

Clinical Pathways

Delirium Clinical Pathway Emergency Department and Inpatient Care

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Objectives of the Pathway



- Define delirium and understand the causes of delirium in pediatric patients
- Describe strategies to prevent delirium
- Demonstrate how to use and interpret the Cornell Assessment of Pediatric Delirium (CAPD) to screen for delirium
- Review important components of the new ED Delirium Clinical Pathway and order set
- Review important components of the new Inpatient Delirium Evaluation, Workup and Management Clinical Pathway and order sets

What is Delirium?



- Acute-onset neuropsychiatric syndrome characterized by disturbances of cognition, attention, consciousness or perception that is potentially life-threatening
 - **Secondary to a medical etiology (not an isolated psychiatric condition)**
 - Can occur as a result of underlying illness, hospitalization, medications or trauma
- Treatment requires inter-professional collaboration between primary physicians, specialists, nursing, and family
 - Early recognition and treatment may prevent adverse outcomes

Why do we care?

- Delirium is a high risk diagnosis, serving as a sign of acute brain dysfunction and a marker for potential significant clinical decompensation
- **All** hospitalized patients are at risk of developing delirium
- Often under-recognized in children:
 - Affects 10-44% of hospitalized children and up to 30% of PICU patients (Bettencourt 2017, Traube 2014, Traube 2017, Smith 2013)
 - Signs may be very subtle

Clinical Presentation of Delirium



- Acute onset (hours-days)
- Waxing/waning course with lucid intervals
- Sleep/wake cycle disruption (often reversed)
- Disturbed consciousness
- Neurocognitive deficits
- Perception, hyper/hypoactivity, mood/affect
- Direct physiological consequence of medical/organic etiology

Clinical Presentation of Psychiatric Illness



- **Psychosis:**
 - Presence of hallucinations, delusional thoughts
- **Mania:**
 - Elated mood, increased energy, rapid speech, grandiosity, decreased need for sleep, impulsivity, flight of ideas, distractibility
- **Depression:**
 - Depressed mood, anhedonia, change in sleep/energy/concentration, guilt, suicidal ideation

Some symptoms overlap with delirium, but....

Delirium vs. Psychiatric Illness



Primary psychiatric illness does not have...

- Acute onset
- Fluctuating course
- Disorientation
- Disturbed consciousness
- Memory/Language/Visuospatial impairment
- Confusion, Inattention

Types of Delirium

Delirium in children can present as hypoactive, hyperactive or mixed type

Table 2 Types of delirium

Type	Signs	Patient example
Hypoactive	Child looks apathetic and seems uninterested ²	Toddler who lies quietly in the bed and does not make eye contact or reach for toys or family members
Hyperactive	Child is irritable despite adequate pain medication and may be thrashing ²	School-aged child receiving mechanical ventilation who is constantly moving around in bed despite adequate pain medication Patient is difficult to sedate
Mixed	Child fluctuates between a hypoactive and a hyperactive state ²	Teenager who vacillates between yelling at staff and thrashing in the bed to being calm and staring off into the distance with no interactions with staff at different times of the day

Potential Causes of Delirium



- Infection (intracranial or systemic)
 - Fever
 - Sepsis
- Drug intoxication
- Drug withdrawal
- Medications
 - Opioids, Benzodiazepines
 - Anti-histamines
 - Corticosteroids
- Metabolic/Endocrine disturbance
 - Electrolyte abnormality
 - Hypoglycemia
- Traumatic Brain Injury
- Seizures
- Hypoxia
- Neoplasm
- Cerebrovascular event
- Autoimmune encephalitis
- Organ dysfunction/Insufficiency
- Hospitalization (Environment)
 - Sleep/wake cycle disruption
 - Prolonged immobilization
 - Unfamiliar surroundings, sensory loss
 - Unmanaged painful stimuli

Independent Risk Factors for Developing Delirium



- Age < 2yo
- Developmental delay
- Illness severity
- Prior coma
- Mechanical ventilation
- Receiving benzodiazepines or anticholinergics

Traube 2017, Silver 2015

Complications from Delirium



- Increased:

- Length of stay
- Safety events (i.e. pulling lines, falls)
- Morbidity and mortality
- Cost of hospitalization
- Use of restraints and sedatives

(Traube 2017, Traube 2016, Turkel 2017)

- Reported long term neuro-developmental and behavioral consequences, including development of PTSD following hospitalization (Brummel 2014)

Delirium Clinical Pathways



- Pathway can help guide appropriate medical evaluation and management for patients with recognized delirium
 - There is a high clinical suspicion for delirium if a patient has any one of the following features:
 - Acute mental status change
 - Acute onset hallucinations/delusions
 - Confusion or impaired memory
 - Alteration in attention or arousal
 - New catatonic features

There are 2 Delirium Clinical Pathways:

1. Delirium Emergency Department Care

- This pathway is focused on identifying delirium and initiating work-up prior to admission

2. Delirium Inpatient Care

- This pathway has three main aims:
 - Prevent and identify delirium in the inpatient setting
 - Guide work-up
 - Manage symptoms

Pathway Overview

The first page is a general overview of the ED and inpatient pathway.

Note that phases of care and scoring tools are easily accessible.

Note that all patients admitted to the med/surg floors are screened for delirium, in order to identify patients early.

CLINICAL PATHWAY:

Delirium Emergency Department and Inpatient

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

- Acute mental status change, acute onset hallucinations or delusions, confusion, impaired memory, alteration of attention or arousal, acute catatonia; OR
- Clinical suspicion of delirium based on [Vanderbilt Assessment for Delirium in Infants and Children \(VADIC\) Assessment Tool](#) or [Cornell Assessment of Pediatric Delirium \(CAPD\) Score](#)
- All patients admitted to Medical/Surgical floors will be screened for delirium

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

Phase of Care - Navigation Links

[Emergency Department](#)

[Inpatient and ED \(Zone C\) Management](#)

[Inpatient Prevention and Screening](#)

[Inpatient Evaluation and Work Up](#)

Scoring Tools - Navigation Links

[Appendix A: Vanderbilt Assessment for Delirium in Infants and Children \(VADIC\) Assessment Tool](#)

[Appendix B: Cornell Assessment of Pediatric Delirium \(CAPD\) Score](#)

[Appendix C: Developmental Anchors](#)

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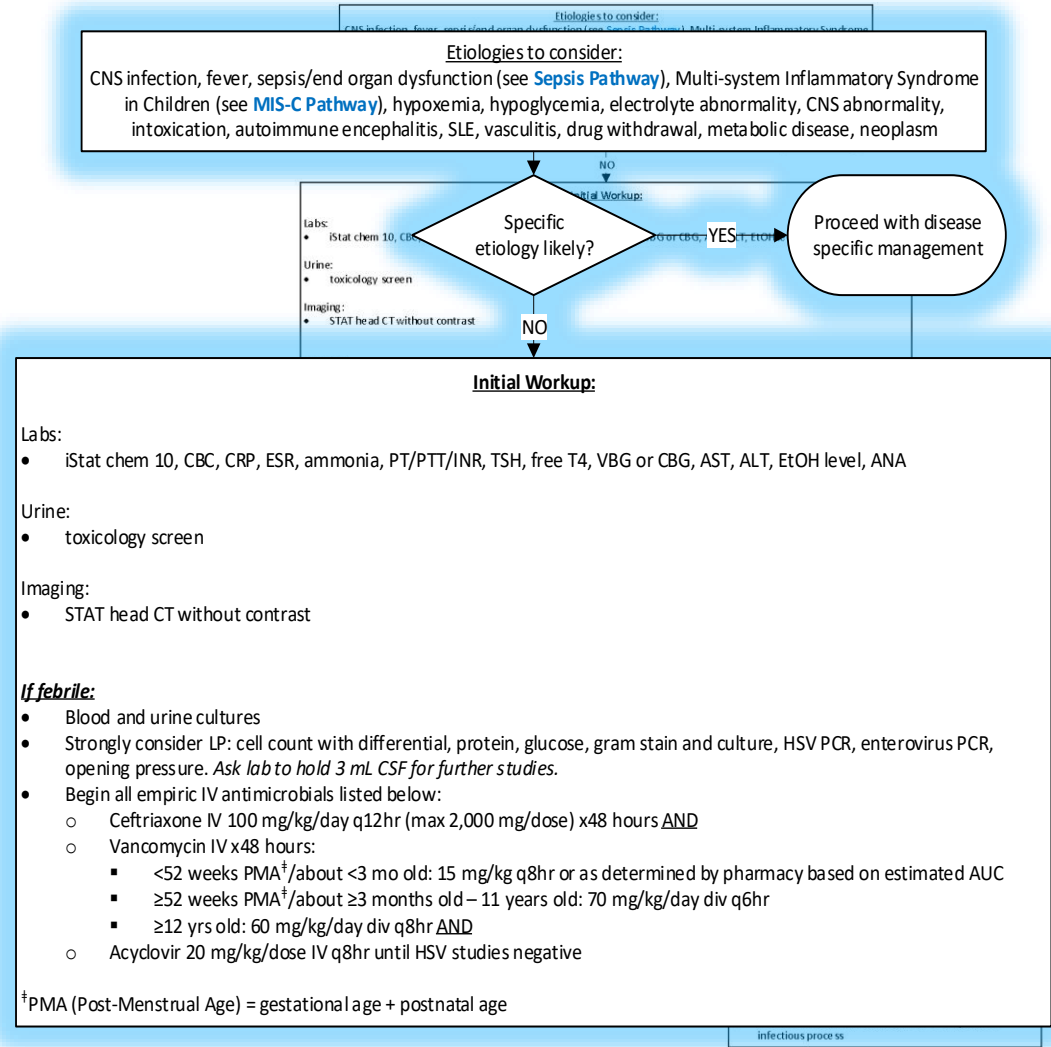
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Emergency Room Care:
1. Evaluation and Work Up
2. Management

It is important to identify potential etiologies of delirium first, and disease specific management should occur.

