From the CDC: Guideline for Prevention of Catheter-associated Urinary Tract Infections 2009 (CAUTI)

From the CDC: Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006 (MDRO)

From the CDC: 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Title 22 Subcommittee Category 1 Review

CAUTI
Appropriate Urinary Catheter Use
A. Insert catheters only for appropriate indications and leave in place only as long as needed. ((Category IB))
Minimize urinary catheter use and duration of use in all patients, particularly those at higher risk for CAUTI or mortality from catheterization such as women, the elderly, and patients with impaired immunity.((Category IB))
Avoid use of urinary catheters in patients and nursing home residents for management of incontinence. ((Category IB))

Use urinary catheters in operative patients only as necessary, rather than routinely. ((Category IB))

For operative patients who have an indication for an indwelling catheter, remove the catheter as soon as possible postoperatively, preferably within 24 hours, unless there are appropriate indications for continued use. ((Category IB))

Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site. ((Category IB))

Ensure that only properly trained persons (e.g., hospital personnel, family members, or patients themselves) who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility. ((Category IB))

In the acute care hospital setting, insert urinary catheters using aseptic technique and sterile equipment. ((Category IB))

Use sterile gloves, drape, sponges, an appropriate antiseptic or sterile solution for periurethral cleaning, and a single-use packet of lubricant jelly for insertion. ((Category IB))
Properly secure indwelling catheters after insertion to prevent movement and urethral traction. ((Category IB))

If intermittent catheterization is used, perform it at regular intervals to prevent bladder overdistension. ((Category IB))

Following aseptic insertion of the urinary catheter, maintain a closed drainage system ((Category IB))

If breaks in aseptic technique, disconnection, or leakage occur, replace the catheter and collecting system using aseptic technique and sterile equipment
Maintain unobstructed urine flow. ((Category IB))

Keep the catheter and collecting tube free from kinking. ((Category IB))

Keep the collecting bag below the level of the bladder at all times. Do not rest the bag on the floor. ((Category IB))

Empty the collecting bag regularly using a separate, clean collecting container for each patient; avoid splashing, and prevent contact of the drainage spigot with the nonsterile collecting container. ((Category IB))

Use Standard Precautions, including the use of gloves and gown as appropriate, during any manipulation of the catheter or collecting system. ((Category IB))

Unless clinical indications exist (e.g., in patients with bacteriuria upon catheter removal post urologic surgery), do not use systemic antimicrobials routinely to prevent CAUTI in patients requiring either short or long-term catheterization. ((Category IB))

Do not clean the periurethral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleansing of the meatal surface during daily bathing or showering) is appropriate. ((Category IB))

If the CAUTI rate is not decreasing after implementing a comprehensive strategy to reduce rates of CAUTI, consider using antimicrobial/antiseptic-impregnated catheters. The comprehensive strategy should include, at a minimum, the high priority recommendations for urinary catheter use, aseptic insertion, and maintenance (see Section III. Implementation and Audit). ((Category IB))

If obstruction occurs and it is likely that the catheter material is contributing to obstruction, change the catheter

Obtain urine samples aseptically. ((Category IB))

If a small volume of fresh urine is needed for examination (i.e., urinalysis or culture), aspirate the urine from the needleless sampling port with a sterile syringe/cannula adapter after cleansing the port with a disinfectant. ((Category IB))

Obtain large volumes of urine for special analyses (not culture) aseptically from the drainage bag. ((Category IB))

Implement quality improvement (QI) programs or strategies to enhance appropriate use of indwelling catheters and to reduce the risk of CAUTI based on a facility risk assessment. ((Category IB))

Provide and implement evidence-based guidelines that address catheter use, insertion, and maintenance. ((Category IB))

B. Education and Training

Ensure that healthcare personnel and others who take care of catheters are given periodic in-service training regarding techniques and procedures for urinary catheter insertion, maintenance, and removal. Provide education about CAUTI, other complications of urinary catheterization, and alternatives to indwelling catheters. ((Category IB))

Ensure that supplies necessary for aseptic technique for catheter insertion are readily available. ((Category IB))

If surveillance for CAUTI is performed, ensure that there are sufficient trained personnel and technology resources to support surveillance for urinary catheter use and outcomes. ((Category IB))

Use standardized methodology for performing CAUTI surveillance. ((Category IB))

Priority Recommendations for Appropriate Urinary Catheter Use
Insert catheters only for appropriate indications and leave in place only as long as needed. ((Category IB))

Avoid use of urinary catheters in patients and nursing home residents for management of incontinence. ((Category IB))

For operative patients who have an indication for an indwelling catheter, remove the catheter as soon as possible postoperatively, preferably within 24 hours, unless there are appropriate indications for continued use. ((Category IB))

Priority Recommendations for Aseptic Insertion of Urinary Catheters
Ensure that only properly trained persons (e.g., hospital personnel, family members, or patients themselves) who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility. ((Category IB))

In the acute care hospital setting, insert catheters using aseptic technique and sterile equipment. ((Category IB))

