

Review Article

Preoperative Evaluation and Delirium Management of Older Adults in Hospital Settings

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A preoperative evaluation typically includes laboratory testing, imaging studies such as X-ray, computed tomography (CT) scan, electrocardiogram, or echocardiogram to appropriately evaluate the extent of injury, and risk stratification tools such as the Revised Cardiac Risk Index; however, older adults, particularly those with chronic cardiac, pulmonary, or renal multimorbidities may require a more thorough assessment to improve their surgical outcomes [1]. Below is a summary of the different areas of interest in the age-friendly approach to preoperative evaluation organized using the 5M's Geriatrics Framework, developed by specialists in 2017, to help optimize the care of older adults [1,2].

Mind

It is paramount to accurately establish a patient's baseline mentation during the preoperative evaluation. By collecting collateral information from caregivers, concerns for underlying cognitive impairment can be more easily identified, which can help define the level of involvement of family members and caregivers needed in the medical decision-making process [3]. It is also important to recognize if a patient is experiencing delirium while conducting the initial interview. Knowing and evaluating a patient's baseline cognition and screening for delirium informs the patient's medical decision-making capacity at that point in time, which is vital for obtaining informed consent for surgical procedures [3]. Delirium is an acute and fluctuating state typified by inattention, disorganized thinking, and altered mental status that is classified as hyper- or hypoactive, or mixed [4]. Increased age and cognitive impairment are pre-existing risk factors for delirium. Hospital admission also increases the incidence of delirium, as does acute medical or metabolic issues, being in an unfamiliar environment, lack of sleep or familiar routine, exposure to procedures, diagnostic testing, and anesthesia, prolonged nothing by mouth (NPO) status, and tethering with foley catheters, sequential sleeves, and telemetry (Table 1). Delirium can also prolong hospital stays, increase the likelihood of discharge to nursing homes, and increase morbidity and mortality [1,4,5].

The Confusion Assessment Method (CAM) Test is an effective screening tool for delirium. The CAM test evaluates attention using exercises such as reciting the days of the week backward, months of the year backward, or a series of numbers backward, known as the digit

Table 1: List of predisposing and precipitating risk factors for delirium in older adults.

Predisposing Risk Factors for Delirium	Precipitating Risk Factors for Delirium
<ul style="list-style-type: none"> • Age 65 or older • Male sex • History of delirium • History of cognitive impairment or dementia • Depression • Functional dependence • Immobility • Sedentary lifestyle • History of falls • Sensory impairment • Decreased oral intake • Dehydration • Malnutrition • Medications • Alcohol use • Multiple comorbidities • Chronic renal disease • Chronic hepatic disease • History of stroke • Neurologic disease • Metabolic derangements • Severe or terminal illness • Infection with human immunodeficiency virus 	<ul style="list-style-type: none"> • Sedative hypnotics • Narcotics • Anticholinergic drugs • Polypharmacy • Alcohol withdrawal • Drug withdrawal • Stroke • Intracranial bleeding • Meningitis/encephalitis • Infection • Hypoxia • Shock • Fever or hypothermia • Anemia • Metabolic derangements • Surgery • ICU admission • Physical restraints • Foley catheter • Pain or stress • Sleep deprivation
<p>Source: Inouye, S.K. Delirium in Older Persons. March 16, 2006. N Engl J Med 2006; 354:1157-1165. DOI: 10.1056/NEJMra052321</p>	

span. The UB- 2 Ultra-brief Delirium Screen (Figure 1) is sensitive and specific for diagnosing delirium and takes one minute to perform. If identified, steps should be taken to mitigate delirium, including a thorough review of home medications to identify commonly deliriogenic drugs, regulation and promotion of patient sleep/wake cycles and the implementation of supportive care measures that reiterate frequent reorientation and reassurance.

Because delirium is typically multifactorial in etiology, a multimodal strategy is most effective to mitigate the severity and shorten the duration of the course. Once recognized, patients should be medically optimized (evaluation for metabolic disturbances, infectious causes, and cardiopulmonary distress). Review current medications for not only those that are commonly deliriogenic, as mentioned above, but also for medications that cause withdrawal with abrupt discontinuation, such as gabapentin and benzodiazepines, and attempt to reduce medications when able. A bedside examination is vital to assess for potential stressors (i.e., peripheral intravenous lines,

