

TRUE



or

FALSE



MTF – Question One

Four days after laparoscopic hemicolectomy, a 78-yr-old woman appears disorientated in time and place.

Appropriate actions are likely to include:

- a. Review the drug chart for pharmacological agents affecting cognition.
- b. Perform neuropsychometric testing for postoperative cognitive dysfunction (POCD), such as the MCoA test.
- c. Assess the patient's pain score and current pain management.
- d. Examine the patient and consider abdominal imaging.
- e. Perform daily assessments of confusion.

MTF – Question Two

Features that are characteristic of POCD include:

- a. Onset of symptoms more than a week after surgery.
- b. New onset of agitation, restlessness and reduced inhibitions.
- c. The incidence is 30% among patients older than 65 yr, 1 week after surgery.
- d. Intraoperative opioids, benzodiazepines and old age are risk factors.
- e. Development of dementia

MTF – Question Three

Appropriate statements regarding how to accurately assess POCD include:

- a. Measure the Abbreviated Mental Test (AMT) before and after surgery.
- b. Current practice varies considerably in timing and definition of testing.
- c. Perform a full clinical neurological examination.
- d. Perform a battery of neuropsychometric tests, validated for mild cognitive impairment.
- e. Rely on self-reported symptoms from the patient.

MTF – Question Four

You assess a frail 82-yr-old gentleman who is scheduled to undergo transurethral resection of the prostate. He lives alone and expresses a strong desire to maintain independence. Appropriate statements regarding reduction in risk of POCD include:

- a. There is good evidence to suggest that spinal rather than general anaesthesia will reduce risk of POCD.
- b. Total intravenous anaesthesia using propofol and the EEG to guide depth of anaesthesia has been shown to reduce POCD.
- c. Treatment of early symptoms with dexmedetomidine will limit further cognitive decline
- d. Use of ketamine during a GA is likely to increase the risk of POCD.
- e. Drugs that reduce inflammatory markers (interleukin [IL]-6 and C-reactive protein [CRP]) are likely to reduce the incidence of POCD and are well suited for use in this population of patients.

MTF Questions



Resuscitation
SOCIETY FOR ANAESTHETISTS
RCSA (Resuscitation Society)
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Postoperative cognitive dysfunction in clinical practice

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Delirium in critically ill patients: current knowledge and future perspectives

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Perioperative management of patients with dementia

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BRITISH MEDICAL ASSOCIATION.

FIFTY-FIFTH ANNUAL MEETING.

PROCEEDINGS OF SECTIONS.

INSANITY FOLLOWING THE USE OF ANÆSTHETICS
IN OPERATIONS.

Read in the Section of Psychology at the Annual Meeting of the British Medical Association held in Dublin, August, 1887.

By GEORGE H. SAVAGE, M.D. LOND., F.R.C.P.,

Medical Superintendent and Resident Physician, Dublin Royal Hospital;
Lecturer on Mental Diseases, City's Hospital.

In treating this subject it will be first necessary to clear away, as much as possible, any fallacies which might induce us to attribute too much importance to any one cause in the production of mental disorder. All writers and observers have noticed that it is very rarely that one cause alone is efficient for the production of any attack of insanity, and that usually there are several predisposing causes which may have been in operation for a long time, as well as one or more exciting causes which may have been in action for much shorter periods.

In the subjoined paper I only point out that I have met with a series of cases of insanity in which the use of anæsthetics, in predisposed subjects, has been followed by insanity. To make the matter more clear I have collected together similar cases which have followed similar causes, such as alcohol, belladonna, &c. I think by this means to be able to show that the relationship is truly causal.

I will at once place before you several propositions which I hope to prove.

Any cause which will give rise to delirium may set up a mere chronic form of mental disorder quite apart from any febrile disturbance. (a) The most common form of mental disorder which arises in

that delirium accompanying fevers may start a similar set of symptoms. After scarlet fever or measles I have several times met with such disorders. Thus, one girl aged 17, bright, intelligent, and active, two of whose sisters and one brother had been insane and recovered, and whose mother, though not actually insane, was subject to periods of extreme mental depression; this girl contracted scarlet fever, early in the illness became very delirious, and after several days of excited sleepless delirium, became insular. The noisy, senseless chatter assumed a more organized form; the excitement was greater, but with less incoherence; agitation of a very painful kind developed, and it was difficult to prevent open masturbation. She refused food, and her condition rapidly passed into a very dangerous typhoid case; she was removed to Dublin, where, after several weeks of extreme violence and weakness, she passed into a state of temporary mental exhaustion—stupor—from which she slowly but certainly recovered, and has remained well ever since. In another case, a girl of about the same age, two of whose sisters were insane, and one brother epileptic, with a very eccentric father, developed acute delirious mania after measles; of which she died in a few days.

