



What you need to know about Delirium in ICU

Dr Valerie Page

Watford General Hospital

Delirium and outcome

40 year old ARDS ICU survivor college graduate

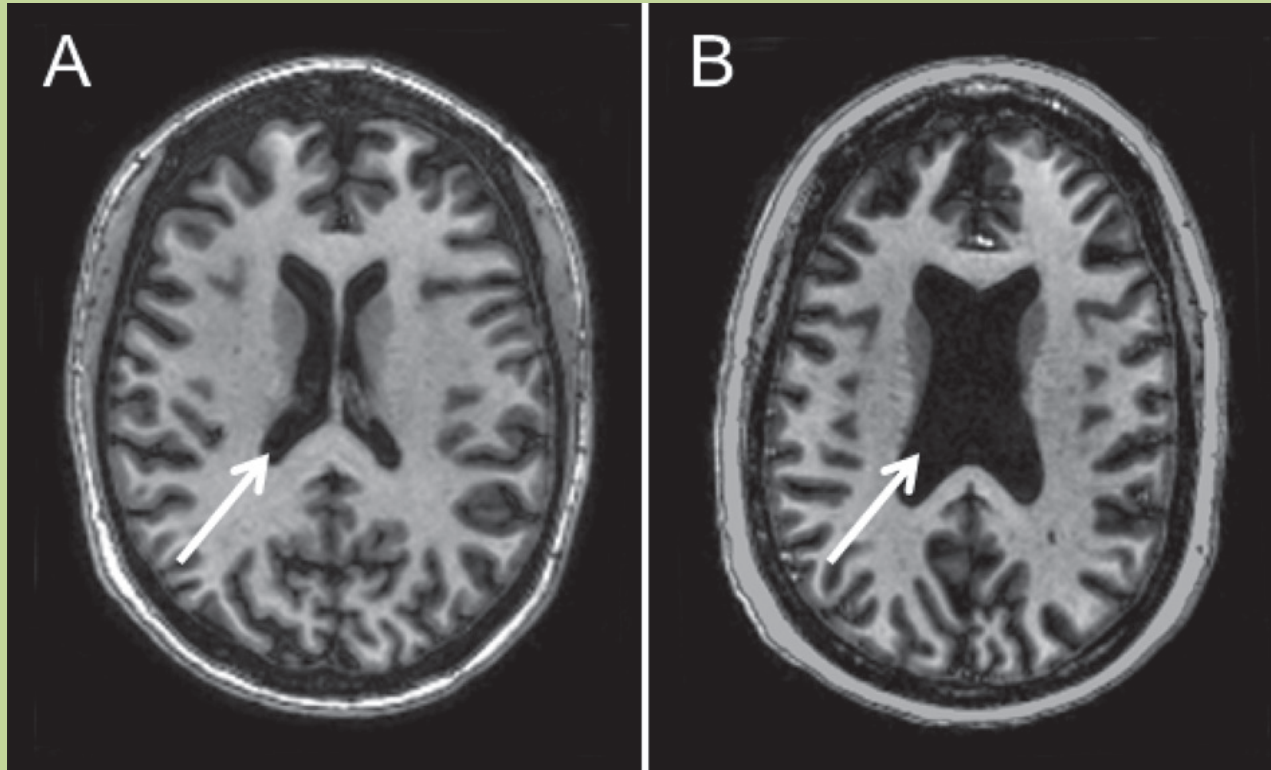
“I have been out of hospital and trying to get on with my life for the past 2 years. I have trouble with people’s names that I have worked with for years. I can’t remember where I put things at home. I can’t help my children with their homework because I can’t remember how to do simple multiplication problems.”



What is happening in the brain?

- Oxidative stress
- Neurotransmitter imbalance
- Neuronal aging
- Inflammation
- Abnormal levels of large neutral amino acids

