient instructed to adhere to respiratory hygiene and principles of cough etiquette. Administrative controls, such as alerts in the electronic medical record and signage, should be used to assist with communication about the need for transmission-based precautions. If the patient is wearing a mask and infectious skin lesions are covered, then the health care workers do not need to wear a mask during transport.

SOURCE CONTROL

Until appropriate patient placement and isolation is established, the patient should wear a surgical mask if medically tolerated.

Conclusion

Isolation, including both standard and transmission-based precautions, is an important part of routine infection control practice in health care settings. Although there is evidence to support the utilization of isolation precautions to reduce the risk of disease transmission, it is important to note that some degree of controversy exists over which pathogens necessitate isolation. For instance, some facilities screen for and implement contact isolation for patients colonized with MRSA, while others use standard precautions for these patients. Although a full discussion of the controversies in isolation practice is beyond the scope of this chapter, decisions regarding the need for isolation of patients should be made after consideration of the available scientific evidence, environmental and facility issues, and local epidemiologic data. It is important to note
that isolation of patients with known or suspected infectious diseases is only one component of a comprehensive infection control program, and should always be utilized in conjunction with other evidence-based measures such as hand hygiene and environmental cleaning in order to prevent the spread of infection in the health care environment.