Delirium

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Learning Objectives

- Recognize the adverse consequences of delirium
- Describe a practical framework to **prevent** delirium
- Develop non-pharmacologic and pharmacologic strategies to **manage** delirium

No disclosures

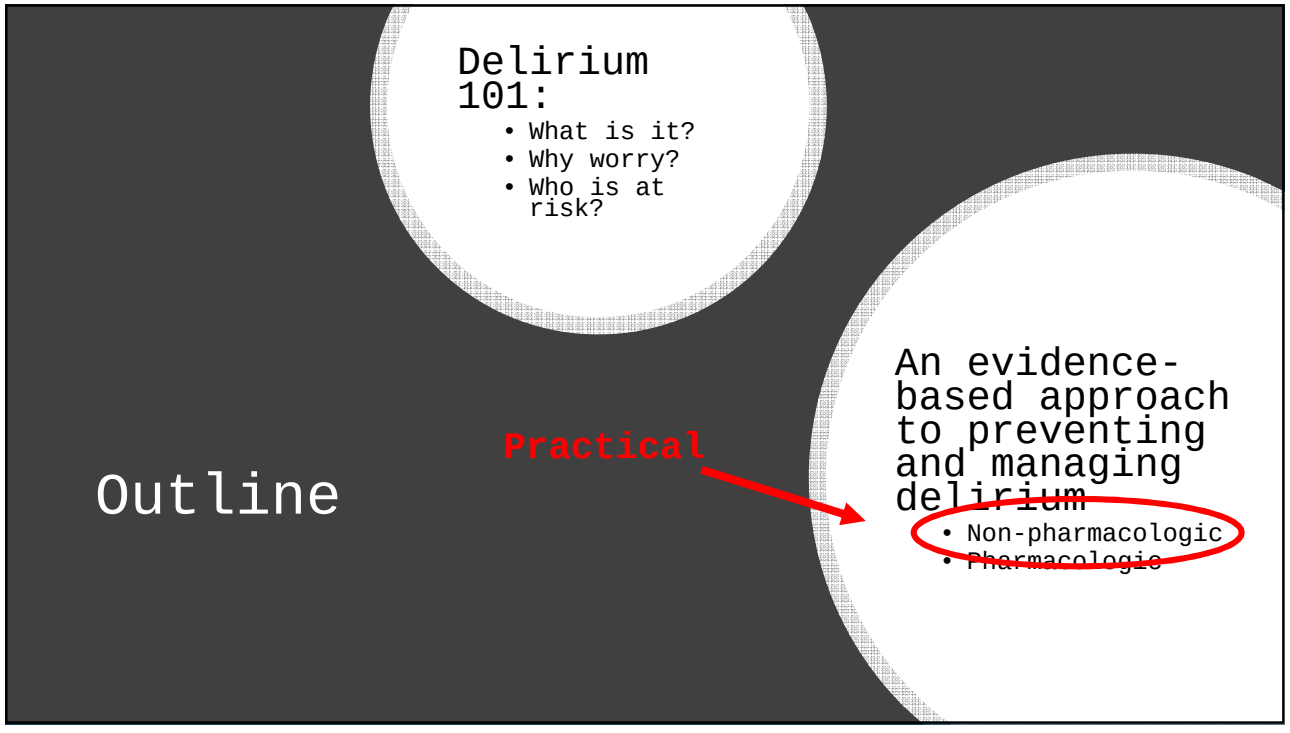
Outline

Delirium 101:

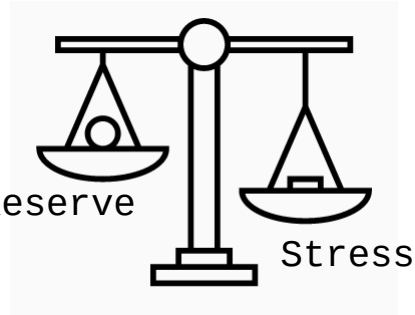
- What is it?
- Why worry?
- Who is at risk?

An evidence-based approach to preventing and managing delirium

- Non-pharmacologic
- Pharmacologic



Cognitive Reserve



Stressor

Delirium 101

What is it?

Why worry?

Who is at risk?

Delirium 101

What is it?

Why worry?

Who is at risk?

A 93-year-old man with a history of dementia complicated by behavioral disturbances is admitted with a pneumonia.

