

# The Epidemiology of Acute and Critical Illness in Older Adults

Linda Bell, RN, MSN

## KEYWORDS

• Older adult • Critical care • Acute • Mortality • Transitions

## KEY POINTS

- The general population of those over age 65 is increasing as well as that of those over age 85.
- Admissions to medical ICUs increase with aging whereas admissions to surgical ICUs are more likely from procedural complications or trauma.
- Among Medicare patient readmissions, 60% are considered potentially preventable.
- Age over 75 is an independent predictor of mortality in ICU admissions, especially in patients who receive mechanical ventilation.

## INTRODUCTION

The population continues to grow across the globe. In 2010, the United Nations estimated the world population at 6.9 billion, with approximately 3.5 billion male and 3.4 billion female. At that time, the estimate for people over age 65 worldwide was approximately 500 million, with 353,000 over age 100.<sup>1</sup> At the same time, population in the United States was more than 300 million. An estimated 43 million of those were over age 65; almost 6 million were over age 85.<sup>2</sup> The 2010 census also found that, for the first time, the number of those aging was increasing rapidly with a concomitant decreasing birth rate.<sup>3</sup> The same census also found that the number of individuals over age 65 living in family households in the United States was twice that of those not living with family; and twice as many women were living alone as were men.<sup>4</sup>

Hospital admissions for individuals over age 65 are measured by admissions from the community and from nursing homes. Community admissions in 2009 were more frequent, at a rate of 310.7/1000 whereas admissions from nursing homes were at a rate of 204.5/1000. Patients admitted from nursing homes had a longer length of stay, however, and were more likely to die in the hospital. Infections, such as septicemia and urinary tract infection (UTI), were the predominant reason for admission from nursing homes. Admission rates for patients over age 65, whether

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Technology-Based Learning, American Association of Critical Care Nurses, 101 Columbia, Aliso Viejo, CA 92656, USA

E-mail address: [Linda.bell@aacn.org](mailto:Linda.bell@aacn.org)

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from community or nursing homes, are at an approximately 2 to 3 times greater rate than for patients under age 65.<sup>5</sup>

### ADMISSIONS TO THE ICU

The Society of Critical Care Medicine has estimated approximately 5 million admissions to ICUs per year.<sup>6</sup> Patients over age 65 accounted for 45% of admissions in one study, with 10% of admissions for patients 85 years or older. The percentage of patients admitted to medical ICUs increases per decade after age 65 whereas the percentage of admissions to the surgical intensive care decreases by decade. Trauma and infectious disease admissions increase with advancing age.<sup>7</sup> Patients over 85 are more likely to be admitted to the ICU after a surgical procedure. Patients admitted without an ICU stay had lower inpatient and 90-day mortality for surgical rather than medical admissions.<sup>8</sup>

Primary admitting diagnosis to the ICU in the over-65 age group changes based on the decade. In the 75 to 84 age group, the principal diagnoses in order of frequency are congestive heart failure (CHF), pneumonia, irregular heartbeat, septicemia, osteoarthritis, and chronic obstructive pulmonary disease. In patients over 85 years, the order of frequency changes to CHF, pneumonia, septicemia, UTIs, irregular heartbeat, and hip fractures. The most common procedure for all patients above age 75 is blood transfusion. Procedures for degenerative bone and joint disorders are more common above age 85, with hospitalization for hip fracture 10 times more frequent than for the 75 to 84-year old age group. The most common procedures in hospitalized patients ages 75 to 84 after blood transfusion are diagnostic cardiac procedures, upper gastrointestinal (GI) endoscopy, and respiratory intubation and mechanical ventilation, followed by echocardiogram and hemodialysis. In the 85+-year-old age group, blood transfusions were followed by upper GI endoscopy, respiratory intubation and mechanical ventilation, diagnostic cardiac catheterization, treatment of fracture of dislocation of the hip and femur, and colonoscopy and biopsy.<sup>9,10</sup>

### EFFECTS OF AGING AND QUALITY OF LIFE

The US Burden of Disease Collaborators found in reviewing their data on disability-adjusted life years (DALY), healthy life expectancy (HALE), and years lived with disability (YLD) that, although cardiovascular diseases, cancer, and chronic respiratory disease all contribute to YLD, by far the largest contributors are mental/behavioral disorders, such as major depressive disorders, and musculoskeletal disorders, such as low back pain. Although life span is increasing, there is not a decrease in years lived with disability; rather, YLDs increased because onset of disability years has remained stable. Contributors to DALYs were diet, tobacco smoking, high body mass index, high blood pressure, high fasting plasma glucose, physical inactivity, and alcohol use.<sup>11</sup> Gill and colleagues<sup>12</sup> found, however, that the trajectory of disability in their study population was not linked to the cause of death except in the patients with advanced dementia. The goal of Healthy People 2010 was to increase perceived health-related quality of life for both physical and mental health. Key surveillance findings were that the biggest increase in overall unhealthy days occurred between ages 45 and 64; however, although the physically unhealthy days increased in the 65 to 74-year old group mentally, unhealthy days and activity limitation days showed no consistent trends.<sup>13</sup>

Older adults have a higher risk of admission to the ICU secondary to trauma and this risk factor increases with age, most likely due to instability, medications, or strange environments.<sup>7</sup> Scheetz<sup>14</sup> also identified calcium loss with decreased bone density,

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