Metabolismo

"Disfunzione cognitiva post-operatoria e delirium"

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Neurocognitive disorders occur frequently in the community with 14 to 48% aged >70 yr suffering **mild cognitive impairment** and an additional 10% suffering **dementia**

> 30% of individuals >65yrs have surgery annually in western countries

Should general anaesthesia be avoided in the elderly?

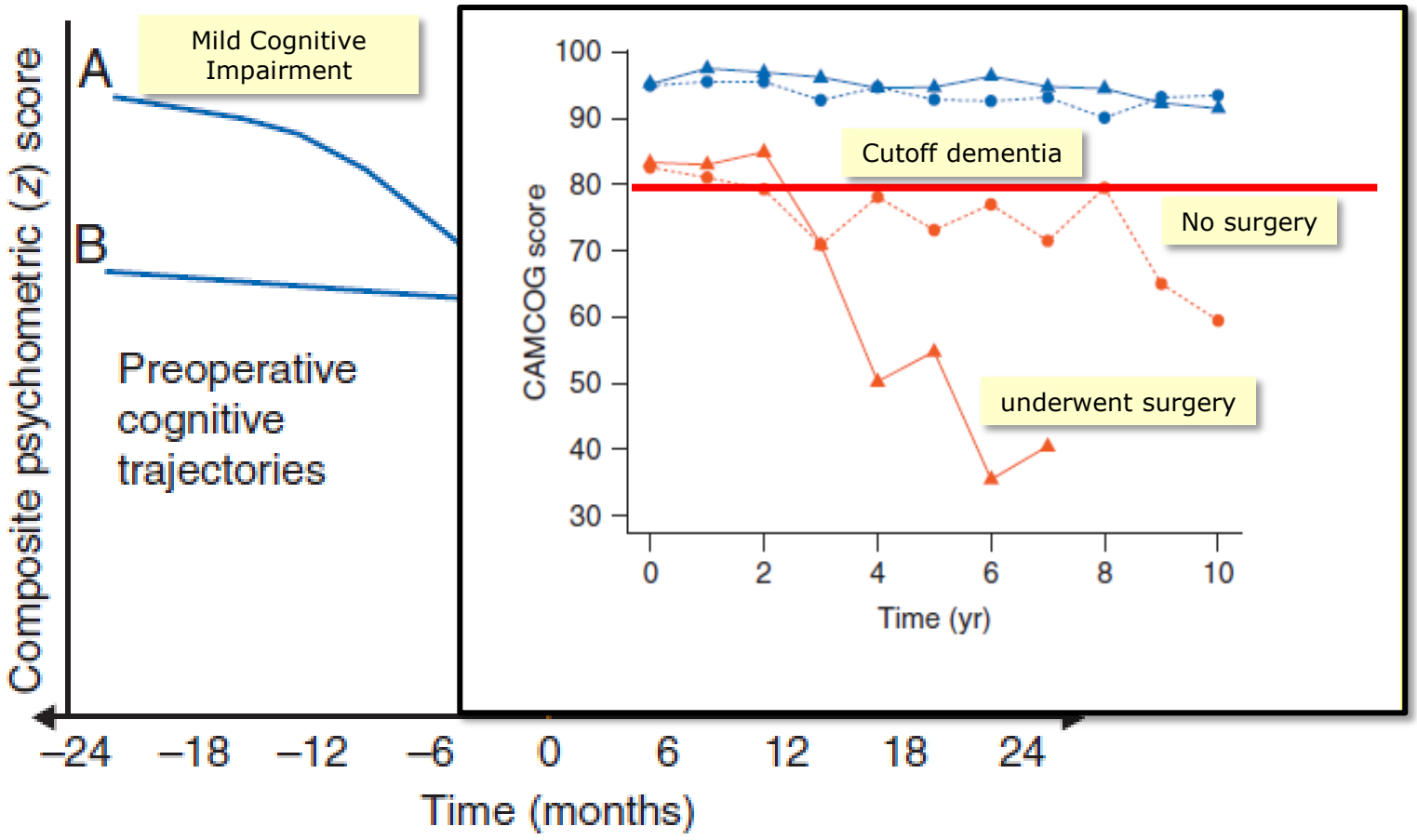
C. Strøm,[1] L. S. Rasmussen[2] and F. E. Sieber[3]

Anaesthesia 2014, 69 (Suppl. 1), 35–44

Hospitalized older surgical patients are faced with many challenges during their **journey** through surgery and the recovery period

- fasting
- opioid analgesics
- anesthetic agents
- intraoperative blood loss
- **postoperative pain**
- nausea and vomiting
- **unfamiliar hospital environment**
- **immobility during the perioperative period**

The trajectories



Needham MJ et al, Anaesthesia 2017; 119: 115-25

The burden

POCD

is a shorter form of

Post Operative Cognitive Dysfunction

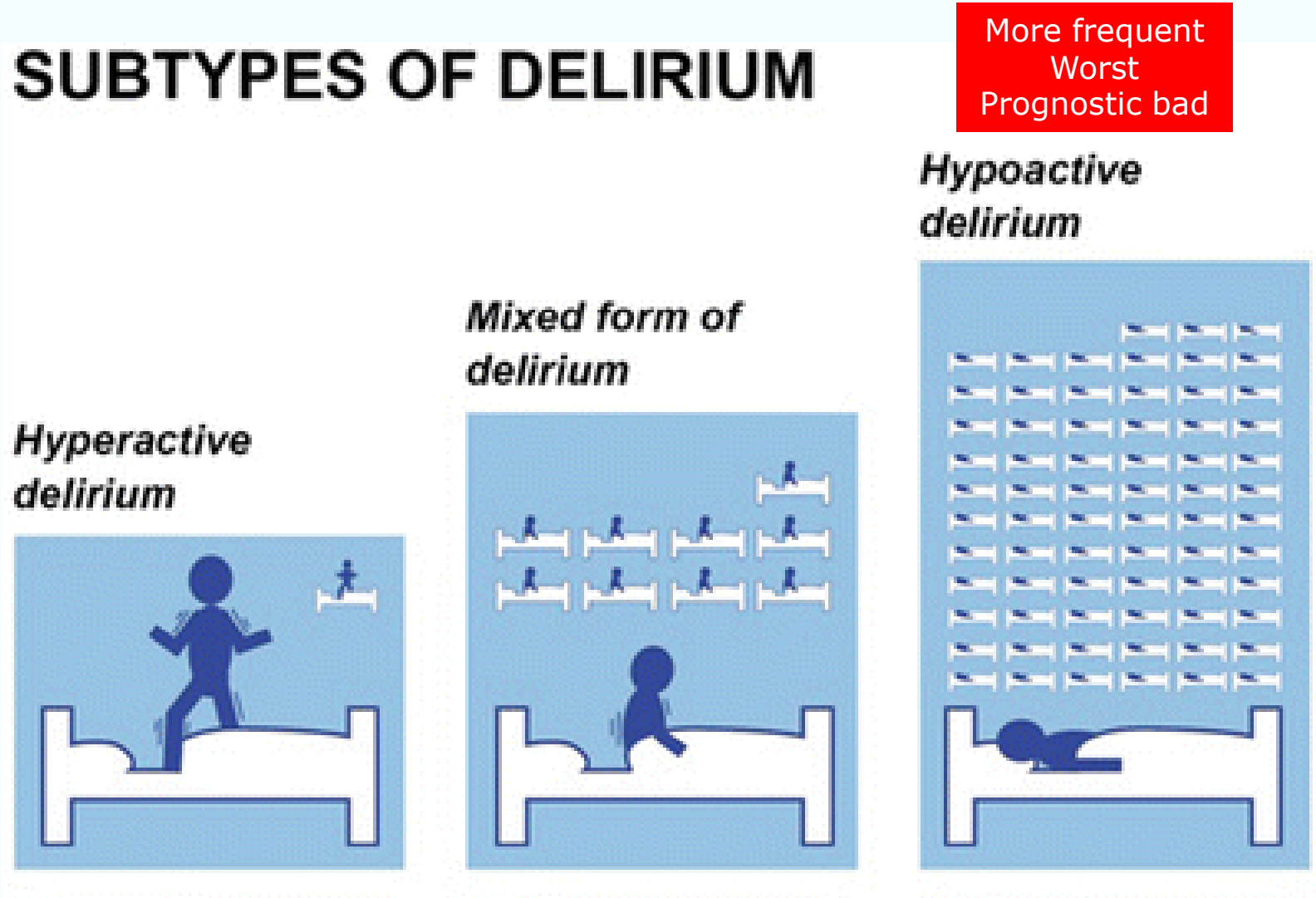
9-54%

1 week after surgery in adults >65yrs, with no difference in rates based on the type of surgery and/or anesthetic

10-17% at 3 months following surgery

3% at 12 months following surgery

What is postoperative delirium?



emergence delirium

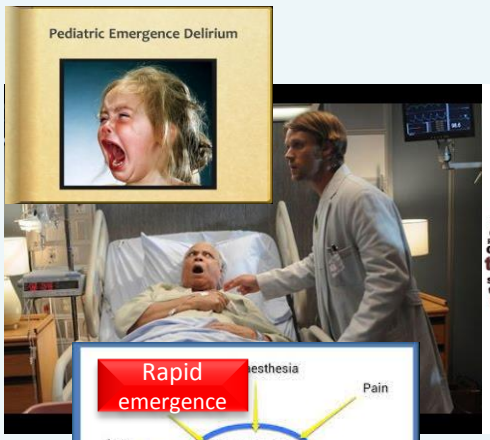
mental disturbance during the recovery from general anesthesia into the recovery room/PACU

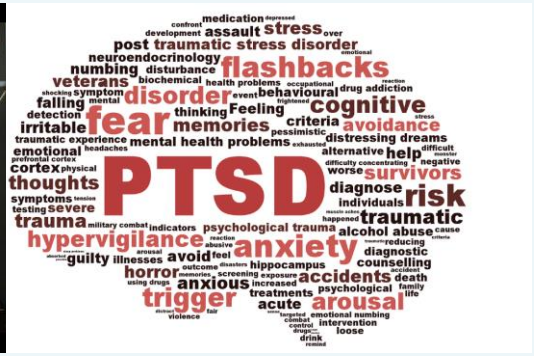
primarily within the first 30 minutes of recovery time and typically resolves within an hour of onset