On cognitive exam:

- Visibly agitated, trying to climb out of bed, difficult to redirect
- Knows his name
- Says he is “at home”
- Does not know the date or day of the week. Tells you the ye
- Can do 3/7 days of week backwards.

Is he delirious?

*A 93-year-old man with a history of dementia complicated by behavioral disturbances is admitted with a pneumonia.

Is he delirious?

A. Yes
B. No
C. I don’t know

Confusion Assessment Method (CAM)

1.* Acute, fluctuating change in mental status
2.* Inattention
3. Disorganized thinking
4. Altered level of consciousness

3D-CAM: derivation and validation of a 3-minute diagnostic interview for CAM-defined delirium: a cross-sectional diagnostic test study. Marcantonio, *et al*, Ann Intern Med, 2014

Site of Care	Incidence
Medicine floor	~30-60%
Post-operative	50%
ICU	75%

Inouye, Lancet, 2013
Marcantonio, JAMA, 2012

Delirium 101

What is it?
Why worry?
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Outcome	OR
Dementia	12.5 (95% CI 11.9 – 84.2)
Institutionalization	2.4 (95% CI 1.8 – 3.3)
Death	2.0 (95% CI 1.5 – 2.5)

Dementia in elderly patients and the risk of postdischarge mortality, institutionalization, and dementia: a meta-analysis. Witlox, *et al*. JAMA 2010

Delirium 101

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Why worry?

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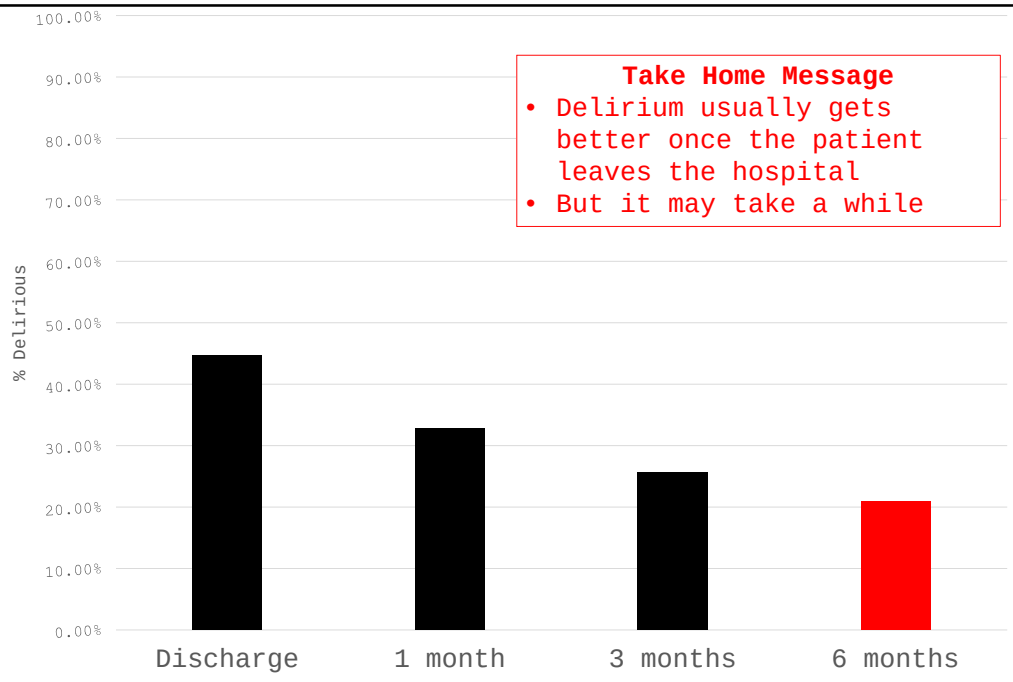

Take Home Message

- Delirium usually gets better once the patient leaves the hospital
- But it may take a while

Persistent delirium in older hospitalized patients: a systematic review of frequency and prognosis. Cole, *et al*. Age and Ageing, 2009

Patient Factors

- Age
- Cognitive impairment/dementia
- Functional impairment
- Sensory impairment
- Male
- Cumulative co-morbidity burden
- Central nervous system disorder
- Psychiatric disorder
- Polypharmacy
- Non-native English speaker

Ormseth, *et al*, JAMA Neurol, 2023

Delirium 101

What is it?
Why worry?
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Environmental Factors

- Restraints/immobilization
- Longer length of stay
- ICU admission
- Sleep disturbances
- Fall
- Bed/ward change

Ormseth, *et al*, JAMA Neurol, 2023

Delirium 101

What is it?
Why worry?
Who is at risk?

