# DELIRIUM

**Session 112**
Managing Delirium in Post-acute and Long Term Care

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1

## Disclosure

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There are no relevant financial relationships to disclose.

2

## Objectives

- Summarize the most common clinical presentation of delirium
- Identify both common and rare contributors to the development of delirium
- Describe the role of structured delirium screening instruments in PALTC
- Review pharmacologic and non-pharmacologic management of delirium

3

## Delirium defined

"...an acute neuropsychiatric disorder... of impaired consciousness... characterized by generalized impairment of cognition, with inattention as its cardinal feature, but also involves a range of noncognitive symptoms affecting motor behavior, sleep-wake cycle, thinking, language, perception, and affect." [1]

4

## Other terms used

- Acute...
  - ...brain failure
  - ...brain syndrome
  - ...dementia
  - ...organic psychosis
  - ...organic reaction
  - ...organic syndrome
  - ...reversible psychosis
  - ...secondary psychosis
- Cerebral insufficiency
- Confusional state
- Dysergastic reaction
- Encephalopathy
- Exogenous psychosis
- Infective-exhaustive psychosis
- ICU psychosis
- Metabolic encephalopathy
- Oneiric state

5

## DSM-5 Diagnostic Criteria

- A **disturbance in attention** (i.e., reduced ability to direct, focus, sustain, and shift attention) **and awareness** (reduced orientation to the environment).
- The disturbance **develops over a short period of time** (usually hours to a few days), **represents a change from baseline** attention and awareness, and **tends to fluctuate** in severity during the course of a day.
- An **additional disturbance in cognition** (e.g., memory deficit, disorientation, language, visuospatial ability, or perception).
- The disturbances in Criteria A and C are **not better explained by another preexisting, established, or evolving neurocognitive disorder** and do not occur in the context of a severely reduced level of arousal, such as coma.
- There is **evidence** from the history, physical examination, or laboratory findings **that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal** (i.e., due to a drug of abuse or to a medication), or exposure to a toxin, or is due to multiple etiologies.

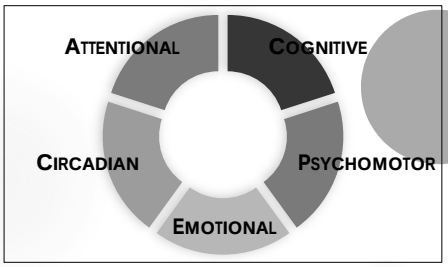
6

## Phenomenology (DRS-98)[3]

| | | |
|---|---|---|
| ▶ Core deficits: | Attention | 97-100% |
| | Orientation | 76-96% |
| | ST memory | 88-92% |
| | LT memory | 89-96% |
| | Sleep-wake | 92-97% |
| | Thought proc. | 54-79% |
| | Visuospatial | 87-96% |
| | Motor | 24-94% |
| | Language | 57-67% |
| ▶ Non-core | Perception | 50-63% |
| | Delusion | 21-31% |
| | Affect | 43-86% |

7

## Delirium: 5 Core Domains[2]




8

## Motor subtypes: [1]

- **Hyperactive** (Greek *phrenitis*)
  - DSM-5: "…hyperactive level of psychomotor activity that may be accompanied by mood lability, agitation, and/or refusal to cooperate with medical care."
  - Excited catatonia sometimes thought to be an extreme variant
- **Hypoactive** (Greek *lethargicus*)
  - DSM-5: "…hypoactive level of psychomotor activity that may be accompanied by sluggishness and lethargy that approaches stupor."
  - Retarded catatonia sometimes thought to be an extreme variant
- **Mixed**
  - Identified as a subtype in the 1990s, so no fancy Greek phrase
  - DSM-5: "…normal level of psychomotor activity even though attention and awareness are disturbed. Also includes individuals whose activity level rapidly fluctuates."

9

## Consequences in Acute Care [2]

- Mortality rates 4-65% during the index hospitalization
- Number of delirious days predicts mortality
- Implications of persistent cognitive difficulties

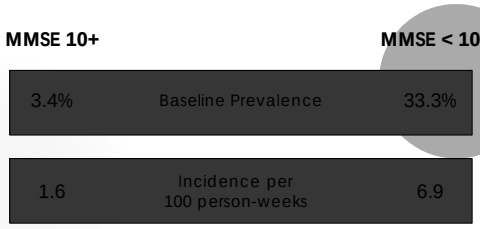
10

## Consequences in PALTC [6]

- Delirium may be present in up to 70% of LTC patients
- Mean duration of delirious episodes 1.5 +- 1.4 weeks
- Increased mortality rate
- Increased fall rates
- Increased polypharmacy for management
- Rehospitalization and extended PA LOS

