The Age-Friendly Health System: Mentation and Mobility

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Objectives

- By the end of this lecture, the physician will:
  - Recognize the 4Ms of an Age-Friendly Health System
  - Identify and treat delirium in an older adult patient
  - Choose an appropriate tool for evaluation of delirium, dementia, and depression in the older adult patient
  - Recognize fall and immobility risks in the older adult patient
  - Apply appropriate tools for prevention of falls
**Case Scenario**

EF is an 82-year-old male who presents to the emergency department with his daughter who is concerned that the patient hasn’t been himself lately. He had a reaction to an insect bite a week ago and started taking diphenhydramine to treat the swelling. Yesterday, he was supposed to attend a family gathering, but when he never showed up, his daughter got concerned and went to his home to check up on him. He was found “fumbling around in the kitchen” looking for something that he couldn’t remember. She noticed he was unsteady on his feet, and she had a difficult time getting him to come to the hospital because he insisted he didn’t want to get admitted.

**Age-Friendly Health System**

- Applying a set of four evidence-based elements of high-quality care, known as the ‘4Ms,’ to all older adults in your health system
- The 4Ms
  - What Matters
  - Medication
  - Mentation
  - Mobility
Age-Friendly Health Systems

- Mentation
  - “Prevent, identify, treat, and manage delirium across settings of care.”

- Mobility
  - “Ensure that each older adult moves safely every day to maintain function and do What Matters.”

1 Institute for Healthcare Improvement. (2019, April). Age-Friendly Health Systems: Guide to Using the 4Ms in the Care of Older Adults.

Mentation

- Delirium – disturbed consciousness
  - Predisposed by dementia, advanced age, hearing and vision impairment, hospitalization, and/or surgery
  - Review prescription and OTC medications along with alcohol use
MES: APPROACH TO MENTATION

Knowing the 3 D’s

OBJECTIVES

- What is delirium?
- How to recognize and diagnose delirium
- The predisposing or precipitating risk factors for delirium in elderly patients
- How to evaluate and treat elderly patients with delirium
- Interventions to prevent delirium
DELIRIUM IS ALSO KNOWN AS:...

- Acute confusional state
- Acute mental status change
- Altered mental status
- Toxic or metabolic encephalopathy

WHAT IS DELIRIUM?

- The *DSM-5* characterizes delirium as a disorder of attention and awareness that develops acutely and tends to fluctuate
INCIDENCE OF DELIRIUM AMONG OLDER PATIENTS IS HIGH

- 1/3 of inpatients aged 70+ on general medical units, half of whom are delirious on admission
- In ICU: more than 75%
- At end of life: up to 85%

MORBIDITY ASSOCIATED WITH DELIRIUM

- Meta-analysis: up to 3000 pts followed for almost 2 years showed increased risk:
  - 2-fold for death
  - 2.4-fold for institutionalization
  - 12.5-fold for new dementia
- Persistent delirium → poor long-term outcomes
DIAGNOSING DELIRIUM

- Confusion Assessment Method (CAM)
  - Most useful bedside assessment tool for delirium per several systematic reviews

Mentation

- Cognitive Assessment Method (CAM)

  Acute onset & fluctuating course OR Altered level of consciousness
THE SPECTRUM OF DELIRIUM (1 of 2)

- Hyperactive, agitated, or mixed delirium — 25% of all cases
- Hypoactive delirium — ≥50% of all cases, but less often recognized and appropriately treated, and poorer prognosis

NEUROPATHOPHYSIOLOGY (1 of 2)

Cholinergic deficiency
- Delirium is caused by anticholinergic drug overdose, reversed by physostigmine
- Acetylcholine is an important neurotransmitter for cognitive processes
- Scales available to measure anticholinergic burden of drug regimens
- Cholinesterase inhibitors have not been effective in preventing/treating delirium
NEUROPATHOPHYSIOLOGY (2 of 2)

