

Delirium

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Faculty/Presenter Disclosure

- **Faculty: James Young**
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 - **Grants/Research Support: None**
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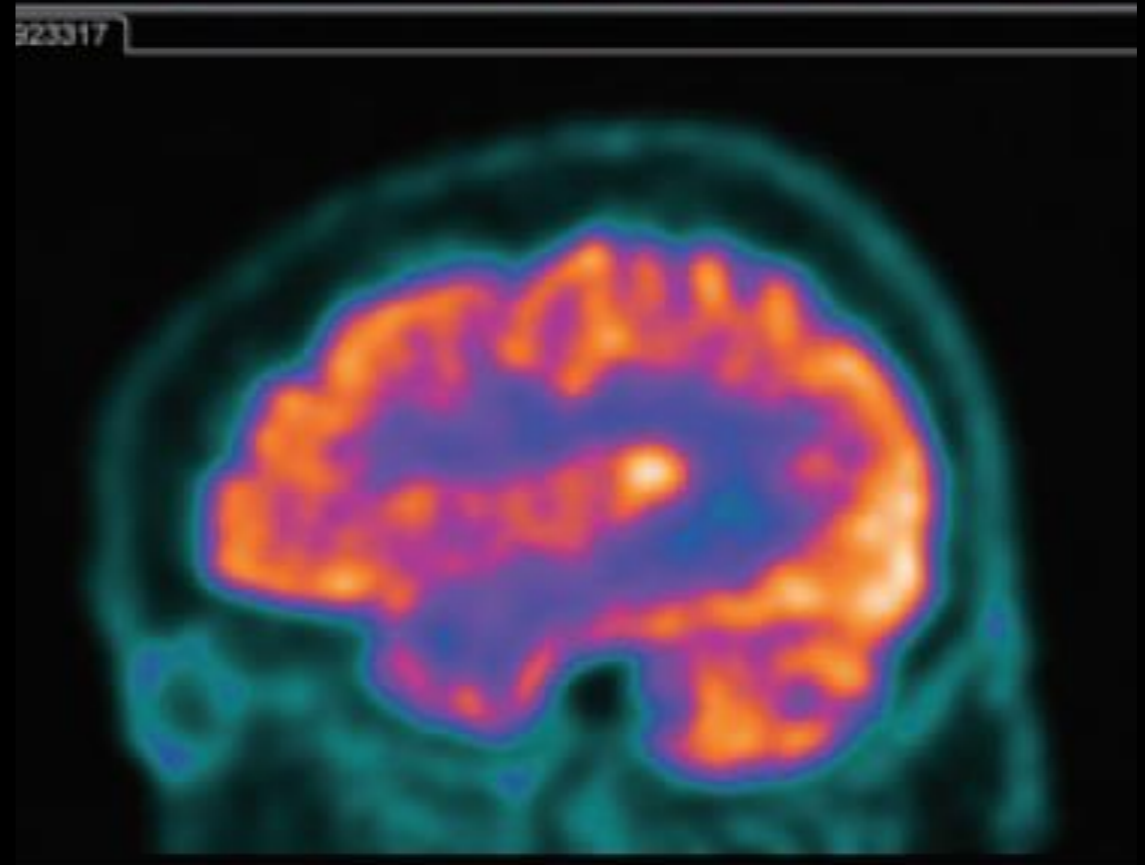
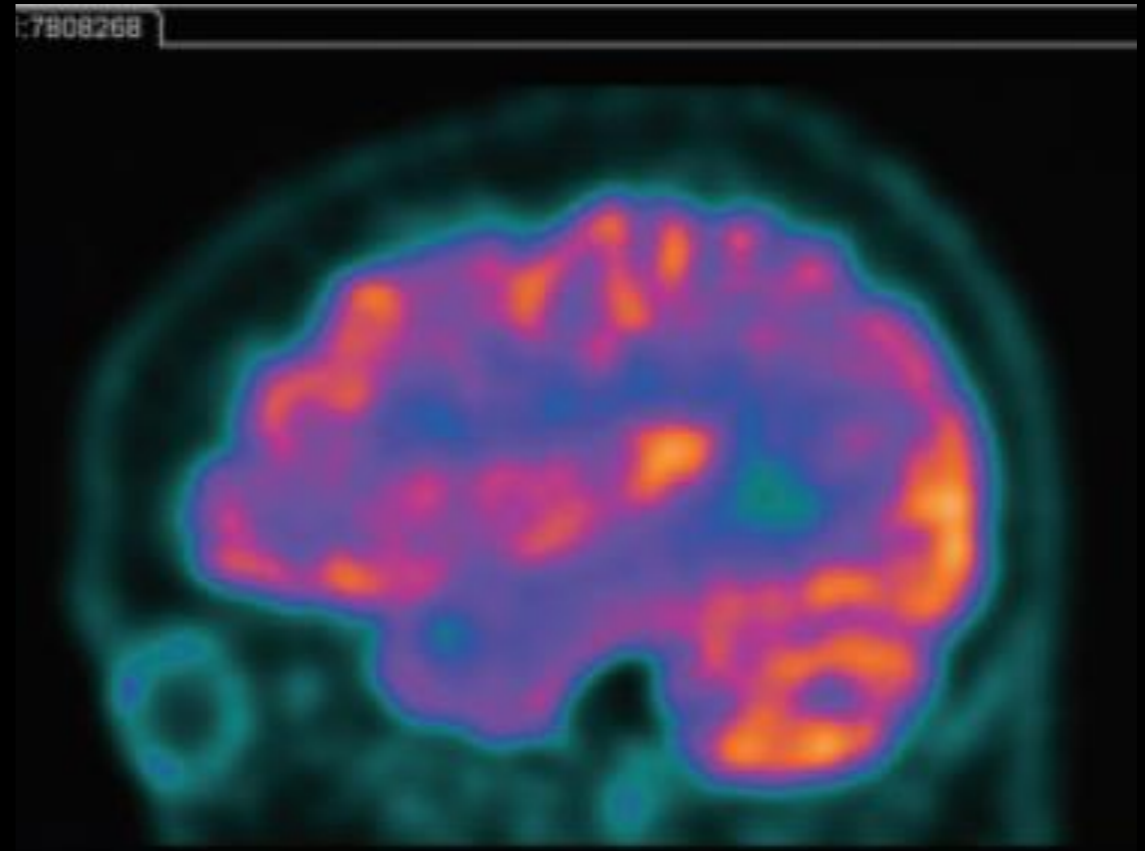
Disclosure of Financial Support

- **Potential for conflict(s) of interest:**
 - None

Mitigating Potential Bias

- None

What is delirium?



- Disturbance of arousal and attention
- “Confusion brought on by a medical problem”

What is it like to be
delirious?

“If I had one word to sum up my ICU experience it would be “horror”. In addition to my paranoid delusions of people trying to kill me, were hallucinations of ants on peoples’ faces, weird things in my IV fluid bags... These hallucinations along with the awful things that were happening “for real” finally got me to a point where I thought, I have to give up, I will either die or live but I can’t fight anymore.”

–Nancy Andrews

Experience of Delirium

- Anxiety, fear, frustration
- “Being trapped in incomprehensible experiences”
beyond one’s control
- Inability to convey needs

How do we clinically
assess delirium?