- 5% to 10% of general surgery patients of all ages
- 41% of older adults

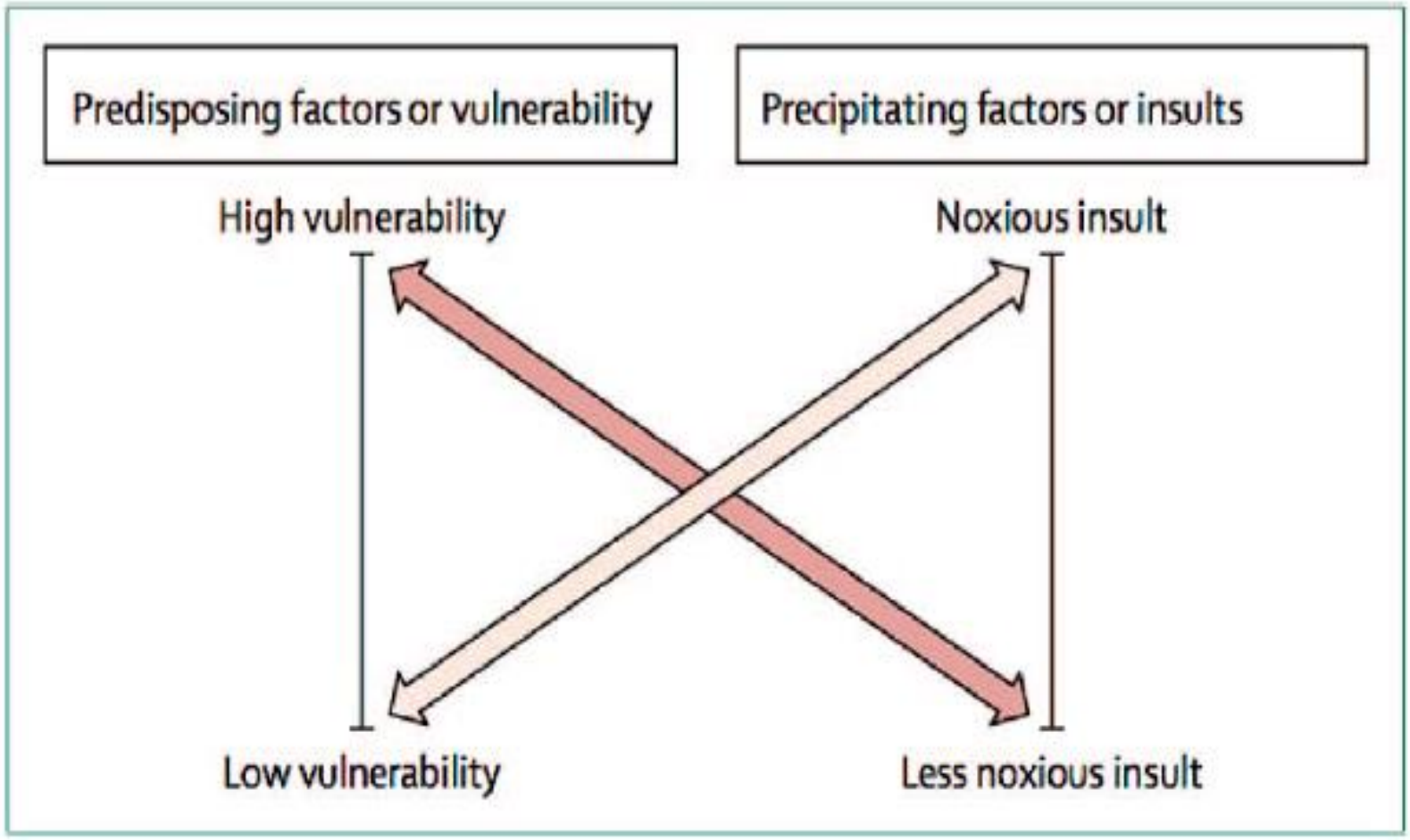
Hallucinations
Confusion

- restlessness
- moaning
- involuntary physical activity
- thrashing





Predisposing and precipitating factors for postoperative delirium



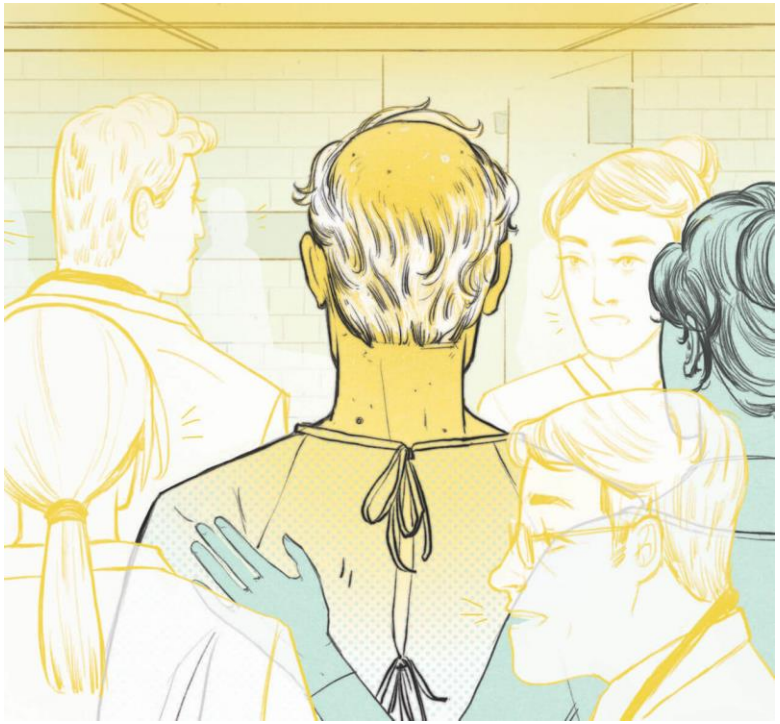
How to diagnose delirium?

Confusion Assessment Method CAM
the most commonly used screening
tool in research
high sensitivity and specificity (between 90–100%)

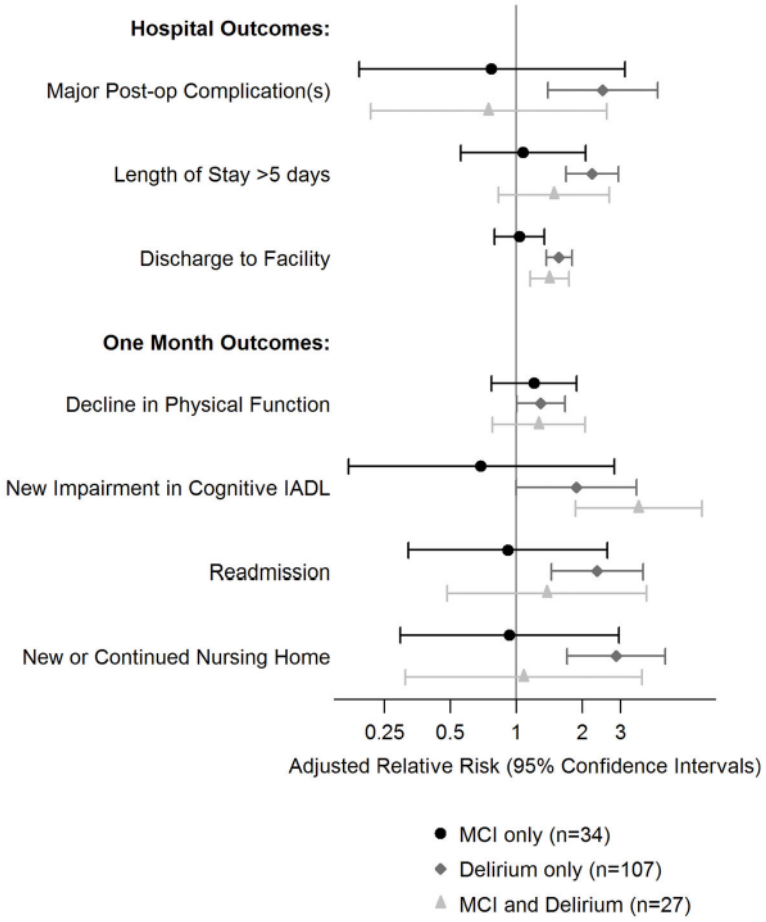
long form with 10 sections

short form with 4 four domains
commonly used in clinical practice

- acuity/fluctuation
- attention
- thinking
- **level of consciousness**



Clinical outcomes in older surgical patients with mild cognitive impairment



560 non-demented adults **≥70 years old**

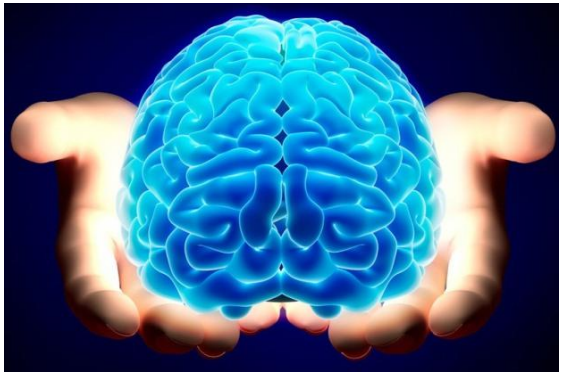
- **Delirium alone** associated with adverse postoperative outcomes and longer LOS
- **MCI** associated with increased risk of delirium after surgery and delirium severity
- **MCI without delirium** not associated with risk of poor postoperative outcomes
- **MCI with delirium** suggests synergistically higher risk of new cognitive impairments and more often discharged to a post-acute facility

healthcare costs

the 1 yr cost of care of patients **with delirium** estimated 2.5 times the cost of care for similar patients without delirium

Racine AM et al, Alzheimers Dement 2018; 14: 590–600

What is postoperative cognitive dysfunction?



significant reduction in **cognitive performance** from baseline following surgery and anesthesia, and diagnosed as subtle deficits in multiple core neurocognitive domains

- executive function
- attention
- verbal memory
- psychomotor speed
- visuospatial abstraction

in the **short** (7 days) and **medium** (1 to 3 months) term after anaesthesia and surgery, not fluctuating with lucid intervals

A problem of proper definition

methodological limitations of current literature

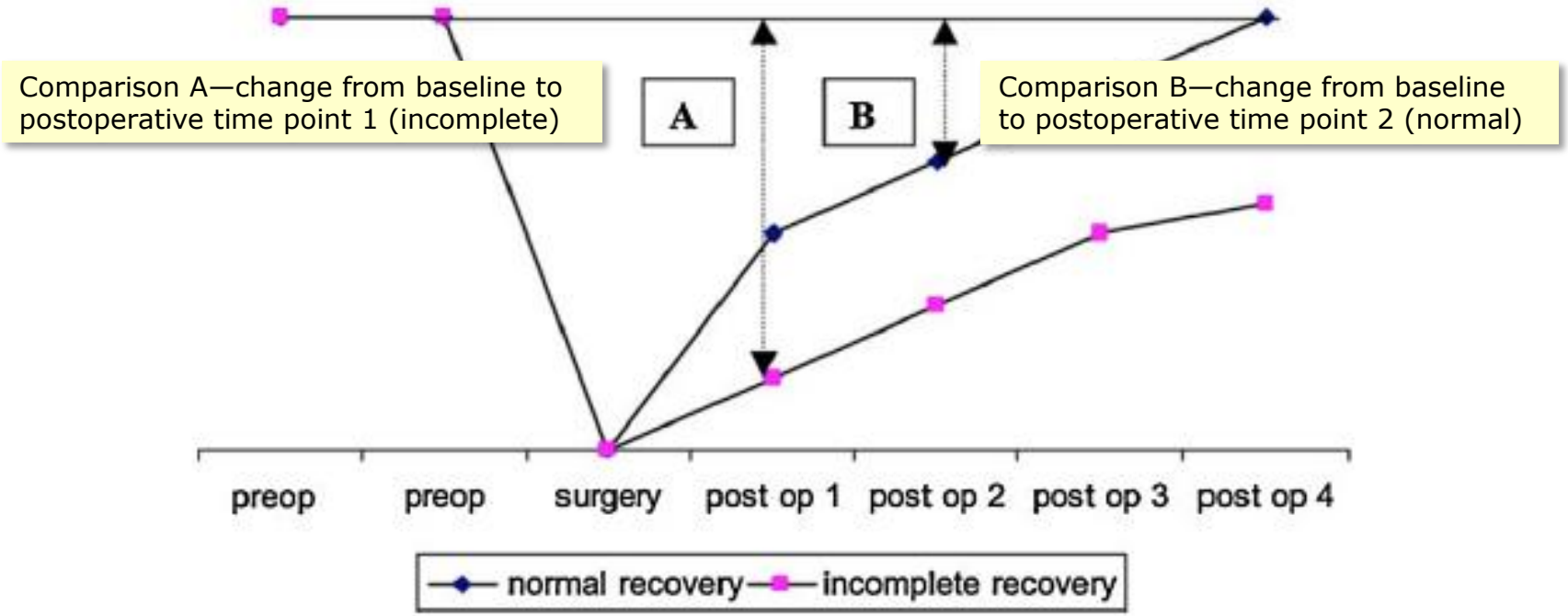
lack of well-defined baseline status

subjective complaints rarely sought (ADLs)

timing of administration of the tests

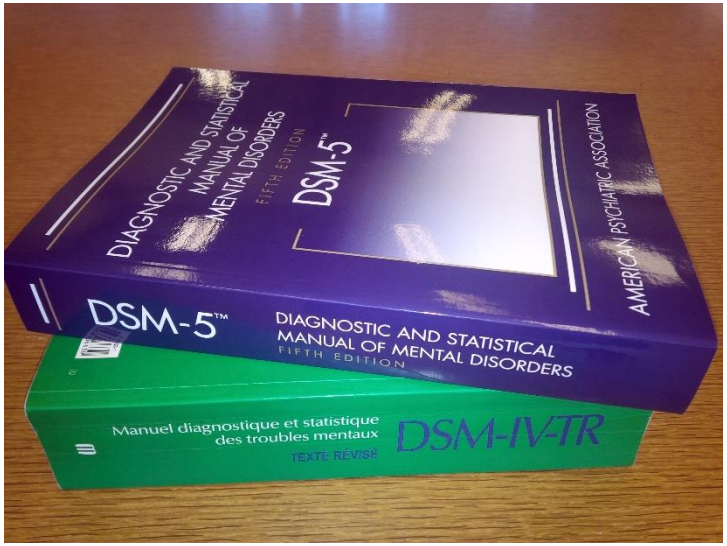
significant heterogeneity in the type and number of tests administered

criteria or definition for change



Typical design of a study examining POCD with a profile of normal recovery and incomplete recovery across multiple postoperative time points

