## **Delirium Prevention**

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

Inclusion Criteria: Patients admitted to the medical-surgical floors

Exclusion Criteria: Patients located in the NICU, ambulatory and perioperative areas, infusion patients, PICU. If in PICU, follow PICU protocol for screening and prevention.



## Environmental Considerations:

- Provide orienting environment (proper use of Whiteboard, clearly visible clocks)
- Promote healthy sleep
   Ensure early mobility and exercise and consult PT, OT and SLP if patient is not at functional baseline
- Encourage family involvement and developmentally appropriate engagement

#### **Medication Considerations:**

- Re-evaluation/ confirmation of home medications
- Assess, prevent, and manage pain
- Assess sedative medication need and effectiveness, wean as able
- Monitor and prevent withdrawal
- Minimize
   polypharmacy and
   deliriogenic
   medications as
   appropriate\*

RN to perform <u>routine</u> delirium screening using CAPD (Appendix A) q12hr and document in medical record for the following patient groups (Please utilize Appendix B: Developmental Anchors for completing the CAPD for children < 2 years old or with developmental disability):

- Transferring out of PICU; post-operative
- Presenting with altered mental status, status epilepticus, loss of consciousness, meningitis/encephalitis, toxin ingestion/poisoning/ overdose, trauma
- Diagnosed with Multi-Inflammatory Syndrome in Children (MIS-C), Kawasaki disease, sepsis/septic shock, sickle cell acute pain crisis, neurosurgical shunt infection, neurosurgical shunt malfunction
- Taking benzodiazepines or opioids in the past 3 days

Consider screening for delirium for the following patient groups who are at high risk for delirium [Note: must add "at risk for delirium" to patient's problem list in Care Navigator to initiate routine screening]

- On <u>multiple</u> deliriogenic medications (not including benzodiazepines or opioids which require automatic screening)\*\*
- Acutely ill patients not identified by above criteria
- Prolonged hospitalization
- Developmental delay/intellectual disability

#### \*Deliriogenic Medications:

- Benzodiazepines and barbiturates
- Opioids
- Anti-cholinergics (e.g. atropine, diphenhydramine)
- Anti-convulsants (e.g. carbamazepine, phenytoin)
- Anti-depressants (e.g. tricyclics, SSRIs)
- Anti-emetics (e.g. promethazine)
- Anti-microbials and anti-virals (e.g. fluoroquinolones)
- Corticosteroids
- H2 receptor blockers (e.g. ranitidine, famotidine)
- Metoclopramide
- Muscle relaxants

High clinical suspicion of delirium: 1) CAPD ≥ 9

OR
2) Clinical recognition of delirium via the following features (≥1):

- Acute mental status change
- Marked change in sleep/wake cycle
- Acute onset of hallucination or delusions
  - Alterations of attention or arousalConfusion or impaired memory
    - New onset catatonic features

Continue prevention and ongoing monitoring via CAPD q12hr and standard

clinical assessments

 Notify provider from primary medical or surgical team.

Yes

 Provider to initiate a bedside assessment of patient and proceed to Delirium Evaluation and Management

**NEXT PAGE** 



No-



## **Delirium Evaluation Primary Steps**

THIS PATHWAY
SERVES AS A GUIDE
AND DOES NOT
REPLACE CLINICAL
HIDGMENT

Inclusion Criteria: Any patient in the Emergency Department or Inpatient Med/Surg Units with the following:

- Acute mental status change characterized by disorientation, impaired memory, alteration of attention or arousal, catatonia; OR
- Suspicion of delirium based on Cornell Assessment of Pediatric Delirium (CAPD) Score (Appendix A) or Vanderbilt Assessment for Delirium in Infants and Children (VADIC) Assessment Tool (Appendix D)

Exclusion Criteria: Patient located in the NICU, ambulatory and perioperative areas, infusion patients, PICU. If in PICU, follow PICU protocol for screening and prevention.