The CAM

- Confusion Assessment Method
- 1. Acute onset and fluctuating course
- 2. Inattention
- 3. Disorganized thinking
- 4. Altered level of consciousness

Performance

Positive LR	9.6
Negative LR	0.16
Sensitivity	94-100%
Specificity	90-95%
Reliability	
Kappa	0.8-1.0

3D CAM ASSESSMENT [CAM Copyright 2003, Hospital Elder Life Program, LLC. Not to be reproduced without permission]

Coding Instructions: Incorrect also includes "I don't know", and No response/non-sensical responses. For any 'Incorrect' or 'Yes' responses, check the box in the final column designating which feature is present.

READ: I have some questions about your thinking and memory....






			CAM Feature			
			1	2	3	4
1. Can you tell me the year we are in right now?	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→	→		
2. Can you tell me the day of the week?	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→	→		
3. Can you tell me what type of place is this? [hospital]	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→	→		
4. I am going to read some numbers. I want you to repeat them in backwards order from the way I read them to you. For instance, if I say "5 – 2", you would say "2 -5". OK? The first one is "7-5-1" (1-5-7).	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→			
5. The second is "8-2-4-3" (3-4-2-8).	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→			
6. Can you tell me the days of the week backwards, starting with Saturday? [S,F,T,W,T,M,S] may prompt with "what is day before" for up to 2 prompts.	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→			
7. Can you tell me the months of the year backwards, starting with December? [D,N,O,S,A,J,J,M,A,M,F,J] may prompt with "what is month before" for up to 2 prompts.	<input type="checkbox"/> Correct	<input type="checkbox"/> Incorrect	→			
8. During the past day have you felt confused?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
9. During the past day did you think that you were not really in the hospital?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
10. During the past day did you see things that were not really there?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				

Observer Ratings: To be completed after asking the patient questions 1-10 above.						
11. Was the patient sleepy, stuporous, or comatose during the interview?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→	→	→	
12. Did the patient show excessive absorption with ordinary objects in the environment (hypervigilant)?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→	→	→	
13. Was the patient's flow of ideas unclear or illogical, for example tell a story unrelated to the interview (tangential)?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→	→		
14. Was the patient's conversation rambling, for example did he/she give inappropriately verbose and off target responses?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→	→		
15. Was the patient's speech unusually limited or sparse? (e.g. yes/no answers)	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→	→		
16. Did the patient have trouble keeping track of what was being said during the interview?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→			
17. Did the patient appear inappropriately distracted by environmental stimuli?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	→			
18. Did the patient's level of consciousness fluctuate during the interview, for example, start to respond appropriately and then drift off?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
19. Did the patient's level of attention fluctuate during the interview, e.g., did the patient's focus on the interview or performance on the attention tasks vary significantly?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
20. Did the patient's speech/thinking fluctuate during the interview, for example, patient spoke slowly, then spoke very fast?	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
OPTIONAL QUESTIONS: COMPLETE ONLY IF FEATURE 1 IS <u>NOT</u> CHECKED AND FEATURE 2 IS CHECKED AND EITHER FEATURE 3 OR 4 IS CHECKED						
21. Contact a family member, friend, or health care provider who knows the patient well and ask: "Is there evidence of an acute change in mental status (memory or thinking) from the patient's baseline?"	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
22. IF SECOND DAY OF HOSPITALIZATION OR LATER AND PREVIOUS 3D-CAM RATINGS ARE AVAILABLE: Review previous 3D-CAM assessments and determine if there has been an acute change in performance, based on ANY new "positive" items	<input type="checkbox"/> No	<input type="checkbox"/> Yes				
CAM Summary: Check if Feature Present in column above			1	2	3	4
DELIRIUM REQUIRES FEATURE 1 AND 2 and EITHER 3 OR 4: _____ Present _____ Not Present						

How long does it take to
do an adequate
assessment?

1 min 14 sec

Comparative Accuracy and Efficiency of Four Delirium Screening Protocols

Claire M. Motyl, BA,   Long Ngo, PhD,^{†‡} Wenxiao Zhou, MSc,[†] Yoojin Jung, PhD,[†] Douglas Leslie, PhD,[§] Marie Boltz, GNP-BC, PhD,[¶] Erica Husser, PhD,[¶] Sharon K. Inouye, MD, MPH, AGSF,^{‡||**} Donna Fick, RN, PhD,^{§¶}   and Edward R. Marcantonio, MD, MSc^{†‡**} *

Item	Question
1	Please tell me the day of the week (UB-2 Item 1).
2	Please tell me the months of the year backwards, starting with December (UB-2 Item 2).



OPEN ACCESS

RESEARCH PAPER

Attention! A good bedside test for delirium?

Niamh A O'Regan,¹ Daniel J Ryan,¹ Eve Boland,² Warren Connolly,² Ciara McGlade,¹ Maeve Leonard,³ Josie Clare,⁴ Joseph A Eustace,⁵ David Meagher,^{6,7} Suzanne Timmons¹

Table 3 Most accurate screening methods from our study, overall group and subgroups based on age and cognitive status. Our preferred screening approaches highlighted in bold

		Screening method	Sensitivity* (95% CI)	Specificity* (95% CI)
General hospital inpatients (n=265)	Single test	MOTYB	83.3% (69.8–92.5)	90.8% (86.1–94.3)
	Simultaneous tests	MOTYB/evidence of confusion (either positive = positive)	93.8% (82.8–98.6)	84.7% (79.2–89.2)
		MOTYB/SSF4 (either failed = positive)	93.8% (82.8–98.6)	81.1% (75.2–86.1)
Older inpatients, ≥69 years (n=133)	Single test	MOTYB	83.8% (68–93.8)	89.6% (81.7–94.9)
Younger inpatients, ≤ 69 years (n=132)	Single test	Evidence of confusion	90.9% (58.7–98.5)	92.5% (86.2–96.5)
	Simultaneous tests	SSF4/evidence of confusion (either positive = positive)	100% (73.3–100)	87.5% (80.2–92.8)
		SSF4/MOTYB (either positive = positive)	100% (73.3–100)	86.8% (79.4–92.2)
Patients with known dementia (n=31)	Single test	MOTYB	87.5% (67.6–97.2)	71.4% (29.3–95.5)
Patients with no history of dementia (n=154)	Simultaneous tests	MOTYB/SSF4 (either positive = positive)	87.5% (67.6–97.2)	86.3% (79.5–91.6)

*Sensitivities and specificities with 95% CIs based only on results from our study.

MOTYB, months of the year backwards test; ssf4, spatial span forwards with a cut-off of 4.

Challenges in LTC

- Differential diagnosis:
 - Dementia
 - Depression
 - Psychosis
 - Decreased LOC
- Early Recognition



Clinical characteristics associated with the onset of delirium among long-term nursing home residents

Evelyn Ning Man Cheung^{1*}, Sophiya Benjamin², George Heckman^{3,4}, Joanne Man-Wai Ho^{1,3,5}, Linda Lee^{5,6}, Samir K. Sinha⁷ and Andrew P. Costa^{1,3,5,8}

- Delirium incidence 40% over stay
- Dementia, presence of pain, use of antipsychotics significantly associated with delirium onset

How do we manage
delirium?

Management

- Prevent delirium
- Make the diagnosis
- Search for the cause
- Treat with medication

How do we prevent
delirium?

TABLE 1. RISK FACTORS FOR DELIRIUM AND INTERVENTION PROTOCOLS.