After the delirium of pneumonia, I have seen similar symptoms arise in nervous patients. What I have already said makes clear what I believe to be an established fact, that any of those febrile conditions may start an insane attack. I am inclined to think that those who come off insane attacks are very often unusually liable to infection, and that having contracted an acute disease, they are more likely to have early and severe delirium.

Besides alcohol and fever, I give one case in which delirium of belladonna proved efficient in starting the insane process. A young girl belonging to a very nervous stock took by accident a dose of belladonna tincture instead of a dose of orange mixture. For two days the medical man treated her delirious condition as due simply to the drug; but at the end of that time she remained still wild and delirious, and I was called in to see her. She passed through a sharp attack of mania of the delirious type, though the bodily illness was not extreme. As in most of the cases to which I have already referred, in the end the girl recovered. From the above, I think I am justified in saying that any toxic agent, more especially those which directly affect the nutrition of the nervous system, such as alcohol, lead, and belladonna, will cause temporary disorder of the intellectual functions,

Dec. 3, 1887.]

THE BRITISH M

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Delirium



Delirium

- The fluctuating changes in attention, level of consciousness and cognitive function in delirium occur acutely within hours or days.
- It is widely considered to be triggered by surgery and anaesthesia.
- It is highly prevalent in surgical patients:
 - 15-53% of older patients after surgery
 - 70-87% of those in critical care.
- Delirium can manifest in a hypo- or hyperactive state.
- Hyperactive delirium is easily detected clinically, with features of psychomotor agitation, reduced inhibitions and restlessness that may threaten the patient's safety.
- The incidence of hypoactive delirium is likely underestimated, as the patient may appear calm, but upon examination shows signs of disorientation, inattention and reduced mobility.

Delirium



Neurocognitive Disorders

Amended DSM-5 diagnostic criteria for Neurocognitive Disorders

- **Mild NCD: noticeable decline in cognitive function, requiring adjustment to maintain independence in activities of daily living that extends beyond the normal changes of ageing**
- **Major NCD: significant burden of cognitive impairment that results in impaired activities of daily living**

Cognitive Domains

- **Learning and Memory**
- **Language**
- **Perceptual Motor**
- **Social Cognition**
- **Complex Attention**
- **Executive Function**
- **Delirium**

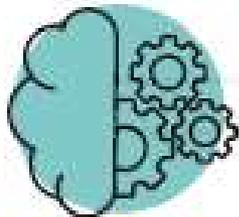
Post Operative Neurocognitive Disorders

Aetiology

- Progression of a pre-existing neurocognitive disorder (NCD)
- Acute onset of delirium
- Development of post operative cognitive decline (POCD)

After surgery and anaesthesia

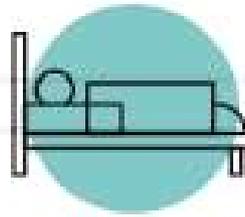
Before to surgery



Neurocognitive disorder
(mild or major)