The diagnostic criteria for the perioperative cognitive changes should **not be differentiated** from neurocognitive disorders in the general population



The three DSM-5 pillars of diagnosis for neurocognitive disorders

1) Subjective complaint (participant, informant, clinician)
2) Objective impairment/change (mild: 1 to 2 standard deviations below norms or controls; major: ≥2 standard deviations below norms or controls)
3) Instrumental ADLs (for major NCD/dementia a decline in function is required)

Recommendations for the Nomenclature of Cognitive Change Associated with Anaesthesia and Surgery—2018

L. Evered, B. Silbert, D. S. Knopman, D. A. Scott, S. T. DeKosky, L. S. Rasmussen, E. S. Oh, G. Crosby, M. Berger, R. G. Eckenhoff, and The Nomenclature Consensus Working Group*

Anesthesiology 2018; 129: 872-9

Working group

Recommendations for POCD

modest (mild-NCD) or significant (major-NCD) cognitive decline from a previous level of performance in one or more cognitive domains up to **12 months**

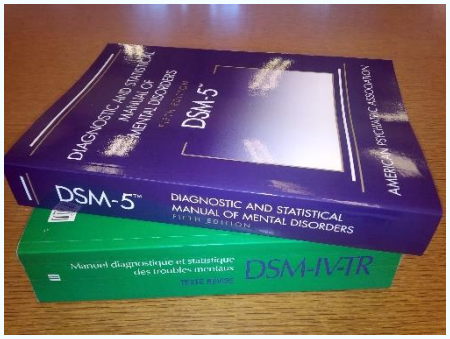
- complex attention
- executive function
- learning and memory
- language
- perceptual-motor
- social cognition

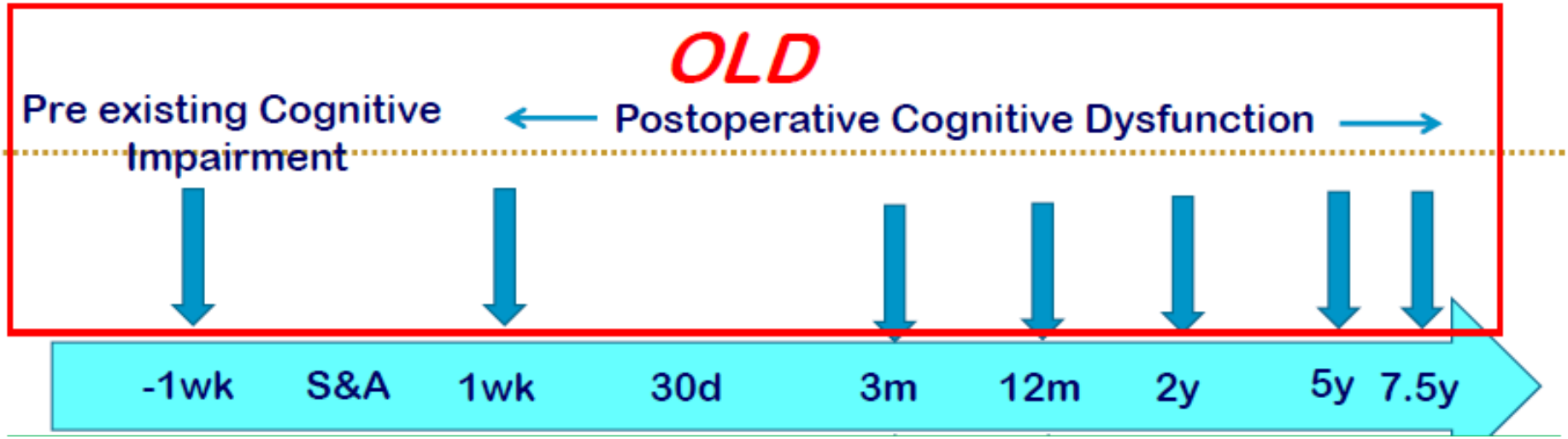
mild-NCD

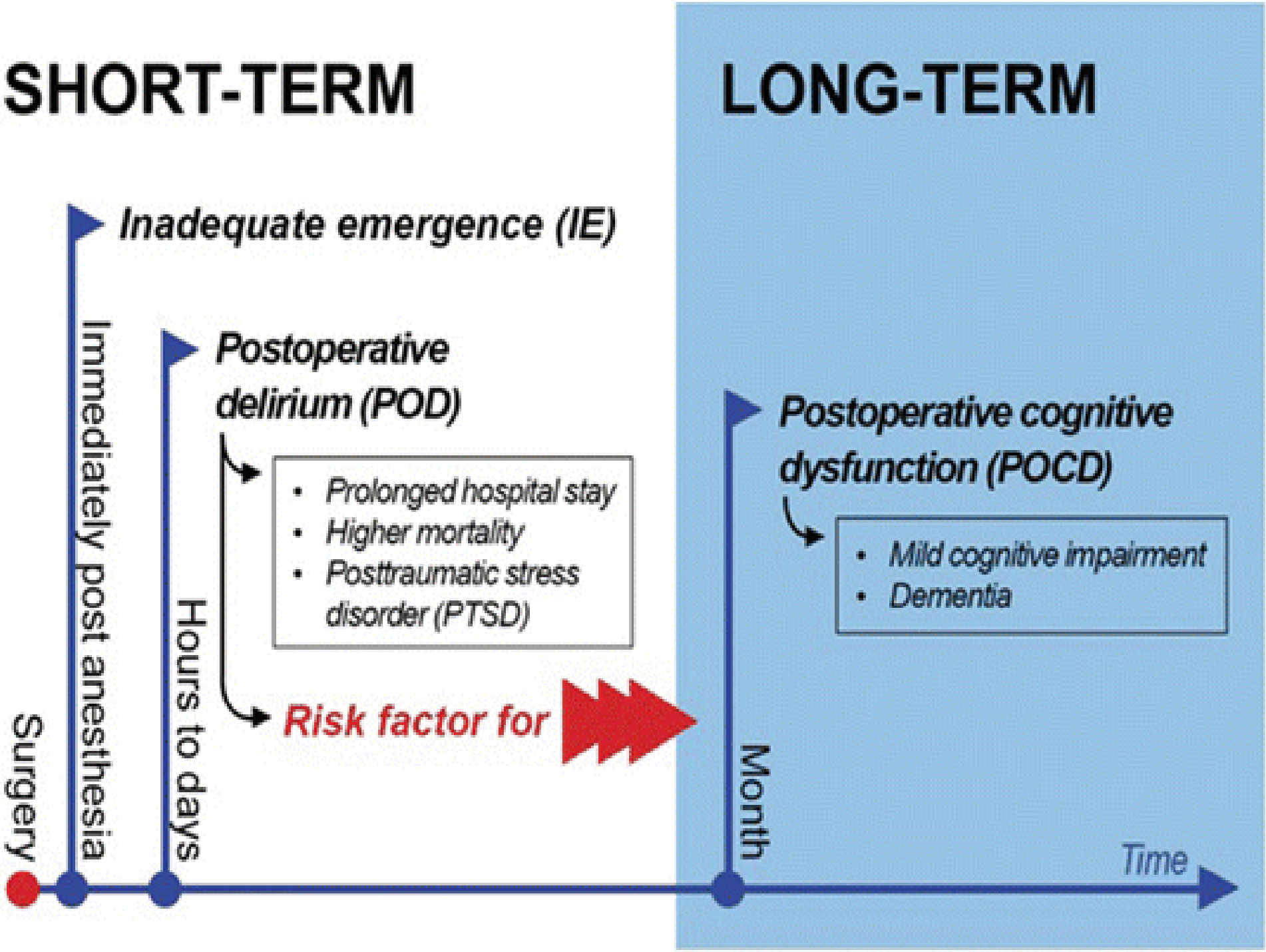
- objective impairment of 1-2 SDs below controls/norms
- subjective complaint
- preserved ADL

major-NCD

- objective impairment of ≥2 SDs below controls/norms
- subjective complaint
- impaired ADL




OLD
Pre existing Cognitive Impairment
Postoperative Cognitive Dysfunction
-1wk
S&A
1wk
30d
3m
12m
2y
5y
7.5y


SHORT-TERM
LONG-TERM
Inadequate emergence (IE)
Immediately post anesthesia
Postoperative delirium (POD)
Hours to days
Prolonged hospital stay
Higher mortality
Posttraumatic stress disorder (PTSD)
Risk factor for
Postoperative cognitive dysfunction (POCD)
Month
Mild cognitive impairment
Dementia
Surgery
Time

Postoperative Delirium and Postoperative Cognitive Dysfunction

Retrospective cohort study of 560 older adults after noncardiac surgery in the Successful Aging after Elective Surgery study (SAGES)

Hypothesis: Delirium is a significant risk factor for postoperative cognitive dysfunction

- Investigated the incidence of postoperative cognitive dysfunction within 6 months
- Evaluated the relationship between post-operative delirium and cognitive dysfunction

- During hospitalization, 134 of 560 partici-pants (24%) developed delirium.
- Fewer than half (47%, 256 of 548) met the threshold for postoperative cognitive dysfunction at 1 month, but this proportion decreased at 2 months (23%, 123 of 536) and 6 months (16%, 85 of 528).

Agreement between delirium and postoperative cognitive dysfunction was poor (kappa < .08) and correlations were small (r < 0.16).

Postoperative cognitive dysfunction risk given history of postoperative delirium	
Post-operative interval	Relative risk; 95% CI
1 month	1.34; 1.07-1.67
2 months	1.08; 0.72-1.64
6 months	1.21; 0.71-2.09

Postoperative delirium and longer-term postoperative cognitive dysfunction may be different disorders.

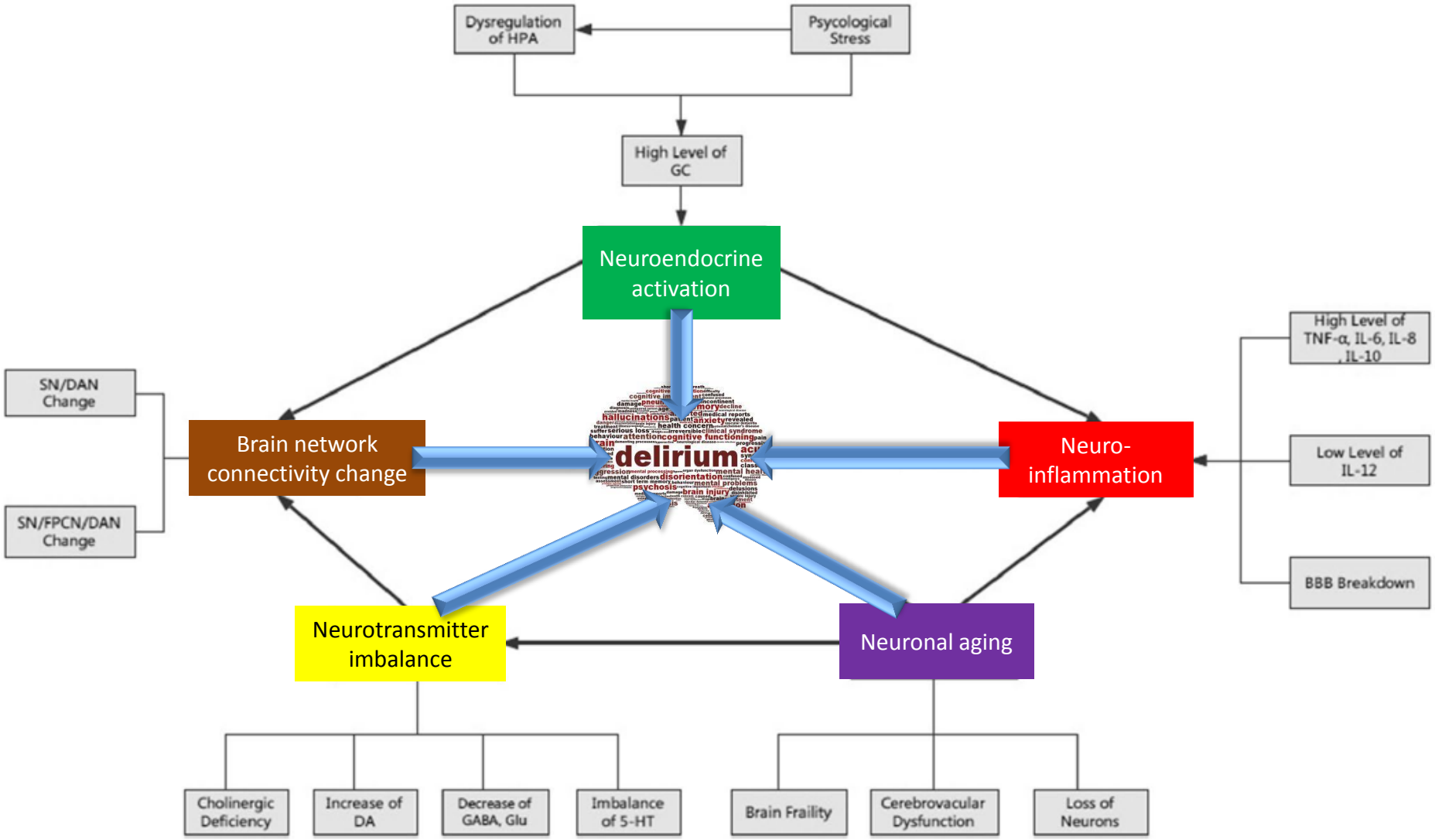
Daiello LA, *et al.* ANESTHESIOLOGY. September 2019.