Priority Recommendations for Proper Urinary Catheter Maintenance (Following aseptic insertion of the urinary catheter, maintain a closed drainage system ((Category IB))

Maintain unobstructed urine flow. ((Category IB))

MDRO
Administrative measures
Make MDRO prevention and control an organizational patient safety Priority *(Category IB)*

Provide administrative support, and both fiscal and human resources, to prevent and control MDRO transmission within the healthcare organization *(Category IB)*

Implement a multidisciplinary process to monitor and improve healthcare personnel (HCP) adherence to recommended practices for Standard and Contact Precautions *Category 1B*

Implement systems to designate patients known to be colonized or infected with a targeted MDRO and to notify receiving healthcare facilities and personnel prior to transfer of such patients within or between facilities *(Category IB)*

Support participation of the facility or healthcare system in local, regional,and national coalitions to combat emerging or growing MDRO Problems *(Category IB)*

Provide updated feedback at least annually to healthcare providers and administrators on facility and patient-care-unit trends in MDRO infections. Include information on changes in prevalence or incidence of infection, results of assessments for system failures, and action plans to improve adherence to and effectiveness of recommended infection control practices to prevent MDRO transmission. *(Category IB)*

Education and training of healthcare personnel
Provide education and training on risks and prevention of MDRO transmission during orientation and periodic educational updates for healthcare personnel; include information on organizational experience with MDROs and prevention strategies. *(Category IB)*

Judicious use of antimicrobial agents. The goal of the following recommendations is to ensure that systems are in place to promote optimal treatment of infections and appropriate antimicrobial use.

In hospitals and LTCFs, ensure that a multidisciplinary process is in place to review antimicrobial utilization, local susceptibility patterns (antibiograms), and antimicrobial agents included in the formulary to foster appropriate antimicrobial use *(Category IB)*

Implement systems (e.g., computerized physician order entry, comment inmicrobiology susceptibility report, notification from a clinical pharmacist or
unit director) to prompt clinicians to use the appropriate antimicrobial agent
and regimen for the given clinical situation.(*(Category IB))*

Provide clinicians with antimicrobial susceptibility reports and analysis of current trends, updated at least annually, to guide antimicrobial prescribing practices *(Category IB)*

Surveillance
In microbiology laboratories, use standardized laboratory methods and follow published guidance for determining antimicrobial susceptibility of targeted (e.g., MRSA, VRE, MDR-ESBLs) and emerging (e.g., VRSA, MDR-*Acinetobacter baumannii*) MDROs
(Category IB)
In all healthcare organizations, establish systems to ensure that clinical microbiology laboratories (in-house and out-sourced) promptly notify infection control staff or a medical director/ designee when a novel resistance pattern for that facility is detected*(Category IB)*

In hospitals and LTCFs, develop and implement laboratory protocols for storing isolates of selected MDROs for molecular typing when needed to confirm transmission or delineate the epidemiology of the MDRO within the healthcare setting *(Category IB)*

Prepare facility-specific antimicrobial susceptibility reports as recommended by the Clinical and Laboratory Standards Institute (CLSI) (www.phppo.cdc.gov/dls/master/default.aspx); monitor these reports for evidence of changing resistance patterns that may indicate the emergence or transmission of MDROs *(Category IB) /1C*

In hospitals and LTCFs with special-care units (e.g., ventilatordependent,

ICU, or oncology units), develop and monitor unit specific antimicrobial susceptibility reports.(*(Category IB)*

Establish a frequency for preparing summary reports based on volume of clinical isolates, with updates at least annually.(347, 362) *Category II/IC*

Monitor trends in the incidence of target MDROs in the facility over time using appropriate statistical methods to determine whether MDRO rates are decreasing and whether additional interventions are needed *(Category IA)*

Specify isolate origin (i.e., location and clinical service) in MDRO monitoring protocols in hospitals and other large multi-unit facilities with high-risk patients *(Category IB)*

Establish a baseline (e.g., incidence) for targeted MDRO isolates by reviewing results of clinical cultures; if more timely or localized information is needed, perform baseline point prevalence studies of colonization in high-risk units. When possible, distinguish colonization from infection in analysis of these data.*(Category IB)*

Infection control precautions to prevent transmission of MDROs

Follow Standard Precautions during all patient encounters in all settings in which healthcare is delivered.(119, 164, 255, 315, 316) *(Category IB)*

Use masks according to Standard Precautions when performing splash generating procedures (e.g., wound irrigation, oral suctioning, intubation); when caring for patients with open tracheostomies and the potential for projectile secretions; and in circumstances where there is evidence of transmission from heavily colonized sources (e.g., burn wounds). Masks are not otherwise recommended for prevention of MDRO transmission from patients to healthcare personnel during routine care (e.g., upon room entry).(*(Category IB)*

Use of Contact Precautions
In *acute-care hospitals*, implement Contact Precautions routinely for all patients infected with target MDROs and for patients that have been previously identified as being colonized with target MDROs (e.g., patients transferred from other units or facilities who are known to be colonized). *(Category IB)*

In *hemodialysis units,* follow the "Recommendations to Prevent Transmission of Infections in Chronic Hemodialysis Patients"(372)(www.cms.hhs.gov/home/regsguidance.asp).*Category IC*

