When the Brain Trips :
How Delirium Drives Falls

NSW Fall Prevention and Healthy Ageing Network Annual Forum - May 2026

Anita Nitchingham

Case 1

85M, presents with confusion, reduced oral intake.

BG of moderate dementia, frail, mild visual impairment, mobilising 4WW

Assistance with showering. Toilets independently. Son helps with ADLs.

Diagnosed with delirium secondary urosepsis (UTI + acute kidney injury)

Transferred from ED to the cardiothoracics ward

“Agitated overnight”. Given some antipsychotics.

Found on the floor, sustained proximal humerus

Treated for UTI/AKI. Analgesia makes him more confused.

Unable to participate in rehab

Respite arranged (likely permanent)

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Case 2

90F, home alone, presents with a fall on the sidewalk after putting out the bins

BG cognitive impairment, frail, mild visual impairment, 4WW

Level 2 home care package (one the waitlist for a higher, assistance with showering)

Unable to walk reporting hip pain, BIBA to the ED.

“Alert and orientated” at triage. Given some analgesia.

Xray- demonstrates hip #

S/B Orthogeriatrics → 10/12 on 4AT

Surgery for hip, ongoing delirium post-operatively but improving

Rehabilitation, discharged home with a TACP

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Delirium  Falls

Measure	Finding
Prevalence	Delirium 25%, falls 1 -2%
Overlap	38-70% of inpatients fallers had delirium
Visibility	Delirium still missed (>30%), Falls hard to miss

Kalivas et al 2023, Lakatos et al 2009, Titlestad 2024,

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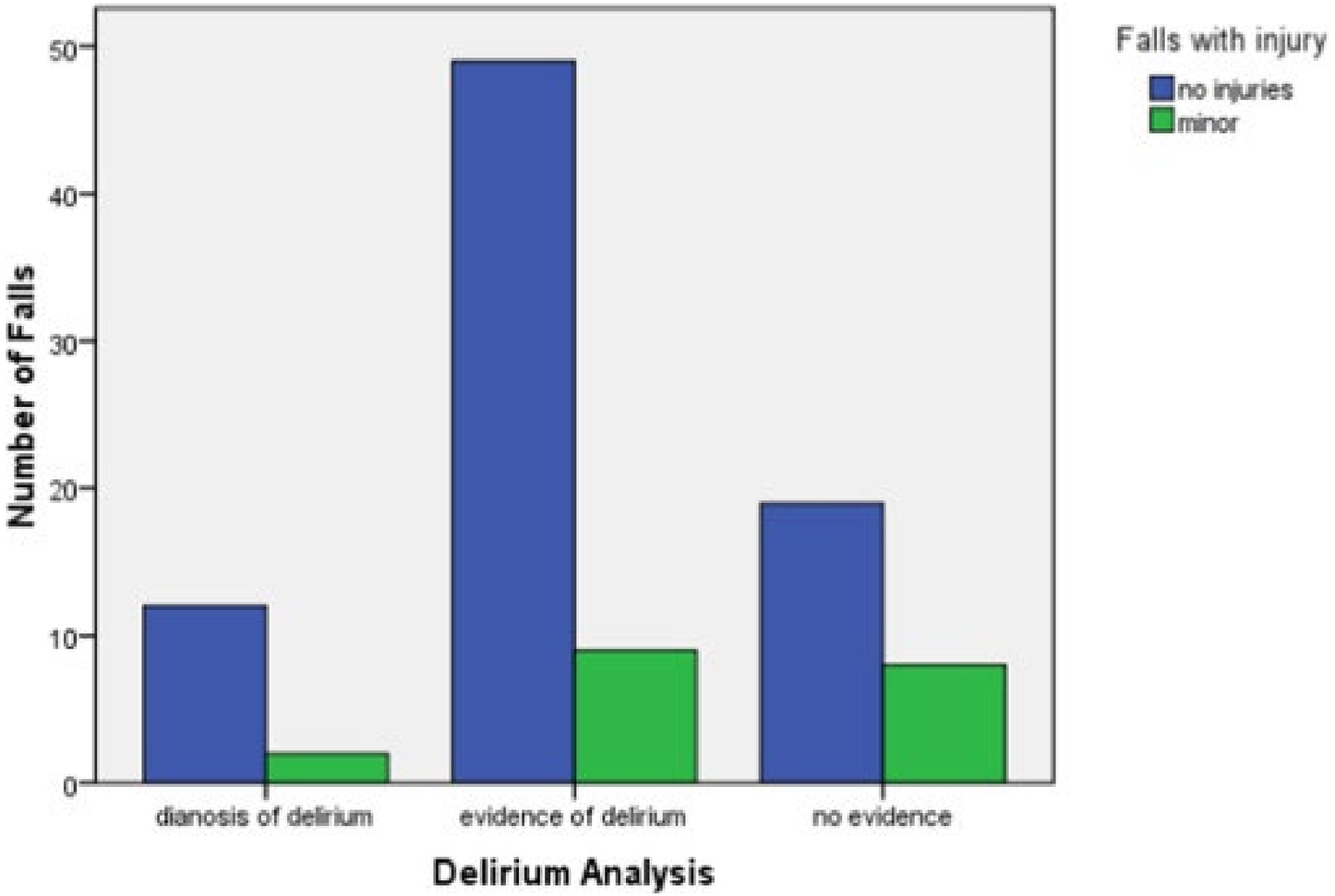
Outcomes

	No delirium		Delirium		
	CAM negative (*n* = 25,948)		CAM positive (*n* = 3,707)		*p*-value
	Falls neg (n = 25,767)	Falls pos (n = 181)	Falls neg (n = 3,602)	Falls pos (n = 105)	
LOS, mean, SD	5.2 ± 5.0	12.8 ± 13.9	12.9 ± 12.1	30.5 ± 26.0	<.0001
LOS, median	4.0	8.0	9.0	22.0	<.0001

Kalivas et al., Journal for Healthcare Quality 2023

Delirium as a driver for falls in hospital



Fall in hospital?

Think delirium
(Screen for delirium)

Babine et al., Psychosomatics 2016

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What is delirium?

Clinical diagnosis (DSM-V):

1. Disturbed **attention** and **awareness**
2. **Acute** and **fluctuating**
3. Additional disturbance in cognition
4. Not pre-existing dementia.
5. **Precipitated by a medical condition** /drug

Phenotypes: hyperactive, hypoactive, mixed.

There are no biomarkers

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What is delirium?