#### Etiologies to consider:

CNS infection, fever, sepsis/end organ dysfunction (see Sepsis Pathway), Multi-system Inflammatory Syndrome in Children (see MIS-C Pathway), hypoxemia, hypoglycemia, electrolyte abnormality, CNS abnormality, intoxication, autoimmune encephalitis, SLE, vasculitis, drug withdrawal, metabolic disease, neoplasm

Treat suspected etiology as Specific appropriate and continue to Delirium NO etiology known? **Evaluation and Management: Secondary Steps** Initial Workup: If febrile and considering CNS infection: **Consult Infectious Diseases** Labs: Blood and urine cultures iStat chem 10, CBC, CRP, ESR, ammonia, PT/PTT/INR, TSH, Obtain LP: opening pressure, cell count with differential, free T4, VBG or CBG, AST, ALT, EtOH level and urine protein, glucose, gram stain and culture, HSV PCR. Call lab toxicology screen (as appropriate) to hold CSF for further studies (ideally 3.5 mL). Begin empiric IV antimicrobials listed below: Ceftriaxone IV 100 mg/kg/day q12hr (max 2,000 mg/ STAT head CT without contrast dose) x36 hours AND Acyclovir IV until CSF HSV studies negative If febrile and considering CNS infection\* <3 months of age: 60 mg/kg/day div q8hr 3 months of age - <12 years old: 45 mg/kg/day ≥12 years of age: 30 mg/kg/day IV div q8hr Discuss with ID if vancomycin should be started x36 <52 weeks PMA<sup>‡</sup>/about <3 mo old: 15 mg/kg q8hr or as determined by pharmacy based on estimated AUC ≥52 weeks PMA<sup>‡</sup>/about ≥3 months old – 11 Any of the following? years old: 70 mg/kg/day div q6hr (max 3 g/day) Ongoing delirium ≥12 yrs old: 60 mg/kg/day div q8hr (max 3 g/ Further workup, evaluation, and treatment required <sup>‡</sup>PMA (Post-Menstrual Age) = gestational age + postnatal age Medical etiology identified, admission criteria met for that diagnosis

 Consider Social Work and/or Psych consult to help determine and support behavioral health needs and establish follow up plan.

NO-

- If inpatient, consider following Delirium Prevention clinical pathway
- Proceed to Secondary Steps algorithm
- If in Emergency Department, consider need for hospital admission to med-surg versus PICU



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# **Delirium Evaluation Secondary Steps**

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

#### <u>Consider the following consultations as appropriate</u> (may recommend LP, EEG, Brain MRI, further lab testing)

- Infectious Diseases: if febrile and not already consulted
- Neurology: if concern for seizure, abnormal EEG, movement disorder, abnormal neurological imaging or focal deficit, or other neurologic diagnosis
- Rheumatology: if patient has signs of autoimmune rheumatic disease, such as rash, elevated inflammatory markers, leucopenia or thrombocytopenia, arthritis, hematuria or proteinuria, nodules on imaging, or other signs of inflammatory disease
- Psychiatry: to assist with recognition/diagnosis of delirium (utilizing Appendix D: VADIC assessment tool); determine/confirm
  etiology; assist with pharm + non-pharmacological management; help with ongoing monitoring/response to therapies; for ongoing
  co-management
- Ophthalmology: (retinal exam may provide cause for infectious and non-infectious causes)

#### Consider Additional Work Up:

(Directed by specialty consultants, and may include the following)