VISIONS

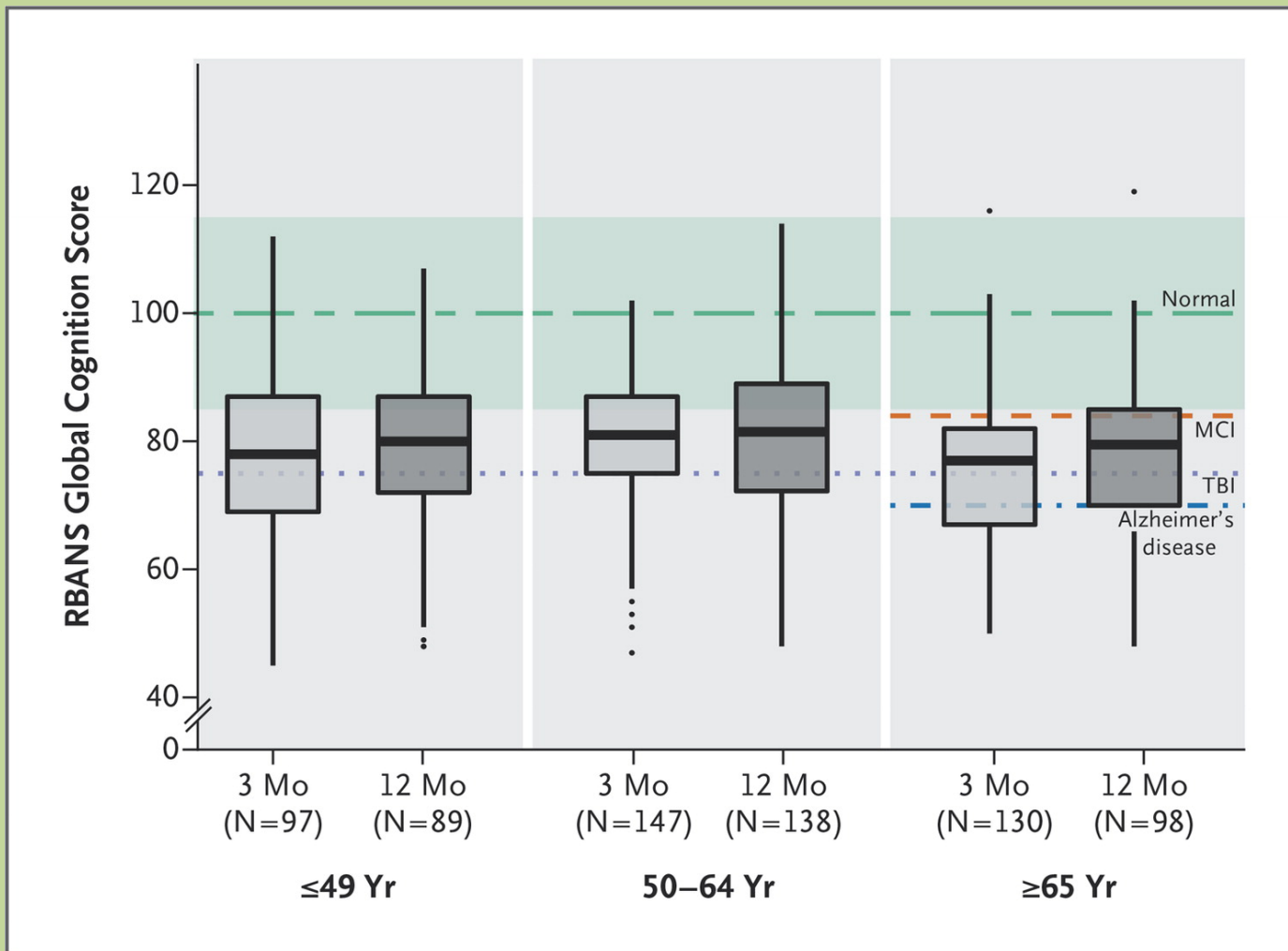


A 46 year old woman ARDS, no delirium.

B 42 year old woman ARDS, 12 days delirium

Gunther CCM 2012

Global Cognition Scores in Survivors of Critical Illness.



Pandharipande P et al. N Engl J Med 2013;369:1306-1316.



The NEW ENGLAND
JOURNAL of MEDICINE

Post-operative cardiac surgery

- 225 patients 60 years or over
- CABG or valve replacement
- Cognitive function monitored with MMSE
- Delirium diagnosed using CAM
- KATZ index of ADLs