Reduced oral intake

Falls

Functional Impairment

Drowsiness

Paranoid

Delirium = acute brain failure

Memory impairment

Hallucinations

Confusion

Disorientation

Incontinence

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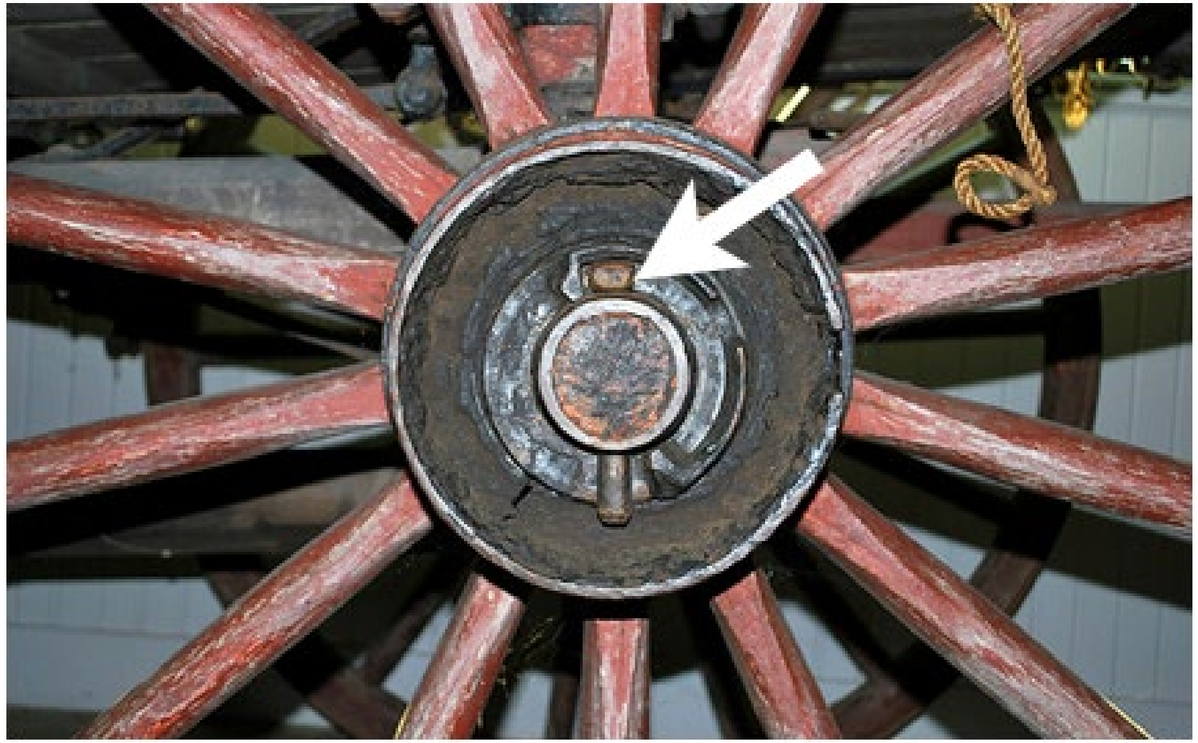
Delirium is a linchpin condition



Why do people become delirious?

Predisposing factors:

- Dementia
- Cognitive impairment
- History of delirium
- Functional impairment
- Visual impairment
- Hearing impairment
- Medical comorbidities
- Alcohol misuse
- Age >75 years

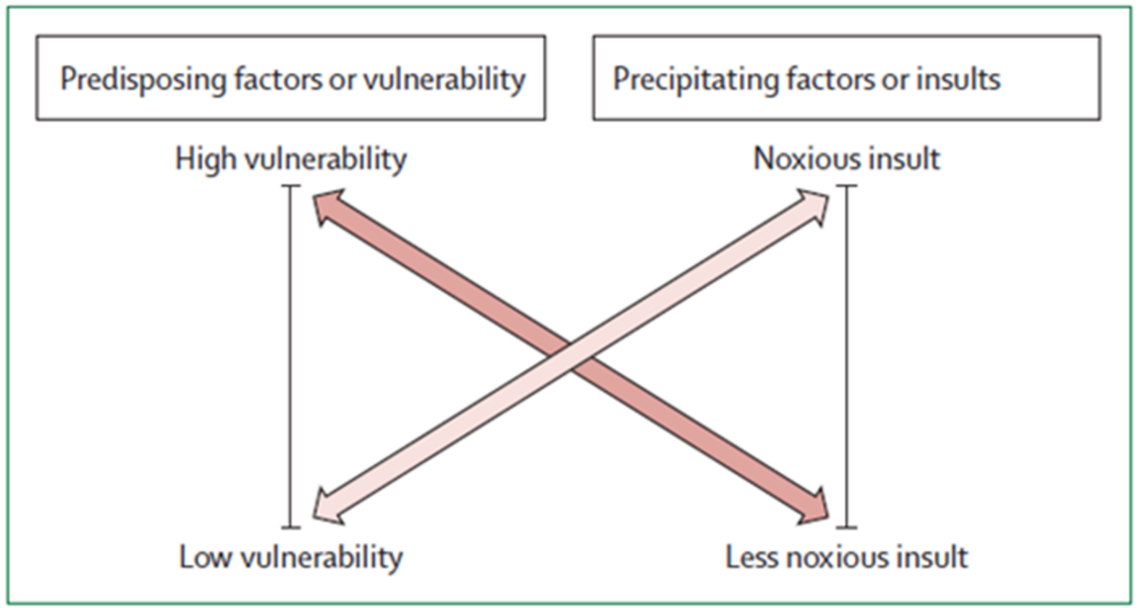


Figure: Multifactorial model of delirium in older people

Precipitating factors:

- Drugs
- Infection (bugs)
- Metabolic
- Brain disorders
- Systemic organ failure
- Urinary retention
- Constipation
- Environmental
- Surgery