TARGETED RISK FACTOR AND ELIGIBLE PATIENTS

STANDARDIZED INTERVENTION PROTOCOLS

Cognitive impairment*

All patients, protocol once daily; patients with base-line MMSE score of <20 or orientation score of <8, protocol three times daily

Orientation protocol: board with names of care-team members and day's schedule; communication to reorient to surroundings
Therapeutic-activities protocol: cognitively stimulating activities three times daily (e.g., discussion of current events, structured reminiscence, or word games)

Sleep deprivation

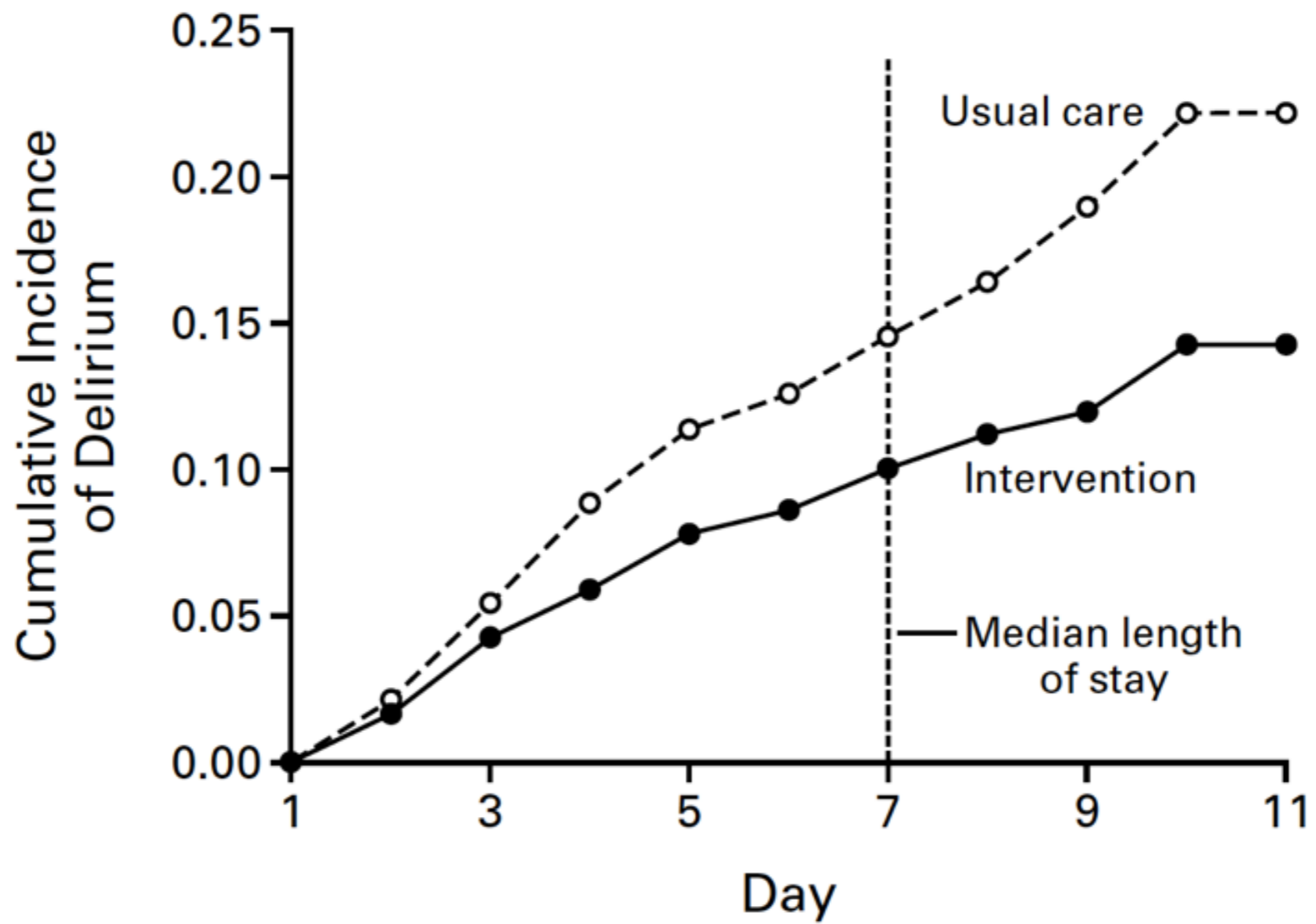
All patients; need for protocol assessed once daily

Nonpharmacologic sleep protocol: at bedtime, warm drink (milk or herbal tea), relaxation tapes or music, and back massage
Sleep-enhancement protocol: unit-wide noise-reduction strategies (e.g., silent pill crushers, vibrating beepers, and quiet hallways) and schedule adjustments to allow sleep (e.g., rescheduling of medications and procedures)

Immobility

All patients; ambulation whenever possible, and range-of-motion exercises when patients chronically non-ambulatory, bed or wheelchair bound, immobilized (e.g., because

Early-mobilization protocol: ambulation or active range-of-motion exercises three times daily; minimal use of immobilizing equipment (e.g., bladder catheters or physical restraints)



Preventing delirium in an acute hospital using a non-pharmacological intervention

FELIPE TOMAS MARTINEZ¹, CATALINA TOBAR¹, CARLOS IGNACIO BEDDINGS¹, GUSTAVO VALLEJO¹, PAOLA FUENTES²

- Education - 10 min teaching
- Extended visitation times

- Incident delirium - 5.6 vs. 13.3%

Table. The Most Common Components of Successful Delirium Prevention Programs

Anesthesia protocols
Assessment of bowel/bladder functions
Early mobilization
Extra nutrition
Geriatric consultation
Hydration
Medication review
Pain management
Prevention and treatment of medical complications
Sleep enhancement
Staff education
Supplemental oxygen
Therapeutic cognitive activities/orientation
Vision and hearing protocols

How do we treat
delirium?

Medications

- **Antipsychotics:** haloperidol, quetiapine, risperidone, olanzapine
- Other: Melatonin, Trazodone
- Not in hypoactive delirium

Antipsychotic Medication for Prevention and Treatment of Delirium in Hospitalized Adults: A Systematic Review and Meta-Analysis

*Karin J. Neufeld, MD, MPH,^{*a} Jirong Yue, MD,^{§a} Thomas N. Robinson, MD, MPH,^{||}
Sharon K. Inouye, MD, MPH,^{**††b} and Dale M. Needham, MD, PhD^{†‡b}*

- Antipsychotic use not associated with change in delirium duration, severity or hospital/ICU LOS