11

## Risk Factors in PALTC: **Cognition** [7]




12

## Causes: Acute Care

- **I** Infection / Iatrogenic
- **W** Withdrawal
- **A** Acute metabolic (acidosis, alkalosis, electrolytes)
- **T** Trauma (closed head injury, CVA)
- **C** CNS pathology (seizure, stroke, encephalitis)
- **H** Hypoxia, Hypercarbia
- **D** Deficiencies (thiamine, niacin, B12, folate)
- **E** Endocrinopathies (thyroid, glucose, adrenal)
- **A** Acute vascular (HTN crisis, arrhythmia)
- **T** Toxins/drugs
- **H** Heavy metals

13

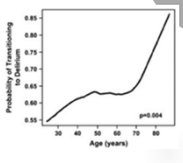
## Causes: PALTC

- **D** Drugs
- **E** Eyes, ears, other sensory deficits
- **L** Low O2 states (MI, CVA, PE)
- **I** Infection
- **R** Retention (urine, stool)
- **I** Ictal state
- **U** Under-hydration / under-nutrition
- **M** Metabolic (DM, Electrolyte derangement)
- **(S)** Subdural Hematoma

14

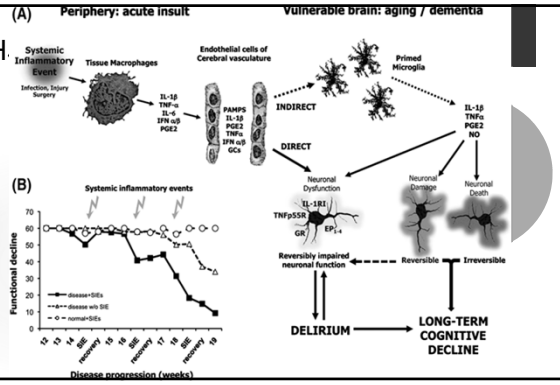
## SIHS: Neuronal Aging

- Diminishing physiologic reserve associated with aging
- Changes in proportion of stress-regulating neurotransmitters
- Relative changes in brain blood flow, vascular density
- Blood-brain barrier permeability disruption
- Neuronal loss




15

SIH




16

## SIHS: Oxidative Stress

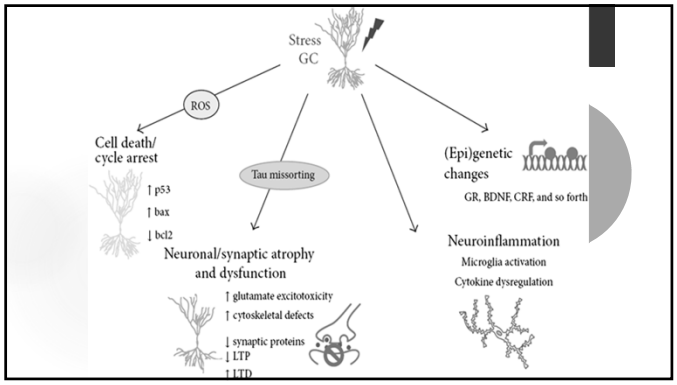
- "Clinical expression of a cerebral metabolic defect"
- Reactive oxygen and nitrogen species cause damage to cell structures, proteins, and DNA
- Brain is highly susceptible due to high lipid content (myelin sheaths), high rates of oxidative metabolism, and low antioxidant capacity
- May reduce ionic gradients thus resulting in cortical spreading depression
- Influx of sodium, calcium; efflux of potassium results in a dramatic release of glutamate and dopamine

17

## SIHS: Neuroendocrine

- Glucocorticoids (GC) in the normal stress response mobilize energy stores and suppress nonvital functions in an effort to facilitate adaptation and maintain homeostasis
- Dysregulation of the limbic hypothalamic-pituitary-adrenal axis may cause chronic activation of GC receptors
- Highest concentration of GC receptors in the brain is in the hippocampus
- Also creates reactive oxygen species and tau hyperphosphorylation

18




19

## SIHS: Circadian dysregulation

- Melatonin production impaired by inflammation
- Deprivation increases both homeostatic and allostatic loads
  - Homeostatic: Buildup of metabolic byproducts
  - Allostatic: Increased sympathetic tone
- Decreased levels of melatonin metabolites found in hyperactive delirium, elevated levels in hypoactive