Inflammation

- Especially important in postoperative, cancer, and infected patients
- ↑ C-reactive protein, ↑ interleukin-6, and ↑ TNFα
- Inflammation can break down blood-brain barrier, allowing medications and cytokines access to CNS
- Neuroinflammation may damage neurons, lead to long-term cognitive effects

RISK FACTOR MODEL

- Delirium “caused” by “sum” of predisposing and precipitating factors
- The greater the burden of predisposing factors, the fewer precipitating factors required to cause delirium
## Predisposing Factors

- Advanced age
- Dementia
- Functional impairment in ADLs
- Multi-morbidity
- History of alcohol abuse
- Male sex (maybe)
- Sensory impairment (↓ vision, ↓ hearing)

## Precipitating Factors

- Acute cardiac events
- Acute pulmonary events
- Bed rest
- Drug withdrawal (sedatives, alcohol)
- Fecal impaction
- Fluid or electrolyte disturbances
- Indwelling devices
- Infections (esp. respiratory, urinary)
- Medications
- Restraints
- Severe anemia
- Uncontrolled pain
- Urinary retention
DELIRIUM AND DEMENTIA

- Dementia: risk factor for delirium
- Delirium in a patient without dementia:
  - Associated with incident dementia
- Delirium in a patient with established dementia:
  - Associated with accelerated cognitive decline

POSTOPERATIVE DELIRIUM INCIDENCE

- Noncardiac surgery: 25%
- Cardiac surgery: 50%
- Hip fracture repair: 50%
- AAA repair surgery
INCIDENCE & RISKS FOR POSTOPERATIVE DELIRIUM

Increased risk with preoperative risk factors:

- Advanced age
- Cognitive impairment
- Physical functional impairment
- History of alcohol abuse
- Abnormal serum chemistries
- Intrathoracic and aortic aneurysm surgery

![Chart showing risk factors and incidence of postoperative delirium]

KEYS TO PREVENTING POSTOPERATIVE DELIRIUM

- Peak onset: 1st postoperative day
- Peak prevalence: 2nd postoperative day
- Associated with postoperative pain, anemia, use of sedatives and opioids
- Recent randomized trial used bispectral monitor to titrate intraoperative sedation (propofol):
  - Delirium rate: light sedation—19%, usual care—40%
EVALUATION:
HISTORY & PHYSICAL

History
- Focus on time course of cognitive changes, esp. their association with other symptoms or events
- Medication review, including OTC drugs, alcohol

Physical examination
- Vital signs
- Oxygen saturation
- General medical evaluation
- Neurologic examination to assess for new focal findings

EVALUATION:
LABORATORY TESTING

- Base on history and physical
- Include complete blood count, electrolytes, renal function tests
- Also helpful in selected situations: UA, urine toxicology, LFTs, serum drug levels, arterial blood gases, chest x-ray, electrocardiogram, cultures
- Cerebral imaging rarely helpful, except with head trauma or new focal neurologic findings
- EEG and CSF rarely helpful, except with associated seizure activity or signs of meningitis
MANAGEMENT: GENERAL PRINCIPLES

- Requires interdisciplinary effort by clinicians, nurses, family, others

- Multifactorial approach is most successful because multiple factors contribute to delirium

- Failure to diagnose and manage delirium → costly, life-threatening complications; loss of function

KEYS TO EFFECTIVE MANAGEMENT

- Identify and treat reversible contributors
  - Optimize medications (see next slide)
  - Treat infections, pain, fluid balance disorders, sensory deprivation

- Maintain behavioral control
  - Behavioral and pharmacologic interventions

- Anticipate and prevent complications
  - Urinary incontinence, immobility, falls, pressure ulcers, sleep disturbance, feeding disorders

- Restore function
  - Hospital environment, cognitive reconditioning, ADL status, family education, discharge planning
MANAGEMENT:
DRUGS TO REDUCE OR ELIMINATE

Almost any medication if time course is appropriate

- Alcohol
- Anticholinergics
- Anticonvulsants
- Antidepressants (anticholinergic only)
- Antihistamines (anticholinergic only)
- Antiparkinsonian agents
- Antipsychotics
- Barbiturates
- Benzodiazepines
- Chloral hydrate
- H₂-blocking agents
- Non-benzodiazepine hypnotics
- Opioid analgesics (esp. meperidine)