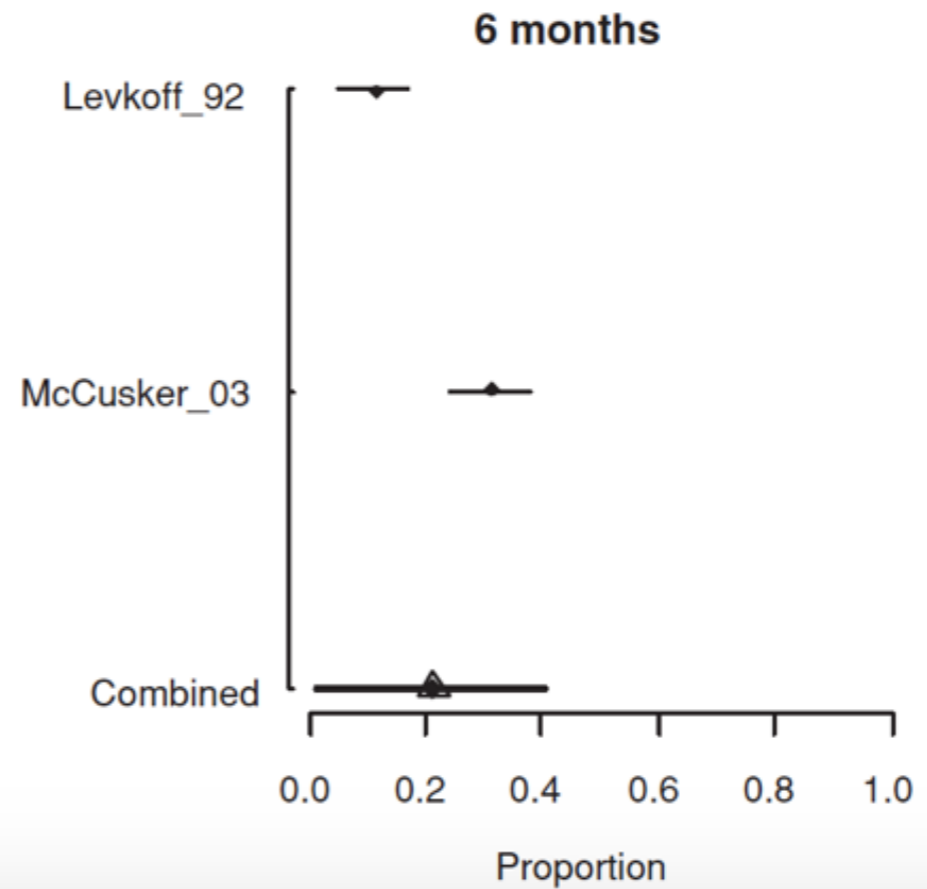
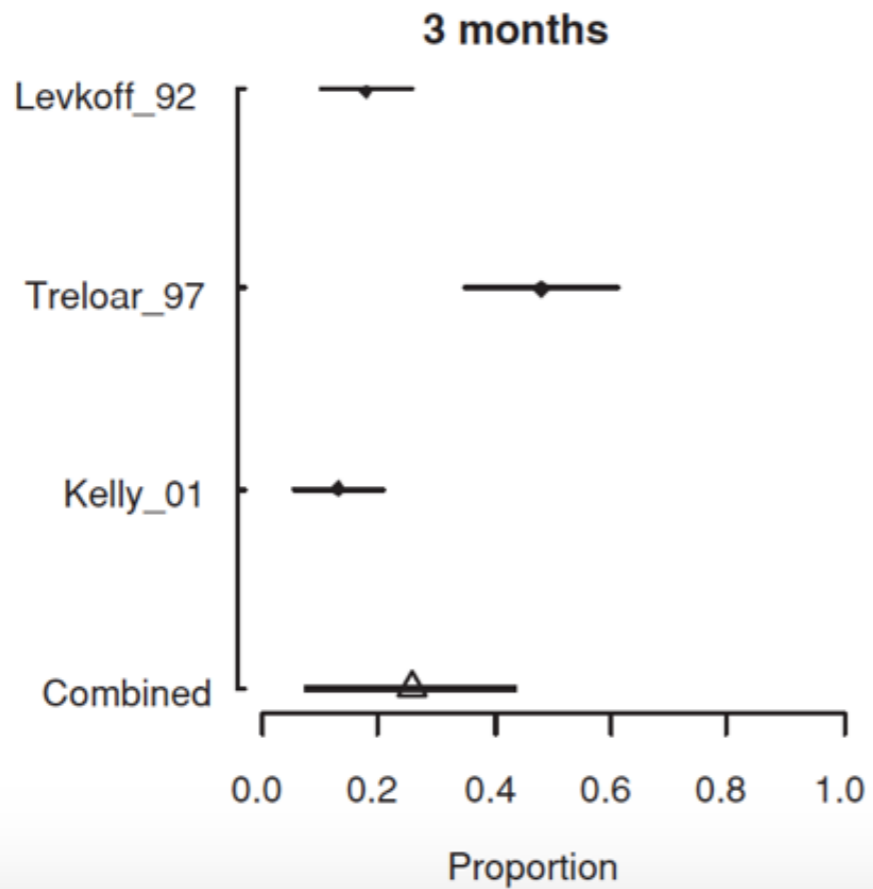
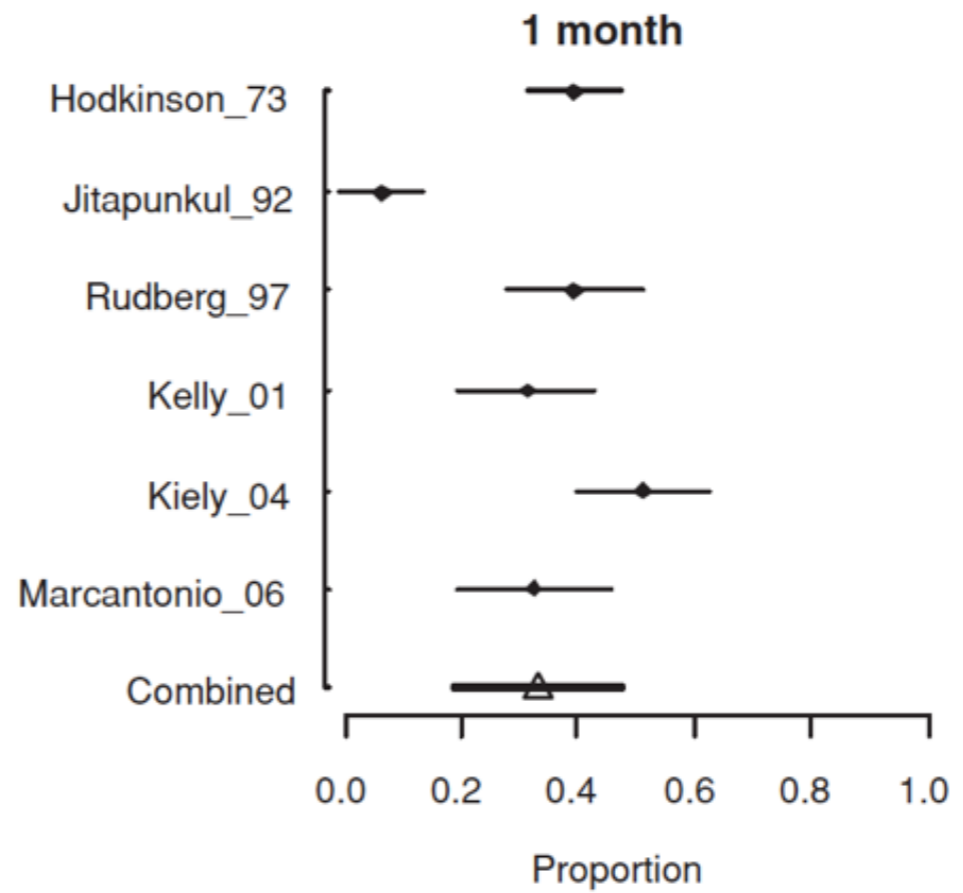
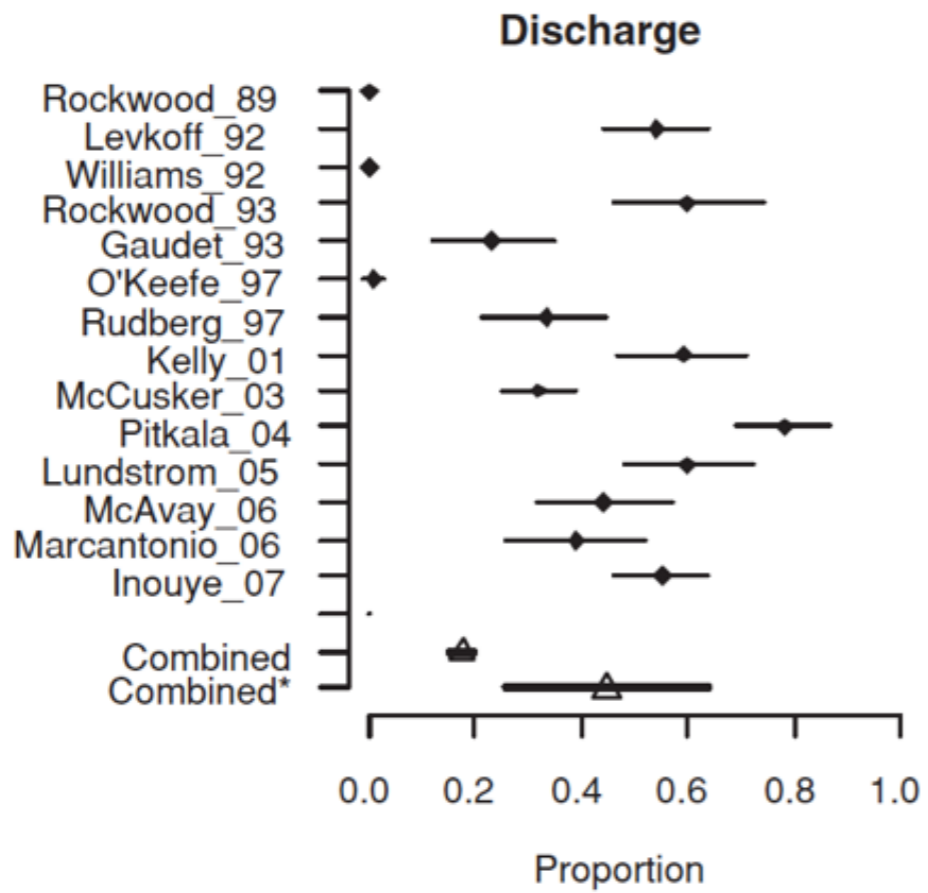
Antipsychotics for Treating Delirium in Hospitalized Adults