If a specific etiology for delirium is not identified on initial assessment, further lab and imaging studies are recommended.



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Emergency Room Care:

1. Evaluation and Work Up
2. Management

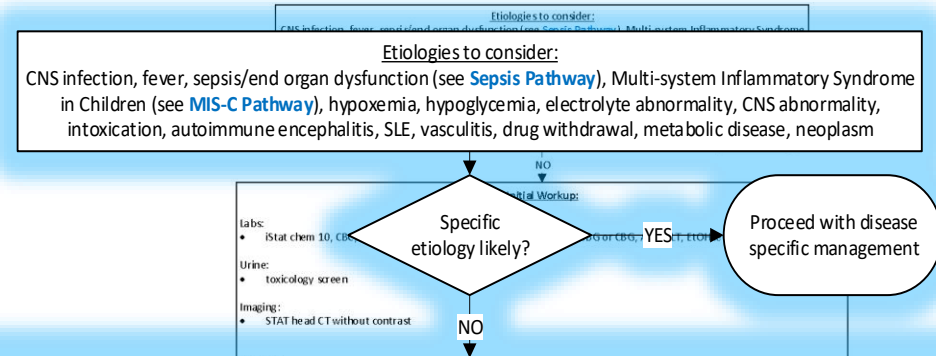
If patient is **febrile**, blood and urine cultures should be obtained, and an LP is strongly recommended.

When performing the LP, please send as much CSF possible to the lab to be saved for potential future studies.

- * **Minimum of 3 ml of CSF should be saved, but as much as 6 ml may be needed for some panels.**
- * **Please call the lab to confirm CSF is being held.**

CLINICAL PATHWAY: Delirium - Emergency Department Care

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Initial Workup:

Labs:

- iStat chem 10, CBC, CRP, ESR, ammonia, PT/PTT/INR, TSH, free T4, VBG or CBG, AST, ALT, EtOH level, ANA

Urine:

- toxicology screen

Imaging:

- STAT head CT without contrast

If febrile:

- Blood and urine cultures
- Strongly consider LP: cell count with differential, protein, glucose, gram stain and culture, HSV PCR, enterovirus PCR, opening pressure. *Ask lab to hold 3 mL CSF for further studies.*
- Begin all empiric IV antimicrobials listed below:
 - Ceftriaxone IV 100 mg/kg/day q12hr (max 2,000 mg/dose) x48 hours **AND**
 - Vancomycin IV x48 hours:
 - <52 weeks PMA[†]/about <3 mo old: 15 mg/kg q8hr or as determined by pharmacy based on estimated AUC
 - ≥52 weeks PMA[†]/about ≥3 months old – 11 years old: 70 mg/kg/day div q6hr
 - ≥12 yrs old: 60 mg/kg/day div q8hr **AND**
 - Acyclovir 20 mg/kg/dose IV q8hr until HSV studies negative

[†]PMA (Post-Menstrual Age) = gestational age + postnatal age

infectious process

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Emergency Room Care:

1. Evaluation and Work Up
2. Management

If the patient is febrile with delirium, empiric broad spectrum antimicrobial coverage should be initiated.

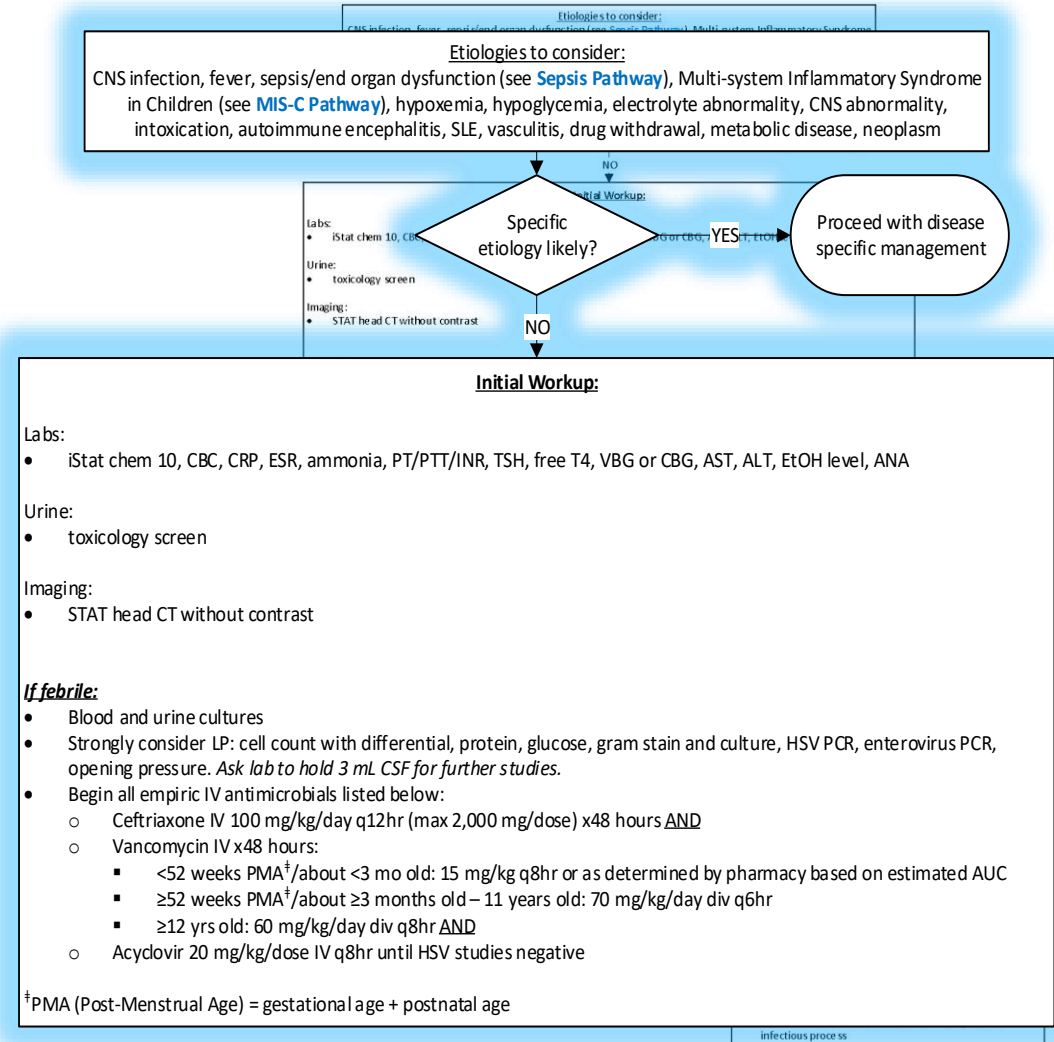
Note: the pharmacy's vancomycin protocol was updated in Feb 2021.

- All patients who have vancomycin IV ordered will be followed by the clinical pharmacist to help determine appropriate dosing parameters.
- Providers will order initial doses per pathway/order set and provide indication within the order.
- IV vancomycin dosing and recommended labs will be managed by pharmacy in conjunction with primary teams.