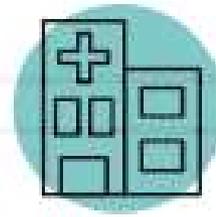
Within 7 days



Postoperative
delirium



Within 30 days



Delayed neurocognitive
recovery



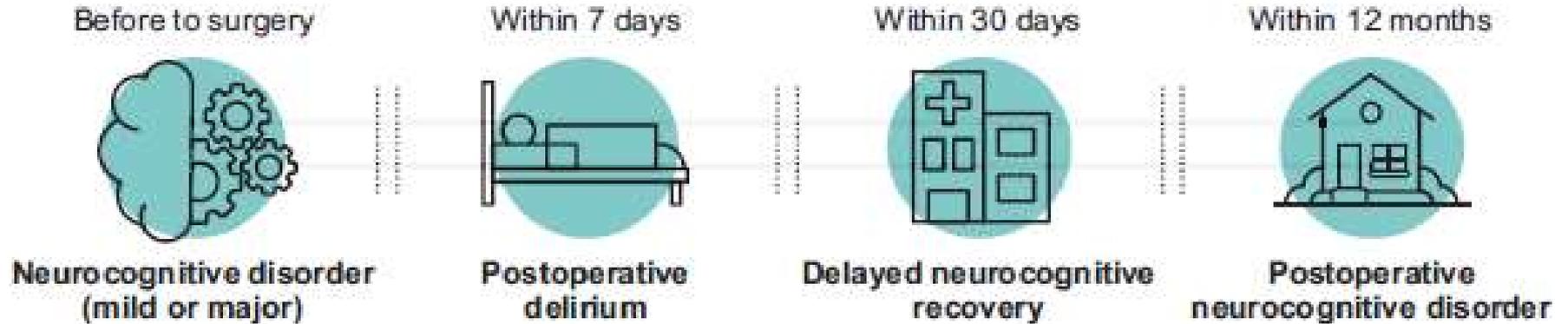
Within 12 months



Postoperative
neurocognitive disorder

Timeline of Cognitive Decline

After surgery and anaesthesia



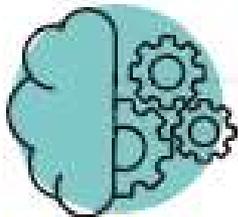
- *Post Operative Cognitive Decline is not currently defined by DSM-5*
- *These are proposed definitions*
- *The newly named 'postoperative neurocognitive disorder' is ideally measured by a battery of neuropsychometric tests (unspecified which)*
- *The working group directs clinicians away from early testing for POCD (<7 days)*

Post Operative Cognitive Dysfunction

- A decline in cognitive ability from a patient's baseline that starts in the days after surgery and is prevalent in 1% of elderly patients after 1 yr.
- Multiple manifestations across cognitive domains
- For the patient, this may result in difficulty writing, managing money or remembering lists, and can have a very tangible effect on their lives after discharge home.

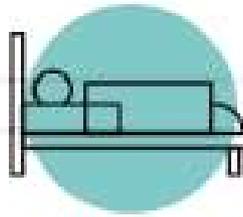
After surgery and anaesthesia

Before to surgery



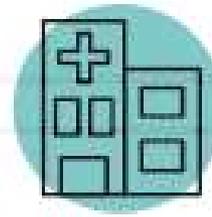
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Within 7 days



Postoperative
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Within 30 days



Delayed neurocognitive
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Within 12 months



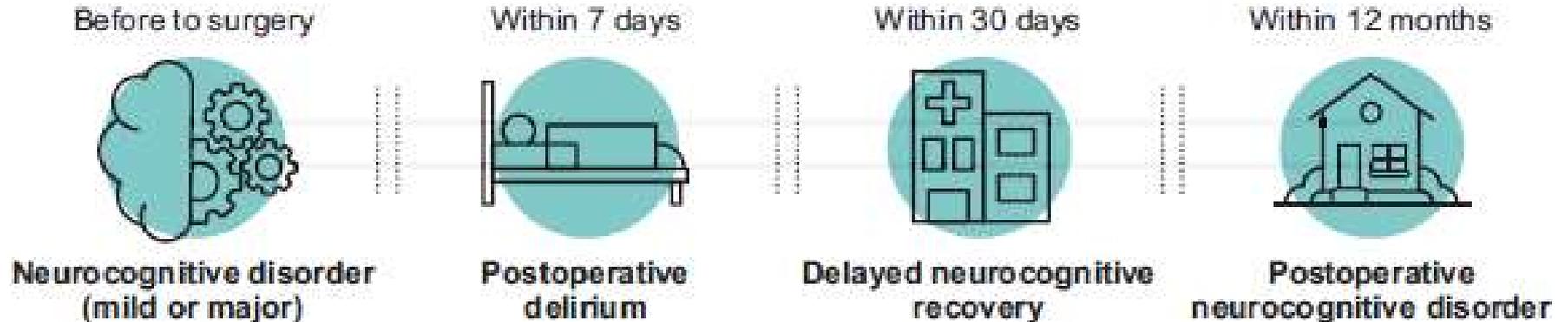
Postoperative
neurocognitive disorder

Post Operative Cognitive Dysfunction

- A study of patients with hip fractures concluded those who developed POCD had poorer ability to function socially and manage activities of daily living at 1 yr.
- A Danish study of 700 patients followed-up for 8 yrs found that early POCD (at 1 week) was associated with individuals leaving the labour market prematurely and withdrawing social benefit payments.
- POCD carries an increased risk of death 1 yr after surgery.
- Follow-up more than 11 yrs after surgery has shown no association between POCD and dementia.