ANESTHESIOLOGY
Trusted Evidence: Discovery to Practice

postoperative delirium is poorly predictive of **postoperative cognitive dysfunction** after 1 month of recovery and beyond, suggesting that POD and POCD are **separate clinical conditions**, rather than shared conditions reflecting two sides of the same coin

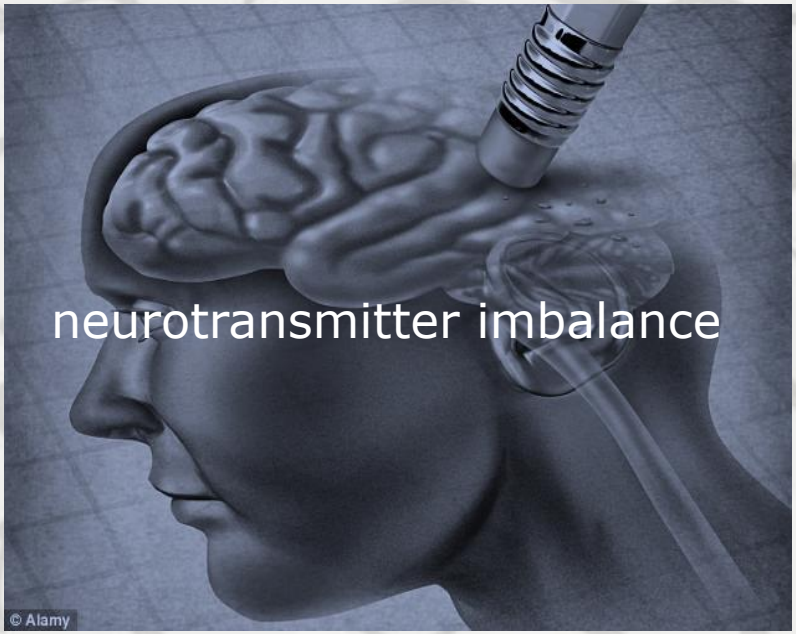
Potential theories on the development of delirium

most complementary rather than competing



synaptic impairment in susceptible patients, such as older adults or patients with previous head injury

brain region-specific vulnerability



alterations of synaptic densities

enzymatic activation
receptor activity

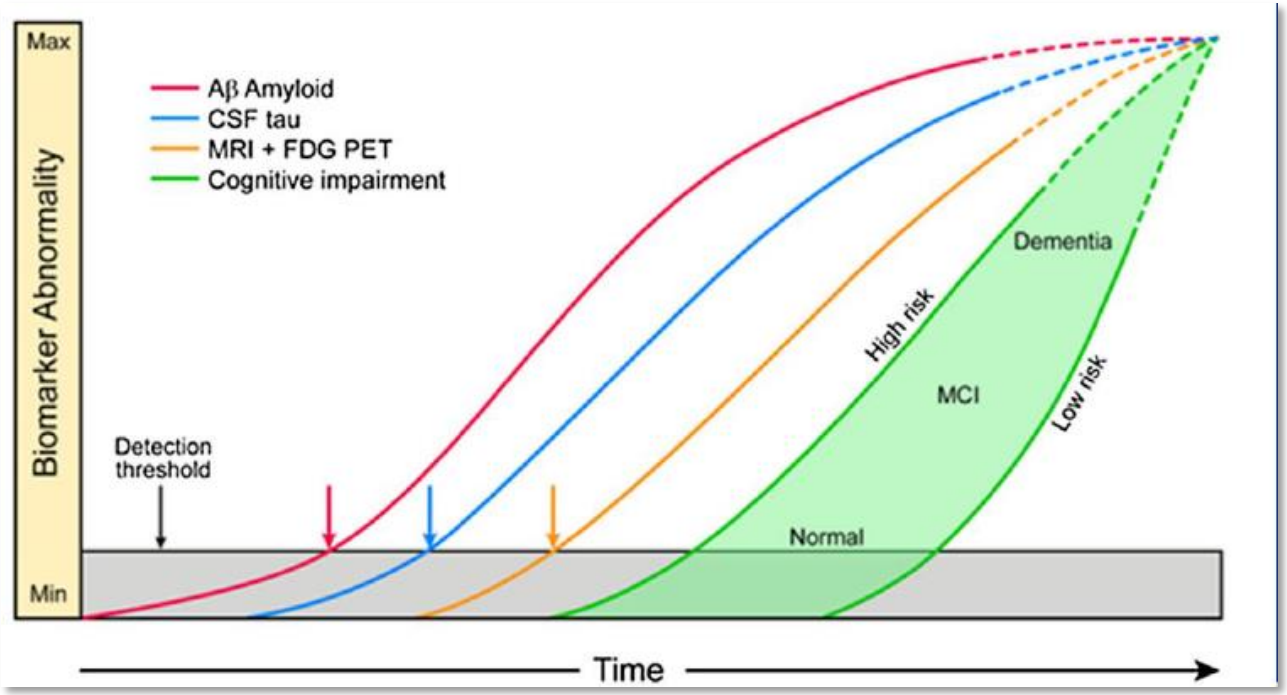
Caspase
GABAa Rs

altered proteins in the brain

- amyloid beta
- Tau protein
- Brain-derived neurotrophic factor

interruption of central cholinergic neurotransmission due to surgical stress and/or direct effect of anesthesia

Alzheimer's Disease Pathology as a risk factor for POD, POCD



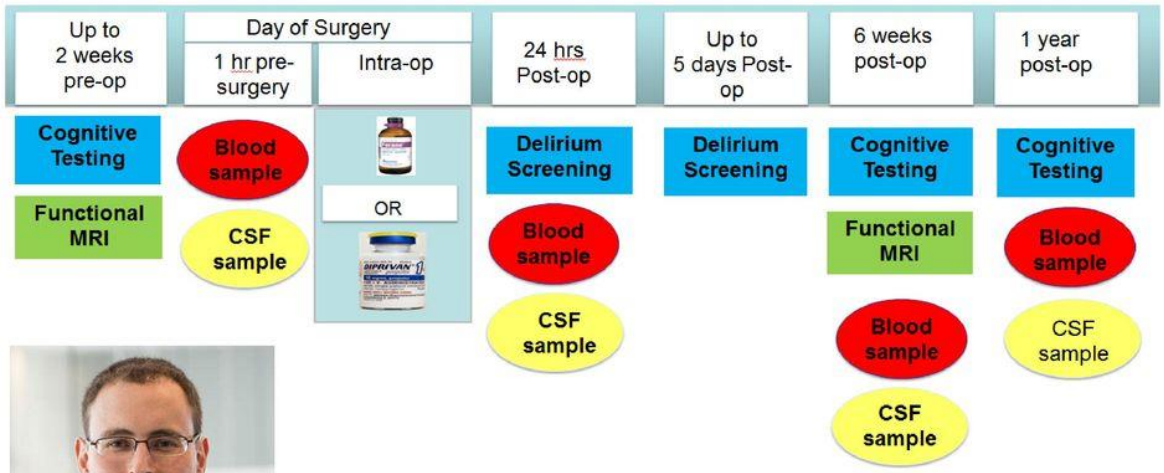
Elevated CSF tau/Aβ ratio → ⬆delirium risk

Low CSF Aβ levels → ⬆POCD risk

Evered et al, Anesthesiology, 2016

MADCO-PC study:

Markers of Alzheimer's Disease & neuro-Cognitive Outcomes after Perioperative Care



PI- Miles Berger, MD PhD, Assistant Prof, Duke Anesthesiology, Pepper Center Senior Investigator

110 surgical patients

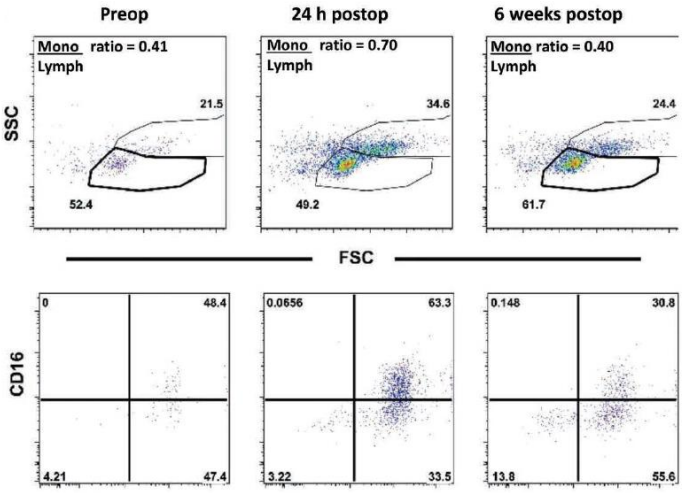
Primary outcome- correlation between perioperative change in CSF AD biomarker (tau) and continuous cognitive change index (from preop to 6 weeks-1 year post-op)

Flow Cytometry Characterization of Cerebrospinal Fluid Monocytes in Patients With Postoperative Cognitive Dysfunction: A Pilot Study

Miles Berger, MD, PhD,*†‡ David M. Murdoch, MD,§ Janet S. Staats, BS,‖ Cliburn Chan, MBBS, PhD,‖ Jake P. Thomas,*¶ Grant E. Garrigues, MD,# Jeffrey N. Browndyke, PhD,‡** Mary Cooter, MSc,* Quintin J. Quinones, MD, PhD,* Joseph P. Mathew, MD, MHSc, MBA,* and Kent J. Weinhold, PhD‖; for the MADCO-PC Study Team

Accepted for publication March 11, 2019

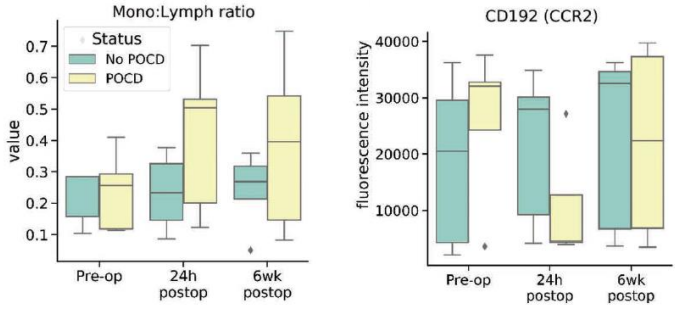
Flow cytometry panel to profile cerebrospinal fluid samples collected before and after major noncardiac surgery in 5 patients ≥60 years of age who developed POCD and 5 matched controls who did not