CLINICAL PATHWAY:

Delirium - Emergency Department Care

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Emergency Room Care:

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2. Management

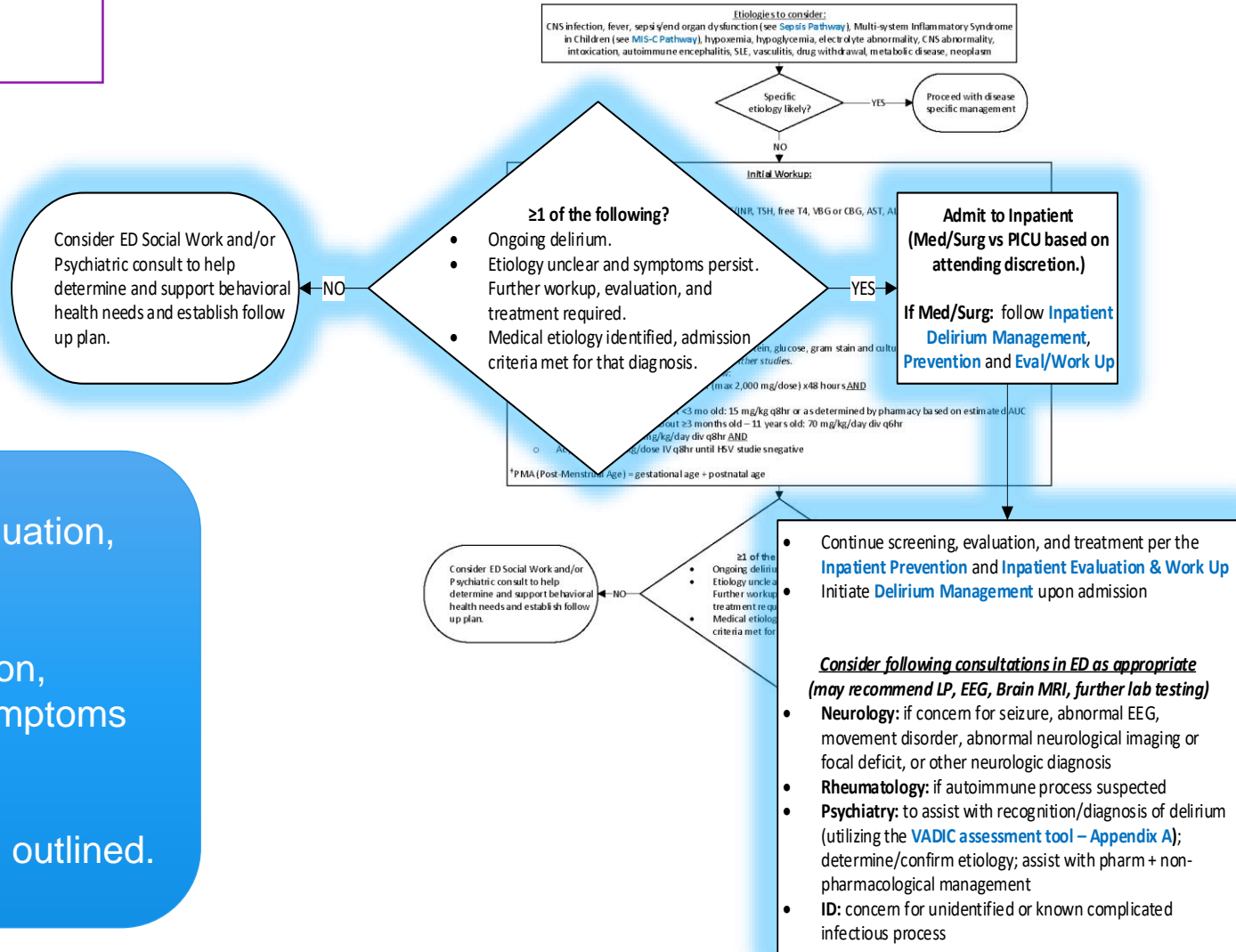
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Based on initial testing and continual evaluation, disposition can be determined.

Specific criteria warrant inpatient admission, including ongoing delirium, or ongoing symptoms with need of further interventions.

Considerations for additional consults are outlined.



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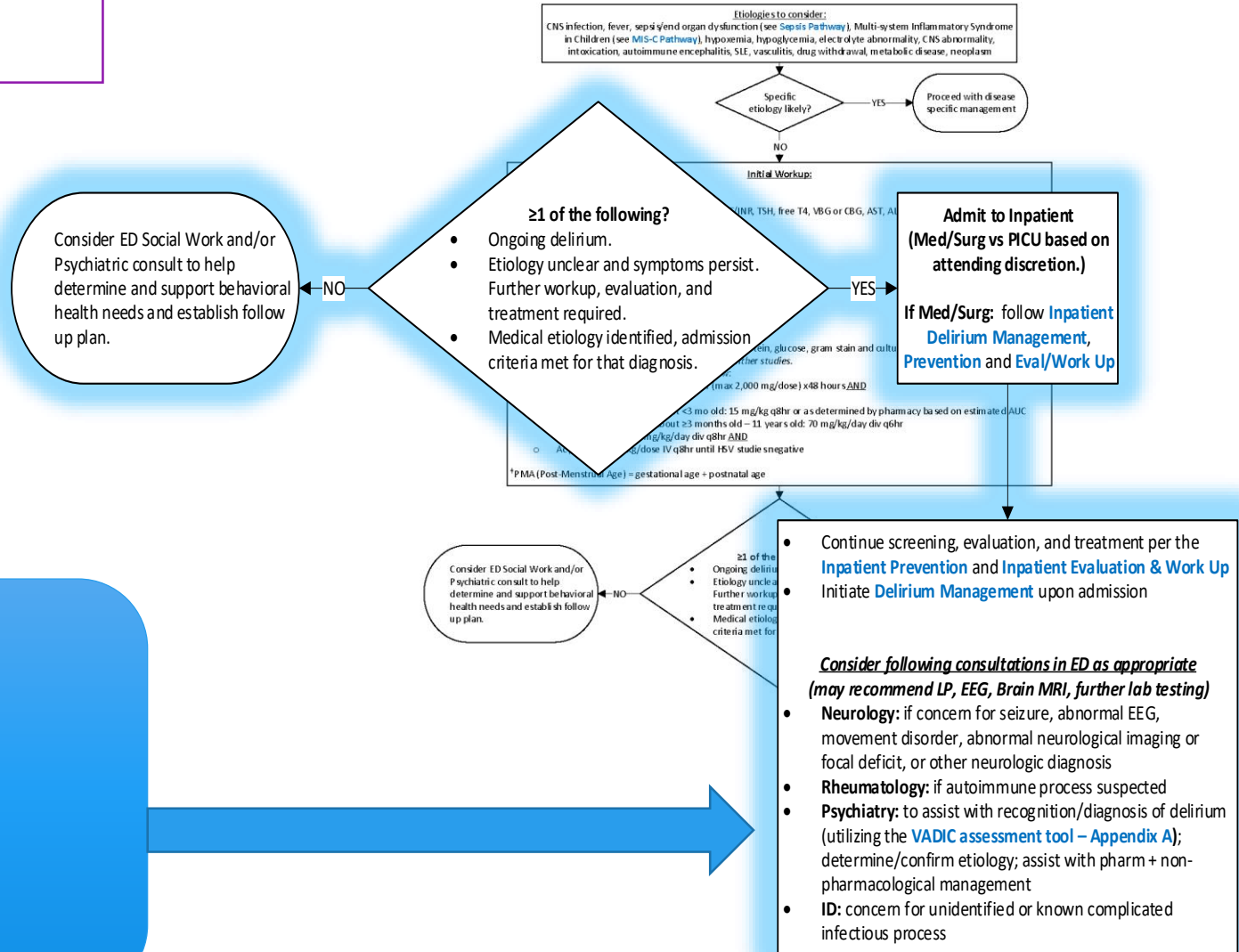
Emergency Room Care:

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2. Management

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Appendix A: The Vanderbilt Assessment for Delirium in Infants and Children (VADIC)

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Emergency Room Care:

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2. Management

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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

Appendix A: The Vanderbilt Assessment for Delirium in Infants and Children (VADIC)

This tool provides a comprehensive framework to standardize pediatric delirium assessment by psychiatrists.

VANDERBILT ASSESSMENT FOR DELIRIUM IN INFANTS AND CHILDREN (VADIC)					
Clinician:			Patient ID:		
Age:	Patient Intubated?	<input type="checkbox"/> YES <input type="checkbox"/> NO	Date/Time:		
Pertinent medication exposure ≤ 24 hrs. prior to assessment (DRUG / DOSE)					
1.			4.		
2.			5.		
3.			6.		
LEVEL OF CONSCIOUSNESS (check one)		MENTAL STATUS			
Combative	<input type="checkbox"/> YES	State of current mental status – Check one option			
Agitated	<input type="checkbox"/> YES	<input type="checkbox"/> At Baseline	<input type="checkbox"/> Acute Change	<input type="checkbox"/> Chronic Change	
Restless	<input type="checkbox"/> YES	Pattern of mental status – past 24 hours		<input type="checkbox"/> Stable	<input type="checkbox"/> Fluctuating
Alert and Calm	<input type="checkbox"/> YES	PERCEPTION			
Drowsy: Not fully alert but easily demonstrates sustained awakening with stimulation only from voice	<input type="checkbox"/> YES	Hallucinations: <input type="checkbox"/> auditory <input type="checkbox"/> visual	<input type="checkbox"/> N/A	<input type="checkbox"/> NO	<input type="checkbox"/> YES
Lethargy: Arouses to voice but difficult to maintain the aroused state	<input type="checkbox"/> YES	Hyperacusis present? <i>Comments:</i>	<input type="checkbox"/> N/A	<input type="checkbox"/> NO	<input type="checkbox"/> YES
Obtundation: Responds to stimulation other than pain. May briefly open eyes or have movement, doesn't interact with person or environment	<input type="checkbox"/> YES	Atypical response to normal stimuli? <i>(stuffed animals, familiar toys)</i>	<input type="checkbox"/> N/A	<input type="checkbox"/> NO	<input type="checkbox"/> YES
Stupor: Responsive only to pain	<input type="checkbox"/> YES	Unable to sooth when fearful stimuli removed?	<input type="checkbox"/> N/A	<input type="checkbox"/> NO	<input type="checkbox"/> YES
Coma: Unresponsive to pain	<input type="checkbox"/> YES	<i>Comments:</i>			
ATTENTION and COGNITION					
DECREASED ability to:	Focus attention: <input type="checkbox"/> NO <input type="checkbox"/> YES	ORIENTATION: <input type="checkbox"/> Person <input type="checkbox"/> Place <input type="checkbox"/> N/A		<i>Comments:</i>	
	Sustain attention: <input type="checkbox"/> NO <input type="checkbox"/> YES				
	Shift attention: <input type="checkbox"/> NO <input type="checkbox"/> YES				