Preventing and Managing Delirium: Non-pharmacologic strategies

Why is the baby crying?

In pain?
Hungry/thirsty?
Wet/soiled?
Constipated?
Retaining urine?
Scared?
Lonely?
Bored?

Why is the ~~baby~~ hospitalized older adult

- Unidentified/incompletely treated disease process
- Medications

“A new problem in an older adult is medication-induced until proven otherwise”

Antihistamines	Diphenhydramine Hydroxyzine Meclizine
Overactive bladder medications	Oxybutynin Solifenacin Trospium
Antidepressants	Tricyclic antidepressants Paroxetine
H2 blockers	Famotidine Ranitidine
Muscle relaxants	Carisoprodol Cyclobenzaprine Methocarbamol

Adapted from 2023 updated AGS Beers Criteria

Inouye, et al, NEJM, 1999

87-year-old woman, hx HTN, HLD, CAD, DM, admitted w/ a UTI, improving on IV antibiotics

“Pt delirious, poor sleep, no help melatonin/trazodone, query quetiapine?”

Sleep

Time	Care
8 PM	Meds and vitals; fingerstick + insulin
10 PM	Turned and repositioned
11 PM	Melatonin, trazodone
12 AM	Vitals; turned and repositioned; got metoprolol
2 AM	Turned and repositioned
4 AM	Vitals; turned and repositioned
5 AM	AM labs
6 AM	More metoprolol
8 AM	Fingerstick + insulin
10 AM	Sound asleep

Improving Sleep Action Items!

- Review timestamps
- Review medications
- Establish a sleep-friendly routine
- Med management:
  - Melatonin
  - Trazodone
  - Suvorexant

Improving Mobility Action Items!

- Assess tethers
- Swap maintenance fluids for boluses
- Cycle tube feeds
- 1:1 observation
- Move to new room vs recliner in hall v recliner next to RN station

Improving Sensory Input Action Items!

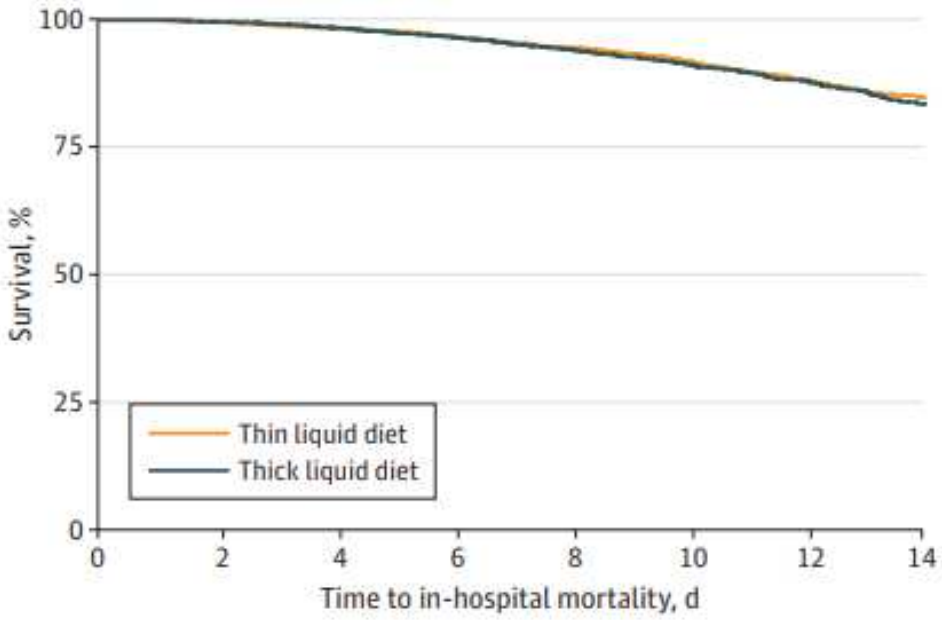
- Hearing aids, eyeglasses
- Pocket talkers
- Voice-to-text apps (eyeHear)
- Translators

Improving Cognition Action Items!

- Introduce staff/roles
- Whiteboard
- Calendar
- Family at bedside
- Photo
- Clothes from home
- Find entertainment!