MANAGEMENT:
NONPHARMACOLOGIC

- Use orienting stimuli (clocks, calendar, radio)
- Provide adequate socialization
- Use eyeglasses and hearing aids appropriately
- Mobilize patient as soon as possible
- Ensure adequate intake of nutrition and fluids, by hand feeding if necessary
- Educate and support the patient and family
Hartford Hospital:

Table 3. Hartford Hospital Per-Patient Costs Associated with Delirium

<table>
<thead>
<tr>
<th></th>
<th>With Delirium</th>
<th>Without Delirium</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital length of stay</td>
<td>12 days</td>
<td>4 days</td>
<td>8 days</td>
</tr>
<tr>
<td>Daily cost</td>
<td>$2,798</td>
<td>$2,225</td>
<td>$573</td>
</tr>
<tr>
<td>Total cost of stay</td>
<td>$31,284</td>
<td>$8,900</td>
<td>$22,384</td>
</tr>
</tbody>
</table>

*Note: The cost of a stay with delirium is based on the extra cost per day applying just to the eight added days.

IHI.ORG Business Case

Mentation

- Dementia – chronic acquired decline in one or more cognitive domains
  - Alzheimer’s (60-70%)
  - Other progressive disorders (15-30%): vascular, Lewy body, frontotemporal
  - Reversible dementias (2-5%): drug toxicity, metabolic changes, thyroid disease, subdermal hematoma, normal-pressure hydrocephalus

Mentation

- Tools for assessment
  - Mini-Mental Status Exam (MMSE) or Folstein test – proprietary
  - Montreal Cognitive Assessment (MoCA)
  - St. Louis University Mental Status Examination (SLUMS)
Delirium vs. Dementia

Delirium
- Acute onset
- Cognitive fluctuations throughout the course of a day
- Impaired consciousness and attention
- Fluctuating levels of alertness
- Altered sleep cycles
- Search for underlying dementia once delirium cleared

Dementia
- Gradual decline in memory.
- No change from baseline

DEPRESSION VS. DEMENTIA (2 of 2)

- Patients with primary depression are generally unlike those with dementia in that they:
  - Demonstrate ↓ motivation during cognitive testing
  - Express cognitive complaints that exceed measured deficits
  - Maintain intact language and motor skills

- ~50% presenting with reversible dementia and depression progress to dementia within 5 yr
Mentation

- Depression screening
  - It is important to consider cognitive impairment or visual deficits before screening
- Tools
  - Geriatric Depression Scale (GDS)
  - Cornell Scale for Depression in Dementia (interviewer-administered)
  - Hamilton Rating Scale for Depression (also interviewer-administered)

Approach to Mobility:

- “Ensure that each older adult moves safely every day to maintain function and do What Matters.”

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Mobility

- Fall risks
  - Changes in blood pressure
  - Medications
  - Visual deficits
  - Confusion
  - History of falls at home or in another facility
  - Activity tolerance
  - Cardiopulmonary status
  - Pain
  - Sensation
  - Tone
  - Balance deficits
  - Weakness
  - Changes in weight bearing
  - Unfamiliar environment

- Immobility Risks while Hospitalized
  - Skeletal demineralization secondary to decreased weight bearing
  - Loss of joint range of motion
  - Decline in muscular strength
  - Impairments in endurance
  - Changes in skin integrity
  - Decreased GI motility
  - Psychological/emotional changes requiring referral to counselor/psychology services
Mobility

- Fall Assessment Tools used to further identify areas of deficit and fall risk.
  - Functional Reach – As reach decreases chance of falling increases.
  - Berg Scale- 14 test positions/tasks measures different aspects of balance
  - Timed up and Go- separates those that can be independently mobile vs. dependent
  - Tinetti- specific movements to challenge gait and balance rating older adults as a high risk vs. moderate risk vs. low risk