- Infectious Encephalitis Panel:
  - Blood: Tick Borne Panel (anaplasma/ehrlichia NAAT, rickettsia serology, babesia NAAT), Lyme IgM/IgG, Arbovirus panel (West Nile IgM/IgG, SLE, EEE, JCV, LaCrosse, Powassan), Mycoplasma IgM/IgG, Bartonella IgM/IgG, Syphilis testing (for at risk patients, order Syphilis TP reflex RPR titer and TPPA)
  - o <u>CSF</u>:
    - If LP not previously obtained: obtain LP and opening pressure, cell count with differential, protein, glucose, Gram stain and culture, HSV PCR. *Call lab to hold and refrigerate ideally at least 3.5 mL CSF for further studies.*
    - Add-Meningitis/Encephalitis (ME) PCR Panel (CSF BioFire)
    - Add on the following tests to the held CSF (ideally 3.5 mL): EBV PCR, Mycoplasma PCR, Bartonella PCR (if hx of exposure to cats/kittens), VDRL (at risk patients)
  - <u>Respiratory:</u> Viral Respiratory BioFire (Dec-May)
- Consider evaluation for other etiologies (including Autoimmune Encephalitis)
  - o Imaging: Brain MRI
  - <u>Blood</u>:
    - Pediatric Autoimmune CNS Disorders Evaluation Panel (serum), ANA, ds DNA Ab, C3, C4, IgG, SSA, SSB, SM (Smith) Ab, SM/
       RNP Ab, anti-phospholipid Ab panel, Von Willebrand Factor antigen, ACE level, ANCA, TPO, anti-thyroglobulin Ab
  - CSF: (add on to previously obtained CSF) Pediatric Autoimmune CNS Disorders Evaluation Panel (CSF)

If diagnosis or treatment plan involves multidisciplinary approach, strongly consider family meeting

Treat suspected etiology as appropriate and continue delirium management per Delirium Evaluation and Management: Delirium Management



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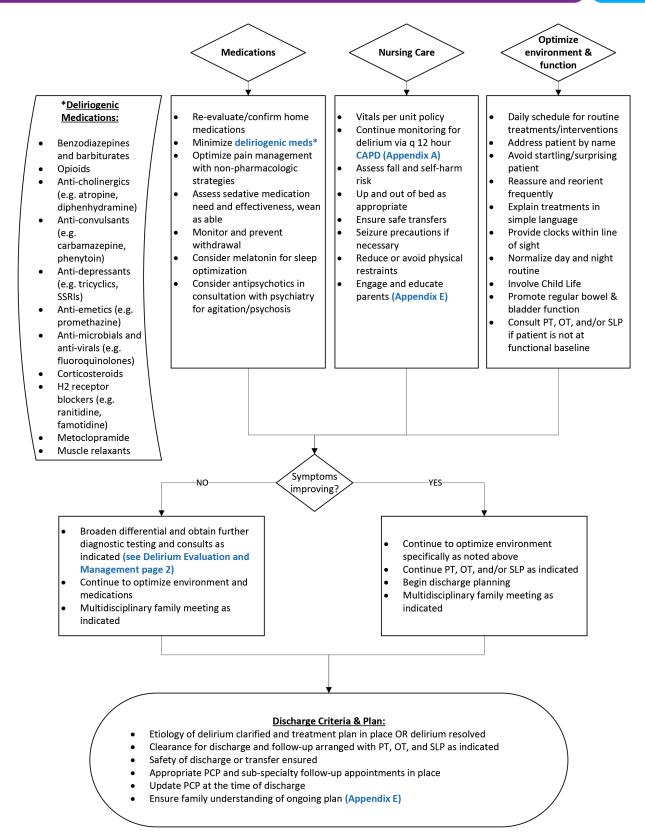






# **Delirium Management**

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.





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#### Appendix A:

### Cornell Assessment of Pediatric Delirium (CAPD) Score - Revised

Figure 1. Cornell Assessment of Pediatric Delirium (CAPD) revised						
RASS Score (if -4 or -5 do not proceed)						
Please answer the following questions based on your interactions with the patient over the course of your shift:						
	Never	Rarely	Sometimes	Often	Always	Score
	4	3	2	1	0	
1. Does the child make eye contact with the caregiver?						
2. Are the child's actions purposeful?						
3. Is the child aware of his/her surroundings?						
4. Does the child communicate needs and wants?						
	Never	Rarely	Sometimes	Often	Always	
	0	1	2	3	4	
5. Is the child restless?						
6. Is the child inconsolable?						
7. Is the child underactive—very little movement while awake?						
8. Does it take the child a long time to respond to interactions?						
TOTAL						

To aid in CAPD scoring, please see **Appendix B**: **Developmental Anchor**s to reference features of normal development and **Appendix C**: **Delirium Manifestations by Age** for characteristics of delirium based on age.









THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

### Appendix B:

#### **Developmental Anchors**

	NB	4 weeks	6 weeks	8 weeks	28 weeks	1 year	2 years	
I. Does the child make eye contact with the caregiver?	Fixates on face	Holds gaze briefly Follows 90 degrees	Holds gaze	Follows moving object/caregiver past midline, regards examiner's hand holding object, focused attention	Holds gaze. Prefers primary parent. Looks at speaker.	Holds gaze. Prefers primary parent. Looks at speaker.	Holds gaze. Prefers primary parent. Looks at speaker	
2. Are the child's actions purposeful?	Moves head to side, dominated by primitive reflexes	Reaches (with some discoordination)	Reaches	Symmetric movements, will passively grasp handed object	Reaches with coordinated smooth movement	Reaches and manipulates objects, tries to change position, if mobile may try to get up.	Reaches and manipulates objects, tries to change position, if mobile may try to get up and walk	
3. Is the child aware of his/her surroundings?	Calm awake time	Awake alert time  Turns to primary caretaker's voice  May turn to smell of primary care taker	Increasing awake alert time Turns to primary caretaker's voice May turn to smell of primary care taker	Facial brightening or smile in response to nodding head, frown to bell, coos	Strongly prefers mother, then other familiars. Differentiates between novel and familiar objects  Prefers primary parent, then other familiars, upset when separated from preferred care takers. Comforted by familiar objects especially favorite blanket or stuffed animal		Prefers primary parent, then other familiars, upset when separated from preferred care takers. Comforted by familiar objects, especially favorite blanket or stuffed animal	
4. Does the child communicate needs and wants?	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Vocalizes /indicates about needs, e.g., hunger, discomfort, curiosity in objects, or surroundings	Uses single words or signs	3 to 4 word sentences, or signs. May indicate toilet needs, calls self or me	
5. Is the child restless?	No sustained awake alert state	No sustained calm	No sustained calm	No sustained awake alert state	No sustained calm state	No sustained calm state	No sustained calm state	
6. Is the child inconsolable?	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, comforting actions	Not soothed by usual methods, e.g., singing, holding, talking	Not soothed by usual methods, e.g., singing, holding, talking, reading	Not soothed by usual methods, e.g., singing, holding, talking, reading (may tantrum, but can organize)	
7. Is the child underactive—very little movement while awake?	Little if any flexed and then relaxed state with primitive reflexes (Child should be sleeping comfortably most of the time)	Little if any reaching, kicking, grasping (still may be somewhat discoordinated)	Little if any reaching, kicking, grasping (may begin to be more coordinated)	Little if any purposive grasping, control of head and arm movements, such as pushing things that are noxious away	Little if any reaching, grasping, moving around in bed, pushing things away	Little if any play, efforts to sit up, pull up, and if mobile crawl or walk around	Little if any more elaborate play, efforts to sit up and move around, and if able to stand, walk, or jump	
8. Does it take the child a long time to respond to interactions?	Not making sounds or reflexes active as expected (grasp, suck, moro)	Not making sounds or reflexes active as expected (grasp, suck, moro)	Not kicking or crying with noxious stimuli	Not cooing, smiling, or focusing gaze in response to interactions	Not babbling or smiling/laughing in social interactions (or even actively rejecting an interaction)	Not following simple directions. If verbal, not engaging in simple dialogue with words or jargon	Not following 1–2 step simple commands. If verbal, not engaging in more complex dialogue	