POCD Timeframe

After surgery and anaesthesia



- The time frame of onset of POCD remains undefined, but it can be detectable from 7 days after surgery.
- Transient cognitive deficits immediately after surgery have multifactorial causes (emergence from anaesthesia, sleep deprivation, pain, anxiety, polypharmacy, inadequate nutrition and operative complications), and these causes, alongside postoperative delirium, will significantly undermine neuropsychological testing for POCD.

POCD Incidence

- The incidence of POCD in elderly patients after non-cardiac surgery is:
 - 30% at 1 week
 - 10-13% at 3 months
 - 1% at 1 year

POCD Aetiology

- The pathogenesis of POCD remains unclear
 - Neuronal death
 - Neuroinflammation
 - Micro-emboli.
- Animal studies have shown that inhalational anaesthetic agents potentiate neuronal death through the degradation of the cholinergic system. These cholinergic pathways are a key element of consciousness, learning and memory.
- Neuroinflammation occurs as inhalational agents increase the permeability of the endothelial cells in the cerebral vasculature, allowing cytokines to enter and damage neural tissue.
- Micro-emboli from the surgical site or air entrainment may cause cerebral infarcts, and have been studied using MRI, but no clear relationship was found.

POCD Aetiology

- Neuroimaging has been studied to discern brain alterations relating to POCD.
- A systematic review found weak evidence to suggest that POCD correlates with:
 - Reduced thalamic volume
 - Reduced hippocampal volume
 - Pre-existing white matter pathology
 - Reduced cerebral blood flow.

POCD Diagnosis

- To best detect subtle and specific neurocognitive changes, diagnosis should include a battery of tests that span the cognitive domains
 - The most current research has studied POCD through assessment with the simple Abbreviated Mental Test or Mini-Mental State Examination (MMSE).
 - These brief and accessible tests were designed for dementia screening and are too crude to identify subtle features of cognitive decline.
 - Single-point testing is inadequate to detect POCD, as diagnosis requires a preoperative baseline and postoperative assessment to quantify a decline
- There are multiple options for sensitive neuropsychometric testing, such as the Montreal Cognitive Assessment tool, Addenbrooke's cognitive examination III and the Quick Mild Cognitive Impairment screen.

POCD Diagnosis

Neuropsychometric testing needs to become embedded in the holistic perioperative care of the elderly surgical population.

“There is a need for preoperative assessment processes that identify patients with baseline cognitive impairment.”