20

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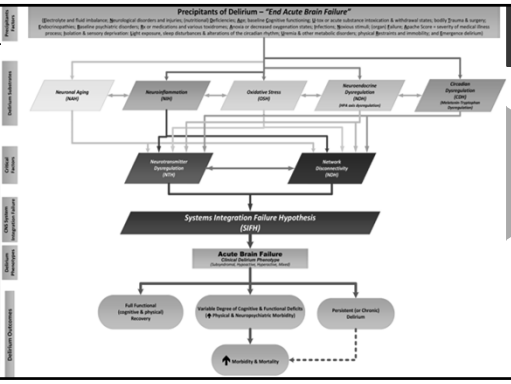



21

22

## Recognizing Delirium

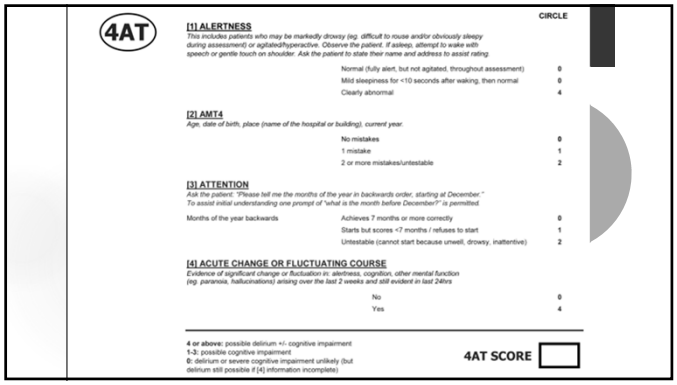
- Cole, et al. graphic

23

## Screening assessment

- CAM: Most widely used instrument, based on DSM criteria
  - CAM-ICU: Modified for critically ill, nonverbal patients
  - bCAM: Modified from CAM-ICU for wider validation
- DRS-R-98
- MDAS
- Helfand, et al. 11/02/2020*

24



4AT

CIRCLE

**[1] ALERTNESS**
*This includes patients who may be markedly drowsy (eg. difficult to rouse and/or obviously sleepy during assessment) or agitated/hyperactive. Observe the patient. If asleep, attempt to wake with speech or gentle touch on shoulder. Ask the patient to state their name and address to assist rating*

| | |
|---|---|
| Normal (fully alert, but not agitated, throughout assessment) | 0 |
| Mild sleepiness for <10 seconds after waking, then normal | 0 |
| Clearly abnormal | 4 |

**[2] AMT4**
*Age, date of birth, place (name of the hospital or building), current year.*

| | |
|---|---|
| No mistakes | 0 |
| 1 mistake | 1 |
| 2 or more mistakes/untestable | 2 |

**[3] ATTENTION**
*Ask the patient: "Please tell me the months of the year in backwards order, starting at December."*
*To assist initial understanding one prompt of "what is the month before December?" is permitted.*

| | | |
|---|---|---|
| Months of the year backwards | Achieves 7 months or more correctly | 0 |
| | Starts but scores <7 months / refuses to start | 1 |
| | Untestable (cannot start because unwell, drowsy, inattentive) | 2 |

**[4] ACUTE CHANGE OR FLUCTUATING COURSE**
*Evidence of significant change or fluctuation in: alertness, cognition, other mental function (eg. paranoia, hallucinations) arising over the last 2 weeks and still evident in last 24hrs*

| | |
|---|---|
| No | 0 |
| Yes | 4 |

**4 or above:** possible delirium +/- cognitive impairment
**1-3:** possible cognitive impairment
**0:** delirium or severe cognitive impairment unlikely (but delirium still possible if [4] information incomplete)

**4AT SCORE**

25

## Clinical examination

- Physical examination
- Neurologic examination
  - Includes sensory examination
  - Assessing for focal neurologic injury
  - Prospective trial in 2011 proposed that the presence of >1 primitive release sign pre- and post-operatively may suggest a higher likelihood of progressing to delirium
  - Myoclonus
    - Positive: muscular contraction
    - Negative: interruption of muscular activity

26

## Management: Environmental

- Sleep-wake support
- Prominent role of ambulation
- Social engagement
- Environmental reorientation
- Responding to

27

## Management: Pharmacologic

- Every class associated with benefits and risks
  - Sedative-hypnotics
    - Benzodiazepines
    - Non-benzodiazepine sleep aids
  - Antipsychotics

28

## New Strategies in Pharmacologic Management?

- Alpha 2 agonism

29

## Prevention of Delirium in PALTC

- Recognition of delirium on admission
- Identification of risk factors at every stage
- Systematic approaches to proactive screening
- Structured responses to medical evaluation
- Proactive support to prevent decompensation

30

## Prehabilitation Expanded

- Automated identification algorithms
- Structured protocol responses
- Hospital Elder Life Program - LTC

31

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32

## Thank you!


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33