Infections are a common cause of morbidity and mortality in LTCF residents. For medical directors, infection prevention and control programs in LTCFs need to be proactive in identifying potential infectious disease threats and implementing appropriate infection control practices. Improving the initial evaluation of infections, the use of antimicrobial agents, and the implementation of hand hygiene and infection control precautions should be key focus areas for medical directors in order to prevent infections and control antibiotic resistance. (J Am Med Dir Assoc 2007; 8: S18–S25)

Keywords: Nursing homes; infections; infection control

Infections are common in long-term care facilities (LTCFs) and lead to increased morbidity and mortality among LTCF residents. On average, LTCF residents will have one or more infections requiring antibiotic therapy during a year and residents with presumed infections account for one quarter of all hospital transfers from LTCFs.1 For medical directors, infection control programs in LTCFs need to be proactive in identifying potential infectious disease threats and implementing appropriate infection control practices. Improving the initial evaluation of infections, the use of antimicrobial agents, and the implementation of hand hygiene and infection control precautions should be key focus areas for medical directors.

RISK FACTORS FOR INFECTIONS IN LONG-TERM CARE FACILITIES

Risk factors for infection include immunologic senescence, malnutrition, comorbid conditions, medications (eg, immunosuppressants), medical devices (eg, urinary catheters) cognitive deficits, functional impairments (eg, fecal and urinary incontinence, immobility, diminished cough reflex)2,3 (Table 1). Some of these factors are not modifiable. Consequently, medical directors should monitor and ensure that for those factors that can be modified, such as antibiotic or device use, appropriate steps are taken to promote appropriate use. In some LTCFs providing postacute care, invasive medical interventions or therapy (eg, central venous catheters, hemodialysis, parenteral antimicrobial or nutrition therapy, mechanical ventilation) are also provided and substantially increase infection risk, especially for bacteremia or pneumonia.

At a group level, LTCFs typically provide physical therapy, shared bathing facilities or whirlpool therapy units, and group dining facilities, which all have the potential to foster person-to-person transmission of infectious agents.2,3 Low health care worker immunization rates for influenza in LTCFs have been associated with respiratory disease outbreaks.4,5 Finally, specific institutional characteristics such as larger size and nursing unit configuration have been associated with infectious disease outbreaks.6 Risk for outbreaks is lower in LTCFs with paid employee sick leave.

Regional outbreaks of antimicrobial-resistant infections and increasing prevalence of antimicrobial-resistant organisms in LTCFs have been reported.7,8 In addition to the individual and institutional risk factors for infection discussed previously, colonization with antimicrobial-resistant pathogens (eg, methicillin-resistant Staphylococcus aureus; vancomycin-resistant Enterococcus [VRE], multidrug-resistant Escherichia coli, Acinetobacter, Enterobacter, or Pseudomonas aeruginosa) increases the likelihood of both epidemics and high rates of endemic disease with antimicrobial-resistant pathogens in LTCFs.9 Risk factors for the development of infection with multidrug resistance include exposure to antimicrobials, lack of handwashing sinks, and lower levels of registered nurse staffing.10

SELECTED INFECTIONS IN LONG-TERM CARE FACILITIES

Urinary Tract Infections

Urinary tract infections (UTIs) account for 25% to 30% of all bacterial infections in LTFCs11,12 and are among the most common bacterial infections in LTCF residents. Accurate clinical diagnosis of symptomatic UTI in frail elderly LTCF residents may be difficult and discrepancy exists among clinicians regarding UTI definitions.13 In the institutionalized elderly, only 4% to 8% of residents with fever and bacteriuria have clinical findings consistent with UTI.14 In residents with an indwelling urinary catheter, about 25% of individuals with fever and bacteriuria had UTI.14 In cognitively impaired frail elderly, eliciting symptoms or signs specific to the urinary tract...
Table 1. Risk Factors for Infection in Long-Term Care Facility Residents