DECREASED indication of consistent preference for objects such as a favorite toy, rattle, pacifier, blanket, book, iPad?	<input type="checkbox"/> NO <input type="checkbox"/> YES
DECREASED ability to screen out extraneous stimuli? (Easily distracted by noise, people)	<input type="checkbox"/> NO <input type="checkbox"/> YES
DECREASED ability to interact with toys/objects appropriately? (No interaction/recognition, uses toy inappropriately)	<input type="checkbox"/> NO <input type="checkbox"/> YES
DECREASED social smile in response to toys or stuffed animals?	<input type="checkbox"/> NO <input type="checkbox"/> YES
Object permanence present? (interacts with Peek-a-boo, hide-and-seek)	<input type="checkbox"/> NO <input type="checkbox"/> YES
SLEEP-WAKE CYCLE	AFFECT
Normal Nap Patterns (12-4h infants, 0.5h toddlers, 0.5h preschool)	Excessive energy for age and context/environment?
Nocturnal Disturbance: (initial, middle, terminal insomnia phase shift)	Irritability or anger: <input type="checkbox"/> NO <input type="checkbox"/> YES
Day-Night Reversal (more difficult to recognize in infants)	Inconsolability: <input type="checkbox"/> NO <input type="checkbox"/> YES
	Inappropriate Affect: <input type="checkbox"/> NO <input type="checkbox"/> YES
	Describe Affect:
<i>Comments:</i>	Confounders present? <input type="checkbox"/> Anxiety <input type="checkbox"/> Pain <input type="checkbox"/> Volitional <input type="checkbox"/> None
LANGUAGE and THOUGHT	
<input type="checkbox"/> Not Present (immature development or developmental delay)	Describe baseline speech and language per parent/nurse if available:
<input type="checkbox"/> Present	<input type="checkbox"/> Appropriate
Receptive Language:	<input type="checkbox"/> Decreased amount
One-Step Command <input type="checkbox"/> NO <input type="checkbox"/> YES	<input type="checkbox"/> Decreased spontaneity
Two-Step Command <input type="checkbox"/> NO <input type="checkbox"/> YES	<input type="checkbox"/> Increased latency
Three-Step Command <input type="checkbox"/> NO <input type="checkbox"/> YES	<input type="checkbox"/> Change from baseline
Does not follow commands (check reason below):	<input type="checkbox"/> Circumstantial
<input type="checkbox"/> Unable due to immaturity/illness (intubated)	<input type="checkbox"/> Tangential
<input type="checkbox"/> Inappropriately not following commands	<input type="checkbox"/> Obstructed due to disease or device
IS ACUTE DELIRIUM PRESENT?	
<input type="checkbox"/> UTA When LOC severely depressed, unable to directly clinically assess patient AND prior clinical assessment not available.	
<input type="checkbox"/> NO If NO consider → Subsyndromal delirium(SS) (Delirium probable but NOT all criteria met): <input type="checkbox"/> NO <input type="checkbox"/> YES	
<input type="checkbox"/> YES If YES then choose type → HYPOACTIVE <input type="checkbox"/> HYPERACTIVE <input type="checkbox"/> MIXED Drug Withdrawal? <input type="checkbox"/> N/A <input type="checkbox"/> NO <input type="checkbox"/> YES	
24-HOUR assessment → IS DELIRIUM PRESENT?	
<input type="checkbox"/> PRESENT <input type="checkbox"/> ABSENT <input type="checkbox"/> SUBSYNDROMAL <input type="checkbox"/> UTA	
<input type="checkbox"/> 1. Acute change Mental Status	<input type="checkbox"/> 3. Inattention present
<input type="checkbox"/> 2. Fluctuating Course	<input type="checkbox"/> 4. Inconsolability
<input type="checkbox"/> 5. Change in Cognition	<input type="checkbox"/> 7. Change in Affect
<input type="checkbox"/> 6. Change in LanguageThought	<input type="checkbox"/> 8. Change in Sleep/Wake Cycle

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

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Inpatient and Zone C: 1. Management

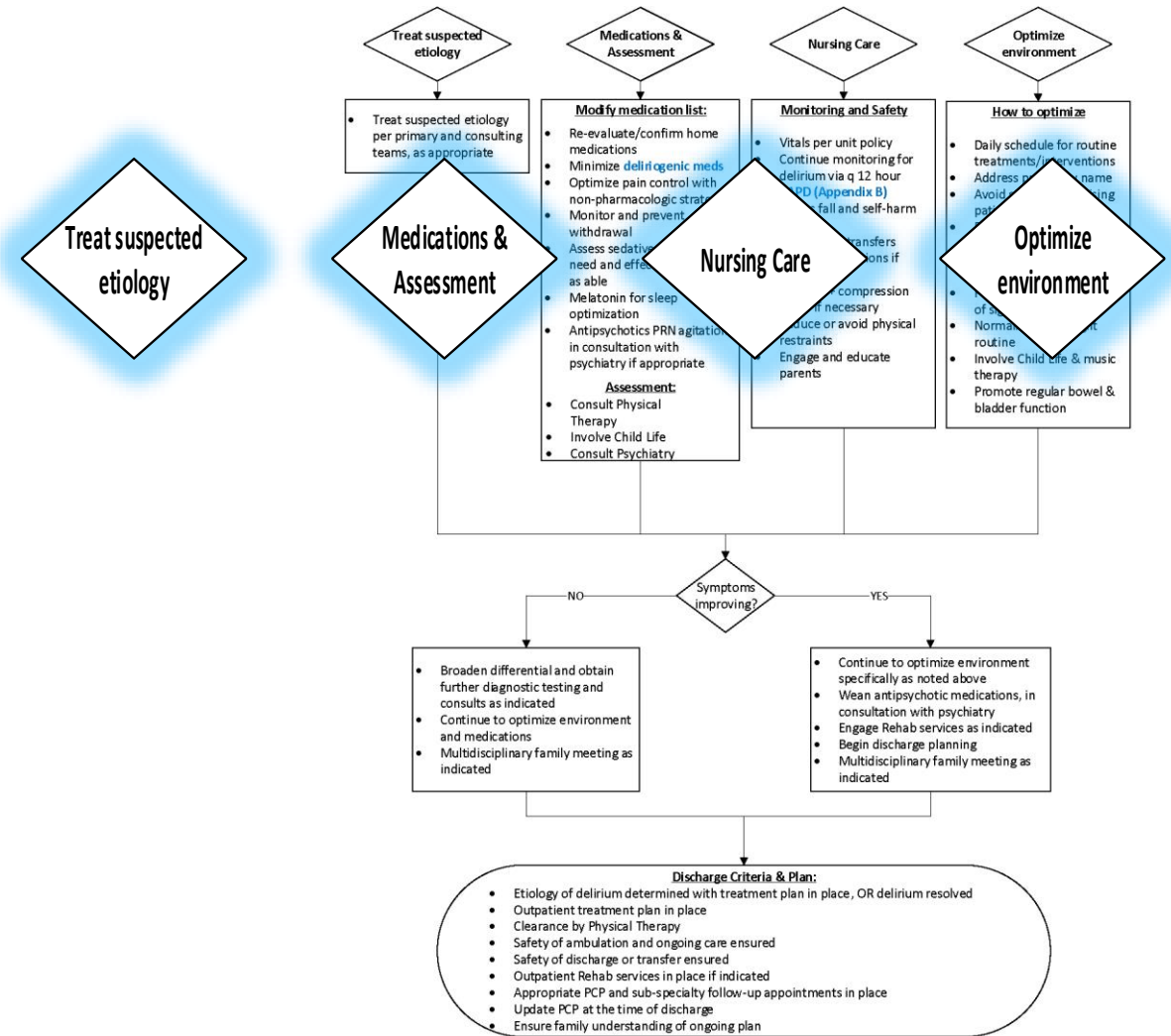
Management of Delirium in the Inpatient or Zone C setting encompasses 4 key categories:

- Treat the suspected etiology
- Medications & Assessment
- Nursing Care
- Optimize Environment

We will discuss these strategies more in depth in later slides.