A Systematic Review

Roozbeh Nikooie, MD; Karin J. Neufeld, MD, MPH; Esther S. Oh, MD, PhD; Lisa M. Wilson, ScM; Allen Zhang, BS; Karen A. Robinson, PhD*; and Dale M. Needham, MD, PhD*

- Current evidence does not support routine use of haloperidol or second-generation antipsychotics to treat delirium in adult inpatients.

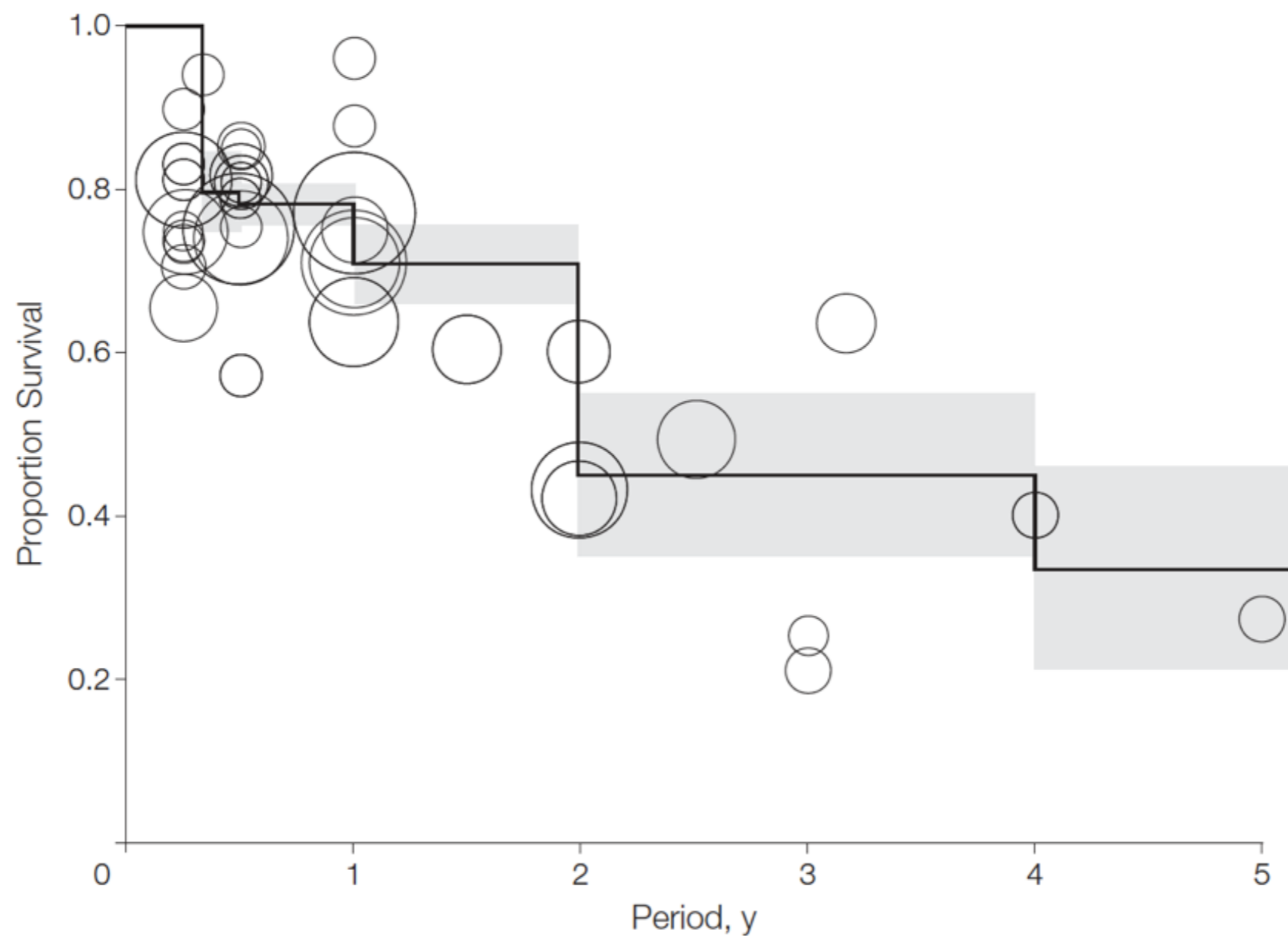
What happens after
delirium?