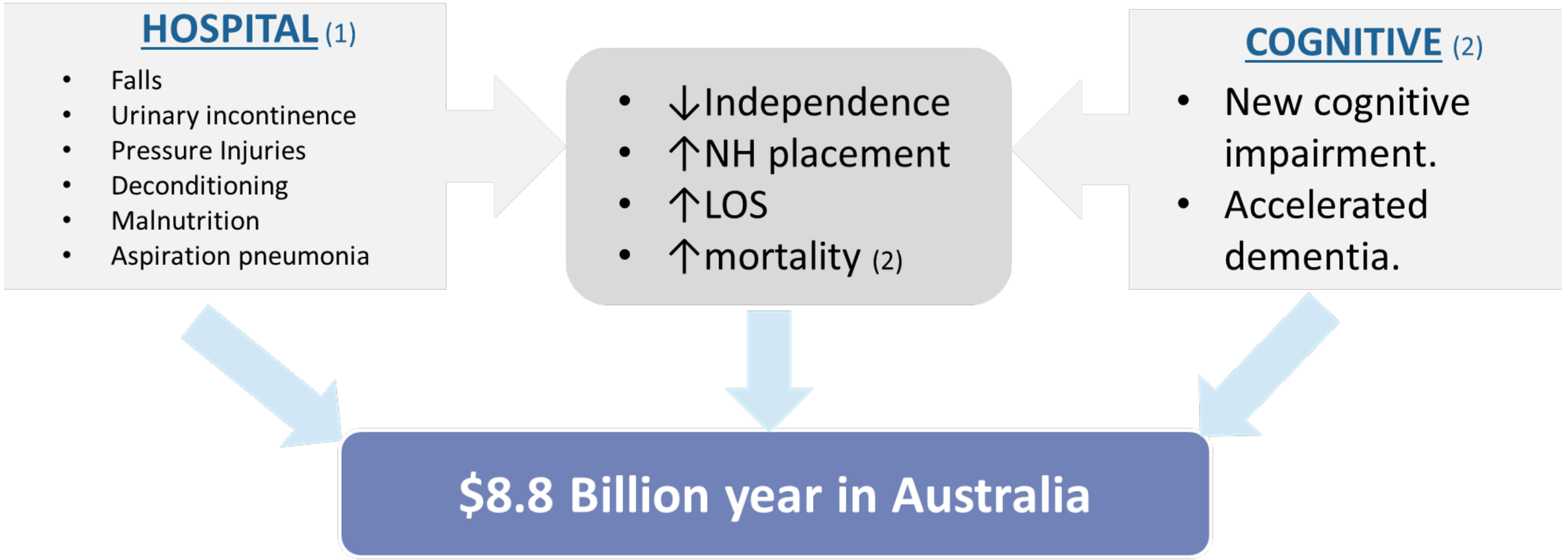
Prevalence >65years : 25%

Point prevalence >18years: 16%

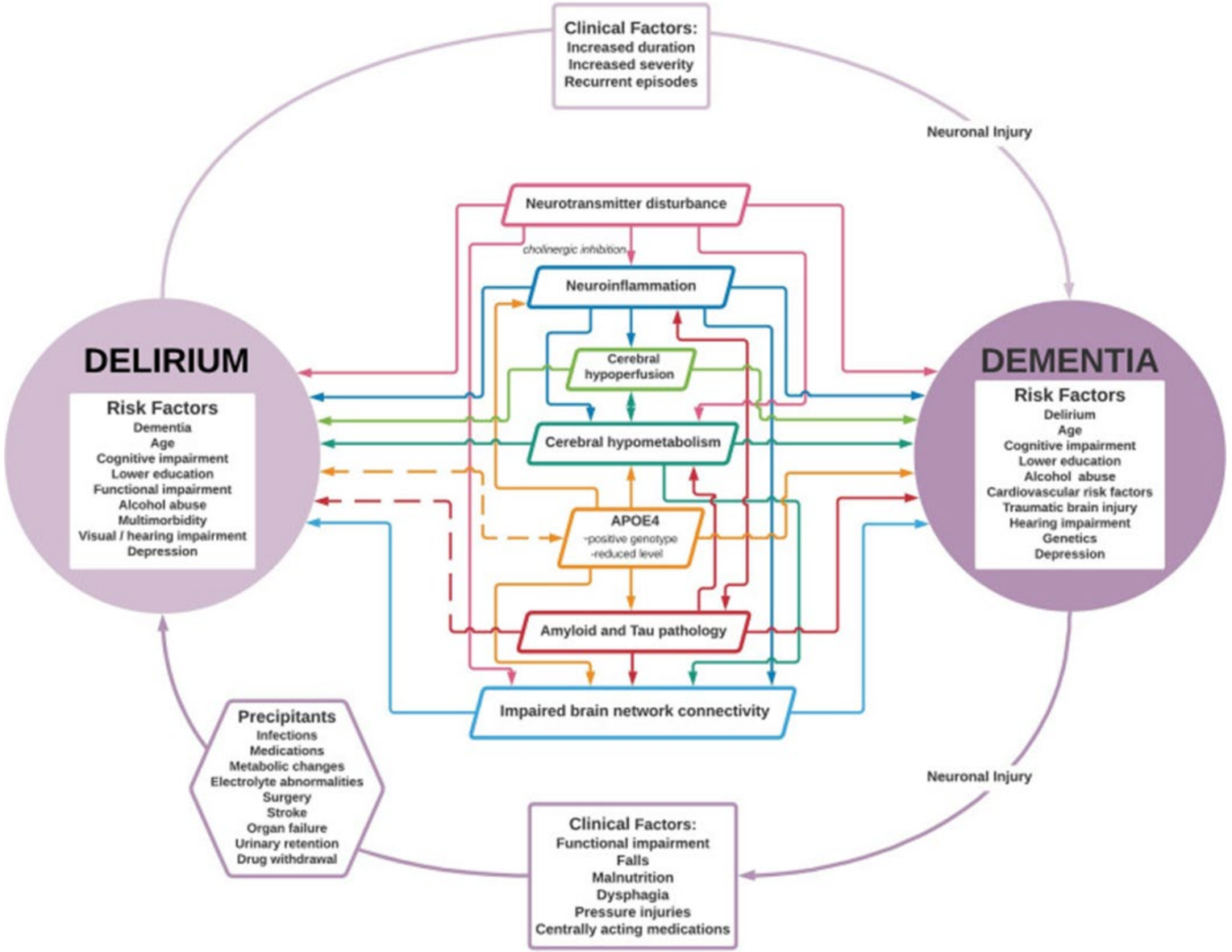
Prevalence ICU : <70%

Inouye SK Lancet 2014; Casey P Int Med J 2018

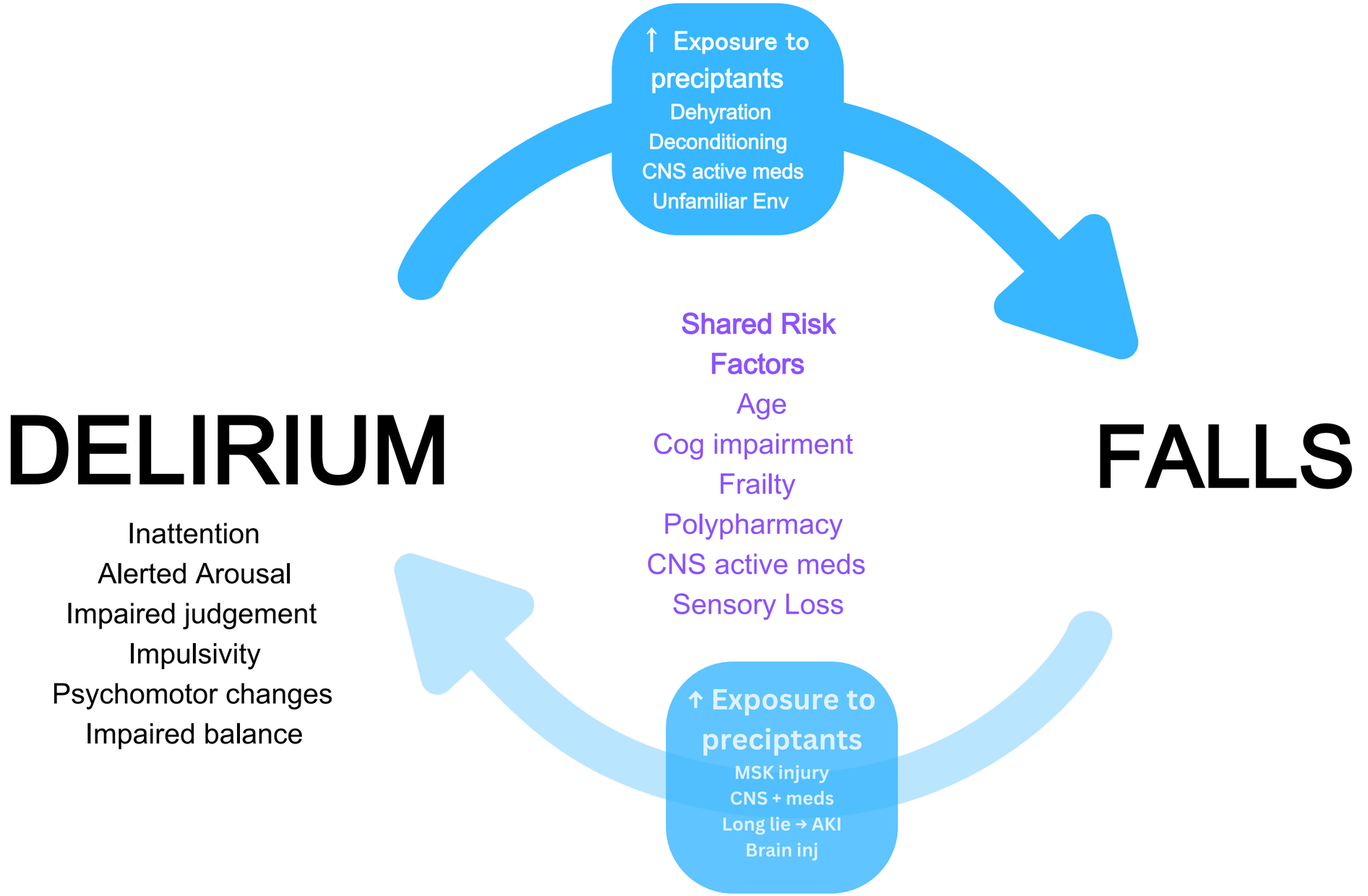
What are the outcomes for patients with delirium?