Patient placement in hospitals and LTCFs

When single-patient rooms are available, assign priority for these rooms to patients with known or suspected MDRO colonization or infection. Give highest priority to those patients who have conditions that may facilitate transmission, e.g., uncontained secretions or excretions*(Category IB)*

When single-patient rooms are not available, cohort patients with the same MDRO in the same room or patient-care area *(Category IB)*

Environmental measures

Clean and disinfect surfaces and equipment that may be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch surfaces (e.g., horizontal surfaces in waiting rooms). *(Category IB)*

Dedicate noncritical medical items to use on individual patients known to be infected or colonized with MDROs. *Category IB*

Prioritize room cleaning of patients on Contact Precautions. Focus on cleaning and disinfecting frequently touched surfaces (e.g., bedrails, bedside commodes, bathroom fixtures in the patient's room, doorknobs) and equipment in the immediate vicinity of the patient. *(Category IB)*

Intensified interventions to prevent MDRO transmission
a. Indications for intensified MDRO control efforts should result in selection and implementation of one or more of theinterventions described in below. Individualize theselection of control measures according to local considerations
(Category IB)

When incidence or prevalence of MDROs are not decreasing despite implementation of and correct adherence to the routine control measures described above, intensify MDRO control efforts by adopting one or more of the interventions described below.*(Category IB)*

When the *first* case or outbreak of an epidemiologically important MDRO (e.g., VRE, MRSA, VISA, VRSA, MDR-GNB) is identified within a healthcare facility or unit*(Category IB)*

Continue to monitor the incidence of target MDRO infection and colonization after additional interventions are implemented. If rates do not decrease, implement more interventions as needed to reduce MDRO transmission. *(Category IB)*

Administrative measures

Identify persons with experience in infection control and the epidemiology of MDRO, either in house or through outside consultation, for assessment of the local MDRO problem and for the design, implementation, and evaluation of appropriate control measures *(Category IB)*

Provide necessary leadership, funding, and day-to-day oversight to implement interventions selected. Involve the governing body and leadership of the healthcare facility or system that have organizational responsibility for this and other infection control efforts*(Category IB)*

Evaluate healthcare system factors for their role in creating or perpetuating transmission of MDROs, including: staffing levels, education and training, availability of consumable and durable resources, communication processes, policies and procedures, and adherence to recommended infection control measures (e.g., hand hygiene and Standard or Contact Precautions). Develop, implement, and monitor action plans to correct system failures *(Category IB)*
During the process, update healthcare providers and administrators on the progress and effectiveness of the intensified interventions. Include information on changes in prevalence, rates of infection and colonization; results of assessments and corrective actions for system failures; degrees of adherence to recommended practices; and action plans to improve adherence to recommended infection control practices to prevent MDRO transmission *(Category IB)*

Educational interventions

Intensify the frequency of MDRO educational programs for healthcare personnel, especially those who work in areas in which MDRO rates are not decreasing. Provide individual or unit-specific feedback when available *(Category IB)*

Judicious use of antimicrobial agents
Review the role of antimicrobial use in perpetuating the MDRO problem targeted for intensified intervention. Control and improve antimicrobial use as
indicated. Antimicrobial agents that may be targeted include vancomycin, third-generation cephalosporins, and anti-anaerobic agents for VRE(217); third-generation cephalosporins for ESBLs and quinolones and carbapenems *(Category IB)*

Surveillance
Calculate and analyze prevalence and incidence rates of targeted MDRO infection and colonization in populations at risk; when possible, distinguish colonization from infection *(Category IB)*

Develop and implement protocols to obtain active surveillance cultures (ASC) for targeted MDROs from patients in populations at risk (e.g., patients in intensive care, burn, bone marrow/stem cell transplant, and oncology units; patients transferred from facilities known to have high MDRO prevalence rates; roommates of colonized or infected persons; and patients known to have been previously infected or colonized with an MDRO).*(Category IB)*

Obtain ASC from areas of skin breakdown and draining wounds. In addition, include the following sites according to target MDROs:

For MRSA: Sampling the anterior nares is usually sufficient; throat, endotracheal tube aspirate, percutaneous gastrostomy sites, and perirectal or perineal cultures may be added to increase the yield. Swabs from several sites may be placed in the same selective broth tube prior to transport.*(Category IB)*

For VRE: Stool, rectal, or perirectal samples should be collected *(Category IB)*

For MDR-GNB: Endotracheal tube aspirates or sputum should be cultured if a respiratory tract reservoir is suspected, (e.g., *Acinetobacter* spp., *Burkholderia* spp.). *(Category IB)*

Obtain surveillance cultures for the target MDRO from patients at the time of admission to high-risk areas, e.g., ICUs, and at periodic intervals as needed to assess MDRO transmission.*(Category IB)*

Conduct culture surveys to assess the efficacy of the enhanced MDRO control interventions.
Conduct serial (e.g., weekly, until transmission has ceased and then decreasing frequency) unit-specific point prevalence culture surveys of the target MDRO to determine if transmission has decreased or ceased. *(Category IB)*