- Immunologic senescence
- Lack of vaccination
- Malnutrition
  - Protein malnutrition or combined protein-calorie malnutrition
- Chronic diseases
  - Cancer
  - Diabetes mellitus
  - Chronic lung disease
  - Congestive heart failure
  - Peripheral vascular disease
  - Autoimmunity, immunocompromised state
- Medications
  - Immunosuppressants
  - Agents that diminish cough reflex
  - Sedatives and hypnotics
- Cognitive deficits that may complicate resident compliance with basic sanitary practices (eg, hand hygiene)
- Functional impairments
  - Fecal and urinary incontinence
  - Immobility
  - Diminished cough reflex
- Medical interventions
  - Central venous catheters, hemodialysis
  - Urinary catheters, gastrostomy catheters
  - Parenteral antimicrobial or nutrition therapy
  - Mechanical ventilation
- Settings
  - Group activities (eg, dining, recreational)
  - Shared bathing facilities
  - Shared equipment (eg, physical therapy, wound care/whirlpool)

(eg, dysuria, frequency, flank pain) can be extraordinarily difficult. Using more nonspecific symptoms (eg, changes in mental status, decreased oral intake) can be misleading. In cognitively impaired elderly, new urinary incontinence should be considered as a potentially useful symptom or sign to indicate UTI, although further studies are needed to better define its sensitivity and specificity for predicting UTI.

Urinalysis (UA) in healthy, young adults is useful in detecting UTIs. However, the presence of pyuria, either by direct microscopy (eg, ≥5 white blood cells [WBCs] on high-powered field) or dipstick (eg, positive leukocyte esterase) is less helpful in frail elderly. For example, in chronically incontinent asymptomatic nursing home residents, both bacteriuria and pyuria are common even in the absence of clinical symptoms of UTI leading to overdiagnosis and overtreatment of UTIs. A recently reported multifaceted intervention in LTCFs using diagnostic and treatment algorithms was successful in reducing antibiotic use for UTIs.

In LTCFs, chronic urinary catheters are used to manage patients who have neurogenic bladders or obstruction to urinary drainage. The presence of a urinary catheter increases risk for UTI dramatically; consequently, primary prevention strategies in LTCF have focused on improved incontinence management and removal of catheters. As an alternative for residents who truly have a long-term indication for a urinary catheter, use of an antimicrobial or silver impregnated catheter may be beneficial.

Respiratory Tract Infection Outbreaks in Long-Term Care Facilities

Respiratory tract infection outbreaks in LTCFs are relatively common and can occur year around. The most common symptoms among residents during outbreaks were cough (83%), fever (40%), and coryza (45%). The most common pathogens were influenza, parainfluenza, or respiratory syncytial viruses; Legionella spp; or Chlamydia pneumoniae.

The most important cause of respiratory tract disease outbreaks in LTCFs is influenza. Of the 20,000 deaths from influenza each year, 90% occur in persons 65 years or older. Primary risk factors are lack of influenza vaccination among residents and health care workers. Ventilation and architectural issues may also play a role. Even widespread use of immunization, the cornerstone of influenza prevention, may be insufficient to prevent some LTCF outbreaks. Especially in older residents, influenza vaccine effectiveness may be diminished because of poor immunologic response to the vaccine. In a LTCF with high rates (>85%) of resident influenza vaccination, outbreaks involving 172 residents were reported despite a match between the vaccine strain and outbreak strain. Although influenza vaccination may not completely prevent clinical disease, clinical presentation is often ameliorated, especially if the match between influenza strains circulating in the LTCF and the vaccine strain is good. In addition to influenza, infections with parainfluenza virus, respiratory syncytial virus, adenoviruses, and rhinoviruses can cause respiratory tract disease in LTCF residents. The key observations from reports on respiratory tract outbreaks are that early identification of the infectious agents, institution of appropriate treatment or prophylaxis, and aggressive use of infection precautions, especially isolation of residents and improved health care worker compliance with hand hygiene recommendations, are critical to minimize serious morbidity and deaths.

Streptococcus pneumoniae is the most common pathogen identified in endemic respiratory tract disease in LTCF residents, is an important cause of invasive disease, and is increasingly resistant to antimicrobials. The incidence of invasive S pneumoniae in LTCF residents is 4 times higher than in community-living elderly individuals. In a review of 26 S pneumoniae outbreaks since 1990, the majority occurred in elderly patients in LTCFs or hospitals. The most common serotypes identified in these outbreaks were 23F, 14, and 4, all of which are included in current formulations of the pneumococcal vaccine. Outbreaks of S pneumoniae pneumonia and bacteremia in Oklahoma, Massachusetts, and Maryland, LTCFs were associated with low pneumococcal vaccination rates. A LTCF outbreak of S pneumoniae pneumonia in Massachusetts was associated with a 20% case-fatality rate. Antecedent infection with human parainfluenza virus was associated with increased risk of S pneumoniae infection.