(1)Siddiqi. Age and Ageing. 2006; (2)McCusker. Arch Intern Med. 2002; (3)MacLullich. Int Rev Psych 2009; (4) Pezullo BMJ Open. 2019



Nitchingham 2021



A clinical perspective

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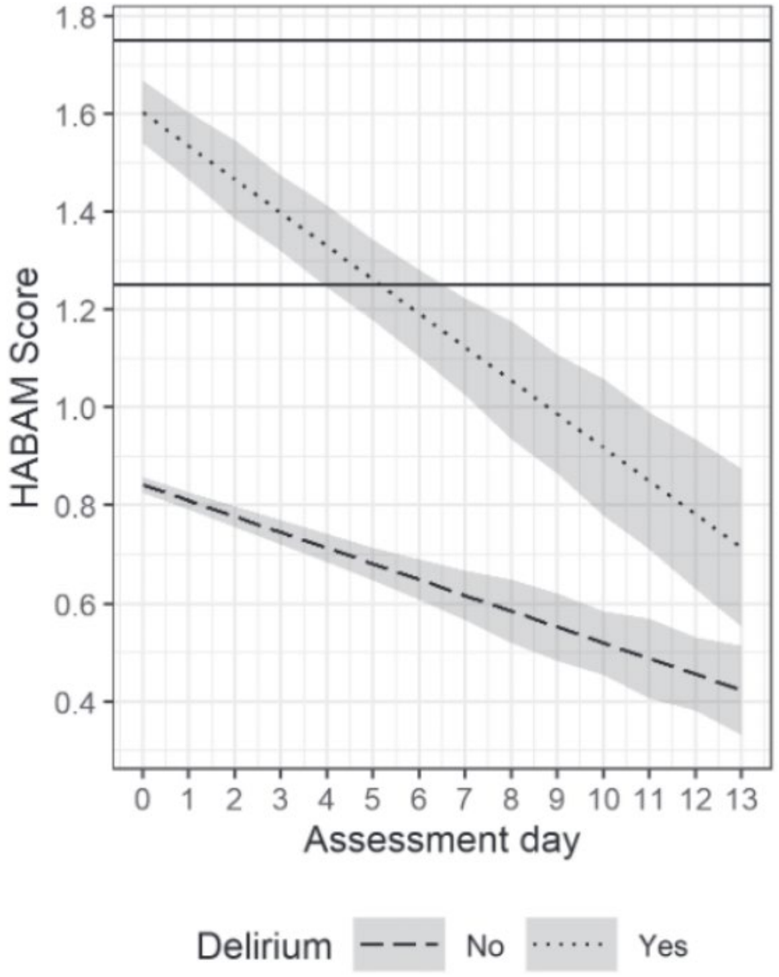
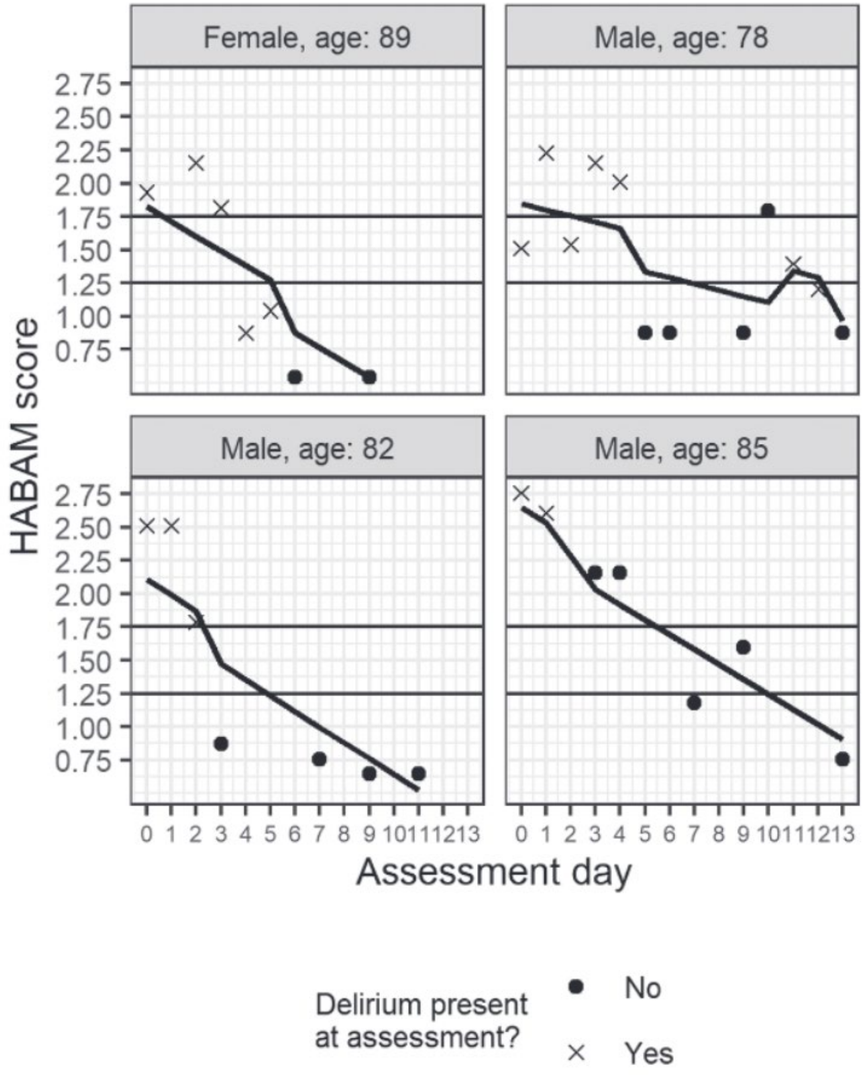
Motor disturbances are a core feature of delirium





Richardson et al 2022

How can we reduce in hospital falls?

By preventing and proactively managing delirium

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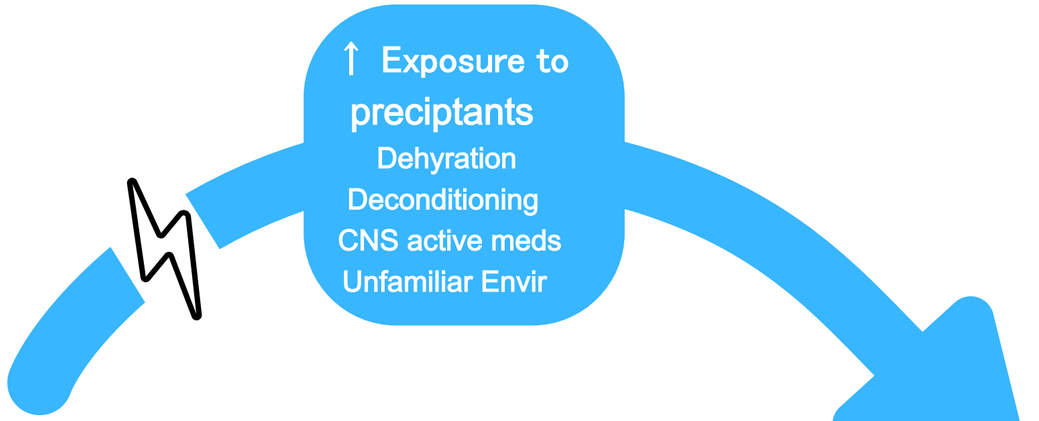
Manage Delirium

Prevent

Complications



DELIRIUM

Inattention
Alerted Arousal
Impaired judgement
Impulsivity
Psychomotor changes
Impaired balance

Shared Risk Factors
Age
Cog impairment
Frailty
Polypharmacy
CNS active meds
Sensory Loss