Repeat point-prevalence culture surveys at routine intervals or at time of patient discharge or transfer until transmission has ceased *(Category IB)*

If indicated by assessment of the MDRO problem, collect cultures to asses the colonization status of roommates and other patients with substantial exposure to patients with known MDRO infection or colonization *(Category IB)*

Obtain cultures of healthcare personnel for target MDRO when there is epidemiologic evidence implicating the healthcare staff member as a source of ongoing transmission.(*Category IB)*

Enhanced infection control precautions

Use of Contact Precautions

Implement Contact Precautions routinely for all patients colonized or infected with a target MDRO *(Category IA)*

Because environmental surfaces and medical equipment, especially those in close proximity to the patient, may be contaminated, don gowns and gloves *before or upon entry* to the patient's room or cubicle *(Category IB)*

When ASC are obtained as part of an intensified MDRO control program, implement Contact Precautions until the surveillance culture is reported negative for the target MDRO (Category IB)

Implement policies for patient admission and placement as needed to prevent transmission of a problem MDRO.(*Category IB)*

Place MDRO patients in single-patient rooms.*(Category IB)*

Cohort patients with the same MDRO in designated areas (e.g., rooms, bays, patient care areas.*(Category IB)*

When transmission continues despite adherence to Standard and

Contact Precautions and cohorting patients, assign dedicated nursing and ancillary service staff to the care of MDRO patients only. Some facilities may consider this option when intensified measures are first implemented *(Category IB)*

Stop new admissions to the unit of facility if transmission continues despite the implementation of the enhanced control measures described above. (Refer to state or local regulations that may apply upon closure of hospital units or services *(Category IB)*

Enhanced environmental measures

Implement patient-dedicated or single-use disposable noncritical Equipment (e.g., blood pressure cuff, stethoscope) and instruments and Devices *(Category IB)*

Intensify and reinforce training of environmental staff who work in areas targeted for intensified MDRO control and monitor adherence to environmental cleaning policies. Some facilities may choose to assign dedicated staff to targeted patient care areas to enhance consistency of proper environmental cleaning and disinfection services.(*(Category IB)*

Monitor (i.e., supervise and inspect) cleaning performance to ensure consistent cleaning and disinfection of surfaces in close proximity to the patient and those likely to be touched by the patient and HCP (e.g., bedrails, carts, bedside commodes, doorknobs, faucet handles). *Category IB)*

Obtain environmental cultures (e.g., surfaces, shared medical equipment) when there is epidemiologic evidence that an environmental source is associated with ongoing transmission of the targeted MDRO. *(Category IB)*

When decolonization for MRSA is used, perform susceptibility testing for the decolonizing agent against the target organism in the individual being treated or the MDRO strain that is epidemiologically implicated in transmission. Monitor susceptibility to detect emergence of resistance to the decolonizing agent. Consult with a microbiologist for appropriate testing for mupirocin resistance, since standards have not been established. *(Category IB)*

Because mupirocin-resistant strains may emerge and because it is unusual to eradicate MRSA when multiple body sites are colonized, do not use topical mupirocin *routinely* for MRSA decolonization of patients as a component of MRSA control programs in any healthcare setting. *(Category IB)*

Limit decolonization of HCP found to be colonized with MRSA to persons who have been epidemiologically linked as a likely source of ongoing transmission to patients. Consider reassignment of HCP if decolonization is not successful and ongoing transmission to patients persists. *(Category IB)*

Recommendations to prevent transmission of infectious agents among patients and healthcare personnel in all settings where healthcare is delivered

Administrative Responsibilities

Healthcare organization administrators should ensure the implementation of recommendations in this section.

Incorporate preventing transmission of infectious agents into the objectives of the organization's patient and occupational safety programs(Category IB) /IC

Make preventing transmission of infectious agents a priority for the healthcare organization. Provide administrative support, including fiscal and human resources for maintaining infection control programs. (Category IB) /IC

Assure that individuals with training in infection control are employed by or are available by contract to all healthcare facilities so that the infection control program is managed by one or more qualified individuals (Category IB) /IC

Determine the specific infection control full-time equivalents (FTEs) according to the scope of the infection control program, the complexity of the healthcare facility or system, the characteristics of the patient population, the unique or urgent needs of the facility and community, and proposed staffing levels based on survey results and recommendations from professional organizations (Category IB)

Include prevention of healthcare-associated infections (HAI) as one determinant of bedside nurse staffing levels and composition, especially in high-risk units (Category IB)

Delegate authority to infection control personnel or their designees (e.g., patient care unit charge nurses) for making infection control decisions concerning patient placement and assignment of Transmission-Based Precautions. Category IC

Involve infection control personnel in decisions on facility construction and design, determination of AIIR and Protective Environment capacity needs and environmental assessments Category IB) /IC

Provide ventilation systems required for a sufficient number of AIIRs (as determined by a risk assessment) and Protective Environments in healthcare facilities that provide care to patients for whom such rooms are indicated, according to published recommendations (Category IB) /IC

