Lee A. Lindquist
Scott M. Dresden  *Editors*

# Geriatric Emergencies
A Case–Based Approach
to Improving Acute Care

Springer

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# Preface

When an older adult enters the emergency department, it is everyone's hope that the best clinical care will be provided. Whether you are an emergency department provider or you bring a beloved older relative or parent to the emergency department or you are a retired clinician seeking emergent care, we all want the best care for our older adult population. Caring optimally for older adults requires specific knowledge of geriatrics and aging. Each older adult that we see prepares us to take better care of the next older adult. With this premise, we sought to put together cases of older adult stories to help clinicians – and anyone else interested in improving the care of older adults – to learn from. Many of these cases arose from Geriatric Emergency Departments – from Northwestern Medicine in Chicago to VA Health Systems in Cleveland – where dedicated geriatrics training of the next generation of emergency department is occurring. It is at these top-rated academic geriatrics programs where health systems across the nation are sending their emergency department staff to participate in intensive geriatrics education with a goal to establish Geriatric Emergency Departments. Geriatric Emergency Departments are the next wave of treating older adults, and they start with healthcare providers who understand the tenets of geriatrics. We hope that this book will help hone provider geriatrics skills and learn better what needs to be done in the emergency department.

We the authors and editors want to thank all of our families, friends, and supporters who assisted us with this book.

Whether it be from proofreading our work to watching our children while we work, we are truly thankful. We hope that in the future, when we ourselves become older adults, the best geriatrics care will be received no matter where the emergency happens.

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# Chapter 1
# Growing Older in the Emergency Department

**Lee A. Lindquist and Paul A. Nelson**

It has been said that the only constant is change. And with more time, comes more change. When you bring your new car in for its first oil change, you are not expecting any surprises. When that same car comes into the shop after 200,000 miles, you might find out about some other areas of concern. The human body is no different. When a person over the age of 65 comes into the emergency department, that individual will – more than likely – have a complex health history. This is complicated further by the changes that occur over time throughout the aging process. From top to bottom (head to foot), this chapter will present some common changes that accompany aging and should be expected when seeing an older adult in the emergency department.

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# Hair

A very common complaint to expect is "My hair is falling out." After ruling out medical pathologic causes, such as hypothyroidism, the conversation has to turn to "this may be normal." Hair loss happens with time; not a big surprise, but why does it happen? Hair follicles spend more time in the latter parts of the cell cycle, telogen or resting phase, instead of the anagen or building phase, resulting in fewer new hairs being built and more older hairs falling out or becoming dormant [1]. An interesting footnote is that hair also loses color and appears gray over time due to the loss and density of melanocytes, which are the cells that convey the color [2]. This is also completely normal and should be expected.

# Ears

Another common complaint to expect is that of hearing loss. Hearing loss increases as people age. The prevalence of age-related hearing loss doubles with each decade of life, with two-thirds of older adults 70 years old and older with a clinically significant hearing loss, increasing to almost 90% of adults older than 80 years [3, 4]. Men are almost twice as likely to have hearing loss as females [5]. When I begin to interview an older adult, I try to stand in front of them and use low-pitched tones. I do this because the higher-frequency tones are the first to be lost with age-related hearing loss. Hearing is even more difficult when there is background noise or multiple people nearby having discussions, like a typical emergency department. If the patient forgets their hearing aids, which can easily happen in an emergency, I will do what I call "flipping the stethoscope." I will place my stethoscope into the ears of the patient and talk into the head or diaphragm. This way, the patient can hear you without needing to be screamed at by the examiner.

So why do older adults lose their hearing? Several changes occur over time in the ear:

- The walls of the external ear canal become thinner.
- Thicker and longer hair follicles in the ear canal reach toward the tympanic membrane and do not sweep cerumen out as efficiently.
- Cerumen becomes drier, and both the number and activity of cerumen glands decreases. This frequently translates into cerumen impactions, which can contribute to hearing loss [6].

## Eyes

Just as hearing decreases over time, so does vision. Specifically, there is decreased depth perception, contrast sensitivity, and acuity [7]. So how does this translate in the emergency department? Writing instructions or printed material for older adult patients should have large font and high contrast (black and white) to make reading easier. Other changes to the eye include:

- Increase in visual threshold (the minimum amount of light needed to see an object) so rooms should be well lit
- Decrease in speed of light adaptation
- Increase in distance needed to focus near objects, due to decrease in lens elasticity and ciliary muscle atrophy
- Decrease in number of photoreceptors
- Decrease in production of tears, so older adult patients have drier eyes [8]

## Mouth

When people consider the oral health issues of an older adult, they might think of tooth loss, dental implants, and dentures. Tooth loss does occur with many older adult patients, so many people require softer food to eat in the emergency department. The mouth itself commonly becomes drier with age, as salivary glands experience fatty replacement and produce less saliva [9]. To further complicate the dry mouth, many older

adults take medications that cause dry mouth as a side effect. Together, this translates into providing foods that are moist and can be easily swallowed (e.g., mashed potatoes with gravy, applesauce). In addition, over the course of time:

• Dentition has increased thickness (and thus decreased pulp space).
• Dentition sensitivity has decreased.
• Smell and taste have decreased [10].

# Gastrointestinal Tract

One of the main concerns/complaints of older adult patients is being constipated or not having regular bowel movements. Constipation becomes more common as people age for a number of reasons, such as medications, decreased mobility, and changes in diet. Yet the natural age-related changes of the GI tract unequivocally contribute. While the motility of the small intestine does not change with age, colon motility slows; meaning, it takes longer for stool to move through the colon. There are also decreased absorption rates of the GI tract. Older adults also tend to drink less water because their thirst mechanism diminishes, which causes the stool to become drier and harder. All of these factors result in hard, less frequent bowel movements which are the epitome of constipation concerns [11]. While some older adult patients may hope for a daily bowel movement, we more commonly see them having one approximately every 3 days.

## *One Caveat with Constipation*

It is imperative to ask older adults complaining of constipation if they use any form of rectal suppository. Older adults who avidly use rectal suppositories are at risk of developing a "suppository plug"; the suppositories pile up in the rectum and may not melt sufficiently because of core body temperature changes. As a result, the mass of unmelted suppositories

can obstruct the rectum and cause constipation. This is usually remedied by a digital rectal exam and manual dis-impaction.

## Kidneys and Fluid Balance

As mentioned above, older adults commonly experience a decreased perception of thirst. This lack of thirst places older adults at an increased risk of volume depletion. When an older adult enters the emergency department for syncope, dehydration should be part of the differential diagnosis [12]. Offering or "pushing" fluids to older adults while they wait is also important, as most older adults will not feel thirsty or ask for a drink [13]. From a fluid balance standpoint, the following also occur with age:

• Impaired response to serum osmolarity
• Decreased ability to concentrate urine following fluid deprivation
• Decreased baroreceptor sensitivity
• Decrease in total body water
• Increased ADH secretion and an increased ADH response to osmoreceptor stimuli [14]

### *With Respect to the Kidneys*

Renal function decreases after age 40, and serum magnesium decreases by about 15% between the third and eighth decade [15, 16]. These changes in renal function result in a decreased renal excretion of drugs, which is why many medications should be renally dosed in older adults.

## Cardiopulmonary

Cardiac murmurs are common in adults over 80 years old. Every patient over 80 who has a murmur does not need an echocardiogram. It is important to ask the patient how long

they have had the murmur. For older adults, the S4 sound is normal and very common. Cardiac output does not change with age. However, the following changes do occur with the heart over time:

• Myocyte hypertrophy
• Increased left ventricular stiffness and wall thickness
• Decreased left ventricular compliance and diastolic filling
• Decreased ability to increase heart rate in response to sympathetic stimulation [17]

From the pulmonary standpoint, the following changes occur with age:

• Decreased chest wall compliance.
• Decreased diaphragmatic strength.
• Decreased FEV1 (5–30 ml/year in non-smokers, 60–70 ml/year in smokers).
• A-a gradient increases with age, while Pa O2 decreases [18].

## Skin

As we age, our skin thins out and becomes more fragile. The superficial blood vessels supplying blood to the skin also decrease and become more fragile. We see this occur when an older adult bumps their calves or arms and hematomas appear under the skin. Other skin changes that come with age are:

• Epithelial layers of skin flatten.
• Interdigitations between the dermis and epidermis are lost.
• Turnover of epidermal cells is slower, which translates to slower wound healing and increased susceptibility to irritants.
• Decreased ground substance and decreased subcutaneous fat.
• Collagen fibers lose elasticity [19].

## Bone

Decreased bone mass occurs with age and is a key reason why older adults are more prone to bone fractures. Height loss is very common among older adults and should be considered normal. The arches of the feet tend to diminish over time, which contributes to the appearance of height loss. The spine also appears to be shorter, sometimes pathologically from osteoporosis and compression fractures, but also as the nucleus pulposus gel between the vertebrate bones harden and become less gel-like. Further changes in bone occur over time due to:

- Decreased vitamin D calciferol (1, 25 (OH2) D) levels
- Decreased uptake of calcium by the gastrointestinal tract
- Decreased vitamin D synthesis by the skin, as older adults spend more time indoors and have decreased exposure to sunlight [20]

## Muscle

Falls happen frequently as people grow older and often result in emergency department visits. Typically, falls are multifactorial, caused by extrinsic (e.g., polypharmacy), environmental (e.g., poor lighting, loose carpets), and most notably intrinsic factors (e.g., balance loss, muscle weakness). Older adults face decreased muscle mass, decreased proprioception/sensitivity, and increased sarcopenia (decreased type 2 muscle fibers), which can all contribute to an increased fall risk. From a gait perspective, older adults experience:

- Decreased stride length
- Broad-based strides with small steps
- Decreased arm swings
- Increased flexion of hips and knees

Muscle loss increases as older adults spend more time being sedentary. The age-related muscle and gait changes, in

addition to sitting more, contribute to the risk of falls. To improve muscle tone and gait, older adults should be referred to physical therapy to work on strengthening muscles and improving balance.

Special attention must be paid to older adult patients during their time in the emergency department. Naturally occurring, age-related issues can create additional problems that may not be usual concerns in an emergency room setting. Hearing loss, decreased vision, and reduced fluid intake are all common effects of the aging process that can make communicating with older adult patients more difficult. Hair loss, tooth loss, and constipation are common complaints that are likely to come up in the conversation. Normal age-related decrease of bone mass, muscle mass, and skin thickness are more issues that older adults deal with. And the effects of time and age on both the cardiopulmonary system and renal function can make the trip to the emergency department even more stressful for older adults. With this understanding in hand, patients over the age of 65 can be better served during any future emergency department visit.

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# Chapter 2
## Components of an Effective Geriatric Emergency Department

**Scott M. Dresden**

## Introduction

The world population is aging. By 2050 the population of elderly people – defined as age 60 and older by the World Health Organization (WHO) – is estimated to nearly double from 12% to 22% worldwide [1]. To help address this older population's health needs, the WHO recognizes that health systems need to be better organized around older people's needs and preferences, designed to enhance older people's intrinsic capacity, and integrated across settings and care providers. Actions in this area needed to strengthen access to health care and people-centered and integrated health services.

One particular site of care which requires improvement to provide people-centered care and integrated health services for older adults is the emergency department (ED). For decades, researchers, clinicians, and policymakers have been lamenting the increasing and perceived inappropriate use of the ED [2, 3]. Despite multiple of attempts at decreasing ED

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use, visits to the ED continue to climb [4]. Older adults use the ED more than any other age group, at a rate of nearly one visit per two people in the United States [5]. In 2010, older adults had nearly 20 million ED visits in the United States, accounting for 15% of all ED visits [6]. Once in the ED, older adults have longer stays, receive a greater number of diagnostic tests, are more likely to be hospitalized, and have higher charges than younger patients [7]. Not only do these increasing visits by older adults put pressure on already overcrowded EDs, but they expose older adults to fragmented care and increased risk of adverse outcomes such as functional decline.

The role of the ED in the health-care system is changing at the same time the population is aging. EDs serve as a hub for prehospital emergency medical systems, an acute diagnostic and treatment center, a health-care safety net, and an always open portal for rapid inpatient admission [8]. The US health-care system is increasingly reliant on the ED for outpatient acute care visits and hospitalizations. The ED is the most common site for acute care outpatient visits in the United States and accounts for over half of all inpatient hospitalizations [9]. The reasons for the increased role of the ED are likely multifactorial, particularly for older adults. Patients have come to rely on the ED as an accessible way to quickly alleviate symptoms, obtain advanced diagnostic procedures, seek reassurance, or initiate treatment. Additionally, access to outpatient care has become more difficult as availability of primary care clinicians and geriatricians has not kept up with the aging population. The growing volume of ED visits by older adults can be viewed as a failure of health-care systems, a problem in need of a solution, or an opportunity to provide accessible, integrated, people-centered care for older adults. The objective of this chapter and the rest of the book which follows is to describe and to demonstrate how an effective geriatric emergency department can reach this high ideal for acute care for older adults.

The ED has the potential to be a site of accessible, integrated, and people-centered health services for older adults. This seems counterintuitive because of the many limitations

of ED care. Care in the ED focuses on immediate problems and centers on rapid evaluation and stabilization. For older adults, the immediate problem is often the result of persistent, unmet, health-related needs, which may be related to impaired functional status, multi-morbidity, lack of social support, cognitive impairment, or depression [10–13]. These needs often go unaddressed, leaving older adults at increased risk for subsequent adverse events including repeat ED visits, hospitalization, nursing home admissions, or death after discharge from the ED [6, 10–12, 14, 15]. When clinicians fail to recognize health-related needs, a common management strategy of many ED physicians is to recommend hospital admission for multidisciplinary, ancillary services evaluation and treatment including physical therapy, occupational therapy, social work, pain management, and caregiver reassurance and respite. These potentially preventable hospitalizations are costly and expose patients to risks such as delirium, falls, and nosocomial infections [16–20]. Many of these patients may be better cared for outside of the hospital. In order to care for these patients safely in the outpatient setting, additional geriatric assessment and care coordination are needed prior to discharge from the ED. EDs often lack the resources and expertise necessary to provide geriatric assessment and care coordination services. However, the ED has enormous potential for improvement in this regard.

The ED has significant potential to improve person-centered care for older adults because it sits at a crossroads between inpatient and outpatient care [21]. This unique setting provides opportunities to serve as a base for assessment, treatment, and care coordination for older adults with acute illnesses and injuries. In order to realize the potential for improvement in the acute care of older adults, policies, guidelines, and accreditations have been developed to improve emergency care across the world [22–24]. One set of guidelines which will serve as the basis for much of the discussion to follow are the Geriatric Emergency Department (GED) Guidelines published in 2014 and endorsed by the American

College of Emergency Physicians, the American Geriatrics Society, the Emergency Nurses Association, and the Society for Academic Emergency Medicine [25].

# Geriatric Emergency Department Multidisciplinary Team

Because of multiple competing priorities in the ED, it is not always feasible to train all emergency physicians, nurses, and other clinicians with specialty knowledge and skills necessary to effectively care for older adults in the ED. Instead, a multidisciplinary team can provide complementary expertise to help address older adults' unique special care needs such as cognitive impairment, falls, depression, functional impairment, depression, sensory impairment, and polypharmacy. In 2012, members of an international panel of geriatric emergency care endorsed ED staffing modifications for a GED [26]. The panel had high levels of endorsement for the availability of specialized nurses (85%), pharmacists (74%), social workers (88%), geriatric consultants (79%), and a designated professional, such as a transitional care nurse (TCN) to coordinate geriatric services (91%) [27, 28]. There were moderate levels of endorsement for the availability of physical therapy (59%) and occupational therapy (53%). The specific roles of these clinicians may vary by site, but their complementary skills can help to perform the varied assessments, modifications, and care coordination described below.

# Identifying Patients Who Benefit from Additional Services

In order for this multidisciplinary team to improve care for older adults, they must first identify patients who are at higher risk for poor outcomes. Not all older adults are at risk for geriatric syndromes. A 65-year-old man who works as an executive at a large corporation, has no medical problems,

and is in the ED with a minor injury such as a laceration to his hand is unlikely to need additional assistance. Routine emergency care is warranted. Conversely, a 95-year-old woman with mild dementia who lives alone, has difficulty making it to her doctors' appointments, and is in the emergency department after a fall down her stairs clearly needs additional assistance. In reality many patients fall in between these two scenarios, and identifying patients who will benefit from additional geriatric assessment and care coordination is often difficult but very important. In one Canadian study, approximately 30% of older adults in the ED had decline in functional status or death in the subsequent 4 months [29]. An Australian study demonstrated that 22% of older adults were hospitalized without ED intervention [30]. A multi-site American study had higher rates (35–44%) of hospitalizations [28]. With ED-based interventions, however, functional decline was decreased in the Canadian study, and hospital admissions were decreased in the Australian and American studies. These studies demonstrate the potential for ED-based intervention; however, the difficulty lies in identifying those older patients in the ED who are well enough to be discharged safely but have enough care needs to benefit from additional interventions. To help identify these patients who will most benefit from additional GED care, screening or care protocols should be developed.

The GED guidelines recommend that all older adults be screened for "high-risk features" and those at risk are referred to inpatient or outpatient services to help improve overall health and functional outcomes. Possible screening tests include the Identification of Seniors at Risk (ISAR) score [31] or the triage risk screening tool (TRST) [32]. Though these tools have not been shown to have good prognostic accuracy, they can help ED teams focus their efforts and identify patients with modifiable risk factors such as polypharmacy or functional dependence. Instead of relying on a screening test to identify patients who may benefit from GED care, ED-wide protocols on priority geriatric conditions such as falls or polypharmacy may

allow the clinicians to use clinical gestalt to help assist in identifying patients who would benefit from GED care. Alternatively, if resources allow, all patients above an age cutoff could be automatically identified as needing GED care. This approach was used in the Australian DEED II study which used an age cutoff of 75 and demonstrated better maintenance of physical and mental function for 6 months after an ED visit [30].

## Assessments, Interventions, and Care Coordination

Once appropriate patients are identified. Validated assessments should be performed to identify common geriatric syndromes. The protocol for performing these assessments may vary by hospital. Some EDs have used a dedicated professional called a transitional care nurse (TCN) to conduct assessments and care coordination. TCNs are ED nurses or nurse practitioners with dedicated education and training in geriatrics [27]. They have dedicated shifts where they are not responsible for primary ED care but are available as an extra resource in the ED for older adults. They perform a battery of assessments and conduct care coordination measures such as consulting other members of the multidisciplinary GED team, primary care physicians, inpatient or outpatient clinicians, and other members of the patient's care team. The TCN model was developed to address the unique and challenging clinical environment of the ED. It is a fast-paced, sometimes chaotic environment with frequent interruptions and sees a wide variety of patients from the worried well to the critically ill. The TCN model capitalizes on the experience of ED nurses who are comfortable and thrive in this environment and provides them with the expertise, to identify and address geriatric-specific needs that frequently go unnoticed or unaddressed in typical EDs. Though they are still relatively new, TCN programs have been shown to decrease hospitalizations for up to 30 days after an ED visit [28].

Other models of geriatric assessment in the ED include the geriatrics consult model or the multidisciplinary availability model. The geriatrics consult model uses the best experts in geriatrics in the hospital, geriatricians, to perform comprehensive geriatric assessment in the ED [33]. However, many hospitals do not have geriatrics consult services available, and those that do are often stretched thin already [34]. This model depends on strong relationships between the geriatric service and the ED and relies on hospital departments outside of the ED to provide personnel and sustainability. Additionally, the time pressures of the ED may limit the practicality of this model for many EDs as ED length of stay is increasingly scrutinized.

The multidisciplinary availability model creates services which are available to the ED, such as pharmacy, social work, and physical therapy, but it depends on the primary ED team to identify the most appropriate clinician to assist with evaluation. This model may be best used for patients with easily identifiable geriatric syndromes, such as falls. For example, physical therapists may be available to perform assessments on older adults in the ED after a fall [35]. This model requires more active screening and involvement of the primary ED team to identify the appropriate clinicians to assist with patient needs than the TCN model or the geriatrics consult model. It is likely most appropriate for focused, easily identifiable geriatric syndromes, but complex and subtle cases may be missed by the primary ED team if there are no comprehensive education and protocols detailing appropriate use of assessments for geriatric syndromes.

Regardless of which model is used, it is important to identify which patients are at risk for negative outcomes. Assessments generally focus on geriatric syndromes which are commonly found in the ED, present a high risk of poor outcome, and may be actionable. Commonly identified risks include medication risk, falls, functional decline, delirium, dementia, elder abuse, and palliative care needs. They should be considered for inclusion in GED care protocols.

## *Medication Risk*

Adverse drug events (ADEs) are common and problematic for older adults; they may be reduced by more accurate medication lists, better patient-clinician communication, and better understanding of potentially inappropriate medications. From 2004 to 2014, ED visits by older adults with ADEs increased from to 200,000 to 450,000 ED visits in the United States annually [36, 37]. Many of these ADEs are preventable [38]. Common preventable causes of ADEs are use of inappropriate drugs, ignoring clinical or laboratory results, inadequate monitoring, inappropriate dose or frequency, and inadequate patient education and patient non-compliance [39].

Polypharmacy, generally defined as taking six or more medications, is common among older adults and is associated with adverse health outcomes [40]. Less than half of patients are familiar with their medications or have a medication list with them, and discrepancies in medication lists are common [41–43]. This presents the possibility of inaccurate information for prescribers, which may lead to unknown drug-drug interactions when starting patients on new medications in the ED. Because of the potential dangers of ADEs for older adults, particularly those with polypharmacy, patients who are found to have polypharmacy likely will benefit from formal medication reconciliation.

Medication reconciliation can be performed by a pharmacist, TCN, physician, or nurse. It is important to have clear expectations as to who will be performing which tasks regarding medication reconciliation to prevent skipped or redundant steps. According to the Joint Commission, medication reconciliation is the process of comparing a patient's medication orders to all of the medications that the patient has been taking [44]. This reconciliation is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be done at every transition of care in which new medications are ordered or existing orders are rewritten. Transitions in care include changes in setting, service, practitioner, or level of care. This process comprises five steps: (1) develop a list of current medications, (2) develop a

list of medications to be prescribed, (3) compare the medications on the two lists, (4) make clinical decisions based on the comparison, and (5) communicate the new list to appropriate caregivers and to the patient.

In addition to polypharmacy, older adults are more susceptible to ADEs from individual medications. Physiologic, pharmacodynamic, and pharmacokinetic changes with age impact the therapeutic window for medications for older adults and make older adults more susceptible to ADEs [45]. To address increased susceptibility to ADEs, the American Geriatrics Society publishes the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults [46]. The Beers Criteria present a set list of medications that can be easily and rapidly applied when making clinical decisions. Common potentially inappropriate medications used in the ED include anticholinergics, anticoagulants, benzodiazepines, and nonsteroidal anti-inflammatory drugs (NSAIDs). The 2015 Beers Criteria are divided into several sections, which include lists of (1) potential inappropriate medications to avoid for many or most older adults, (2) medications for older adults with specific diseases or syndromes to avoid, and (3) medications to be used with caution. Published data have found an association between the use of medications on the Beers list and adverse outcomes including higher costs, increased ED visits, hospitalizations, and death [47, 48].

As part of a medication screen in a GED, medications which appear on the Beers Criteria should be flagged. The risks of the flagged medication should be considered against the possible benefits, and a conversation about possible deprescribing should commence between the ED team and the patient's outpatient medical care team. It may not be possible to avoid all high-risk medications. Continuity with inpatient and outpatient clinicians is essential. In addition to flagging outpatient medications, clinicians in the GED should feel empowered to discuss potentially inappropriate use of medications in the ED and upon discharge from the ED. Common potentially inappropriate medications used in the ED include anticholinergics, anticoagulants, benzodiaz-

epines, and nonsteroidal anti-inflammatory drugs (NSAIDs). If these medications are ordered or prescribed, discussion about the risks, benefits, and alternatives should be had between the ordering team and the GED team.

## *Falls*

The CDC estimates that more than one out of four adults 65 years and older fall each year, and 2.8 million of these older adults are treated in the ED for fall-related injuries [49]. Identification of risk factors for falls in older adults can have important implications on patients' long-term quality of life [50]. Sometimes these risk factors are apparent and related to the chief complaint. But often they are subtler and may even be actively concealed by the patient.

In order to identify patients who would most benefit from fall risk interventions, screening tests for geriatric ED patients at risk of falling have been developed. The Carpenter score and the Tiedemann score were each developed in older adult ED patients [51, 52]. Of the two scores, the Carpenter score appears to be most effective in identifying patients who are at low risk for fall in the next 6 months. Both are included in a later chapter in this book.

In addition to the Carpenter and Tiedemann screens, the CDC developed the Stopping Elderly Accidents, Deaths & Injuries (STEADI) program. STEADI uses a 12-item screening test to identify patients at risk of falling. This test takes approximately 15 min to administer [53] and combines the approach of risk factor assessment with functional assessment. Few ED studies have assessed predictors of future falls or interventions to reduce fall risk, and the existing studies show poor prognostic accuracy for the 6 months following an ED visit [54]. If a patient is high risk by the screening, a functional assessment is recommended. Potential functional assessments include the Timed Up and Go (TUG) test, the 30-s chair stand test, and the four-stage balance test. Patients who are at high risk for falls by screening, functional assess-

ment, or both should be referred to physical therapy for further evaluation and rehabilitation. Ideally, this referral can be initiated in the ED. However, depending on local resources and individual safety concerns, it may need to happen in the inpatient or outpatient settings.

## Functional Decline

Functional decline is defined as "a decrement in physical function, cognitive function, or both" [55]. It is one of the most common and serious clinical problems for older adults and is often measured by a reduction in ability to perform self-care activities of daily living (ADLs) [56, 57]. Functional decline has major impacts on patients' ability to live independently in the community. Screening for functional decline in the ED is important as dependence on one or more ADLs at the time of an ED visit is associated with increased risk of nursing home placement over the next year [58]. Additionally, functional decline is associated with increased mortality, increased need for rehabilitation and home care services, and greater healthcare expenditures. ADLs as defined by Katz et al. include bathing, dressing, toileting, transferring, continence, and feeding. Patients who require supervision, direction, personal assistance, or total care are considered dependent for that ADL. Identifying functional decline can prompt a social work consult who may be able to assist with home care resources or nursing home placement if necessary [59].

## Delirium

Delirium, an acute decline in attention and cognition, is a common problem for older adults in the ED, occurring in approximately 10% of older adults in the ED and 14–56% of hospitalized older adults [60–62]. Though in the past, delirium has been minimized as an expected part of aging, it is a serious form of organ (brain) dysfunction and can accurately be

called "acute brain failure" [63]. ED patients with delirium are over 2.5 times more likely to die in the next 6 months as those who don't have delirium [64]. Delirium is also associated with poor patient and hospital outcomes including lasting functional decline, nursing home placement, extended hospital length of stay, increased need for restraints, and added staffing [25]. Fortunately, detection of delirium in the ED dramatically decreases the risk of death at 6 months and 18 months after an ED visit [65].

Delirium is not a normal consequence of aging; rather it is an acute brain failure. It is common, occurring in 10% of geriatric ED patients, and is a major threat to their quality of life [66]. Delirium is associated with higher death rates, prolonged hospitalization, increased health-care costs, and accelerated long-term functional and cognitive impairment [65, 67–69]. The effects of delirium are most severe when delirium is undetected [65]. Therefore, it is concerning that delirium is frequently missed by emergency physicians (EPs) in 57–83% of cases [70].

Though commonly thought of in the hyperactive or agitated form which is characterized by increased psychomotor activity, anxiety, and agitation, delirium can also be hypoactive (quiet) or mixed [71]. Hypoactive delirium is characterized by decreased psychomotor activity and has the appearance of depression and sedation. This subtype is most often missed by physicians and can be difficult to identify without a delirium assessment because of its subtle presentation [72]. A patient with mixed-type delirium exhibits fluctuating levels of psychomotor activity over a period of time.