FALLS

Prevent

Delirium

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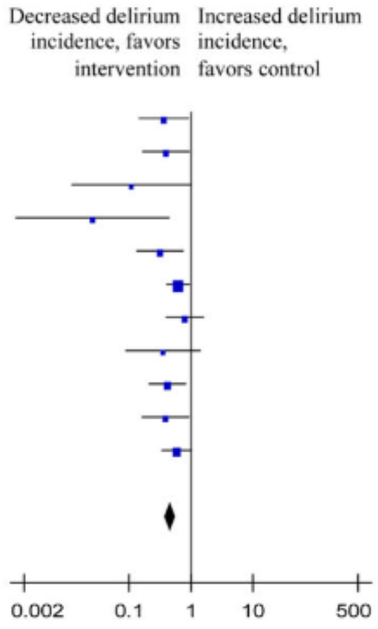
Non -pharmacological multicomponent intervention

*can **reduce** hospital acquired **delirium** by up to **40%***

Incidence of Delirium

	Odds Ratio (95% CI)	Weight, %
Andro 2011	0.36 (0.15-0.89)	7.0
Bo 2009	0.39 (0.17-0.93)	7.3
Caplan 2007	0.11 (0.01-0.99)	2.6
Chen 2011	0.03 (0.00-0.44)	5.7
Holt 2013	0.31 (0.13-0.74)	9.1
Inouye 1999	0.62 (0.41-0.94)	23.4
Jeffs 2013	0.79 (0.40-1.57)	7.6
Kratz 2008	0.35 (0.09-1.39)	3.1
Lundstrom 2007	0.42 (0.21-0.80)	11.3
Martinez 2012	0.38 (0.16-0.91)	7.3
Vidan 2009	0.59 (0.34-1.00)	15.5
Fixed-effects model: P < 0.00001	**0.47 (0.38-0.58)**	**100.0**
Heterogeneity: I^2 = 18%; P = 0.27	**NNT = 14.3 (95% CI 11.1-20)**	



* CI = confidence interval; NNT = number needed to treat

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Hshieh T, JAMA Int Med et al 2016

Multicomponent intervention for delirium prevention

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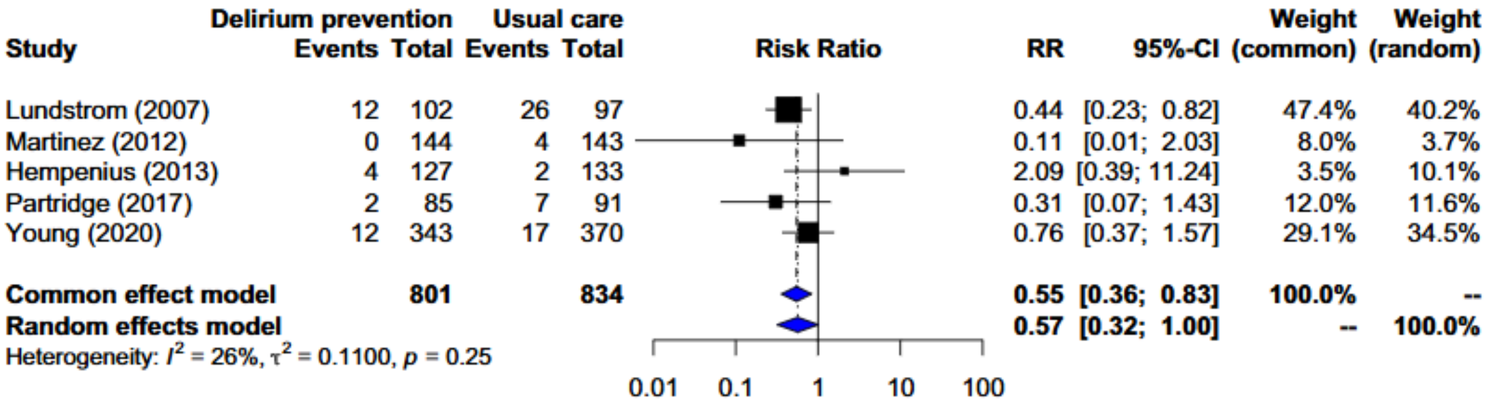
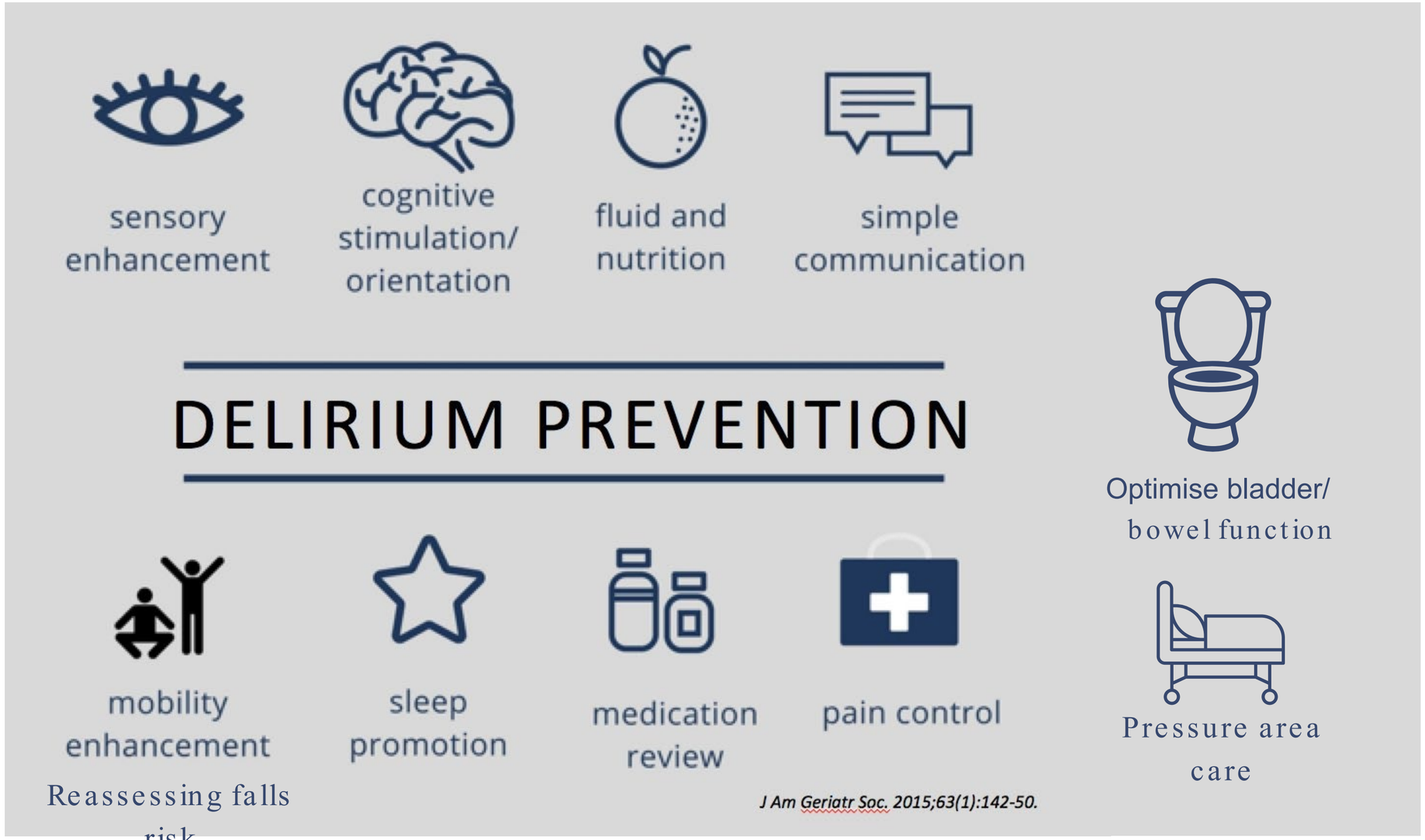
Do multicomponent interventions reduce the risk of falls?