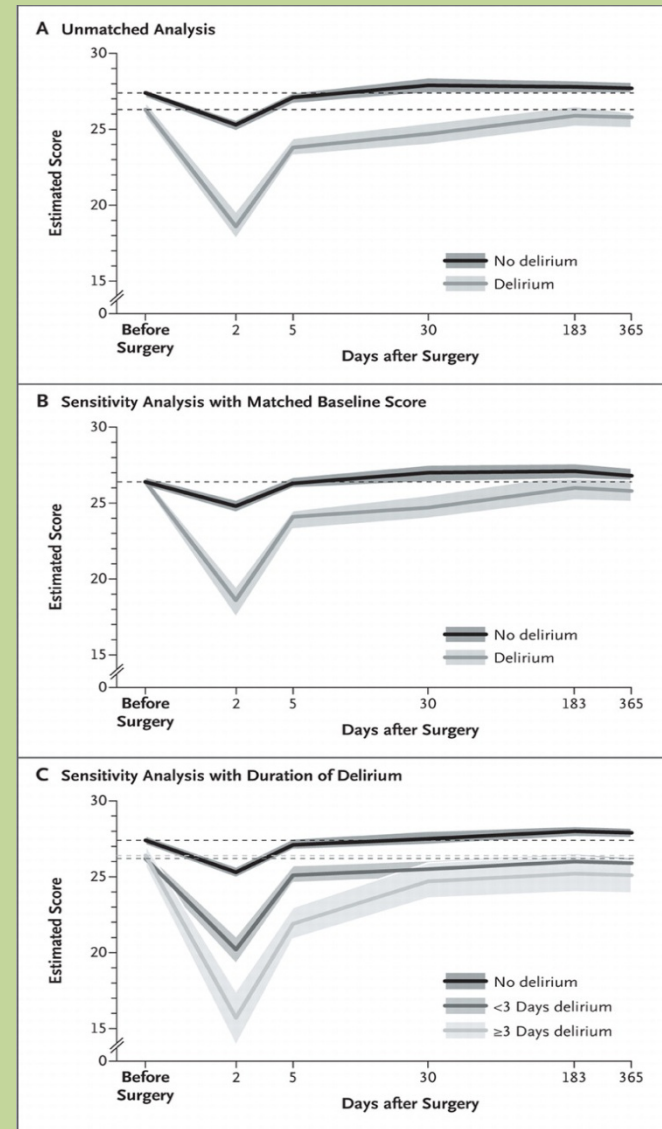
Results -trajectories

46% patients developed delirium

Time to return to preoperative MMSE

No delirium: 1 month.

Delirium: not returned by 1 year, still improving up to 6 months



Cognitive outcomes Hope-ICU

Telephone Interview of Cognitive Status

	Haloperidol	Placebo
TICS-M Median (IQR) n = 57	22 (18-27)	21 (18-24)


≤ 31 cutoff score separates MCI from normal cognition (sensitivity 71.4%)

≤ 27 score separates MCI from dementia (sensitivity 69%).

The delirium experience

“The rest of my stay in ICU was filled with more incidents of despair, humiliation and terror. I saw a patient stabbed to death by his wife, and two people committing suicide. I witnessed arguments, in my mind all caused by me, and the pain I felt as my lungs started to recover was all part of a plan to give me pain inducing drugs – in fact I had seen doctors laughing about it.

The day after I was extubated I found myself in the High Dependency Unit, where the sheer terror of the execution attempts began.”