Legionnaire's disease, caused by Legionella pneumophilia, remains an important consideration during respiratory tract...
disease outbreaks. Outbreaks in both LTCFs and hospitals are generally associated with contaminated water systems. *L pneumophila* may persist in health care facility water systems despite the use of a variety of interventions.\(^5\) To identify these outbreaks earlier, LTCF clinicians and staff should maintain a high index of suspicion for Legionnaire’s disease and obtain the proper laboratory support for microbiologic testing to identify *L pneumophila*.

### Gastrointestinal Infections

Diarrhea in LTCF residents is common and may be a result of both infectious and noninfectious causes. Diarrheal or gastrointestinal outbreaks in LTCFs are potentially explosive, have high attack rates once established, and can result in severe dehydration and death. Outbreaks can affect both residents and staff causing severe disruption in the LTCF. The usual modes of transmission are through person-to-person transmission or, less commonly, through foodborne transmission. The most common outbreaks are attributable to norovirus or rotavirus. Outbreaks attributable to bacterial pathogens are less commonly reported.

The most common cause of gastroenteritis outbreaks in LTCFs is norovirus and rotavirus.\(^6\)–\(^8\) These outbreaks are characterized by vomiting, diarrhea, dehydration, and high attack rates among both residents and health care workers. In addition to person-to-person transmission, heavy environmental contamination may have been present making eradication of the outbreak difficult. Occasional foodborne outbreaks may also be seen in LTCFs with agents such as *Salmonella* or *Clostridium perfringens*.\(^9\),\(^10\) These outbreaks may initially be related to poor food preparation techniques in the LTCF or health care worker foodborne illness subsequently transmitted through person-to-person transmission. It is important for medical directors and infection control professionals to include health care workers, food service workers, and environmental sanitation workers in investigating outbreaks that may appear to be foodborne.

A diarrheal disease of growing importance in LTCFs is *Clostridium difficile*. *C difficile* infections may occur as a result of antibiotic therapy given in the LTCF or may be imported from acute care facilities.\(^11\) An emerging strain of *C difficile* with higher rates of resistance to fluoroquinolones may also be associated with worse outcomes, especially in elderly residents in LTCFs.\(^12\) Medical directors should encourage practitioners to test for *C difficile* toxin in LTCF residents who have diarrheal disease with a recent history of exposure or when the diarrhea cannot be explained.

### Skin Infections

Skin infections in LTCF residents are usually fungal or bacterial, easily treated, and self limited. However, LTCF residents have several risk factors that may promote both more serious infections and skin infection outbreaks. These risk factors include poor nutritional status, presence of surgical wounds or pressure ulcers, skin maceration or wetness because of contact with feces or urine, and the use of common bathing facilities. Examples of LTCF skin infection outbreaks attributable to bacteria include *S pyogenes*–associated cellulitis, *Pseudomonas aeruginosa* associated with a contaminated whirlpool bath, and group A *Streptococcus* or antimicrobial-resistant organisms causing infections of pressure ulcers.\(^3\) In addition to bacterial skin infections, scabies is an important parasitic skin infection that not infrequently causes outbreaks in LTCFs. Transmission of scabies may occur by contact with mite-contaminated inanimate objects (eg, bed linens) or direct person-to-person contact. Outbreaks of scabies in 3 Norwegian LTCFs lasted for 5 months and involved 27 patients or health care workers.\(^13\) Initial treatments with permethrin were not successful; however, benzyl benzoate was effective. Ultimately more than 600 residents and staff were treated. A key observation from these outbreaks was the need for simultaneous treatment of residents and staff and disinfection of bedding, clothing, and the environment. As with other outbreaks, early identification is optimal for management of scabies outbreaks and may occasionally require dermatological consultation or skin biopsy for diagnosis.