<h2 style="text-align: center;">UB-2 Ultra-Brief Delirium Screen</h2>
<p>Before you begin, ensure the environment is as calm and quiet as possible and you are seated at eye level. Also, ensure the patient has sensory aids in place, if available, such as glasses, hearing aids or a translator if needed.</p>
<p>1: "Please tell me the day of the week" Patient may use visual aids in the room such as White Board, Calendar, Newspaper or personal watch or phone but cannot ask anyone in the room for the correct answer.</p> <p>2: "Please tell me the months of the year backward, starting with December" If the older adult does not seem to understand the task, an initial prompt for clarification to get them started is allowed. You may prompt with: "What is the month that comes before December?" If the older adult cannot continue after they have been given the initial clarifying prompt, mark as "incorrect".</p>
<p>1 or 2 incorrect answers is a positive screen concerning for delirium. The patient should be screened further using the remaining items of the UB-CAM to establish a diagnosis of delirium.</p>
<p>Adapted from the figure: "The Ultra-Brief Confusion Assessment Method (UB-CAM)" as part of original research articles: Armstrong B*, Habtemariam D* (*co-first), Husser E, Leslie DL, Boltz B, Jung Y, Fick DM, Inouye SK, Marcantonio ER**, Ngo LH** (**co-last). A mobile app for delirium screening. JAMA Open. 2021 May 20;4(2):ooab027. doi: 10.1093/jamiaopen/ooab027. eCollection 2021 Apr. PMID: PMC8446432 Marcantonio ER*, Fick DM* (co-first), Jung Y, Inouye SK, Boltz M, Leslie DL, Husser EK, Shrestha P, Moore A, Sulmonte K, Siuta J, Boustani M, Ngo LH. Comparative Implementation of a Brief App-Directed Protocol for Delirium Identification by Hospitalists, Nurses, and Nursing Assistants: A Cohort Study. Ann Intern Med. 2022 Jan;175(1):65-73. doi: 10.7326/M21-1687. Epub 2021 Nov 9. PMID: PMC8938856.</p>

Figure 1: The UB-2 Ultra-Brief Delirium Screen with detailed instructions. The UB-2 Ultra-Brief Delirium Screen is a sensitive and specific screening tool for diagnosing delirium that takes one minute to perform. If the screen is positive, it should be followed by the remaining items of the Ultra-Brief Confusion Assessment Method (UB-CAM).

telemetry) and screen for urinary retention and constipation. While hyperactive delirium tends to receive more attention in the hospital, patients with hypoactive delirium tend to have poorer outcomes, and it is estimated that hypoactive delirium is three times more common [4,6]. Therefore, when delirium is identified, a multifaceted non-pharmacological approach should be implemented (Figure 2). Antipsychotic usage to manage the resulting symptoms of delirium, such as agitation, may still occur despite a non-pharmacological approach. Though the literature does not identify one specific antipsychotic that provides optimal treatment for delirium, the brief use of antipsychotics in older patients with delirium may markedly reduce the length of hospital stay and associated healthcare costs [4,6].

However, antipsychotics should be used only if the patient presents a risk of harm to themselves or others.

Mobility

Describing a patient's functional capacity with an inventory of the Activities of Daily Living (ADLs) and instrumental Activities of Daily Living (iADLs) (Table 2) is a foundational component of the preoperative assessment. In general, iADLs require more cognitive reserve as they require a degree of future planning, safety awareness, executive thinking, and a level of independence. Deficits in iADLs are typically seen before deficits in ADLs in normal aging. However, the rate of loss of function can exponentially increase when a patient