It is important to have a consistent protocol to screen geriatric patients in the ED so that hypoactive and mixed delirium is not missed. The Delirium Triage Screen (DTS), brief Confusion Assessment Method (bCAM), and the DTS followed by the bCAM all are quick assessments and with good sensitivity and specificity for identifying delirium [73]. The DTS is the highly sensitive, and the bCAM is highly specific. Combining the DTS with the bCAM if the DTS is positive provides high sensitivity and specificity (Fig. 2.1). After identifying delirium, it is important to begin to look for its

**Step 1: Delirium Triage Screen**
Rule-out Screen: Highly Sensitive

**Altered Level of Consciousness**
*RASS*

— Yes → DTS Positive Confirm with bCAM

No

**Inattention**
*"Can you spell the word 'LUNCH' backwards?"*

>1 errors → DTS Positive Confirm with bCAM

0 or 1 error

ED-DTS Negative
No Delirium

**Step 2: Brief Confusion Assessment Method**
Confirmation: Highly Specific

**Feature 1 - Altered Mental Status or Fluctuating Course**

— No → **bCAM Negative No Delirium**

Yes

**Feature 2 - Inattention**
*"Can you name the months backwards from December to July?"*

— 0 or 1 errors → **bCAM Negative No Delirium**

> 1 errors

**Feature 3 - Altered Level of Consciousness?**
*RASS*

— Yes → **bCAM POSITIVE DELIRIUM PRESENT**

No

**Feature 4 - Disorganized Thinking**

*1) Will a stone float on water?*
*2) Are there fish in the sea?*
*3) Does one pound weigh more than two pounds?*
*4) Can you use a hammer to pound a nail?*

*Command: "Hold up this many fingers" (Hold up two fingers). "Now do the same thing with the other hand" (Do not demonstrate).*

— Any Errors → **bCAM POSITIVE DELIRIUM PRESENT**

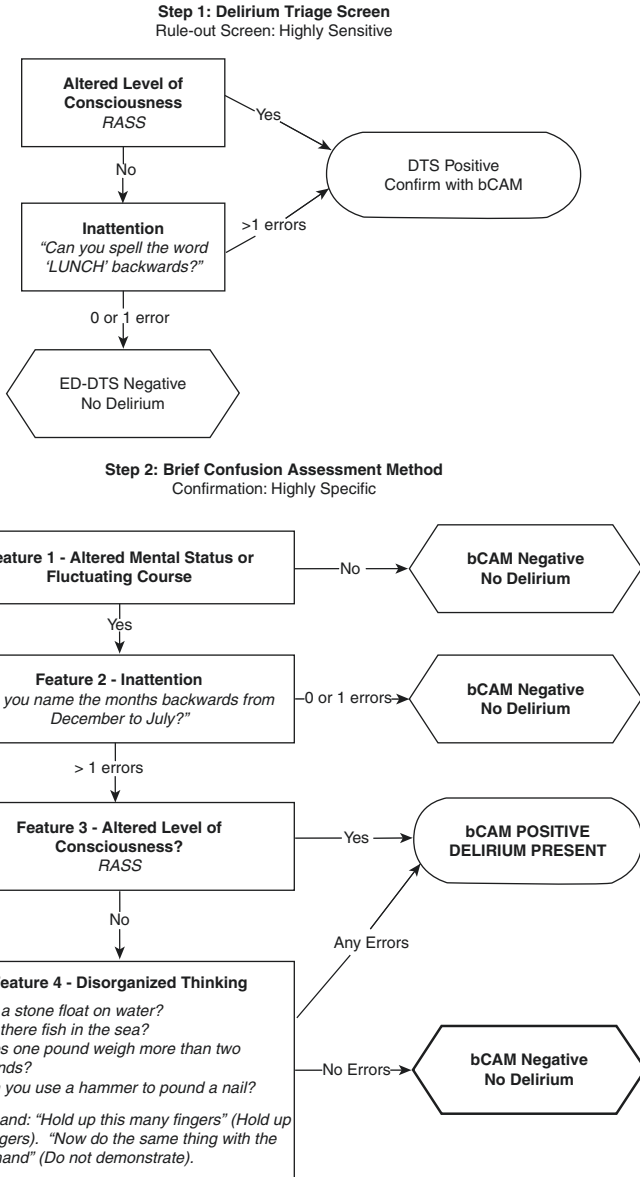— No Errors → **bCAM Negative No Delirium**

FIGURE 2.1 Delirium triage screen followed by brief confusion assessment method. (Han et al. [73]. Reproduced with permission)

cause. Oftentimes, the evaluation and treatment of delirium require hospitalization.

Common causes of delirium that should be evaluated for include:

• Infections – most commonly urinary tract infections (UTI) or pneumonia.
• Medications.
• Anticholinergic medications.
• Sedative/hypnotics.
• Opioids.
• Any new medication, especially if multiple medications have been recently added.
• Electrolyte imbalances.
• Alcohol/drug use or withdrawal.
• New focal neurologic findings should guide an evaluation for stroke syndromes.

## *Dementia*

Of the 20 million ED visits each year by older adults, between 20% and 40% of those were by persons with dementia, who use the ED at a higher rate than persons of similar age without dementia [74]. Many ED-based cognitive impairment and general adverse outcome screening tools have been developed [75–77]. The accepted criterion standard ("gold standard") is the Mini-Mental State Exam (MMSE) where a cutoff score <23 out of 30 has been widely accepted as an indication of cognitive dysfunction. However, the MMSE takes time and is not practical as an ED cognitive screen, with studies suggesting its implementation would miss 70% of patients [76].

More appropriate for the ED, the Short Blessed Test (SBT) is a six-item screening test that takes <10 min to administer and is graded from 0 to 12 (normal 0–4; questionable 5–9; impaired 10–12) and has high sensitivity and specificity [78]. The Ottawa 3DY (O3DY) is a four-item screen where one or more errors indicate impairment and has a

sensitivity of 95% [79]. Other cognitive screens such as the Brief Alzheimer's Screen and the Montreal Cognitive Assessment (MoCA) have both been suggested as potential ED cognitive screens, but neither have been validated in large ED patient populations.

**Ottawa 3DY screen for cognitive impairment [79]:**

- What is the day?
- What is the date?
- What year is it?
- Spell "world" backward.

Once dementia is identified in the ED, coordinating care becomes extremely important. Because care for patients with dementia overlaps geriatrics and neurology, resources in any given area may differ. Additionally, specialized clinics such as the Alzheimer's Disease Research Centers funded by the National Institute on Aging often require definitive imaging and cerebrospinal fluid analysis prior to a clinic visit. It is not necessary nor practical for these tests to be performed in the ED, so oftentimes coordination with the patient's primary care physician for definitive testing is necessary.

## Elder Abuse

Elder abuse is defined as "Intentional actions that cause harm or a serious risk of harm to a vulnerable elder by a caregiver or person who stands in a trust relationship with the elder, or failure by a caregiver to satisfy the elder's basic needs or to protect the elder from harm." Each year approximately 4% of all older adults (approximately 1.2 million older adults) are known to be abused or neglected in the United States [80]. This number is likely a gross underestimate as only 20% of cases of elder abuse cases are reported. Elders who are ill, frail, disabled, mentally impaired, or depressed are at greater risk of abuse, but those who do not have these obvious risk factors can also find themselves in abusive situations and relationships [81].

Fewer than 5% of cases of abuse or neglect are identified and reported to authorities, and these delays in intervention may lead to increased morbidity and mortality [82]. In the ED, elder abuse frequently goes undetected [83]. It is not clear why elder abuse detection in the ED is so low, but it may be related to lack of formal training in identifying signs of abuse, uncertainty about the appropriate steps to take after identification, and doubts about the effectiveness of interventions [84].

Elder abuse can occur in multiple forms including [85]:

- Physical abuse – inflicting, or threatening to inflict, physical pain or injury on a vulnerable elder or depriving them of a basic need
- Emotional abuse – inflicting mental pain, anguish, or distress on an elder person through verbal or nonverbal acts
- Sexual abuse – non-consensual sexual contact of any kind and coercing an elder to witness sexual behaviors
- Exploitation – illegal taking, misuse, or concealment of funds, property, or assets of a vulnerable elder
- Neglect – refusal or failure by those responsible to provide food, shelter, health care, or protection for a vulnerable elder
- Abandonment – the desertion of a vulnerable elder by anyone who has assumed the responsibility for care or custody of that person

Although extreme cases may be apparent during routine ED assessment, most cases are subtle and present with non-specific signs. Victims may be either unable or unwilling to report the problem. Differentiating between unintentional and intentional injuries and between illnesses that occurred despite appropriate care or because of neglect often requires collecting detailed information from multiple sources, which takes time [81].

Identifying elder abuse can be assisted by using standardized screening questions. The American Medical Association screening questions for abuse or the Elder Abuse Suspicion Index can be used to help identify elder abuse in the ED [81, 86]. Sensitivity and specificity of these screens are subopti-

mal; however, they may provide some structure and context to allow for evaluation of possible elder abuse [87].

Elder Abuse Suspicion Index [86]:

1. Have you relied on people for any of the following: bathing, dressing, shopping, banking, or meals?
2. Has anyone prevented you from getting food, clothes, medication, glasses, hearing aids, or medical care or from being with people you wanted to be with?
3. Have you been upset because someone talked to you in a way that made you feel shamed or threatened?
4. Has anyone tried to force you to sign papers or to use your money against your will?
5. Has anyone made you afraid, touched you in ways that you did not want, or hurt you physically?
6. Doctor: Elder abuse may be associated with findings such as poor eye contact, withdrawn nature, malnourishment, hygiene issues, cuts, bruises, inappropriate clothing, or medication compliance issues. Did you notice any of these today or in the last 12 months?

The patient can answer "yes," "no," or "unsure." A response of "yes" on one or more of questions 2 through 6 should prompt concern for abuse or neglect.

When elder abuse is identified or reasonably suspected, members of the health-care team are mandated to file a report in most US states [88]. Generally, reports are filed through Adult Protective Services (APS), which are government agencies responsible for receiving and investigating elder abuse reports. In many EDs, social work acts as a liaison between the primary care team and APS. However, if social work is not available, the treating clinicians can and should file a report on their own.

## Palliative Care Needs

According to the World Health Organization, palliative care is "an approach that improves the quality of life of

patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual." Palliative care [89]:

- Provides relief from pain and other distressing symptoms
- Affirms life and regards dying as a normal process
- Intends neither to hasten nor postpone death
- Integrates the psychological and spiritual aspects of patient care
- Offers a support system to help patients live as actively as possible until death
- Offers a support system to help the family cope during the patient's illness and in their own bereavement
- Uses a team approach to address the needs of patients and their families, including bereavement counseling, if indicated
- Will enhance quality of life and may also positively influence the course of illness
- Is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications

The ED is starting to be recognized as a potential source for palliative care. Identifying and addressing patients' palliative care needs in the ED can relieve suffering and change the care trajectory for patients with severe or terminal chronic diseases such as dementia, heart failure, chronic obstructive pulmonary disease, stroke, or cancer. Early use of palliative care has been shown to promote quality of life, as well as reduce costs associated with treatments [90–92]. Models of palliative in the ED most frequently focus on identifying patients with palliative care needs and helping to expedite palliative care consultation [93, 94]. This model of ED-based palliative care consultation has been shown to improve quality of life in patients with advanced cancer without detrimental effect on 1-year survival [95]. It is likely that this model can

be applied to other serious and terminal diseases such as dementia, heart disease, and chronic obstructive pulmonary disease.

Depending on availability within a health system, ED-based palliative care consultation or referral may be able to address the following common palliative care concerns:

- *Uncontrolled pain or other symptoms in patients with life-limiting illnesses*
- *Complex goals of care*
- *Hospice placement*
- *Outpatient palliative care referral*

In addition to referral to palliative care, palliative care needs can be directly addressed in the ED. Common palliative care needs for patients in the ED include pain, difficulty with medications, feeling overwhelmed, home care needs, and aligning care with patient goals. In the following chapters, we will discuss further treatment of malignant pain in the ED and goals of care discussions in the ED, as these are two of the most common palliative care needs that can be addressed directly in the ED.

## Approach to Palliative Care in the ED

For clinicians in the ED, a simple approach to palliative care can be helpful to ensure that emergency clinicians address the most time-sensitive and impactful aspects of end-of-life care during an ED visit. One such method is the "ABCD" method from the Education in Palliative and End-of-Life Care for Emergency Medicine (EPEC-EM) curriculum [96]:

- A (advance care plan) – Is an advance care plan available to review?
- B (better symptoms) – Can symptoms such as dyspnea or pain be better controlled?
- C (caregivers) – Are the patient's clinical context and recent functional changes discussed with caregivers?
- D (decision-making) – Does the patient have decision-making capacity, or is the legal surrogate identified and accessible?

After addressing these important aspects of care, treatment decisions which better align with patients' wishes can be made with patients and their caregivers, whether those wishes are entirely for life-sustaining treatment, entirely for comfort care, or commonly a blend of life-sustaining treatment and consideration of physical, psychosocial, and spiritual comfort.

## Conclusion

This overview highlights the multifaceted needs of older adults which have not traditionally been addressed in the ED. This is not a comprehensive list of ways to better care for older adults in the ED, and there are many models for how this person-centered care can be delivered to older adults with acute care needs. Improving care for older adults in these domains depends on increased education of emergency clinicians and reliance on a multidisciplinary team. Guidelines such as the Geriatric Emergency Department Guidelines go into detail on how to implement teams and processes to address these common needs of older adults. Rather than going into detail on how to implement these processes, the following chapters in this book will discuss illustrative cases which highlight the needs of older adults in the ED and strategies to address those needs. Based on hospital and local resources, the teams and protocols in a given geriatric ED will vary; however, the focus always should be on providing high-quality, accessible, integrated, people-centered health services for older adults. When this goal is achieved, patients will benefit from fewer hospitalizations, falls, adverse drug events, delirium, and functional decline and better overall quality of life.

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# Chapter 3
# Cognitive Impairment in the ED

**Jill M. Huded and Todd I. Smith**

## Abbreviations

| | |
|---|---|
| ACE | Acute care for elders |
| AD8 | Alzheimer's disease-8 |
| ADL | Activity of daily living |
| AGS | American Geriatrics Society |
| BAS | Brief Alzheimer Screen |
| bCAM | Brief Confusion Assessment Method |
| CAM | Confusion assessment method |
| DLB | Dementia with Lewy bodies |
| *DSM-5* | *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* |
| ED | Emergency department |
| EQUiPPED | Enhancing quality of prescribing practices for older veterans discharged from the emergency department |
| FTD | Frontotemporal dementia |
| GNL | Geriatric nurse liaison |

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| GRACE | Geriatric Resources for Assessment and Care of Elders |
| HBPC | Home-based primary care |
| HELp | Hospital Elder Life Program |
| MMSE | Mini-mental state examination |
| MoCA | Montreal cognitive assessment |
| O3DY | Ottawa 3 day-year |
| OMCT | Orientation-memory-concentration test |
| PIM | Potentially inappropriate medication |
| QCS | Quick confusion scale |
| SAEM | Society of Academic Emergency Medicine |
| SBT | Short blessed test |
| SIS | Six-item screener |

**Case Example**

Mr. C is a 72-year-old veteran with a history of depression, atrial fibrillation, stage 2 chronic kidney disease, prior tobacco use, and cognitive impairment who is brought to the emergency department (ED) by his wife for weight loss and leg swelling. She provides much of the history, reporting that he has lost 20–25 lbs over the prior 6 months. His appetite is poor, and several months ago he developed progressive bilateral ankle swelling not associated with trauma, pain, or warmth. He has not displayed cardiopulmonary symptoms. On examination, the patient appears older than his stated age with evidence of temporal wasting. No cardiac murmurs or pulmonary crackles are present. Symmetric 1+ bilateral lower extremity edema to the mid-shins is noted. He is cooperative and can follow commands, however looks to his wife when asked questions. Complete blood count and renal function panel are unremarkable other than low serum albumin at 3.1 g/dL. Chest X-ray shows stable hyperinflation.

# Geriatric ED Evaluation

Upon completion of examination by the ED clinician, the patient and wife are greeted by the geriatric nurse liaison (GNL). The GNL obtains additional history from the veteran's wife, learning out that he was diagnosed several years ago with early-onset dementia. Prior to this diagnosis, he was an active community leader and respected reverend who recently was forced to step down from preaching after repeated confusion while giving Sunday sermons. He no longer drives after getting lost while driving in their neighborhood. His wife must now assist with his self-care needs, medications, and doctor's appointments, making it difficult for her to continue volunteering or attending to her own health needs. No longer does the couple have a flourishing work and social calendar, as their daily schedules now revolve around Mr. C's eating, bathing, dressing, and medication needs.

The GNL performs geriatric screens for delirium, functional status, fall risk, and caregiver burden. The Brief Confusion Assessment Method (bCAM) is used to assess for delirium. Mr. C displays inattention and disorganized thinking, and his wife reports new sluggishness over the last week since his haloperidol dose was increased. Because he qualifies for delirium by criteria of the bCAM, screening for dementia is deferred. Katz Activities of Daily Living (ADLs) are used to assess functional status. He requires assistance with bathing, dressing, toileting, transferring, continence, and feeding, therefore scores 0 out of 6 points and is unable to perform ADLs without the assistance of others. Formal gait assessment is deferred as the patient required two nursing assistance to transfer from his wheelchair to the ED bed. He uses a cane at baseline and has had two falls in the prior 6 months at home. Caregiver burden assessment via the Modified Caregiver Strain Index is completed by his wife. She scores 24 out of 26 points, suggesting a high level of caregiver burden. Lastly, his medications are reviewed by the ED pharmacist. Notable medications include donepezil 5 mg

nightly, haloperidol 2 mg scheduled three times daily with an additional 2 mg dose as needed, trihexyphenidyl 25 mg every morning, and stool softeners.

## Discussion of Findings

This case demonstrates several geriatric syndromes frequently encountered in the ED: delirium superimposed on baseline dementia, functional dependency, falls, frailty, polypharmacy, and caregiver burden. The patient's tenuous status to remain at home could go unrecognized if the ED evaluation is focused solely on the chief complaints of weight loss and lower extremity swelling, highlighting the importance of specialized acute care of the older adult. We will focus specifically on dementia and delirium screening and interventions in this chapter, given the prevalence of cognitive impairment in the acute care setting and the priority of older adults to remain "mentally sharp" [1]. The Society of Academic Emergency Medicine (SAEM) Geriatrics Task Force recognized the prevalence of cognitive impairment and importance of mental status screening in the ED in its Geriatric Emergency Care Model. Later, in 2014, recommendations for staffing, environmental modifications, screening, policies, and outcome measures for dementia and delirium were published in the Geriatric Emergency Department Guidelines [2]. Both sets of guidelines acknowledge the complexity of older adults' medical needs, the impact of cognitive impairment on ED presentation and overall functional decline, and the importance of sensitive and quick screening tools for delirium and dementia.

## Delirium

### *Delirium Overview*

Diagnostic criteria for delirium, as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*

(*DSM-5*), include an acute and frequently fluctuating disturbance in attention along with a change in cognition (such as memory deficit, language disturbance, disorientation, perceptual disturbance) [3]. Up to 25% of hospitalized older adults may experience delirium [4, 5] with an estimated prevalence of 7–17% upon presentation to the ED. [6] Up to 70% of delirium cases go undetected by clinicians in the ED, inpatient, and community settings. Nearly a quarter of these patients will be discharged home from the ED [7–9], putting them at risk for medication noncompliance and poor post-acute care follow-up. Hospital mortality rates in patients with delirium rival those of sepsis and acute myocardial infarction. Standard screening tools for delirium are recommended given its association with functional decline, increased risk of prolonged hospitalization and mortality, and healthcare expenditures [10]. Even if triggers for delirium are identified and targeted, delirium may persist for several weeks to months.

## *Delirium Forms and Features*

The cardinal features of delirium are acuity of onset and inattention. Typically, the onset of delirium occurs over hours to days. Because changes in mental status often wax and wane in delirium, patients may present to the ED during a period of relative lucidity, making it crucial to obtain collateral information from friends and family. Inattention is displayed as difficulty following a conversation, easy distraction, or perseveration. It can be assessed through repetition tasks, months of the year or days of the week recited backwards, or digit spans. Level of consciousness is commonly impaired, ranging from somnolence or lethargy to hyperalert; however, a change in consciousness is not required to diagnose delirium. Lastly, patients may have disorganized thinking, displayed as hallucinations, delusions, disjointed speech, or abnormal thought processes.

Delirium may present as hypoactive, hyperactive, or mixed forms, with hypoactive delirium having the worst prognosis.

The restlessness, agitation, vigilance, and hallucinations (typically visual) of hyperactive delirium make this form more easily recognizable by healthcare providers. Patients may switch back and forth between hyperactive and hypoactive delirium in the mixed form.

## Delirium Evaluation

The foundation of the evaluation of delirium is a thorough history to determine if the patient's mental status is a change from baseline and the acuity of changes. An accurate history will also determine potential causes, guiding the treatment plan. A widely adopted bedside diagnostic tool used to identify delirium is the Confusion Assessment Method (CAM) [11]. Its high sensitivity (94–100%) and specificity (90–95%), along with variations tailored for unique settings, have facilitated its widespread clinical use. The Brief Confusion Assessment Method (bCAM) [12] is recommended by the Geriatric Emergency Department Guidelines as the tool used to confirm suspected delirium (see Fig. 3.1). The bCAM includes specific questions that clinical staff can use to assess each of the four CAM features (acute altered mental status, inattention, altered consciousness, and disorganized thinking). Positive screens for delirium should be followed by evaluation for the underlying cause (see Fig. 3.2). Brain imaging, typically a non-contrast computed tomography of the brain, should be performed if concerned for head trauma or other neurologic insult. Evaluation for infection, metabolic derangements, toxins, polypharmacy, sensory impairment, dehydration, pain, and constipation should also be considered.

## Delirium Interventions in the ED

Delirium treatment is threefold: curbing further alteration in mental status through delirium preventative measures,
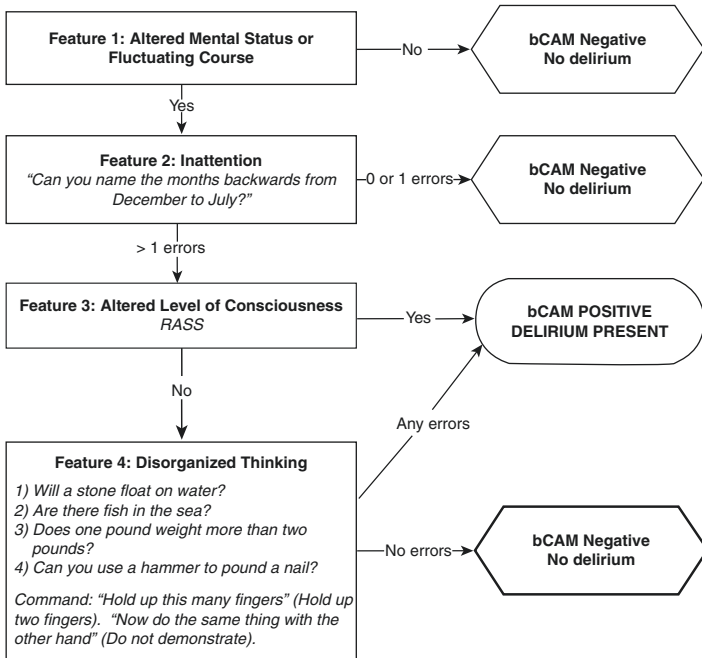
FIGURE 3.1 The brief confusion assessment method. (From Han et al. [12])

correcting precipitating factors, and treating behavioral manifestation such as agitation or hallucinations through non-pharmacological and pharmacological means (Table 3.1). Nonpharmacological strategies and avoidance of high-risk medications should be enacted for all older adults treated in aging-friendly EDs, i.e., for both those at risk for delirium and diagnosed with delirium. Optimization of the environment can be performed with basic modifications to ED layout and patient rooms such as noise reduction strategies, large face clocks and visible calendars, and patient-controlled diurnal lighting. If hearing or visual impairment are suspected, many aging-friendly EDs now have hearing amplifiers [13] and magnifying glasses available for patient use. Avoidance of
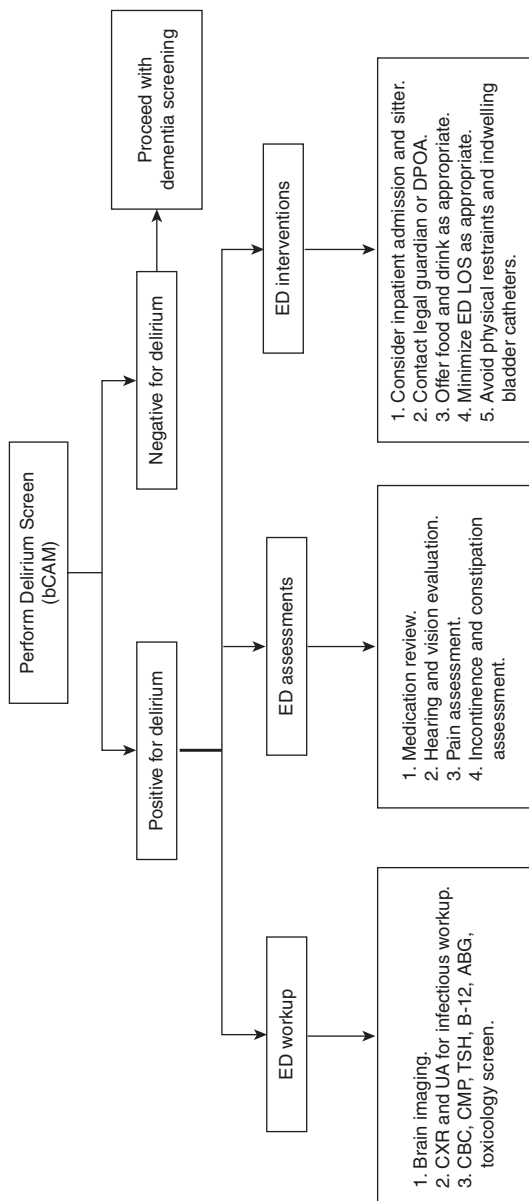
FIGURE 3.2 ED delirium algorithm

Table 3.1  Nonpharmacological and pharmacological strategies for delirium

| Nonpharmacological strategies for delirium | Pharmacological strategies for delirium |
|---|---|
| Correct sensory deficits (hearing aids or amplifiers, cerumen disimpaction, eyeglasses or magnifying glasses) | Avoid high-risk medications (anticholinergic medications, sedatives/hypnotics, narcotics) |
| Optimize environmental sensory stimulation (noise reduction strategies, diurnal lighting) | Consider medications to treat delirium in severely agitated patients who: |
| Reorientation (large face analog clocks, visible calendars, dry erase boards, identify healthcare team members) | Are at risk for harming themselves or others or |
| Avoid physical restraints | Medical care is disrupted or delayed due to agitation |
| Avoid indwelling bladder catheterization | |
| Encourage supervised mobility | Haloperidol 0.5–1.0 mg po or IM |
| Encourage family/friends to remain at bedside | Avoid IV given the risk of QTc prolongation |
| Consider a bedside sitter | Double dosage if initial dose is ineffective |
| Provide adequate nutrition and fluids | Most older patients respond to 1–2mg total |
| Minimize invasive procedures | Quetiapine is antipsychotic of choice for patients with Lewy body dementia and Parkinson disease |
| | Initial dose is 12.5–25 mg po daily or q12H |

invasive procedures, restraints, and indwelling Foley catheterizations are now commonly used quality metrics.

Pharmacological strategies include avoidance of high-risk medications and the use of antipsychotic medications in agitated patients at risk of harm to themselves or others. Polypharmacy is an independent predictor of delirium among older adults who require inpatient admission after evaluation and treatment in the ED. One study found positive CAMs in 69% of inpatient older adults receiving polypharmacy, compared to 30% of those without polypharmacy (a relative risk of for delirium of 2.33) [14]. The American Geriatrics Society (AGS) updated its Beers Criteria in 2015, a list of potentially inappropriate medications (PIMs) that should be avoided in older adults [15]. Mechanisms to avoid the prescription of PIMs have been developed by EDs in an effort to reduce the number of patients discharged with suboptimal prescriptions, estimated to be up to 30% [16]. The Enhancing Quality of Prescribing Practices for Older Veterans Discharged From the Emergency Department (EQUiPPED) program is one such model aimed at reducing the prescription of PIMs through the implementation of clinical decision support, ED provider education, and individual ED provider feedback on prescription practices, resulting in a relative reduction in PIM prescription by almost 50% at one site [17, 18]. If medication administration in the ED is required for behavioral manifestations of delirium such as severe agitation, pharmacologic options are limited to antipsychotics. Benzodiazepines should be avoided unless the trigger for delirium is alcohol or benzodiazepine withdrawal [19].

# Dementia

## *Dementia Overview*

Mr. C, as described above, is a common example of a patient with cognitive impairment encountered in the ED. His baseline cognitive impairment increased his frailty and poor

reserve to acute or subacute insults, such as malnutrition and medication changes. Patients with dementia visit the ED more frequently and have higher rates of hospitalization and ED revisits than those without dementia [20]. Up to two-thirds of community-dwelling individuals with dementia will require hospitalization at least once every 3 years [21], the majority entering the acute care setting through the ED. ED costs of care may be up to 75% higher for those with a dementia diagnosis based on Medicaid and Medicare cost findings [20].

