Infection Control in Alternative Health Care Settings: An Update

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KEYWORDS

• Infection control • Health care delivery • Nursing homes • Hand hygiene

KEY POINTS

- With changing health care delivery, patients receive care at various settings, including acute care hospitals, nursing homes, outpatient primary care and specialty clinics, as well as at home. Each of these settings exposes patients to pathogens.
- Each health care setting faces unique challenges, requiring individualized infection control programs.
- Infection control programs in nursing homes should address: surveillance for infections and antimicrobial resistance, outbreak investigation and control plan for epidemics, isolation precautions, hand hygiene, staff education, and employee and resident health programs.

BACKGROUND

Health care delivery in the United States has evolved significantly over the latter part of the twentieth century. Health care delivery has moved from acute care facilities to rehabilitation units, nursing homes (NHs), assisted living facilities, home, and outpatient settings. Measures to reduce health care costs have led to a reduced number of hospitalizations and shorter lengths of stay, along with increased outpatient, home care, and NH stays for older adults.[1–3]

This article focuses on infection control issues in NHs and outpatient settings.

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INFECTION PREVENTION PROGRAMS IN NURSING HOMES

NHs host approximately 1.5 million residents, which is more than in acute care hospitals and centers. About 3–15% of such residents acquire an infection in these facilities (1.8–13.5 infections per 1000 residents care days). Infections are among the top five causes of death[4,5] and rank even higher among preventable causes. It is no surprise then that NH residents are more likely to be prescribed antimicrobial therapy than any other drug class. Antimicrobial therapy accounts for 20% or more of all recorded adverse drug reactions.[6,7] Every year there are more than 2 million discharges, and these numbers will grow following shifts in the demographic curve.[2] The high volume of transfers from and to hospitals is a major determinant in shaping the epidemiology of infections in NHs.

Even with the evolution of health care delivery within the United States, NHs are institutions that provide health care to people who are unable to manage independently in the community in two different circumstances: (1) for chronic care management, and (2) for short-term rehabilitative services following an acute care hospital stay, to complete their medical treatment plan before returning to independent living. As NHs accept increasingly medically complex patients from acute care, infection prevention becomes crucial. Infection prevention research in the NH setting has made enormous strides in the last 2 decades.

However, NHs have unique characteristics that create special challenges in implementing an infection prevention program. First, effective infection control programs require human and capital investment. Initial access to funds and to personnel experienced in infection prevention can be a challenge. Second, NH residents are particularly susceptible to infections because of comorbidities, greater severity of illness, functional and cognitive impairment, incontinence, and indwelling device use such as urinary catheters and feeding tubes. These factors also make the diagnostic process more challenging, especially when cognitive deficit is present or when fever response is inadequate. Third, NH residents may also serve as host reservoirs for antimicrobial-resistant pathogens such as methicillin-resistant *Staphylococus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE). Indeed, a previous stay in a NH is considered to be a risk factor for colonization with multidrug-resistant organisms (MDROs). With reduction in the hospital length of stay, the severity of illness among post-acute care residents has increased, with resultant inherent transfers back to the hospital. Thus, residents serve as vectors, transmitting pathogens from one setting to another. Fourth, the diagnostic yield of specimens is often subpar because of sampling difficulties (eg, obtaining a sputum sample or clean-catch urine sample). Delays in access to technology such as chest radiographs, blood, and microbiology tests may postpone diagnosis and affect clinical evaluation. Communication with off-site clinical providers is an additional challenge, since indirect assessment of residents encourages risk-aversion practices such as overuse of long-term empirical antibiotic therapy. This starts the vicious cycle of selection of MDROs, leading in time to further overuse of empiric wide-spectrum antibiotics.

To help navigate through those challenges, specific criteria for the diagnosis of infection were developed. These criteria have been recently modified incorporating the larger body of evidence and improvements in diagnostic tools now available.[8] Loeb's minimum criteria should be used to help determine when it is appropriate to initiate antimicrobial therapy.[9] Unfortunately, adherence to these criteria is still suboptimal.[10,11]

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