Involve infection control personnel in the selection and post-implementation evaluation of medical equipment and supplies and changes in practice that could affect the risk of HAI Category IC

Ensure availability of human and fiscal resources to provide clinical microbiology laboratory support, including a sufficient number of medical technologists trained in microbiology, appropriate to the healthcare setting, for monitoring transmission of microorganisms, planning and conducting epidemiologic investigations, and detecting emerging pathogens. Identify resources for performing surveillance cultures, rapid diagnostic testing for viral and other selected pathogens, preparation of antimicrobial susceptibility summary reports, trend analysis, and molecular typing of clustered isolates (performed either on-site or in a reference laboratory)

and use these resources according to facility-specific epidemiologic needs, in consultation with clinical microbiologists (Category IB)

Provide human and fiscal resources to meet occupational health needs related to infection control (e.g., healthcare personnel immunization, post-exposure evaluation and care, evaluation and management of healthcare personnel with communicable infections (Category IB) /IC

In all areas where healthcare is delivered, provide supplies and equipment necessary for the consistent observance of Standard Precautions, including hand hygiene products and personal protective equipment (e.g., gloves, gowns, face and eye protection)
(Category IB) /IC

Develop and implement policies and procedures to ensure that reusable patient care equipment is cleaned and reprocessed
appropriately before use on another patient. (Category IA) /IC

Develop and implement systems for early detection and management (e.g., use of appropriate infection control measures, including isolation precautions, PPE) of potentially infectious persons at initial points of patient encounter in outpatient settings (e.g., triage areas, emergency departments, outpatient clinics, physician offices) and at the time of admission to hospitals and long-term care facilities (LTCF) (Category IB)

Develop and implement policies and procedures to limit patient visitation by persons with signs or symptoms of a communicable infection. Screen visitors to high-risk patient care areas (e.g., oncology units, hematopoietic stem call transplant [HSCT] units, intensive care units, other severely immunocompromised patients) for possible infection 43 24, 41, 962, 963.(Category IB)

Identify performance indicators of the effectiveness of organization-specific measures to prevent transmission of infectious agents (Standard and Transmission-Based Precautions), establish processes to monitor adherence to those performance measures and provide feedback to staff
members . (Category IB)

Education and Training

Provide job- or task-specific education and training on preventing transmission of infectious agents associated with healthcare during orientation to the healthcare facility; update information periodically during ongoing education programs. Target all healthcare personnel for education and training, including but not limited to medical, nursing, clinical technicians, laboratory staff; property service (housekeeping), laundry, maintenance and dietary workers; students, contract staff and volunteers. Document competency initially and repeatedly, as appropriate, for the specific staff positions. Develop a system to ensure that healthcare personnel employed by outside agencies meet these education and training requirements through programs offered by the agencies or by participation in the healthcare facility’s program designed for full-time
Personnel. (Category IB)

Include in education and training programs, information concerning use of vaccines as an adjunctive infection control measure (Category IB)

Enhance education and training by applying principles of adult learning, using reading level and language appropriate material for the target audience, and using online educational tools available to the institution (Category IB)

III.Surveillance

Monitor the incidence of epidemiologically-important organisms and targeted HAIs that have substantial impact on outcome and for which effective preventive interventions are available; use information collected through surveillance of high-risk populations, procedures, devices and highly transmissible infectious agents to detect transmission of infectious agents in the healthcare facility (Category IA)

Apply the following epidemiologic principles of infection surveillance (Category IB)

- Use standardized definitions of infection
- Use laboratory-based data (when available)
- Collect epidemiologically-important variables (e.g., patient locations and/or clinical service in hospitals and other large multi-unit facilities, population-specific risk factors [e.g., low birth-weight neonates], underlying conditions that predispose to serious adverse outcomes)
- Analyze data to identify trends that may indicated increased rates of transmission
- Feedback information on trends in the incidence and prevalence of HAIs, probable risk factors, and prevention strategies and their impact to the appropriate healthcare providers, organization administrators, and as required by local and state health authorities

Develop and implement strategies to reduce risks for transmission and evaluate effectiveness (Category IB)

When transmission of epidemiologically-important organisms continues despite implementation and documented adherence to infection prevention and control strategies, obtain consultation from persons knowledgeable in infection control and healthcare epidemiology to review the situation and recommend additional measures for control . (Category IB)

Standard Precautions Assume that every person is potentially infected or colonized with an organism that could be transmitted in the healthcare setting and apply the following infection control practices during the delivery of health care.

