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# Emergency Forum

## Goal-Directed Care: 10 Tips for Resuscitating Older Adults in the Emergency Department

Christina Shenvi, MD, PHD, MBA,* and Clifford Reid, MD†

*University of North Carolina, Chapel Hill, North Carolina, and †Senior Staff Specialist in Emergency Medicine, Northern Beaches Hospital, Senior Staff Specialist in Prehospital & Retrieval Medicine New South Wales Ambulance, Sydney, Australia

*Reprint Address:* Christina Shenvi, MD, PhD, MBA, 170 Manning Dr. CB 7594, Chapel Hill, NC, 27599

□ **Abstract— The resuscitation of older adults in the emergency department (ED) presents unique challenges due to physiological changes with aging, loss of physiologic reserve, polypharmacy, multimorbidity, and often unknown care goals. This review outlines ten high-yield, practical strategies to improve the care of critically ill older adults. We emphasize the importance of a patient-centered, goal-directed approach to care. The article discusses the importance of avoiding cognitive biases, interpreting vital signs in the context of aging, and adapting airway, breathing, and circulatory management techniques for the older patient. Special attention is given to recognizing and managing delirium, evaluating trauma with age-specific considerations, and tailoring diagnostic approaches and resuscitation care. These principles aim to enhance both the quality and appropriateness of emergency care for this rapidly growing and vulnerable population. © 2025 Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.**

□ **Keywords—Geriatrics; Geriatric emergency medicine; Resuscitation; Goal-directed care**

### Introduction

Resuscitating older adults (age 65 and over) in the emergency department (ED) presents a unique set of challenges that require a individualized approaches. Many standard protocols or practice guides were often designed for or researched in younger populations, such as the New Orleans Criteria or the Canadian Head CT rules. The aging population is growing, and with it, the number of older adult patients in the ED who require resuscitation. While there were 31 million older adults in 1990 (12.6% of the population) and 40 million in 2010 (13% of the population), it is estimated that there will be 70 million by the year 2030 (20% of the population) in the United States (1). Studies have estimated that by 2030, older adults will make up 20% of the population, 25% of ED visits, and 50% of ambulance arrivals to the ED (2,3).

This article presents ten key concepts and skills for resuscitating critically ill older adults in the ED setting. The authors have over 40 years of combined experience caring for older patients in the ED. Author CR is an emergency physician and intensivist, and an expert on resuscitation, while author CS is fellowship-trained and an expert in geriatric Emergency Medicine (EM). We collaborated to create this article by drawing from evidence, best practices, and practical experience drawn from the resuscitation and geriatric EM disciplines.

### Discussion

*Avoid Cognitive Traps and Premature Diagnostic Closure*

One of the significant challenges in the resuscitation of older adults is the high risk of cognitive biases, such as premature closure and anchoring (4,5). These biases

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can be particularly problematic in caring for older adults. Older adults often present with multiple pathologic conditions coexisting at the same time, making it easy to anchor, misdiagnose, or overlook critical conditions. For example, a patient presenting with signs and symptoms of a urinary tract infection (UTI) may also have other underlying processes such as a bowel obstruction, mesenteric ischemia, or colitis.

Emergency physicians must maintain a broad differential diagnosis and avoid the temptation to prematurely close a patient encounter and attribute all the symptoms to one specific diagnosis. If a single diagnosis is not enough to account for the degree of illness severity, then it is important to continue the medical workup. For example, a patient may have dysuria that is accounted for by a positive urinalysis but may have abdominal pain out of proportion to what is expected for a UTI, indicating a secondary diagnosis exists. Patients often arrive with multiple chief complaints, and emergency physicians must rule out life threatening conditions for each presenting issue. For example, chest pain and abdominal pain could be caused by one condition, such as an aortic dissection, or there could be separate issues that both require a medical workup.

There are some mental tactics and practices that can help physicians actively avoid biases (6,7). These approaches are often called cognitive forcing strategies, which are deliberate mental processes to help avoid cognitive bias and errors in decision-making. First, physicians can implement a diagnostic pause before making a final decision and consider what else could be going on by asking: "Am I missing something?" This will allow them to take another look at the patient's workup before making a final disposition decision. In addition, the emergency physician can ask: "What if the opposite is true?" This approach would enable them to challenge their initial hypothesis to see if there is something they are overlooking. They could use metacognitive monitoring, which refers to continuously monitoring one's own internal state and thinking processes in order to recognize when they might be feeling rushed, stressed, or subject to bias, which could lead to inappropriate diagnoses, discharges, or admissions (8,9).