Improving Hydration Action Items!

- Make water accessible
- Encourage frequent sips
- Confirm procedure scheduling – AM if able
- Double check duration of pre-procedure NPO
- Reassess need for thickened liquids



Makhnevich, *et al*, JAMA Int Med 2024

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The New York Times

THE NEW OLD AGE

Three Medical Practices That Older Patients Should Question

…The rationale is that this sludgy stuff prevents patients from drawing liquids into their lungs and from developing aspiration pneumonia. But does the practice work? Some geriatricians have doubted it for years.

Now, a large-scale study from the Feinstein Institutes for Medical Research in Manhasset, N.Y., has found that liquid thickening doesn't actually help such patients…

Thickened liquids taste horrible

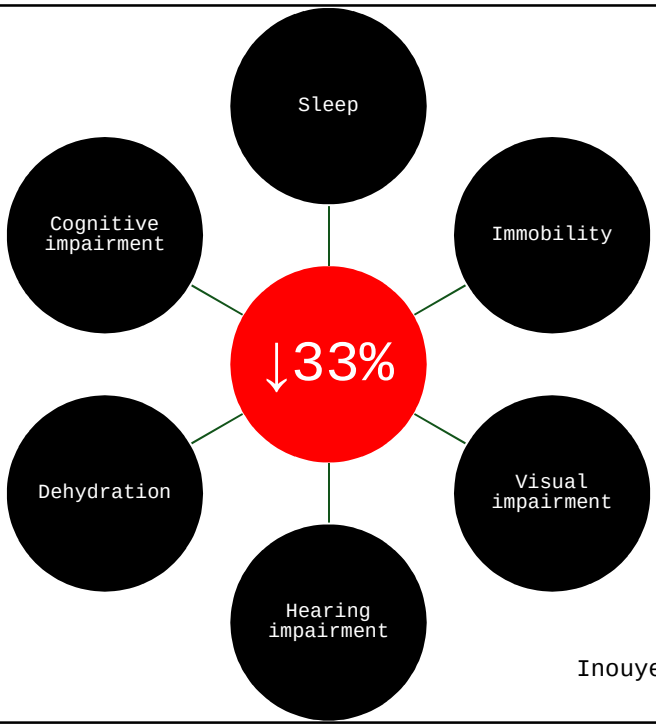
Have not been shown to reduce risk of:
- PNA
- Mortality

DePippo, et al, Neurol, 1994

Have been shown to increase risk of:
- Dehydration
- Reduced QOL

Robbins, at al, Ann Int Med,2008

Incidence of delirium, usual care: 15%



Incidence of delirium, intervention: 9.9%

Inouye, et al, NEJM, 1999

Preventing and Managing Delirium: Pharmacologic strategies

*A 73-year-old generally healthy man is admitted with shortness of breath. COVID+. Hypoxic in the ED, intubated and admitted to the ICU. Extubated after 8 days. Transferred to the floors the next day.

- Agitated, thrashing in bed
- On tube feeds via dobhoff #3
- Staff feels unsafe (knocked off RN's faceshield)
- All your non-pharmacologic interventions are not working.

What medication would you

*What medication would you try first?

Author, Yr	Type	N, Study Population	Intervention/ Control	Study Results
Page 2013	P,T	141 ICU patients	Haloperidol/ placebo	No difference in delirium-free or coma-free days. No difference in mortality.
Hakim 2012	T	101 cardiac surgery 65+	Risperidone/ placebo	Lower delirium rate. No difference in LOS in ICU or hospital.
Wang 2012	P	457 noncardiac surgery/ICU patients 65+	Haloperidol/ placebo	Reduced incidence of delirium. No difference in LOS, complications, or mortality
Girard 2010	T	101 ICU patients	Haloperidol/ ziprasidone/ placebo	No difference in delirium-free or coma-free days. No difference in mortality
Larsen 2010	P	400 knee- or hip-replacement	Olanzapine/ placebo	Reduced incidence of delirium, but greater duration and severity in olanzapine
Prakanrattana 2007	P	126 cardiac surgery	Risperidone /placebo	Lower incidence of delirium. No difference in LOS, ICU days, or complications
Kalisvaart 2005	P	430 hip-surgery 70+	Haloperidol/ placebo	No difference in delirium; but decreased duration and severity; decreased LOS