Delirium in Elderly Patients and the Risk of Postdischarge Mortality, Institutionalization, and Dementia

A Meta-analysis

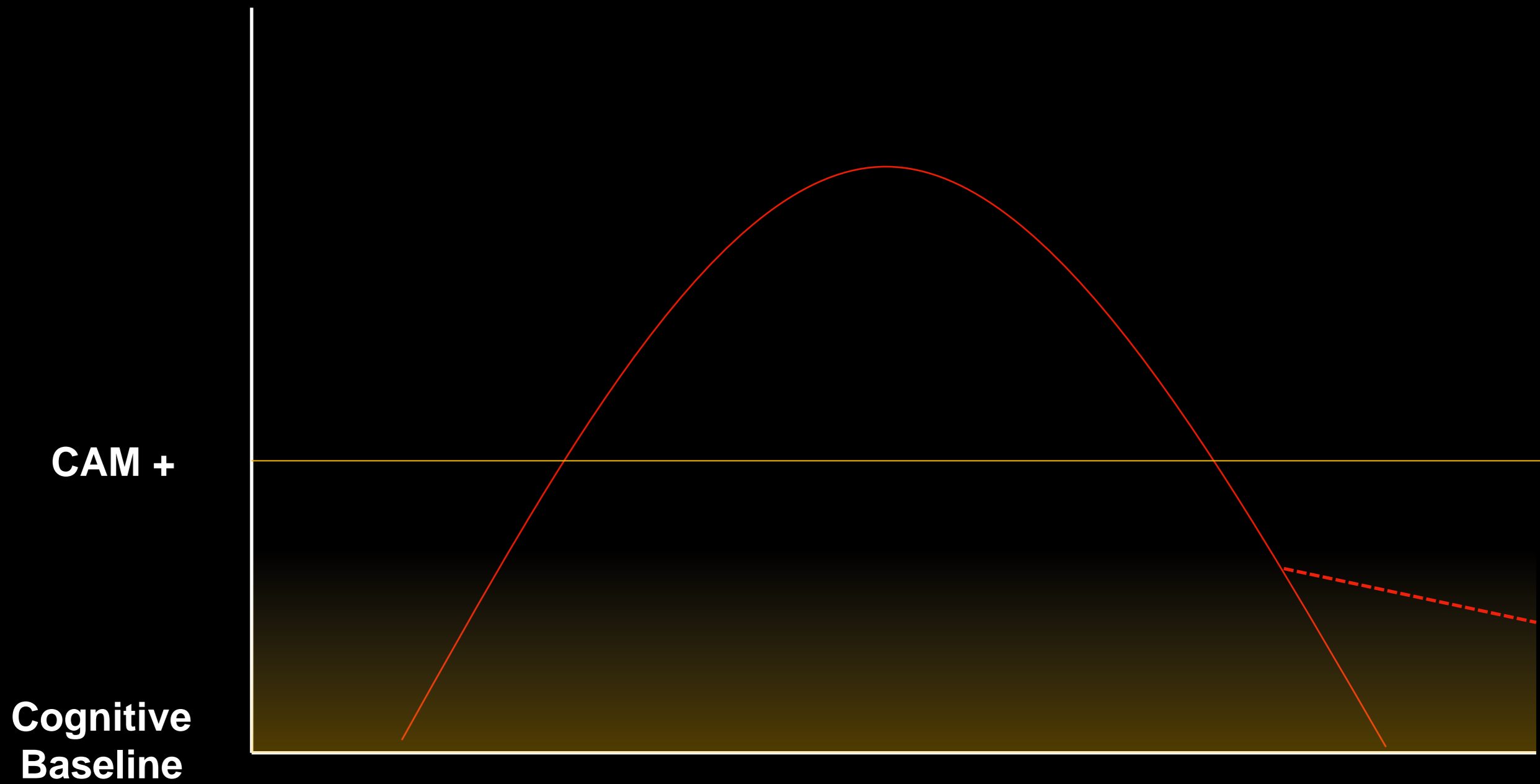
3. Meta-analytic Survival Curve



The course of delirium in older long-term care residents

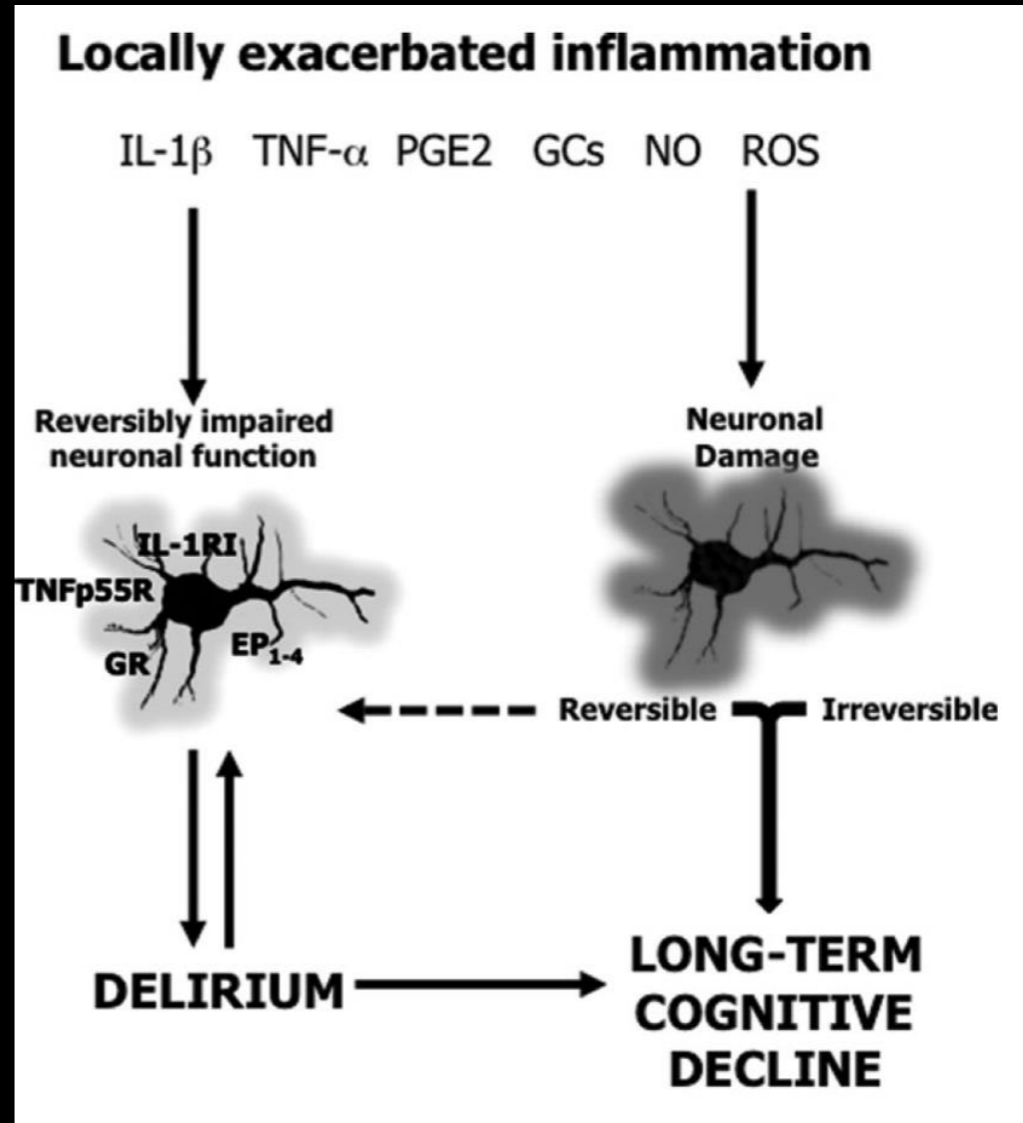
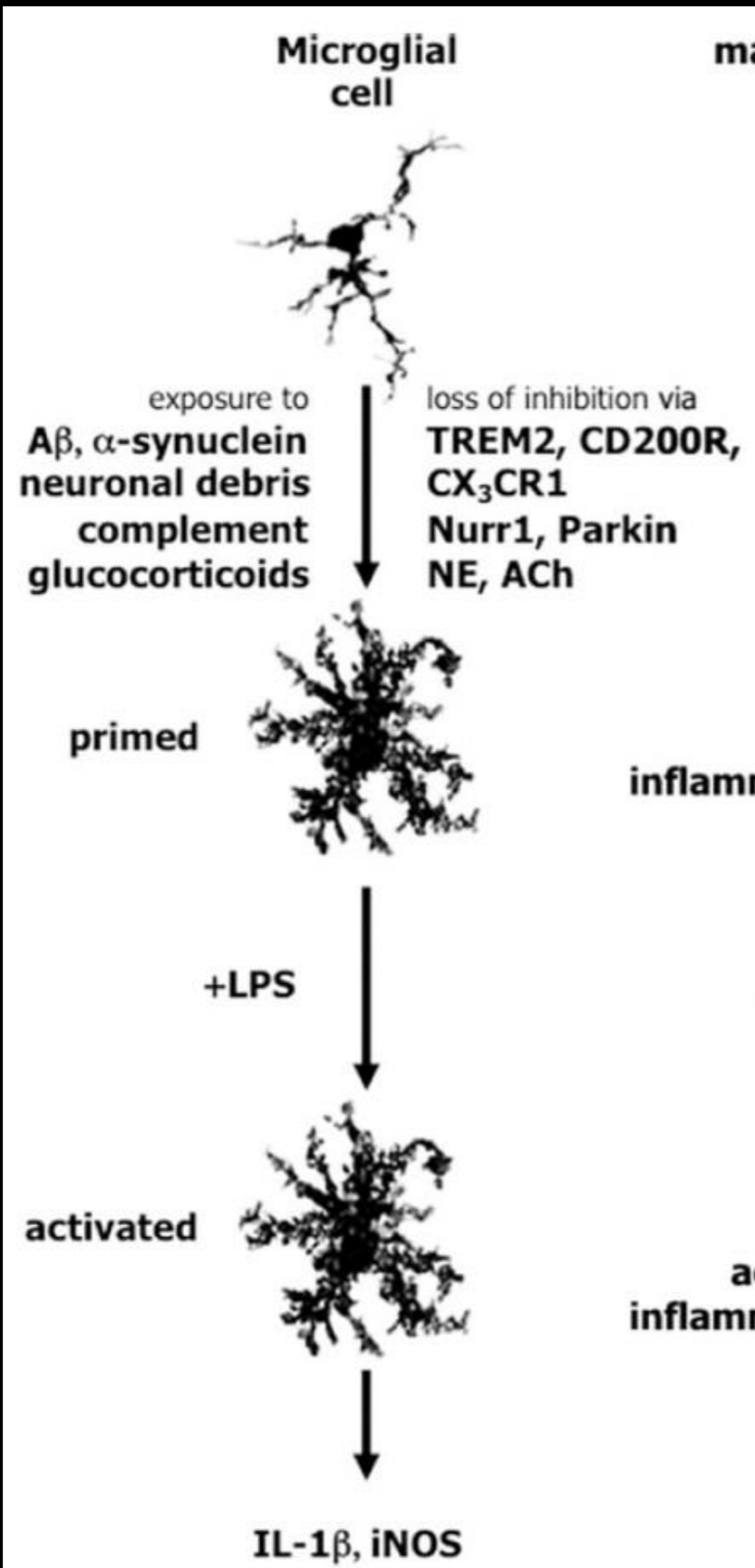
Martin G. Cole^{1,2}, Jane McCusker^{2,3}, Philippe Voyer⁴, Johanne Monette⁵, Nathalie Champoux⁶, Antonio Ciampi^{2,3}, Minh Vu^{7,8} and Eric Belzile²