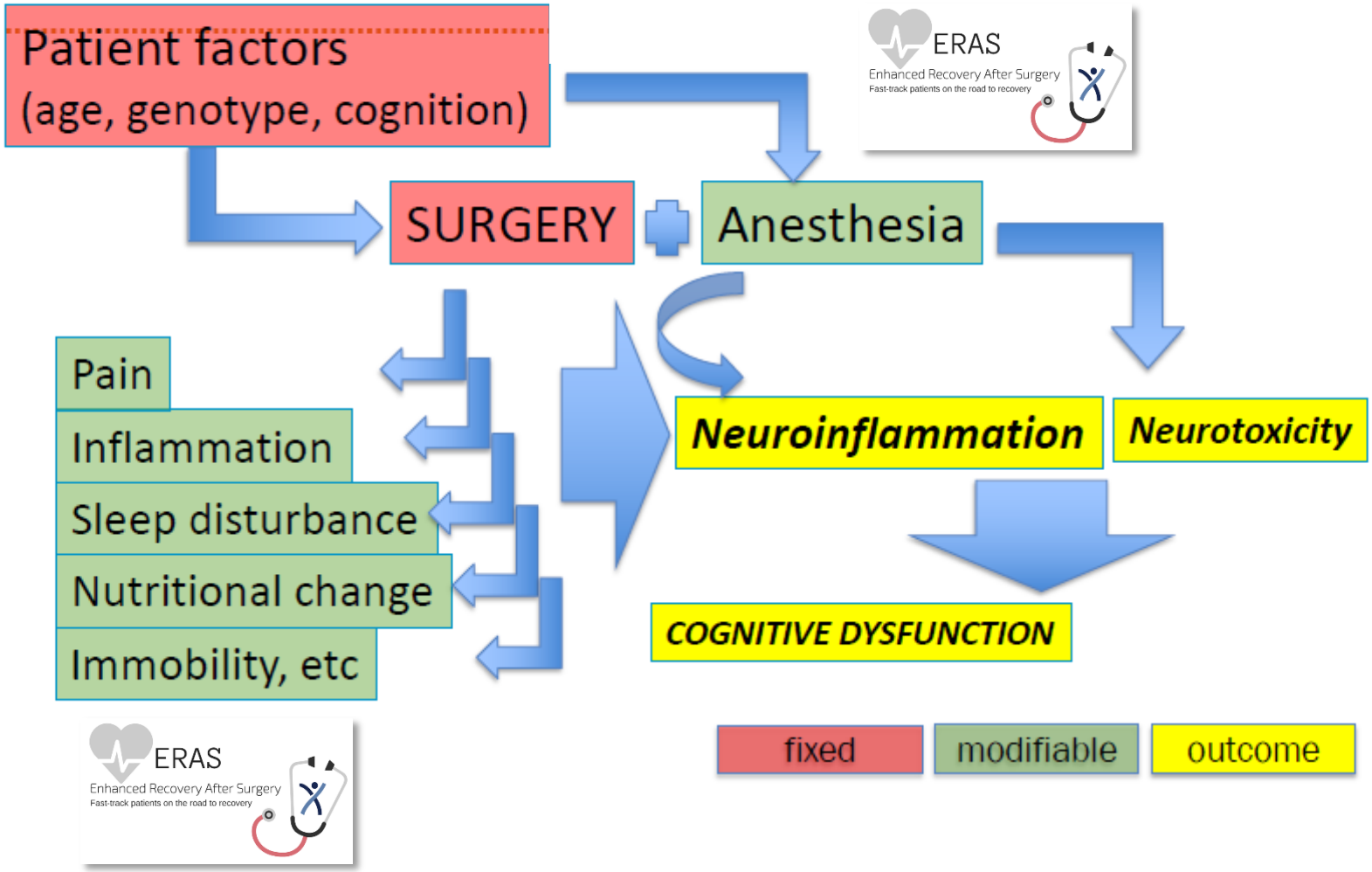
Patients who developed POCD

- increased CSF monocyte/lymphocyte ratio
- monocyte chemoattractant protein 1 receptor downregulation on CSF monocytes

24 hours after surgery



Where can we be active?



Brain protection

Preoperative recognition

Tailored anesthesia
Environmental

Monitoring

Postoperative comprehensive
rehabilitation
Follow-up

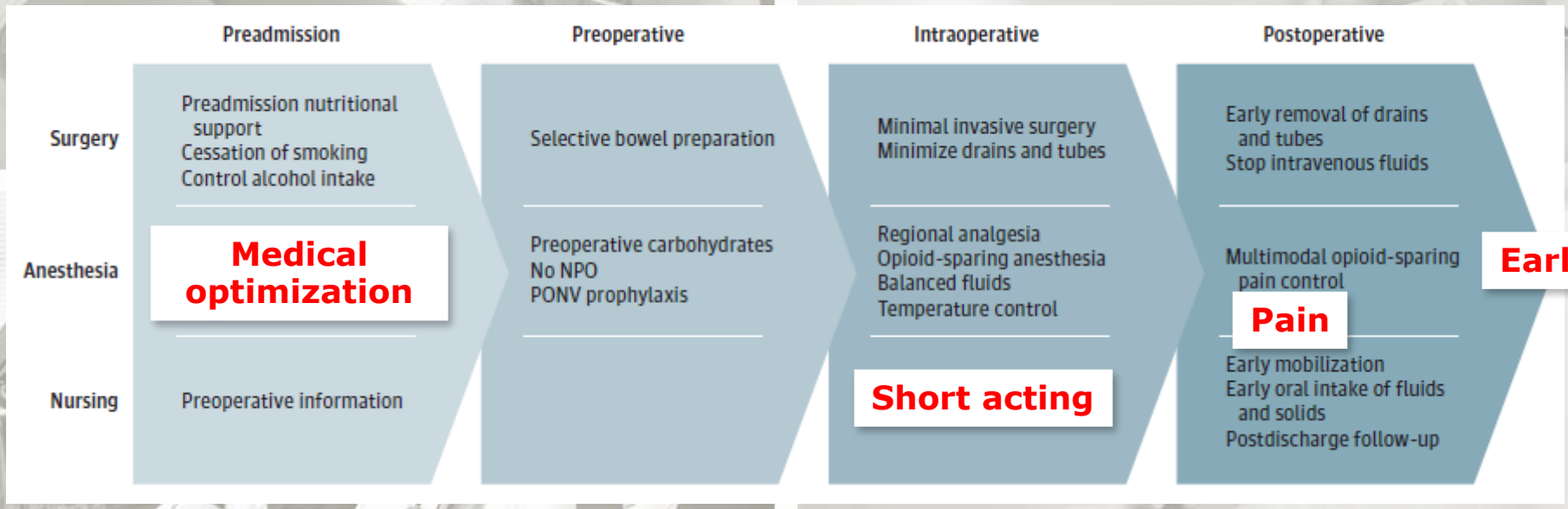
JAMA Surgery | Review

Enhanced Recovery After Surgery
A Review

Olle Ljungqvist, MD, PhD; Michael Scott, MD; Kenneth C. Fearon, MD, PhD†

JAMA 2017; 152: 292-8

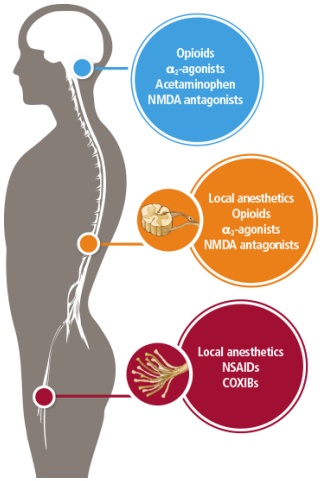
The journey



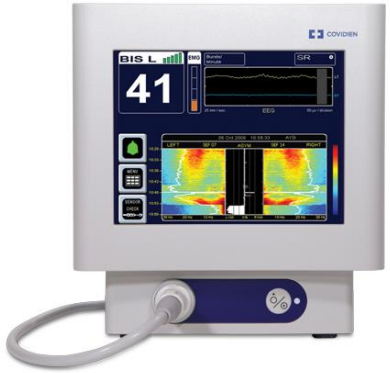
A combined strategy

Multimodal anesthesia

Multimodal analgesia



Active body warming



Depth of anesthesia monitoring

Recovery Rooom

Thiopental to desflurane - an anaesthetic journey. Where are we going next?

J. R. Sneyd[1,2,*]

British Journal of Anaesthesia 2017; 119 (S1): i44–i52

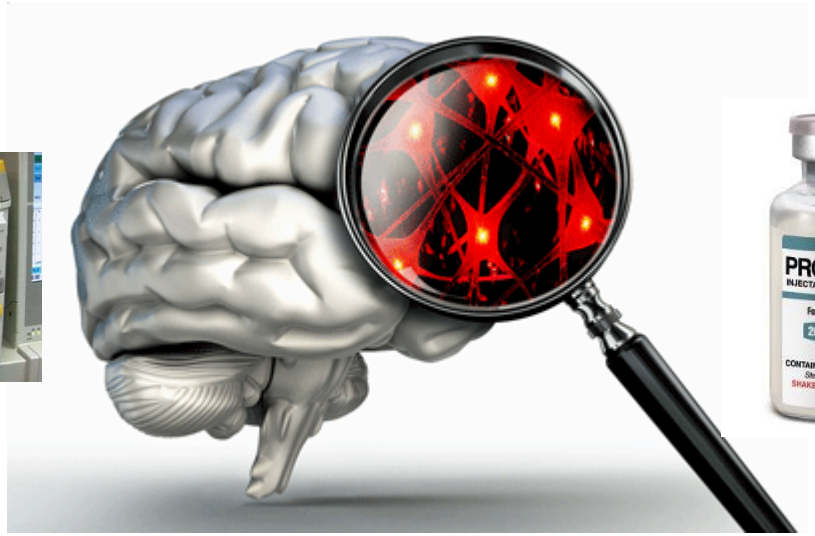
- Anaesthetic neurotoxicity
- Emergence delirium
- Anaesthesia and cancer
- Cognitive impairment, dementia and anaesthesia

Brain protection

Less tau proteins and caspase activation

attenuated excitotoxicity

- Inhibition of glutamate sensitive NMDA receptors
- Inhibition of postsynaptic glutamate receptor responses
- Activation of GABA A receptors