Life Stage	Hypoactive Delirium	Hyperactive Delirium
Infants	Unable to fixate on faces Primitive reflexes only Lethargy Little movement when awake, with movement being non-purposeful Not crying when hungry	Unable to fixate on faces Primitive reflexes only Irritability Non-purposeful movements, shaking head Inconsolable, restless Minimal calm awake time
Children	Unable to communicate needs Confusion Decreased coordination Unable to participate in play Non-purposeful actions Not answering questions quickly or appropriately Lethargy Averting eyes or staring Increased effort to sit up and walk around	Unable to communicate needs Confusion Unable to participate in play Non-purposeful actions Not answering questions quickly or appropriately Irritability Inconsolable, restless Unable to make eye contact In hospital, attempting to remove intravenous and monitoring lines
Adolescents/adults	Disoriented Inattentive Impairment of sleep-wake cycle Emotional disturbance Falling asleep inappropriately	Disoriented Inattentive Impairment of sleep-wake cycle Emotional disturbance Irritable, agitated

Burke H, Jiang S, Stern TA. Assessment and management of delirium in pediatric patients. *Prim Care Companion CNS Disord*. 2023;25(1):22f03257.









### **Delirium**

## Appendix D: Vanderbilt Assessment for Delirium in Infants and Children (VADIC)

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

VANDERBILT ASSESSMENT FOR DELIRIUM IN INFANTS AND CHILDREN (VADIC)									
Clinician:			Patient ID:						
Age:	Patient Intuba	ted? 🗆 YES	□ NO	Da	Date/Time:				
Pertinent medication exposure ≤ 24 hrs.	prior to asses	sment (DRUG	/ DOSE)						
1.			4.						
2.			5.						
3.			6.						
LEVEL OF CONSCIOUSNESS (che	eck one )			MEN	ITAL STA	TUS			
Combative	□ YES	State of cur	rent mental sta	tus – Ched	ck one op	tion			
Agitated	□ YES	□ At l	Baseline □ Acute Change			□ Chronic Change			
Restless	□ YES Pattern of mental status – past 24 hours				□ Stable		□ Fluctuating		
Alert and Calm	□ YES PERCEPTION					NC			
<b>Drowsy</b> : Not fully alert but easily demonstrates sustained awakening with stimulation only from v		Hallucinatio	Hallucinations: □ auditory □ visual				□ N/A	□ NO	□ YES
Lethargy: Arouses to voice but difficult to maintain the aroused state			s present? Comments:			□ N/A	□ NO	□ YES	
			ypical response to normal stimuli?  uffed animals, familiar toys)  □ N/A				□ NO	□ YES	
Stupor: Responsive only to pain	□ YES	Unable to sooth when fearful stimuli removed?				□ N/A	□ NO	□ YES	
Coma: Unresponsive to pain	□ YES Comments:								
ATTENTION and COGNITION									
DECREASED ability to: Focus attention: NO YES Sustain attention: NO YES Shift attention: NO YES Shift attention: NO YES Shift attention: NO YES									









