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Occupational Therapy's Role in Delirium Assessment, Prevention, & Management within the Intensive Care Unit

Lyndsay Laxton, OTR/L
Meghan Morrow, OTR/L

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Learning Outcomes

1. Identify characteristics of delirium and a screening tool with high validity and specificity to identify the presence of delirium.
2. Identify neurocognitive and health outcomes of patients experiencing delirium.
3. Implement 3-5 targeted interventions to prevent and manage delirium.

2

Overview

- What is Delirium?
- Clinical Relevance
- Assessing for Delirium
- Intervention Strategies
- Case Studies

3

What is Delirium?

- A disturbance in attention and awareness (ability to direct, focus, and sustain attention).
- A disturbance in cognition (memory, orientation, language, visuospatial ability, or perception).
- The disturbance develops over a short period of time (usually hours to days), represents a change from baseline, and tends to fluctuate during the course of the day.
- The disturbance is not better explained by another pre-existing, evolving, or established neurocognitive disorder.

DSM-5

4

Delirium Sub-Types

Hypoactive

- Decreased level of arousal
- Slowed speech
- Slowed or absent motor movement

Mixed

Hyperactive

- Restlessness
- Agitation
- Increased motor movement and speech
- Impulsivity
- Delusions or hallucinations

Yang et al. (2009)

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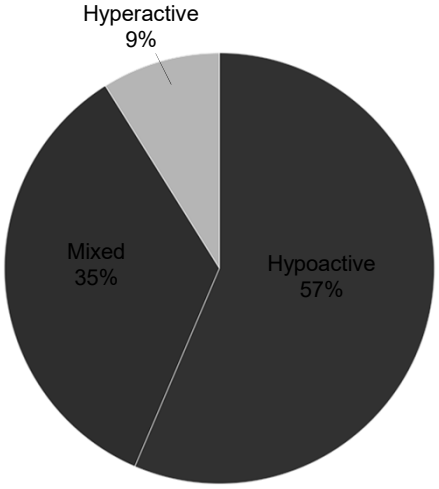
Clinical Relevance

- **Prevalence**
  - **~35% of patients within the ICU experience delirium**
    - **~80% of patients requiring mechanical ventilation**
- **Vulnerable Populations**
  - **Advanced age (>65 years old)**
  - **Post-surgical**
  - **Pre-morbid depression**
  - **Pre-existing cognitive impairment**
    - **Ex.) CVA, TBI**
  - **Poor eyesight or hearing**
  - **Presence of infection or sepsis**



Clancy, Edington, Casarin, Vizcavchipi, 2015
Salluh et al., 2015
Vanderbilt University Medical Center, 2013

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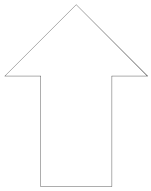
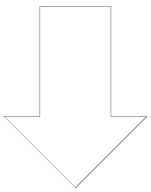
Clinical Relevance

Clinical Implications



Time receiving mechanical ventilation
ICU length of stay
Hospital length of stay
Mortality at 6 months & 1 year post ICU stay
Post-discharge anxiety and depression



Long-term global cognition & executive function
Independence with ADL performance

Salluh et al., 2015
Davydow, 2009

7

Post-Intensive Care Syndrome

"New or worsening impairments in physical, cognitive, and/or mental health in ICU survivors."

Parker, Sricharoenchai, & Needham, 2013

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Clinical Relevance

ABCDE Bundle for reducing PICS risk in a mechanically ventilated patient	
A	Airway management using light sedation to promote awakening
B	Breathing trials assessing respiratory function as early as possible to wean the patient off the ventilator
C	Coordination of care and communication with family members helps to minimize adverse outcomes
D	Delirium assessment and prevention by avoiding benzodiazepines when possible and orienting the patient to person, place, and time with assistance from the family
E	Early mobilization to reduce the incidence of delirium and improve patient outcomes

Davidson, J. E., Harvey, M.A., Bemis-Dougherty, A., et al (2013)

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Clinical Relevance

ABCDE + FGH Bundle for reducing PICS Risk	
F	Family involvement, follow-up referrals, and functional reconciliation
G	Good handoff communication to patient and family regarding progress and medical course
H	Handout material on PICS and PICS-F

Davidson, J. E., Harvey, M.A., Bemis-Dougherty, A., et al (2013)

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Delirium Assessment & Other Measures

- Confusion Assessment Method-ICU (CAM-ICU)
- CAM Severity (CAM-S)
- Richmond Agitation- Sedation Scale (RASS)
- Intensive Care Delirium Screening Checklist (ICDSC)
- Orientation Log (O-Log)