### Infections With Antimicrobial-Resistant Organisms

Both endemic and epidemic infections in LTCFs occur as a result of antimicrobial-resistant organisms.\(^34\) Important antimicrobial-resistant pathogens include methicillin-resistant *Staphylococcus aureus*; vancomycin-resistant *Enterococcus* (VRE), and multidrug-resistant gram-negative rods such as *E coli*, *Acinetobacter*, *Enterobacter*, or *Pseudomonas aeruginosa*.\(^34\),\(^35\) Widespread colonization of residents in LTCFs with antimicrobial-resistant organisms provides a potential reservoir for subsequent transmission and outbreaks. In Chicago, a city-wide outbreak of multidrug-resistant *Klebsiella pneumoniae* and *E coli* demonstrated that LTCFs were important reservoirs for antimicrobial-resistant organisms.\(^36\) Furthermore, in a single Chicago skilled nursing facility, 43% of residents were colonized with at least one antimicrobial-resistant organism.\(^36\) Recent studies have demonstrated success in reducing VRE colonization or infection and may offer important intervention strategies for the future.\(^37\),\(^38\) These studies have documented the importance of resident screening, isolation, health care worker hand hygiene, and decreased inappropriate antimicrobial use.

In addition to cross-transmission, widespread antimicrobial use is a potential risk factor for the development of antimicrobial resistance within LTCFs. Previous studies suggest that 25% to 75% of antibiotic use is inappropriate. A large study in Canadian LTCFs found that one third or more of antibiotic prescriptions were given to patients not meeting infection definitions. Most of these prescriptions were for suspected UTI in residents who more likely had asymptomatic bacteriuria.\(^39\) In addition to increasing the risk of colonization or infections with antimicrobial-resistant organisms, inappropriate antimicrobial use adds to patient care costs and may place the patient at risk for adverse medication reactions.\(^39\)–\(^41\)
INFECTION CONTROL ISSUES

Evaluation of Fever and Infection in Long-Term Care Facility Residents

While not traditionally considered as part of the infection control program, medical directors should ensure that suspected infections are appropriately evaluated. Recommendations outlining the minimum evaluation for infection in nursing home residents have been promoted. For residents with suspected infection, the guideline recommends that nurse’s aides measure vital signs (eg, temperature, blood pressure, pulse, respiratory rate, presence of pain), identify residents with fever or suspected infection, and relay this information to licensed nursing staff. Next, the licensed nursing staff (eg, LPN or RN) should perform an initial clinical assessment on residents with fever or suspected infection, and significant findings should be relayed to clinicians. LTCFs should have training and procedures in place to ensure that residents with suspected infection are quickly identified by nursing staff and appropriate information relayed to clinicians.

In most LTCFs, limited diagnostic testing for residents with suspected infection is available. Laboratory testing is usually sent to a hospital or reference laboratory. The delay between obtaining specimens and actual laboratory processing and reporting results back to clinicians in LTCFs can be substantial. This delay may lead to poor decisions regarding the need for empiric or continued antimicrobial use. Medical directors should work with LTCF administrators, directors of nursing, and laboratory providers to both improve specimen collection and reporting of results. Using acute care facility antibiotic susceptibility testing profiles (eg, antibiograms) may be misleading and the availability of an LTCF-specific antibiogram may improve the initial selection of empiric antimicrobial therapy. Where possible, laboratory providers should provide a facility-specific antibiotic susceptibility testing profile (ie, antibiogram) either for the individual facility or for a network of LTCFs. Clinicians should reevaluate residents on antimicrobial therapy at 48 to 72 hours with the goal of tailoring antimicrobial therapy at 48 to 72 hours with the goal of tailoring antimicrobial susceptibility profiles to the clinical course, identified pathogens, and antimicrobial susceptibility profile. Residents who require diagnostic studies not available in the LTCF or who are unstable should be transferred to acute care hospitals for further evaluation and therapy unless they have advanced directives (eg, “living wills”) for no hospitalization.