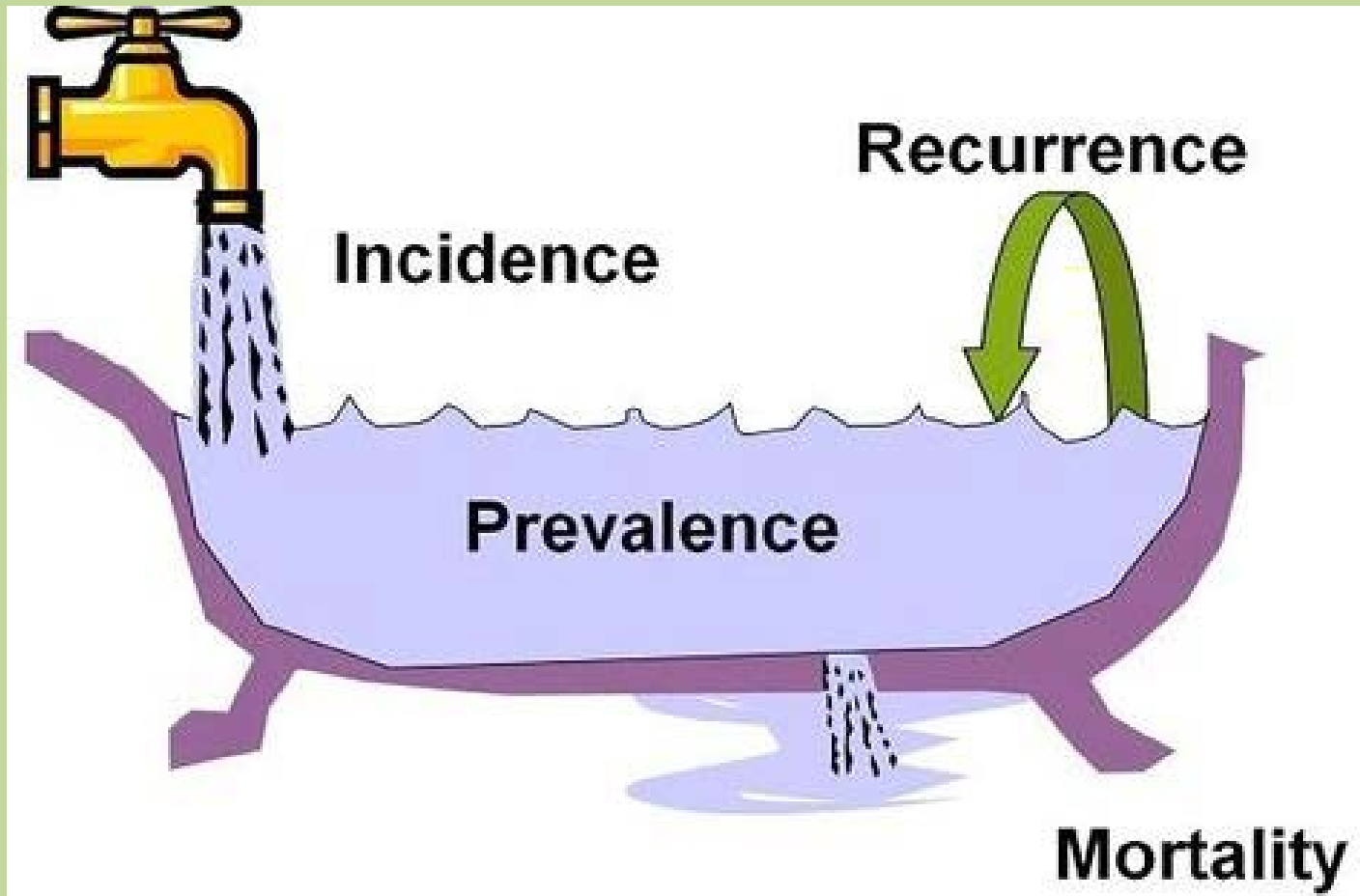
Delirium – DSM V

- Disturbance in attention and awareness
- Acute onset and fluctuates
- Disturbance in cognition
- Not explained by pre-existing, established or evolving neurocognitive disorder and non-comatose patient
- Evidence for cause

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Subsyndromal delirium

- One or more symptoms
- Not meeting full criteria
- Not progressing to delirium
- Intermediate outcomes



North America

- SLEAP trial 420 ventilated patients
 - APACHE 23
 - 54% delirium,
 - 4% ICDSC 0 throughout
- BRAIN trial 821 patients
 - APACHE 25
 - 74% delirium

Mehta S, Cook D, Devlin JW, et al Prevalence, risk factors, and outcomes of delirium in mechanically ventilated adults. *Crit Care Med*. 2015; **43** :557-66.

P.P. Pandharipande, T.D. Girard, J.C. Jackson, et al. Long-Term Cognitive Impairment after Critical Illness. *N Engl J Med* 2013; **369**:1306-16.

Netherlands

Netherlands:

Before/after study: 476 patients before/after
study 44% to 97%

Observational study: 1112 consecutive patients
50% at least 1 episode

van den Boogaard M et al. Haloperidol prophylaxis in critically ill patients with a high risk for delirium. *Crit Care*. 2013 Jan 17;**17**:R9.

Klowenberg K et al. The attributable mortality of delirium in critically ill patients: prospective cohort study. *BMJ* 2014; 349: g6652

World ICU population

- Belgium 15%
- Germany 26.9%
- Sweden 39%
- Australia 12.4%
- UK 32.4%

Van den Boogaard Intensive care medicine 2014; 40: 361-9

Incidence

Acute general hospital 1000 beds = 100 delirious patients

Critical Care

- 1:5 high dependency up to 4:5 sick ventilated patients
- Compare 3:5 with fractured neck of femur

Watford

Incidence of delirium by subgroup

Crit Care 2009; 13: R16

	Delirious	Not delirious
Elective post-operative (n=23)	1 (4%)	22 (96%)
Emergency admissions (n=57)	22 (45%)	27 (55%)
Ventilated patients (n=27)	17 (63%)	10 (37%)

What does it look like?





Delirium motoric types

- Hyperactive – psychomotor agitation
- Hypoactive – psychomotor lethargy and sedation, appears quiet & co-operative BUT with inattention and disorganised thinking.
- Mixed – fluctuating hypo/hyperactive symptoms