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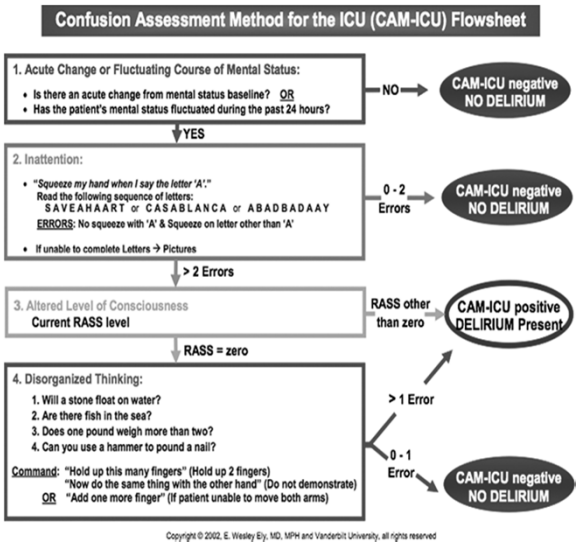
Confusion Assessment Method-ICU (CAM-ICU)

- Intended to assist with identifying the symptoms of confusion or delirium
- Administration time: 2-3 minutes
- Sensitivity rating: 95 to 100%
- Specificity: 93 to 98%
- **Most heavily researched*



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Confusion Assessment Method - Severity (CAM-S)

- Assess severity of delirium through observation of symptoms.
- Increased severity correlates to increased LOS, mortality, and nursing home residence.

Table 1

The CAM-ICU-7 Delirium Severity Scale

CAM-ICU		
Items	**Grading**	**Score**
1. Acute Onset or Fluctuation of Mental Status Is the patient different than his/her baseline mental status? OR Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation/level of consciousness scale (i.e., RASS/SAS), GCS, or previous delirium assessment?	0 absent 1 present	
2. Inattention Say to the patient, "*I am going to read you a series of 10 letters. Whenever you hear the letter 'A,' indicate by squeezing my hand.*" Read letters from the following letter list in a normal tone 3 seconds apart. SAVEAHAART (Errors are counted when patient fails to squeeze on the letter "A" and when the patient squeezes on any letter other than "A")	0 absent (correct ≥ 8) 1 for inattention (correct 4-7) 2 for severe inattention (correct 0-3)	
3. Altered Level of Consciousness Present if the Actual RASS score is anything other than alert and calm (zero)	0 absent (RASS 0) 1 for altered level (RASS 1, −1) 2 for severe altered level (RASS >1, <−1)	
4. Disorganized Thinking Yes/No Questions 1. Will a stone float on water? 2. Are there fish in the sea? 3. Does one pound weigh more than two pounds? 4. Can you use a hammer to pound a nail? Errors are counted when the patient incorrectly answers a question. Command: Say to patient "Hold up this many fingers" (Hold two fingers in front of patient). "Now do the same with the other hand" (Do not repeat number of fingers) An error is counted if patient is unable to complete the entire command.	0 absent (correct ≥ 4) 1 for disorganized thinking (correct 2, 3) 2 for severe disorganized thinking (correct 0, 1)	
	Total Score	

CAM-ICU: Confusion Assessment Method for the Intensive Care Unit; RASS: Richmond Agitation Sedation Scale; SAS: Sedation-Agitation Scale; GCS: Glasgow Coma Scale

Inouye, S.K. et al., 2015

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Additional Measures

Richmond Agitation & Sedation Scale (RASS)

Scale	Label	Description	
+4	COMBATIVE	Combative, violent, immediate danger to staff	
+3	VERY AGITATED	Pulls to remove tubes or catheters; aggressive	
+2	AGITATED	Frequent non-purposeful movement, fights ventilator	
+1	RESTLESS	Anxious, apprehensive, movements not aggressive	
0	ALERT & CALM	Spontaneously pays attention to caregiver	
-1	DROWSY	Not fully alert, but has sustained awakening to voice (eye opening & contact >10 sec)	VOICE
-2	LIGHT SEDATION	Briefly awakens to voice (eyes open & contact <10 sec)	VOICE
-3	MODERATE SEDATION	Movement or eye opening to voice (no eye contact)	VOICE
	If RASS is ≥ -3 proceed to CAM-ICU (Is patient CAM-ICU positive or negative?)		
-4	DEEP SEDATION	No response to voice, but movement or eye opening to physical stimulation	TOUCH
-5	UNAROUSEABLE	No response to voice or physical stimulation	TOUCH
	If RASS is -4 or -5 → STOP (patient unconscious), RECHECK later		

Sessler, et al., Am J Repir Crit Care Med 2002; 166: 1338-1344 Ely, et al., JAMA 2003; 286: 2703-2991

- Medical scale used to measure the agitation or sedation level of a patient
- Integral part of the CAM-ICU assessment
- Assists with initiating spontaneous awakening trials with nursing staff
- Correlates to delirium type
  - Hyperactive vs. hypoactive?