CLINICAL PATHWAY: Delirium - Inpatient and Zone C Management

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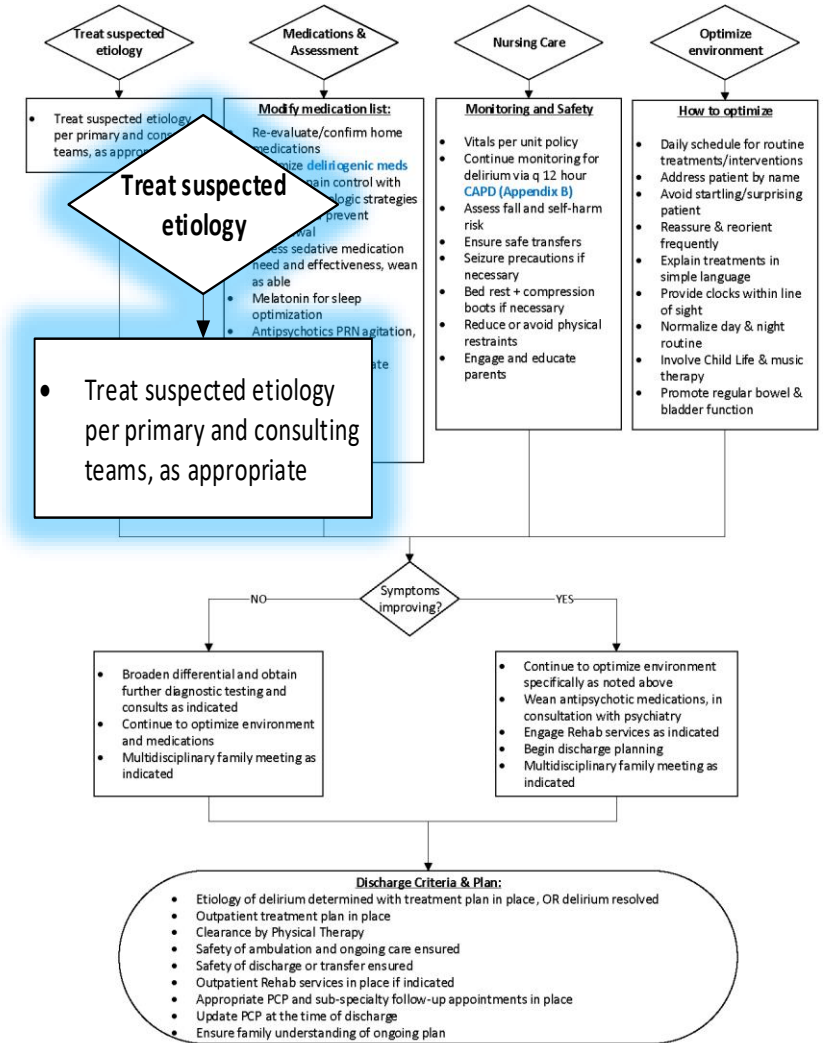
Inpatient and Zone C: 1. Management

It is always important to assess for the most likely etiology of delirium.

Be sure to involve any consulting teams as appropriate.

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Inpatient and Zone C: 1. Management

Because certain medications can contribute to delirium, it is important to re-evaluate medications, and minimize any deliriogenic medications the patient is on.

Clicking on “deliriogenic meds” will bring you to a list of medications listed in the Inpatient Prevention portion.

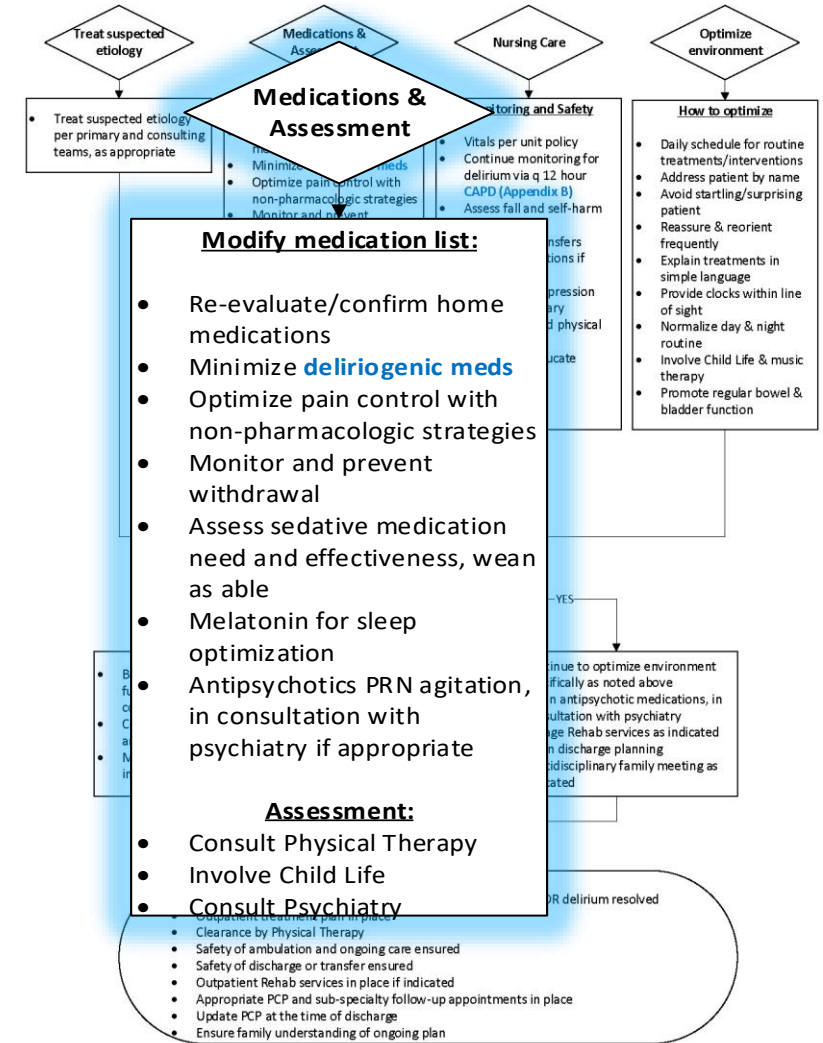
Psychiatry may assist with treatment of agitation.

Physical therapy and Child life should become involved as early as it is safe to do so.

Child life is helpful for creating a functional plan to help normalize day time and night time routines.

CLINICAL PATHWAY: Delirium - Inpatient and Zone C Management

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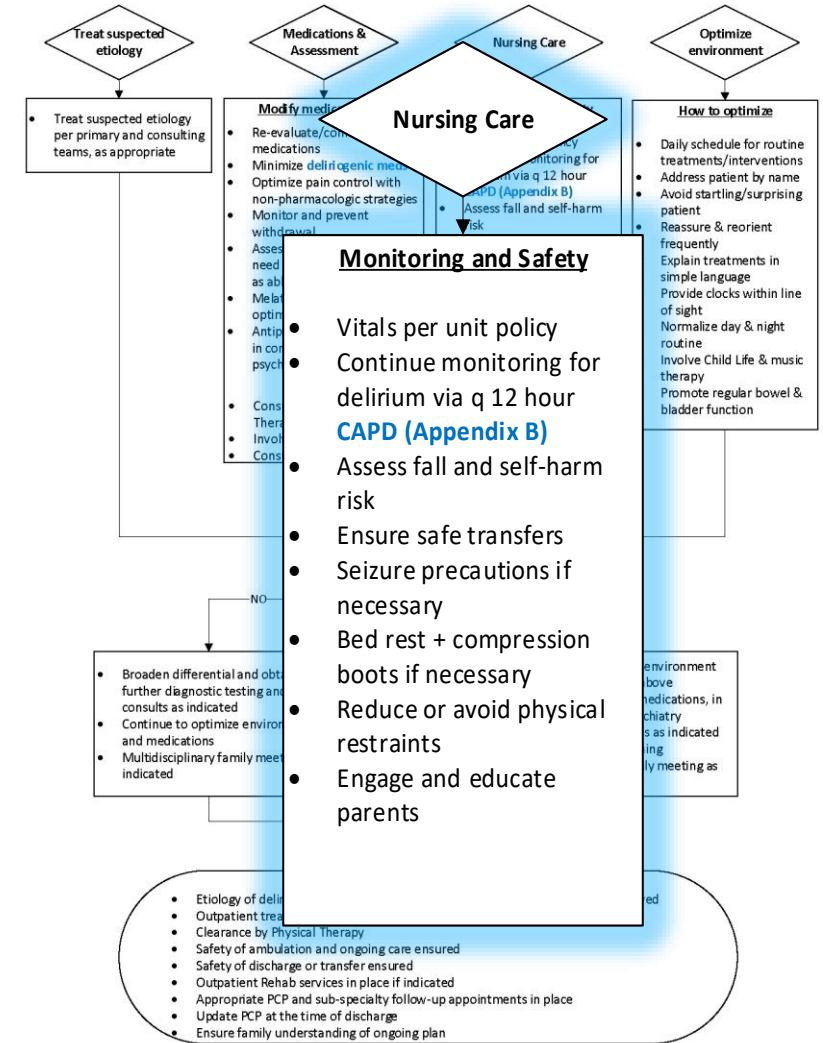
Inpatient and Zone C: 1. Management

Continued and regular assessment of delirium is very important to assess for improvement or worsening.