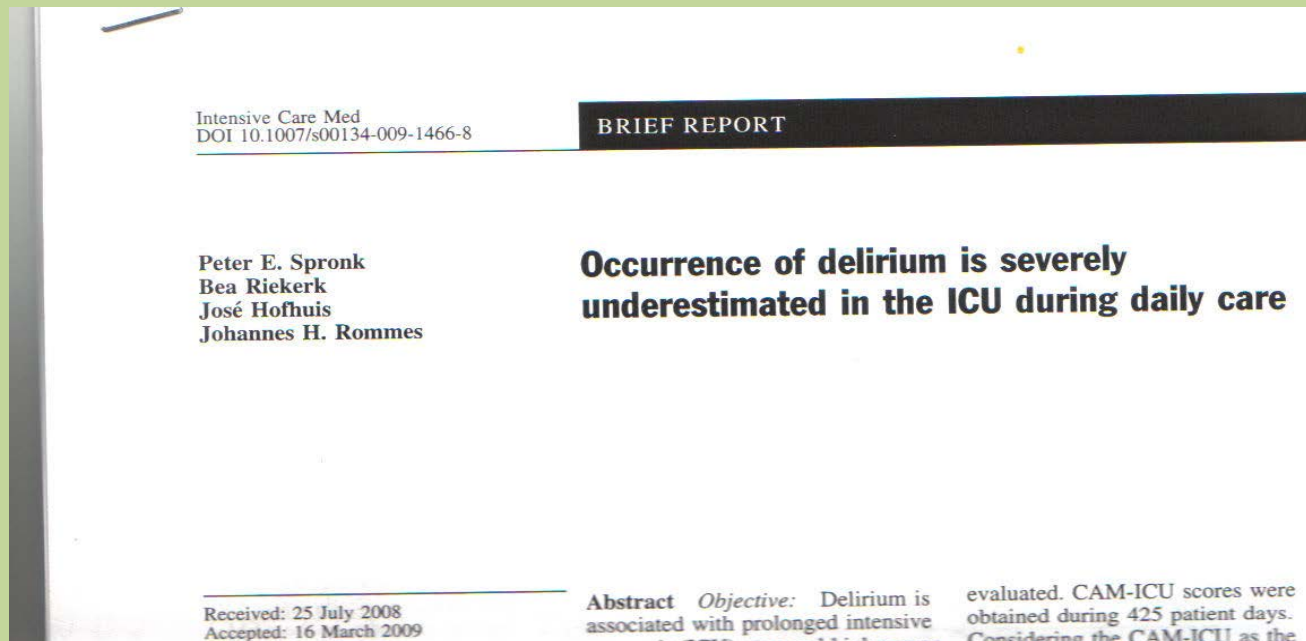
Identification



CAM-ICU



Diagnosing delirium



46 patients Median age 73 years (IQR = 64–80)

CAM-ICU scores during 425 patient days

Delirium in 50% of the patients 3 days (range 1–9).

Clinical detection 24%

Rapidly Reversible, Sedation-related Delirium versus Persistent Delirium in the Intensive Care Unit

Shruti B. Patel, Jason T. Poston, Anne Pohlman, Jesse B. Hall, and John P. Kress

Department of Medicine, Section of Pulmonary and Critical Care, University of Chicago, Chicago, Illinois

Can delirium be diagnosed in sedated patients?

Patel SB. AJRCCM 2014;189:658-65

Takala J. AJRCCM 2014;189:622-24



Sedation related delirium

- 102 of 256 patients
- Paired CAM-ICU before and after SAT
- 28.9% CAM-ICU (n=11) negative after SAT
- 89% at least 1 day delirium pre vs. 77% post.
- Outcomes, same for rapidly reversible as no delirium.

Can delirium be diagnosed in
comatose patients?

We Know

- More sedation, more delirium
- More delirium, worse outcomes
- Less sedation, better outcomes

Balas MC et al Crit Care Med 2014, Jackson DL et al Crit Care 2010, Dale CR Ann Am Thorac Soc 2014, Shehabi Y et al Intensive Care Med 2013, Tanaka LMS et al, Crit Care 2014, Porhomayon J et al. J Cardiovasc Thorac Res 2015, Girard TD et al. Lancet 2008; 371 (9607) 126-134

Sedation induced coma

RASS -3 to -5

- SPICE/ANZICS trial deep sedation throughout the first 48 hours in 171 (68%) patients
- SPICE group Malaysia deep sedation in 159 (61%) patients and 1,658 (59%) of all RASS assessments at 48 hours.
- ABC trial day 1, 52% control group, 56% intervention group were in coma.

Shehabi Y, et al. *Intensive Care Med* 2013; **39**: 910-8,

Shehabi Y et al Sedation Practice in Intensive Care Evaluation (SPICE) Study Investigators; ANZICS Clinical Trials Group. *Am J Respir Crit Care Med*. 2012; **186**: 724–31

Girard TD et al. *Lancet* 2008; **371**: 126–34

Watford – first 2 days

- Average number of RASS per shift 3.56
- Number of RASS -1 to +1 = 18.7%
- In 28.3% of patients
- No correlation with APACHE



Delirium or Depression?