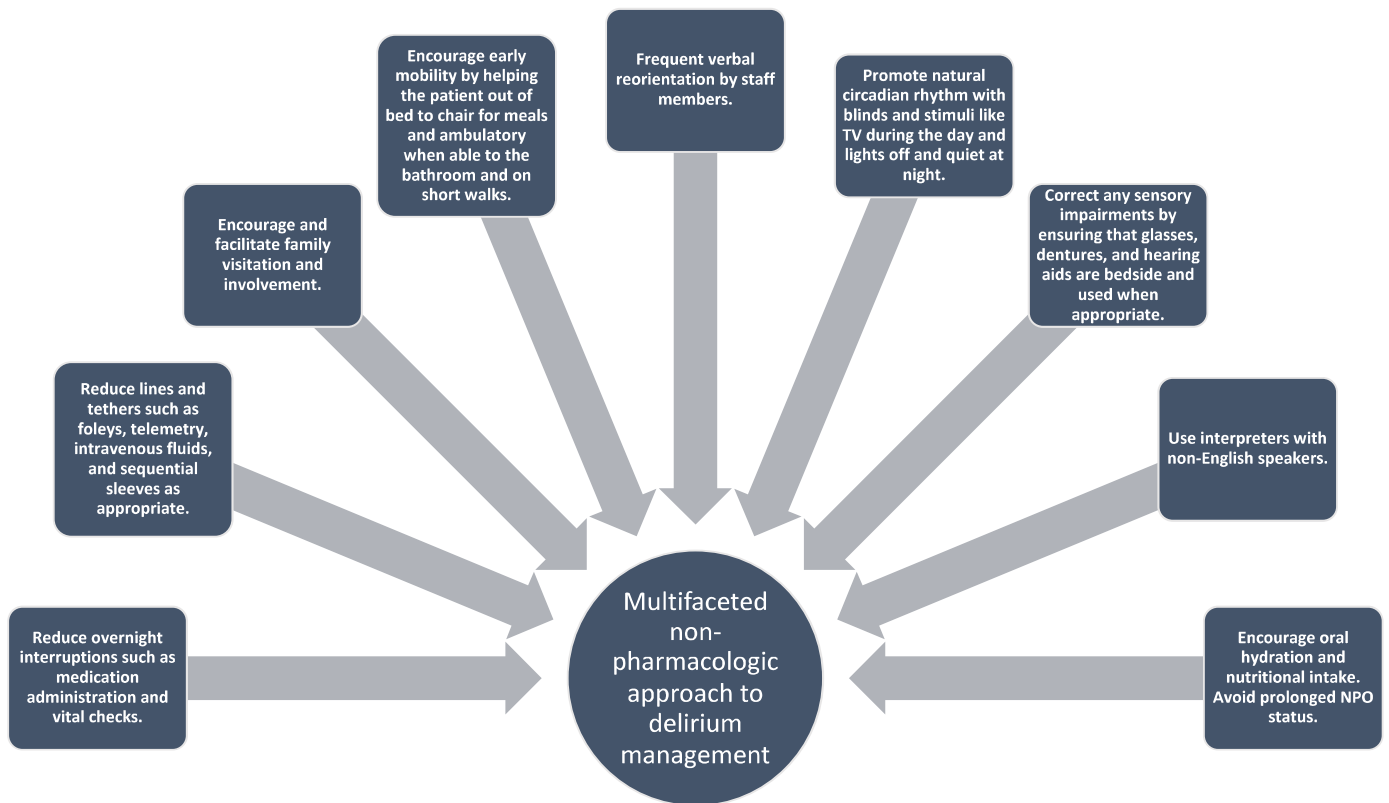


Figure 2: Infographic detailing the multifaceted non-pharmacological approach to older adults identified as having delirium during their hospital course.

Activities of Daily Living (ADLs)	Instrumental Activities of Daily Living (iADLs)
<ul style="list-style-type: none"> Bathing Toileting Getting dressed Feeding Walking Grooming 	<ul style="list-style-type: none"> Using the telephone Groceries/shopping Cooking Transportation Housekeeping Laundry Managing medications Handling finances
<p>Source: Katz S. Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. <i>J Am Geriatr Soc.</i> 1983 Dec;31(12):721-7. doi: 10.1111/j.1532-5415.1983.tb03391.x. PMID: 6418786.</p>	

Table 2: List of the six (6) Activities of Daily Living (ADLs) and the eight (8) instrumental Activities of Daily Living (iADLs).

has underlying progressive cognitive impairment. In addition to an ADL/iADL inventory, knowing the patient’s dependence on assistive devices (i.e., cane, walkers) and how their home environment is structured (stairs, safety devices such as chair lifts, modifications to bathrooms) help inform successful disposition planning and set realistic expectations with patients and family members regarding the trajectory of one’s recovery that may ultimately require more help or supervision in the home.

Medications and Medical Complexity

As adults age, changes in normal physiology cause the body and

brain to be more susceptible to medication’s adverse side effects. Changes in liver and kidney function (Figure 3), specifically, affect the metabolism of medications that can cause reduced clearance, increasing the time a medication lingers in circulation [7,8]. For example, a patient may have poorly controlled hypertension for which they were prescribed two to three antihypertensives for decades – but with aging-driven changes – these dosages may become more potent and lead to hypotension or dizziness. An accurate and comprehensive medication reconciliation, including a list of all current and recently discontinued medications (both prescribed and over-the-counter) with dosing and frequency, when they were started and their indications, how they are taken, and a review of supplements, is integral to every pre-operative evaluation. Similarly, alcohol use and tobacco smoking history should be elicited to prevent alcohol withdrawal and contextualize concern for poor wound healing.