As opposed to the acute onset of delirium, dementia is a progressive and sustained decline in memory. A diagnosis of dementia also requires impairments in at least one other cognitive function (language, executive, or visual-spatial) with interference in one's daily life. The most common causes are Alzheimer's dementia, accounting for approximately 60% of cases, and vascular dementia, accounting for 20% of cases. Other neurodegenerative causes include dementia with Lewy bodies (DLB), Parkinson's disease, and frontotemporal dementia (FTD). Nondegenerative etiologies include chronic traumatic encephalopathy, alcohol-related dementia, and infection-related dementia. If no functional impairment is present however there are objective signs of memory loss on testing, this is considered mild cognitive impairment (MCI). Six to 15% of patients with MCI will progress to dementia. Of note, not all chronic cognitive changes in older adults are diagnostic of a neurodegenerative process. Normal aging is associated with declines in processing speed, attention, and memory formation.

## Dementia Evaluation

There are many tools available to detect dementia in the ED setting (Table 3.2). The Mini-Mental State Examination (MMSE) is well-validated and has widespread use in many settings; however, it can be time-consuming (taking up to 10 min to perform), cumbersome in the ED (requiring the patient to draw), and suboptimal for detecting mild cognitive impairment, FTD, and DLB [22]. It was copyrighted in 2001,

TABLE 3.2 Tools for dementia evaluation. Sensitivities and specificities for all but the six-item screener, Montreal cognitive assessment, and mini-mental state examination were obtained from studies performed in the ED setting

| Evaluation tools | Timing | Design | Sensitivity, % (95% CI) | Specificity % (95% CI) |
|---|---|---|---|---|
| Short blessed test | <2 min | Weighted six-item test evaluating orientation, registration, and attention | 95 (88–98)[a] | 65 (61–67) |
| Brief Alzheimer's screen | <3 min | Four-item test used to detect mild dementia | 95 (88–98)[a] | 52 (48–54) |
| Ottawa 3DY | <1 min | Four-item test sharing elements with MMSE | 95 (85–99)[a] | 51 (45–53) |
| Caregiver-completed Alzheimer's Disease-8 | <1 min | Designed for informant caregivers. Eight performance and memory-based questions | 83 (71–91)[a] | 63 (55–68) |
| Quick confusion scale | <3 min | Six-item test focusing on orientation, memory, and concentration | 64[b] (no CI provided) | 82 |
| Six-item screener | 1 min | Three questions on temporal orientation and three-item recall | 63 (53–72)[c] | 81 (75–85) |

| | | | | |
|---|---|---|---|---|
| Mini-cog | 2–4 min | Three-item recall and clock drawing | 75 (48–93)[d] | 85 (73–93) |
| Montreal cognitive assessment | <10 min | 30 points total. ≤ 26 = abnormal normal. Add 1 point if less than 12 years of education | 91 (84–95)[e] | 81 (81–88) |
| Mini-mental state examination | <10 min | 30 points total. ≤24 = abnormal normal | 81 (78–84)[e] | 89 (87–91) |

[a]Carpenter et al. [42]
[b]Stair et al. [29]
[c]Wilber et al. [30]
[d]Wilber et al. [43]
[e]Tsoi et al. [44]

therefore requires permission to be used in the clinical setting. The Montreal Cognitive Assessment (MoCA) is similar to the MMSE in design and time requirements. The MoCA was designed to detect mild cognitive impairment and is ideally used in those who score 24–30 on the MMSE [23]. In the ED setting, we recommend the Short Blessed Test (SBT), also known as the Orientation-Memory-Concentration Test (OMCT) [24]. The SBT typically takes up to 5 min to perform with good sensitivity for dementia (95%), however has less specificity when compared to the MMSE (65%). Other quick cognitive tests include the Brief Alzheimer Screen (BAS) [25], Ottawa 3 Day-Year (O3DY) [26], Alzheimer's Disease-8 (AD8) [27, 28], Quick Confusion Scale (QCS) [29], Six-item Screener (SIS) [30, 31], and Mini-Cog [32].

## *Dementia Interventions in the ED*

Dementia screens suggestive of cognitive impairment should be followed by specific management while the patient is in the ED in addition to thoughtful post-ED interventions (see Fig. 3.3). Information obtained through cognitive evaluation in the ED changed treatment plans and disposition in 100% of patients in one study [33]. In addition to determining if the patient's current mental status is near their baseline, the electronic medical record should be used to determine if a legal guardian or enacted durable power of attorney (DPOA) for healthcare is on file. Similar to any patient with delirium, frailty, or acute illness, those with dementia should be provided nutrition while in the ED if clinically appropriate and receive timely workup and treatment.

## Cognitive Impairment Interventions upon Discharge from the ED

Significant opportunities for post-ED interventions for those with diagnosed or suspected delirium or dementia exist. The ED visit may signal a decline in functional status, mounting
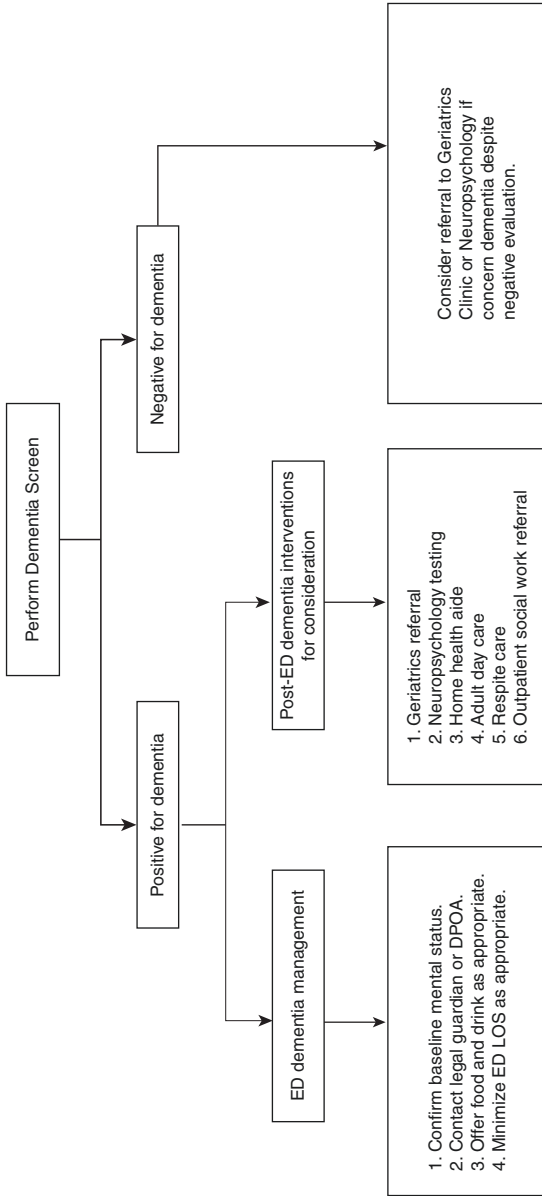
FIGURE 3.3  ED dementia algorithm

Perform Dementia Screen

Positive for dementia

Negative for dementia

ED dementia management

Post-ED dementia interventions for consideration

Consider referral to Geriatrics Clinic or Neuropsychology if concern dementia despite negative evaluation.

1. Confirm baseline mental status.
2. Contact legal guardian or DPOA.
3. Offer food and drink as appropriate.
4. Minimize ED LOS as appropriate.

1. Geriatrics referral
2. Neuropsychology testing
3. Home health aide
4. Adult day care
5. Respite care
6. Outpatient social work referral

caregiver burden, and suboptimal medication regimen rooted in progressive cognitive impairment. An intentional, structured investigation of dementia may serve as a springboard to investigate these coexisting geriatric syndromes. For Mr. C, an accurate assessment of dementia could not be performed given current delirium. However, discussion of his recent change in mental status then allowed for discussion of his failing health and increased home care needs.

The Geriatric Emergency Department Guidelines highlight the importance of tailoring post-ED care to the most appropriate setting, i.e., avoiding unnecessary hospitalizations and enabling older adults to receive ED follow-up care through home and community supports. For patients with cognitive impairment, thoughtful consideration of post-ED care is especially pertinent given the risk of cognitive and functional decline during and following hospitalization [34]. Hospitalized patients diagnosed with delirium have shown twice the rate of cognitive decline during the year following an acute admission. Clinicians in aging-friendly EDs are expected to "pause before hospitalization" for those with baseline cognitive impairment [35]. Evaluation and development of interdisciplinary, comprehensive care plans for older adults may initially be met with resistance given the potential for added time to ED workflow. However, transitional care nurses tasked with developing and coordinating these plans in the ED have decreased acute admission rates [35]. Further research to evaluate the quality of life and satisfaction of ED care following an upfront investment of geriatric resources is needed.

Hospital at Home is one alternative to hospitalization for those with acute medical illness. Up to one-third of older adults with an acute medical condition warranting inpatient admission can be safely and successfully treated through the Hospital at Home model [36]. In addition to decreased risk of delirium, Hospital at Home has been found to lower costs and mortality rates while improving satisfaction [37]. Other home care models include Geriatric Resources for Assessment and Care of Elders (GRACE) [38] and home-based primary care (HBPC) [38].

Programs shown to mitigate the number and duration of delirium episodes, in addition to decreasing costs and 30-day readmissions, for older patients requiring hospitalization include Acute Care for Elders (ACE) units [39, 40] and Hospital Elder Life Program (HELp) [41]. ACE units are specialized inpatient units using teams of geriatric specialists to provide patient-centered care, medication review, environmental optimization, early discharge planning, and rehabilitation. ACE teams include geriatric-trained physicians, therapists, pharmacists, social workers, case managers, dieticians, and nurses. The HELp model specifically targets delirium through interventions for dementia, sleep deprivation, immobilization, sensory impairment, and dehydration.

For patients with significant care needs, referrals for nonskilled care in the home (i.e., home health aides), respite care, adult day care, and long-term care homes can be performed prior to discharge from the ED. These referrals and other social work resources in the ED are often essential to timely care transitions. If a social worker is not available in the ED, prompt referral to outpatient Geriatrics clinic or a multidisciplinary home care program should be considered. Home health aides are ideal for patients requiring services for personal care, such as bathing, toileting, and dressing. Medicare and most private health insurances will not pay for an aide if there is no skilled medical or therapy need. Certain long-term care insurance and Veterans Administration benefits may be used for home health aide services. Respite care is temporary planned or emergency care providing relief to the family caregiver. Respite care can be performed in the home and in skilled nursing facilities. Adult day care is a wonderful option for many patients with cognitive impairment whose priority is to remain living at home with family caregiver support but would benefit from care in a structured environment during the day. Initiating these outpatient services while in the ED, as opposed to post-ED follow-up several weeks to months later, can likely decrease ED revisits, hospitalization, and additional patient morbidity.

## Case Summary

ED geriatric assessment revealed overmedication with haloperidol, progressive functional impairment, and severe caregiver burden. Mr. C's GNL developed a care plan with the input of his ED physician, pharmacist, and social worker. No acute medical conditions warranting an inpatient admission were discovered in the ED. His outpatient psychiatrist was contacted for assistance with modifying the haloperidol dose, a trial run at a VA-contracted adult day care facility was arranged, and a request for home health aide hours was made. In addition, Mr. C was referred to outpatient Geriatrics clinic and Caregiver Support Services. This comprehensive plan aligned with his wife's wish of continuing to care for him at home. Equipping Mr. C's wife with tools and resources to address his increasing frailty avoided hospitalization for social concerns or respite and minimized his risk for further delirium and avoided the hazards of hospitalization.

## Key Points

1. Delirium should be considered an acute medical condition warranting evaluation for the underlying cause and treatment, given its increased risk of mortality and functional decline.
2. The CAM or one of its derivatives, such as the bCAM, is a bedside tool used to identify delirium, and ED utilization of these tools can reduce the 70% of delirium cases that have historically gone undetected during ED visits.
3. Delirium preventative measures, such as medication review, hydration, ambulation, sensory optimization, reorientation, and avoidance of physical restraints and external devices, are key components of delirium treatment in the ED.
4. Patients with dementia are frequently treated in the ED and, if hospitalized, at increased risk for delirium and long-term cognitive decline. Therefore, implementing ED meth-

ods that promote safe discharge plans and appropriate follow-up care should be utilized.

5. The Short Blessed Test is a timely, sensitive, and relatively specific test to evaluate for dementia in the ED setting.

6. Opportunities for specialized inpatient programs, such as Acute Care for Elders, and early outpatient referrals should be considered for patients diagnosed with new or progressive dementia in the ED.

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# Chapter 4
## Syncope in a Rural Emergency Department Setting

**Lucy Morse and Lee A. Lindquist**

**Case**

Ms. Patricia Spencer is an 81-year-old woman, accompanied by her son, who arrives at the emergency department of a hospital in a small town in rural Illinois following a fall that resulted from what she describes as a "fainting spell." She describes "feeling a little sick to the stomach and then a bit dizzy" while standing at her kitchen sink. She reports gripping the edge of the sink as her vision started to "get grainy around the edges and then go gray" and lowering herself to the floor. She regained consciousness after an unknown period of time that she says she thinks "wasn't all that long." She was able to stand back up by using a nearby chair for support, at which point she called her son, who left work and

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drove her to the emergency department. They report driving approximately 45 min in order to get to the emergency room, during which time Ms. Spencer says she felt "a little weak and shaken up" but otherwise normal.

Upon further questioning, she denies experiencing palpitations or a racing heart. She denies feeling chest tightness or pressure and did not experience shortness of breath but thinks she might have been breathing a little faster when she realized what was happening. When prompted, she notes she felt "a little warm" before losing consciousness. Although she notes that it took her "a few seconds" to become oriented after regaining consciousness, she denies any lasting confusion; she also denies incontinence or injury to her mouth or tongue following the episode. When asked whether anything similar had happened to her before, Ms. Spencer notes that she fainted once as a young adult while standing in church after skipping breakfast, but she has not lost consciousness since then. She notes one near fall 2 months prior, caused by slipping on the ice while retrieving her mail; she was able to catch herself on the mail post and right herself without injury.

*Medications:*
Daily multivitamin
Atorvastatin 10 mg once daily
Celecoxib 200 mg once daily

Patricia's past medical history is significant for partial small bowel obstruction 3 years ago which resolved spontaneously with supportive treatment. She has no history of heart anomalies or arrhythmia and also denies family history of arrhythmia or sudden cardiac death. She has a history of osteoarthritis in her hands and in both hips. She had a bilateral total hip arthroplasty 8 years ago without complication.

Patricia is a never smoker, does not drink alcohol or caffeine, and lives alone in her home in rural Illinois. Home is single floor but has several steps at the entranceway. Her son lives nearby and is her primary source of support; he helps her with grocery shopping and some chores, but she cooks and cleans for herself and manages her own medication and finances independently.

*Physical exam:*

Blood pressure taken immediately upon presentation to the ED is 142/80, with heart rate of 72 bpm. Cranial nerves II–XII are intact bilaterally. Cardiac exam reveals regular rate and rhythm, S1 and S2 audible, and no S3, S4, murmurs, rubs, or gallops. Basic MSK exam reveals range of motion and strength equal throughout bilateral upper and lower extremities, notably with 5/5 strength in hip flexion and extension bilaterally. There is no evidence of trauma (bruising, tenderness) to the head, trunk, or legs; there is full range of motion and no tenderness to palpation at any bony landmarks of the hip. Left wrist is slightly tender upon flexion and palpation. Wrist has full range of active motion and extension and flexion are 5/5 strength. Patient is alert and oriented x3; light touch and pain perception are intact bilaterally in upper and lower extremities.

## Diagnostic Approach and Questions Raised

What are the appropriate next steps in working up this syncopal episode?

Should Ms. Spencer's hypertension be treated? Does her age impact the decision-making?

Is it safe for Patricia to be living independently? Would returning to her home environment be considered high risk?

# Diagnostic Workup of Syncope in the Older Adult

## *Common Causes of Syncope in the Older Adult*

Syncope is a common complaint in the older adult, accounting for up to 3% of all ED visits, and is more common in older adults relative to the general population [3]. While only 10% of syncope is cardiac in origin in adults of ages 18–65, 40% of cases are cardiac in origin in the older adult population [10]. Several other common non-cardiac causes of syncope in the older adult can be grouped together in the category of neurally mediated syncope: these include carotid sinus hypersensitivity, situational syncope, and vasovagal syncope. Orthostatic hypotension is a major cause of syncope in older adults, accounting for up to 30% of syncopal episodes by some estimates; this is defined as a drop of >20 mmHg systolic or >10 mmHg diastolic upon standing [9]. Older adults are frequently prone to orthostatic hypotension because they do not drink enough fluids in a day. Normally with age, older adults lose their thirst mechanism, so frequently the first sign of dehydration is syncope. Further complicating the lack of fluid, many older adults experience incontinence and so may limit their fluid intake if they are planning to go outside of the home or to a specific event. If the older adult is dehydrated, it is likely that orthostatic hypotension will be present and easily remedied by giving fluids in the ED and encouraging daily fluid intake.

Postprandial hypotension is also disproportionately observed in older adults and should be considered if the clinical context is suggestive [12].

Data on relative prevalence of these etiologies is limited and mixed, in part due to the absence of confirmed diagnosis in up to 40% of syncopal episodes presenting to the emergency department; however, since the introduction of diagnostic approaches such as tilt-table testing, it has been shown that vasovagal syncope is underdiagnosed and accounts for a significant proportion of syncopal episodes in older adults [6, 16]. Critically, many cases of syncope in older adults are multifactorial in origin, and contributing factors such as poly-

pharmacy and underlying comorbidities may go unrecognized as causal agents in the episode [9].

## Our Patient

Although not strongly indicated based on symptoms, a cardiac cause must be carefully considered due to the patient's age. Although the patient has no history of arrhythmia and has no history consistent with MI or CHF, she does take a statin, suggesting that she may be at risk for heart disease which is a significant independent risk factor for syncope of cardiac origin [1]. By virtue of her age, gender, and hyperlipidemia, assessing for an arrhythmogenic or structurally mediated cause should be a priority. However, her HPI indicates a prodrome highly consistent with vasovagal syncope: this evidence is particularly notable considering that classic vasovagal symptoms, including nausea, warmth, dizziness, and diaphoresis, are less commonly seen in older adults with vasovagal syncope [16]. Vasovagal origin is also made more likely by her account of beginning to experience symptoms while she had been standing for some time; this feature, however, should also lead us to consider a delayed orthostatic hypotension.

The patient's presentation is less concerning for high-risk causes such as seizure or stroke. The absence of significant confusion or incontinence makes seizure unlikely, and although TIA or ischemic stroke may also be considered in the context of the patient's age and possible CV risk factors, TIA very rarely precipitates a true loss of consciousness. The patient's absence of paralysis or focal neurological deficits in her history and physical should also redirect the physician away from this possibility [9].

## Diagnostic Workup: Avoiding Overtesting in the Emergency Department

### Cardiac Workup

An EKG is safe, noninvasive, and inexpensive; considering baseline frequency of cardiac cause in syncope in older adults,

it should be performed upon presentation. In the case of a negative EKG, however, echocardiography is not indicated unless there is some suspicion for structural heart disease [9]. Similarly, a Holter monitor should not be considered in this patient if the EKG is normal; based on the isolated nature of this incident and her lack of a cardiac history, it would be unlikely to add value to the diagnostic approach and introduces the possibility of incidental findings which would lead to further unnecessary testing [9].

## Orthostatic Vital Signs

Due to the nature of the patient's given history, orthostatic vital signs should be assessed at both 1 and 3 min after standing [8]. The patient should also be questioned as to the length of time that she was standing prior to experiencing symptoms in order to better establish likelihood of orthostatic versus vasovagal etiology.

## Overtesting in the Context of the Geriatric Patient

Imaging (MRI and head CT) in the absence of focal neurological deficits, paralysis, or another cause for high clinical suspicion should be avoided. Similarly, EEG testing in the absence of symptoms suggestive of seizure is not indicated. Due to the patient's description of a prodrome and her insistence of a lack of "palpitations" or chest-localized symptoms, tilt-table testing should not be ordered: it is cumbersome and time-consuming, and most importantly, confirmation of the clinical suspicion of vasovagal syncope is unlikely to alter the management approach taken with this patient at this time.

# Hypertension in the Emergency Department

The attending physician notes Ms. Spencer's high blood pressure and requests past records from her PCP. Her charts indicate past pressure taken 18 months ago was 134/80;

however, the physician considers whether or not to treat the hypertension observed in this encounter.

Is treatment indicated based on Ms. Spencer's most recent measurement? Are there special considerations in treating hypertension in the older adult?

## *Hypertension in Older Adults: When to Treat*

Current guidelines from the ACC/AHA recommend treating a blood pressure with systolic >130 or a diastolic pressure >80; based on her measurements in the emergency room, Patricia would be diagnosed with stage 1 hypertension and should be treated with a target of <130/80 [18]. However, Patricia's elevated systolic with non-hypertensive diastolic measurement is likely an effect of "white-coat hypertension" within the context of an emergency room setting that can be stress-inducing and disorienting, especially for older adults. Furthermore, evidence for treatment thresholds for hypertension in adults over 80 years old is inconclusive. Some studies have shown a trade-off between decreased stroke risks with an increase in all-cause mortality with aggressive blood pressure management [4]. However, one large-scale RCT indicated greater improvements in all-cause mortality, cardiovascular events, and stroke for individuals over 75 with a target of 120 relative to 140 systolic BP [19]. Other research has shown that the use of moderate to high levels of antihypertensive medication is associated with increased risk of injurious falls and that risk is further elevated in patients with a prior history of injurious falls [5].

Current guidelines for adults ages 60 and over released by the AAFP and ACP based on the most recent RCTs and meta-analyses taken together recommend a goal of <150 systolic BP and <140 systolic BP in the case of high stroke risk only: no benefit in all-cause mortality was consistently demonstrated in lowering systolic BP below 140 mmHg [13].

## *Our Patient*

In approaching the treatment of this patient, the focus should be on first establishing her baseline blood pressure outside of a clinical environment through the use of home blood pressure monitoring, which would permit a current, averaged value that could be used to assess the value of an antihypertensive. Possible side effects of commonly pre-scribed antihypertensives such as thiazide diuretics and ACE inhibitors must also be considered within the context of this patient specifically: electrolyte disturbances in older adults can precipitate life-threatening consequences, and the risk of hypotension due to hypovolemia leading to an injurious fall is particularly important to consider in the case of a community-dwelling adult in a rural setting where access to immediate care and emergency response services is limited [15, 17].

Considering the patient as an individual with low stroke risk and higher risk of falls, antihypertensives should not be initiated based on this blood pressure measurement; how-ever, primary care follow-up based on current, averaged measurements in the patient's home environment is indicated.

## Assessment of Risk in the Older Adult

Patricia and her son are relieved to hear that her syncope is unlikely to be caused by a heart condition and that she will be sent home with a home blood pressure monitor to track her vitals. Ms. Spencer notes that she was lucky that her episode happened in the kitchen, near her telephone, and that her son was able to come so quickly and drive her to the hospital. Her son wants to know what the physicians think about his moth-er's safety in her home.

How do you think about the risks associated with Ms. Spencer's living situation? What steps can you take to assess and manage these risks in the context of emergency care?

## *Functional Assessment of the Older Adult in the Emergency Department Setting*

Older adults are at higher risk for hospital admission and emergency department readmission following initial presentation to the emergency department relative to the general adult population. It is hypothesized that this trend, in part, can be attributed to incongruity between the episodic care model for acute illness upon which emergency department care hinges and the complex factors and comorbidities that underlie chief concerns bringing older adults to the emergency room [7]. In the setting of an emergency department without a pre-existing system to assess function and risk in older adult patients, a realistic approach would be to screen for overall risk with a simple itemized tool, such as the ISAR (identify seniors at risk) six-item survey [11]. Based on the outcome of this screen, further testing for common geriatric syndromes could be initiated. One example of a systematized approach to screening older adult patients for risk in the emergency department is the GEDI WISE program at Northwestern Memorial Hospital: specialized nurses screen for cognition, delirium, fall risk, functional status, care transitions, and caregiver strain using a series of validated tools if an ISAR >2 detected in any ED patient aged 65 or over [2].

Application of some or all of these tools could be used to better treat Patricia. Although her case does not necessitate hospital admission or involve inpatient testing, her presentation at the emergency department can be seen as an opportunity to connect her with services and care that may better allow her to age in place and work to avoid a repeat syncopal episode with an injurious fall or a mechanical fall like the near-miss that she describes taking place several months earlier.

## *Next Steps and Post-discharge Planning*

Within the context of this ED encounter, providers should prioritize gait assessment in combination with a timed get up

and go test (TUG test) [14]. If she tests positive, she should be connected with appropriate PT and OT services, and assistive devices should be discussed with the patient and her son. The patient should be connected with social work to facilitate a home safety evaluation, which may lead to recommendations for modification of her home environment, and safety precautions such as a wearable medical alert device. Other precautions should include a basic cognitive test in order to rule out cognitive impairment or dementia as a factor in her recent episode and an assessment of caregiver strain in the case of her son: although her son's proximity and presence in Patricia's daily life are a critical reason that her discharge can be considered low risk, it is also important to establish that the current structure is sustainable before she returns to her home. This is made especially critical in the context of the rural community in which she lives, where her access to resources that would facilitate her instrumental ADLs would otherwise be severely limited. Through the initiation of these sequences in the emergency department, Patricia will be better able to retain her current level of independence and avoid the need to transition to assisted living, and the likelihood of an avoidable return to the emergency room will be diminished.

## Case Conclusion

Ms. Spencer is discharged after a brief stay in observation, where telemetry further reinforced the absence of a cardiac cause of her syncope. Later blood pressure readings remained somewhat elevated but did drop to 130/80 over the course of her stay. TUG test time was 11 s, cognition was found to be within a normal range, and caregiver strain was found to be low (upon further discussion, it was revealed that her grandson and daughter-in-law were also involved in her support). Although the TUG test was not definitively high risk, it was considered borderline within the social context such that the patient received a consult with PT and OT services, who rec-

ommended an outpatient evaluation at a later date. Home safety evaluation was scheduled for later that week. Patient was discharged with educational materials about vasovagal syncope as well as verbal instructions and information on prodromal symptoms and safety measures. She was also provided with a prescription for a home blood pressure monitor, with instructions to follow-up with primary care after several days of use.

## Summary Points

- Syncope in adults is often multifactorial, and assessment should take into account medications and underlying comorbidities. Cardiac cause of syncope is more frequent in older adults, as is syncope due to orthostatic and post-prandial hypotension; however, reflex syncopes are also very common in older adults and may be less readily recognized in this population due to decreased frequency of classic prodromal symptoms.
- Blood pressure readings in the emergency room are often not reflective of an older adult's average values, and treatment should not typically be initiated based on this measurement. Treatment indications for hypertension in older adults remain complex and must be approached within the context of risks associated with medication, including electrolyte disturbances and hypotension-induced falls.
- Assessing an older adult's ability to age in place should be based on a multidisciplinary approach that takes into account common geriatric syndromes such as falls, functional dependence, and cognitive changes, while also including appraisal of determinants such as social support and home environment. Steps can be taken in the emergency department to screen for possible obstacles to independent living and to connect patients with medical and social services to decrease risk and promote safe independent living if indicated.

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# Chapter 5
# ER Referrals and Hospitalizations from Post-acute and Long-Term Care Facilities

**Fernanda Heitor**

## Post-Acute and Long-Term Care Facilities: INs and OUTs: The Nursing Home "Frequent Flyer" and Avoiding the Avoidable

Tuesday, 1:30AM – emergency department (ED) arrival referred by local "nursing home" – Ms. "M," 85-year-old lady with past medical history of allergic bronchopulmonary aspergillosis and bronchiectasis complicated by recurrent hemoptysis, paroxysmal A-fib not on anticoagulation due to bleeding risk, HTN, NIDDM, CVAs with mild residual right-side leg weakness, chronic anxiety and depression, hypothyroidism, and malnutrition. She was recently hospitalized for 2 weeks due to recurring hemoptysis and underwent IR-guided angio-bronchoscopy without identifying the source

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of bleed. Thoracic surgery was consulted but did not recommend further invasive intervention due to significant risks versus low likelihood of success. Hospice consultation was offered but the patient declined. She elected to remain "full code" and was fully coherent and able to make informed decisions regarding her healthcare. She is unmarried and with no kids of her own, as well as no close family contact. A friend was designated her Healthcare Power of Attorney (HPOA), and she was admitted to a skilled nursing facility (SNF) for subacute rehabilitation after hospital discharge. During SNF stay, she presented, over a period of 3 weeks, four episodes of hemoptysis of about 100 to 200 ml associated with anxiety attacks and was referred to the nearest ED for acute care. On all occasions, she was re-admitted or stayed in observation and had extensive diagnostic workup performed. She was also again offered hospice enrollment but repetitively declined. Furthermore, on all occasions, upon coming back to the SNF, there were multiple medication discrepancies and changes on her antidepressant regimen. On this last hospital stay, she was discharged on Clonazepam 1 mg PO TID PRN anxiety and Ambien 10 mg PO qHS, and her long-term Sertraline 150 mg PO qday was no longer active in her medication list. She was re-admitted to the SNF on Friday at 10PM. Admission procedures were performed by a new nurse who paged the on-call covering physician who did not have access to the electronic medical records. Through nurse report, the physician reviewed the discharge medication list. The patient was evaluated by her regular facility physician on Monday morning and noted to be very somnolent.