### **Delirium**

## Appendix D: Vanderbilt Assessment for Delirium in Infants and Children (VADIC)

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

DECREASED indication of <b>consistent preference</b> for objects such as a favorite toy, rattle, pacifier, blankie, book, iPad?  DECREASED ability to <b>screen out</b> extraneous stimuli? (Easily distracted by noise, people)  DECREASED ability to <b>interact</b> with toys/objects appropriately? (No interaction/recognition, uses toy inappropriately)  DECREASED <b>social smile</b> in response to toys or stuffed animals?  Object permanence present? (interacts with Peek-a-boo, hide-and-seek)  NO YES  NO YES								
SLEEP-V	AKE CYCLE	AFF	ECT					
Normal Nap Patterns (Q2-4h infants preschool): Nocturnal Disturbance : (initial, linsomnia, phase shift) Day-Night Reversal (more difficult to	niddle, terminal	NO   YES   Irritability or anger   NO   YES   NO   YES   Inconsolability   NO   YES						
Comments:								
	LANGUAGE a	and THOUGHT						
Two - Step Command	□ YES □ YES □ YES reason below):	Describe baseline speech and language per parent/nurse if available:  Appropriate Decreased amount Decreased spontaneity Increased latency Change from baseline Circumstantial Tangential						
□ Unable due to immaturity/illness (intubated) □ Inappropriately not following commands □ Obstructed due to disease or device								
IS ACUTE DELIRIUM PRESENT?								
When LOC severely depressed, unable to directly clinically assess patient <b>AND</b> prior clinical assessment not available.								
□ NO If NO consider → Subsyndromal delirium(SS) (Delirium probable but NOT all criteria met ): □ NO □ YES								
□ YES If YES then choose type → □ HYPOACTIVE □ HYPERACTIVE □ MIXED Drug Withdrawal? □ N/A □ NO □ YES								
24-HOUR assessment → IS DELIRIUM PRESENT? □ PRESENT □ ABSENT □ SUBSYNDROMAL □ UTA								
□ 1. Acute change Mental Status	□ 3. Inattention present	□ 5. Change in Cognition □ 7. Change in Affect						
□ 2. Fluctuating Course □ 4. Inconsolability		□ 6. Change in Language/Thought □ 8. Change in Sleep/M						

DELIRIUM = 1+2+3+5+7 AND 4 OR 6 OR 8



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# **Delirium in Children and Adolescents**

"Delirium in Children and Adolescents." American Academy of Children and Adolescent Psychiatry, October 2023, <a href="https://www.aacap.org/AACAP/Families\_and\_Youth/Facts\_for\_Families/FFF-Guide/Delirium-in-Children-and-Adolescents-120.aspx">https://www.aacap.org/AACAP/Families\_and\_Youth/Facts\_for\_Families/FFF-Guide/Delirium-in-Children-and-Adolescents-120.aspx</a>

Delirium is a serious condition involving severe confusion and changes of behavior. Many conditions can cause delirium such as infection, fever or medication side effects. Although delirium can occur anywhere, it is more likely to happen when children are in the hospital. It is usually temporary and reversible when the underlying condition is treated. When a child or teenager is delirious, they do not act like themselves. It can be very frightening to both the child and parent. A delirious child needs medical attention immediately.

Symptoms of delirium may come and go. They can include:

- Confusion—not knowing where they are, what day it is, who they're with or who they are
- Agitation or restlessness
- Picking at things that aren't there
- Being upset and not responding to usual soothing
- Trouble with attention or memory
- Difficulty staying alert
- Sleep disturbances
- New or different behaviors like aggression, suspiciousness, or being withdrawn
- Talking in a way that doesn't make sense
- Seeing or hearing things that aren't real









### Appendix E: Caregiver Delirium Handout

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

There are many causes of delirium, including:

- Underlying illness or infection
- Medications
- High fever
- Anesthesia
- Head injury
- Disruption of the sleep-wake cycle
- Not enough oxygen to the brain
- Drugs or alcohol
- Poisoning
- Electrolyte imbalances

While your doctor treats the cause of your child's delirium, there are things that you can do to make your child more comfortable. Some of these things include:

- Be calm and reassuring at the bedside
- · Remind your child gently where they are and what time of day it is
- Provide familiar things such as a favorite blanket, stuffed animal, family pictures or comforting music
- Don't argue with a confused child
- Distract your child with happy thoughts or images
- Provide glasses if needed
- Help keep your child safe during agitation
- Encourage getting out of bed if medically allowed and being awake during the day
- Encourage longer stretches of sleep at night
- Explain to your child later if they have questions or remain upset about confusion or hallucinations

If your child has delirium in the hospital, your doctor may recommend a consultation with a child and adolescent psychiatrist to help evaluate and treat your child. When a child has delirium or a serious medical illness, this experience can be stressful for both the child and the family. Sometimes continued mental health support may be helpful to address emotional or behavioral consequences even after the delirium has gone away.

#### **Related Resources:**

- www.icudelirium.org
- www.iacapap.org (pediatric delirium chapter)