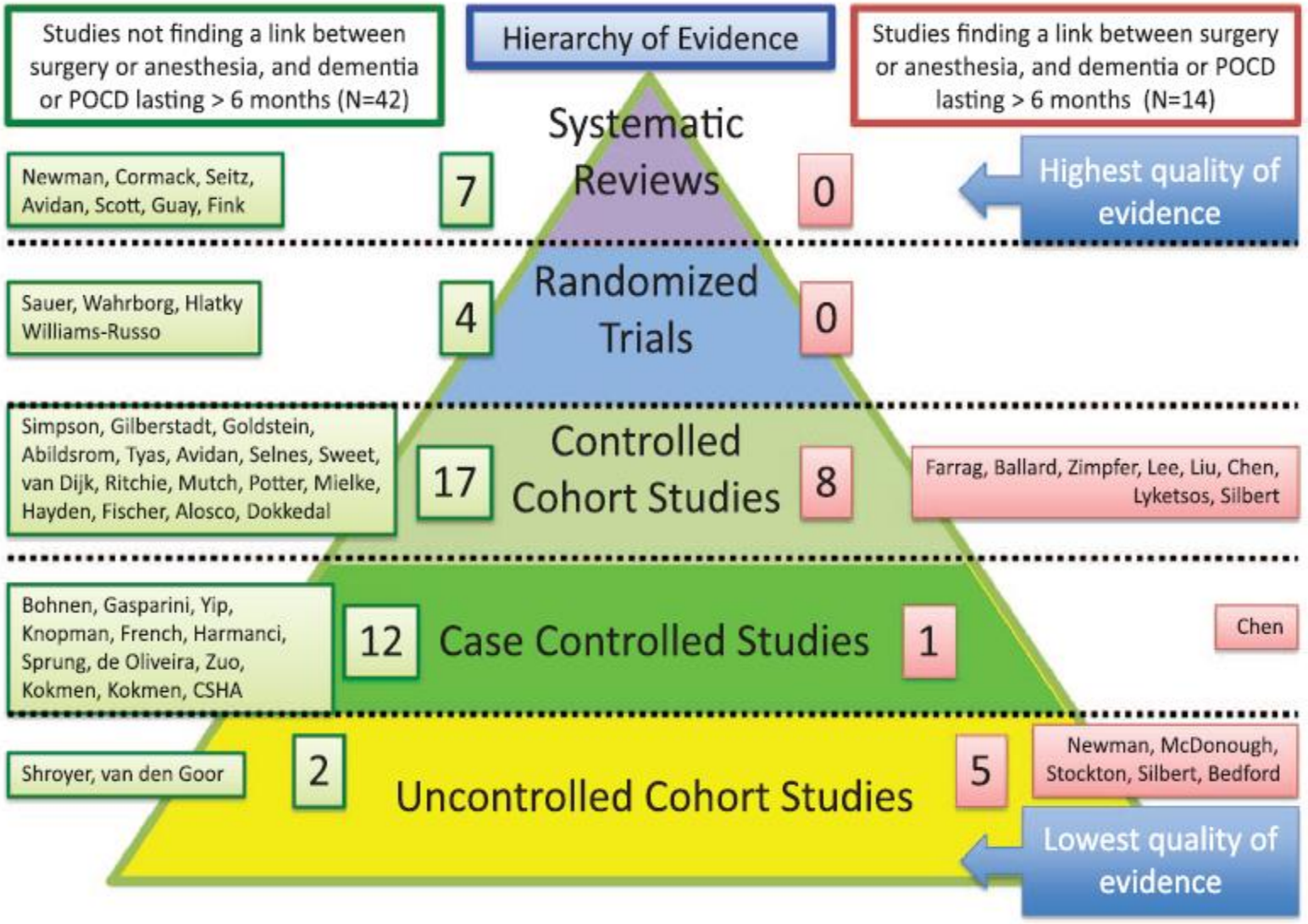
Less effective

reducing sympathetic tone

Handbook of Clinical Neurology, Vol. 121
Neurologic Aspects of Systemic Disease Part III
Jose Biller and Jose M. Ferro, Editors

- MAC decline by ≈6% per decade after 30 years of age
- avoiding volatile anesthetic overdose by closely monitoring the **age-adjusted MAC fraction**
- **adjust end-tidal volatile anesthetic concentration during surgery**

The shortcoming



major surgery and general anesthesia are unlikely to cause persistent POCD or incident dementia

Postoperative Cognitive Function Following General Versus Regional Anesthesia: A Systematic Review

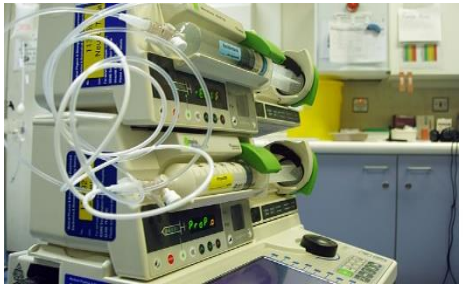
Nicholas Davis, MD, Melissa Lee, MD,* Albert Y. Lin, MD, MPH,* Lisa Lynch, MD,* Matthew Monteleone, MD,* Louise Falzon, PGDipInf,†‡ Nighat Ispahany, MLS,‡ and Susan Lei, MD**

References	Anesthetic Techniques	Outcomes at ≥ POD 7
Asbjorn et al[11]	GA vs. EA	No difference in standard (Z) scores on psychological tests involving short-term, long-term, verbal, and visual memory, $P > 0.05$
Berggren et al[12]	GA vs. EA	50% of EA group and 38% of GA group experienced mental status change, no significant difference, $P > 0.05$
Bigler et al[13]	GA vs. SA	No difference on abbreviated mental test between GA and SA groups, Student t test, $P > 0.05$
Campbell et al[14]	GA vs. LA	No evidence of a change in the relationship between the LA and GA groups with time for all tests performed, analyzed using multivariate analysis of variance
Chung et al[15]	GA vs. SA	No difference in mini-mental status exam score or geriatric mental exam score between or within groups, $P > 0.05$
Chung et al (1989)[16]	GA vs. SA	No difference in mini-mental status exam score or geriatric mental exam score between or within groups, $P > 0.05$
Crul et al[17]	GA vs. SA	No difference in 3 cognitive function tests using multivariate analysis of variance, $P > 0.05$
Ghoneim et al[18]	GA vs. SA vs. EA	No difference in 17 cognitive function tests using multivariate analysis of variance, $P > 0.05$
Haan et al[19]	GA vs. SA	No difference in 3 cognitive function tests using multivariate analysis of variance, $P > 0.05$
Hole et al[20]	GA vs. EA	0/29 patient in EA and 7/31 patients in GA with persistent mental changes, 2-sided Student t test or χ^2 test, $P < 0.01$
Jones et al[21]	GA vs. SA	Of 7 cognitive function tests, significant difference in recognition and response times on choice reaction time test (improved in general anesthesia group, $P < 0.05$)
Karhunen and Jonn[22]	GA vs. LA	Two tests of memory were performed, patient in LA group scored significantly worse on Luria memory test, $P < 0.01$
Mandal et al[23]	GA vs. EA	Two cognitive function tests performed, gross difference at 7 d favoring regional anesthesia in the mini-mental status exam, $P < 0.01$
Nielson et al[24]	GA vs. SA	No difference in 8 cognitive function tests, $P > 0.05$
Riis et al[10]	GA vs. EA vs. GEA	No difference in 13 cognitive function tests, data comparison via Z scores, $P > 0.05$
Williams-Russo et al[25]	GA vs. EA	No difference in 10 cognitive function tests, comparison via Student t test, $P > 0.005$

no substantial differences in cognitive outcomes between regional and general anesthetic techniques

"Intravenous versus inhalational maintenance of anaesthesia for postoperative cognitive outcomes in elderly people undergoing non-cardiac surgery"

Miller D et al, Cochrane Database Syst Rev. 2018 Aug 21;8:CD012317



Cochrane

28 RCTs 4507 randomized participants
different types of surgery

- Cardiovascular
- Laparoscopic
- Abdominal
- Orthopaedic
- Ophthalmic

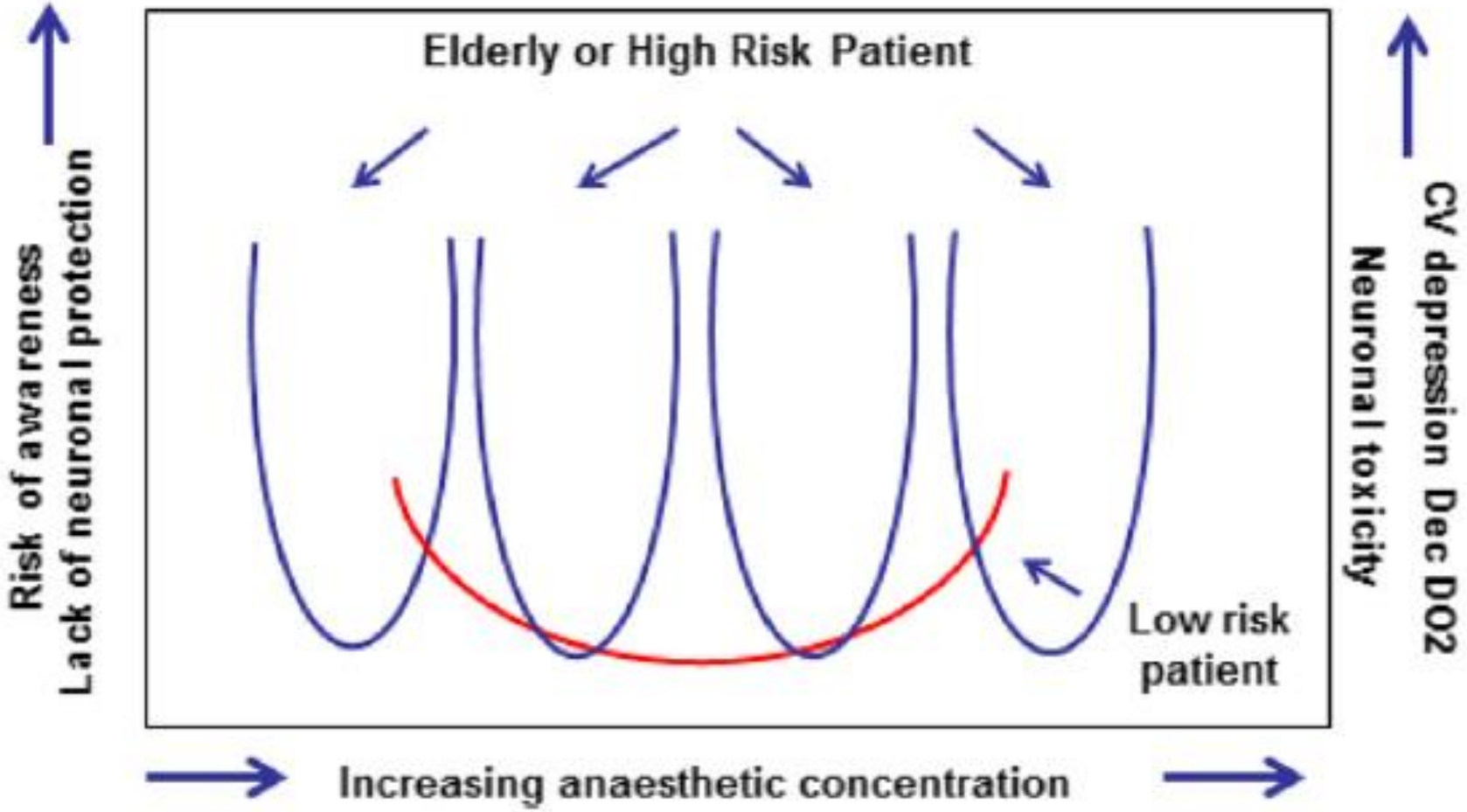
Inhalational maintenance agents

- Sevoflurane 19 studies
- Isoflurane 8 studies
- Desflurane 3 studies

no evidence of a difference in incidences of postoperative delirium according to type of anaesthetic maintenance agents (OR 0.59)

uncertain whether maintenance with propofol-based TIVA or with inhalational agents affect incidences of postoperative delirium, mortality, or length of hospital stay because certainty of the evidence was very low

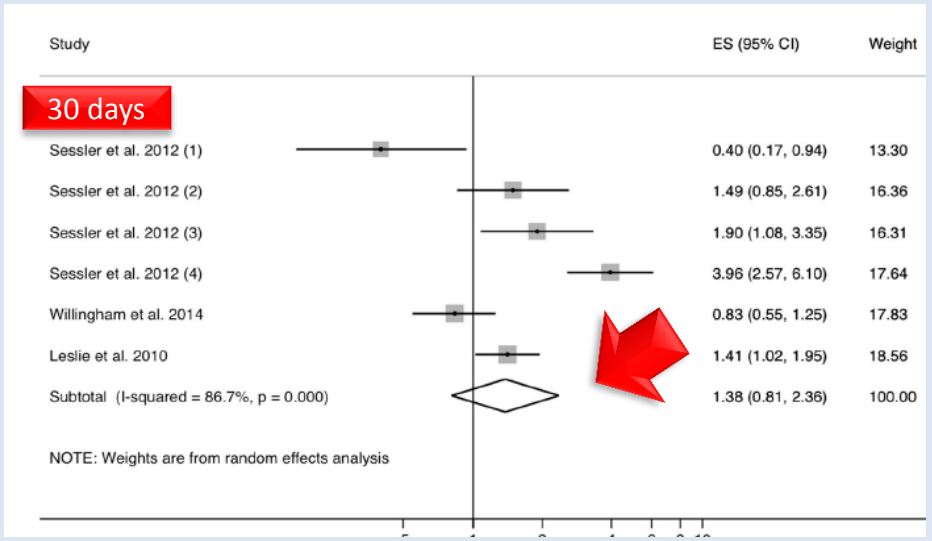
Association of excessive depth of anesthesia with poor outcomes especially in high-risk patients

