Delirium

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Objectives

- Describe the causes of delirium in the acute care setting
- List common medications used in the acute care setting that may lead to delirium
- Recognize acute delirium
- Initiate effective pharmacological and non-pharmacological treatments for delirium

Delirium

- Syndrome characterized by:
  - Acute onset of cerebral dysfunction
  - With a change or fluctuation in baseline:
    - Mental status
    - Inattention
    - And either disorganized thinking or an altered level of consciousness
- Can present as hypoactive (lethargic), hyperactive (hallucinations/delusions), or mixed

Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Delirium vs. Dementia

Delirium

- Rapid onset
- Inattention
- Clouded consciousness (bewildered)
- Fluctuating course

Dementia

- Gradual onset
- Intellectual impairment
- Memory disturbance
- Personality/mood change
- No clouding of consciousness

Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.
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Costs of Delirium- ICU patients

- Increased mortality
- Increased hospital LOS
- Increased cost of care
- Long-term cognitive impairment consistent with a dementia-like state
- Increased risk of discharge to long-term care

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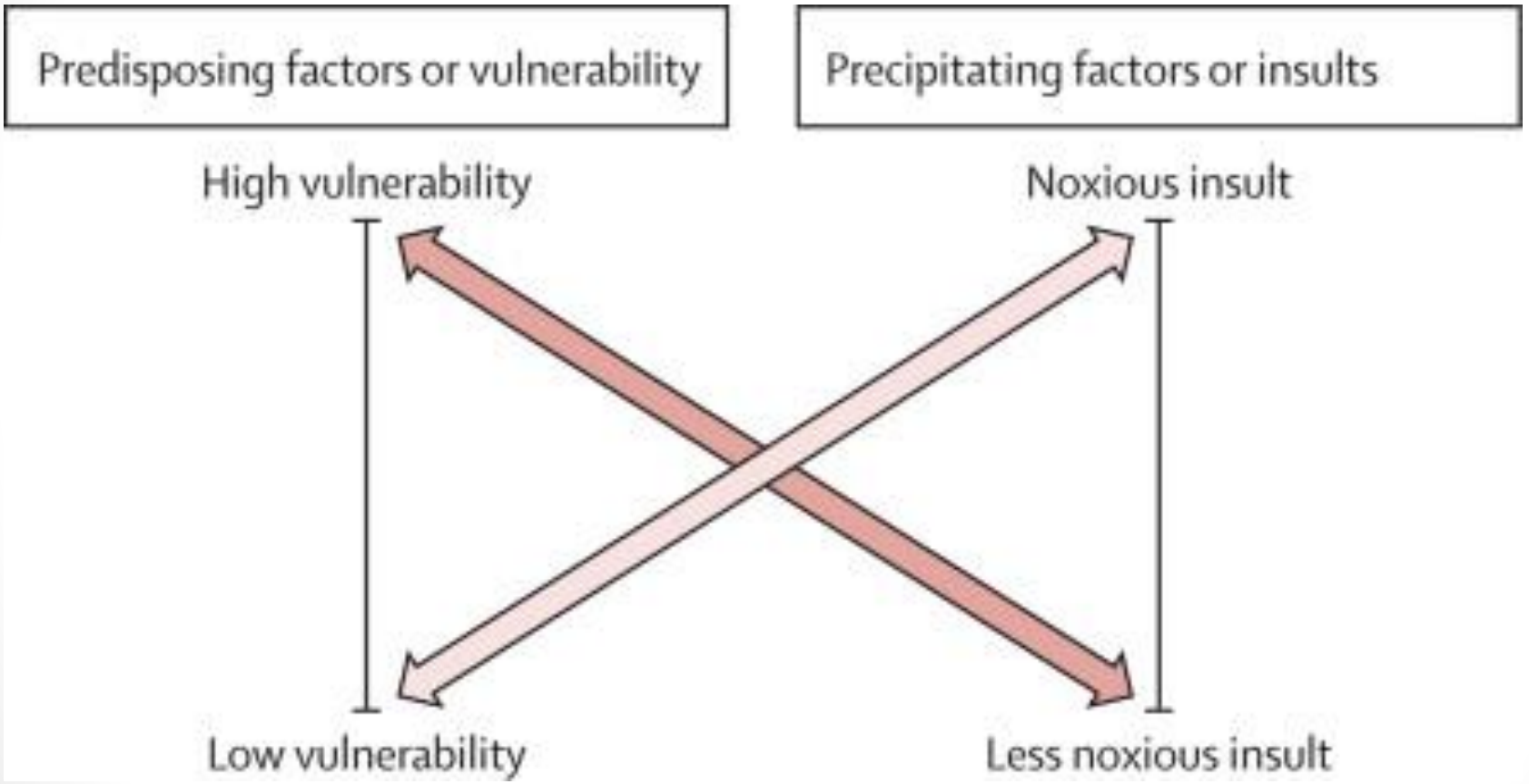
Causes of Delirium



Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.

Predisposing Factors

- Pre-existing dementia or cognitive impairment
- History of delirium
- Functional or visual impairment
  - Immobility, hearing impairment
- Severity of illness
- Depression
- History of TIA or CVA
- Alcohol misuse
- Older age (≥ 75 years)

Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.
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Precipitating Factors

- Several drugs used
- Exposure to psychoactive, sedating, analgesic, and anticholinergic medications
- Prolonged physical restraints
- Use of bladder catheter
- Increased BUN:SCr ratio, abnormal albumin
- Infection
- Surgery or trauma
- Coma

Risk Factors- ICU Patients

- Four baseline risk factors are positively and significantly associated with the development of delirium in the ICU:
  - Pre-existing dementia
  - History of hypertension
  - History of alcoholism
  - High severity of illness at admission

Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.
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High-Risk Medications

High risk medications
Analgesics NSAIDS, opiates
Anticholinergics Atropine, benztropine, diphenhydramine, scopolamine
Antidepressants Mirtazapine, SSRIs, TCAs
Sedative-hypnotics Benzodiazepines, propofol?
Corticosteroids Hydrocortisone, prednisone, methylprednisolone, dexamethasone
Dopamine agonists Amantadine, bromocriptine, levodopa, pergolide, pramipexole, ropinirole

Han L, et al. *Arch Intern Med.* 2001;161:1099-1105.
Pandharipande P, et al. *Crit Care Clin.* 2006;22:313-327.
Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.
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Prevention

- Early mobilization
- Optimize environment
- Use an interdisciplinary team approach
  - Protocols
  - Checklists to assess pain, sedation, and delirium

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Prevention

- Assess and treat pain
  - Behavioral Pain Scale (BPS)
  - Critical-Care Pain Observation Tool (CPOT)
- Assess sedation using validated sedation scale
  - Richmond Agitation-Sedation Scale (RASS)
  - Sedation-Agitation Scale (SAS)
- Daily drug holiday for those on continuous sedation

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Behavioral Pain Scale (BPS)

Pain Behaviors	A None	B Mild	C Moderate	D Severe
Restless	Quiet	Slightly restless	Moderately restless	Very restless
Tense muscles	Relaxed	Slight tenseness	Moderate tenseness	Extreme tenseness
Frowning/grimacing	No frowning/grimacing	Slight frowning/grimacing	Moderate frowning/grimacing	Constant frowning/grimacing
Patient sounds	Talking in normal tone/No sound	Sighs, moans softly	Groans, moans loudly	Cries out or sobs

Mateo OM, et al. *Journal of Post Anesthesia Nursing. 7(1): 15-21.*
Inouye SK, et al. *Lancet*. 2014;383(9920):911-22.

Richmond Agitation Sedation Scale

Score	Term	Description
+4	Combative	Overtly combative, violent, immediate danger to staff
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious but movements not aggressive vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to voice **(≥ 10 seconds)**
-2	Light sedation	Briefly awakens with eye contact to voice **(<10 seconds)**
-3	Moderate sedation	Movement or eye opening to voice **(but no eye contact)**
-4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Sessler CN, et al. *Am J Respir Crit Care Med*. 2002; 166:1338-1344.
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Richmond Agitation Sedation Scale