Hand Hygiene

During the delivery of healthcare, avoid unnecessary touching of surfaces in close proximity to the patient to prevent both contamination of clean hands from environmental surfaces and transmission of pathogens from contaminated hands to surfaces. (Category IB) /IC

When hands are visibly dirty, contaminated with proteinaceous material, or visibly soiled with blood or body fluids, wash hands with either a nonantimicrobial soap and water or an antimicrobial soap and water. (Category IA)

If hands are not visibly soiled, or after removing visible material with nonantimicrobial soap and water, decontaminate hands in the clinical situations described in IV.A.2.a-f. The preferred method of hand decontamination is with an alcohol-based hand rub 562, 978. Alternatively, hands may be washed with an antimicrobial soap and water. Frequent use of alcohol-based hand rub immediately following handwashing with nonantimicrobial soap may increase the frequency of dermatitis 559. (Category IB)
Perform hand hygiene:
Before having direct contact with patients (Category IB)

After contact with blood, body fluids or excretions, mucous membranes, nonintact skin, or wound dressings (Category IA)

After contact with a patient's intact skin (e.g., when taking a pulse or blood pressure or lifting a patient). (Category IB)

After removing gloves. (Category IB)

Do not wear artificial fingernails or extenders if duties include direct contact with patients at high risk for infection and associated adverse outcomes (e.g., those in ICUs or operating rooms) . (Category IA)

Personal protective equipment (PPE)
Observe the following principles of use:

Wear PPE, as described when the nature of the anticipated patient interaction indicates that contact with blood or body fluids may occur (Category IB) /IC
Before leaving the patient's room or cubicle, remove and discard PPE (Category IB) /IC

Gloves

Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, nonintact skin, or potentially contaminated intact skin (e.g., of a patient incontinent of stool or urine) could occur
. (Category IB) /IC

Wear gloves with fit and durability appropriate to the task (Category IB)

Wear disposable medical examination gloves for providing direct patient care.
Wear disposable medical examination gloves or reusable utility gloves for cleaning the environment or medical equipment.
Remove gloves after contact with a patient and/or the surrounding environment (including medical equipment) using proper technique to prevent hand contamination (Do not wear the same pair of gloves for the care of more than

one patient. Do not wash gloves for the purpose of reuse since this practice has been associated with transmission of pathogens
(Category IB)

Gowns
Wear a gown, that is appropriate to the task, to protect skin and prevent soiling or contamination of clothing during procedures and patient-care activities when contact with blood, body fluids, secretions, or excretions is anticipated 739, 780, 896. (Category IB) /IC

Wear a gown for direct patient contact if the patient has uncontained secretions or excretions (Category IB) /IC

Remove gown and perform hand hygiene before leaving the patient's environment Category IB) /IC

Routine donning of gowns upon entrance into a high risk unit (e.g., ICU, NICU, HSCT unit) is not indicated (Category IB)

Mouth, nose, eye protection

Use PPE to protect the mucous membranes of the eyes, nose and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions. Select masks, goggles, face shields, and combinations of each according to the need anticipated by the task performed (Category IB) /IC
For procedures (e.g., bronchoscopy, suctioning of the respiratory tract [if not using in-line suction catheters], endotracheal intubation) in patients who are not suspected of being infected with an agent for which respiratory protection is otherwise recommended (e.g., M. tuberculosis, SARS or hemorrhagic fever viruses), wear one of the following: a face shield that fully covers the front and sides of the face, a mask with attached shield, or a mask and goggles (in addition to gloves and
gown) . (Category IB)

Respiratory Hygiene/Cough Etiquette
Educate healthcare personnel on the importance of source control measures to contain respiratory secretions to prevent droplet and fomite transmission of respiratory pathogens, especially during seasonal outbreaks of viral respiratory tract infections (e.g., influenza, RSV, adenovirus, parainfluenza virus) in communities (Category IB),

Provide resources and instructions for performing hand hygiene in or near waiting areas in ambulatory and inpatient settings; provide conveniently-located dispensers of alcohol-based hand rubs and, where sinks are available, supplies for handwashing
(Category IB .)

During periods of increased prevalence of respiratory infections in the community (e.g., as indicated by increased school absenteeism, increased number of patients seeking care for a respiratory infection), offer masks to coughing patients and other symptomatic persons (e.g., persons who accompany ill patients) upon entry into the facility or medical office and encourage them to maintain special separation, ideally a distance of at least 3 feet, from others in common waiting areas (Category IB)

Patient placement
IV.D.1. Include the potential for transmission of infectious agents in patient-placement decisions. Place patients who pose a risk for transmission to others (e.g., uncontained secretions, excretions or wound drainage; infants with suspected viral respiratory or gastrointestinal infections) in a single-patient room when available (Category IB)

Patient-care equipment and instruments/devices

Establish policies and procedures for containing, transporting, and handling patient-care equipment and instruments/devices that may be contaminated with blood or body fluids (Category IB) /IC
Remove organic material from critical and semi-critical instrument/devices, using recommended cleaning agents before high level disinfection and sterilization to enable effective disinfection and sterilization processes (Category IA)

Wear PPE (e.g., gloves, gown), according to the level of anticipated contamination, when handling patient-care equipment and instruments/devices that is visibly soiled or may have been in contact with blood or body fluids (Category IB) /IC

Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for other surfaces (e.g., horizontal surfaces in
waiting rooms) (Category IB)

Use EPA-registered disinfectants that have microbiocidal (i.e., killing) activity against the pathogens most likely to contaminate the patient-care environment. Use in accordance with manufacturer's instructions (Category IB) /IC