Matters Most

Goals of care fall under the domain of Matters Most, and it encompasses much more than “Code status.” Still, engaging in a meaningful discussion about priorities can be challenging when the patient has suffered a sentinel event or is presented with the stressor of deciding to undergo surgery. Therefore, it is important to document conversations regarding goals of care to share with the care team, such as postoperative expectations and ideal living situation, and complete the necessary paperwork, such as Health Care Proxy forms and orders for life-sustaining treatments [9]. Many older adults may already have pre-existing Do Not Resuscitate (DNR) and/or Do Not Intubate (DNI) advanced directives. In these cases, the Code Status can be suspended

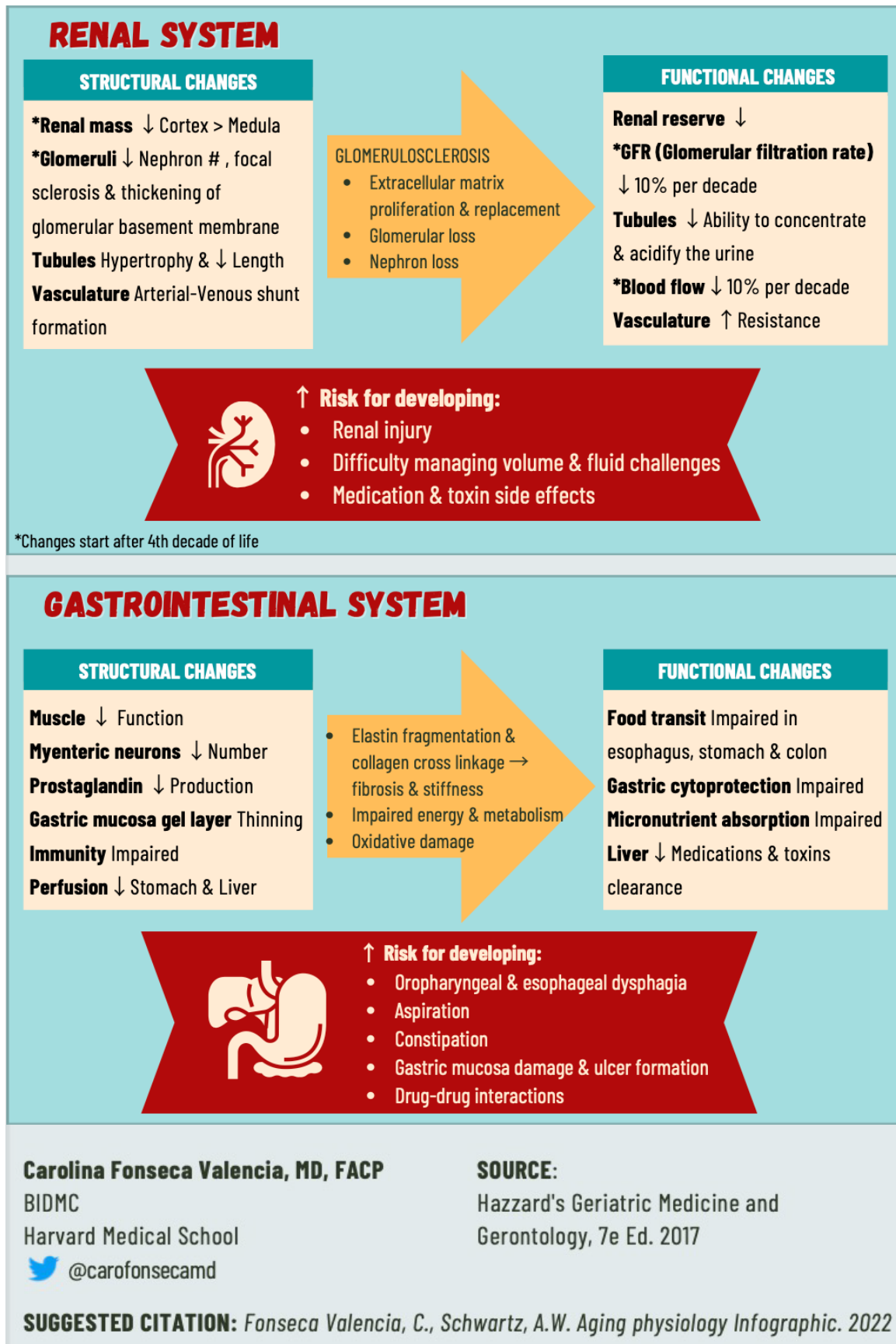


Figure 3: Infographics describing the natural aging of the renal and gastrointestinal systems and how the aging physiology predisposes older adults to medication side effects and drug-drug interactions.

perioperatively to ensure adequate support during surgery and acute postoperative care. It is also possible to reverse the Code Status to “Full Code” but avoid cardiac chest compressions, which some older adults and families prefer. SUMMARY A formulaic approach using the 5M’s Geriatric Framework when evaluating the biomedical, functional, mobility, cognitive, and psychosocial domains affecting our older adults can be incredibly useful in capturing all the elements necessary for a comprehensive preoperative assessment. When applied through the lens of aging physiology with the patient and their family’s goals of care in mind, this information can help increase patient safety during the hospital stay, improve surgical outcomes, and reduce the incidence of complications [10-12].

Keywords: *Preoperative assessment, Preoperative management, Delirium, Geriatrics, 5M’s, Older adults, aging*

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