- Mean duration 11.3 days
- Recovery
 - 1 week 57%
 - 4 weeks 77%
 - 24 weeks 80%
- Many episodes preceded and/or followed by one or more CAM symptoms for weeks



Why?

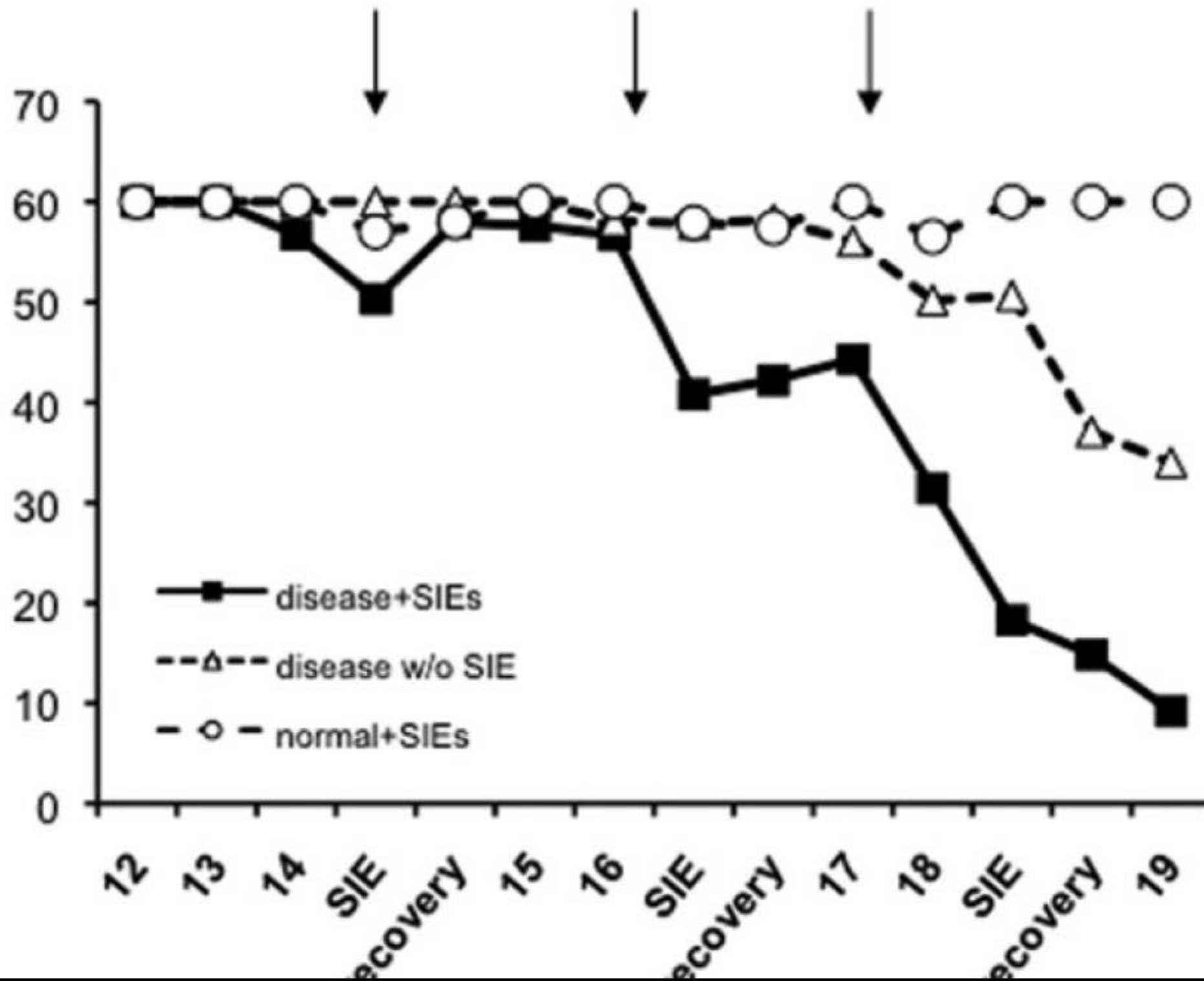
- Increased complications
- Marker of active underlying illness/comorbidity/vulnerability
- Unleash a cascade of detrimental changes in the brain



