

# Hypertension in the Older Adult



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## KEYWORDS

• Hypertension • Elderly hypertension • Blood pressure • Geriatric

## KEY POINTS

- Hypertension is common among elderly patients, and with projected population, aging is anticipated to be an ever-increasing public health problem.
- Hypertension is associated with significant cardiovascular risk for heart attack, stroke, and chronic kidney disease and remains the most common reason adults to see their primary care provider aside from routine medication refill visits.
- Confusion still exists regarding treatment of elders, specifically who to treat and how low to push blood pressures.
- Quality of life, adverse treatment effects, and goals of care should be central to the treatment of hypertension in older and frail adults.

## INTRODUCTION

Approximately 1 in 3 adults have hypertension (HTN) with another 8% estimated to be undiagnosed, making it the most common reason after medication refills for adult primary care visits.<sup>1</sup> Currently, 76.4 million adults have HTN in the United States alone.<sup>2</sup> This statistic, combined with HTN's association with aging physiology and the aging of the populous, makes HTN one of the most pressing current public health concerns.<sup>3,4</sup>

HTN is defined as isolated systolic elevation, isolated diastolic elevation, or both.<sup>5</sup> Although ongoing research has provided large-scale data on both the measurement and treatment of HTN, practitioners have been left with the difficult task of assessing conflicting reports about who to treat, how low to drive pressures, and how to balance the increasing concern of overtreatment. This is especially problematic in the

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treatment of older and more frail adults for whom adverse side effects and poor outcomes are more worrisome.

### HYPERTENSION DEFINED AND MEASURED

HTN has traditionally been defined as systolic blood pressure (SBP)  $\geq 140$  mm Hg or diastolic blood pressure (DBP)  $\geq 90$  mm Hg taken as the average of 3 properly measured readings on 2 or more outpatient office visits.<sup>6-8</sup> Although the basic tenants of this definition continue to stand today, additional research into the best methods for screening for HTN and the most appropriate numerical definitions has given rise to some confusion about how to define this common cardiovascular disease.

Blood pressure measurements in the outpatient office setting can miss elevations occurring at other times or incorrectly diagnose white coat HTN as primary essential HTN. More recent recommendations therefore are to use home ambulatory blood pressure monitoring as the preferred measurement for diagnosis. These ambulatory home measurements more closely correlate with daytime blood pressure readings and are more accurate.

Ambulatory readings averaging  $\geq 130/80$  over a 24-hour period are diagnostic of HTN. If measuring daytime pressures only, HTN would be defined by greater than 135/85, whereas nocturnal measures of 120/70 would constitute HTN diagnosis owing to decreased pressures during nighttime sleep rhythms. If it is not possible to monitor patients at home in this manner, traditional one-point-in-time measures would be acceptable. By this traditional method, HTN could be defined as  $\geq 140/90$  as noted above.

Appropriate measurement of blood pressures is important because HTN disease is associated with significant morbidity and mortality, including heart attack, stroke, chronic kidney disease (CKD), and death. Accordingly, HTN remains the most important risk factor for many of these associated cardiovascular disorders. Effective treatment to reduce blood pressure to goal is the single most important modifiable intervention to improve both the length and quality of life for adults, especially older adults, who are disproportionately affected.

### *Pathology*

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HTN results from the body's response to external stressors to maintain the blood pressure at effective ranges for perfusion of vital organs such as the brain and heart. When plasma volume or cardiac output are ineffective, common regulating pathways such as the Renin-angiotensin system and autonomic nervous system respond accordingly to increase blood pressure. Cardiac output volume and systemic vascular resistance result in measurable blood pressure ( $CO \times SVR = BP$ ). If the body cannot maintain perfusion to organs as needed at normal blood pressures, it will compensate by either increasing output volume or resistance, thereby increasing pressures.<sup>5</sup>

As changes occur in body position, baroreceptor-mediated responses in the autonomic nervous system increase tone in veins and arteries while lower-extremity and abdominal muscular contractions increase blood return from the lower extremities. These instantaneous, automatic responses maintain blood pressure and therefore adequate cerebral perfusion with position changes.<sup>9</sup> If these mechanisms do not work correctly or work inefficiently, an acute decrease in blood pressure can occur. A decrease of  $\geq 20$  mm Hg in systolic or  $\geq 10$  mm Hg diastolic pressures occurring with changes in position is defined as orthostatic hypotension.<sup>10</sup>

Orthostatic hypotension is more common among elderly and frail patients, occurring in up to 40% of elderly patients with cardiovascular risk factors.<sup>11,12</sup> Normal

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