Include multi-use electronic equipment in policies and procedures for preventing contamination and for cleaning and disinfection, especially those items that are used by patients, those used during delivery of patient care, and mobile devices that are moved in and out of patient rooms frequently (e.g., daily) (Category IB)

Textiles and laundry

Handle used textiles and fabrics with minimum agitation to avoid contamination of air, surfaces and persons. (Category IB) /IC

Safe injection practices The following recommendations apply to the use of needles, cannulas that replace needles, and, where applicable intravenous delivery systems

Use aseptic technique to avoid contamination of sterile injection equipment (Category IA)
Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed. Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient. (Category IA)

Use fluid infusion and administration sets (i.e., intravenous bags, tubing and connectors) for one patient only and dispose appropriately after use. Consider a syringe or needle/cannula contaminated once it has been used to enter or connect to a patient's intravenous infusion bag or administration set (Category IB)

Use single-dose vials for parenteral medications whenever possible (Category IA)

Do not administer medications from single-dose vials or ampules to multiple patients or combine leftover contents for later use (Category IA)

If multidose vials must be used, both the needle or cannula and syringe used to access the multidose vial must be sterile (Category IA)

Do not keep multidose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable (Category IA)

Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients (Category IB)

Infection control practices for special lumbar puncture procedures Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture and spinal or epidural anesthesia (Category IB)

Worker safety Adhere to federal and state requirements for protection of healthcare personnel from exposure to bloodborne pathogens. Category IC

General principles

In addition to Standard Precautions, use Transmission-Based Precautions for patients with documented or suspected infection or colonization with highly transmissible or epidemiologically-important pathogens for which additional precautions are needed to prevent transmission (Category IA)

Extend duration of Transmission-Based Precautions, (e.g., Droplet, Contact) for immunosuppressed patients with viral infections due to prolonged shedding of viral agents that may be transmitted to others (Category IA)

Contact Precautions
Use Contact Precautions as recommended in Appendix A for patients with known or suspected infections or evidence of syndromes that represent an increased risk for contact transmission. For specific recommendations for use of Contact Precautions for colonization or infection with MDROs, go to the MDRO guideline:

Patient placement
V.B.2.a. In acute care hospitals, place patients who require Contact Precautions in a single-patient room when available (Category IB)

When single-patient rooms are in short supply, apply the following principles for making decisions on patient placement: suitable roommates (Category IB)

Change protective attire and perform hand hygiene between contact with patients in the same room, regardless of whether one or both patients are on Contact Precautions
(Category IB)

Use of personal protective equipment
Gloves Wear gloves whenever touching the patient's intact skin 24, 89, 134, 559, 746, 837 or surfaces and articles in close proximity to the patient (e.g., medical equipment, bed rails). Don gloves upon entry into the room or cubicle. (Category IB)

Gowns
Wear a gown whenever anticipating that clothing will have direct contact with the patient or potentially contaminated environmental surfaces or equipment in close proximity to the patient. Don gown upon entry into the room or cubicle. Remove gown and observe hand hygiene before leaving the patient-care environment (Category IB)
Patient-care equipment and instruments/devices

Handle patient-care equipment and instruments/devices according to Standard Precautions (Category IB) /IC

In acute care hospitals and long-term care and other residential settings, use disposable noncritical patient-care equipment (e.g., blood pressure cuffs) or implement patient-dedicated use of such equipment. If common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment
before use on another patient (Category IB)

Environmental measures Ensure that rooms of patients on Contact Precautions are prioritized for frequent cleaning and disinfection (e.g., at least daily) with a focus on frequently-touched surfaces (e.g., bed rails, overbed table, bedside commode, lavatory surfaces in patient bathrooms, doorknobs) and equipment in the immediate vicinity of
the patient (Category IB)

Discontinue Contact Precautions after signs and symptoms of the infection have resolved or according to pathogen-specific recommendations (Category IB)

Droplet Precautions
Use Droplet Precautions as recommended in Appendix A for patients known or suspected to be infected with pathogens transmitted by respiratory droplets (i.e., large-particle droplets >5μ in size) that are generated by a patient who is coughing, sneezing
or talking. (Category IB)

Patient placement
In acute care hospitals, place patients who require Droplet Precautions in a single-patient room when available Category II When single-patient rooms are in short supply, apply the following principles for making decisions on patient placement:

Place together in the same room (cohort) patients who are infected the same pathogen and are suitable roommates . (Category IB)

Ensure that patients are physically separated (i.e., >3 feet apart) from each other. Draw the privacy curtain between beds to minimize opportunities for close contact (Category IB)
Change protective attire and perform hand hygiene between contact with patients in the same room, regardless of whether one patient or both patients are on Droplet
Precautions (Category IB)

Discontinue Droplet Precautions after signs and symptoms have resolved or according to pathogen-specific recommendations in Appendix A. (Category IB)

Airborne Precautions
Use Airborne Precautions as recommended in Appendix A for patients known or suspected to be infected with infectious agents transmitted person-to-person by the airborne route (e.g., M tuberculosis measles, chickenpox , disseminated herpes zoster (Category IA) /IC

Patient placement
In acute care hospitals and long-term care settings, place patients who require Airborne Precautions in an AIIR that has been constructed in accordance with current guidelines
(Category IA) /IC

Provide at least six (existing facility) or 12 (new construction/renovation) air changes per hour.