*Adjust Your Approach to Interpreting Vital Signs*

Without accounting for age-related changes in vital signs (10), vital signs can be misinterpreted or falsely reassuring. For instance, blood pressure and heart rate that appear normal for a younger person may signify underlying shock in an older adult. A systolic blood pressure of 117 mmHg, while seemingly normal, could represent significant hypotension in an older patient whose baseline is significantly higher or who has a history of hypertension. Similarly, the tachycardic response to sepsis, blood loss, or intravascular depletion may be blunted due to beta-blocker use, cardiac disease, or the decline in sympathetic response with age. Therefore, the absence of tachycardia is not helpful in ruling out early shock, and its presence should raise the physician's level of concern (11,12).

*Adjust Your ABCs: Airway*

Airway management in older adults can present unique challenges. Factors such as decreased neck mobility, kyphosis, and unstable or missing dentition can complicate both bag-mask ventilation and intubation. Furthermore, older patients are more prone to more rapid oxygen desaturation due to diminished pulmonary reserves. Preoxygenation and careful planning are critical to avoid hypoxia during intubation (13).

When performing a rapid sequence intubation to secure the airway, the administration of induction agents and paralytics must be done cautiously. Doses often need adjustment due to altered pharmacodynamics in older adults. Over-sedation can lead to hypotension, while under-sedation may result in unfavorable intubating conditions. Medications such as etomidate and ketamine, that do not significantly drop blood pressure, may be preferable in patients who are at risk of developing significant hypotension and subsequently cardiovascular collapse postintubation.

*Adjust Your ABCs: Breathing*

For patients who need respiratory support, the usual tools can all be used, such as intubation, noninvasive ventilation, high-flow nasal cannula, etc. The main consideration for older patients is that they more often have underlying lung disease and therefore have less reserve and will decompensate faster during intubation. To optimize their oxygen levels prior to intubation, 100% FiO2 by a nonrebreather mask, noninvasive positive pressure ventilation, or bag valve mask (BVM) should be used. A nasal cannula at high flow rates can be used during preoxygenation and can remain in place during intubation for apneic oxygenation, although results from studies on the impact of apneic oxygenation are somewhat varied (14–16). During preoxygenation for older patients with dentures, it is helpful to keep the dentures in if they require bag-valve-mask ventilation but remove them prior to intubation. For patients with significant kyphosis, it may be necessary to support the head and shoulders with pillows or blankets to maintain the patient in a position suitable for airway management. The older patient's lower physiologic reserve means that the team's skills need to be used at their highest level to achieve successful first pass intu-

bation. If video laryngoscopy is available, it is likely the best option, given the higher rate of first-pass success (17).

*Adjust Your ABCs: Circulation*

Physicians typically assess circulation through pulses, blood pressure, and markers of end organ hypoperfusion. For older adults, physicians should be particularly vigilant about occult shock, in which organ hypoperfusion is present despite seemingly normal vital signs. Early use of bedside point-of-care ultrasound can be a valuable tool in identifying the underlying cause of shock, such as hypovolemic, obstructive, cardiogenic, or distributive. Careful interpretation of vital signs within the patient's history and baselines, as well as use of the shock index can potentially help in identification of occult shock.

For older patients with trauma, revising the vital signs criteria (11) for trauma activation, or use of the shock index (12) can improve the identification of older patients with potentially significant injuries and at risk for worse outcomes. The shock index is calculated from the heart rate divided by the systolic blood pressure. Older adult patients with traumatic injuries who had a shock index of 1 or higher had four-fold higher in-hospital mortality in one systematic review and meta-analysis, compared with patients with a shock index less than one (18).

Older patients who have an infection or may be septic are less able to mount a febrile response. Therefore, even smaller temperature changes may indicate significant infection. Even subtle temperature changes may indicate a significant underlying infection, and lack of fever does not exclude a serious infection or sepsis (19–20).

*Sepsis: Think Beyond Antibiotics*

In managing sepsis in older adults, early and appropriate antibiotic therapy is crucial, but source control is also important. Emergency physicians should consider the "four Ds" for treating septic patients: Drugs (antibiotics), Drainage (of abscesses or obstructed systems), Debridement (of necrotic tissue), and Device removal (such as infected catheters and bandages) (21). In the elderly, there should also be an awareness of the possibility of infective endocarditis, particularly in patients with prosthetic heart valves or indwelling catheters.

Skin infections are common in this patient population, and patients may not be aware of skin and soft tissue infections due to neuropathy, limited mobility, or the presence of chronic wounds. It is important to perform a thorough head to toe examination to look for sacral ulcers that the patient may not be aware of, particularly if they are wheelchair- or bed-bound, as well as assessing for heel ulcers, foot wounds, other infections, or trauma. When patients arrive with a bandage, remove the bandage to assess for a hidden soft-tissue infection or pressure ulcers underneath.