- *‘The symptoms of delirium, when they are present, are prominent and take diagnostic precedence as delirium frequently indicates serious and urgent physical pathology or morbidity.’*
- *‘Because of their clinical overlap, in a hospital setting, clinicians should not rule out delirium in any patient with suspected depression – ‘*

Take home messages: O’Sullivan et al Lancet Psychiatry 2014

Delirium or Depression?

Overlapping features

- Affective changes
- Sleep disturbance
- Underactivity or lethargy
- Apathy
- Agitation
- Impaired speed of information processing
- Delusions or hallucinations
- Impaired memory

Delirium – Prominent features

- Fluctuation in intensity of symptoms
- Acute onset
- Altered consciousness
- Marked inattention
- Underlying physical cause
- Disorientation
- Disorganised thinking
- Poor comprehension

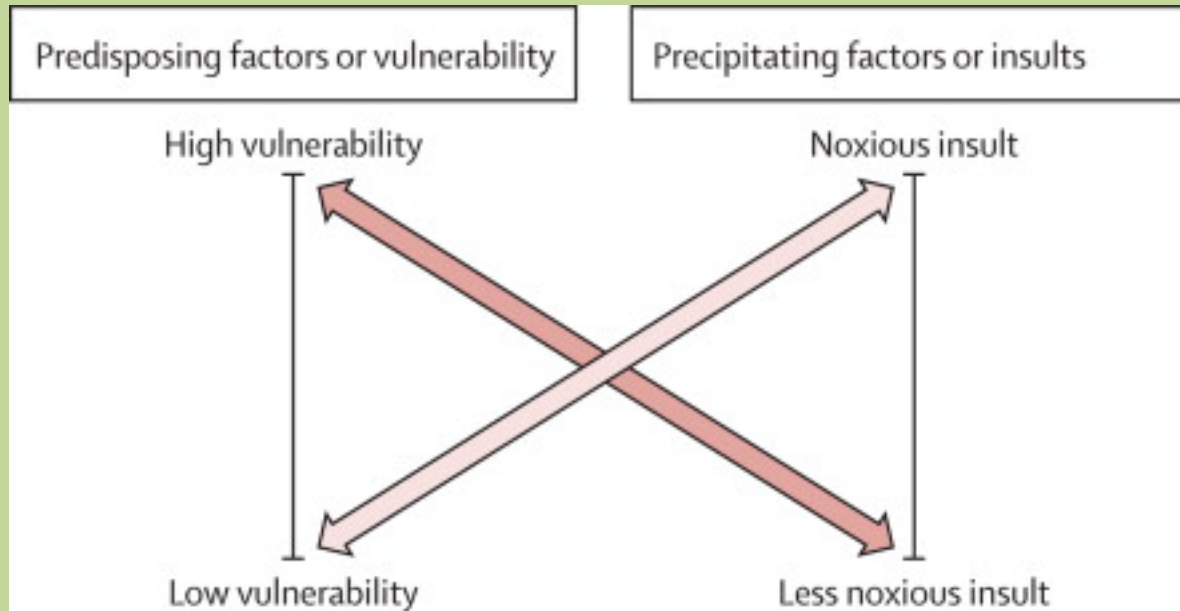


Figure. Multifactorial model of delirium in older people
Onset of delirium is dependent on a complex interaction between the patient's baseline vulnerability (predisposing factors) at admission and precipitating factors or noxious insults..

Sharon K Inouye, Rudi GJ Westendorp, Jane S Saczynski

Delirium in elderly people

, Volume 383, Issue 9920, 2014, 911–922

Risk factors

Host factors	Acute illness	Iatro/envIRON
Elderly	Severe sepsis	Sedative/analges
Co-morbidities	ARDS	Immobilisation
Pre-existing cognitive impair	MODS	TPN
Hearing/vision impairment	Drug OD or illicit drugs	Sleep deprivation
Neurological dis	Nosocomial inf.	Malnutrition
Alcohol/smoker	Met. disturbance	Anaemia

Management

- Sedation score and delirium screening
- Identify and treat precipitating factor
- Minimise impact of predisposing factors
- Pharmacological therapy