Guidelines

Peri-operative care of people with dementia



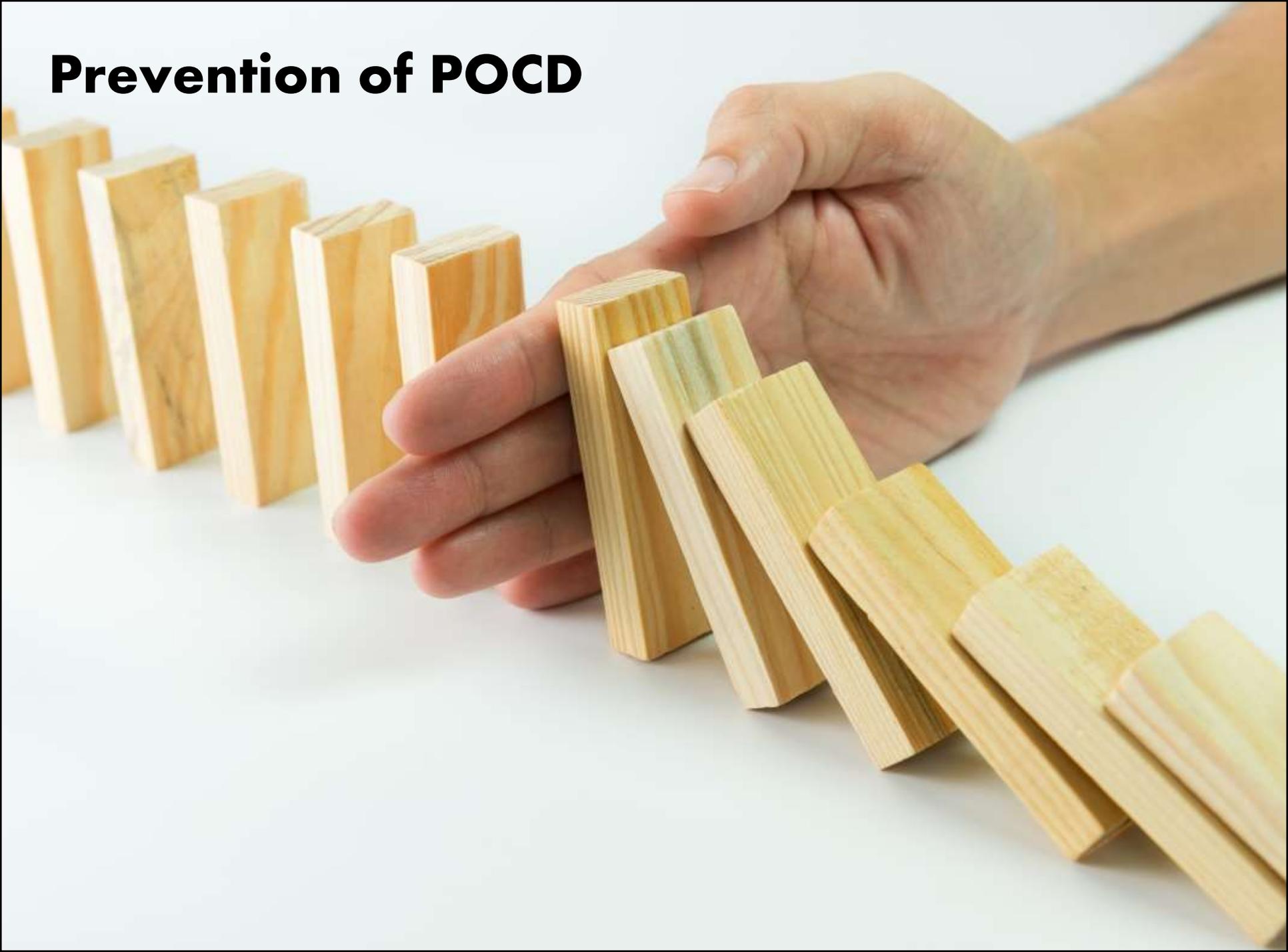
Association
of Anaesthetists

February 2019

POCD Risk Factors

- The risk factors identified for POCD are:
 - Advancing age
 - Lower educational level
 - A history of a previous cerebral vascular accident with no residual impairment.
 - Both preoperative Mild Cognitive Impairment and cognitive dysfunction at hospital discharge correlate with POCD at 3 months after surgery.
- Further studies have suggested predictors for early POCD to include:
 - The duration of anaesthesia
 - Postoperative infections
 - Second operations
 - Respiratory complications.

Prevention of POCD



Prevention of POCD

- General or Regional Anaesthesia?
- Inhalational or Intravenous Anaesthesia?
- EEG Guided Depth of Anaesthesia Monitoring?
- Clinical Variables?
- Other Drugs?
 - Ketamine
 - Dexmedetomidine
 - NSAIDs
 - Steroids

POCD

What will make a difference?

Strength of evidence

Strong

Moderate

Weak

Decrease risk



Increase risk

Advanced age

Lower educational status

Previous stroke

POCD at hospital discharge

EEG-guided anaesthesia

Dexmedetomidine

Respiratory complications

Postoperative infection

Duration of anaesthesia

Reoperation

Propofol

Ketamine

NSAIDs

MTF – Question One

Four days after laparoscopic hemicolectomy, a 78-yr-old woman appears disorientated in time and place.

Appropriate actions are likely to include:

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You assess a frail 82-yr-old gentleman who is scheduled to undergo transurethral resection of the prostate. He lives alone and expresses a strong desire to maintain independence. Appropriate statements regarding reduction in risk of POCD include:

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