Inouye, Marcantonio, and Metzger, Lancet 2014

Agent	Dosing	EPS risk	Notes
Haloperidol 12-38 hours	0.25 – 0.5 mg, PO, IM, IV	High	Longest track record; available in multiple

(adapted from) Delirium in hospitalized older adults. Marcantonio. NEJM, 2017

Agent	Dosing	EPS risk	Notes
Haloperidol 12-38 hours	0.25 – 0.5 mg, PO, IM, IV	High	Longest track record; available in multiple formulations, less sedating
Risperidone	0.25 – 0.5	High (but	Less sedating

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Risperidone 20 hours	0.25 – 0.5 mg, PO, ODT, IM	High (but slightly less than Haldol)	Less sedating

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| Olanzapine 21-54 hours | 2.5 – 5 mg PO, IM, ODT | Moderate | Anti-emetic effect |

(adapted from) Delirium in hospitalized older adults. Marcantonio. NEJM, 2017

Agent/half life	Starting dose	Extrapyramidal	Notes
Haloperidol 12-38 hours	0.25 – 0.5 mg, PO, IM, IV	High	Longest track record; available in multiple formulations, less sedating
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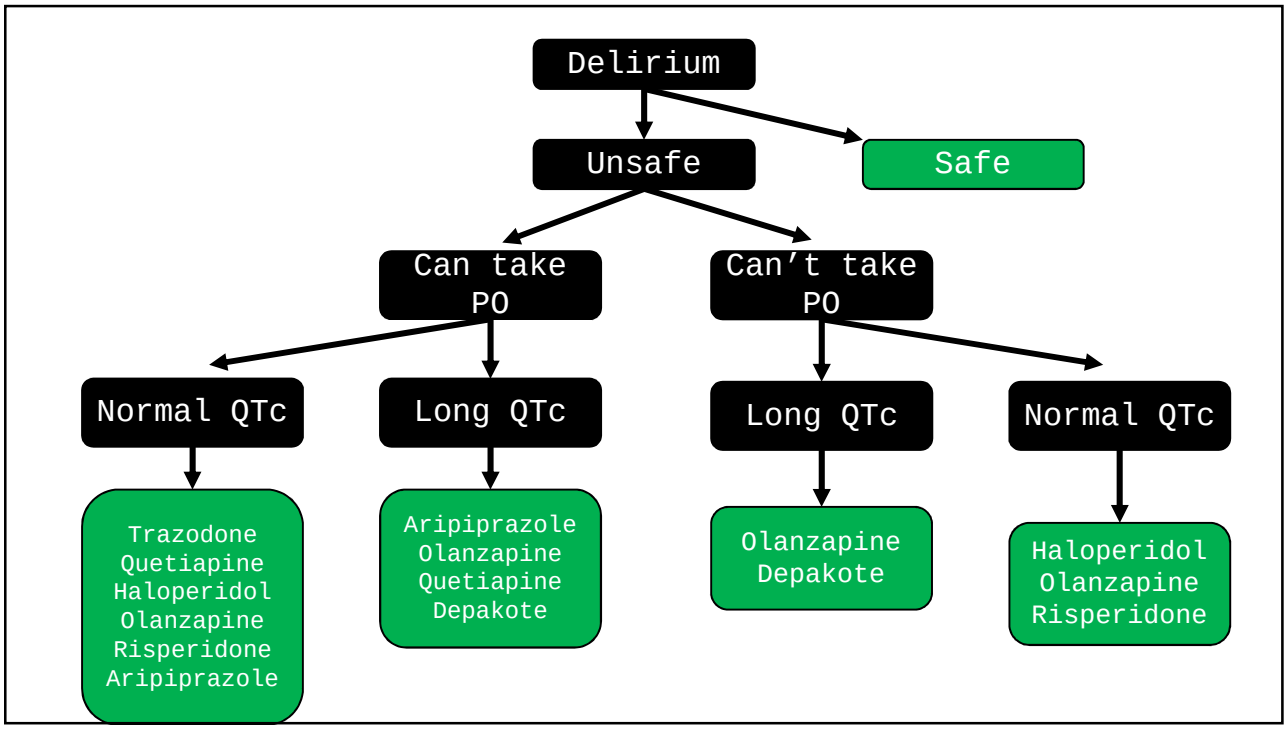
Olanzapine 21-54 hours	2.5 – 5 mg PO, IM, ODT	Moderate	Anti-emetic effect
Quetiapine 6 hours	12.5 – 25 mg PO	Low	Most sedating; preferred in patients with parkinsonism
Aripiprazole 75 hours	1 mg PO	Low	Least risk of QTc prolongation