## "Why Does the Nursing Home Keep Sending This Patient Back to the ED?"

A large percentage of older adults visiting emergency departments (EDs) are nursing facility (NF) residents. A National Nursing Home Survey conducted by the Centers for Disease Control and Prevention (CDC) concluded that 8% of NF

residents throughout the United States had an ED visit in 90 days and that 40% of those visits (involving more than 50,000 residents) were deemed preventable [1]. Of those 8% residents, 15% (more than 18,000 residents) had two or more ED visits in that time period.

Besides obvious cost issues, it can certainly be frustrating to ED staff to admit the same patient multiple times, especially if coming from a nursing facility where, technically, patients are under medical care. Many conditions are preventable and able to be appropriately managed at certain facilities; nonetheless, there is a large misunderstanding regarding the type and amount of care provided throughout the various types of facilities. There is an absolute goal to avoid unnecessary ED referrals, but, on certain occasions, it is impossible not to do so without compromising patient safety.

## Understanding "Nursing Home": What Is It Exactly?

Typically the term "nursing home" refers to an extended or long-term care (LTC) facility and can be also described as "memory care." Most long-term care is not medical care but rather assistance with activities with daily living or custodial care (such as help with bathing, dressing, grooming, moving in or out of bed or chair, toileting, and eating). Nursing facilities can also provide rehabilitative care to patients following hospital discharge. This is known as subacute or post-acute rehabilitation and is delivered in "skilled" nursing facilities (SNFs) specialized in providing full-time care to individuals with functional or cognitive impairments and with the need for continuous skilled care. These skilled services include intravenous therapy, artificial nutrition and hydration, complex wound care, ostomy care or rehabilitation with physical therapy (PT), occupational therapy (OT), or speech therapy (ST) [2]. In SNFs, post-acute (or subacute) care consists of about 1–2 h of therapy a day (PT, OT, and/or ST) and about 2–3 h of nursing care daily with physician evaluations once or

twice a week. This setting is much different from acute reha-
bilitation facilities ("inpatient" rehabilitation) where, follow-
ing hospital discharge, patients will receive 3–5 h of daily
therapy along with at least 5 h of daily nursing care and a 24/h
on-site physician with specialty consults and diagnostics pro-
cedures readily available.

Long-term skilled nursing care is often needed for people
with chronic medical conditions, severe pain, or permanent
disabilities. Skilled nursing care may be needed on either a
short-term or long-term basis [2].

The term "nursing home" may also be generally used for
assisted living (AL) facility and independent living (IL) facil-
ity. These are two models of residential care following a non-
medical model but rather a more homelike care [3].

Assisted living (AL) communities (or assisted care) are
designed for residents who are unable to safely live indepen-
dently but do not require a high level of care. Assistance with
medications, meals, housekeeping, and perhaps some activi-
ties of daily living are provided. Social activities and sched-
uled transportation are also available in most settings.
Typically, living space consists of a private apartment with a
limited kitchen area, support staff available 24 h, and access
to licensed nurse services. Residents remain fairly indepen-
dent, getting assistance as needed. Some might have extended
assistance from personal caregivers [2, 4].

Independent living (IL) communities (or senior apart-
ments, retirement villages, retirement communities, congre-
gate care, or continuing care retirement community – CCRC)
are directed for residents with few medical problems and who
are very independent. They might live in a variety of
apartment sizes and options (from studios to large 2+ bed-
rooms) and have access to on-site fine dine services with
custom-designed meal packages, housekeeping, social activi-
ties, and entertainment events (many sites offering concierge
services) [2].

There is some stigma related to the term "nursing home."
For many, it evokes a demeaning setting and minimizes the
broad significance that it has. It refers to a multitude of senior

living possibilities with various amounts of support and an industry that is growing supported by close federal and state monitoring and regulations.

## Post-acute and Long-Term Care Facilities STATS

According the 11th edition of the Centers for Medicare & Medicaid Services' (CMS) Nursing Home Data Compendium [5]:

- More than 15,600 nursing facilities participate in the CMS programs with an overall occupancy rate of about 80%.
- Over 1.4 million people live in US nursing facilities; this roughly corresponds to 2.6% of the population above 65 years of age and 9.5% of those 85 and above.
- Overall, 15% of the nursing facility population is under age 65, while 7.8% are over 95 years.
- Nearly 66% are women.
- Almost 15% of occupants have more than five impairments in activities or daily living (bed mobility, dressing, eating, transferring, and toileting) or severe cognitive impairment.
- More than 34% have severe bowel and/or bladder incontinence.

## Post-acute and Long-Term Care Facilities Staffing Nuances: Understanding Nursing Care at Nursing Facilities

Nursing facilities in the United States are regulated under the Nursing Home Reform Act, a part of the OBRA-78 or Omnibus Budget Reconciliation Act of 1987, a federal law signed by President Ronald Reagan [14, 15]. This was the first major revision of the federal standards for care at nursing

facilities since the creation of Medicare and Medicaid in 1965. Facilities aiming to receive Medicare and Medicaid funding ought to provide services so that each resident can "attain and maintain her highest practicable physical, mental, and psycho-social well-being" [6, 7]. OBRA has had a significant impact and changed drastically the care at nursing facilities, guarantying the rights of residents of such certified facilities.

Both federal and state laws regulate nursing facility staffing standards. Federal standard requirements for nursing services are described as "sufficient nursing staff with the appropriate competencies and skills sets to provide nursing and related services to assure resident safety and attain or maintain the highest practicable physical, mental, and psychosocial well-being of each resident" [8]. There is no enforcement for a minimum number of nursing staff per facility. According to the Code of Federal Regulations, unless a specific waiver is in place, the regulation specifies the facility must have [8, 12, 16]:

– A registered nurse (RN) – at least 8 consecutive hours/ day, 7 days/week.
– A registered nurse to serve as a full-time (40 h per week) director of nursing (DON) and may serve as charge nurse for facilities with 60 or fewer residents.
– One RN and one licensed nurse (RN or LVN/LPN) for the two remaining shifts, with no adjustment for resident acuity [6].

Staffing standards vary widely between states. A 2010 review disclosed the following findings comparing standards for a 100-bed nursing facility to standardize the data across states [11]:

– Twenty states had higher requirements for RNs than the federal requirements.
– Fifteen states had the same requirements.
– Sixteen states had lower requirements.

The analysis of these standards was measured and converted as care hours per resident day (hprd). Reviewing the data, the federal minimal requirement staffing standards for

registered nurses (RNs) was 0.08 RN hprd (hours per resident-day) and for licensed nurses (LN) was 0.30 LN hprd (hours per resident-day).

Across states, LN care ranged from a low of 0.14 LN hprd (hours per resident day) in Alabama and Virginia to a high of 1.08 hprd in Delaware.

Per abovementioned review, in 2010, US nursing facilities had a staffing average of 0.71 RN hours, 0.80 LVN-LPN hours, and 2.41 nursing assistant (NA) hprd (3.9 total hours) [11].

Understaffing and high staff turnover usually are major issues in skilled nursing and long-term care facilities leading to quality problems [8]. As above, regulation requires "sufficient" nursing staff to meet the needs for the facilities' residents, and there is plenty of evidence that better care is linked to higher levels of staffing [9, 10].

With this is mind, in 2014, the Consumer Voice launched a national staffing campaign [13] with a long-term goal of passing a legislation to mandate that each resident in a nursing facility receives, daily, at least 4.1 h of nursing care (2.8 h from nursing assistants, 0.55 h from licensed practical nurses, and 0.75 h from registered nurses). This was deemed the minimum amount of care in order to prevent common quality of care problems such as dehydration, loss of ability to perform basic activities of daily living (such as eating and dressing), pressure ulcers, and falls. Efforts are still in place (Tables 5.1 and 5.2).

## Post-acute and Long-Term Care Facilities: Understanding Medical Care

Health care in nursing facilities is based on the interplay of three factors: interdisciplinary teamwork; expertise in the care of comorbid, disabled, and elderly patients; and compliance to government regulations.

Besides nursing care, physical/occupational and speech therapy consist the bulk of the care provided at skilled and long-term care facilities. Usually, there is also availability of

Table 5.1 Definitions of nursing facility staffing

| | |
|---|---|
| DON | Director of nursing (per federal requirement a DON must be a licensed RN. States may have their own requirements) |
| RN | Registered nurse (2-year degree, 3-year diploma, 4-year degree, or more education. Licensed in a state) |
| LPN/ LVN | Licensed practical nurse/licensed vocational nurse (1-year degree. Licensed in a state) |
| LN | Licensed nurse (can be a RN or LVN/LPN) |
| NA | Nursing assistant or nurse's aide |
| CNA | Certified nursing assistant (NA who completed 75 h of training and passed a competency exam) |

Certified nursing assistants (CNAs) provide the majority of hands-on care in nursing facilities
Source: author

psychology and podiatry consults, and most of the facilities do also offer psychiatry and physical and rehabilitation medicine consults. Geriatricians, internists, or family practitioners generally provide medical care.

A physician involved in nursing facility care must undergo an initial and periodic credentialing and privileging process by the facility and is responsible for maintaining a schedule of visits that are appropriate to the facility resident's medical condition and in accordance to payer regulations. Physicians may practice individually, along with mid-level providers or as members of a group practice. Residents at skilled nursing facilities (SNFs) are seen within 72 h of admission and at least two–three times in the 1st month and, if stable, once a month thereafter. This minimum schedule is required by federal regulation but is not sufficient for many residents with a high level of medical complexity and acuity, requiring far more medical attention [17]. For long-term care, residents are seen within 30 days of admission and then routinely at least once every 2 months. Physicians may delegate every other scheduled visit to a nurse practitioner (NP) or physician assistant (PA), but admission visits have always to be performed by the physician.

Table 5.2 Nursing hours per resident day reported in all US nursing homes in 2014 compared to recommended minimum staffing levels and expected staffing levels

| Total number of nursing homes (15,391) and percentiles | RN hours per resident day | LVN/ LPN hours per resident day | CNA hours per resident day | Total nursing hours per resident day |
|---|---|---|---|---|
| 90% *N* = 1539 | 1.36 | 1.26 | 3.27 | 5.39 |
| 75% *N* = 3848 | 0.98 | 1.02 | 2.80 | 4.55 |
| Mean | 1.00 | 0.90 | 2.64 | 4.54 |
| Median *N* = 7696 | 0.72 | 0.81 | 2.40 | 3.97 |
| 25% *N* = 3848 | 0.53 | 0.60 | 2.08 | 3.53 |
| 10% *N* = 1539 | 0.39 | 0.39 | 1.83 | 3.18 |
| CMS study recommended minimum standard | **0.75** | **0.55** | **2.80** | **4.10** |
| Average CMS expected staffing based on resident acuity | **1.08** | **0.66** | **2.43** | **4.17** |

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4833431/table/t1-hsi-9-2016-013/

The physician is not physically on-site at the nursing facility. Overall, physicians make rounds at facilities usually once or twice a week.

## Post-acute and Long-Term Care Facilities: Understanding Diagnostics and Ancillary Services

Skilled nursing and long-term care facilities (SNFs and LTCs) are equipped to offer and manage peripheral IVs and PICC line placements, initiation of nasogastric tube

feedings, urinary catheter placement, staple and suture removal, and wound care.

Only certain ancillary services such as portable imaging (X-rays, ultrasound including venous duplex), electrocardiograms, and blood draws are available [2]. Contracted third-party vendors, who are not on-site, provide these services. Typically, the imaging vendor travels to the facility and the test is performed usually within 24 h. Laboratory specimens (urine, stool, blood) are collected by the facility nurse or by a phlebotomist from the outside lab where the samples are processed. Typically, specimen collection occurs in the mornings on weekdays only, and, for most part, there is a possibility of a "STAT" order to be placed usually taking more than couple of hours and limited to business hours on weekdays. It is not uncommon for nursing facilities to receive post-hospital discharge instructions for blood test on weekend, and that is, by default, not available. Diagnostics or procedures requiring to be performed within half or 1 h are not possible in the nursing facility setting and require transfer to the local emergency department [2].

Transfusions, IV chemotherapy, hemodialysis, BiPAP initiation, continuous telemetry, and minor surgeries are typically not performed at SNFs [2] (Table 5.3).

## Star Rating System: Understanding Quality Among Facilities

Through public reporting of performance, in order to encourage nursing facilities to pursue higher quality and to assist consumers decide between facilities, the Centers for Medicare and Medicaid Services (CMS) maintains a website comparing ratings among the facilities. This information, the "Nursing Home Compare," can be found by searching for facilities by location or name at http://www.medicare.gov/nursinghomecompare/.

A five-star rating system incorporates health inspections, quality measures, and staffing into an overall score [2, 18].

Table 5.3  Care and services available at different types of nursing facilities

| Service | Acute rehab | Subacute rehab (SNF) | Long-term care (nursing facility) | Assisted living (AL) | Independent living (IL). |
|---------|-------------|---------------------|-----------------------------------|----------------------|--------------------------|
| Nursing care | Provided primarily by registered nurses (RNs) certified in rehabilitation nursing | Provided primarily by CNAs and nonprofessional nursing assistants certified in long-term care with LPN and RN supervision | Provided primarily by CNAs and nonprofessional nursing assistants certified in long-term care with LPN and RN supervision | As needed access to licensed nurse services | Some access to licensed nurse services |
| | At least 5 h/day | In average, 3 h/day | In average, 3 h/day | Typically business hours | Business hours |
| | Available 24 h | Available 24 h | Available 24 h | | |

(continued)

TABLE 5.3 (continued)

| Service | Acute rehab | Subacute rehab (SNF) | Long-term care (nursing facility) | Assisted living (AL) | Independent living (IL). |
|---|---|---|---|---|---|
| Physician care | Provided primarily by physiatrists | Provided primarily by geriatric, internal or family medicine physicians | Provided primarily by geriatric and internal or family medicine physicians | Typically, there is no physician on-site | Typically, there is no physician on-site |
| | Available 24 h | Care typically one to three times/week | Medicare requires evaluation every 60 days | Usually care by concierge providers or home health visits | Usually care by concierge providers or home health visits |
| | Specialty consults available | Specialty consults minimal/limited availability (usually psychiatry sometimes cardiology, nephrology) | Specialty consults minimal/limited availability (usually psychiatry sometimes cardiology, nephrology) | | |
| | | Obs: Psychology and podiatry consults are common | Obs: Psychology and podiatry consults are common | | |

| Diagnostics (labs/imaging) | Readily available on-site | Limited availability | Limited availability | Limited availability contracted service by request | Usually not available on-site outpatient referrals |
|---|---|---|---|---|---|
| | | Services offered per contracted agencies. Done by request without urgent availability. "STAT" orders can take more than few hours | Services offered per contracted agencies done by request without urgent availability. "STAT" orders can take more than few hours | No urgent availability | |

Source: author

This information, readily available, gives each nursing facility a rating between one and five stars. Facilities with five stars are considered to have quality "much above average," whereas a one-star rating is considered "much below average."

Multiple factors account for the rating. Since the website launching in 1998, the type and amount of information provided have substantially increased, and one of the main criticisms is that the results are heavily based on self-reported data. The website information reflects results from state health inspection database and staffing ratios plus quality measures as reported by the facilities themselves. It is also possible to find reports pertaining federal sanctions imposed by CMS against facilities cited with deficiencies due to violating federal standards of care [19].

CMS reports 18 different quality measures derived from resident assessments conducted by the facilities and submitted to CMS. These qualities measures derive from Minimum Data Set (MDS), a national database with assessments done by the facility, on every resident, at regular intervals. The data reflects each resident's health, physical functioning, mental status, and general well-being and is used by the nursing facility to assess each resident's needs and to develop a plan of care. The rating system is very complex, and half of the 18 measures are not at all used to calculate the rating, with a drawback that the distribution of ratings for quality measures is "allowed to shift" with three of the nine measures (catheter, the long-stay pain measure, and short-stay pressure ulcers) being risk-adjusted [19].

Furthermore, an obvious limitation, as disclosed on CMS data sources: "All of these data are reported by the nursing homes themselves. Nursing home inspectors review it, but don't formally check it to ensure accuracy… The information should be interpreted cautiously and used along with information from the Long Term Care Ombudsman's office, the State Survey Agency, or other sources." [20]

Another data source is the Medicare claims data. It utilizes invoices submitted to Medicare by nursing facilities and hos-

pitals for payment purposes and is used to calculate hospital readmission rate, emergency room visits, and discharges [20].

Health inspection surveys are conducted though a federally validated protocol by state agencies and visits occur unannounced each year. Inspections take into account complaint investigations conducted during the three most recent state inspections [19, 20].

The inspection report by the Department of Health and Human Services lists deficiencies as "F-Tags," according to the potential level of harm, along with a summary statement of the deficiency. These deficiencies can vary tremendously. They might be seemingly minor (e.g., "observed healthcare cook in the kitchen drying drops of liquid in a blender bowl with a paper towel - the bowl should have been air dried. This then generates a "tag" with the report "based on observation, interview, and record review, the facility failed to ensure food was prepared under sanitary conditions by failing to air-dry blender bowl" – this impacts on the star rating). Deficiency might carry potentially worse outcomes (e.g., "failing to have a program that investigates, controls, and keeps infection from spreading" – as in observing someone not washing hands or not using gloves for a wound dressing change).

All the detailed information is publically and readily available at the CMS website under health inspections, "most recent standard health inspection" full report (Fig. 5.1).

## Practices and Procedures: Understanding Treatment Limitations at Nursing Facilities

There is a pervasive myth that nursing facilities are like hospital facilities. While skilled nursing and long-term care facilities are able to offer some extent of in-depth medical care, they are primarily resident and communities directed and focus on promoting autonomy and choice in a less structured environment, striving for a more residential type of atmosphere [21].

| | State Inepctions | Nursing Homes reported quality | | |
|---|---|---|---|---|
| ■5 stars | 11% | 28% | | |
| ■4 stars | 23% | 21% | | |
| ■3 stars | 23% | 18% | | |
| ■2 stars | 23% | 20% | | |
| ■1 star | 20% | 13% | | |
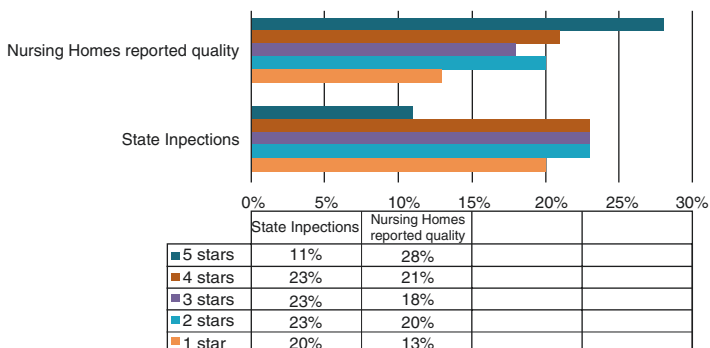
FIGURE 5.1 Comparison of star ratings between nursing facilities and state inspections. Nursing facilities' self-reported rating tends to be higher compared to state health inspection scores. Note: Composite score including only nursing homes certified by either Medicare or Medicaid. (Source: Kaiser Family Foundation analysis of Nursing Home Compare date, February 2015. https://kaiserfamilyfoundation.files.wordpress.com/2015/05/8726-figure-3.png)

## Restraints Use

Some medical care limitations include restrictions of high-risk medications such as sedatives, hypnotics, and antipsychotics and strict regulation to complete elimination of physical restraints (any mechanical of physical device, material, or equipment attached to of adjacent to the resident's body, restricting freedom of movement and normal access to their body). There is sufficient empirical evidence that, in many cases, physical restraints cause more harm than benefit and there is increasingly focus on ethical care at nursing facilities. Furthermore, federal and state laws, along with nursing facility advocates, have significantly curbed the use of such therapies. The target is to address alternatives to the need of restraints, either physical or pharmacological, by increasing supervision and providing specialized attention in order to suit each individual needs [22].

As noted in multiple studies, falls do not warrants the use of a physical restraint even though restraints have been

traditionally used as a fall prevention approach. As evidence shows, restraints have serious drawbacks and can contribute to serious injuries. There is no good evidence that the use of physical restraints, including but not limited to side rails or bed alarms, will prevent or reduce falls in nursing facilities. Additionally, falls that occur while a person is physically restrained often result in more severe injuries [23–26].

## Medication Limitations

Nursing facilities do not have on-site pharmacy.

For instance, upon admission to a nursing facility, a patient might not have any medication available for hours (until medications verified by nurse, by admitting physician, requested in pharmacy, order completed, and delivered to facility). Having this in mind, it is essential to take into account that, before referring a patient to a nursing facility, it is very important to give the patient any soon upcoming scheduled meds prior to patient leaving the hospital (especially antibiotics, pain control, or time-sensitive medications).

Medications are provided by a vendor pharmacy. A consultant pharmacist reviews medication use, and there is an increasing focus to encourage residents and families to participate in care planning meetings at the facility and to raise any concerns regarding medication schedules. Facility nurses also play an invaluable role in monitoring and giving feedback about medication appropriateness.

Nursing homes do carry "emergency kits" designed to provide certain medications to residents during emergency situations only. Federal and state laws regulate procedure and requirements for the kits and noncompliance results in Drug Enforcement Administration (DEA) audits. These emergency kits contain only a small quantity of medications to be dispensed when pharmacy services are not available. The contents of the kit need to be in accordance with facility policies and procedures and are determined in consultation with the pharmacist and the facility's medical director and director of nursing (DON).

There are increasing concerns and scrutiny regarding the use of high-risk or psychotropic medications at nursing facilities. The federal government implemented, in 2012, a program to reduce the use of antipsychotics in such facilities – The "National Partnership to Improve Dementia Care in Nursing Homes" [27]. This resulted in a decline of such medication use to about a third nationwide (from 23.9% of residents in 2012 to about 15.7% in 2017) [28]. Further decline is expected, and the Centers for Medicare and Medicaid Services (CMS) has a goal of an additional 15% reduction of antipsychotic medication use by 2019 [27, 28].

Controlled medications do require a valid prescription in order to be dispensed at nursing facilities. So, upon admission to a skilled nursing facility (SNF), if a patient does not have a valid prescription from hospital discharge, invariably there will be delays in obtaining such treatment.

On November 2017, the CMS implemented several regulatory changes including significant limitations on the use of PRN or "as needed" psychotropics. Per CMS, psychotropic is "any drug that affects brain activities associated with mental processes and behavior." This definition encompasses antipsychotics, antidepressants, anxiolytics, and hypnotics. Nonetheless, in addition to these medication classes, state surveyors also consider other drugs that may affect brain activity as psychotropics: mood stabilizers, anticonvulsants, muscle relaxants, anticholinergics, antihistamines, NMDA receptor modulators, and over-the-counter or natural or herbal products (such as melatonin).

The CMS has placed a 14-day limit on the duration of PRN psychotropic medications. For continuation of use, the order needs to be extended by the attending physician with documentation of clinical rationale for extension along with providing specific duration of use. For antipsychotics, the 14-day limit may not be extended, and instead a new order needs to be placed with documentation of rationale and benefit. There are no exceptions for hospice residents [29].

## Putting It All in Perspective

The term "frequent flyer" is well known to medical staff, and, contrary to the beneficial association pertaining to the airline industry, the implications of recurring hospitalizations are stressful, costly, and dangerous. Nonetheless, avoiding re-hospitalizations and the "super utilizers" is not a straightforward task, but there is certainly room for improvement in averting what is indeed avoidable.

Potentially avoidable hospitalizations are defined as hospital admissions that could have been warded off if the condition was timely prevented or treated outside of the emergency room or an inpatient hospital setting.

A CMS research in long-term care (LTC) facilities revealed that about 45% of hospital admissions among individuals receiving either Medicare skilled nursing facility services or Medicaid nursing facility services could have been avoided, accounting for 314,000 potentially avoidable hospitalizations and $2.6 billion in Medicare expenditures in 2005 [30].

Per data from the National Nursing Home Survey, fever, chest pain, heart disease (mainly heart failure), mental status changes, gastrointestinal bleeding, urinary tract infections, metabolic disturbances, pneumonia, diseases of the skin, and injuries due to falls have been identified as reasons for potentially preventable visits to an ED. Furthermore, injuries from falls were the most common conditions accounting for potentially preventable ED visits by nursing home residents (Fig. 5.2).

When evaluating factors involved in re-hospitalizations, it is important to take into account that nursing facility residents often have multi-comorbidities, and not always appropriate resources are available at such facilities to proper manage complications or changes in baseline health status. Sometimes, for patient safety, a transfer to the ED is truly unavoidable but hospitalization could be prevented. For instance, if a nursing home resident who is on Coumadin has a fall with associated head injury, mostly universally there will
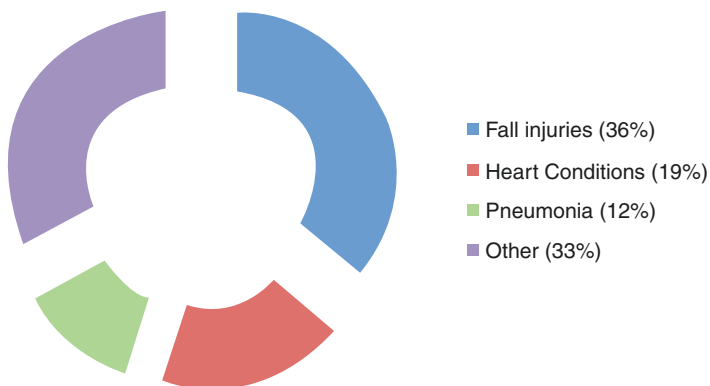
Figure 5.2 Conditions related to potentially preventable ED visits by nursing home residents in a 90-day period [31]. (Other: fever, mental status changes, gastrointestinal bleeding, urinary tract infections, metabolic disturbances, and diseases of the skin). (Source: CDC/NCHS, National Nursing Home Survey 2004)

be a transfer to the closest ED. For most part, a CT scan of the brain for intracranial bleeding assessment is expected, and, once hemorrhage is ruled out, considering that patient is at "baseline", the nursing facility will be ready to accept the patient back. However, many times the patient ends up being hospitalized and multiple work ups are conducted. In this case, there is a true opportunity to avoid re-hospitalization since, for most part, the patient was at baseline health status, and, likely, workups for possible underlying issues might have already been done at the nursing facility (e.g., urinalysis, blood tests). Unfortunately due to gaps in communication and limitations of medical records continuity, many investigations ended up being duplicated many times unnecessarily. With this in mind, it is of extreme importance a good communication between providers regarding patient status and treatment expectations.

A decision to whether or not refer a nursing facility resident to hospital is multifactorial and often an imprecise process influenced by the patient's medical needs, rights, and probable outcomes, as well as the limitations of care in the

nursing facility and outside social pressures, such as family wishes and financial costs [33].

There are many programs and initiatives geared toward improving potentially preventable hospitalizations. North-western Memorial Hospital in Chicago has an initiative, as part of GEDI WISE (Geriatric Emergency Department Innovations through Workforce, Informatics, and Structural Enhancements), a Health Care Innovation Award funded by CMS, to reduce hospitalizations by providing geriatric-specific care to older patients. This effort is based on a multidisciplinary approach to elder care with interventions by geriatric specialized nurse practitioners and social workers at the emergency department, advocating for elderly patients, without urgent medical need, to be redirected back home with a proper follow-up plan.

Indiana University has also a project, OPTIMISTIC (Optimizing Patient Transfers, Impacting Medical Quality and Improving Symptoms: Transforming Institutional Care), aimed to lower the number of unnecessary hospitalizations by recognizing medical conditions in patients early, improving communication when transfers to hospitals do need to occur and improving advance care planning for terminally ill patients [32].

The INTERACT (Interventions to Reduce Acute Care Transfers) is a quality improvement program designed to assist skilled nursing facilities with early identification, assessment, intervention, documentation, and communication of changes in a resident's condition. The effective implementation of this program has been associated with significant reductions in hospitalizations of nursing facilities' residents. Better communication and increasing familiarity with this program are the most important steps for its success over time [34].

Overall, there is a robust body of evidence that, to reduce avoidable hospitalizations, there is a need to improve support for nursing facility infrastructure, clinical practice, and communication tools for health professionals, increased attention to reducing the frequency of medically futile care, and financial and other incentives for NHs and their affiliated hospitals to improve care [35].