Fluid management in the elderly septic patient is challenging due to the narrow margin between not enough and too much fluid. Older adults are less tolerant of both fluid deficits and surpluses, given the common presence of diastolic dysfunction and other comorbidities like chronic kidney disease. Fluid resuscitation should be initiated when needed, but frequent volume and vital sign checks should be used to guide resuscitation. The 30 cc/kg bolus called for by many sepsis protocols may not be appropriate for all patients, particularly those with cardiac or renal dysfunction. Point-of-care ultrasound assessment of the lungs, cardiac function, and inferior vena cava (IVC) can help determine the patient's overall volume status and guide resuscitation. In addition, the early use of vasopressors should be considered to maintain perfusion and reduce the risk of pulmonary edema (19).

Moreover, the diminished response to catecholamines in older adults means that traditional markers of shock, like lactate levels and tachycardia (20), may not be as pronounced, necessitating a more thoughtful approach to circulatory support.

*Trauma: Avoid Hidden Dangers*

Trauma in older adults often involves mechanisms that would be considered minor in younger patients but can lead to significant injury (22–24). Falls are the most common cause of trauma admissions and mortality in older adults (22,25). Rib fractures can occur even from a low impact fall and can result in significant morbidity due to the risk of pneumonia (26,27). Older adults have twice the mortality following thoracic trauma compared with younger patients. For each additional rib fracture, the mortality risk increases by 19%, and the pneumonia risk by 27% for older adults (27). Similarly, hip fractures most often occur with a ground-level fall and result in twice the 1-year mortality of matched controls (28).

In the ED setting, regional anesthesia for pain control should be strongly considered to avoid the side effects of systemic opioids. Fascia iliaca or femoral nerve blocks for hip fractures and erector spinae plane blocks for rib fractures should be considered. Use of facia iliaca or femoral nerve blocks can provide excellent pain control and reduce the amount of systemic opioids (29–31) needed. Erector spinae blocks for rib fractures can improve pain and respiratory function (32).

*Delirium: Recognize it as Acute Brain Failure and Look for Underlying Causes*

Delirium should be recognized as a sign of likely underlying medical disorder. Delirium consists of an acute

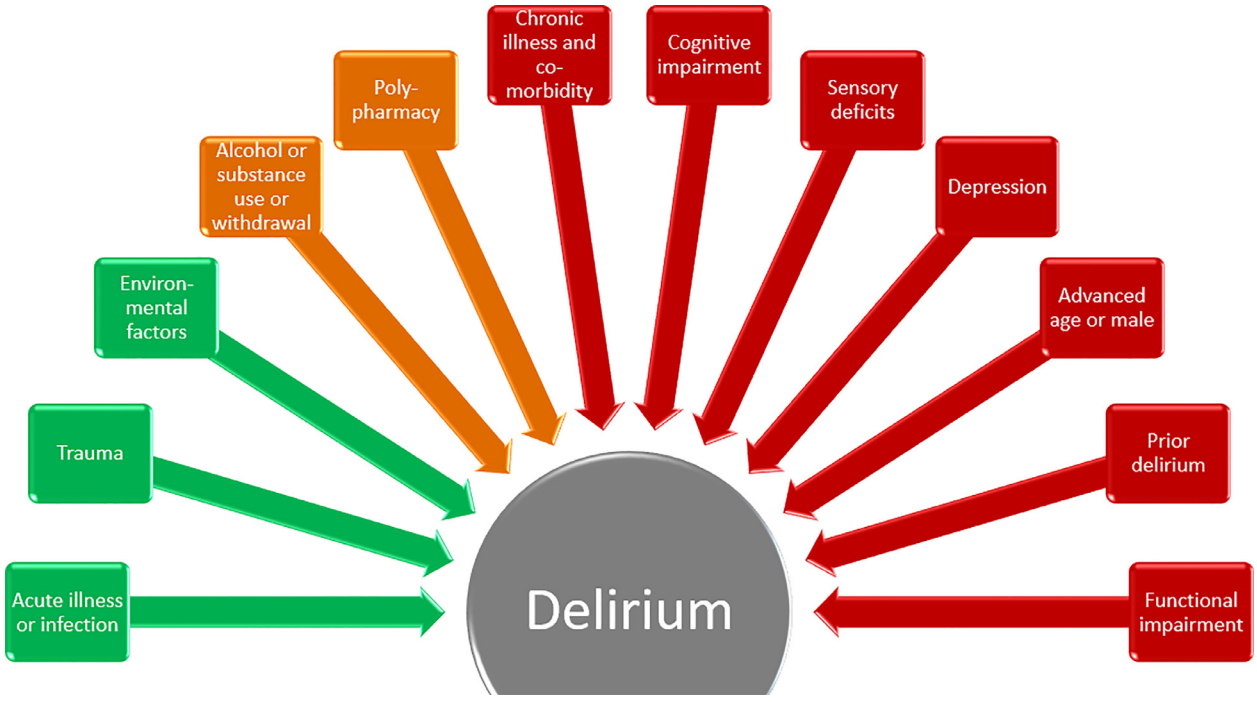


**Figure 1. Potential precipitating factors (green), predisposing factors (red), and factors that could be both predisposing or precipitating (orange) for delirium.**

onset of waxing and waning course, inattention, and either an altered level of consciousness or disorganized thinking (8). The presence of delirium in an older patient will usually indicate an underlying pathology, such as an infection, electrolyte disturbance, medication side effect, or other acute disorder. Delirium can be precipitated by nonphysiologic causes such as a change in the environment, living situation changes, or loss of sleep. However, in the ED setting, if a patient presents with or develops delirium, it should trigger a workup to uncover the precipitating organic cause.