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CONTINUED

Intensive Care Delirium Screening Checklist (ICDSC)

Give a score of "1" to each of the 8 items below if the patient clearly meets the criteria defined in the scoring instructions. Give a score of "0" if there is no manifestation or unable to score. If the patient scores ≥4, notify the physician. The diagnosis of delirium is made following clinical assessment; document in the Assessment and Intervention record (RN) and progress note (MD).

Assessment	Scoring Instructions	Score
1. Altered Level of Consciousness*	• If MAAS portion of VAMAAS is 0 (no response) or 1 (response to noxious stimulus only), record "UIA" (unable to score) and do not complete remainder of screening tool. • Score "0" if MAAS score is 3 (calm, cooperative, interacts with environment without prompting) • Score "1" if MAAS score is 2, 4, 5 or 6 (MAAS score of 2 is a patient who only interacts or responds when stimulated by light touch or voice – no spontaneous interaction or movement; 4, 5 and 6 are exaggerated responses).	
If MAAS ≠ 0 or 1, screen items 2-8 and complete a total score of all 8 items.		
2. Inattention	"1" for any of the following: • Difficulty following conversation or instructions • Easily distracted by external stimuli • Difficulty in shifting focuses	
3. Disorientation	"1" for any obvious mistake in person, place or time	
4. Hallucination/ delusions/ psychosis	"1" for any one of the following: • Unequivocal manifestation of hallucinations or of behaviour probably due to hallucinations (e.g.catching non-existent object) • Delusions • Gross impairment in reality testing	
5. Psychomotor agitation or retardation	"1" for any of the following: • Hyperactivity requiring additional sedatives or restraints in order to control potential dangerousness (e.g. pulling out IV lines, hitting staff) • Hypoactivity or clinically noticeable psychomotor slowing. Differs from depression by fluctuation in consciousness and inattention.	
6. Inappropriate speech or mood	"1" for any of the following (score 0 if unable to assess): • Inappropriate, disorganized or incoherent speech. • Inappropriate display of emotion related to events or situation.	
7. Sleep wake/cycle disturbance	"1" for any of the following: • Sleeping less than 4 hours or waking frequently at night (do not consider wakefulness initiated by medical staff or loud environment). • Sleeping during most of day.	
8. Symptom fluctuation	"1" for fluctuation of the manifestation of any item or symptom over 24 hours (e.g., from one shift to another).	
TOTAL SCORE (0-8/8):	A score ≥ 4 suggests delirium. A score > 4 is not indicative of the severity of the delirium.	

Last reviewed August 22, 2014

Adapted with permission (Skrobik, Y) Bergeon, et al, 2001, Intensive Care Medicine

Larsen, et al. (2018)

Intensive Care Delirium Screening Checklist (ICDSC)

- The current literature of delirium in the neuro population pertains to patients with **mild to moderate** illness severity.
- In the neuro-critically ill, delirium screening is challenged by limited feasibility.
- Recent literature has demonstrated that the ICDSC may be a valid tool & the CAM-ICU is less suitable for delirium detection for patients in the Neuro- ICU.

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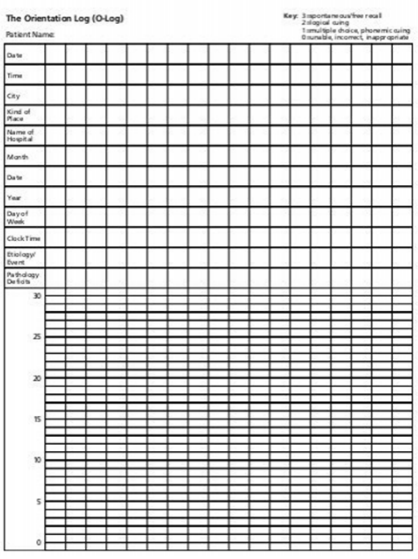
CONTINUED

Additional Measures

The Orientation Log (O-Log)

- Quick, quantitative measure of orientation status
- Patient responses are scored according to the following criteria:
  - 3 = correct spontaneously or upon first free recall attempt
  - 2 = correct upon logical cueing
  - 1 = correct upon multiple choice or phonemic cuing
  - 0 = incorrect despite cueing, inappropriate response, or unable to respond.