Direct exhaust of air to the outside. If it is not possible to exhaust air from an AIIR directly to the outside, the air may be returned to the air-handling system or adjacent spaces if all air is directed through HEPA filters.

Whenever an AIIR is in use for a patient on Airborne Precautions, monitor air pressure daily with visual indicators (e.g., smoke tubes, flutter strips), regardless of the presence of differential pressure sensing devices (e.g., manometers

Keep the AIIR door closed when not required for entry and exit

In ambulatory settings:

Develop systems (e.g., triage, signage) to identify patients with known or suspected infections that require Airborne Precautions upon entry into ambulatory settings. (Category IA)

Place the patient in an AIIR as soon as possible. If an AIIR is not available, place a surgical mask on the patient and place him/her in an examination room. Once the patient leaves, the room should remain vacant for the appropriate time, generally one hour, to allow for a full exchange of air (Category IB) /IC

Instruct patients with a known or suspected airborne infection to wear a surgical mask and observe Respiratory Hygiene/Cough Etiquette. Once in an AIIR, the mask may be removed; the mask should remain on if the patient is not in an AIIR (Category IB) /IC

Personnel restrictions Restrict susceptible healthcare personnel from entering the rooms of patients known or suspected to have measles (rubeola), varicella (chickenpox), disseminated zoster, or smallpox if other immune healthcare personnel are available . (Category IB)

Wear a fit-tested NIOSH-approved N95 or higher level respirator for respiratory protection when entering the room or home of a patient when the following diseases are suspected or confirmed: . Infectious pulmonary or laryngeal tuberculosis or when
infectious tuberculosis skin lesions are present and procedures that would aerosolize viable organisms (e.g., irrigation, incision and drainage, whirlpool treatments) are
performed Category IB)

For patients with skin lesions associated with varicella or smallpox or draining skin lesions caused by M. tuberculosis, cover the affected areas to prevent aerosolization or contact with the infectious agent in skin lesions (Category IB)

Exposure management Immunize or provide the appropriate immune globulin to susceptible persons as soon as possible following unprotected contact (i.e., exposed) to a patient with measles, varicella or smallpox: (Category IA)

Administer measles vaccine to exposed susceptible persons within 72 hours after the exposure or administer immune globulin within six days of the exposure event for high-risk persons in whom vaccine is contraindicated
Administer varicella vaccine to exposed susceptible persons within 120 hours after the exposure or administer varicella immune globulin (VZIG or alternative product), when available, within 96 hours for high-risk persons in whom vaccine is contraindicated (e.g., immunocompromised patients, pregnant women, newborns whose mother’s varicella onset was <5 days before or within 48 hours after delivery
Administer smallpox vaccine to exposed susceptible persons within 4 days after exposure
Discontinue Airborne Precautions according to pathogen-specific recommendations in (Category IB)

Protective Environment (Table 4)
Place allogeneic hematopoietic stem cell transplant (HSCT) patients in a Protective Environment as described in the “Guideline to Prevent Opportunistic Infections in HSCT Patients” 15, the “Guideline for Environmental Infection Control in Health-Care Facilities” 11, and the “Guidelines for Preventing Health-Care-Associated Pneumonia, 2003” 14 to reduce exposure to environmental fungi (e.g., Aspergillus sp) (Category IB)

Environmental controls Filtered incoming air using central or point-of-use high efficiency particulate (HEPA) filters capable of removing 99.97% of particles >0.3 µm in diameter. (Category IB)

Directed room airflow with the air supply on one side of the room that moves air across the patient bed and out through an exhaust on the opposite side of the room. (Category IB)

Positive air pressure in room relative to the corridor (pressure differential of >12.5 Pa [0.01-in water gauge]). (Category IB)

Monitor air pressure daily with visual indicators (e.g., smoke tubes, flutter strips) (Category IA)

Well-sealed rooms that prevent infiltration of outside air (Category IB)

At least 12 air changes per hour 13. (Category IB)
Avoid carpeting in hallways and patient rooms in areas.(Category IB)

Use of Standard and Transmission-Based Precautions in a Protective Environment.

Use Standard Precautions as recommended for all patient interactions. (Category IA)

Implement Droplet and Contact Precautions as recommended for diseases listed in Appendix A.

Transmission-Based precautions for viral infections may need to be prolonged because of the patient’s immunocompromised state and prolonged shedding of viruses (Category IB)

Implement Airborne Precautions for patients who require a Protective Environment room and who also have an airborne infectious disease (e.g., pulmonary or laryngeal tuberculosis, acute varicella-zoster). (Category IA)

Ensure that the Protective Environment is designed to maintain positive pressure (Category IB)

Use an anteroom to further support the appropriate air-balance relative to the corridor and the Protective Environment; provide independent exhaust of contaminated air to the outside or place a HEPA filter in the exhaust duct if the return air must be recirculated, (Category IB)