Functional Reach Test
Berg Scale

Timed Get-Up and Go Test

The Timed Up and Go (TUG) Test
Tinetti Test

Mobility

- Assisted devices
  - Canes
    - Straight cane
    - Four-point or quad cane
  - Walkers
    - Standard
    - Rolling
    - Pulmonary
  - Wheelchairs
    - Standard
    - Motorized
Case Scenario

EF is an 82-year-old male who presents to the emergency department with his daughter who is concerned that the patient hasn’t been himself lately. He had a reaction to an insect bite a week ago and started taking diphenhydramine to treat the swelling. Yesterday, he was supposed to attend a family gathering, but when he never showed up, his daughter got concerned and went to his home to check on him. He was found “fumbling around in the kitchen” looking for something that he couldn’t remember. She noticed he was unsteady on his feet, and she had a difficult time getting him to come to the hospital because he insisted he didn’t want to be admitted.

Consider how you would approach this patient in an age-friendly manner.

- Mentation?
- Mobility?

Summary

Age-Friendly Health Systems apply the 4Ms while providing care to the older adult patient

- What Matters
- Medication
- Mentation
- Mobility

- Prevent, identify, treat, and manage delirium
Summary

- Mentation can be evaluated using CAM, MoCA, SLUMS, and/or GDS
- Mobility is key doing What Matters
- Recognizing fall and immobility risks leads to fall prevention

QUESTION 1 (1 of 4)

An 85-year-old man comes to the office to discuss treatment options related to recently diagnosed aortic stenosis. He lives alone, with the support of his daughter since his wife died 3 years ago.

- He is short of breath with minimal activity, and he has been hospitalized twice in the past 3 months for heart failure. He does not have classic symptoms of angina.
  - He says that he would rather die than live as he has for the past few months.
  - He has told his daughter how he feels.
- History: diabetes mellitus, osteoarthritis, prostate cancer
  - Prostate cancer responded to hormone therapy
  - No significant change in PSA levels over past 3 years
Medications: lisinopril, spironolactone, a β-blocker, increased dosages of diuretics

- He remains symptomatic despite treatment.

Echocardiography findings

- Ejection fraction of 62%, aortic valve area of 0.6 cm², and mean transvalvular pressure gradient of 41 mmHg.
- Results from a nuclear stress test done 1 year ago were normal.

A consulting interventional cardiologist told him that he may be a candidate for transcatheter aortic valve replacement (TAVR) but had concerns about his age and comorbidities.

QUESTION 1 (2 of 4)

- Discuss benefits of hospice.
- Increase diuretic dosage.
- Call cardiology.
- Ask if daughter can be involved in the TAVR discussion

QUESTION 1 (3 of 4)

Which one of the following is the most appropriate next step?

A. Discuss benefits of hospice.
B. Increase diuretic dosage.
C. Call cardiology.
D. Ask if daughter can be involved in the TAVR discussion
QUESTION 1 (4 of 4)

Which one of the following is the most appropriate next step?

A. Discuss benefits of hospice.
B. Increase diuretic dosage.
C. Call cardiology.
D. Ask if daughter can be involved in the TAVR discussion

QUESTION 2 (1 of 3)

- An 80-year-old woman comes to the office to discuss her oncologist’s recommendation that she consider adjuvant chemotherapy. She is concerned about the potential adverse effects of the chemotherapy.
- She recently had surgery for an obstructing colon cancer; regional lymph nodes were positive for metastatic adenocarcinoma.
  - Her recovery from surgery was prolonged because of difficulty with ambulation and increased weakness.
- History: heart failure (ejection fraction of 19%), COPD
  - In the past year, she has had 3 episodes of respiratory failure requiring ventilator therapy.
Which one of the following would provide the most useful information to help with her decision?

A. Clinical practice guidelines related to her diseases
B. Number of patients who would need to be treated for 1 patient to benefit from the chemotherapy
C. Chance of harm from treatment
D. Lag time between treatment and benefit
References

- Institute for Healthcare Improvement. (2019, April). *Age-Friendly Health Systems: Guide to Using the 4Ms in the Care of Older Adults*.