## Ms. "M"

The recurrent hospitalizations on the vignette initially presented illustrate a problematic issue of many layers. Ms. M's recurrent readmissions could have been prevented by better communication between facilities and healthcare providers. Furthermore, the transitions of care resulted in another potential risk factor for her health, polypharmacy.

## Optimizing Care

Ms. "M's" medication regimen was improved with discontinuation of Clonazepam and Ambien. Sertraline was continued and patient's mentation slowly improved. She was offered psychology consult at the SNF, and, along with close follow-ups by the attending physician, a clear plan of care was established with nurse education in the event of large volume hemoptysis and close monitoring of blood counts with outpatient blood transfusions as appropriate. Eventually, after ongoing discussions and poor progress on rehabilitation therapy, the patient requested hospice consult and soon after was discharged home under hospice care.

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# Chapter 6
# Can Home Visits Make a Difference to Emergency Department Visits? "I will just stop by his place on the way home: Who knew it would be a journey?"

**Dwayne Dobschuetz and Katherine O'Brien**

The first, second, and third time I met Jim was in the emergency department. His diagnoses after those initial visits were always the same: chest pain, syncope, or simply "I had too much to drink." After the third visit, I completed a geriatric assessment, in which I found him to be malnourished, socially isolated, and a Vietnam vet. When it came time for a follow-up phone call, I found that he did not have a phone number listed. I looked up his given address and found that he was nearby. Rather than simply writing it off, I felt that I could simply stop by the address on my bike ride home. The address was a bar and he had mentioned that he lived above.

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When I arrived, I asked where the apartments were, and the bartender said that there were no apartments. They then quizzed me more, and I identified myself as a nurse, and someone finally exclaimed, "Oh, you mean Jim." His ethnic name didn't translate and so everyone just called him that. I then was led up to his studio apartment and found the door open. I stepped in and sucked in air. It was an eye-opening experience to say the least. Dishes filled the counter. There was paper and trash strewn around the kitchenette area. Everything was in disarray. I didn't look in every area of the living space, as I didn't want to invade his privacy. The apartment's appearance did not improve with the second visit. Books were piled up and clutter was everywhere. I was able to complete a physical exam on Jim and tried to do a comprehensive geriatric assessment. I noticed that his medications were lined up neatly on a table; these medications seemed to be the only part of his medical care that he was compliant with. At this point, I tried to reach out to his VA provider but never heard back from him. In all of his 13 visits to the ED or admissions to our hospital over the previous 6 months, I was unable to find any contact made with "his" physician. He had a pacemaker, but the only time that it was ever evaluated was when he had been admitted to the hospital. In the process of leaving Jim, the owner of the bar and the building approached and asked to speak with me, and she shared some information about his social history. He had been a resident there for the past 10 years. He was becoming increasingly withdrawn from his family, calling them only infrequently and not even seeing them at holidays. He had two older brothers who did not live in the city. I left my card and number and stated that Jim needed more help and that I would try and find some type of assistance for him.

A month passed and I received a call from the bar owner, just as I had contemplated another visit. She expressed her concern over his most recent hospitalization. I looked it up and didn't find it. Our hospital had been on bypass, and as a

result, Jim was diverted to a nearby hospital where he was admitted for several days and treated for dehydration. I realized then that the hospital encounters I had numbered were only a small percentage of his encounters with the healthcare system. He was being admitted to other hospitals depending on when and where he called 911. The owner was distraught over the possibility that she or one of her employees would find him dead in the apartment. The only reason that anyone knew of his difficulty this time was that he had left his door ajar and someone saw him staggering and falling to the floor, prompting a call to 911. When I arrived for a follow-up, I found his vitals were normal, reactions fine, and no pain or difficulties encountered except for some hesitancy going up the stairs. This time I noticed, in addition to the normal mess, many chicken bones and whiskey bottles lying on the floor. I picked up a bottle and didn't even recognize the brand. It was a gallon jug. "It costs $15.95 at Walgreens" was his response when queried. "Someone broke into my place while I was gone and trashed the place." I explained that other than the whiskey bottles, it didn't look any different. I shared that everyone was concerned for his well-being and that he needed help if he was to remain living on his own. He agreed, stating that he seldom went further than to McDonald's for food and to the Walgreens for liquor. The bar was no longer letting him in, not wanting to contribute to his ongoing condition.

Contacting protective services was my next step along with talking to one of his brothers who told me "Jim tells me that he only has two drinks per night." Jim's brother then stated that "they must be half-bottle glasses!" When I recontacted the agency for follow-up, I was referred to another agency that did the home safety check. However, they could not tell me the results of the evaluation, stating "patient confidentiality." I was told I could find out only from Jim himself. The owner told me later that two people had come by but had not spoken with her for any confirmation. She was frustrated that nothing had occurred after the evaluation.

Since I had not made much progress, I decided to call the VA to determine if there were any available resources for him. Phone tag ensued with the social worker assigned to him. Later, I even called the patient hot line but was told, "we will contact his doctor." Obviously, I needed to redouble my efforts with contacting his doctor and the agencies themselves. To compound the problem, the owner told me that the previous weekend Jim had stood outside his apartment and urinated in the hallway. The situation was growing worse.

On another visit, 4 months after my initial contact, Jim himself gave me the name of the initial evaluator who had come to see him and gave me permission to contact him. The evaluator had found him decisional and found there was little that he could offer as a result. I was more than discouraged with this information, but several days later, I ran into a resident physician who worked at the VA. He directed me to a contact that had cared for Jim in the VA clinic. The resident physician then shared the frustration that their clinic had with Jim's compliance with care, stating missed appointments and poor follow-through. I felt that I was at an end.

Several days later, I received a call from the VA social worker, who set Jim up with a housekeeper service which began to call on him twice a week. I noticed an almost immediate change in his environment. At this point she also set up several follow-up appointments that he kept, giving me hope that he might finally be turning a corner. It didn't continue. The housekeeping service lasted probably a month until he no longer answered his door or his phone and the service finally stopped coming.

Each time Jim was admitted, I would go to see him in the hospital. He would be eating as much as he could and receiving IV fluids for rehydration. He would be discharged with no change in his condition at home. He would continue to eat just enough to keep him alive, smoke two to three packs of cigarettes per day, and live in squalor, wearing the

same filthy clothes day after day. I almost jumped for joy when I found that after another visit to a nearby hospital, he was admitted to a subacute rehab facility for a brief stay after a fall. I tried to enlist their help to transition him to a facility for long-term care, but once again, I did not make any progress. It was at this point that I contacted the social worker at the VA to see if there might be a long-term VA facility where he could reside. I received a long formal application for a state facility, which seemed an answer to his care needs. I started to help him with the application until I was told by a social worker, who saw him on a recent admission, that he did not want to move out of Chicago where he had lived for over 40 years.

While it had become increasing difficult for me to even stop by his apartment, I was astounded by the continued welcome from the owner of the building and the various bartenders. They continually expressed gratitude for my willingness to follow up with Jim. They felt I shared their concern for him and recognized that I was trying to do something. In my most recent encounter, Jim recounted that in January, he had been patting himself on the back for staying out of the hospital for a month but then related that he had been back four times in February. He admitted that it was becoming increasingly difficult for him to manage and that he was no longer even taking his medications. He had run out. I told him that I would try again to coordinate with the various clinics and services to help him be in a place that would keep him healthy, but it would require his cooperation and buy-in.

I thought that by my visiting Jim at home, I could make a difference. Most of the time I felt discouraged by the lack of results from my attempts at care. Little did I realize the potential impact my visits could have upon his hospitalizations. It has proved to be a test of perseverance and a lesson in the importance of individual responsibility and readiness that must be shared by the individual with whom we hope to assist.

**The Score Card for "Jim"**

*July 2016–February 2017* 6 months before intervention
   ***13 Northwestern Medicine Encounters***
   3 ED visits
   10 Hospital Admissions
   No Home Visits
   *February 2017–February 2018* 12 months after initiation of Home Visits
   ***15 Northwestern Medicine Encounters***
   4 ED Visits
   11 Hospital Admissions
   7 Home Visits with APRN/No other Primary Visits or Interventions.
   Conclusion: I should have visited more!

# The Case for a Home-Based Primary Care Program Connected from a Geriatrics Emergency Department

The population of aging homebound patients is growing at an astonishing rate. The census bureau projects that by the year 2050, the population of age 65 and older will double and those age 85 and older will quadruple [1]. About 5.6% (2 million) of the Medicare community population are completely or mostly homebound [2, 3]. Medicare enrollment is also projected to increase by more than 50% by 2030 [4]. Those in need of personal assistance with everyday activities increase from just under 10% of those in their late 60s to 20% of those 75–79 to over half of those 85 and older [5]. In its present form, the US health-care system focuses resources on hospitals and nursing homes, which leads to massive displacement and suffering of our oldest old. Change will require a major overhaul of current practice patterns and social service provision. If we respect the values and preferences of our older adults to help

facilitate care within the home, this system redesign will emphasize services that allow frail and chronically ill citizens the choice to live at home as long as possible.

## Defining Community-Based Home-Based Primary Care (HBPC)

HBPC is an interdisciplinary-based team model, which brings traditional clinic- and hospital-based practitioners to the home, addresses multiple domains of care, and involves a great deal of care coordination. HBPC is different from traditional home health care, which typically addresses an acute need, such as physical therapy. Typically, the interdisciplinary HBPC team consists of health-care providers and community partners, working in conjunction with both the patient and their caregivers. Successful HBPC programs are typically truly integrated and include a wide variety of specialists including physicians, pharmacists, social workers, advanced practice providers, physical and occupational therapists, and dieticians [6]. The interdisciplinary team is critical for the success of HBPC, as a complete assessment spans many areas including medical history and plan of care, nutritional status, functional status, cognitive status, medications, equipment, mental health, caregiver support and evaluation of caregiver burnout, safety, health maintenance, advanced care planning and goals of care, spiritual needs, and financial needs. HBPC addresses our most vulnerable patient populations: those who have functional, cognitive, and/or social impairments, who are dealing with multiple chronic conditions, who are at the end of life, and who are estimated to be half of the costliest 5% of patients [7].

## Benefits of Home-Based Primary Care

Home-based primary care has been demonstrated to have beneficial effects on the health-care system, patients, and

providers. Interventions targeted at the highest-need and highest-cost patients have the potential to produce sizeable financial benefits. In a large case control study, patients followed by one HBPC team had 17% lower Medicare costs (about $8477 less per beneficiary) over a 2-year follow-up period [8]. In another study of a VA-based HBPC program, there was a 16.7% annual reduction in VA costs, 10.8% annual reduction in Medicare costs, and a 13.4% annual reduction in combined VA and Medicare costs. Not only were costs reduced, but there was a 25.5% reduction in hospital admissions and a 36.5% reduction in hospital days [9]. Other studies have demonstrated a decrease in the number of emergency department visits, the total number of readmissions, the time between discharge and readmission, as well as a decreased in the overall number and number of bed days of admissions to long-term care facilities [6, 10]. Finally, the data from Independence at Home Project, which is a CMS-sponsored demonstration involving multiple HBPC practices, provided evidence for decreased readmissions to the hospital, reduced costs to the system, allowed patients to remain at home, and overall improved care [11]. In addition to benefits to the system, there is evidence that HBPC practices provide benefit to patients that goes beyond the traditional clinic settings. Qualitative data has shown improved satisfaction from veterans enrolled in HBPC programs through the VA system. These veterans felt that HBPC helped to prevent hospitalizations, continue living at home, and gain access to care that they might not otherwise receive [9]. In another qualitative review from a large, academic-based HBPC program, patients described multiple benefits of HBPC including access to providers, affordability (i.e., not having to financially afford transportation to and from clinics), facilitating care coordination, and improved ability to remain at home [2]. Finally, from a provider standpoint, the team approach to patient care that HBPC improves physician satisfaction [12]. In addition, the case described above particularly demonstrates some of the valuable information that can be gleaned from a house call that one cannot uncover via traditional care

settings. Discovering the disarray of the home of the patient described above, as well as the state of his nutritional intake and substance use, provided important information to his provider to help further his care. Only within the home is the care team truly able to observe their patient functioning in their own environment, which traditional functional assessments cannot fully capture. As the health-care system shifts toward a value-based model, HBPC will continue to grow in importance as it is a successful way to provide high-level, quality care to the most complex patients.

## Conclusions

After a typical emergency room visit, most providers recommend close follow-up for the patient with their primary care provider. Frustration can occur when these highly complex patients continually return to the emergency room without following through with the recommended follow-up. One issue may be that these patients are unable to access care. This is where HBPC can be invaluable, and emergency room providers can work to connect patients with HBPC programs. As demonstrated above, HBPC has the potential to reduce emergency room visits, admissions, and readmissions if implemented successfully. In summary, the rapid rate of growth of the elderly population, with many being homebound, justifies the need to transform the emphasis on traditional clinic and hospital-based care. Home-based primary care is an answer to this need and has demonstrated benefits for the system, patient, and providers.

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# Chapter 7
# Medication Errors in Aging Adults: A Case-Based Approach to Medication Management

**Abbie Lyden and Katherine Allen**

**Case Presentation**

An 82-year-old female with a history of atrial fibrillation, hypertension, chronic kidney disease, dementia, fibromyalgia, and insomnia presents to the emergency department (ED) by ambulance from a skilled nursing facility after an unwitnessed fall. Facility staff states that she was found on her bedroom floor and unable to get up. At baseline, she ambulates without assistance. Per records, she was recently diagnosed with a urinary tract infection and was started on trimethoprim-sulfamethoxazole. The facility reports she has had decreased oral intake recently.

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Her medication list includes tramadol (100 mg q6hr, recently started for fibromyalgia), warfarin (2 mg daily), diazepam (10 mg nightly for insomnia), lisinopril (5 mg BID), ferrous sulfate (325 mg BID), aspirin (81 mg daily), amlodipine (10 mg daily), and ibuprofen (600 mg q6hr prn, uses approximately twice per day per facility staff).

Initial vital signs: T 99.1F, HR 70, BP 130/90, RR 16, and SpO2 98% on room air.

She is oriented to self only (which is her baseline per facility staff). Her workup is remarkable for an elevated INR of 4.2, serum creatinine 2.4 mg/dL, and BUN 52 mg/dL. In the ED, she is diagnosed with prerenal acute kidney injury (AKI). All other workup is negative; there is no evidence of bleeding and no musculoskeletal findings from the fall. In the ED she receives IV fluids and is admitted for AKI. During her hospital stay, her antibiotic is changed to cephalexin, and her INR trends down to goal (2–3). Her ibuprofen is discontinued as it likely contributed to AKI, particularly in the setting of decreased oral intake. Her tramadol dose is decreased and dosed appropriately for her AKI.

## Introduction

Medication therapy is among the most widely used and highly valued interventions for treating diseases in aging adults given the potential positive impact on quality of life and survival [1]. Yet, these benefits must be balanced with the risk of adverse drug events and resultant ED and hospital visits. In the United States, it was estimated that there were over 99,000 emergency hospitalizations for adverse drug events among patients >65 years of age between 2007 and 2009. Two-thirds of these were deemed to be unintentional [2].

### Polypharmacy

When evaluating a patient's risk of developing an adverse drug event, polypharmacy must be considered. Polypharmacy

is defined as the use of multiple medications by a patient. The specific cutoffs of numbers of medications associated with polypharmacy range from 5 to 20 but is often described as patients taking 6–9 medications. Excessive polypharmacy has also been described as taking more than ten medications. The presence of polypharmacy has been associated with adverse health outcomes in ED patients [3].

Greater than 90% of older adults in the ED are taking one or more medications with an average of 4–8 medications. Upon ED discharge, 30–50% are sent home with at least one new prescription [4]. Hospital admission, falls from standing, and fall-related fractures have been associated with polypharmacy in emergency department patients [5]. When prescribing to older adults, ED clinicians should consider the number and type of medications that the patient is already taking so as to avoid polypharmacy whenever possible. It should be noted that most geriatric patients in the ED have multiple disease states and thus many indications for medication therapy, which may require six or more medications. Underprescribing, generally defined as a lack of indicated drug or use of an ineffective dose, may occur due to clinician concern for adverse effects and lead to negative morbidities and quality of life. Clinicians, both in the ED and outpatient, at some times may choose to underprescribe to increase medication compliance, limit drug-drug interactions, or prioritize the treatment of serious disease states over preventative care. Care must be taken to decrease polypharmacy yet avoid inappropriate underprescription [6].

## Potentially Inappropriate Medications and American Geriatrics Society Beers Criteria

In the case presented above, there are several high-risk medications prescribed. For clinicians, it is important to identify these medications and utilize them appropriately or, in some cases, avoid them entirely. Here we will describe resources available to guide clinicians as well as present specific medication classes which when misused can lead to adverse events. Various criteria and approaches for identifying inappropriate medications in the elderly have been utilized, the American Geriatrics Society (AGS) Beers Criteria being the most commonly used method

in the United States [7]. Alternatively, the Drug Burden Index measures exposures to anticholinergic and sedative medications as well as total numbers of medications and daily dosing and is intended to identify drug-related sources of impaired physical and cognitive performance in older people [8]. High drug burden indices have been associated with functional decline in older adults living in the community and an increased risk of falls in long-term care facilities.

## Beers Criteria

The American Geriatrics Society (AGS) Beers Criteria detail potentially inappropriate medications (PIM) for use in older adults and is the most widely cited and utilized method for evaluating appropriate medication use in this population [7]. Initially developed in 1991 for use in the nursing home population in an attempt to reduce the frequency of medication errors, the Beers Criteria have been updated and released several times, most recently in 2015. The AGS Beers Criteria have been used by the National Committee for Quality Assurance and Pharmacy Quality Alliance to develop the quality measure Use of High-Risk Medications in the Elderly (HRM). The HRM quality measure is utilized by the Centers for Medicare and Medicaid Services to monitor the quality of care delivered to Medicare beneficiaries. A second quality measure, Potentially Harmful Drug-Disease Interactions in the Elderly, was similarly based on the AGS Beers Criteria. The quality measures and Beers Criteria include medications that should be avoided in the elderly along with medications that could exacerbate falls, dementia, and chronic kidney disease.

The most recent Beers Criteria [7] are divided into several sections/tables, which include lists of (1) potential inappropriate medications to avoid for many or most older adults, (2) medications for older adults with specific diseases or syndromes to avoid, and (3) medications to be used with caution (Table 7.1). The 2015 Beers Criteria have added on a section of drugs that should be avoided or have their dose adjusted based on an individual's kidney function as well as a select number of drug-drug interactions that have been associated

TABLE 7.1 Highlighted potentially inappropriate medications from 2015 Beers Criteria

| Organ system, therapeutic category, and drugs | Rationale | Recommendation | Quality of evidence | Strength of recommendation |
|---|---|---|---|---|
| *Anticholinergics* | | | | |
| First-generation antihistamines | Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; risk of confusion, dry mouth, constipation, and other anticholinergic effects or toxicity | Avoid | Moderate | Strong |
| Diphenhydr-amine (oral) | | | | |
| Doxylamine | | | | |
| Hydroxyzine | | | | |
| Meclizine | Use of diphenhydramine in situations such as acute treatment of severe allergic reaction may be appropriate | | | |
| Promethazine | | | | |

(continued)

TABLE 7.1 (continued)

| Organ system, therapeutic category, and drugs | Rationale | Recommendation | Quality of evidence | Strength of recommendation |
|---|---|---|---|---|
| *Anti-infective* | | | | |
| Nitrofurantoin | Potential for pulmonary toxicity, hepatotoxicity, and peripheral neuropathy, especially with long-term use; safer alternatives available | Avoid in individuals with creatinine clearance <30 mL/min or for long-term suppression of bacteria | Low | Strong |
| *Central nervous system* | | | | |
| Antipsychotics, first (conventional) and second (atypical) generation | Increase of cerebrovascular accident (stroke) and greater rate of cognitive decline and mortality in persons with dementia<br><br>Avoid antipsychotics for behavior problems of dementia or delirium unless nonpharmacological options (e.g., behavioral interventions) have failed or are not possible *and* the older adult is threatening substantial harm to self or others | Avoid, except for schizophrenia, bipolar disorder, or short-term use as antiemetic during chemotherapy | Moderate | Strong |

| | | | | |
|---|---|---|---|---|
| Barbiturates | High rate of physical dependence, tolerance to sleep benefits, greater risk of overdose at low dosages | Avoid | High | Strong |
| Benzodiazepines | | | | |
| *Short- and intermediate-acting* | Older adults have increased sensitivity to benzodiazepines and decreased metabolism of long-acting agents; in general, all benzodiazepines increase risk of cognitive impairment, delirium, falls, fractures, and motor vehicle crashes in older adults | Avoid | Moderate | Strong |
| Alprazolam | | | | |
| Estazolam | | | | |
| Lorazepam | | | | |
| Oxazepam | | | | |
| Temazepam | | | | |
| Triazolam | | | | |
| *Long-acting* | | | | |

Table 7.1 (continued)

| Organ system, therapeutic category, and drugs | Rationale | Recommendation | Quality of evidence | Strength of recommendation |
|---|---|---|---|---|
| Chlordiazepoxide (alone or in combination with amitriptyline or clidinium) | May be appropriate for seizure disorders, rapid eye movement sleep disorders, benzodiazepine withdrawal, ethanol withdrawal, severe generalized anxiety disorder, and periprocedural anesthesia | | | |
| Clonazepam | | | | |
| Diazepam | | | | |
| Nonbenzodiazepine, benzodiazepine receptor agonist hypnotics | Benzodiazepine receptor agonists have adverse events similar to those of benzodiazepines in older adults (e.g., delirium, falls, fractures); increased emergency department visits and hospitalizations; motor vehicle crashes, minimal improvement in sleep latency and duration | Avoid | Moderate | Strong |
| Eszopiclone | | | | |
| Zolpidem | | | | |
| Zaleplon | | | | |

**Gastrointestinal**

| | | | | |
|---|---|---|---|---|
| Metoclopramide | Can cause extrapyramidal effects, including tardive dyskinesia; risk may be greater in frail older adults | Avoid, unless for gastroparesis | Moderate | Strong |
| Proton pump inhibitors | Risk of *Clostridium difficile* infection and bone loss and fractures | Avoid scheduled use for >8 weeks unless for high-risk patients (e.g., oral corticosteroids or chronic NSAID use); erosive esophagitis, Barrett's esophagus, pathological hypersecretory condition, or demonstrated need for maintenance treatment (e.g., due to failure of drug discontinuation trial or $H_2$ blockers) | High | Strong |

TABLE 7.1 (continued)

| Organ system, therapeutic category, and drugs | Rationale | Recommendation | Quality of evidence | Strength of recommendation |
|---|---|---|---|---|
| *Pain medications* | | | | |
| Meperidine | Not effective oral analgesic in dosages commonly used; may have higher risk of neurotoxicity, including delirium, than other opioids; safer alternatives available | Avoid, especially in individuals with chronic kidney disease | Moderate | Strong |
| Non-cyclooxygenase-selective NSAIDs, oral: | | | | |
| Aspirin >325 mg/day, Diclofenac, Ibuprofen, Meloxicam, Nabumetone, Naproxen | Increased risk of gastrointestinal bleeding or peptic ulcer disease in high-risk groups, including those aged >75 or taking oral or parenteral corticosteroids, anticoagulants, or antiplatelet agents; use of proton pump inhibitor or misoprostol reduces but does not eliminate risk. Upper gastrointestinal ulcers, gross bleeding, or perforation caused by NSAIDs occur in approximately 1% of patients treated for 3–6 months and in ~2–4% of patients treated for 1 year; these trends continue with longer duration of use | Avoid chronic use, unless other alternatives are not effective and patient can take gastroprotective agent (proton pump inhibitor or misoprostol) | Moderate | Strong |

| | | | | |
|---|---|---|---|---|
| Indomethacin | Indomethacin is more likely than other NSAIDs to have adverse CNS effects. Of all the NSAIDs, indomethacin has the most adverse effects. Increased risk of gastrointestinal bleeding, peptic ulcer disease, and acute kidney injury in older adults | Avoid | Moderate | Strong |
| Ketorolac includes parenteral | Increased risk of gastrointestinal bleeding, peptic ulcer disease, and acute kidney injury in older adults | | | |
| Skeletal muscle relaxants<br>Carisoprodol<br>Cyclobenzaprine<br>Methocarbamol | Most muscle relaxants poorly tolerated by older adults because some have anticholinergic adverse effects, sedation, increased risk of fractures, effectiveness at dosages tolerated by older adults questionable | Avoid | Moderate | Strong |

with harm in the aging population. Use of medications included in the Beers Criteria is associated with adverse clinical outcomes and increased outpatient visits and hospitalizations, leading to higher costs [9]. In addition, use of medications included in the Beers Criteria by nursing home residents is associated with an increased number of ED visits, hospitalizations, and death [10, 11].

Medications of particular mention in the ED geriatric population include anticoagulants, sedatives, and analgesics, due to increased risk of adverse drug reactions (Table 7.1). NSAIDs can lead to peptic ulcer disease or gastrointestinal bleed, while anticholinergics commonly lead to bladder outflow obstruction and cognitive impairment. A study that used electronic data to survey adverse drug events (ADEs) associated with emergency department visits for patients ≥65 years of age identified four types of medications (warfarin, insulin, oral antiplatelet agents, and oral hypoglycemics) which accounted for 67.0% of ADEs leading to ED visits [2].

## *Specific Classes of Medications*

### Over-the-Counter Medications

There are multiple factors in the aging population which may increase their likelihood of developing a drug-related problem, which include frailty, coexistent medical problems, issues with memory, and medication use. When considering medication use, it is important to consider nonprescribed over-the-counter (OTC) medications when evaluating an ED patient [12]. One study of 3000 ambulatory adults greater than 75 years of age found that nearly 75% use at least one dietary supplement [13]. Yet, clinicians may forget to question patients on OTC or herbal medication consumption during interviews, and three-quarters of patients >18 years of age report that they do not inform their clinicians about nonprescription therapies [14]. Herbal or dietary supplement medications most commonly used include ginseng, *ginkgo biloba*

extract, St. John's wort, saw palmetto, kava, and valerian root. Dietary supplements are not without adverse effect; in fact, they have been found to have numerous clinically significant drug interactions and potentially adverse organ system toxicities. Some examples of these drug-drug interactions include increased risk of bleeding when *ginkgo biloba* is coingested with warfarin, whereas the consumption of St. John's wort with warfarin may result in decreased INR and efficacy of anticoagulation. St. John's wort, when coingested with serotonin reuptake inhibitors, can increase the risk of serotonin syndrome [6].

## Anticholinergic Medications

In the older adult, anticholinergic medications are associated with adverse effects, including memory impairment, confusion, hallucinations, dry mouth, blurred vision, constipation, nausea, urinary retention, impaired sweating, and tachycardia, and are extensively highlighted within Beers Criteria [7]. In addition to the increased risk of falls and fracture, drugs with high anticholinergic activity and resultant sedative effects may have a negative impact on functional status and cognitive function. One study demonstrated anticholinergic use to be associated with decreased Mini-Mental State Examination scores in community-dwelling older people [15]. The number of medications with anticholinergic activity is extensive and extends beyond just one medication class, including antihistamines, antidepressants, antimuscarinics (urinary incontinence), antipsychotics, antispasmodics, antiemetics, skeletal muscles relaxants, and antiparkinsonian agents [16].

## Anticoagulants

Anticoagulation is commonly used in older adults for non-valvular atrial fibrillation, valvular heart disease and prosthetic heart valves, and venous thromboembolism. Although anticoagulation is of benefit to some groups of older adults,

there are a number of concerns for its use in older patients, the most important of which is an increased risk of bleeding. Studies have demonstrated a correlation between age and major bleeding in anticoagulated older adults [17]. Older adults taking concurrent aspirin or P2Y12 receptor antagonists (e.g., clopidogrel) are at higher risk of bleed. The risk of an adverse event due to drug-drug interactions for patients prescribed oral vitamin K antagonists is of particular concern. The risk of bleeding with warfarin therapy is increased with coadministration of selective and nonselective nonsteroidal anti-inflammatory drugs (NSAIDs), selective serotonin reuptake inhibitors, omeprazole, lipid-lowering agents, and amiodarone [6]. Direct oral anticoagulants (DOACs) have been used increasingly as an alternative to vitamin K antagonists, but it should be noted that this class of medications requires avoidance or dose reduction in patients with renal insufficiency.