Modified nursing care and safety monitoring are a vital part of the management plan.

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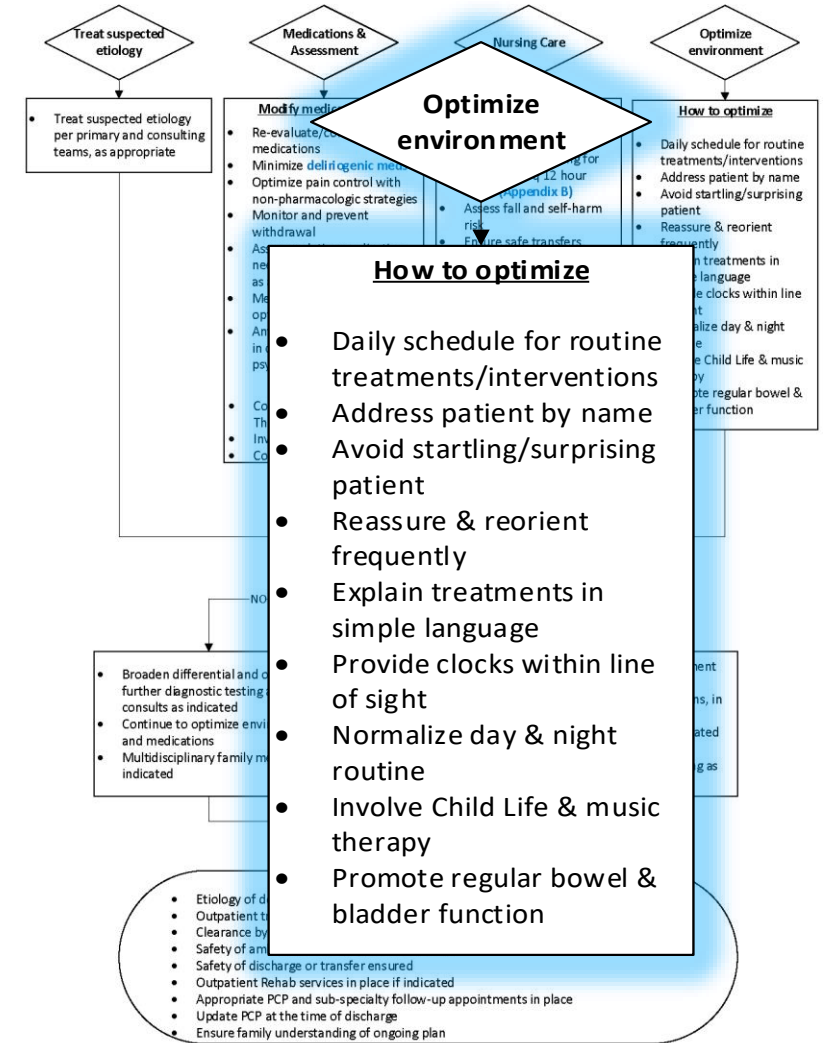
Inpatient and Zone C: 1. Management

Optimizing the environment to help re-orient the child to their surroundings can help improve delirium.

Having a daily schedule, providing clocks, and decreasing potential stressors are all examples.

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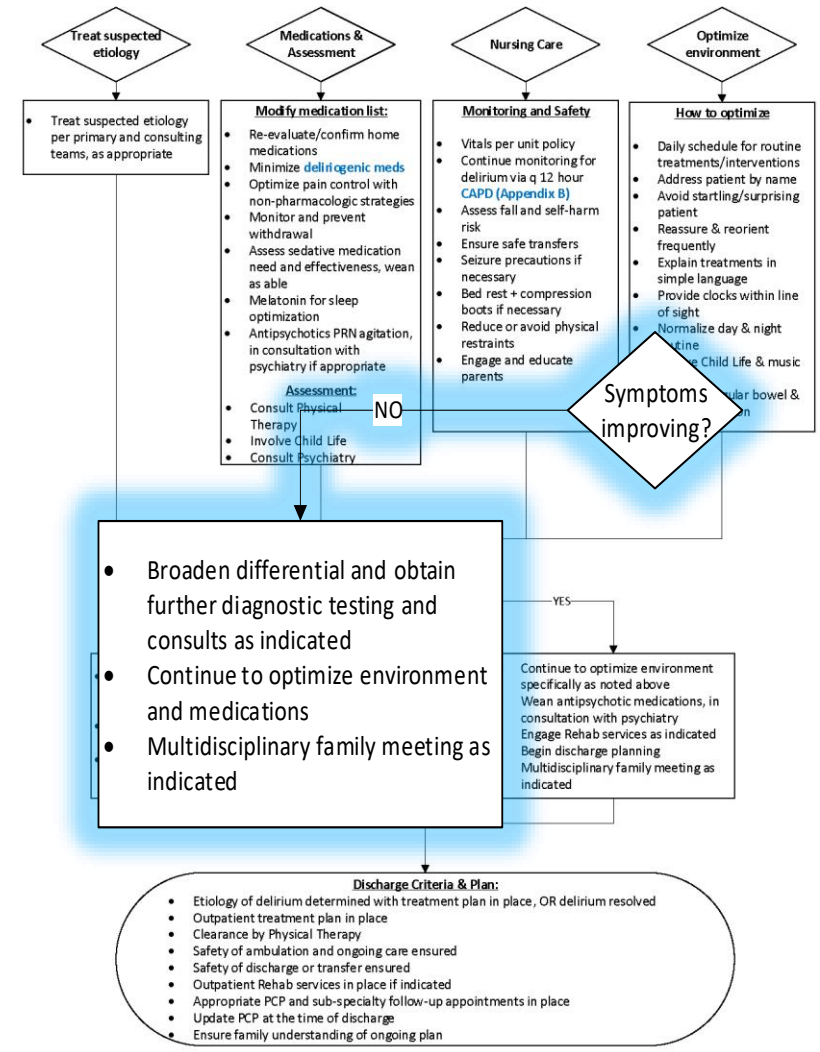
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Inpatient and Zone C: 1. Management

If symptoms are not improving, the differential should be broadened to further assess for a potential etiology.

Optimization of the environment and the patient's medication should be ongoing during this time.



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Inpatient and Zone C: 1. Management

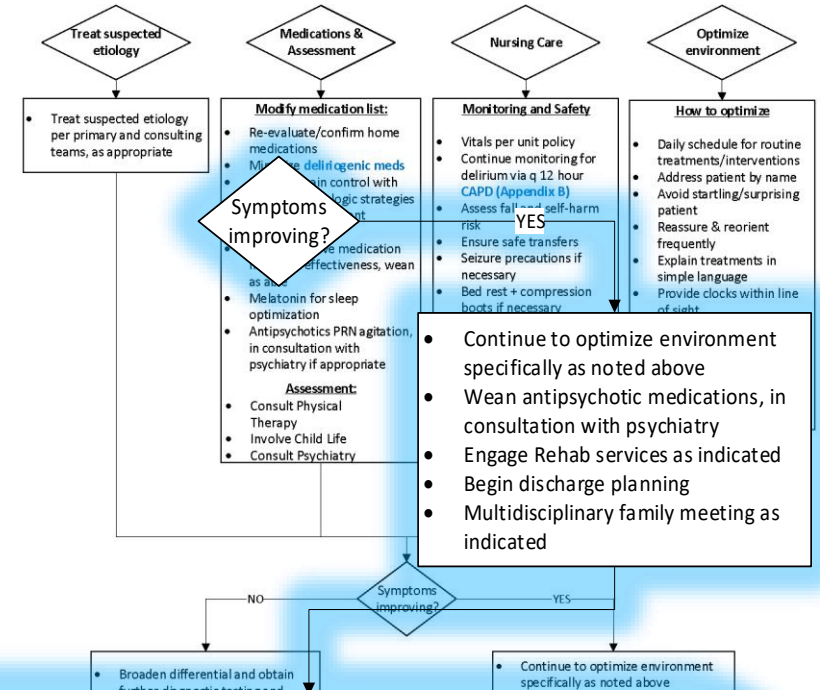
If symptoms of delirium are improving, management strategies to continue while planning towards discharge.