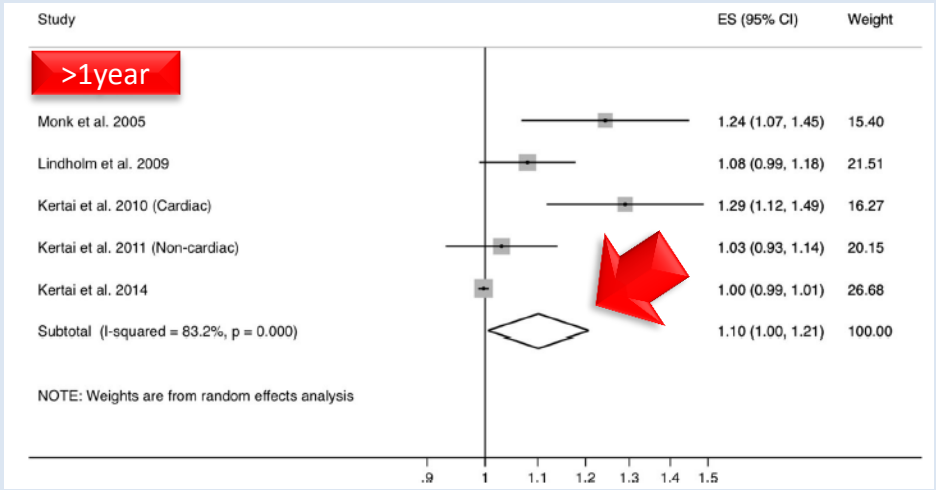


Can J Anesth/J Can Anesth (2017) 64:597–607
DOI 10.1007/s12630-017-0872-6

REPORTS OF ORIGINAL INVESTIGATIONS

Relation between bispectral index measurements of anesthetic depth and postoperative mortality: a meta-analysis of observational studies

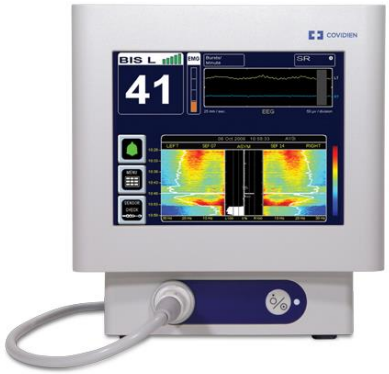




Processed electroencephalogram and evoked potential techniques for amelioration of postoperative delirium and cognitive dysfunction following non-cardiac and non-neurosurgical procedures in adults (Review)

Punjasawadwong Y, Chau-in W, Laopaiboon M, Punjasawadwong S, Pin-on P

Cochrane Database of Systematic Reviews 2018, Issue 5. Art. No.: CD011283



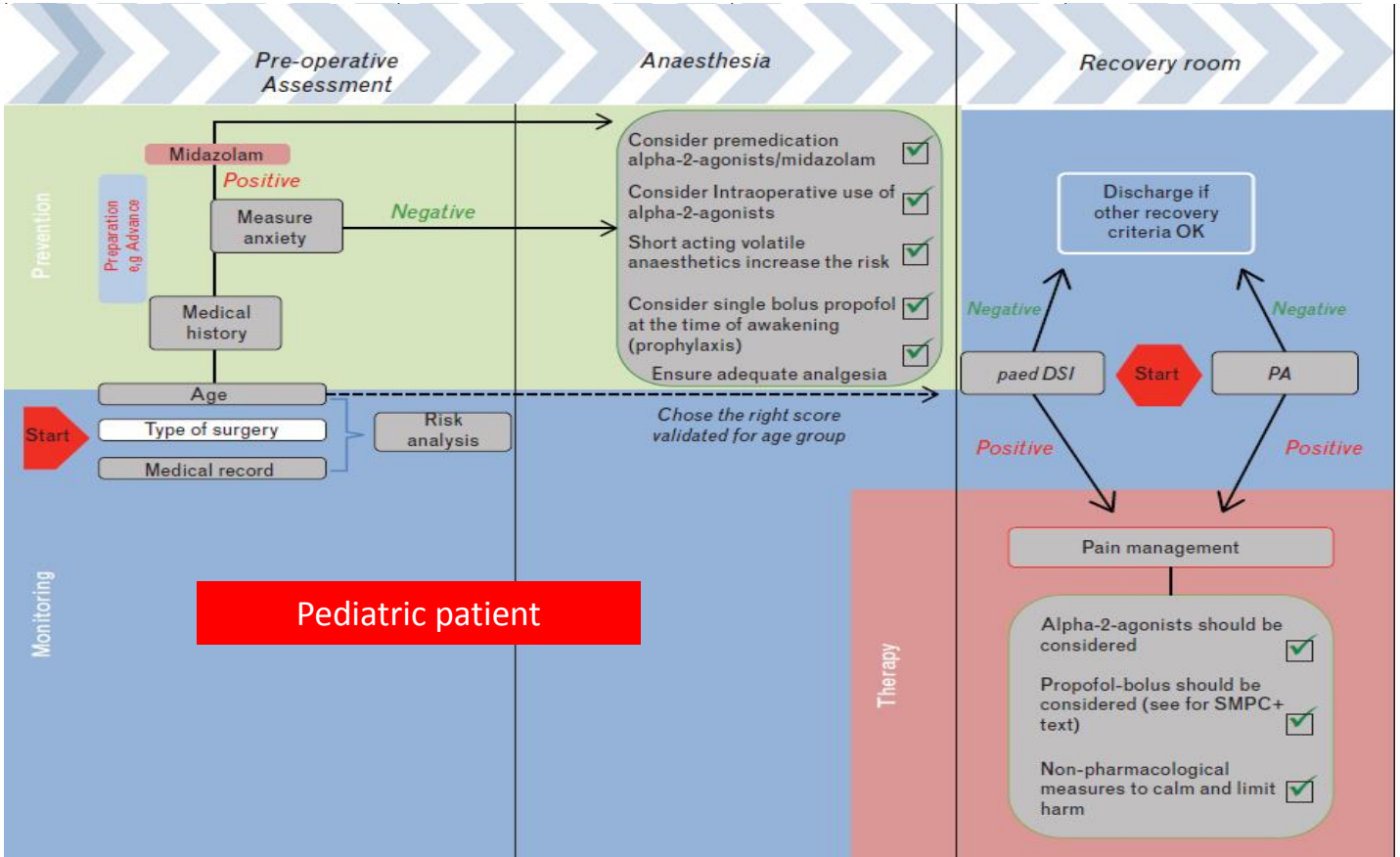
- using the processed EEG to help deliver the optimal depth of anaesthesia could reduce the incidence of POD from 21.3% to 15.2%.
- results from three studies (2051 participants) indicate that this could also reduce the incidence of POCD at three months from 9.1% to 6.4%.

EJA

Eur J Anaesthesiol 2017; **34:**192–214

GUIDELINES

European Society of Anaesthesiology evidence-based and consensus-based guideline on postoperative delirium



Stress–diathesis model for postoperative delirium

away from the hypothesis that anesthetic toxicity is largely responsible for negative cognitive effects

- depression
- anxiety disorders

- a **very high risk** group for POD with readily identified diathesis markers, at risk irrespective of the anesthetic course, but potentially worsened by a **poorly conducted anesthetic**
- a **low risk** group with no or few diathesis markers who do not manifest POD **irrespective of anesthetic exposure** or duration of procedure
- an **intermediate risk** group with evidence of premorbid diatheses placed at risk by an **unstable anesthetic course**

El-Gabalawy R et al, Front Aging Neurosci (2018) 9:274

Proposed treatments for POCD

protecting neurons during and
promoting neuronal health
before surgery

preventing the oxidative
component of inflammation

blocking inflammation by inhibiting
inflammatory mediators

Evidence From Human Studies

Promising results in animal studies, more modest results when applied to human populations

Novel therapies for POCD

pharmacological and behavioural

Parecoxib/COX-II Inhibitors

N-acetylcysteine

Statins

Dexmedetomidine

Pregabalin

Dexamethasone

Lidocaine

Ketamine

Minocycline

- Hospital Elder Life Program **HELP**
- Awakening and Breathing Coordination, Choice of drugs, Delirium monitoring and management, Early mobility, and Family engagement (**ABCDEF**) bundle

Perioperative cognitive protection

Behavioural and Nonpharmacological Strategies
for Prevention of Delirium

Pre-habilitation

Re-habilitation

1. Sensory enhancement (ensuring glasses, hearing aids, or listening amplifiers)
2. Mobility enhancement (ambulating at least twice per day if possible)
3. Cognitive orientation and therapeutic activities (tailored to the individual)
4. Pain control with scheduled acetaminophen if appropriate
5. Cognitive stimulation (if possible, tailored to the individual's interests and mental status)
6. Simple communication standards and approaches to prevent the escalation of behaviours
7. Nutritional and fluid repletion enhancement
8. Sleep enhancement (daytime sleep hygiene, relaxation, nonpharmacological sleep protocol, and nighttime routine)
9. Medication review and appropriate medication management
10. Daily rounding by an interdisciplinary team to reinforce the interventions

American Geriatrics Society Expert Panel on Postoperative Delirium in Older Adults. Postoperative delirium in older adults: best practice statement from the American Geriatric Society. J Am Coll Surg. 2015;220:136-148

avoidance or reduction of benzodiazepines and anticholinergics

Best Practices for Postoperative Brain Health: Recommendations From the Fifth International Perioperative Neurotoxicity Working Group

Miles Berger, MD, PhD,* Katie J. Schenning, MD, MPH,† Charles H. Brown IV, MD, MHS,‡ Stacie G. Deiner, MD,§ Robert A. Whittington, MD,‖ and Roderic G. Eckenhoff, MD,¶ for the Perioperative Neurotoxicity Working Group

Anesth Analg 2018;127:1406–13

Consensus Statement

"More studies are needed to evaluate the efficacy, feasibility, and cost-effectiveness of various strategies to assess short and long-term cognitive outcomes after hospital discharge, to optimally manage these disorders, and to clarify who should follow patients after surgery for these disorders and what patients should be told about the current understanding regarding recovery from these disorders"

Brief Cognitive Screening Tools

Tool/Test	Advantage	Disadvantage	Sensitivity[a]	Specificity[a]	Time to Administer
Minicog[14–18]	Brief, minimal language, education, race bias	Use of different word lists may affect scoring	76–100 (54–100)	54–85.2 (43–88.4)	2–4 min
MoCA[19–22]	Can identify mild cognitive impairment, available in multiple languages	Education bias, limited published data	n/a	n/a	10–15 min
MMSE[18,23,24]	Widely used and studied	Subject to age and cultural bias, ceiling effects	88.3 (81.3–92.9)	86.2 (81.8–89.7)	7–10 min
Clock-drawing test[18,25]	Very brief	No standards for administration and scoring	67–97.9 (39–100)	69–94.2(54–97.1)	<2 min
Verbal Fluency Test[18,26]	Brief	Cut point not obvious	37–89.5 (19–100)	62–97 (48–99)	2–4 min
CODEX[27–29]	Brief	Less well studied	81%–93%	81%–85%	≤3 min

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Università Cattolica del Sacro Cuore

Valutazione del rischio di insorgenza del *delirium post*-operatorio (POD) nei pazienti sottoposti a chirurgia per *hip fracture*

Una complicanza maggiore dell'*hip fracture* nell'anziano è il *delirium* post operatorio (POD) con un'incidenza variabile, a seconda delle stime, tra il 13 e il 70%.

Endpoints

- L'endpoint primario dello studio è la comparsa di POD entro i primi 7gg.
- Gli endpoints secondari sono lo sviluppo di POCD, demenza di qualunque tipo di nuova insorgenza a 12 mesi, mortalità a 30gg, tempo di degenza postoperatoria (comprendente la riabilitazione eseguita all'interno del Policlinico).

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Università Cattolica del Sacro Cuore

Test neuropsicologi e scale usate nello studio

• **RASS: La *Richmond Agitation-Sedation Scale*** misura il livello di agitazione o sedazione di un paziente; ottenere un RASS score risulta il primo punto per somministrare il Confusion Assessment Method (CAM). Lo score va da +4 (combattivo o violento), passando per 0 (calmo e vigile, presta attenzione al caregiver) a -5 (non risvegliabile alla voce né alla stimolazione fisica)

• **CAM-ICU: il *Confusion Assessment Method*** – *intensive care unit* è uno strumento neuropsicologico che valuta la presenza di Delirium nei pazienti critici

• **MoCA: il *Montreal Cognitive Assessment*** è un test rapido di screening del deterioramento cognitivo lieve. Permette di verificare diverse aree funzionali: attenzione, concentrazione, funzioni esecutive, memoria, linguaggio, abilità visuo-costruttive, astrazione, calcolo, orientamento.