## Sedatives and Antipsychotics

The use of medications with central nervous system effects has been associated with a 50% increase in the risk of falls in elderly individuals [18, 19]. Older patients have an increased sensitivity to benzodiazepine use and decreased metabolism of longer-acting agents. In addition, in older patients with renal or hepatic impairment, there may be delayed drug elimination contributing to drug accumulation and adverse effects. Benzodiazepine use has been associated with an increased risk of hospitalization for falls and hip fractures, delirium, cognitive impairment, and motor vehicle crashes in older adults. Importantly, short courses of benzodiazepines have similar adverse event risk as chronic use. Studies have demonstrated the rates of hip fractures and falls as high in the first 2 weeks of therapy with the highest risk being within the first 7 days [20, 21].

Sedatives and anxiolytics, antidepressants, antipsychotics, lithium salts, and stimulants have been implicated in a significant number of adverse drug event ED visits.

Zolpidem specifically was associated with 21% of all adult psychiatric medication-related ED visits in adults aged 65 or older [22]. First- and second-generation antipsychotics can increase the risk of cerebrovascular accident and lead to greater rate of cognitive decline and mortality in older patients with dementia. With increasing evidence of potential harm, it should be noted that there is conflicting evidence on antipsychotic effectiveness in delirium and dementia. For this reason, antipsychotic agents should be avoided for delirium or behavioral complications of dementia unless nonpharmacologic options (e.g., behavioral interventions) have failed or are not possible and the older adult is of substantial harm to themselves and others [7]. Short-term use of antipsychotics (e.g., quetiapine, risperidone, or haloperidol) should thus be restricted to individuals who are distressed and at risk to self or others, have psychosis, and have failed verbal and nonverbal de-escalation techniques. In these patients, it is important to limit the dose and duration of therapy.

## Analgesics (NSAIDs and Opioids)

Studies have shown significant adverse events secondary to the use on nonsteroidal anti-inflammatory drugs (NSAIDs) in older adults, including an increased risk of peptic ulcer disease or gastrointestinal bleed, renal impairment, and heart failure [23–25]. The risk of toxicity increases in patients taking corticosteroids, anticoagulants, and antiplatelet agents. The use of concomitant proton pump inhibitors (PPIs) decreases but does not eliminate the risk of gastrointestinal bleed. In addition, scheduled PPIs for >8 weeks are generally avoided due to the risk of bone loss, fractures, and *Clostridium difficile*, as outlined in the Beers Criteria [7, 26].

Among the opioid analgesics, meperidine, propoxyphene, and codeine should generally be avoided. Meperidine does not appear to be an effective oral analgesic in dosages commonly used and has been associated with a higher risk of neurotoxicity, including delirium [7]. The use of propoxy-

phene and codeine by older adults has been associated with hip fracture and an increased composite risk of hospitalization, ED visit, or death in older patients [10, 26].

## *Drug-Drug Interactions*

Adverse drug events related to drug-drug interactions (DDIs) in older adults are common and may be life threatening. Among the most common include warfarin, as is the case with our patient who was recently started on an interacting antibiotic (trimethoprim-sulfamethoxazole). Trimethoprim-sulfamethoxazole can potentiate the effect of warfarin and increase the INR. The use of sulfonamides with sulfonylureas may lead to clinically significant hypoglycemia. When calcium-channel blocking agents such as diltiazem or verapamil are taken with other medications which interfere with their CYP3A4 metabolism, older adult patients are at greater risk for hypotension and delirium. Increased serotonin activity leading to altered mental status has been described when SSRIs are used in combination with psychotropic medications, opioids, and diuretics. It is important to use caution when initiating a geriatric patient on a new medication and pay particular attention to screening for drug-drug interactions [5].

## Medication Response

Medication response differs in older adults due to the decline in organ functional reserve that occurs with aging. In the geriatric population, responses to drugs may be increased, decreased, or remain relatively unchanged due to the variety of comorbid conditions, the use of concomitant medications, and the age-related physiologic changes that make responses to therapy heterogeneous and unpredictable. Complicating matters further, the aging process affects patients along a

spectrum, with some patients maintaining a relatively fit and healthy lifestyle, and others with frailty and multiple organ dysfunctions [27]. For these reasons, concrete recommendations for dosing medications in the geriatric population are hard to come by. Empiric dose reductions are often applied for safety concerns given the multitude of reasons elderly patients may have more pronounced effects from approved doses. Prescribers must consider how the below age-related changes affect their geriatric patients to safely and effectively prescribe drug treatments.

Let's take a closer look into some of the pharmacodynamic changes that may be at play for our case patient.

## *Diet*

As with our case patient, older adults in the ED often have reduced or inconsistent dietary intake, which can affect the absorption and bioavailability of certain medications. Our patient presents here with an elevated INR, which is most likely due to a decreased PO intake leading to inconsistent levels of vitamin K-laden foods which is essential in order to maintain the balance between the safety and efficacy of a therapeutic INR while on warfarin therapy. This increase in INR was compounded due to the recent initiation of an interacting antibiotic. If decreased oral intake is due to an acute illness, changes in the warfarin dose would likely not be necessary once the patient goes back to their normal routine. Holding a dose or decreasing the warfarin dose while the patient is acutely ill may be sufficient. If the patient is unable to maintain a consistent diet, warfarin therapy may not be the best therapeutic option. Anticoagulant options that require less dietary consistency include low-molecular-weight heparins (LMWHs; e.g., enoxaparin, dalteparin) or some of the DOACs. However, as mentioned previously, DOACs are not without geriatric concerns due to their renal elimination.

## *Renal Dysfunction*

Our patient presents with a prerenal AKI due to decreased oral intake. Decreased renal clearance will lead to drug accumulation and adverse effects if drugs are not appropriately dose adjusted. For our patient, her tramadol dose is higher than recommended for her creatinine clearance and may have contributed to her fall. Clinicians must be aware that serum creatinine values in the geriatric population are not a reliable measure of renal function and should always calculate creatinine clearance in order to estimate glomerular filtration rates (GFR), using equations such as the Cockcroft-Gault equation (Fig. 7.1). While it is always important to calculate creatinine clearance, it is also important to understand the limitations of these calculations in the geriatric population. Serum creatinine values may not be an accurate estimate in patients who have significant muscle wasting and alterations to their lean body mass, thus leading to a seemingly low serum creatinine value resulting in an overly generous creatinine clearance or GFR. Outside of acute changes associated with an AKI, it is important to recognize that GFR naturally decreases by approximately 10% per decade after age 20. By the time patients reach the age of 65, it should be assumed that they will only have 50% of the renal clearance capacity of their younger counterparts, even in the absence of diagnosed renal disease. Clinicians should remain attuned to this natural decline in renal clearance, as serum creatinine values tend to remain stable until at least 50% of filtration capacity is lost. Dose adjustments for renal dysfunction are commonly needed in the geriatric population [28].

$$eCrCl = \frac{(140 - Age) \times Weight\ (kg)}{72 \times Creatinine_{serum\ (mg/dL)}} \times 0.85\ if\ female$$

FIGURE 7.1 Cockcroft-Gault equation. Estimate of creatinine clearance/glomerular filtration rate (GFR)

## *Liver Dysfunction and Protein Binding*

Decline in hepatic blood flow and a decline in number and activity of the cytochrome P-450 oxidative enzyme system are associated with advanced age. These will both factor into drug metabolism in the geriatric population, by decreasing clearance of hepatic drugs and increasing half-lives. A prime example in our patient is the inappropriate use of the benzodiazepine diazepam to treat her insomnia, which likely contributed to this patient's fall. Diazepam is metabolized via oxidative pathways and has a very long half-life, which makes it much more likely to accumulate in older adults and cause prolonged sedation. Furthermore, geriatric patients with liver dysfunction or other comorbidities that may affect albumin concentrations will have an effect on drugs that are highly protein bound, decreasing their volume of distribution and increasing maximal serum concentrations. Diazepam is also a drug that is highly protein bound; thus "normal" doses as recommended in the package insert will lead to more profound effects because there is more active drug than a patient with normal albumin concentrations. Specific dose recommendations for patients with mild-to-moderate hepatic impairment and alterations in protein binding are rather limited. Understanding the physiology of how aging relates to the liver's clearance ability would explain why initiating lower doses of highly protein-bound and hepatically cleared medications is prudent in the geriatric population [28].

## *Lean Body Mass*

Older adults have an increased body fat percentage relative to lean body mass, as well as decreased total body water and muscle mass. These physiologic changes have an effect on the volume of distribution of drugs. Drugs that are lipophilic (e.g., benzodiazepines) will have an increased volume of distribution in the geriatric population. Lipophilic drugs also tend to have longer half-lives since the drug is cleared more slowly as

it takes longer to leech out of fat stores. Conversely, hydrophilic drugs will have a smaller volume of distribution in geriatric patients, resulting in higher maximal serum concentrations, which will increase the potential for augmented response and risk of adverse effects [29].

## Central Nervous System

Our case patient is on several CNS-active medications (e.g., tramadol, diazepam). Older adults have increased sensitivity and susceptibility to medications that are active in the CNS, which is proposed to be due to changes in receptor reserve and changes to intracellular signaling pathways [27]. Common ailments in the elderly such as dementia or stroke can also alter the integrity of the blood-brain barrier, allowing additional drug to penetrate the CNS. Additionally, poor oxygenation, changes in brain perfusion, and decreased CNS functional reserve will affect how geriatrics respond to CNS-active medications [30].

# Practical Approaches to Patient Care

## Accurate Medication Histories

Errors in prescribing can often be attributed to medication discrepancies, which occur when patients are unaware of the medications they should be taking and can lead to incorrect documentation in electronic health records and patient charts. One study of nearly 800 patients prescribed 15 medications found that every individual had at least one medication discrepancy. Examples of discrepancies included dosing/frequency errors or missing medications when comparing medication lists created by referring providers and home healthcare nurses [31]. Obtaining accurate medication lists through medication reconciliation has been shown to decrease ED visits and rehospitalizations for patients by up to 37% [32].

## *Getting the Pharmacist Involved: Medication Therapy Management Services*

Medication use has become a mainstay of geriatric medical care. Given the high prevalence of prescription drug use in the geriatric population, understanding how to optimize drug therapy in this unique population becomes imperative. Pharmacists in the ED play an integral role in improving transitions of care within the healthcare continuum for the geriatric population. Older adults in the ED are prime candidates for medication therapy management (MTM) services which pair patients with a pharmacist in order to provide medication counseling and reconciliation to avoid potentially inappropriate prescribing and medication use. Several studies have demonstrated that pharmacist-driven MTM services in the emergency department and other clinical areas have significantly decreased hospital utilization and readmissions and led to cost reduction and decreased polypharmacy and inappropriate prescribing [33–40]. The American Geriatric Society recommends that all geriatric patients receive an annual drug regimen review to allow for opportunities for discontinuation of unnecessary medications, as well as the addition of effective medications that may not be currently prescribed [34]. As part of the 2010 Affordable Care Act, Medicare Part D prescription drug plans are required to offer medication therapy management (MTM) services to eligible patients, namely, those with certain diagnoses (varying dependent on the plan), a minimum number of prescription medications, and likelihood of exceeding a medication cost threshold [41].

## Conclusion

Older adults frequently require multiple medications due to chronic disease states, which places them at higher risk of polypharmacy, adverse drug events, and drug-drug interactions. The use of potentially inappropriate medications in the elderly can lead to adverse outcomes, including ED visits and hospitalizations. Recognizing high-risk medications in the

elderly and taking into consideration physiologic changes in the geriatric population can help improve safe medication prescribing. Obtaining an accurate medication history and the use of a pharmacist medication therapy management can help to decrease adverse drug events in older adults in the ED.

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# Chapter 8
# Pain, Opioid Use, and Palliative Care of Older Adults in the Emergency Department

**William P. Burns**

> **Case**
>
> Mary M is an 82-year-old woman with history of Stage IV breast cancer metastatic to the lung and bone who was brought to the emergency department from a nursing home by ambulance because of back pain.
>
> Upon arrival, Mary is alert and uncomfortable. She is initially alone in the emergency department, but her family is en route to meet her in the ED. She reports uncontrolled mid-thoracic back pain that feels sharp and does not radiate. It feels very similar to pain that she has suffered from for several years and has been attributed to compression fractures at T7 and T8 sec-

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ondary to metastatic disease. The spinal metastases had previously been treated with radiation and which provided some pain relief. However, a second cycle of radiation was ineffective.

In the ED, she denies any recent falls or trauma. Additionally, she denies any lower extremity weakness and lower extremity numbness, specifically no saddle anesthesia. She also denies incontinence of bowel or bladder.

*Review of Systems:*
Positive for back pain.
Shortness of breath at baseline.
Negative for sedation, confusion, chest pain, nausea, vomiting, abdominal pain, dysuria, weakness, and numbness.

Her past medical history is significant for breast cancer with metastases to the lung and bone, hypertension, hypercholesterolemia, and type 2 diabetes mellitus. She is on 4L of oxygen via nasal cannula at baseline.

Past surgical history: Right complete hip replacement 5 years ago and appendectomy 40 years ago.

*Vital Signs:*
Pulse 82 | Respiratory rate 14 | Oxygen saturation 98% on 4L NC | Blood pressure 110/90 | Temperature 37.0 Celsius | Pain score 9/10.

*Physical Exam:*
General: Chronically ill appearing and cachectic.
HEENT: Temporal wasting, pupils normal in size and reactive.
Cardiac: Normal rate and rhythm, no murmur.
Pulmonary: Rare crackles, good air movement, no wheezing.
Abdominal: No distension, no tenderness to palpation.
Musculoskeletal: No lower extremity edema or swelling.

Back: Tenderness to palpitation in the midline over her thoracic spine.

Neurologic: Alert and oriented to person, place, time, and situation. Cranial nerves intact. 5/5 strength in all four extremities, sensation intact in all four extremities and perineum.

A review of the electronic medical record indicates that she was recently discharged from the hospital to a skilled nursing facility yesterday after a 7-day admission for severe back pain. During her hospitalization she received a CT pulmonary angiography which was negative for pulmonary embolism but showed continued progression of lung metastases and an MRI of her spine which was significant for progression of her known T7/T8 metastatic disease, but no cord compression was seen. At the time of that discharge, her pain was well controlled with two tablets of hydrocodone 10 mg/acetaminophen 325 every 6 h as needed for pain. Since discharge she has been taking it every 6 h and reports that her pain is only slightly improved for 2–3 h after each dose.

Additional review of the electronic medical record shows that Mary has been admitted seven times in the past 6 months. Her most recent discharge weight is 15 lbs below her baseline weight 9 months ago. Additionally, there is a recent note from her oncologist describing a meeting during which it was determined that there are no other disease-directed treatment options available.

## Emergency Department Management

### *Address the Primary Complaint*

Mary has poorly controlled, acute on chronic malignant pain which has and will continue to require opioids to maximize her function and minimize her suffering. Further increasing

hydrocodone/acetaminophen is not advisable as she is already receiving 2600 mg of acetaminophen per day (325 per tablet × 2 tablets per dose × 4 doses per day). The American Geriatric Society last updated their guidelines for pain control in 2009 but at that time recommended a limit of 3000 mg per day [4].

The National Comprehensive Cancer Network has published guidelines for the initiation of short-acting opioids in both opioid-naïve and opioid-tolerant patients [10]. The first step in any opioid conversion is to calculate the patient's current daily requirement in oral morphine equivalents (OMEs). The relative potency of hydrocodone to morphine has been studied in cancer patients and has been found to vary from 1:1 to 1:2 with a median of 1:1.5 [7]. Specifically, it was discovered that at hydrocodone doses higher than 40 mg per day, the equivalence was closer to 1:1. Given Mary's daily requirement of 80 mg hydrocodone, her total OME requirement would also be approximately 80 mg.

The National Comprehensive Cancer Network (NCCN) provides guidelines for the treatment of malignant pain. The guideline differs between opioid-naïve and opioid-tolerant patients. Based on FDA guidelines, patients are considered opioid-tolerant if they are receiving at least the following for 1 week or longer [10]:

• Sixty milligrams oral morphine/day
• Twenty-five micrograms transdermal fentanyl/hour
• Thirty milligrams oral oxycodone/day
• Eight milligrams oral hydromorphone/day
• Twenty-five milligrams oral oxymorphone/day
• Equianalgesic dose of another opioid.

To treat severe pain, the NCCN guidelines suggest providing a PO or IV dose equivalent to 10–20% of the total opioid dose equivalent the patient has received in the past 24 h [10]. For Mary that would mean 8 (10%) to 16 (20%) OMEs. IV formulations benefit from a faster peak effect at 15 min compared to 60 min for PO formulations. Therefore, opioid-tolerant patients with pain that is not meaningfully improved by their initial dose may be re-dosed 15 min after an IV dose

and 60 min after an oral dose. Additionally, it is possible to be more specific in dosing IV formulations as it is possible to easily administer doses that would otherwise require complex fractioning of tablets.

Morphine could be tried again with a longer dose interval, but since it was ineffective before, it is unlikely to be effective now. Hydrocodone is metabolized by the liver to active hydromorphone and inactive norhydrocodone, so hydromorphone is likely the best next agent as she has been exposed in the past.

*Sometimes patients taking opioids develop adverse effects to them. Alternatively, patients with significant tolerance to an opioid may not experience symptom relief with dose increases. In either case, the best practice is to transition the patient to a different opioid. This process is commonly referred to as opioid rotation. Opioid rotation is complex and very patient dependent. The examples provided below are just examples, and extreme care should be taken when performing opioid rotations* [10].

1. Mary's current 24-h opioid requirement = 80 mg hydrocodone.

   Hydrocodone is approximately equivalent to oral morphine.
2. Eighty micrograms hydrocodone ≅ 80 mg oral morphine.

   Thirty micrograms oral morphine ≅ 2 mg IV hydromorphone.
3. Eighty micrograms oral morphine ≅ 5.3 mg IV hydromorphone per 24 h.

   Correction for cross tolerance is typically a 25% reduction but can be up to 50 or 75% depending on patient factors including pre-existing opioid toxicity, renal function, and hepatic function.
4. A 25% reduction for cross tolerance = $0.75 \times 5.3 = 4$ mg IV hydromorphone per 24 h.
5. Four micrograms IV hydromorphone * 10% = 0.4 mg IV hydromorphone low-end starting dose.

   The peak effect of all IV opioids in opioid-tolerant patients is approximately 6 min. Therefore, it is critical

to assess the patient's pain level and screen for adverse effects shortly after dosing. Fifteen to 30 min post-dose is probably a more realistic timeline in a busy clinical environment. In contrast, the peak effect of immediate release oral opioids is approximately 60 min which decreases the rate at which doses can be administered safely.

(a)   Pain score unchanged or increased: Increase dose by 50–100%.
(b)   Pain score decreased to 4–6: Repeat prior dose.
(c)   Pain score decreased to 0–3: Continue at current effective dose as needed.

Based on the opioid equivalence calculations above, Mary was given 0.5 mg IV hydromorphone. After 15 min she reports that her pain is unchanged and remains intolerably severe at 9/10. In response she was given 1.0 mg IV hydromorphone. After another 15 min, she reported that her pain was improved but still severe at 7/10. In response she was given 1.0 mg IV hydromorphone again. After another 15 min, she reported that her pain was significantly improved to a tolerable level of 3–4/10. She remained comfortable for another 3 h, but then her pain then began to worsen, and she required another 1.0 mg IV hydromorphone dose before she was transported to her hospital room.

## *Discussion of Care Options*

If the patient's pain can be sufficiently controlled, it is reasonable to explore if the patient is open to a discussion of goals of care. Unfortunately, physician-initiated goals-of-care conversations frequently focus on determining a patient's code status, rather than directly discussing patient's goals. In order to avoid this common misstep, Dr. David Wang has developed an emergency department-focused approach to a 5-min goals-of-care conversation detailed in Table 8.1 [11].

TABLE 8.1 Approaching 5-min ED goals-of-care conversations systematically as a procedure

| Phase | Action |
|---|---|
| Minutes 1–2 | Elicit patient understanding of underlying illness and today's acute change |
| | If available, build on previous advance directives or documented conversations |
| | Acquire sense of patient's values and character (to help frame prognosis and priorities for intervention) |
| | Name and validate observed goals, hopes, fears, and expectations |
| Minutes 3–4 | Discuss treatment options, using reflected language |
| | Continually recenter on patient's (not family's) wishes and values |
| | Recommended a course of action, avoiding impartiality when prognosis is dire |
| Minute 5 | Summarize and discuss next steps |
| | Introduce ancillary ED resources (eg, hospice/observation unit, social work, chaplain) |

**Example Conversation Between Mary and the Emergency Physician (EP)**

EP:     Mrs. M, as physicians we always want to make sure that the care we provide is consistent with our patient's wishes. Would it be okay with you if we discussed your hopes?

Mary:   Yes.

EP:     What things are most important to you?

Mary:   I need my pain to be better and I want to be at home with my family.

EP:      I hear how important pain control and family are. Also, I can see that you have had to be in the hospital a lot recently. I see you met with your oncologist recently. Could you tell me what your understanding of that meeting was?

Mary:    There are no more treatment options for the cancer while I am this weak. I was hoping the rehab would make me stronger, but I don't think I can handle it.

EP:      I hear your concern, and I worry that rehab won't be as effective as we had hoped and will keep you from home and your family. If you had to choose between possibly having more time but spending lots of it in hospitals and rehab or possibly having less time but spending it at home, do you have an idea which one you would prefer?

Mary:    I want to be at home and can accept less time if I am comfortable, but I am afraid that my pain won't be controlled.

EP:      We want to support your goal to be at home and hear that pain control is a concern. We will treat your pain aggressively, and while you are here we will find a regimen that works.

Mary:    Thank you.

EP:      When patients' primary goal is for comfort and to stay at home, I strongly recommend that they consider additional support at home through hospice. Hospice nurses actively monitor and treat symptoms, arrange support equipment like oxygen or a hospital bed, deliver medications, and have backup teams that provide phone support, and if necessary, in-home support any time or day.

| | |
|---|---|
| Mary: | I thought hospice was just for people who are dying. |
| EP: | Too many people are not enrolled in hospice until their time is very short, but the longer you are enrolled in hospice, the more you can benefit from the care team and their support. Patients and their families who enroll in hospice frequently wish they had enrolled in hospice earlier. If it is okay I will ask the social worker to follow-up with you to get more information about hospice? |
| Mary: | I would appreciate that. |

## *Barriers to Goals of Care Conversations*

There are many barriers in the emergency department to goals of care conversations such as these: High patient volume, frequent interruptions, and caring for other critically ill patients are some reasons why EPs are reluctant to start these conversations in the ED. In addition, education about the philosophy of, indications for, and specifics of hospice are rarely covered in emergency medicine training. Despite these barriers, a significant majority of attending physicians and residents believe palliative care to be an essential core competence for their practice, and conducting an ED-focused goals of care conversation is a key skill which can be performed quickly in the ED [6].

# What Can You Do in Your Clinical Practice?

## *Chaplain Referral*

A variety of individuals provide spiritual care in healthcare settings, but many hospitals employ professional chaplains. Certified professional chaplains must have a graduate-level

education in theology, at least 1 year of supervised postgraduate training in an accredited healthcare chaplaincy program, and complete ongoing educational requirements.

It is a common misconception among other healthcare providers that spiritual distress cannot be present if an individual doesn't adhere to a religion. Instead it is better to approach the concept of spiritual care from the perspective that humans generally seek to find meaning in the events of our lives, actions, and relationships. For some individuals, religion provides a structured system to help find that meaning. For others, silence, walks, fishing, rock climbing, painting, listening to hair metal music, or any number of activities or actions is the mechanism that they process and find meaning in their lives.

Acute illness or trauma as well as life-limiting illnesses almost uniformly interrupt the normal lives of our patients. Consequently, their normal mechanisms for finding meaning are usually disrupted. One of the core functions of healthcare chaplains is to assess for such disruptions and after establishing rapport to help patients identify alternative mechanisms to process and find meaning.

A common barrier to chaplaincy referral is clinician concern that the patient or family may misperceive the chaplain's presence as an indication of ominous news or imminent death. This perception may be because most professional healthcare chaplaincy referrals are triggered in association with cardiac arrest, major trauma, or deaths. However, chaplaincy referral can also be helpful for patients and family members in less extreme situations. Patient and family misperceptions can be prevented by first explaining that the chaplain is a part of the care team and an extra layer of support. Occasionally a patient or family member may worry that a chaplain will proselytize to them, but you can assure them that proselytizing in the clinical environment is simply not allowed by organizations that accredit and govern professional healthcare chaplains. If possible, it is always helpful to provide the chaplain with a quick explanation of the patient's clinical situation. Chaplains have strong and rapidly effective rapport-building skills, but providing them some information can help them better prepare.

## Social Work Referral

Patients with serious illness and particularly those with limited social support, advanced age, financial stress, mental health disorders, or functional decline benefit tremendously from the support of social workers. Social workers are staunch advocates for patients and their families in addition to providing psychosocial support, education, and assisting with connections to private and public resources.

Social workers frequently identify and then help address critical barriers confronting patients and families that were not identified by physicians. In some states social workers are the primary agents for completion of healthcare power of attorney forms, and/or in many health systems, they are the primary leaders of goals-of-care conversations.

When referring to hospice, social workers play a critical role as not all insurance plans include a hospice benefit. Additionally, although the hospice benefit does not cover residential care in a nursing home, veterans and patients with Medicaid can often qualify for nursing home care concurrently with hospice.

In the case of Mrs. M, a social worker could be extremely helpful. They might explore how Mrs. M and her family members are each processing her decline. Also, it is very common for individuals in crisis to have difficulty naming their emotions which can serve as a block to them processing them which social workers can frequently assist with. Often, patients and their families will start to talk about death or funeral planning after a change in goals of care, and social workers can often provide the best guidance among hospital staff.

## Patient Identification

Though anecdotal experience of patients with palliative care needs frequently using the emergency department is common for practicing emergency department clinicians, there is a paucity of reported evidence on the frequency with which patients use the ED for palliative care needs. This is complicated by a lack of consensus on what is classified as a pallia-

tive care need or the specific definition of palliative care [12]. For many if not all medical professionals, the palliation of their patients' physical symptoms such as pain, dyspnea, and nausea is an intrinsic part of their care. Palliative care is differentiated by a focus on pain as not only the result of physical symptoms but also resulting from existential, psychosocial, and spiritual suffering. These topics have a significant amount of overlap, and therefore strict definitions are not available. The following topics were identified as descriptors of palliative care needs by chaplains, pain medicine physicians, and palliative physicians: isolation, loneliness, abandonment, meaninglessness, hopelessness, guilt, religious uncertainty, and dying [9].

Identification of ED patients who may benefit from palliative care can be guided by clinician gestalt or through formal screening questionnaires such as the SPEED screen. SPEED asks screening questions across five domains of palliative care needs: physical, spiritual, social, therapeutic, and psychological [8].

## Palliative Care Referral

Patients with palliative needs may benefit from inpatient palliative care consultation, or outpatient palliative care referral, depending on their clinical situation. For hospitalized patients, palliative care consultation triggered on the basis of emergency physician or emergency nursing gestalt has been shown to significantly reduce hospital length of stay [13]. Additionally, referral to palliative care from the emergency department was formally adopted as a Choosing Wisely recommendation by the American College of Emergency Physicians in 2013 [1].

For Mrs. M a palliative care consultation could provide several benefits. Management of cancer-associated pain is a core expertise of palliative care providers with specific expertise in the initiation and titration of both extended release formulations to provide consistent control of pain and consideration of other adjuvant therapies like steroids as an

example. Additionally, palliative care consultation can help when patients are unsure about their goals of care. Palliative care providers can also help explain to patients and their families what specifically a home-based comfort-focused care plan might look like.

## Hospice Referral

Hospice is a means for delivering palliative care that is unique to the United States. It is primarily a defined Medicare benefit that is included in many private insurance plans. Hospice can be difficult to explain to patients and, in fact, is often confusing for medical providers. The primary source of confusion seems to arise from the dual nature of hospice as both a philosophy of care and a defined insurance benefit.

Unfortunately, the philosophy of hospice care is frequently misunderstood to be only applied to care at the very end or last few days of life. More specifically, it can be generally understood to be comfort-focused care that is provided to patients with serious, life-limiting conditions who either are no longer a candidate for curative or intensive life-extending therapies or whose goals are not consistent with the therapies that are available to them. However, just because the goals of a patient or their decision maker are consistent with hospice, it does not mean they are eligible for the hospice benefit.

The general philosophy of hospice could be interpreted to apply to a significant proportion of emergency department patients. The reality is that like most insurance benefits, hospice eligibility has specific restrictions. Most private insurers mirror Medicare guidelines; however, rarely, some plans still do not have a hospice benefit. Medicare requires a physician certify that a patient is terminally ill with a life expectancy of 6 months or less based on the normal course of their disease [5]. In order to assure compliance, most hospice agencies follow a relatively standard set of disease-specific guidelines. Such guidelines can be exceptionally specific, and patients are sometimes unable to access hos-

pice services due to an inability to confirm a terminal condition despite progressive decline.