All residents with a presumed infection should have a complete blood count (CBC) performed. The presence of leukocytosis (WBC count $\geq 14,000$) or a significant “left shift” warrants further careful assessment for infection. Urinalysis and urine cultures are often overused in LTCFs. For residents without indwelling urinary catheters, urinalysis and urine cultures should be ordered when localized symptoms of urinary tract infection are present. In residents with chronic indwelling urinary catheters, urinalysis and urine cultures should be obtained primarily in residents who have presumed sepsis or clearcut urinary tract symptoms. For residents with suspected pneumonia, the minimum evaluation should include a chest radiograph and determination of oxygen saturation using pulse oximetry.

In addition to recommended tests, some laboratory tests may not be appropriate in LTCF residents. In most LTCFs, sputum and blood cultures should not be obtained because of the high likelihood of contamination. Whereas a properly collected sputum Gram stain and culture can be very helpful in evaluating pneumonia, sputum studies should be obtained only if purulent sputum is available and if the sample can be transported to the clinical laboratory within 2 hours or less of collection. In most LTCFs this will not be possible. In addition to the high rate of contamination, blood cultures in the LTCF population are usually low yield unless sepsis is present. For residents with presumed sepsis, strong consideration should be given for transfer directly to acute care facilities for evaluation and management. If a LTCF resident has advance directives for no hospitalization, then clinicians should refrain from obtaining blood cultures in most situations because the data gained is unlikely to result in better medical care for the resident. If blood cultures are obtained in the LTCF, medical directors should ensure that staff members (eg, nurses) collecting the blood samples have been properly trained. Working with the hospital or commercial laboratories to monitor for probable contaminants in blood culture results (eg, coagulase-negative Staphylococcus) may provide early clues when collection techniques are suboptimal. Similarly, surface cultures from infected wounds are not recommended because of the high likelihood of contamination and the low yield from these cultures.

Infection Control Program

LTCFs are required by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), Centers for Medicare and Medicaid Services (CMS), and state accrediting organizations to have functional infection control programs. Several reviews, guidelines, and position statements for infection control in LTCFs have been published previously and offer guidance in terms of structure and activities of these programs. In addition, guidelines from the Centers for Disease Control and Prevention for many aspects of infection control are available through the Internet (www.cdc.gov/ncidod/dhqp). The key components of a well-organized infection control program in LTCFs include the following: (1) a well-trained infection control professional (ICP) to head the program, (2) an infection control committee, (3) a written and widely disseminated infection control plan, and (4) sufficient administrative support to undertake core infection control functions.

The 2 most important aspects of a LTCF infection control program are that the ICP is trained in infection control and that the LTCF administrator provides support and resources for the program. In the northeastern United States, most ICPs are registered nurses (90%) who perform infection control duties on a part-time basis. However, only half (52%) have formal infection control training and most had significant additional clinical or administrative nursing duties. More recent surveys are even less encouraging regarding the availability of infection control staff that has had even minimal training in infection control. Medical directors should advocate for
formal infection control training for nurses or other staff who will be responsible for infection control activities.

To assist the ICP, an active infection control committee can be instrumental in building an effective infection control program. In smaller LTCFs, the committee should consist of the ICP, nursing director, medical director, and administrator. In larger LTCFs, the infection control committee might include consultant pharmacists, an infectious disease specialist consultant, representatives from physical therapy or rehabilitation, and environmental services. In addition, the formation of teams including both LTCF clinicians, ICPs, and nursing staff may be especially beneficial in outbreak management. To address resource limitations, LTCFs should develop alliances with acute care hospitals or other LTCFs in the local region. In a multifacility LTCF corporation, consideration should be given to developing a corporate infection control program that can support and train facility ICPs. In some LTCFs, the infection control committee or its functions may be part of the facility’s overall quality management or improvement program. In this setting, it is important to maintain a distinct focus, expertise, and resource commitment on infection control.

Immunization

Currently, LTCF residents should have yearly influenza vaccination and pneumococcal vaccination at least once after age 65. Overall vaccination rates among LTCF residents for influenza vaccine and pneumococcal vaccine are suboptimal and many LTCFs have inadequate policies addressing routine vaccination. Preventing influenza and pneumococcal infections through an active immunization program is important not only for preventing these infections, but also for limiting empiric antimicrobial use and avoiding post-influenza secondary bacterial infection. The components of a well-organized immunization program include a written facility policy and plan on immunization, an implementation manual, training for staff members including physicians on the immunization plan, collecting and recording baseline vaccination rates for current residents, and then initiation of vaccination of both current residents and new arrivals.