Specimen type	Blood	eGFR	30 L mL/min/(> 60)
Sodium	140 mmol/L (135 - 145)		1.73m ²
Potassium	4.8 H mmol/L (3.2 - 4.5)	Protein	44 L g/L (62 - 83)
Chloride	110 mmol/L (100 - 110)	Albumin	23 L g/L (33 - 47)
Bicarb.	23 mmol/L (22 - 33)	Globulin	21 L g/L (25 - 45)
Anion Gap	9 mmol/L (4 - 13)	Bilirubin	70 C umol/L (< 20)
OSM(Calc)	295 mmol/kg(275 - 295)	CK	215 H U/L (< 10)
Glucose	9.2 H mmol/L (3.0 - 7.8)	ALP	98 U/L (40 - 110)
Fasting RR	..> (3.0 - 6.0)	Gamma GT	16 U/L (< 50)
Urea	15.0 H mmol/L (3.0 - 8.0)	ALT	125 H U/L (< 45)
Creatinine	216 H umol/L (70 - 120)	AST	215 H U/L (< 40)
Urea/Creat.	69 (40 - 100)	LD	2690 H U/L (110 - 250)
Diff: Manual	Specimen: Blood		
Hgb : 83 L	WBC : 11.4 H		
PLT : 44 L	:		
RBC : 2.72 L	HCT : 0.24 L		
GENERAL COAGULATION			
INR	1.2		
Prothrombin Time	12		
APTT	27		
Fib (derived)	8.0 H		

Predisposing factors?

Management – non-pharmacological

“Delirium bundle”, optimisation of risk factors

- Address visual, hearing impairment
- Orientation
- Familiar nurse
- Mobilisation
- Drug overhaul
- Sleep

Naughton et al. J Am Geriatri Soc 2005;53:18-23, Lundstrom et al J Am Geriatri Soc 2005;53:622-28

Drugs and delirium

- Opiate analgesics
- Benzodiazepines
- Corticosteroids
- Anticholinergic load

Furosemide

Ranitidine

Digoxin

Brain road map for rounds

(script for interdisciplinary communication)

Skipping any of these steps could leave the clinical team wanting more information!

Investigate (Ask these questions)	Report (only takes 10 seconds)
Where is the patient going?	Target level of consciousness (RASS, SAS)
Where is the patient now?	Actual level of consciousness (RASS, SAS) Delirium assessment (CAM-ICU, ICDSC)
How did they get there?	Drug exposures

SLEEP, ITS IMPORTANCE IN PREVENTING INSANITY

We wish we could impress upon all, the vast importance of securing sound and abundant sleep ; if so, we should feel that we had done an immense good to our fellow-beings, not merely in preventing insanity, but other diseases also.

American Journal of Insanity

Boston Med Surg J 1845; 32:299-301

Deep sedation

=

Sleep deprivation

Sleep and sedatives

- Not cyclical – medication specific, dose dependent
- Decrease in SWS & REM sleep
- ?restorative
- Benzos and Propofol activate GABA in VLPO – suppress histamine release from TMN
- NA release from LC not inhibited
- Overdose – burst suppression

Sleep disturbance - sedatives

- Observational study 21 ventilated patients
- Polysomnography
- Opiates 100%, Benzo 23%, Propofol 82%
- Normal features of sleep not identified
- REM in 2 subjects
- ?Altered state of consciousness, continual sleep deprivation

Delirium

- Does sleep deprivation contribute to delirium?
- Does delirium contribute to sleep deprivation?
- Review of 17 surgical studies – not a risk factor
- Plausible but not proven

Case story

- Independent
- Lives alone
- Widow 2 years
- Was refused hip operation
- Suffers from pain

Day 8/9

- RASS +4
- Intermittent fast AF
- Palliative care referral.
- Continued quetiapine at night
- 0.5mgs lorazepam iv
- Lines out
- Continue NG feed

Day 10

- Woke up
- Asked for her glasses
- RASS 0
- CAM-ICU positive
- Delirium cleared
- Discharged to ward



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Global Delirium Market To Witness Exponential Growth, in-Depth Analysis and Forecast by 2019

A new market report published by Transparency Market Research is Delirium Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, by 2019

Posted via [Industry Today](#). Follow us on Twitter [@IndustryToday](#)



According to a recent market study published by Transparency Market Research (TMR), Delirium is a serious mental disorder, which can cause two most common type of behaviors, namely, hyperactive behavior, which is characterized by severe confusion, disorientation and disturbance in consciousness that fluctuates and hypoactive behavior, which is characterized by the sudden onset of withdrawal from interaction with the outside world. This serious mental disorder is mainly caused due to physical or mental illnesses, which is temporary and reversible in most of the cases. Major symptoms include clouding of consciousness, disorientation of thoughts, illusions, hallucinations, fluctuating levels of consciousness, dysphasia, dysarthria, tremors, asterixis in hepatic encephalopathy and uremia. Some major factors that cause delirium are withdrawal from alcohol or sedatives, drug abuse, chemical disturbances within the body, infections, strokes, dementia, poisoning and surgeries.