Depending on the circumstance, a multidisciplinary family meeting may be necessary.

The patient must have specific criteria met in order to be discharged – specifically, delirium should have resolved (or a treatment plan is in place for etiologies that have been determined).

CLINICAL PATHWAY: Delirium - Inpatient and Zone C Management

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- Discharge Criteria & Plan:**
- Etiology of delirium determined with treatment plan in place, OR delirium resolved
 - Outpatient treatment plan in place
 - Clearance by Physical Therapy
 - Safety of ambulation and ongoing care ensured
 - Safety of discharge or transfer ensured
 - Outpatient Rehab services in place if indicated
 - Appropriate PCP and sub-specialty follow-up appointments in place
 - Update PCP at the time of discharge
 - Ensure family understanding of ongoing plan

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Inpatient and Zone C:

1. Prevention and Identification

2. Evaluation and Work up

The Delirium – Inpatient Prevention and Screening algorithm is meant for all patients admitted on the Med/Surg units at CT Children’s, not just for those with suspected or known delirium.

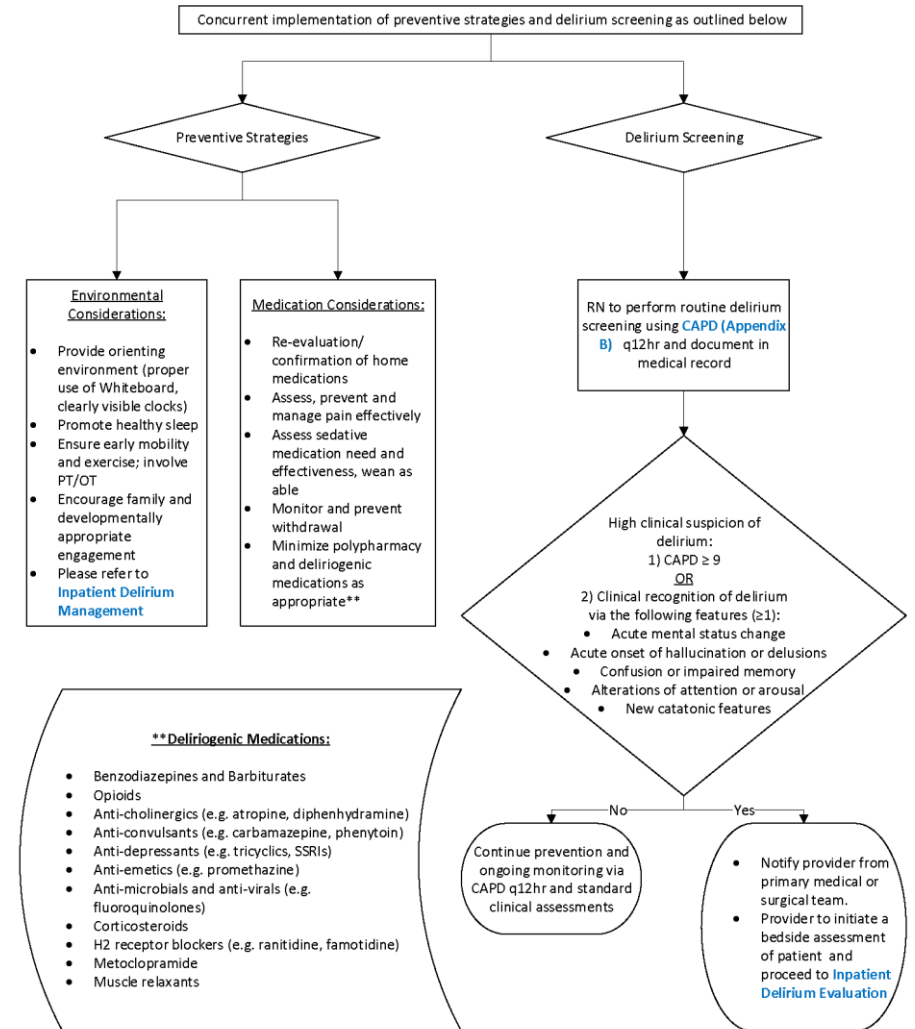
Of note:

PICU patients should be excluded from this pathway. They are being screened with the CAPD score, but providers and nurses should follow the specific protocols for screening, prevention and treatment for PICU patients.

CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

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Inpatient and Zone C:

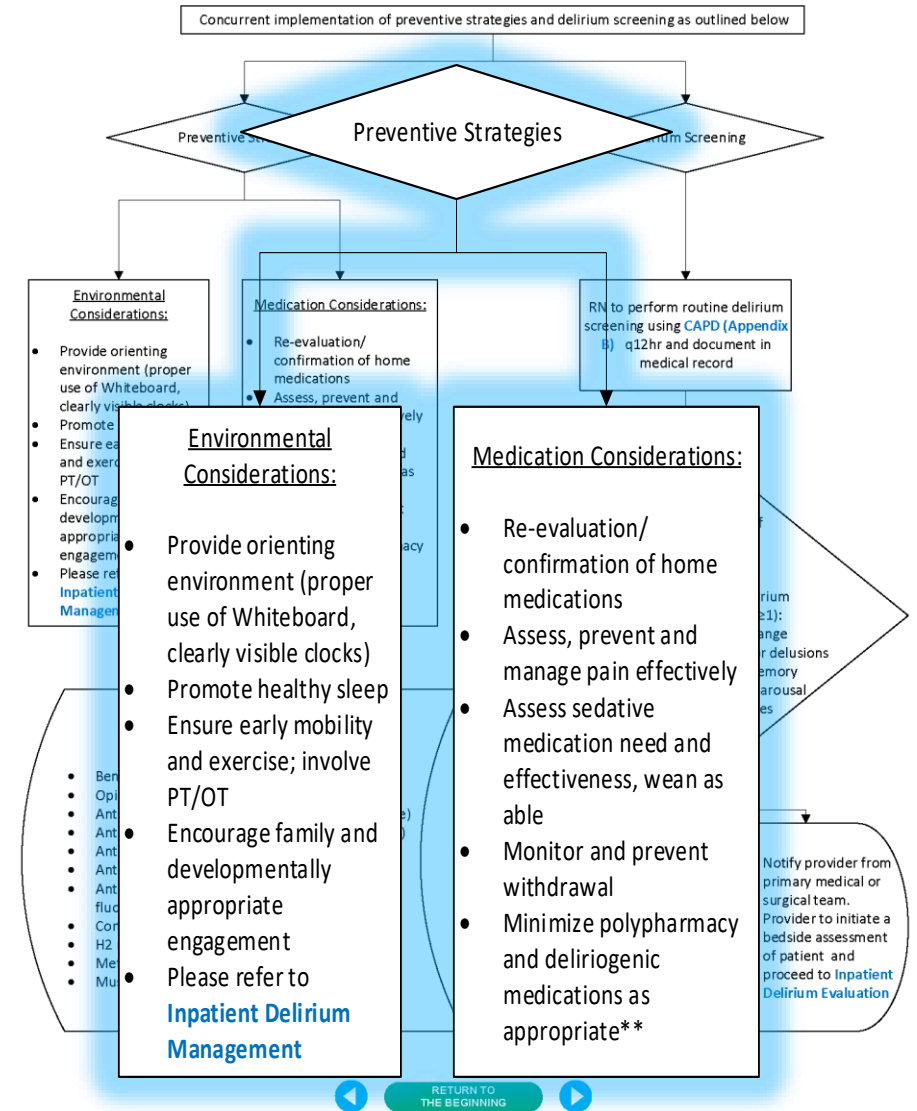
1. Prevention and Identification
2. Evaluation and Work up

Prevention is key!

Proactive measures to prevent delirium include both environmental and medication considerations.