To monitor for outbreaks and institute timely control measures, LTCF infection control personnel should include active surveillance for acute febrile respiratory tract illnesses as part of the overall infection control plan. Furthermore, LTCF personnel should develop the surveillance system in conjunction with local and state health departments to enhance communication and ensure compliance with public health requirements. Recently, implementation of standing orders for influenza and pneumococcal vaccination in LTCFs has been proposed as an effective intervention to increase vaccination rates, although use of standing orders is not yet widespread.

LTCF health care workers should strongly consider receiving annual influenza vaccination. Influenza outbreaks in LTCFs with high rates of resident immunization have been attributed to low rates of health care worker vaccination. Similarly, health care worker vaccination is associated with reduced LTCF resident mortality. New efforts by the

<table>
<thead>
<tr>
<th><strong>Table 2. Minimum Criteria for the Initiation of Antimicrobial Therapy in Nursing Home Residents</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skin and Soft Tissue Infections</strong></td>
</tr>
<tr>
<td>New OR increasing purulent drainage at the wound, skin, or soft tissue site</td>
</tr>
<tr>
<td>OR two of the following:</td>
</tr>
<tr>
<td>Fever*</td>
</tr>
<tr>
<td>Redness</td>
</tr>
<tr>
<td>Warmth</td>
</tr>
<tr>
<td>Tenderness</td>
</tr>
<tr>
<td>New or increasing swelling at the affected site</td>
</tr>
<tr>
<td><strong>Lower Respiratory Infections</strong></td>
</tr>
<tr>
<td>For residents with fever &gt;38.9°C</td>
</tr>
<tr>
<td>AND at least one of the following:</td>
</tr>
<tr>
<td>&gt;25 breaths per minute productive cough</td>
</tr>
<tr>
<td>Fever &gt;37.9°C but &lt;38.9°C</td>
</tr>
<tr>
<td>Cough AND at least one of the following:</td>
</tr>
<tr>
<td>Pulse &gt;100</td>
</tr>
<tr>
<td>Delirium</td>
</tr>
<tr>
<td>Rigors</td>
</tr>
<tr>
<td>Respiratory rate &gt;25</td>
</tr>
<tr>
<td>Afebrile with COPD and age &gt;65</td>
</tr>
<tr>
<td>New OR increased cough with purulent sputum production</td>
</tr>
<tr>
<td>Afebrile without COPD</td>
</tr>
<tr>
<td>New cough with purulent sputum</td>
</tr>
<tr>
<td>AND &gt;25 breaths per minute OR delirium</td>
</tr>
<tr>
<td><strong>Urinary Tract Infection</strong></td>
</tr>
<tr>
<td>No indwelling catheter</td>
</tr>
<tr>
<td>Acute dysuria alone or fever*</td>
</tr>
<tr>
<td>AND at least one of the following: new or worsening urgency, frequency, suprapubic pain, gross hematuria, costovertebral angle tenderness, urinary incontinence</td>
</tr>
<tr>
<td>With chronic indwelling catheter</td>
</tr>
<tr>
<td>AND at least one of the following: Fever,* new costovertebral angle tenderness, rigors, new-onset delirium</td>
</tr>
<tr>
<td><strong>Fever</strong> With Unknown Focus of Infection</td>
</tr>
<tr>
<td>Fever* AND new onset of delirium OR rigors</td>
</tr>
</tbody>
</table>

* Fever defined as >37.9°C (100.0°F) or 1.5°C increase over baseline.

Centers for Medicare and Medicaid Services and the Joint Commission for Accreditation of Healthcare Organizations are likely to require immunization in health care workers and LTCFs will, increasingly, be evaluated based on health care worker immunization rates.