Additionally, it is important to realize that the hospice benefit does not provide custodial care for patients who are unsafe at home. Patients with Medicaid or who are veterans may receive custodial care benefits to allow them to stay in a nursing home but that benefit is intrinsic for Medicaid and the Department of Veterans Affairs. Patients with private medical insurance or Medicare do not have the same benefit, and a nursing home placement would be out-of-pocket for them. Additionally, inpatient palliative care units do exist, but they function similarly to hospitals, in that the hospice must justify each day why the patient requires ongoing inpatient care. Some examples of reasons why a hospice patient might need an inpatient level of care include opioid titration requiring intravenous administration, a sudden loss of ability to take oral medications, or a sudden loss of caregivers at home among other reasons.

Because it is possible that patients may not be eligible for hospice, it is generally prudent to try to under-promise and over-deliver on the availability of hospice services. Rather than guaranteeing hospice services, clinicians in the ED may instead encourage patient and their families to engage in dialogue with hospice to understand if and how they can help.

## Symptom Screening

Although pain frequently afflicts patients with life-limiting illnesses, it is not the only symptom. Fatigue, existential distress, spiritual distress, anxiety, depression, xerostomia (dry mouth), dyspnea, loss of appetite, nausea, constipation, and diarrhea are common contributing symptoms. Few of these symptoms can be resolved in the emergency department, but often patients are unable to spontaneously identify them, so naming them for the patient and alerting the inpatient or continuity teams is the first step in alleviating or controlling the symptom. If a standardized symptom assessment tool is

preferred, there are several in regular use. The Edmonton Symptom Assessment System (ESAS) is one of the oldest, best validated, and available online [2].

## Additional Training

Fellowship training in hospice and palliative medicine is an option for graduates of emergency medicine residencies and offers additional practice opportunities including inpatient consultation, outpatient clinic, or hospice medical direction. However formalized graduate medical education is unlikely to be preferable or feasible for the vast majority of active emergency physicians. The Education in Palliative and End-of-Life Care or EPEC program has an emergency medicine provider-focused, 3-day-long curriculum called EPEC-EM which is typically held in the fall and provides instruction in essential clinical competencies [3].

## Mary's Course

Mary was admitted to the hospital to facilitate continued pain management via opioid titration. Further dose changes were necessary, but ultimately, she was well controlled with a fentanyl patch and with hydromorphone for breakthrough pain. After an additional discussion with the social worker as well as her family, she consented to an informational visit with a hospice liaison. Together they identified that it would make the most sense for Mary to stay with her daughter who would provide most of Mary's care. When Mary was no longer able to complete her activities of daily living, the family planned to hire caregivers to be with Mary when her daughter was at work. After signing consents, the hospice was able to arrange for equipment like a hospital bed and an oxygen concentrator to be delivered to the home. Also, a hospice nurse was able to meet Mary and her daughter at home right after discharge to help them transition to home. Mary survived another 12 weeks at home with the support of her family and the hospice team.

## Key Points

- Consider palliative care consult or hospice referral, when appropriate, in patients who present to the emergency department.
- Utilize rapid opioid titration guidelines like the National Comprehensive Cancer Network guidelines for patients with cancer who present to the emergency department with uncontrolled pain.
- Consider having a focused goals of care conversation with patients who present to the emergency department with recurrent exacerbations of chronic, life-limiting illnesses.

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# Chapter 9
# Acute Mental Status Changes and Over-the-Counter Medications in Older Adults

**Katherine M. Hunold**

**Case**

Berta is a 78-year-old woman with history of pulmonary fibrosis, pulmonary hypertension, atrial fibrillation, and hypothyroidism. Her son brought her to the emergency department, although she has no complaints. She states that she is not sure where she is or why she is there but that she is "enjoying herself."

Her son reports Berta is confused and unable to remember details, specifically "she does not know my name." He reports that he went to check on his mother this evening because she had been having abdominal pain. He notes that she is eating less than usual and has been "eating Tums like candy." She did not know the name of her son or her grandchildren when they arrived. She also could not remember why

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he was coming or that she had been having abdominal pain. He expressed that he is very worried about her and feels guilty that "we did not check on her sooner." He denies any known falls. He confirms her medication list: clonazepam, digoxin, furosemide, levothyroxine, mirtazapine, sertraline, sildenafil, spironolactone, and warfarin.

Her son reports that Berta lives at home and requires occasional help from her children who live in the area. She no longer drives. Her children have noted decreasing function but report that she can generally care for herself well. She is in charge of her own medications. Her routine grocery shopping is done for her by her children. Her daughter-in-law of >20 years is also present and confirms the recent history and patient's baseline function.

*Review of systems:*
Positive for intermittent burning epigastric pain.
*Vital signs:*
P 74 | RR 16 | SpO2 100% on home 2L NC | BP 98/67 | T 36.8°C.
*Pertinent exam:*
HEENT: Tacky mucous membranes.
Abdominal, Skin: WNL
Cardiac: Faint systolic ejection murmur.
Musculoskeletal: No edema.
Neurologic: Alert to person, place; not time, situation. Cannot name objects but can describe their function. CN exam WNL. Motor and sensory exam WNL.

## Emergency Department Initial Management

Berta is unable to provide a history in the ED. Luckily, her son accompanied her and provided important information. Unfortunately, histories in geriatric patents can be limited due

to both their acute presentation (i.e., dyspnea limiting ability to communicate) and memory loss. In these situations, electronic medical records may provide additional medical history particularly if they are linked to other hospital systems.

Altered mental status in geriatric patients has many possible etiologies. In Berta's presentation there are several important etiologies to consider: medication side effect or toxicity, dehydration, electrolyte abnormality, acute renal injury, accidental or intentional drug overdose, intoxication, head injury, stroke, intracranial hemorrhage, etc.

Berta initially denied symptoms but reported burning epigastric pain on ROS. Geriatric patients often present with abnormal symptoms [1–5] for life-threatening diagnoses such as myocardial infarction, pulmonary embolism, aortic dissection, aortic aneurysm, mesenteric ischemia, etc. In her case, her clinical presentation, physical exam, and vital signs were not concerning for pulmonary embolism or surgical causes of her symptoms. However, electrocardiography and cardiac enzyme testing should be performed as her epigastric pain may represent an unexpected presentation [1–3] of acute coronary syndrome.

Berta was confused and had naming difficulty, but the remainder of her neurologic exam including cranial nerves, strength, and sensation was normal. Polypharmacy is a common cause of hospital admission in older adults [6] and should always be considered in an altered older adult [7], especially when they administer their own medications. Toxicologists are often consulted for cases of overdose on psychiatric or analgesic medications in these patients [8]. It is also important to consider intentional ingestions as older adults are high-risk for suicide attempts [9].

Berta had no evidence of trauma on exam, but intracranial hemorrhage or hematoma is another important consideration in altered older adults, especially if they are taking anticoagulants such as warfarin. Elder abuse or neglect should also be considered in these patients.

Given the above considerations, Berta was also placed on cardiac monitoring, had labs drawn, and had an electrocardio-

gram, chest X-ray, and CT scan of her brain. She was given famotidine for her epigastric pain and given 1 L of IV normal saline as she appeared clinically dehydrated. Aspirin was initially held given the concern for possible intracranial hemorrhage.

| Laboratory | | | |
|---|---|---|---|
| WBC 8.2 | Na 133 | PT 24.5 | Within normal limits: |
| HGB 13.8 | K 3.6 | INR 2.2 | TSH |
| HCT 40.6 | Cl 94 | PTT 36 | Free T4 |
| Platelets 150 | CO2 33 | | Hepatic function panel |
| | Glucose 124 | Troponin 0.14 | Ammonia |
| | Ca 154 | Digoxin level 2.4 | EtOH level |
| | BUN 29 | | Salicylate level |
| | Creatinine 1.31 | | Acetaminophen level |

*EKG*
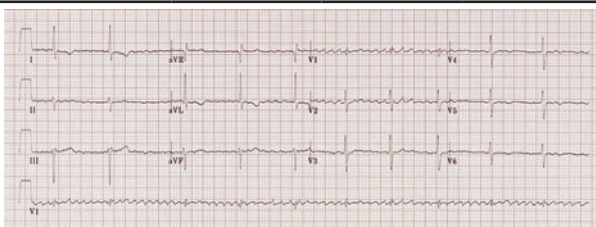


*Chest X-ray* (portable): No acute cardiopulmonary pathology. Stable appearance of chronic changes due to pulmonary disease.

*CT brain:* No acute findings.

## ED and Hospital Course

These results demonstrated acute renal injury (baseline creatinine was 0.8, checked 2 weeks prior at a routine primary care visit), hypercalcemia, elevated troponin, elevated digoxin level, and other mild electrolyte abnormalities. She had EKG changes consistent with digoxin toxicity but no evidence of ST segment elevation. She had no evidence of infection in her history or laboratory results.

She was started on IV fluids for dehydration and treatment of hypercalcemia and given calcitonin for hypercalcemia per hospital protocol, and she received IV potassium and magnesium replacement. She was given DigiFab for her elevated digoxin level per cardiology's recommendations, though hypercalcemia was likely potentiating this effect [10–12]. She was given aspirin for the elevated troponin; she was continued on home warfarin.

During her ICU admission, no medical explanation for hypercalcemia was found. It was thought to be due to large consumption of Tums over short period of time. Her troponin elevation was 0.02, above the upper limit of normal. This remained stable and then downtrended; she never had EKG changes consistent with ischemia. All of her laboratory abnormalities improved with continued IV and then oral hydration when she could tolerate.

Berta's presentation may have been avoided if geriatric-specific interventions were made previously. Her son shared that she was no longer driving. Therefore, when she began to experience abdominal pain, she was unable to get to a doctor. She later shared with an inpatient team that she did not want to be a burden on her children and the Tums helped her pain.

During the hospitalization, she received physical and occupational therapy evaluations. These evaluations determined that she was safe to return home but confirmed her inability

to drive a motor vehicle. Social work provided local resources for affordable transportation that Berta could arrange when needed; this prevented her feeling as though she was a burden to her children.

# What Can You Do in Your Clinical Practice?

## *Digoxin Toxicity*

Digoxin increases cardiac inotropy by increasing intracellular calcium through reversible inhibition of the sodium-potassium ATPase pump. It has been associated with increased risk of death from any cause including cardiovascular deaths and stroke [13]. Although digoxin use has decreased as new agents have become available, digoxin toxicity remains an important cause of ED presentation in geriatric patients and subsequent hospitalizations [14]. Emergency medicine physicians must remember to consider this diagnosis.

Acute digoxin toxicity is usually characterized by nausea, vomiting, abdominal pain, cardiac dysrhythmias, and changes in color vision. Chronic toxicity has predominance of neurologic symptoms such as weakness, fatigue, confusion, and delirium [10]. Arrhythmias are caused by increased intracellular calcium. Toxicity is more common in geriatric patients and is potentiated by hypokalemia, hypomagnesemia, hypercalcemia [11, 12], as well as many common medications [10]. Importantly, digoxin toxicity can occur at normal digoxin levels when hypercalcemia is present [11, 12]. However, there is no evidence to support the "stone heart theory" that states IV calcium is contraindicated in digoxin toxicity [15].

Supportive care with close cardiac monitoring for arrhythmias is the mainstay of treatment for digoxin toxicity. If an acute ingestion is known and the patient is awake, GI decontamination with activated charcoal can be considered [10]. Digoxin-specific antibody fragments (digoxin-Fab) are indicated in patients with chronic poisoning in cases of life-threatening arrhythmias, hyperkalemia, or hemodynamic

instability with an elevated digoxin concentration. It should also be given if there is an acute ingestion leading to poisoning. Rare, but important, side effects include heart failure, increased ventricular rate, and hypokalemia [16]. Elderly patients have variable responses to the antibody treatment and may require additional supportive treatments [17].

## Hypercalcemia

Hypercalcemia can cause a wide range of symptoms including but not limited to weakness, dehydration, polydipsia, confusion, hallucinations, hyporeflexia, hypertension, dysrhythmias, nausea, vomiting, and abdominal pain. EKG changes may be present: QT shortening, "coved" ST wave, and wide T wave. As above, beware of hypercalcemia's effect on digoxin [10].

Calcium levels above 14, regardless of symptoms, should be treated. The recommended treatments are [10]:

1. 0.9% normal saline at 500–1000 mL per hour for 2–4 h with titration to urine output or 2 L per day.
2. Furosemide to promote diuresis.
3. Correction of hypokalemia and hypomagnesemia if present.
4. Consider steroids to decrease absorption of calcium from bone, calcitonin or bisphosphonates based on cause, and hemodialysis.

## Dehydration

Hydration status is best measured by urine output [18]. Dehydration may cause reductions in alertness and ability to concentrate and increase in headache and fatigue [19]. It has also been implicated as the precipitating factor in urolithiasis, urinary tract infection, constipation, hypertension, venous thromboembolism, fatal coronary heart disease, stroke, dental disease, hyperosmolar hyperglycemic diabetic ketoacido-

sis, gallstone disease, mitral valve prolapse, and glaucoma [20]. Unsurprisingly, geriatricians believe that dehydration is a common precipitant for hospital admissions and it is associated with increased morbidity and mortality [18, 21].

Direct comparison of IV and oral rehydration has not been extensively studied in the geriatric population. The mental status, ability to tolerate oral rehydration, and urine output of each patient should be considered when choosing initial rehydration modality and during reassessment.

## *Brain Imaging*

In altered older adults, such as Berta, CT brain imaging is an important component of evaluation as intracranial etiologies are one of the most common causes of AMS in this group [22]. CT brain imaging is also an important diagnostic tool in older adults after minor trauma, as clinical decision tools are not as robust as in younger populations [23]. Accordingly, common CT head imaging decision tools such as the Canadian Heat CT Rules [24], New Orleans Criteria [25], and the NEXUS criteria [26] include older age as a trigger for head CT in minor trauma. Current research is ongoing on geriatric-specific head CT indications after trauma including anticoagulation [27, 28] and the utility of repeat head CT to assess for delayed traumatic intracranial bleeding [29].

## *Physical Therapy and Occupational Therapy*

Patients who are discharged home and are unable to safely function are at risk for falls and return ED visits [30]. Both physical therapy and occupational therapy can be beneficial as self-reported mobility [31] and ability to perform activities of daily living are often overestimated by elderly patients [32, 33]. Physical therapy and occupational therapy evaluations, in both the ED and inpatient settings, can help establish true abilities and aid in safe disposition planning.

## *Social Work*

Geriatric patients often present to the ED with nonmedical problems that can affect their health such as poverty, social isolation, elder abuse, difficulty walking, lack of transportation, difficulty scheduling a doctor's appointment, difficulty getting prescriptions filled, and lack of dental care [34–38]. These and other "social syndromes" may increase inpatient mortality [39]. Social workers can link patients to community resources that may help avoid a hospitalization during their current ED visit or prevent future ED visits [40]. Additionally, social workers can assist in cases of suspected elder abuse, a diagnosis that is often missed by ED physicians [35, 41].

## *Geriatrics Consult*

Comprehensive geriatrics consults in the ED are feasible [42] and reduce hospital admissions [43]. Geriatrics consults decrease polypharmacy in inpatients [44] and improve functional outcomes in inpatient trauma patients [45], and these benefits may extend to elderly ED trauma patients being considered for discharge. If geriatrics consults are available in your ED or observation unit, learn what the capabilities are and consider it in appropriate patients.

## *Disposition*

Carefully consider if your geriatric patient requires hospitalization or if their needs could be met as an outpatient or in an observation unit. Hospital admission is associated with decreased function status [46–48], delirium [47, 48], and pressure ulcers [47, 48]. Collectively, these outcomes are associated with longer hospital length of stay, higher medical costs, and higher mortality [47].

Meaningful and impactful geriatric evaluations including PT, OT, social work, and geriatrician evaluation can be per-

formed in the ED [49] or an observation unit [42] if this is available at your hospital. These programs can prevent hospital admissions while linking geriatric patients to high-yield resources prior to discharge home. While geriatric patients felt to be high-risk are often excluded from observation protocols, many could be cared for in an observation unit [50].

## *Caregiver Burden*

Berta's son expressed guilt over his mother's presentation. In her son and other formal and informal caregivers, physicians must not overlook caregiver burden. Families often care for older adults with complex medical problems and social syndromes. The savings associated with family providing care is over $50,000 annually compared to paid caregivers [51]. Caregiver burden is common in those helping chronically ill older adults, with 40% of caregivers reporting high burden [52]. These caregivers report feeling abandoned and unrecognized by the healthcare system [53]. You can help by integrating the caregiver into the care team, ensuring caregivers are caring for themselves too, and educating them on available resources [54].

# Berta's Post-discharge Course

Berta was discharged home from the hospital at her baseline mental status. She was appreciative for the resources provided and agreed to go see her primary care doctor 1 week after discharge but call if she had questions or problems before then.

When she saw her primary care doctor 1 week later, Berta was at her baseline mental status and again thriving at home. She was performing her own activities of daily living again. She had in-home PT several times per week to assist with strengthening after her hospital stay, and she was taking advantage of community transportation options so that she did not have to burden her family.

## Key Points

- Consider geriatric-specific factors or syndromes that may have led to the patient's presentation, and mobilize appropriate resources for success at discharge.
- Digoxin (and other medications) that a patient is supposed to be on could be contributing to their presentation; utilize medication review on every geriatric patient.
- Utilize other professionals including social work, physical therapy, and occupational therapy to establish a safe disposition plan.

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# Chapter 10
## Identifying Fall Risk in the Emergency Department

**Chirley M. Rodriguez**

**Case**

Gladys is an 84-year-old woman with a past medical history significant for hypertension, hyperlipidemia, and type 2 diabetes mellitus. She was brought to the emergency department (ED) by ambulance for a wound on her left lower extremity. She states that she lost her balance while walking and bumped her leg on the corner of a coffee table. At first, she wasn't concerned since she thought it was just a small abrasion. However, by the next day, it had become red and uncomfortable.

Gladys has had long-standing diabetes complicated by neuropathy as well as retinopathy. Although she ambulates independently, she reports feeling clumsy with her feet at times. It is a common occurrence for her to grab furniture or walls while ambulating in order to maintain balance; it is especially difficult for her to walk

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at night. Recently, Gladys was diagnosed with a lumbar compression fracture, and she has noted increased difficulty with walking. She lives in a two-story home with her elderly husband, and she is very concerned about falling. Whenever she goes up stairs, she feels like she is holding on for her life.

Gladys is unable to list her current medications and cannot recall if she took any this morning. She mentions that her daughter and son-in-law typically organize her pill box, but they had to travel unexpectedly for personal reasons.

On physical exam, she is noted to have an oral temperature of 98.6 °F, heart rate of 78, respiratory rate of 14, and blood pressure of 156/70. She is thin and is wearing glasses. She is well-groomed, and she is comfortably resting in the bed. Cardiac exam is notable for a 3/5 systolic crescendo decrescendo murmur in the aortic region. She has clear lung sounds in all fields. Her lower extremities are without gross deformity. Her left lower extremity has a healing area of desquamation with surrounding erythema over the lateral calf. The area is tender but without associated purulent drainage, induration, or fluctuance. It measures approximately $8 \times 5$ cm.

X-ray of the lower extremity reveals no fractures. Lab results are notable for glucose of 243 mg/dL and leukocytosis to 13.1. Gladys is diagnosed with cellulitis of her left lower extremity. She is given IV cefazolin in the emergency department and a prescription for oral cephalexin as an outpatient. Prior to discharge, Gladys's nurse cleans the abraded area and applies a dressing while instructing Gladys how to do the same at home. Gladys mentions to the nurse that she does not have anyone to pick her up from the hospital or take her to the pharmacy to get her new prescription filled. Because the ED is busy, and the bed is needed for other patients,

her nurse suggests that social work meet Gladys in the lobby after discharge to assist her with these matters. Gladys is agreeable and tries to get out of bed with notable difficulty. She is able to stand up, but she needs to grab onto furniture and railings to stabilize herself. This is the first time Gladys is ambulating in the department, and the bedside nurse is now second guessing the discharge plan.

## Geriatric ED Evaluation

The bedside nurse alerts the emergency physician, who in turn evaluates Gladys with a quick Timed Up and Go Test. It takes 36 s for her to stand up, walk 10 ft, turn around, and sit down. Since any result >12 s is concerning for gait problems, her discharge is postponed. Physical therapy is consulted in the ED. The physical therapist recommends a walker and home physical therapy, which both Gladys and the physician feel comfortable with. The social worker meets with Gladys and is able to coordinate therapy and a ride home for Gladys. She realizes it will likely be difficult for Gladys to fill her prescription, so she faxes the prescription to the hospital's outpatient pharmacy and is able to have it filled prior to discharging Gladys home.

### Background

The US population is rapidly aging. By 2030 one out of every five Americans will be an older adult. By 2050 Americans aged 65 or older will number nearly 89 million people or more than double the number of older adults in the United States in 2010 [1]. As the population ages, the needs and quality of life of this growing population need to be addressed. Because of progression of comorbid conditions and economic and social pressures, older adults use healthcare resources,

particularly the ED, more frequently than younger adults [2]. The emergency department is a primary point of contact for these patients to be evaluated and can serve as a key place for medical and social issues to be identified and addressed [3].

Falls are a common problem for older adults which can lead to significant morbidity and increased healthcare costs for older adults. The CDC estimates that more than one out of four adults 65 years and older fall each year, and 2.8 million of these older adults are treated in the ED for fall-related injuries [4]. Furthermore, 800,000 elderly patients require hospitalizations for fall injuries [4]. Costs attributable to falls in 2015 alone were estimated at approximately $50 billion for both those that were fatal and nonfatal [5].

Though not typically evaluated in the ED, identification of risk factors for falls in older adults can have important implications on patients' long-term quality of life [6]. Sometimes these risk factors are clear and related to the chief complaint. But often they are subtler and may even be actively concealed by the patient. Elderly patients may be battling depression, issues with mortality, and fear of loss of independence which may prompt them to hide previous falls or other risk factors. In order to maintain patients' quality of life and prolong their independence, it is important for the ED team to evaluate risks for future falls.

## How to Identify Fall Risk in the ED

The CDC offers an algorithm for fall risk screening, assessment, and intervention as part of the initiative Stopping Elderly Accidents, Deaths, and Injuries (STEADI) [1]. The STEADI algorithm begins with screening questions and identifying the number of falls within the past year, focusing on identifying issues with gait, strength, and balance, and finally recommending various interventions based on risk stratification including physical therapy for patients in moderate- and high-risk groups **(**Fig. 10.1**)**. It was developed for use in the outpatient clinic but is extremely useful in the ED as well.
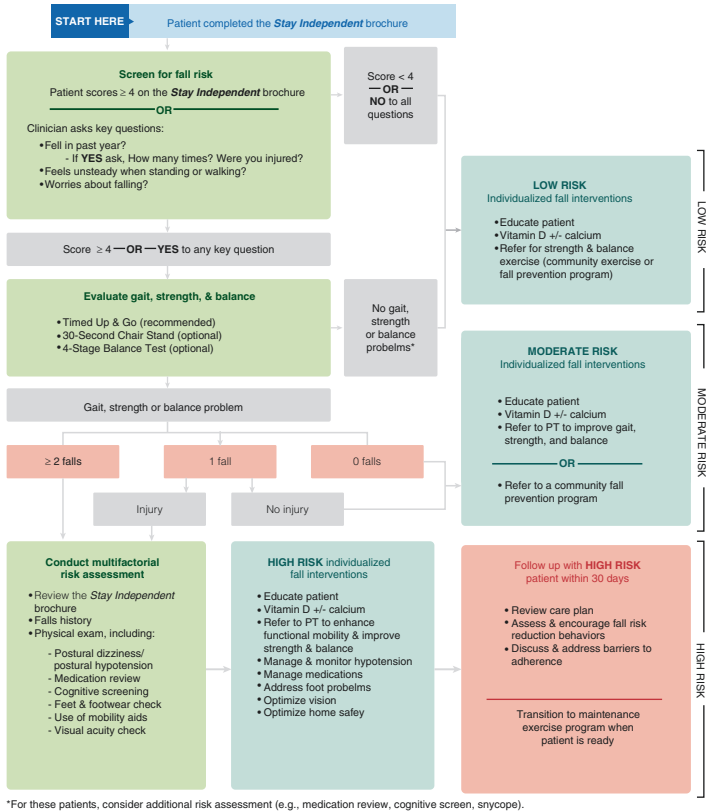
FIGURE 10.1 CDC Stopping Elderly Accidents, Deaths, and Injuries (STEADI) algorithm [5]

## Step 1: Screening

A number of fall risk screening questionnaires have been proposed for use in the ED. The fall risk questionnaire used in the STEADI program's *Stay Independent* brochure was developed in a US Veteran community and assisted living population [4]. The *Stay Independent* screening was later evaluated in a US and Thai ED. Although the whole screen was not found to be predictive of fall within

6 months, return to the ED, hospitalization, or a composite score, some of the individual questions were associated with an increased risk of falls. Those questions were having fallen in the past year, using or having been advised to use a cane or walker to get around safely, feeling unsteady when walking, having to rush to the toilet, having lost some feeling in the feet, and taking medication that sometimes causes light-headedness or fatigue [7].

*STEADI Stay Independent Screen* [4, 8]*:*

- *I have fallen in the past year (2 points).*
- *I use or have been advised to use a cane or walker to get around safely (2 points).*
- *Sometimes I feel unsteady when I am walking (1 point).*
- *I steady myself by holding onto furniture when walking at home (1 point).*
- *I am worried about falling (1 point).*
- *I need to push with my hands to stand up from a chair (1 point).*
- *I have trouble stepping up onto a curb (1 point).*
- *I often have to rush to the toilet (1 point).*
- *I have lost some feeling in my feet (1 point).*
- *I take medicine that sometimes makes me feel light-headed or more tired than usual (1 point).*
- *I often feel sad or depressed (1 point).*
- *Interpretation: ≥4 points indicate increased risk for falls.*

Additional screens which have been developed for use in the ED include the Carpenter score which identified non-healing foot sores, any fall within the past year, inability to cut one's own toenails, and self-reported depression as risk factors for falls [9]. The Tiedemann scale evaluates for two or more falls within the past year and if the patient takes six or more medications [10].

*Carpenter Score* [9]:

- *Presence of nonhealing foot sore?*
- *Any fall in last 12 months?*
- *Inability to cut own toenails?*

- *Self-reported depression?*
- *Interpretation ≥1 "yes" responses is a community-dwelling older adult at increased risk for falls.*

  *Tiedemann Score* [10]*:*

- *Two or more falls in the past year? (2 points).*
- *Take six or more medications? (1 point).*
- *Interpretation Score ≥2 indicates older adult at increased risk for falls.*

## Step 2: Functional Testing

The purpose of screening is to identify patients who are at moderate-to-high risk of falling in the near future. Once patients at moderate to high risk are identified, either through screening (as recommended by the STEADI program) or gestalt, functional testing can be performed. One recommended functional assessment is the Timed Up and Go test (TUG) [11]. In order to perform the TUG test, the provider has the patient sit in a standard chair. The patient is asked to stand up from a seated position, walk 10 ft, turn, walk back, and sit down in the chair. The clinician is not only timing the patient but also observing postural stability, gait, and arm swing. It is also important for the provider to stand near the patient for safety. An older adult that takes 12 s or greater to complete the test is considered to be at risk for falling.

Other assessments include the 30 s chair stand and four-stage balance tests [12, 13]. The 30 s chair stand test is used to test leg strength and endurance. In order to perform this assessment, the patient is seated in the middle of a straight back chair without arm rests. The patient is instructed by the clinician to cross their arms across the chest, place hands over the opposite shoulder, and to keep the arms resting on the chest. The patient is to keep their feet flat on the ground with their back straight. The clinician, standing next to the patient,

will say "go" signaling the patient to rise to a full standing position and sit back down repetitively. This standing and sitting is timed and continues for 30 s while the provider counts the number of times the patient stands. Scoring is based on age and gender averages. Any score below the average indicates a risk for falls.

## Thirty Second Chair Stand Test Averages [14]

| AGE | MEN | WOMEN |
| --- | --- | --- |
| 60-64 | < 14 | < 12 |
| 65-69 | < 12 | < 11 |
| 70-74 | < 12 | < 10 |
| 75-79 | < 11 | < 10 |
| 80-84 | < 10 | < 9 |
| 85-89 | < 8 | < 8 |
| 90-94 | < 7 | < 4 |

A below average score indicates a risk for falls.