Yes - Delirium prevention trials may **reduce** the risk of in hospital **falls by up to 40%**



He S, AJA 2021

Multicomponent intervention for delirium ~~prevention~~ treatment



Are there any drug treatments for delirium?

No

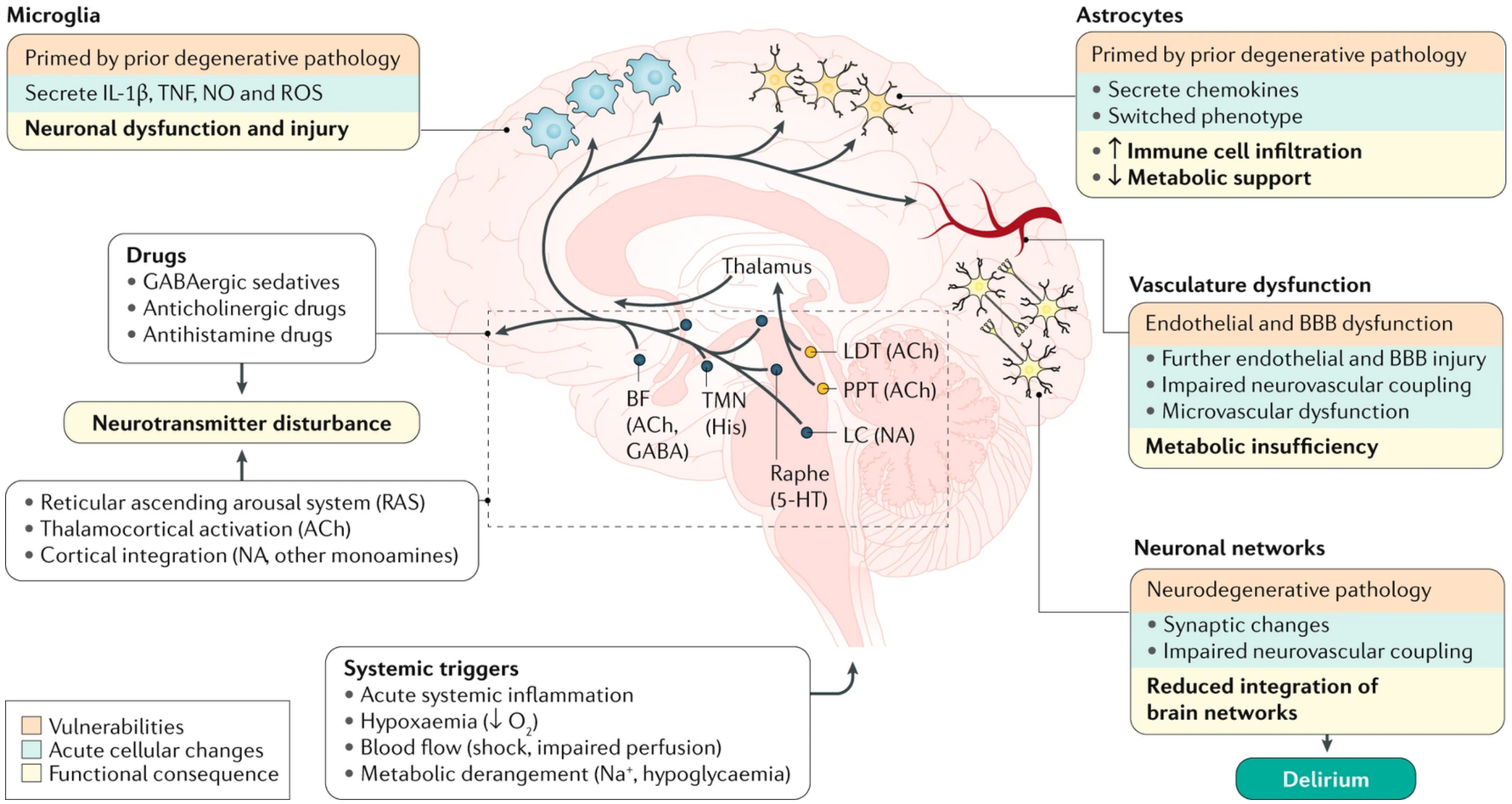
Antipsychotics are used off -label for psychotic symptoms with associated distress or for chemical restraint BUT **do not shorten delirium, improve severity or improve major outcomes** .

Antipsychotics also increase the risk of falls (OR 1.54)

Drug management of delirium: use the lowest effective dose for the shortest time

Neufeld 2016, Seppala JAMDA 2018

Are there any other drugs on the horizon?



Not all delirium in the same...

Wilson 2020

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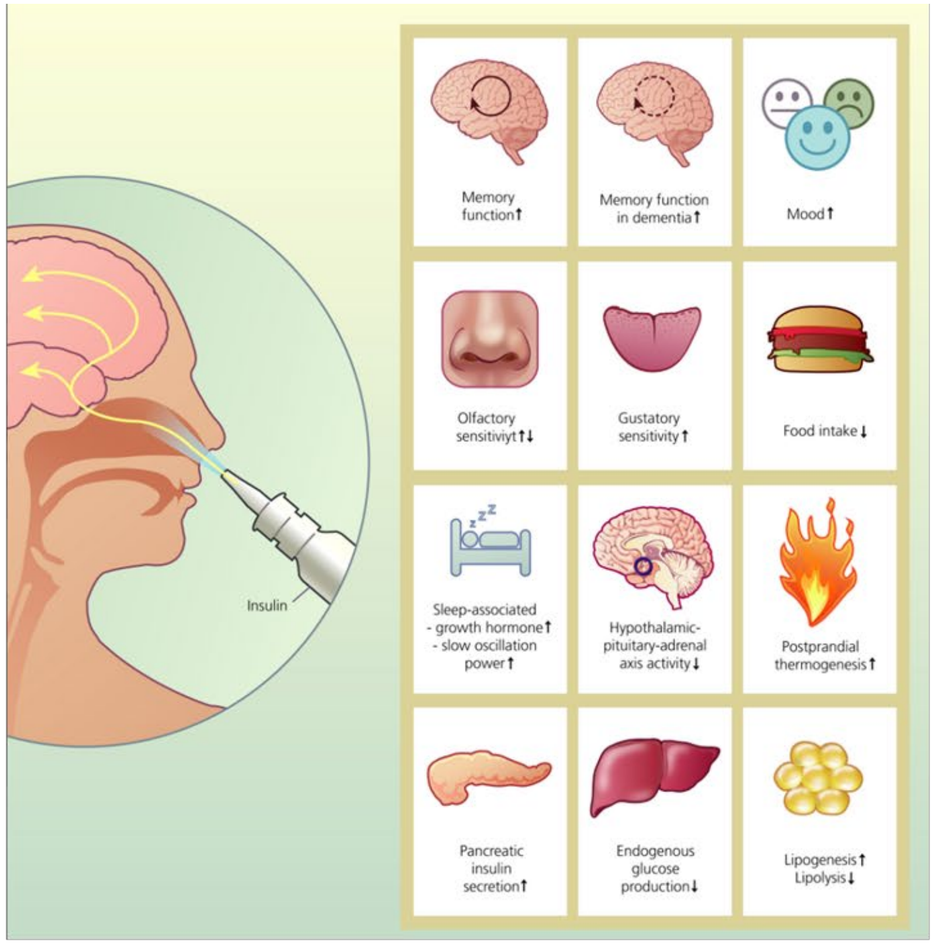
Intranasal insulin?