Delirium can be considered acute brain failure. Similar to other end-organ failures, such as acute kidney failure or acute heart failure exacerbations, a precipitating cause should be sought. Just as a rising creatinine or an elevated lactate can point us to sepsis, delirium can point us to seek out a medical problem. There are many factors that predispose an older patient to develop delirium (9) when a younger patient would not. Some of the predisposing factors include advanced age, comorbidities, dementia, visual or hearing impairment, functional impairment, malnutrition, depression, terminal illness, falls, and a history of delirium. Polypharmacy, alcohol use, or drug use could both predispose a patient to delirium as well as precipitate it (Figure 1). With one or more of those predisposing factors, a patient may then develop delirium in response to an acute precipitating factor. These precipitating factors could include systemic disorders such as infection, electrolyte disorder, dehydration, hypoxia, hypercarbia, hypo/hyperglycemia, central nervous system (CNS) disorders (such as stroke, intracranial hemorrhage, or infection), medications (such as polypharmacy, overdose, withdrawal, or medication side effects), or environmental factors such as sleep deprivation, pain, environmental changes, or prolonged ED stays (Figure 1).

*Practice Goal-Directed Care*

For many years, sepsis care was guided by the early goal directed care guidelines (33). Here, we recommend a different type of primary goal, which is the goal that is in line with the patient's wishes and care plan. In resuscitating older adults, it is imperative to align resuscitative efforts with the patient's goals of care. Aggressive interventions may not always be in the best interest of a frail patient with many co-morbidities or poor quality of life and may not be what the patient would have wanted. Emergency physicians should engage in early discussions with patients and families to ensure that the resuscitation plan aligns with the patient's wishes, balancing the intensity of care with realistic outcomes and quality-of-life considerations. Domain 1 of the Centers for Medicare and Medicaid Services (CMS) Age Friendly Hospital Measure (16) approved in 2024 includes requiring that hospitals elicit patient healthcare goals and align care with them. This domain aligns with the earlier Age-

Friendly Health Systems 5Ms Initiative item of focusing on "What Matters Most" to the patient (17). At the very least, physicians can check the electronic medical record to find out if advance directives or do not resuscitate/do not intubate (DNR/DNI) orders are in place.

It is important, for many reasons in the care of older adults, to gather collateral information. Often, talking with a caregiver, family member, or facility staff is the only way to discover the current goals of care, learn if the patient has established advance directives, understand the patient's baseline functional status, and to find out their recent symptoms and medications. Assigning a team member to gather the collateral early in the treatment process can help gather information that will be critical to diagnosis and management, and to help understand the patient's priorities.

### *Bring Your A-Game*

For many of the reasons presented here, older adults require more skill to manage and resuscitate. Higher rates of underlying frailty, multimorbidity, and lower physiologic reserve mean many aspects of the resuscitation require the medical team to navigate a narrow band of safety to avoid over-volume resuscitating or under-resuscitating, hyperoxia and hypoxia, over-sedation or under-sedation, hypotension and hypertension. Resuscitation of older patients should involve thoughtful approaches, a broad assessment for underlying causes, and treatment plans that are aligned with the patient's goals of care.

## Conclusion

Resuscitating older adults in the emergency department requires a shift in both mindset and practice. Emergency physicians must remain vigilant for the subtle signs of critical illness in older adults and be prepared to adjust standard protocols to meet their complex needs. By recognizing the unique challenges and adapting our approach, we can provide more effective and compassionate care for this vulnerable population.

## Statement on Generative AI USE

During the preparation of this work the authors used Chat GPT4.0 in order to proofread and provide writing feedback. After using this tool/service, the authors reviewed and edited the content thoroughly and take full responsibility for the content of the publication.

## Declaration of competing interest

CS: Speaker to Curvafix staff (2023, completed) an orthopedic device company. Member of advisory panel to Noven Pharmaceuticals (2024-ongoing). Speaker bureau for Astra-Zeneca (2024, completed). CR: None.

## CRediT authorship contribution statement

**Christina Shenvi:** Writing – review & editing, Writing – original draft, Conceptualization. **Clifford Reid:** Writing – review & editing, Writing – original draft, Conceptualization.

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