The four-stage balance test can be used to assess static balance [13]. In this assessment the patient is taken through four standing positions, each more difficult to maintain than the prior. The provider demonstrates each position for the patient and stands beside the patient for safety. If the patient can successfully hold the position for 10 s without the need for support or moving their feet, then the next position is attempted. If unable to hold for 10 s, the test is stopped. The first position is with the feet side by side; second is with the instep of 1 ft touching the big toe of the other foot; third is a tandem stand with 1 ft in front of the other, heel touching toe; and fourth is standing on 1 ft. Those unable to hold any of the first three positions for at least 10 s are at increased risk of falling.

## Four-Stage Balance Test [15]

| | | |
|---|---|---|
| | ① Stand with your feet side-by-side. | Time: _____seconds |
| | ② Place the instep of one foot so it is touching the big toe of the other foot. | Time:_____seconds |
| | ③ Tandem stand: Place one foot in front of the other, heel touching toe. | Time:_____seconds |
| | ④ Stand on one foot. | Time:_____seconds |

Finally, assessment for orthostatic hypotension may identify particular modifiable risk factors for falls. After the patient lies down for 5 min, the blood pressure and pulse should be measured. The patient should then stand and the pulse and blood pressure should be repeated. The standing blood pressure and pulse should then be repeated in 1 and 3 min. If the patient experiences light-headedness, a drop of systolic blood pressure $\geq$20 mmHg, or a drop of diastolic blood pressure of $\geq$10 mmHg, the patient may be at risk for falls.

### Step 3: Intervene

When patients are identified as high risk for falls, additional measures should be put into place. When gait, strength, or balance issues are identified in the ED, referral to physical therapy in the ED or as an outpatient is likely warranted. Additionally, community exercise or fall prevention programs may be available and may be beneficial for some patients. Some patients may benefit from appropriate assist devices such as a cane or walker. Others may benefit from home or outpatient PT, inpatient rehabilitation, or subacute rehabilitation. In some cases, inpatient or observation hospitalization may be necessary to facilitate initiation of inpatient or subacute rehabilitation. In these scenarios formal consultation by a physical therapist is beneficial.

When patients are identified as having orthostatic hypotension, evaluating the patient's fluid intake and medication lists for medications which may be high risk for orthostatic hypotension should commence. In some EDs, pharmacists can help review the patient's medications to identify possible changes. All changes to home medications should be discussed with the original prescribing physician or the patients' primary care physician if possible.

In this case Gladys is a seemingly capable and independent elderly woman: she is well-groomed, she answers questions appropriately, and she reportedly lives independently with her husband. Without a formal complaint to the physician, there are many risk factors in her story that are likely to be missed or overlooked during the encounter. Because Gladys arrived via ambulance and was evaluated for cellulitis, her gait was never assessed during the visit. Her gait, although seemingly unrelated to her chief complaint, is fundamental to her well-being and quality of life. After identifying Gladys's gait instability, it is appropriate for the bedside nurse to question discharging this elderly woman back to her multilevel home without further evaluation.

Gladys' fall risk and lack of access to her medications were ultimately identified and addressed prior to discharge but were nearly missed. She could have been sent home without the ability to fill her antibiotic prescription, and she could have had worsening of her infection. Worsening infection could further increase her risk of falls and easily could have led to a poor outcome. A multidisciplinary approach to ED care for older adults like Gladys early on may have helped avoid these near misses.

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# Chapter 11
## Capacity, Advanced Planning, and Buying Time

**Hashim Q. Zaidi**

**Case Introduction**
Ellen Roosevelt is an 89-year-old female with a medical history of coronary artery disease, hypertension, hyperlipidemia, and Alzheimer's dementia who is brought in the emergency department (ED) by emergency medical services (EMS) from her nursing home for mental status changes. EMS reports they were called to the facility where she resides after her nursing aide reported she has not been eating or drinking well for the last few days. Today she was noted to be less responsive to questions from staff. She was found to have a fever of 102 °F and was tachypneic and hypoxic. When you, as the emergency department (ED) care team member, examine her, you see an ill-appearing, cachectic, elderly female who is tachypneic and intermittently moaning in

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response to your questions. She withdraws from painful stimuli. She has pooled secretions in the back of her oropharynx and does not appear to have a gag reflex. She is hypotensive with pressure of 80/50 mmHg and is requiring 10 l of oxygen via nonrebreather mask to keep her oxygen saturation above 90%.

Your electronic medical records note the patient has been admitted multiple times over the last year for pneumonia and urinary tract infections, all treated with antibiotics to resolution. She has never been intubated in your facility. In the most recent hospital discharge summary, it is noted that she was listed as "Do Not Resuscitate (DNR)/Do Not Intubate (DNI)," a change from previous admissions, but it does not elaborate much further. The records also list the patient's adult sister as her designated healthcare power of attorney (POA).

EMS brings paperwork from the nursing home which includes her facility-administered medication list. There is documentation from the facility that also supports she is listed as "DNR/DNI" under the facility's code status. She is accompanied by another resident from the facility who identifies herself as a long-time friend of Ellen Roosevelt. When you inquire about care preferences or advance directives, she believes there may be a written set of advance directives as well as specific wishes on what she wanted done if she was gravely ill. She believes they may reside with her adult living sister but does not know what they state. She urges you to do everything you can to help her friend get well again. She informs you the patient is a widow with no living children and one adult sibling who has been designated as her POA. They do not know of any Practitioner Orders for Life-Sustaining Therapy (POLST) forms applicable to the patient.

Ms. Roosevelt has intravenous (IV) fluids started with basic labs sent off. A high-flow nasal cannula is applied to help comfortably oxygenate her which she tolerates well and improved her oxygen saturations to 94%. She is sat up to 30°, so her secretions do not bother her or pool in the back of her throat, and pillows used provide lumbar and neck support. She is given rectal acetaminophen with improvement in her fever. A chest X-ray reveals a right lower lobe pneumonia. She is started on antibiotics for the pneumonia. Given her oxygen requirement, the charge nurse is concerned that the general medicine floor will not admit her. Given the reported DNR/DNI status, the emergency physician does not want to intubate her or admit her to the intensive care unit (ICU). How should the emergency department team proceed? What interventions should or should not be performed in the acute setting given her clinical status, recent medical history, and reported desires? What advance care directive considerations should be taken into account in the emergency department or if the patient goes to the intensive care unit?

## Capacity and Competence

One of the challenges facing clinicians in situations similar to that presented in the case example is determining if the patient has decision-making capacity. In the example above where the patient's clinical status is such that she is unable to communicate, it becomes straightforward to conclude she does not have the capacity to make her own medical decisions. Consider, however, if the patient had been verbally responsive or perhaps even able to hold a dialogue; the physician is obligated legally and ethically to determine if the patient has decision-making capacity.

The definition of capacity is broad reaching, context dependent, and often elusive. Additionally, capacity is often interchanged with competence in medical and legal literature. To standardize the terminology in this text, we will define capacity as "a threshold requirement for persons to retain the power to make decisions for themselves" [1]. Capacity in this sense refers to the ability to understand relevant information, communicate a choice, appreciate a situation and its consequences, and reason about treatment choices [2].

Competence is a term that is often interchanged with capacity in the medical setting. It is vital to distinguish medical capacity from the judicial use of word competency. As a legal term, competency refers to an individual's sufficient ability in a broad sense to make legally recognized rational acts such as enter legal pleas, vote, prepare a will, testify, and make their own medical decisions [3].

Medical decision-making capacity is often determined by a physician and includes elements of the relevant criteria as seen in Table 11.1 [2]. Medical decision-making capacity is a dynamic process that is determined by many factors. A patient may not have medical decision-making capacity at one point in time, but a change in clinical status at a later point may reverse that. In addition, a patient may have capacity in one decision but not in another depending on the nature and potential consequences of the decision in question [5]. For example, a patient may be deemed to have capacity for a decision such as choosing the route of antibiotics for a low-risk infection in the emergency department but may not have decision-making capacity to refuse antibiotics all together if they are lacking in appreciating the situation and its consequences. Physicians caring for a patient in the acute setting have the added difficulty of having to determine decision-making capacity for complex far-reaching decisions in a short span of time. Hasty decisions without careful considerations to the principles of beneficence, nonmaleficence,

and justice within the limitations of that patient's decision-making capacity may lead to compromised patient safety or autonomy.

TABLE 11.1 Definitions of the four decision-making abilities and the clinical characteristics of these abilities in the setting of older patients with dementia

| Ability | Definition | Clinical Characteristics |
| --- | --- | --- |
| Understanding | The ability to comprehend basic information about a problem, its potential solutions, and the risks and benefits associated with those solutions | This ability is often highly impaired in the setting of mild- to moderate-stage dementia benefits associated with those solutions<br><br>May be influenced by level of education and intelligence and how information is presented |
| Appreciation | The ability of a person to recognize how a problem or solution pertains to his or her specific situation | Impairments manifest as a loss of insight or behaviors of denial in the clinical setting<br><br>Depending on the type and complexity of the decision, the range of impairment may vary considerably among patients with mild- to moderate-stage dementia |

TABLE 11.1 (continued)

| Ability | Definition | Clinical Characteristics |
|---------|-----------|--------------------------|
| Reasoning | The ability to consider potential solutions to problems by: | This ability is frequently impaired in mild and especially in moderate stages of dementia |
| | 1. Demonstrating how one solution is better in comparison to another | Performance in this ability may decline rapidly along with the progression of cognitive decline |
| | 2. Describing how a solution would affect his or her everyday life | |
| | 3. Demonstrating a logical thought process in determining a choice | |
| Expressing a choice | The ability to render a clear choice for the decision under consideration | Impairment is often preserved despite the presence of impairments in other decisional abilities and, when present, is associated with more advanced stages of dementia |

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Determining decision-making capacity is a challenge given the time constraints encountered in the emergency department. However, it remains a critical component of care provided and has far-reaching consequences. Often a determination of medical decision-making capacity in the ED will

persist until a change in the patient's mental status or ability to communicate. Occasionally, a more formal evaluation by a psychiatrist or ethics board will alter capacity decisions. The process for determining medical decision-making capacity may be influenced by local laws; therefore, local definitions for medical decision-making capacity as well as the institutional process should be well understood or reviewed when deciding if a patient has medical decision-making capacity.

When determining capacity, it is important to identify the patient's ability to express a choice, understand, appreciate, and reason [2, 6]. For example, if Ms. Roosevelt was awake and was able to express she did not want an IV placed, she would be expressing a choice. Patients may be able to express a choice such as with as much as yes or no answers, a nod, or even a grunt. Stability of choice is also something to be noted by the clinical team; patients may change their mind about decision, but an individual changing their mind minute to minute may not be adequately showing evidence of expressing a clear decision. Patients with thought, memory, speech, auditory, or cognitive disorders may have a preference or choice but may have difficulty expressing that choice. Reasonable efforts should be made to involve these patients to probe for a communicable preference or decision, but this again may be hindered by time constraints in the emergency department. For many older adults, a choice may be present but not known to the care team until effective communication is established through hearing amplification or translation into the patient's native language.

Despite being able to express a choice, decisional capacity may not be present if patients cannot express understanding of their current situation, appreciate the risks and benefits of the proposed choices, or reason through options logically. If Ms. Roosevelt is able to express that IVs are painful and expresses her choice that she does not want one, the conversation should advance to inquire if she understands why the medical team recommends IV access, what is her current medical state, what the other options are, and the risks of refusing the said intervention. Given that the ED is often

filled with uncertainty, it frequently falls to clinicians in the ED to explain what the medical evaluation reveals or what the team is concerned about. One method is to discuss the situation, the decision to be made, and its risks, benefits, and alternatives with the patient and see if the patient is conducting logical reasoning with gentle probing. Asking them once again what their preference is, what they understand of what they have been told, and how they came to their decision can help clarify some of the above components. This series of questions not only determines the patient's ability to understand relevant information but also if they can appreciate the situation as well as its consequences. In terms of their ability to reason, the clinician must analyze the process by which a patient reaches their concluding choice, not necessarily the choice itself. How did the patient come to their answer? Does their logic weigh why one option is better than another? What important pieces of information are they able to manipulate to come to a conclusion and do they align appropriately with the current situation?

A common fallacy in determining capacity is presuming underlying cognitive or psychiatric disorders preemptively exclude patients from decision-making capacity. Physicians have been shown to often believe patients with dementia, depression, or psychosis or under involuntary commitment lack decision-making capacity without evaluation or consideration of the decision in question [7]. These patients cannot be presumed to lack capacity until thought is given toward the components of capacity they preserve and those they lack. For example, a patient with a chronic stable underlying psychotic disorder may have decision-making capacity in regard to many healthcare decisions. Scrutiny is required, and a higher standard for capacity is needed in a high-risk situation with increased chances for an adverse outcome.

To provide a more structured assessment of capacity, several validated decision-making tools have been developed such as the MacArthur Competence Assessment Tool for Treatment (MacCAT-T) [8]. The interview typically takes

15–20 min and involves the clinical course beginning with the nature of the medical condition, treatment recommendation, risks, benefits, and alternatives and is followed by asking probing questions that delve into the patient's ability to choose, understand, appreciate, and reason through a medical decision. However, standardized tools, such as the MacCAT-T, are not practical for use in the ED. Alternatively, the CURVES assessment tool provides an abbreviated screen more appropriate for the ED [9].

This mnemonic being developed helps to consolidate some of the integral aspects to answer for a capacity assessment (Fig. 11.1). The "Emergency" and "Surrogate" aspects help to frame the assessment for the acute setting to weigh imminent risk to the patient and if surrogate decision-making is available. It is important to recognize that in the acute setting being able to communicate with a surrogate decision-maker can help clarify goals of care and should be reasonably attempted by providers but also depends on the acuity of the situation and availability of the surrogate. It should be noted that surrogates include advance healthcare directives. When available these documents should be located and reviewed.



Does the patient have decision-making capacity?

**Choose and Communicate** - Can the patient communicate a choice?

**Understand-** Does the patient understand the risks, benefits, alternatives, and consequences of the decision?

**Reason -** Is the patient able to reason and provide logical explanations for the decision?

**Value -** Is the decision in accordance with the patient's value system?

Can emergency treatment without informed consent be provided?

**Emergency -** Is there a serious and imminent risk to the patient's well-being?

**Surrogate-** Is there a surrogate decision-maker available?

FIGURE 11.1 Mnemonic for the assessment of decision-making capacity and provision of emergency treatment. A patient lacks capacity if any of the prerequisite abilities (to choose and communicate, understand, reason, or value a decision) are absent. If a patient lacks capacity in an emergent situation and no surrogate decision-maker is available, then emergency treatment without informed consent may be provided for a medically warranted course of action. (Reprinted from Chow et al. [9], Page 423. Copyright 2010 with permission from Elsevier)

## Advance Care Planning

Advance care planning is a process that helps support adults of any age or health state understand and share their personal values, life goals, and preferences regarding future medical care [10]. This process helps to inform and empower patients about current and future medical care options. The goal of advance care planning (ACP) is to ensure that medical care is in line with the patient's values, goals, and preferences. ACP is particularly important near the end of life. This can help patients to receive quality end of life care which includes five valued components: adequate pain and symptom management, avoiding inappropriate prolonging of dying, achieving a sense of control, relieving burden, and strengthening relationships with loved ones [11]. Advance care planning is a proactive, continuous process between a patient and their healthcare team. However, the term is often conflated with a set of documents known as advance directives. Advance directives, sometimes called as a living will, are documents to help outline care preferences and are completed while a patient has decisional capacity and is able to express those wishes. The contents of these documents are highly variable and may contain generalities about what a patient would or would not prefer up to highly specific contents on specific interventions. There are advantages and disadvantages for each of the advance directive formats available [12].

Advance directives are simply one set of tools to assist with advance care planning and help to document a patient's wishes. Since the passage of the Patient Self Determination Act of 1990, mandating that all Medicare-certified institutions provide information regarding patients' right to formulate advance directives, use of advance directives has been increasing [13]. Advance directives may be effective in reducing hospitalization and chances of dying in a hospital, decreasing the use of life-sustaining (or death-prolonging) treatment, and increasing the use of palliative and hospice care. However, simply having advance directives does not

necessarily guarantee improved outcomes. The impact of advance directives depends on the type of advance directive a patient has completed and how ACP has been implemented overall [14].

## *Durable Power of Attorney for Healthcare and Living Wills*

Several types of advance directives exist to help a patient clarify their wishes, and an emergency care provider may see one or more of these with a patient presenting to the ED in the United States. One of the most prevalent advance directive forms is the Durable Power of Attorney for Healthcare (DPAHC). This legal document may go by several different names depending on the state nomenclature including "Healthcare Proxy" or "Healthcare Power of Attorney" or "Medical Power of Attorney," but the contents are relatively similar. This type of form is a signed legal document authorizing another person to make medical decisions on a patient's behalf if they lack the ability or capacity to do so for themselves [15]. These forms can be state specific in the United States and may be combined with other components of advance directives. An example of a Power of Attorney for Healthcare for the State of Illinois can be seen in Fig. 11.2. One component often included in many DPAHC forms is a living will. The living will is a document that often helps outline a patient's wishes in specific medical circumstances. Commonly, it works to help clarify invasive resuscitation or prolonged life-support situations. This may be variable from state to state as well as patient to patient, and clinicians should be familiar with the state and local legal statutes surrounding validity and applicability of these documents.

Early studies of advance directives and the early formats of advance care planning failed to show meaningful improvement in important outcomes such as mechanical ventilation, days spent in the ICU, or reported pain [16]. Since then, however, an increased movement toward advance care planning

FIGURE 11.2  A sample of a healthcare power of attorney form from the State of Illinois

beyond a single document or discussion has been promoted to help a patient and family members understand what their own wishes are in a complex medical situation and how to express them to healthcare providers. More recent studies have shown that advance care planning, particularly in the form of meaningful discussions in conjunction with well-documented advance directives, helps patients receive care that is in line with their wishes and may help to reduce family stress, anxiety, and depression [13, 17]. Studies of bereaved family members also report greater hospice use and improved communication with healthcare providers when advance directives are involved [18].

The challenges with advance directives are multiple and also lie at the heart of the issue of attempting to plan end of life care, i.e., patient and their loved ones often don't know what they want for end of life care. Beyond the educational hurdles to be conquered before making informed planning decisions, even when that education is supplied, it may not stimulate informed advance care planning [19, 20]. If advance care planning does proceed, these preferences can be variable

and may quickly change when hospitalization or illness occurs [21]. Additionally, physicians have difficulty extrapolating end of life preferences from advance directives; interestingly this was worse in primary physicians and more accurate in the emergency or critical care physicians that had never met the patient before [22]. This is also amplified in difficult clinical scenarios resulting in physicians frequently making treatment decisions not consistent with an explicit advance directive [23]. Though advance directives have not delivered the silver bullet for improving end of life care, they can be used as a foundation to help build advance care planning and lead to high-quality end of life care.

## *Surrogates*

Surrogate decision-making or "alternate decision-maker" is anyone exercising decisional authority on behalf of an incapacitated patient. This may be an appointee by a court, by a patient's advance directive, or by DPAHC or a default surrogate depending on the situation. All US states honor the DPAHC or equivalent as well as court-appointed surrogate decision-maker. The DPAHC is described above in which a patient with decisional capacity identifies whom they would prefer to make decisions on their behalf should they lose capacity. Because advance directives are frequently not completed, surrogate decision-makers are often assigned via legal statute [24, 25]. Significant variability arises between state differences in the "surrogacy ladder" and with the terminology used between states and districts in the United States. Among the 50 US states and District of Columbia, 41 jurisdictions have a provision for appointment of a default surrogate for medical decision-making in the absence of an agent [25]. Of those, 35 establish a surrogate hierarchy with the highest priority given to spouse, children, or parents. Seven states provide for a domestic partner or common-law spouse to become surrogate decision-makers and allow for same-sex partners to occupy one of the top rungs. Physicians should

carefully familiarize and stay up to date with their local practices for surrogate decision-makers. Six states require the surrogate decision-making hierarchy only be invoked in special circumstances, and four have no provisions on default surrogate decision-making. It is imperative the treating clinician be aware of local and state statutes regarding default surrogate decision-makers.

In the acute setting, it can be difficult to identify or contact the default surrogate decision-makers. In the clinical example above, most states, given no spouse or children, would default her sister as her decision-maker. This, however, could be overridden by specific, legally valid advance directives such as a DPAHC that employs a friend or significant other in the decision-making role instead of the default surrogate decision-maker. Of note, significant others not legally married or with a DPAHC may not be given the same rights of default surrogate depending on the state and local statutes. Not surprisingly, these situations can become complicated, and physicians should always avail themselves to the hospital ethics or risk management team in times of uncertainty. Figure 11.3 provides a general hier-



- Patient with Decisional Capacity
- Court Appointed Healthcare Agent
- Designated Healthcare Power of Attorney
- Default Surrogate Decision Maker (Varies by State/District)
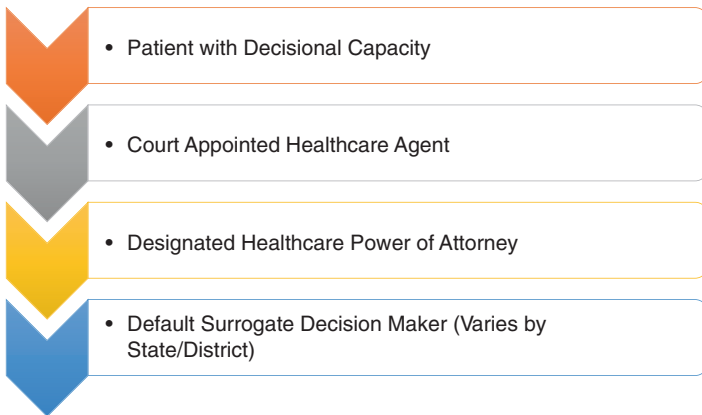
FIGURE 11.3 Hierarchy of decision-makers beginning from a patient with decisional capacity to the default surrogate decision-maker

archy of surrogate decision-makers following a patient with decisional capacity.

## *POLST*

Advance directives have a wide range of forms as described above and can have limited use in the acute setting [26]. Patients and families often struggle with a multitude of choices even preceding end of life care, and the acute setting is often a suboptimal environment to establish meaningful discussions with patients or family members.

To standardize the instructions for healthcare professionals when death was imminent, the Physician Orders for Life-Sustaining Treatment (POLST) was developed [27]. The POLST form (Fig. 11.4) sought to standardized portable medical orders for patients with progressive, chronic illnesses regarding life-sustaining medical treatment, including resuscitation, intubation, antibiotics, artificial nutrition, and hydration. The format gained increased favor and popularity among healthcare providers as it was thought to address many of the shortcomings in typical advance directives at the time as well as its ability to span a variety of settings, e.g., prehospital, ED, inpatient, nursing home, hospice, etc. [28]. POLST forms support a degree of individualization that helps clarify patient preferences to actionable medical orders with ease [29]. Additionally, POLST forms can be used by nonphysician facilitators to guide patients through the process of identifying what, if any, life-sustaining treatments they would want near death.

## End of Life Care Communication

Rather than simply filling out forms, advance care planning should bring together the person, individuals they trust in decision-making, and clinicians to support discussions about the patient's preferences regarding medical care. These discussions should match the level of discussion the patient finds

FIGURE 11.4 An example of a Physician Orders for Life-Sustaining Treatment (POLST) form from the State of Illinois available at http://www.polstil.org/

comfortable and should be revisited when health or life circumstances change [10]. End of life care discussion has been shown to decrease costs and promote a higher quality of death [30].

## *ED Goals of Care*

Advance care planning can help direct care in the ED if it is performed prior to an ED visit [14]. However, end of life care often brings patients to the emergency department. Up to 80% of cancer patients seek care in the ED in the last 6 months of life [31, 32]. The ED is often a difficult environment to begin a goal of care discussion much less an end of life one. Aside from prognostic uncertainty, logistical and time constraints, and lack of familiarity by the patient and family to the care team, many ED staff members are not trained in end of life care. Many providers report feeling underprepared and may feel the ED is an inappropriate place to conduct such care [33]. However, many critically ill patients in the ED have not had ACP discussions or do not have legal documentation. Though it is not the optimal site of ACP, discussions about advance care planning in the ED can go a long way to help identify and honor patients' wishes. The ED team should strive to provide care that is consistent with the patient's values and goals. The initial steps should be to identify or clarify any previous ACP and what the discussion has been to date with their primary physician or a specialist. The care team should inform the patient or surrogate decision-maker of their suspected diagnosis, prognosis, risks and benefits or treatment, and treatment alternatives. They should provide all options for care and treatment and attempt to connect the options back to any previously ACP and see if the current preferences align with previous preferences. Care values and goals can change dramatically moment to moment, and it should be noted not to assume they have remained unchanged in this particular acute setting.

One method to help clinicians walk through these steps is the "ABCD" method from the Education in Palliative and End-of-Life Care for Emergency Medicine (EPEC-EM) curriculum [34]. In this paradigm, A (advance care plan) refers to if there is an advance care plan available to review? B (better symptoms) asks if there can be better symptom control done to mitigate overwhelming symptoms such as dyspnea or

pain? C (caregivers) requests caregivers for information on the patient's clinical context and recent functional changes? And finally, D (decision-making) asks if the patient has decision-making capacity to discuss goals or is the legal surrogate identified and accessible? This model helps ED clinicians frame many of the difficulty questions that immediately apply to the acutely ill patient where end of life care may be needed.

## ED Interventions

Often the questions for the ED clinicians are related to choosing which interventions are appropriate for the patient? This is easy in the critically ill adult whose goals of care are to avail every medical therapy to prolong life or for the patient who has specified through clear advance directives that they should have comfort care only. The challenge lies in patients who may not have clear or any advance directives and are critically ill and there is uncertainty about what their goals are.

In our case example above, what should be done about Ms. Roosevelt's airway? What about fluids? Vasopressors? Antibiotics? One of the luxuries often not afforded in the ED is time to evaluate fully a patient's goals and care wishes and discuss with the family, friends, or long-term care providers to obtain that information. By identifying low-risk temporizing interventions, the ED team can help to facilitate appropriate care and be able to escalate or de-escalate care when and if the patient's goals of care are found to be clearer.

For Ms. Roosevelt, it would be appropriate to start an IV line, provide IV fluids, draw labs, and obtain basic data such as imaging and electrocardiogram. These are not only noninvasive for the large part but also help provide information on the diagnosis and prognosis of her condition. However, if she is tachypneic and hypoxic, has pooled secretions in the back of her oropharynx, and does not appear to have a gag reflex, it appears that she requires endotracheal intubation; however, because there is confusion about a previous DNR/DNI status,

it is not clear if that would honor Ms. Roosevelt's wishes. In situations like this, one useful tool for buying time for the ED care team is to initiate noninvasive ventilation for a short term while more information is gathered. While this is often seen for certain patients with reversible etiologies of respiratory failure with an adequate mental status, it may be appropriate in certain clinical situations after careful discussion with relevant decision-makers present with explicit parameters for its intentions, uses, and success and failure parameters [35]. If aspiration is a significant concern, alternatives can include nasal bi-level positive airway pressure (BiPAP) and high-flow nasal cannula to help provide positive pressure and oxygenation short of endotracheal intubation.

Antibiotics are a controversial area in palliative care particularly in the emergency department. Many providers see little to no harm in treating empirically until definitive goals of care can be achieved. This may be appropriate in certain situations, but side effects, increased resistance patterns, and no data to show palliative effects of symptoms all weigh against its hasty use [36]. Nearly 90% of hospitalized patients with advanced cancer receive antimicrobials in the week prior to their death and similarly with nearly a quarter of hospice patients [37, 38]. The ED is likely a prime area to improve appropriate antimicrobial use, and it begins with identifying the patient's goals of care and advocating for them. Evidence-based and goal-directed counselling about infections at the end of life should be a component of advance care planning. If a patient's goal is to maximize comfort, then it is reasonable to recommend no infectious evaluation and antimicrobial intervention. Adequate antipyretics, pain control, and symptom management should be identified as the priority in this case.

## Case Resolution

*After initiating high-flow nasal cannula, the ED physician contacts Ms. Roosevelt's sister, her only known living relative. She states she is the DPAHC and that on her last admission*

*her sister had made it clear she did not want invasive therapies if she had another pneumonia. She states that Ms. Roosevelt had started a living will with her sister and her primary physician but did not yet complete it. She states her sister was looking for comfort rather than more time spent in a hospital. They had discussed if she were to ever become critically ill, they would arrange for home hospice. With this information, the ED team is able to transition her to home hospice directly from the ED to her sister's residence for comfort measures.*

## Resources for Patients and Providers

American Association for the Advancement of Retired Persons Printable Advance Directive Forms: https://www.aarp.org/caregiving/financial-legal/free-printable-advance-directives/

Aging with Dignity (5 Wishes) forms: https://www.aging-withdignity.org/

CaringInfo- National Hospice and Palliative Care Organization: www.caringinfo.org

POLST- National POLST paradigm: www.polst.org

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