1. Observe patient	
Patient is alert, restless, or agitated.	(Score 0 to +4)
2. If not alert, state patient's name and say to open eyes and look at speaker	
Patient awakens with sustained eye opening and eye contact.	(Score -1)
Patient awakens with eye opening and eye contact, but not sustained.	(Score -2)
Patient has any movement in response to voice but no eye contact.	(Score -3)
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.	
Patient has any movement to physical stimulation.	(Score -4)
Patient has no response to any stimulation.	(Score -5)

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Sedation-Agitation Scale (SAS)

Score	Term	Descriptor
7	Dangerous agitation	Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side
6	Very agitated	Requiring restraint and frequent verbal reminding of limits, biting ETT
5	Agitated	Anxious or physically agitated, calms to verbal instructions
4	Calm and cooperative	Calm, easily arousable, follows commands
3	Sedated	Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again
2	Very sedated	Arouses to physical stimuli but does not communicate or follow commands, may move spontaneously
1	Unarousable	Minimal or no response to noxious stimuli, does not communicate or follow commands

Riker RR, et al. *Crit Care Med*. 1999; 27(7):1325-9.
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Prevention

- No pharmacological prevention recommended, includes:
  - Atypical antipsychotics
  - Haloperidol
  - Dexmedetomidine

- Avoid benzodiazepines

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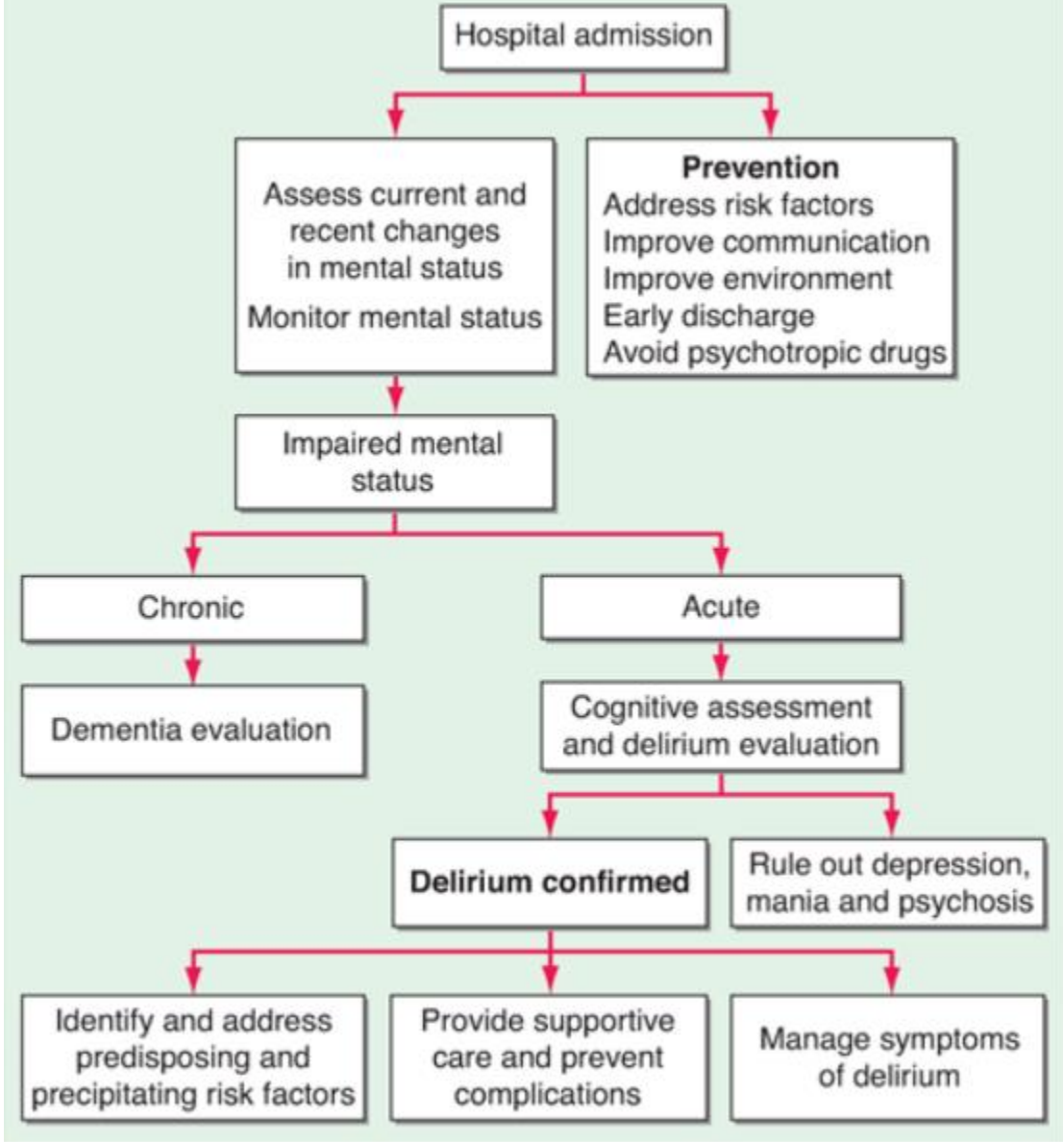
Assessment and Management of Delirium in Hospitalized Older Patients



Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: www.accessmedicine.com

Diagnosis

- Use validated assessment tool
  - Confusion Assessment Method
    - Non-ICU patients
  - Confusion Assessment Method for the ICU (CAM-ICU)
  - Intensive Care Delirium Screening Checklist (ICDSC)

Inouye SK, et al. *Ann Intern Med*. 1990;113(12):941-948.
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

CAM (Non-ICU patients)

Feature 1: Acute Onset and Fluctuating Course

- Is there evidence of an acute change in mental status from the patient's baseline?
- Did the (abnormal) behavior fluctuate during the day; that is, did it tend to come and go, or increase and decrease in severity?

Feature 2: Inattention

- Did the patient have difficulty focusing attention; for example, being easily distractible, or having difficulty keeping track of what was being said?

Inouye SK, et al. *Ann Intern Med*. 1990;113(12):941-948.

CAM (Non-ICU patients)

Feature 3: Disorganized Thinking

- Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Feature 4: Altered Level of Consciousness

- Overall, how would you rate this patient's level of consciousness?
  - Alert (normal)
  - Vigilant (hyperalert)
  - Lethargic (drowsy, easily aroused)
  - Stupor (difficult to arouse)
  - Coma (unarousable)

Inouye SK, et al. *Ann Intern Med*. 1990;113(12):941-948.

CAM-ICU

- Step-wise evaluation of level of consciousness (RASS) and content of consciousness (CAM-ICU)
  - Same feature domains as CAM, adjusted for critically ill patients
- Scored the same as CAM (features 1 and 2 plus either 3 or 4)

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ICDSC

- Patient scored over the course of a shift
- Features include:
  - Altered level of consciousness, inattention, disorientation, hallucinations, psychomotor agitation/retardation, inappropriate speech/mood, sleep-wake cycle disturbances, and fluctuation of symptoms
- If any feature present, 1 point added per feature
- Scored 0-8 with scores 1-3 indicating subsyndromal delirium and scores $\geq$ 4 indicating delirium

Bergeron N, et al. *Intens Care Med.* 2001;27:859-64
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Treatment

- Remove all possibly contributing medications
- Optimize environment
  - Open windows
  - Turn on lights during day
  - Early mobilization
  - Engage patient
  - No restraints
- Treat any precipitating disease states (sepsis, etc)

Inouye SK, et al. Lancet. 2014;383(9920):911-22.
Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Treatment

- There is no evidence that haloperidol reduces the duration of delirium
- Atypical antipsychotics may reduce the duration of delirium
- Rivastigmine not recommended to reduce the duration of delirium in ICU patients

Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

Treatment

- Atypical antipsychotics may reduce the duration of delirium in adult ICU patients
  - Quetiapine

Treatment

- Avoid atypical antipsychotics in patients:
  - With baseline QTc prolongation
  - On medications known to increase QTc interval
  - With previous history of torsades de pointes
- In delirium unrelated to alcohol or benzodiazepine withdrawal, dexmedetomidine > benzodiazepine infusions

Barr J, et al. *Crit Care Med*. 2013;41(1):263-306.

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