Agent	Dosing	EPS risk	Notes
Trazodone 5-9 hours	12.5 – 25 mg PO	None	Less sedating Can cause orthostatic hypotension PRNs ok in nursing facilities
Depakote 9-19 hours	125 – 250 mg PO/IV	None	Limited evidence Generally well-tolerated; monitor for hepatotoxicity
Clonidine	No evidence that it works		
Cholinesterase inhibitors	No evidence that it works		
Lorazepam	Evidence that it makes things worse		


Delirium
Unsafe
Safe
Can take PO
Can't take PO
Normal QTc
Long QTc
Long QTc
Normal QTc
Trazodone
Quetiapine
Haloperidol
Olanzapine
Risperidone
Aripiprazole
Aripiprazole
Olanzapine
Quetiapine
Depakote
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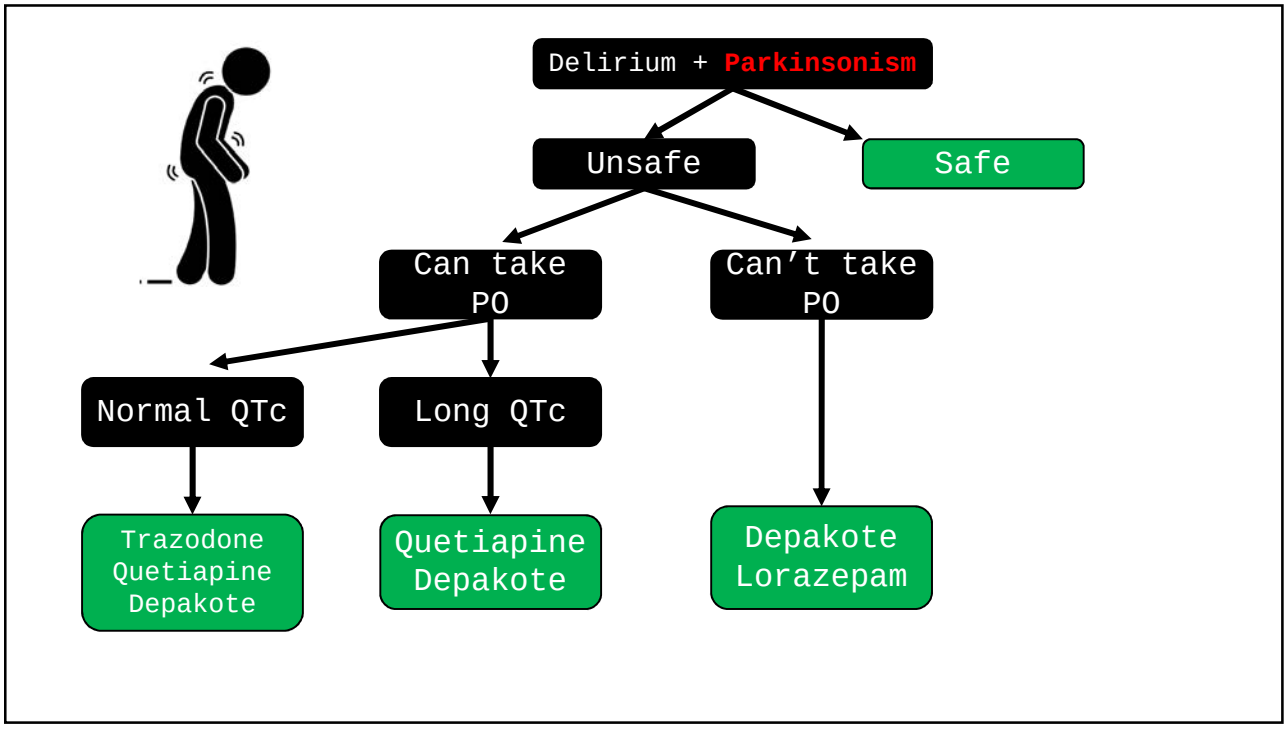
Delirium + Parkinsonism
Unsafe
Safe
Can take PO
Can't take PO
Normal QTc
Long QTc
Trazodone
Quetiapine
Depakote
Quetiapine
Depakote
Depakote
Lorazepam

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Questions?