

# Respiratory Syncytial Virus and Other Noninfluenza Respiratory Viruses in Older Adults



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## KEYWORDS

- Respiratory syncytial virus • Noninfluenza respiratory virus • Outbreak • Elderly
- Long-term care facility • Multiplex respiratory viral panel

## KEY POINTS

- Among older adults, the morbidity and mortality of respiratory syncytial virus infections is similar to that of influenza.
- Several other respiratory viruses (human metapneumovirus, parainfluenza virus, rhinovirus, coronavirus and adenovirus) may cause outbreaks among residents of long-term care facilities.
- Supportive care is the mainstay of medical therapy; effective antivirals or vaccinations do not yet exist for noninfluenza respiratory viruses.
- Rapid diagnostic molecular tests will augment our epidemiologic understanding of noninfluenza respiratory viral outbreaks.
- Infection prevention and control measures for contagious individuals includes hand hygiene, cough etiquette, and use of a mask, gown, and gloves by health care workers.

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## INTRODUCTION

Respiratory tract infections are a common cause of morbidity and mortality in older adults. In 2014, influenza and pneumonia accounted for 2.3% of deaths among adults 65 years or older in the United States.<sup>1</sup> Older adults, especially those older than 75 years of age, experience the highest rate of influenza-associated mortality rate among all age groups.<sup>2</sup> The availability of rapid diagnostic tests, antiviral medications, and, most notably, the seasonal influenza vaccine mitigate some of influenza's devastating effects.<sup>3</sup> Respiratory viruses other than influenza also cause significant morbidity and mortality among older adults, particularly those who are residents of long-term care facilities (LTCFs).<sup>4,5</sup> These viruses include respiratory syncytial virus (RSV), human metapneumovirus (HMPV), parainfluenza virus, rhinovirus, coronavirus, and adenovirus. In this article, we review viruses, other than influenza, that are common causes of respiratory infections in older adults and discuss relevant diagnostic tests, transmission, and infection prevention and control measures.

### *Epidemiology*

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In the United States, the National Respiratory and Enteric Virus Surveillance System, a voluntary laboratory-based system affiliated with the Centers for Disease Control and Prevention (CDC), monitors temporal and geographic patterns associated with the detection of RSV, HMPV, parainfluenza viruses, and respiratory adenoviruses.<sup>6</sup> Data from the National Respiratory and Enteric Virus Surveillance System informs reports from the CDC regarding ongoing trends in detection of respiratory viruses. Although comprehensive, the National Respiratory and Enteric Virus Surveillance System data do not include patient demographics and therefore do not specifically provide information about the epidemiology of respiratory viruses in older adults or LTCFs. Additionally, other than to rule out influenza, for which there is effective antiviral therapy, molecular diagnostic tests are not yet widely used in the evaluation of older adults or LTCF residents with respiratory infections. Accordingly, most of our understanding of the epidemiology of noninfluenza respiratory infections among older adults is informed through research studies and descriptions of outbreaks in LTCFs (**Table 1**).

## RESPIRATORY SYNCYTIAL VIRUS

First isolated from chimpanzees in 1956, RSV is a nonsegmented, single-stranded, negative-sense RNA virus within the Paramyxoviridae family (**Table 2**).<sup>7</sup> Most recognized for its effect on children, RSV also causes severe infections among older adults. Similar to influenza, it generally circulates from fall through spring, with a peak in January.<sup>8</sup> A protein on the surface of the virus, dubbed the F protein, causes cell membranes of nearby cells to fuse to form the syncytia for which the virus is named.

### *Epidemiology*

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Among older adults, RSV causes morbidity and mortality that rivals that of influenza. Falsey and colleagues<sup>9</sup> described RSV infections among older adults over 4 consecutive winters from 1999 to 2003. Among older adults hospitalized with a respiratory viral infection ( $n = 1388$ ; age  $75 \pm 12$  years), the authors detected roughly similar proportions of RSV and influenza (142 and 170 cases, respectively). Furthermore, they also found that people with RSV and influenza had similar rates of intensive care stays (15% vs 12%) and mortality (8% vs 7%), respectively. Among this community-dwelling population, for whom the prevalence of vaccination against influenza and *Streptococcus pneumoniae* was greater than 75%, the incidence of RSV was similar to that for nonpandemic influenza.

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