



Preface

The Intersection of Age and Infections: Understanding the Impacts from Diagnosis to Management



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According to the Pew Research Center,¹ by the year 2050, there are expected to be 81 million people over the age of 65 living in the United States, more than doubling their numbers from the start of the century. In fact, as a group, older adults are expected to expand faster than the general population, extending their representation to one in every four adults by the year 2060. With aging comes increasing likelihood of acute and chronic comorbid conditions, including infections. Given that over a third of all health care spending in the United States is for people 65 and older, in economic terms alone, this graying of the population is expected to have a significant impact.² For example, one study estimated that antibiotic-resistant pathogens among hospitalized older adults nationwide cost nearly \$1.9 billion in a single year.³ Beyond the economic implications, the fact remains that infections are a major source of morbidity and mortality in older individuals. According to the Centers for Disease Control and Prevention,⁴ one-third of all deaths in people over the age of 65 are caused by infections.

Nothing has brought into focus the impact of aging on outcomes in infections more than the COVID-19 pandemic. In 2020, this infection alone was the third leading cause of death in older adults, with influenza and pneumonia being the 10th leading causes. Infections may even be a factor in other foremost causes of mortality in this age group, such as Alzheimer,⁵ lower respiratory tract disease,⁶ and diabetes.⁷ Occasionally, infectious syndromes may also be implicated in thromboembolic events, such as cerebrovascular accidents and myocardial infarctions, which can be precipitated by prothrombotic states caused by infection, well documented in diseases such as pneumococcal pneumonia,⁸ influenza,⁹ and COVID-19.¹⁰

Several biologic and structural factors not only work in synergy to make older adults more vulnerable to infection than their younger counterparts but also result in poorer outcomes when they do become infected. Many older adults are exposed to communal conditions, such as long-term care living facilities, making them more susceptible to the spread of infection. Age-associated changes in skin and mucosal barriers further result in conditions that make pathogen evasion more difficult.^{11,12} Immunosenescence and “inflammaging” together make it more challenging for older adults to neutralize antigens and result in a heightened inflammatory response to infections.^{13–15} To make matters worse, immunosenescence results in suboptimal vaccine responses in older adults, the singular best infection prevention tool we have.¹⁶ Even diagnosis of infections can be a challenge in older adults. It is well documented that older adults may lack common presenting signs and symptoms of infection, such as fever, resulting in diagnostic delays. All these dynamics work together to create the perfect storm that leads to poor outcomes in infected older adults. In addition, due to issues related to polypharmacy, comorbid conditions, and structural barriers, age also has a profound impact on the management of infections.

In this issue of Infections in Older Adults, *Infectious Diseases Clinics of North America*, which serves as both an update and an extension to the 2017 issue, our goal is to give the readers a sense of the importance, scope, and complexities of infections in this population. Given the disproportionate impact of COVID-19 on older adults, we dedicate two articles exploring this important topic. We revisit some important perennial infections, such as *Clostridium difficile*, resistant gram-negative bacterial and nosocomial infections, and provide an update in these fields. Articles on bacterial prostatitis and outpatient parenteral antibiotic therapy highlight diagnostic and management dilemmas that are unique to older adults in the ambulatory setting. As we use more immunosuppressive therapies in older adults, opportunistic infections have become required reading for all infectious disease specialists. We hope the review on infectious complications of immunosuppressive therapy in older adults will serve as a relevant primer. A review on antibiotic stewardship at the end of life addresses the other end of the spectrum of infection management. Articles on vaccine-preventable infections and infection control in long-term care facilities serve as tools to prevent infections in this population. We also examine a crucial chronic viral infection, HIV, and its interaction with aging. And lastly, we present a review on an increasingly relevant subject in older adults, sexually transmitted infections.

We feel privileged to have worked with colleagues with such a breadth of expertise in infectious diseases and are truly grateful for their time and valuable contributions. Finally, we would like to thank the consulting editor for giving us the opportunity to curate this issue, and we thank the staff at *Infectious Disease Clinics of North America* for their patience as the COVID-19 pandemic continues to place extraordinary demands on our field.

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