Hallschmid 2021

JOURNAL ARTICLE

Long-acting intranasal insulin for the treatment of delirium—a randomised clinical trial

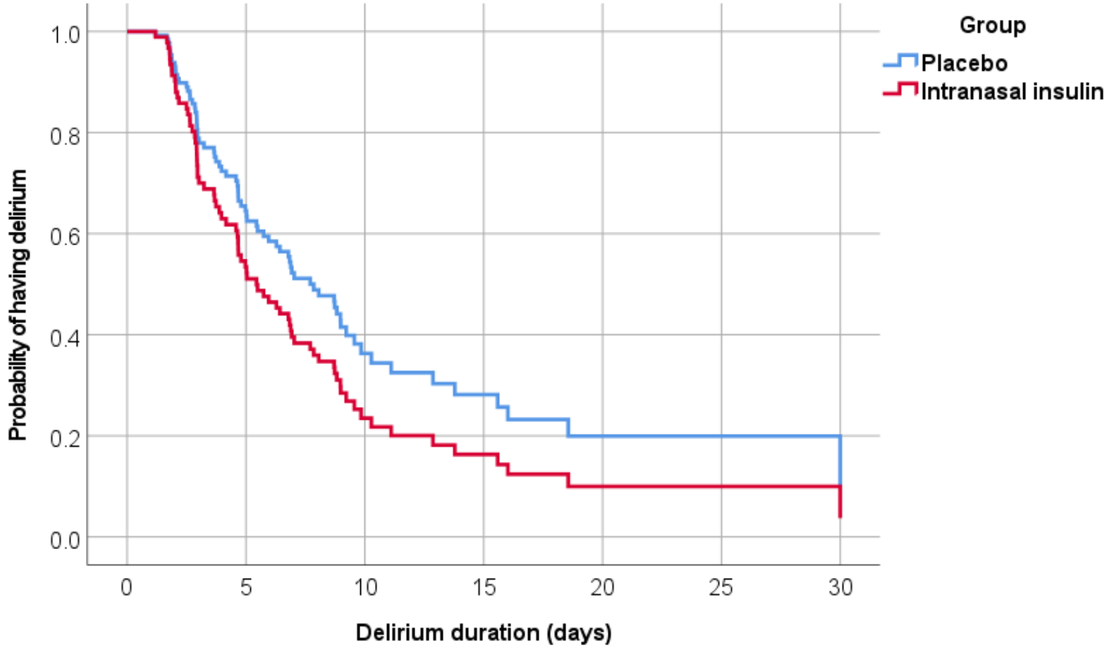
Anita Nitchingham ✉, Jacqueline C T Close, Lara Ann Harvey, Morag E Taylor, Peter Humburg, Bernard Tuch, Meera Agar, Gideon A Caplan

Age and Ageing, Volume 54, Issue 10, October 2025, afaf276,
https://doi.org/10.1093/ageing/afaf276
Published: 14 October 2025 **Article history** ▾

Analysis of the primary outcome

	Whole Cohort	Control	Intervention
	n=97	n=49	n=48
Duration of delirium (median, IQR)	5.87 (3.0, 9.7)	6.8 (3.97, 9.76)	4.83 (2.93, 9.21)