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CONTINUED

Traditional OT Interventions

- **Early Engagement**
  - Mobilization
  - ADL Participation
  - Leisure Participation
- **Sleep Hygiene**
  - Cluster care at night
  - Mute alarms
- **Cognitive Re-Training**
  - Word Search
  - Crossword Puzzles
- **Environmental Modifications**
  - Lights on during the day
  - Clock present in the room
  - Calendar
- **Polysensory Stimulation**
  - Glasses
  - Hearing aids
  - Dentures
    - **overstimulation vs under stimulation*
- **Communication**
  - Modified communication strategies

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Cutting Edge Evidence Based OT Interventions

ICU Diary	Music Therapy
Spontaneous Awakening Trial	Family Education

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ICU Diary

- **Definition**
  - "*Following a timeline design, they provide a background to the cause of the patient's ICU admission and an ongoing narrative outlining day-to-day activities.*"

- **Purpose**
  - Assist to fill memory gaps
  - Recreate biographical account of factual events
  - Validate emotions/experiences in reality
  - Establish realistic goals for functional recovery
  - Reduction of anxiety/depression
  - A platform for family to express emotions, share experiences
  - Cognitive intervention (STM, orientation)

Date	Activities / Milestones / Event
Ex.) 1	You came to the University of Colorado Hospital in Aurora, CO very early this morning with abdominal pain.
Ex.) 2	Today was the 1st day you received Physical Therapy & Occupational Therapy. You sat on the edge of the bed for 20 minutes! :)
Ex.) 3	The doctors felt it would be several more days until your lungs were ready to breath on their own, so they changed your breathing support from a ventilator in your mouth/throat, to a tracheostomy in your neck. You had surgery today for a tracheostomy & a feeding tube in your abdomen.
Ex.) 4	Today you had a lot of blood coming out of your rectum, from a bleed inside your body. You were taken for a procedure to stop the bleeding and given a signficant amount of blood products to make up for the blood you had lost.

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Music Therapy

With various pathophysiological models for delirium, implicating neuro-inflammation, neurotransmitter imbalances and an aberrant stress reaction….

Music listening has been shown to activate areas of the brain involved with:

- memory
- cognitive function
- emotion

Music has a calming effect.

Why?

Due to entrainment of the ANS, reduction of sympathetic activation and damping of the inflammatory state.

Music Therapy seems like a promising tx. intervention

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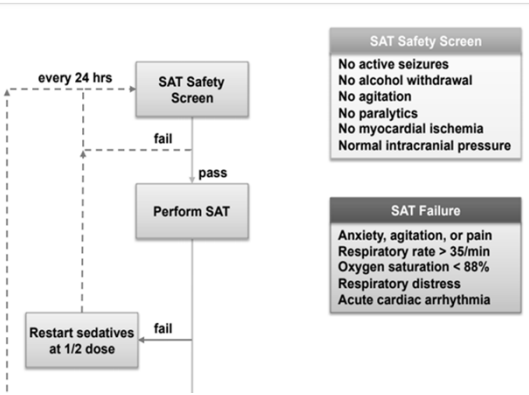
Spontaneous Awakening Trials

- Daily sedative interruptions initiated by the medical team.
- One of the recommended titration methods in the recent Pain, Agitation and Delirium (PAD) guidelines.
- Increasing OTs presence and role in assessment of delirium during SATs
  - Assess delirium via CAM-ICU
  - Provide recommendations for non-pharmacological delirium management/prevention



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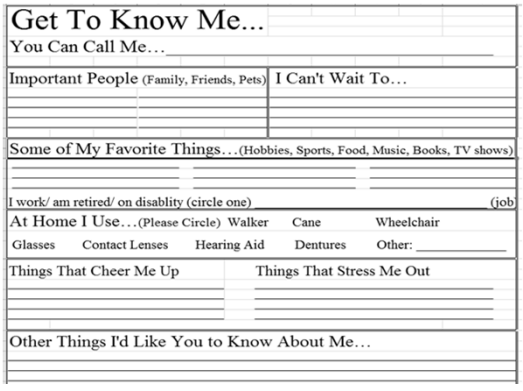
Family Education

- Education starts on day one of admission!
  - Family Menu & Get to know me.
- Resources/ Handouts
  - Instruct on strategies.