Antimicrobial Prescribing

Decreasing inappropriate antimicrobial use in LTCFs should be an important component of an effective infection control program. Categories of inappropriate use include continued antimicrobial use despite the absence of clinical evidence of infection, antimicrobial therapy with agents not active against the suspected bacterial pathogen, and use of antimicrobials in residents with known allergies to the agent or with significant drug-drug interactions. Inappropriate use of an antimicrobial agent adds to patient care costs, may place the patient at risk for adverse medication reactions, and increases the risk of infections with antibiotic-resistant organisms.
Hand Hygiene

Improved adherence to hand hygiene (ie, hand washing or use of alcohol-based hand rubs) has been shown to terminate outbreaks in health care facilities, to reduce transmission of pathogens (eg, methicillin-resistant Staphylococcus aureus) and reduce overall infection rates. Current hand hygiene guidelines recommend the increased use of alcohol-based hand rubs by health care personnel because these products address some of the obstacles that health care professionals face in maintaining hand hygiene. In situations where a health care worker's hands are visibly soiled, soap and water should be used before the alcohol hand product. Gloves can reduce hand contamination by 70% to 80%, prevent cross-contamination, and protect patients and health care personnel from infection and should be used in situations where health care workers come into contact with patient secretions. Hand rubs should be used before and after each patient just as gloves should be changed before and after each resident interaction.

When evaluating hand hygiene products for potential use in health care facilities, medical directors, administrators, or product selection committees should consider the relative efficacy of antiseptic agents against various pathogens and the acceptability of hand hygiene products by personnel. Characteristics of a product that can affect acceptance and therefore usage include its smell, consistency, color, and the effect of dryness on hands. LTCFs should develop and implement a system for measuring improvements in adherence to these hand hygiene recommendations. Some of the suggested performance indicators include periodic monitoring of hand hygiene adherence and providing feedback to personnel regarding their performance, monitoring the volume of alcohol-based handrub used per 1000 patient days, monitoring adherence to policies dealing with wearing artificial nails, and focused assessment of the adequacy of health care personnel hand hygiene when outbreaks of infection occur.

Infection Control Precautions

Infection control precautions are recommended, effective, and widely used in hospitalized patients who are colonized or infected with selected infectious disease pathogens. The primary categories of infection control precautions are standard precautions (use in all LTCF residents) and transmission-based precautions. Transmission-based precautions include contact precautions, droplet precautions, and airborne precautions. Airborne precautions are rarely used in LTCFs because they require N-95 respirators and negative-pressure ventilation. In most LTCFs, simply having LTCF staff comply with standard precautions is likely to have an enormous impact on reducing transmission of infectious disease pathogens. Often with bed-bound residents, health care workers are the usual vectors for transmission of pathogens. Decisions about isolation of LTCF residents colonized or infected with antimicrobial-resistant organisms must be considered on an individual resident and facility basis and must incorporate both an assessment of risk for cross-transmission and the impact on the resident’s social and psychological health. Isolation of the elderly in health care settings is not innocuous and can lead to worse outcomes. In addition to national guidelines, many state or local health departments have developed guidelines regarding use of contact precautions or isolation of residents in LTCFs in that state or local jurisdiction. The LTCF medical director should be knowledgeable about these guidelines when making decisions regarding use of infection control precautions or isolating residents.

Consultant pharmacists may offer an important expertise in improving the management of a wide range of medications, including antimicrobials. For medical directors in particular, consultant pharmacists can be a potential resource regarding antibiotic utilization data and improving antibiotic management. During disease outbreaks in LTCFs, consultant pharmacists can provide valuable resident and family counseling regarding medication side effects or support regarding distribution of prophylactic antimicrobials (ie, oseltamivir).

CONCLUSIONS

For LTCF medical directors, infection control should be a major focus. The major infection risk factors include the chronically ill population, the potential for cross-transmission during group activities and resident–health care worker interactions, and the widespread empiric use of antimicrobial therapy. LTCF medical directors should be proactive in ensuring residents receive appropriate immunizations, develop infection control practices that promote appropriate clinician evaluation for suspected infection, and in promoting good hand hygiene and appropriate empiric antimicrobial prescribing. Medical directors should also advocate for a well-staffed and effective infection control program. For medical directors with an interest in applied or quality improvement research, better understanding of the role and impact of infection control practices in LTCFs is urgently needed. In particular, research to better understand how to apply guidelines and practices to LTCFs that are traditionally used in acute care settings would be beneficial.

REFERENCES