Survival Analysis

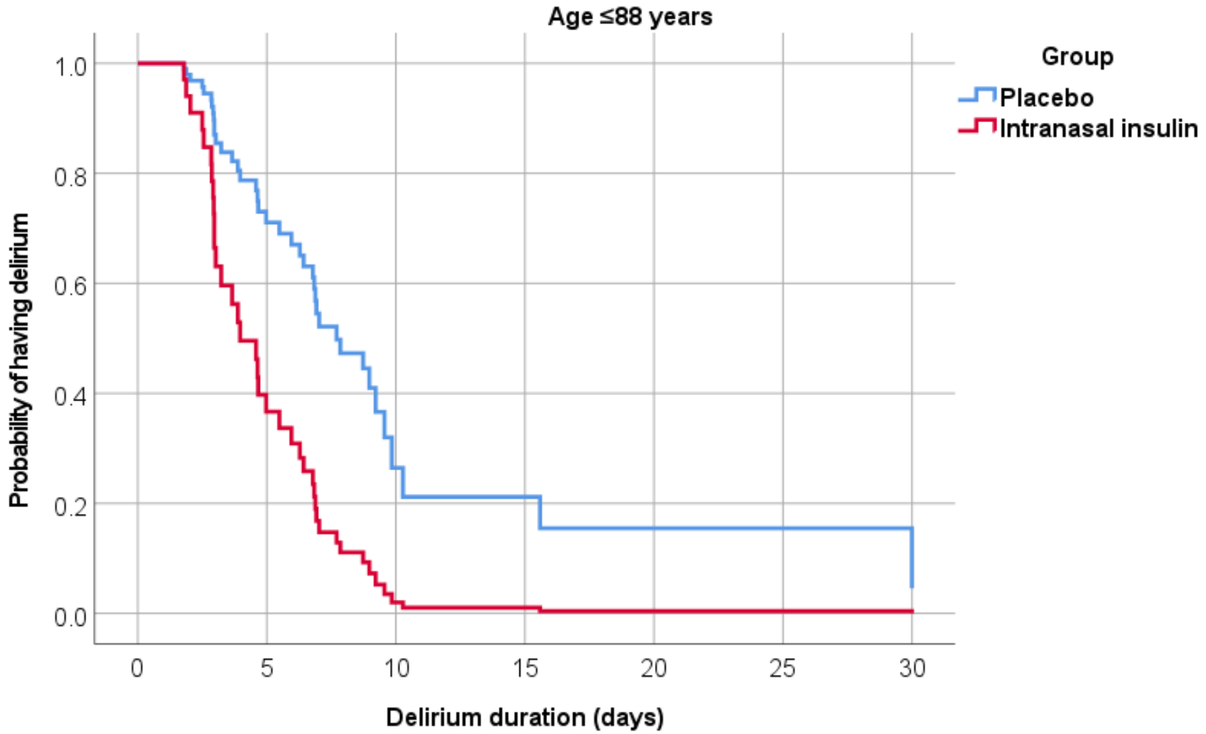


***HR 0.69; 95%CI 0.43-1.12, P=0.13**

**Adjusted for age, sex, cognition, APACHE, comorbidity, frailty*

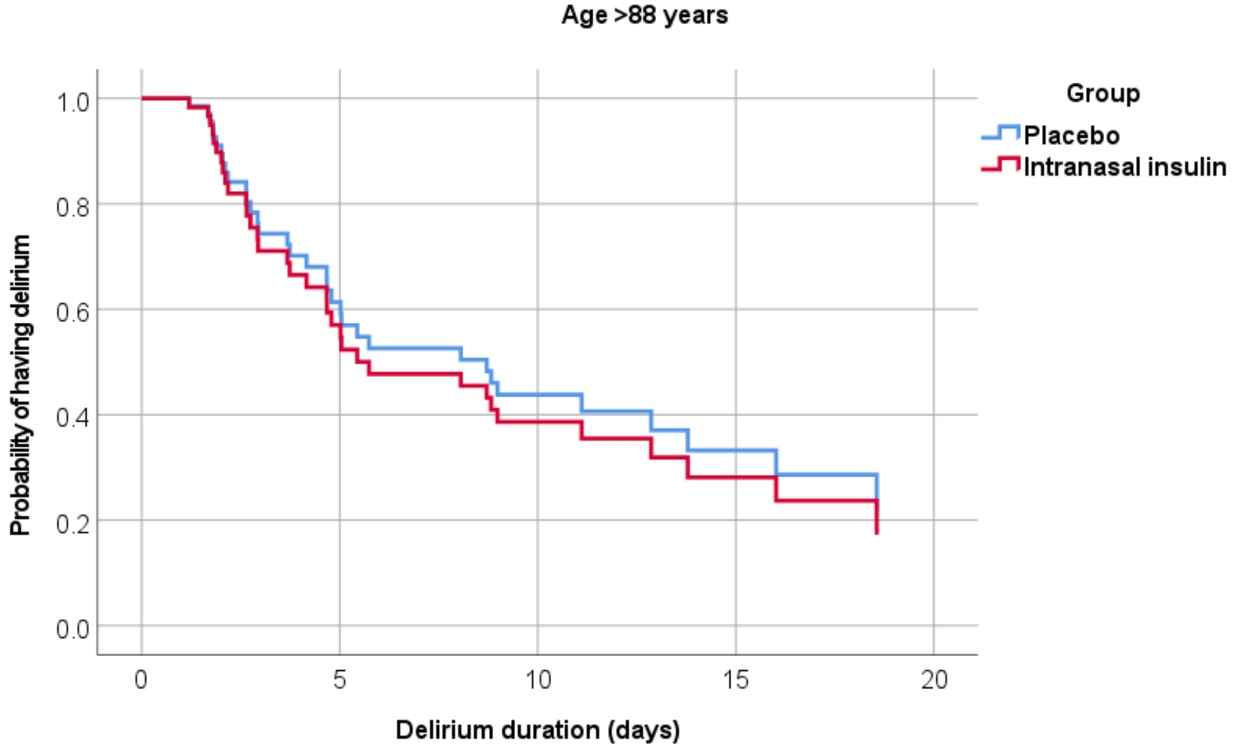
Subgroup analysis by age

Age <88 years
N=46



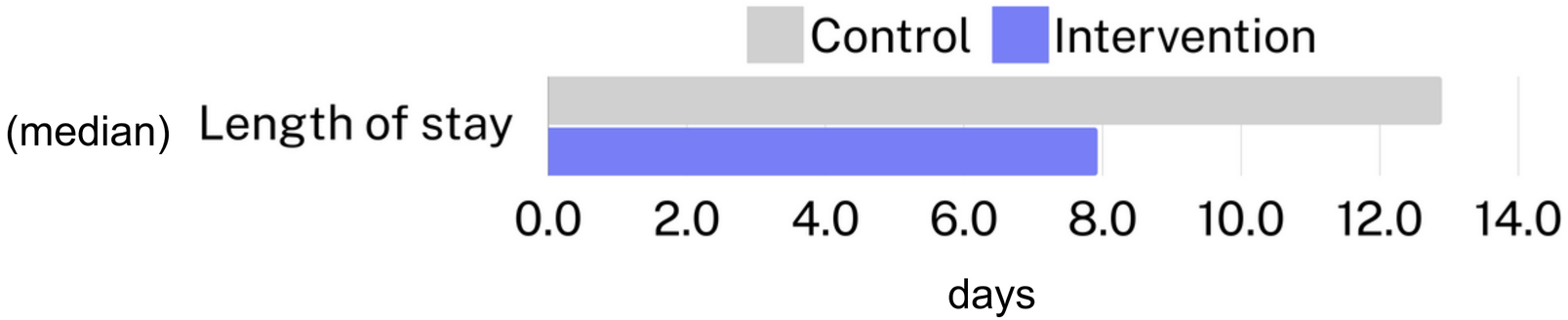
	control	intervention	p
Median duration of delirium (days)	7.0	3.9	HR 0.39, 95% CI [0.17-0.87], p= 0.02

Age >88 years
N=51



	control	intervention	p
Median duration of delirium (days)	4.9	5.4	HR 0.88, 95% CI [0.41-1.93], p= 0.76

Secondary outcomes



	Total	Control	Intervention	
Length of stay (median, IQR)	**9.6 (5.0, 16.4)**	**12.9 (7.8, 17.4)**	**7.93 (4.6, 14.5)**	**HR 0.56; 0.35-0.89, P=0.01**

More research needed

What about post-discharge care?

JOURNAL ARTICLE

The association between delirium and falls in older adults in the community: a systematic review and meta-analysis

Charlotte Eost-Telling, Lucy McNally, Yang Yang, Chunhu Shi, Gill Norman, Saima Ahmed, Brenda Poku, Annemarie Money, Helen Hawley-Hague, Chris J Todd, Susan Deborah Shenkin, Emma R L C Vardy

Age and Ageing, Volume 53, Issue 12, December 2024, afae270,

Delirium and subsequent falls (N=1)

- RR 6.66 (low certainty)

Falls and subsequent delirium (N=3)

- OR 2.01

Most studies didn't adjust for important factors: dementia, frailty, comorbidity

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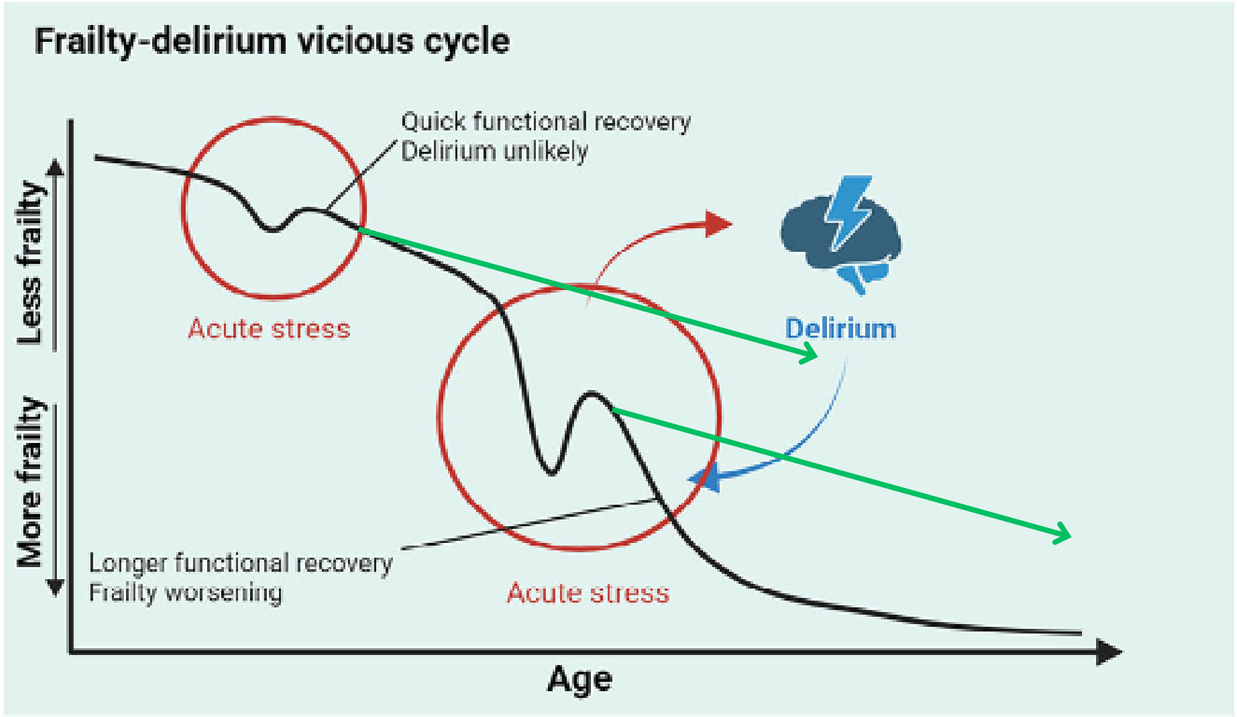
What about post-discharge care? (2)



Can outpatient care change the trajectory?

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Take home messages

1.Delirium is acute brain failure, it is still often missed

2. When an older inpatient falls – **Think Delirium**

3. When an older inpatient has delirium – **Think Falls**

4. Preventing delirium may also prevent falls

5. Delirium and falls are often markers of frailty → start thinking beyond discharge

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Patients & Families

AUSTRALASIAN DELIRIUM ASSOCIATION

www.delirium.org.au

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