COMMENTARY

A Significant Step Forward: New Definitions for Surveillance of Infections in Long-Term Care

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(See the article by Stone et al, on pages 965–977.)

According to a recent European expert consultation, healthcare-associated infections in long-term care facilities (LTCFs) are one of the "eight plausible infectious disease threats with the potential to be significantly more problematic than they are today."[1(p2068)] In fact, LTCFs pose several challenges to infection control, including high prevalence of infections, high rates of colonization with antimicrobial-resistant microorganisms, frequent and inappropriate prescribing of antimicrobials, frequent transfer of residents from the hospital, scarce resources, and absent or poor coordination of clinical and nursing care.[2]

These challenges have long been recognized, but in recent years they have possibly become worse. The growing number of elderly individuals with medically complex situations that require long-term care, the higher proportion of LTCF residents receiving several invasive procedures, and the establishment of new healthcare settings such as long-term acute care hospitals in the United States[3] have significantly increased the risk of infection and created "the perfect storm of antimicrobial resistance."[4(p920)]

Surveillance is universally recommended in LTCFs as a core component of infection control programs,[5] with the aim of increasing the awareness of the problem, establishing an infection control "presence" in the facility, identifying critical areas for infection control, determining trends, and identifying and preventing outbreaks in a timely fashion. However, definitions of infections must be adapted to the specific characteristics of this resident population: elderly patients with infections frequently present with clinical manifestations that are different from those of younger adults, such as absent or blunted fever, atypical manifestation of a disease, or a subacute course of disease.[6]

In the past 30 years, the infection surveillance definitions developed by McGeer and colleagues[7] specifically for LTCFs have been widely used in North America and Europe.[8] These definitions were the result of an expert consultation and were developed to be used in facilities that provide homes for elderly residents who require 24-hour personal care under professional nursing supervision. Intravenous therapy or laboratory or radiology facilities are not usually available in these facilities.[7] Not only were the reliability or validity of these definitions not assessed, the populations studied also changed dramatically.

In this issue of *Infection Control and Hospital Epidemiology*, Stone et al[9] present the results of a comprehensive effort to revise the McGeer Criteria. This is a significant step forward, for 3 reasons: (1) after 30 years, new definitions for specific infection sites were developed; (2) harmonization of surveillance across different settings was pursued; and (3) a change in the methodology to evidenced-based criteria and a focus on avoidable infections was established.

The new criteria are based on a structured review of the literature and were reviewed, modified, and approved by members of the Society for Healthcare Epidemiology Long-Term Care Special Interest Group and a panel of outside reviewers. However, "most of the studies were small or uncontrolled,"[9(pXXX)] thus suggesting that additional efforts are needed to improve our knowledge in this field.

Only those infection criteria for which recent and relevant research is available were revised. Criteria for systemic infections, common cold, conjunctivitis, ear infections, sinusitis, and herpes simplex and zoster infections were left unchanged; criteria for influenza were only slightly modified to keep track of cases that occurred outside of the influenza season, as a consequence of the A/H1N1 pandemic. Criteria for gastrointestinal infections were left unchanged, but specific criteria for norovirus and *Clostridium difficile* infections were added. Skin infection criteria were not substantially changed, except in this setting National Healthcare Safety Network criteria for surgical site infections were included. Major changes were made to the criteria for defining respiratory tract and urinary tract infections (UTIs).

The revisions were made with the aim of increasing the specificity and positive predictive value (PPV) of the criteria.

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Received July 3, 2012; accepted July 8, 2012; electronically published September 6, 2012.

 0899-823X/2012/3310-0002$15.00. DOI: 10.1086/667747

This is crucial for an effective surveillance system: a high PPV limits unnecessary interventions, both for endemic cases and outbreaks, and it curbs misallocation of precious resources.[10] The importance of PPV in the context of LTCFs is well exemplified by UTIs. The original McGeer Criteria do not require a positive urine culture result to define a case; however, several studies have shown that more than half of LTCF residents who had symptoms raising suspicion of a UTI had negative culture results[11] despite the reported high prevalence of asymptomatic bacteriuria in this setting. Thus, symptoms alone do not seem to be sufficient to identify cases of UTI with a high level of specificity. As a result, the revised criteria require a positive urine culture result as a necessary condition for diagnosis of UTI.[9]

Several unspecific, atypical symptoms may be the only clues of infection in an elderly patient.[6] The revised criteria provide explicit definitions for fever, acute confusion or altered mental status, and acute functional decline according to existing guidelines or when using scales commonly adopted in the LTCF setting (ie, criteria applied in the Minimum Data Set system used in the United States).

Harmonizing the criteria for defining infections in the acute and long-term care settings is also an important aim of the revision: the window of more than 2 calendar days that has traditionally been used to define an infection as hospital acquired has been extended to apply to LTCFs as well. This was pragmatic choice; however, as emphasized by Stone et al,[9] debate still exists regarding the use of this time frame to determine whether a *C. difficile* infection has a LTCF onset. Moreover, the revised criteria provide a response to the changing scenario in LTCFs, making it possible to develop a uniform surveillance system across the spectrum of LTCFs from the nursing home to the long-term acute care hospital.

It is also important to note that with the revision, Stone et al attempted to address a crucial question: which infections should have priority in long-term care surveillance and control programs because they have been shown to be avoidable or are a significant cause of morbidity or mortality? The updated criteria include the following infections as priority targets of interventions: respiratory, gastrointestinal, and conjunctivitis viral infections that are highly transmissible in the healthcare setting; pneumonia; UTIs; other gastrointestinal infections; skin and soft tissue infections; and infections attributable to pathogens causing serious outbreaks, such as group A streptococci.

The revised McGeer definitions have several pros but also some potential cons that warrant further study. The first is their generalizability in countries other than those in North America. The new criteria to improve the specificity for the diagnosis of respiratory tract infections and UTIs require laboratory and diagnostic confirmation, which means ready access to testing facilities. This is not a universally standard practice: for example, the first European Point Prevalence survey of LTCFs in 2010 indicated that a urine sample was obtained from only 42.4% of residents who had a clinically identified UTI.[8] Similarly, the Minimum Data Set and the ADL (activities of daily living) scale to define functional decline are used in only a few European countries.[8]

The second issue that should be investigated further is potential underestimation of the real burden of infections in LTCFs: given atypical presentations of infection in the elderly, prompt and accurate diagnoses may be more difficult in this setting. In France, Rothan-Tondeur et al[12] demonstrated that an application of the McGeer definitions underestimated the number of nursing home–associated infections when compared with provider diagnoses (crude prevalence, 4.1% and 14.5%, respectively). Thus, further studies aimed at quantifying the accuracy of the new surveillance criteria in different settings would be useful.

In conclusion, this is an important step forward. After 30 years, a new set of criteria based on more recently available scientific evidence has been established for the surveillance of infections in LTCFs. It is advisable that this new criteria be widely used and evaluated, in different long-term care settings and in all countries.

ACKNOWLEDGMENTS

Potential conflicts of interest. The author reports no conflicts of interest relevant to this article. All authors submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and the conflicts that the editors consider relevant to this article are disclosed here.

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