Valutazione dello stato di coscienza e monitoraggio del delirium

Fase 1 – Livello di Coscienza: RASS

Punteggio	Definizione	Descrizione	
+4	COMBATTIVO	Chiaramente combattivo, violento, imminente pericolo per sé o per lo staff	OSSERVAZIONE
+3	MOLTO AGITATO	Aggressivo, rischio evidente di rimozione invasività	
+2	AGITATO	Frequenti movimenti afinalistici, disadattamento alla ventilazione meccanica	
+1	IRREQUIETO	Ansioso ma senza movimenti aggressivi o vigorosi	
0	SVEGLIO E TRANQUILLO	Comprende i periodi di sonno fisiologico	
-1	SOPOROSO	Non completamente sveglio, apre gli occhi allo stimolo verbale, mantiene il contatto visivo > 10 secondi	STIMOLO VERBALE
-2	LIEVEMENTE SEDATO	Brevi risvegli allo stimolo verbale, contatto visivo < 10 secondi	
-3	MODERATAMENTE SEDATO	Movimenti o apertura degli occhi allo stimolo verbale (ma senza contatto visivo)	

Se RASS ≥ - 3 ➡ somministra CAM-ICU (il paziente ha delirium oppure no?)

-4	SEDAZIONE PROFONDA	Nessuna risposta allo stimolo verbale, movimenti o apertura occhi alla stimolazione fisica	STIMOLO TATTILE
-5	NON RISVEGLIABILE	Nessuna risposta alla stimolazione tattile o dolorosa	

Se RASS ≤ -4 ➡ RIVALUTA più tardi (paziente attualmente incosciente)

Sessler, et al. AJRCCM 2002; 166:1338-1344.[2]
Ely, et al. JAMA 2003; 289:2983-2991.[3]

CAM-ICU: Scheda di lavoro

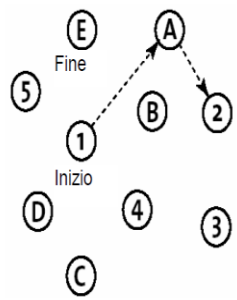
Punto 1: Alterazione Acuta o Fluttuazione dello Stato Mentale	**Punteggio**	**Segna se presente**
Il paziente si presenta in modo diverso dal suo stato mentale di base? OPPURE Il paziente ha presentato fluttuazioni dello stato mentale nelle ultime 24 ore come evidenziato da una variazione in una scala di sedazione (i.e., RASS), di stato di coscienza (GCS), o in un precedente assessment sul delirium?	Se almeno una risposta è SI →	☐
Punto 2: Disattenzione		
Test 'Lettere' (in alternativa consulta il manuale per il test '**Immagini**') Indicazioni. Dire al paziente: *"Sto per leggerle una serie di 10 lettere. Mi stringa la mano quando dico la lettera A".* Leggere le lettere dalla seguente lista con un tono di voce normale e costante ad intervalli di 3 secondi. **S A V E A H A A R T** Viene contato un errore quando il paziente non stringe la mano sulla lettera "A", o quando la stringe in risposta alle altre lettere	Numero di errori > 2 →	☐
Punto 3: Alterato Livello di Coscienza		
Il paziente è agitato, sedato o incosciente?	RASS ≠ 0 →	☐
Punto 4: Pensiero Disorganizzato		
Domande a cui si può rispondere solo Sì/No. come ad esempio: 1. Un sasso galleggia nell'acqua? 2. Ci sono pesci nel mare? 3. Un chilo pesa più di due chili? 4. Si può usare il martello per piantare un chiodo? **Errore: quando il paziente risponde in maniera scorretta alla domanda.** **Ordine semplice** 5. Dire al paziente: *"Mi mostri queste dita"* (mostrare 2 dita); *"Ora faccia lo stesso con l'altra mano"* (senza mostrarle) se il paziente non riesce a muovere entrambe le braccia dire: *"Aggiunga un altro dito"* **Errore: quando il paziente non è in grado di completare l'intero esercizio.**	Numero totale di errori > 1 →	☐

Punto 1 +	**Almeno uno** + **fra punto 3 e 4**	Soddisfazione dei criteri →	☐ CAM-ICU Positivo (presenza di Delirium)
Punto 2 +		Criteri non soddisfatti →	☐ CAM-ICU Negativo (assenza di Delirium)

MONTREAL COGNITIVE ASSESSMENT (MOCA)
- ITALIA -

NOME: _____
Scolarità: _____ Data di nascita: _____
Sesso: _____ DATA: _____

VISUOSPAZIALE / ESECUTIVO



Copi Il cubo

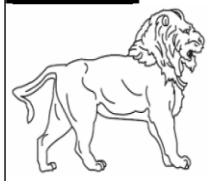
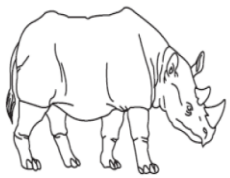
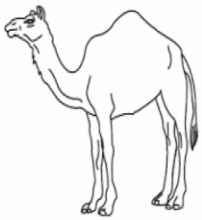
[ ] [ ]

Disegni un orologio (undici e dieci) (3 punti)

[ ] Contorno [ ] Numeri [ ] Lancette

PUNTI __/ 5

DENOMINAZIONE

[ ] [ ] [ ] __/ 3

MEMORIA Leggere la lista di parole: il soggetto deve ripeterle. Fare le prime 2 prove di seguito e il " Richiamo " dopo 5 min.

	Faccia	Velluto	Chiesa	Margherita	Rosso
1°prova					
2°prova					

0 punti

ATTENZIONE

Leggere la serie di cifre (una cifra / sec.)
Il soggetto deve ripeterle [ ] 2 1 8 5 4
Il soggetto deve ripeterle in ordine inverso [ ] 7 4 2
__/ 2

Leggere la serie di lettere. Il soggetto deve dare un colpetto con la mano sul tavolo ad ogni lettera "A". **0 punti se ≥ 2 errori**
[ ] F B A C M N A A G H L B A F A H D E A A A G A M O F A A B
__/ 1

Sottrazione di 7 partendo da 100 per 5 volte [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65
4 o 5 sottrazioni corrette: **3 pt**, 2 o 3 corrette: **2 pt**, 1 corretta: **1 pt**, 0 corretta: **0 pt**
__/ 3

LINGUAGGIO

Ripeta:
So solo che oggi dobbiamo aiutare Giovanni. [ ]
Il gatto si nascondeva sempre sotto il divano quando c'erano cani nella stanza. [ ]
__/ 2

Fluenza / In 1 minuto, nomini il maggior numero possibile di parole che iniziano con la lettera "**F**". [ ] __(**N ≥ 11 parole**)
__/ 1

ASTRAZIONE Similitudini tra per es. banana / arancio = frutti; [ ] treno / bicicletta [ ] orologio / righello
__/ 2

RICHIAMO DIFFERITO Deve ricordarsi le parole **SENZA AIUTO**

	AIUTO		Faccia [ ]	Velluto [ ]	Chiesa [ ]	Margherita [ ]	Rosso [ ]	Punti solo per ripetizione **SENZA AIUTO**
Opzionale	Categoria Seman.	Scelta multipla						

__/ 5

ORIENTAMENTO [ ] Data [ ] Mese [ ] Anno [ ] Giorno [ ] Luogo [ ] Città
__/ 6

Versione 26 Luglio 2006
www.mocatest.org

Normale: ≥ 26 / 30

TOTALE __/30
Aggiungere 1 punto se ≤ 12 anni di istruzione

VALUTAZIONE DEL RISCHIO DI INSORGENZA DEL DELIRIUM NEI PAZIENTI CON FRATTURA DI FEMORE PROSSIMALE

Gemelli

Fondazione Policlinico Universitario A. Gemelli
Università Cattolica del Sacro Cuore

SCHEDA DI ARRUOLAMENTO

SPAZIO ETICHETTA

(criterio esclusione all'arruolamento: età < 65 anni)

Indicare livello scolarità: _____

TRAUMA CRANICO SI | NO

SCOMPENSO CUORE/POLMONE ACUTO *(specificare)*

_____

_____

_____

DEMENZA MODERATA-SEVERA SI | NO

ASSENZA CAREGIVER SI | NO

TABAGISMO e/o ADDICTION SI | NO

_____

HCV SI | NO

PREGRESSO TIA/STROKE *(evento/anno/reliquati)*

_____

_____

_____

_____

PREGRESSA CHIRURGIA CARDIOVASCOLARE O NEUROCHIRURGICA (tipo/anno)

_____

_____

_____

TERAPIA *(FARMACO e POSOLOGIA)*

- _____
- _____
- _____
- _____
- _____
- _____

PROVENIENZA

CASA PROPRIA | ALTRO OSPEDALE | RESIDENZA PROTETTA

STATO DI SALUTE GENERALE

- **IA** SI | NO
- **DM** SI | NO
- **Insulino-dipendente** SI | NO
- **CREATININA >1.5 mg/dL** SI | NO
- **OSAS** SI | NO
- **FA CRONICA** SI | NO
- **PORTATORE PM/ICD** (se si, spiegare tipologia) SI | NO

Ricovero pre-operatorio in reparto (medico/chirurgico)

ADL (0-6) _____

IADL (0-8) _____

PERFORMANCE STATUS (I.K.)

Tempo dall'arrivo in PS al I MOCA (ORE) _____ 8-20 | 20-8

Tempo dall'arrivo in PS all'intervento chirurgico (ORE)

Valore Hb e SpO2 pre-operatorio g/dL | %

TRASFUSIONE PRE-I.C.? SI | NO — SE SI, SPECIFICARE: _____

NRS PRIMA VISITA ANESTESIOLOGICA / ARRIVO IN SO (0-10)

ANTIDOLORIFICI PRE-OPERATORI *(se SI, specificare prescrizione e posologia)*

- _____
- _____
- _____
- _____

Intervento svolto in sala urgenze? SI | NO

Anestesia eseguita (descrizione)

_____

_____

_____

Blocco fascia? SI | NO

Necessità di trasfusione durante o nel post –IC SI | NO

Se si, specificare: _____

_____

POST-IC, PZ INVIATO PRESSO:

TIPO | RR

Valore Hb, SpO2 e NRS post- I.C.

g/dL | % _____

Complicanze post-operatorie (se SI, specificare quali):

- _____
- _____

23. *Valore Hb (mg/dL):*

FINE I.C. | PRIMA GIORNATA Post-I.C. | TERZA GIORNATA Post-I.C.

_____ | _____ | _____

24. SpO2 all'uscita RR/TIPO. Necessità di ossigenoterapia all'arrivo in reparto?

% | SI / NO

INOTROPI/VASOCOSTRITTORI IN INFUSIONE INTRA E POST-OPERATORI **(se SI, specificare farmaco e posologia)** SI | NO

- _____
- _____
- _____

Riabilitazione motoria post-I.C. (specificare dove svolta e tipologia)

_____

Farmaci psicotropi peri-I.C.

- _____
- _____
- _____
- _____

TEMPO DI DEGENZA post-I.C. E DESTINAZIONE:

_____

_____

_____

Numero giorni

MORTALITA' POST-I.C.

primi 30 giorni	primo anno	dopo primo anno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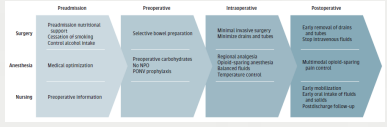
The tailoring

rigorous and routine preoperative cognitive screening

- identifying preexisting cognitive impairment
- determining if the patient has a history of previous postoperative confusion or delirium documenting other episodes of delirium or confusion
- assessing for low education

use of specific anesthetic regimens

- general versus regional anesthesia
- **specific anesthetic agents**
- blood transfusions
- systemic arterial pressure monitoring
- depth of anesthesia
- normothermia



ERAS postoperative protocols


grazie