Get To Know Me...

You Can Call Me…_____

Important People (Family, Friends, Pets)	I Can't Wait To…

Some of My Favorite Things…(Hobbies, Sports, Food, Music, Books, TV shows)

I work/ am retired/ on disablity (circle one) _____ (job

At Home I Use…(Please Circle) Walker Cane Wheelchair

Glasses Contact Lenses Hearing Aid Dentures Other: _____

Things That Cheer Me Up	Things That Stress Me Out

Other Things I'd Like You to Know About Me…

Delirium Prevention Strategies:

- Use calm, short, concise instructions and explanations.
- Address weather outside and time of day
- Re orient as needed
- Encourage family pictures and familiar objects in room
- Supply current calendar and clock in room
- Maintain normal schedules and routines
- Provide adequate lighting
- Encourage friends and family to visit regularly
- Keep window blinds open during the day and closed during the night.

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Case Study: Mike

- HPI: 58yo M, s/p elective ostomy reversal, with intraoperative course complicated by a bowel perforation, admitted to the ICU for concern of developing sepsis.
- Objective Measures
  - CAM-ICU positive x4 days - hallucinations, globally disoriented, tangential speech
  - CAM-S: 4/7
  - O-Log: 8/30 – poor orientation of location, etiology & pathology of deficits
- Interventions
  - Environmental modifications –introduced natural light, changed TV channel
  - Re-orientation: calendar, sign with name of the hospital
  - Family education and engagement with his daughter

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Case Study: Bonnie

- HPI: 89yo F, s/p T10 - S1 PSF with intra-operative course complicated by a dural tear, admitted to the ICU for hemodynamic monitoring and pain management. Pt developed an incisional infection, requiring return to OR for I&D x3.
- Objective Measures
  - CAM-ICU positive x5 days – lethargic, motor slowing, minimal speech
  - CAM-S: 5/7
- Interventions
  - Environmental modifications – lights on, TV on, music playing, hearing aids
  - Progressive mobility and ADL engagement
  - Family education and engagement with her husband

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Case Study: Pema

- HPI: 47 y.o. female no significant PMH with HH1F3 subarachnoid hemorrhage in a distribution consistent with ruptured Acomm aneurysm. LOS: 24 days

- Objective Measures
  - CAM –ICU negative day 1-4 of admission. CAM-ICU positive day 5-24. Presented with mixed delirium – fluctuating between lethargic and impulsive.
  - CAM-S: 6/7
  - RASS: 0
  - O-Log: 0 to 4/30 – poor orientation of location, reason for admission, month, date and year.
- Interventions
  - OOB for all meals 3x daily with chair alarm on at all times when OOB.
  - Poly stimulation: glasses on and dentures in during the day/ all meal times.
  - Bedside table with clock, current calendar, ICU diary and basic “you are here” handout.
  - RN staff to ambulate patient 2x daily and re-orient per Q1 neuro check
  - Music “Therapy” 2 hours a day: 1 hour in am; 1 hour in pm.

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Case Study: Daniel

- HPI: 58 y.o. male admitted on 10/23/2018 with hydrocephalus/ VPS malfunction. LOS: 23 days.

- Objective Measures
  - CAM-ICU negative for all 23 days of admission.
  - CAM-S: 0/7
  - RASS: 0
  - O-Log: 28/30- disorientation to time.

- Interventions
  - Supply current calendar and clock in room.
  - Maintain normal schedules and routines.
  - Engage in meaningful conversation to simulate memory and logic
  - Offer mirror for grooming
  - Encourage self care activity at appropriate times (Self feeding, grooming)

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Critical Care Culture is Changing … Is Your Practice?

- Assess for delirium during each session & implement necessary prevention or treatment strategies according to your findings.
- Incorporate family into your prevention and treatment through education and training.
- Occupational therapist have significant value in maintaining delirious patient's quality of life and overall outcomes.
- We hope you now feel empowered to assess and treat your delirious patients more confidently and effectively.

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Resources

- **Hospital Elder Life Program (HELP) for Prevention of Delirium**
  - https://www.hospitalelderlifeprogram.org
- **Vanderbilt University Medical Center: ICU Delirium and cognitive impairment study group**
  - http://www.icudelirium.org/index.html
- **American Delirium Society**
  - https://americandeliriumsociety.org/
- **CAM Assessment**
  - https://www.youtube.com/watch?v=yEwBzKTbJEk

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