GLIA 2013 61:71–90

Brain Behav Immun. 2010 6: 996–1007

Systemic inflammatory events



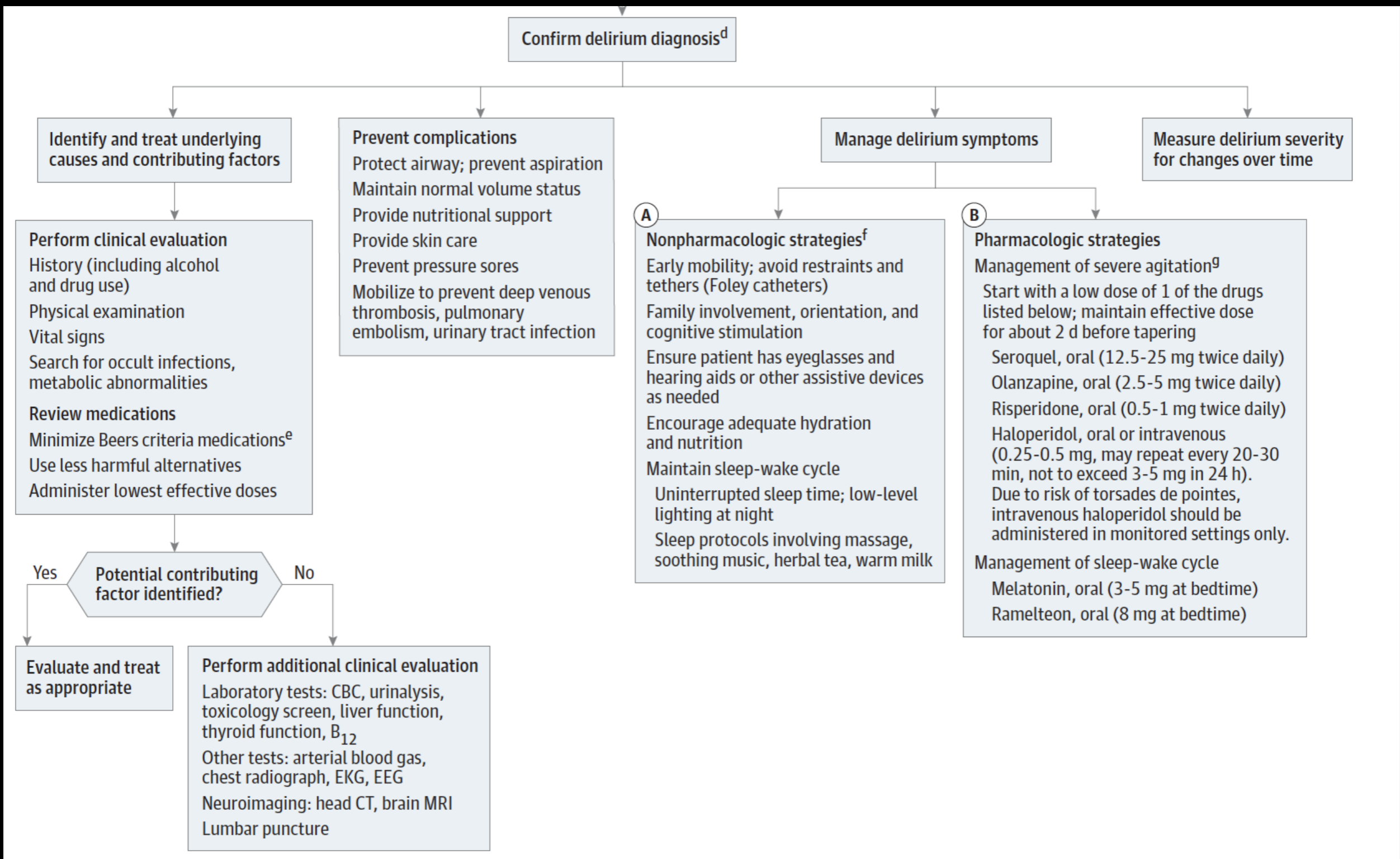
COVID-19

- “*Delirium* occurrence in the elderly with dementia may represent a prodromal phase of COVID-19, and thus deserves special attention, especially in the presence of **lymphopenia.**”

In summary

Delirium is bad, so you should:

- Know the CAM and carefully assess attention in suspected cases
- Look carefully for the cause
- Recognize the significance of delirium to the patient and family
- Prevent delirium proactively to reduce the burden of significant adverse outcomes



Box 1. Clinical Practice Guideline Summary

This clinical practice guideline provides eight strong recommendation statements.

For these recommendations, the panel weighed the evidence for each intervention and determined either that the benefits clearly outweighed the risks or that the risks clearly outweighed the benefits.

- Multicomponent nonpharmacologic interventions delivered by an interdisciplinary team should be administered to at-risk older adults to prevent delirium.
- Ongoing educational programs regarding delirium should be provided for health care professionals.
- A medical evaluation should be performed to identify and manage underlying contributors to delirium.
- Pain management (preferably with nonopioid medications) should be optimized to prevent postoperative delirium.
- Medications with high risk for precipitating delirium should be avoided.
- Cholinesterase inhibitors should not be newly prescribed to prevent or treat postoperative delirium.
- Benzodiazepines should not be used as first-line treatment of agitation associated with delirium.
- Antipsychotics and benzodiazepines should be avoided for treatment of hypoactive delirium.

This clinical practice guideline provides an additional 3 weak recommendation

statements. The panel judged the evidence to be in favor of these interventions, but the current level of evidence or potential risks of the treatment did not support a strong recommendation.

- Multicomponent nonpharmacologic interventions implemented by an interdisciplinary team may be considered when an older adult is diagnosed with postoperative delirium to improve clinical outcomes.
- The injection of regional anesthetic at the time of surgery and postoperatively to improve pain control with the goal of preventing delirium may be considered.
- The use of antipsychotics (eg, haloperidol, risperidone, olanzapine, quetiapine, or ziprasidone) at the lowest effective dose for the shortest possible duration may be considered to treat delirious patients who are severely agitated or distressed or who are threatening substantial harm to self and/or others.

2006 Recommendation: 4.4.2 Antipsychotics (page 41-44)

High potency antipsychotic medications are preferred over low potency antipsychotics [B].

Haloperidol is suggested as the antipsychotic of choice based on the best available evidence to date [B].

Atypical antipsychotics may be considered as alternative agents as they have lower rates of extra-pyramidal signs [B].

Modified Recommendations: Antipsychotics

In older persons with a delirium where pharmacotherapy is indicated, low dose, short-term therapy with haloperidol or an atypical antipsychotic (e.g., olanzapine, quetiapine, risperidone) can be considered. Haloperidol is not recommended if there is pre-existing Parkinson disease or Lewy body dementia [B].