Major driving factors for the growth of this market include, increasing prevalence of various neurological disorders worldwide, rising number of cases of physical and mental illnesses, increasing prevalence of cardiovascular diseases and rising demand for advanced therapeutics. The world is experiencing a shift in the population suffering from mental disorders, which is increasing at a rapid rate due to various factors like brain and heart related problems, related surgeries, alcohol or other drug abuse etc. These will help drive the demand for new and advanced therapeutics for delirium treatment. Thus, above factors will drive the growth of this market in future.

Get Sample Report: http://www.transparencymarketresearch.com/sample/sample.php?flag=B&rep_id=2339

Geographically, North America dominates the delirium market followed by the European market. Some of the major factors responsible for these regions' dominance are their high awareness levels about the disease and its available treatments and their affordability. However, Asia-Pacific is the most lucrative market as this region is showing the fastest growth due to increasing incidences of the disease and growing healthcare awareness as well. Some of the key players operating in this market are Air Liquide Sante International, Asklepios Kliniken GmbH, Dr. Franz Kohler Chemie GmbH, Fraser Health, Gaia

Categories

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Welcome to your preview of The Times

My nightmare in hospital

David Aaronovitch
Last updated at 5:45PM, November 12 2011

David Aaronovitch explains how routine keyhole surgery led to a terrifying bout of 'ICU psychosis' during which he thought he was going mad

On Sunday, September 4, I woke up to find that I was no longer mad. It was 2pm, my two brothers were sitting on either side of my hospital bed, my wife between them, the sun was slanting in through the window behind me and the horror that had dominated my life for nearly a week had evaporated. But I will never forget those days and nights of terror and delusion, and will never think about madness in the same way again.



David Aaronovitch, photographed last month
Mark Harrison

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www.icusteps.org



The image shows a browser window displaying a PDF document from icusteps.org. The document is titled "Delirium and intensive care". The page features a header with a blurred image of two people in blue scrubs, a yellow horizontal bar, and the title "Delirium and intensive care" in large black font. Below the title is a teal horizontal bar. The main content includes a section titled "What is delirium?" followed by a paragraph explaining delirium as acute confusion, a bulleted list of symptoms, and two paragraphs of text discussing patient experiences and family interactions.

icusteps.org/assets/files/booklet/delirium.pdf

icusteps.org/assets/files/booklet/delirium.pdf

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Delirium and intensive care

What is delirium?

Delirium is a name for acute confusion. The patient who is delirious is often experiencing a world that makes no sense to us but is very real to them. For instance they may:

- not know they are in hospital
- think they can see frightening animals
- think they have been kidnapped
- think staff are only pretending to be nurses
- try to make sense of the noises around them and create a different explanation for them, so for instance if another patient is upset, they may think someone is being tortured.

The main point is that the patient is absolutely convinced about the reality of the confused world they are in. It can be terrifying for them and very worrying for relatives.

Often a patient who is delirious will still recognise friends and family although they will not generally believe their reassurances. They will usually want to get out of bed and be taken home. Patients with delirium can find it very difficult to understand or retain information – so even if they appear to understand what is happening, or may be joining in a conversation, they may not remember what has just been said to them. Delirium can also fluctuate, one minute you will be having a normal conversation and next they will say something that makes no sense.

1

www.icudelirium.org

The screenshot shows the website's header with the title "ICU Delirium and COGNITIVE IMPAIRMENT STUDY GROUP" and logos for Vanderbilt University Medical Center, Monroe Carell Jr. Children's Hospital at Vanderbilt, and the United States Department of Veterans Affairs. The main banner features a background image of medical monitors and a text overlay: "The ABCDEF Bundle decreases mortality and improves cognitive dysfunction." Below this is a button that says "LEARN MORE AT PUBMED.GOV". At the bottom of the banner area, there are two navigation options: "for Medical Professionals" and "for Patients and Families", along with a search bar and a "GO" button. Below the search bar, it says "Search results powered by Vanderbilt University".

ABCDEFs of Prevention and Safety

ABCDEF is a standard bundle of ICU measures that includes spontaneous **Assess for and manage pain, Both Spontaneous Awakening Trials (SAT) & Spontaneous Breathing Trials (SBT), attention to the Choice of sedation and analgesia, Delirium monitoring and management, Early mobility, and Family engagement.** All individual components of this bundle are evidence based and can help standardize communication, improve interdisciplinary patient care, reduce mortality, and improve long-term cognitive and functional outcomes. This bundle helps to keep patients and families as the center and focus of care.

SUPPORT THE RESEARCH

what is Delirium?

Delirium is basically inattention and confusion that represents the brain temporarily failing. A person who is delirious is unable to think clearly and can't make sense of what is going on

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