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Inpatient and Zone C:

1. Prevention and Identification

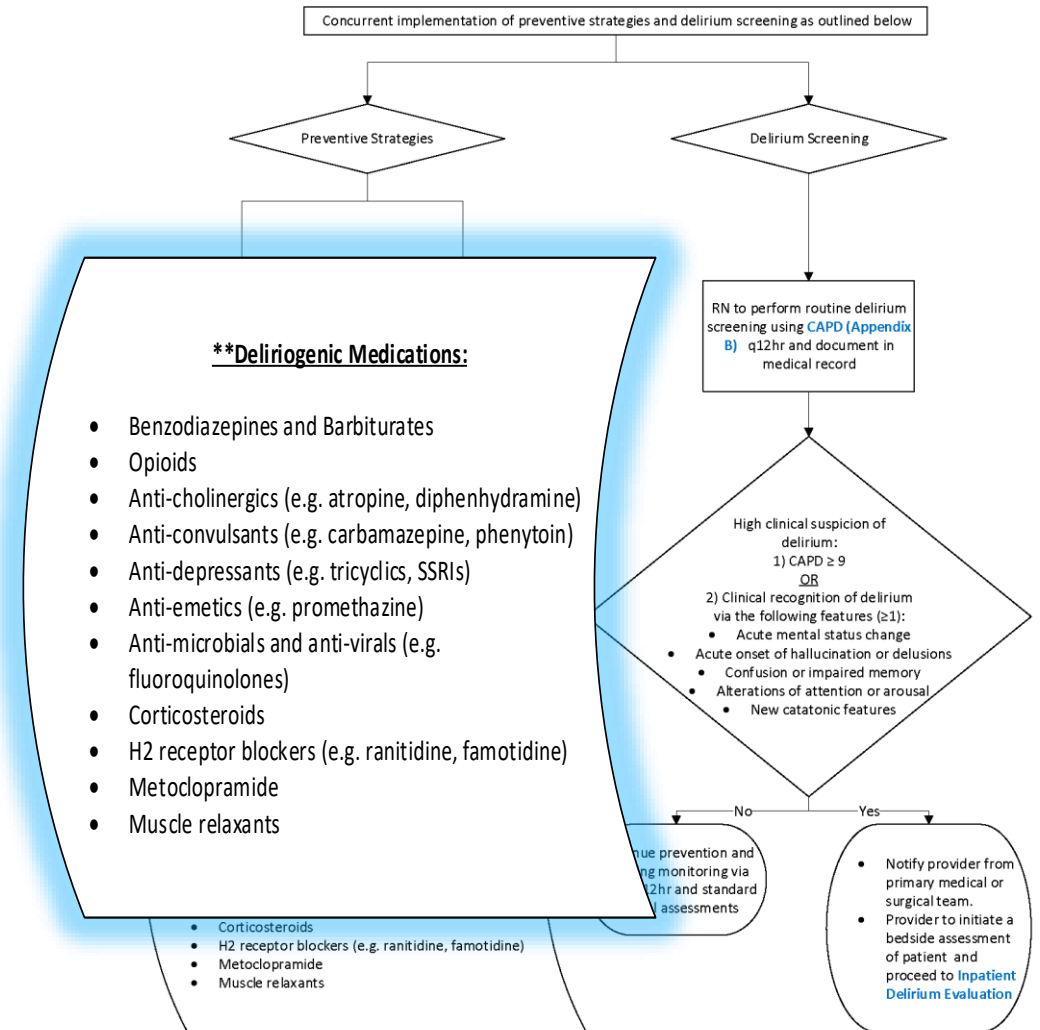
2. Evaluation and Work up

Deliriogenic medications are listed and should be reviewed for every patient presenting with delirium.

CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

THIS PATHWAY
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Inpatient and Zone C:

1. Prevention and Identification

2. Evaluation and Work up

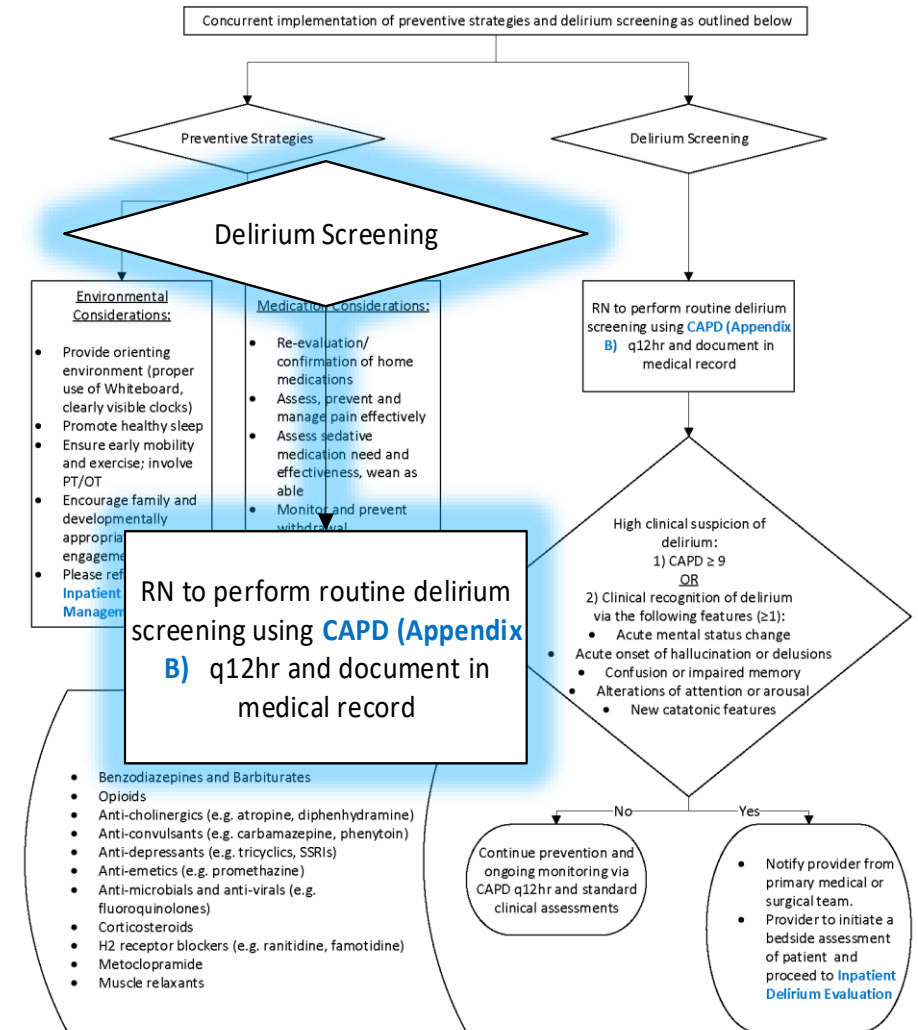
All med/surg patients will be screened with the CAPD tool.

Nursing will complete the screening about every 12 hours. The screen will occur towards the end of the shift to capture the “overall assessment” or average behavior. This is NOT a “moment in time” assessment.

CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

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Inpatient and Zone C:

1. Prevention and Identification
2. Evaluation and Work up

CAPD screening tool (Cornell Assessment of Pediatric Delirium)

- Validated for patients 0-21 yrs
- Easy to use
- Can trend over time
- Based on developmental anchor points for patients <2 years old or developmentally delayed
- Detects hypoactive and hyperactive forms of delirium

In developmentally normal children, CAPD sensitivity 92% and specificity 86.5%

In developmentally delayed children, CAPD sensitivity 96% and specificity 51%

CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

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Concurrent implementation of preventive strategies and delirium screening as outlined below

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

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Inpatient and Zone C:

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CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

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Concurrent implementation of preventive strategies and delirium screening as outlined below

CAPD uses Developmental Anchor Points

- Anchor points are a reference for normative behaviors based on age/developmental level
- Used for patients < 2 years of age (and/or of that developmental level)
- Observable behaviors as they would be seen in hospital setting
- Adjusted for alterations by “sick behavior,” pain, anxiety, and developmental delay

	NB	4 weeks	6 weeks	8 weeks	28 weeks	1 year	2 years
1. 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 state	No sustained calm state	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, feeding, 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

The CAPD: Documenting it in the chart



- CAPD Screening Tool is a screening tool based on these 8 questions, answered based on observed patient behaviors over the course of the shift and reflective of their current developmental level
- Scoring will be completed by nursing twice daily, ideally towards the end of their shift
- Providers may be asked by nursing to help answer some questions in the tool that they are having trouble evaluating (Can be completed in a team approach for a patient that is difficult to assess)
- Parents may also be a resource to help answer these questions based on parents observation, comparing to baseline behaviors

A screenshot of a software interface titled "Inpatient, Delirium4". The interface includes patient information (Age: 20 months, Sex: M, Bed: 302), a time taken field (1024), and a date field (10/26/2018). Below this are several sections for assessment questions, each with a radio button and a set of four options (0=Always, 1=Often, 2=Sometimes, 3=Rarely, 4=Never). The questions are: "Does the child make eye contact with the caregiver?", "Are the child's actions purposeful?", "Is the child aware of his/her surroundings?", "Does the child communicate needs and wants?", "Is the child restless?", "Is the child inconsolable?", "Is the child underactive? (very little movement while awake)", and "Does it take the child a long time to respond to interactions?". Each question has a corresponding anchor text for 2-year-olds and a note for older patients. At the bottom, there is a "Calculated Delirium Score (CAPD):" field and three buttons: "Accept", "Accept and New", and "Cancel".

The CAPD: Where is it in the Chart?

Assessment Scoring		Report
03/28 0701	03/29 0701	Most
03/29 0700	03/29 1100	Recent
Delirium (CAP-D):	0-2	2 03/29 0400

On the patient's Summary screen under "Assessment Scoring"

On the Vital Signs screen listed under the vitals signs

Cornell Assessment of Pediatric Delirium											
CAP-D Score			8	5	4	0	0	3	0	2	CAP-D Score

You can also add a column for the CAPD to "My List" for easy viewing when looking at your patient list

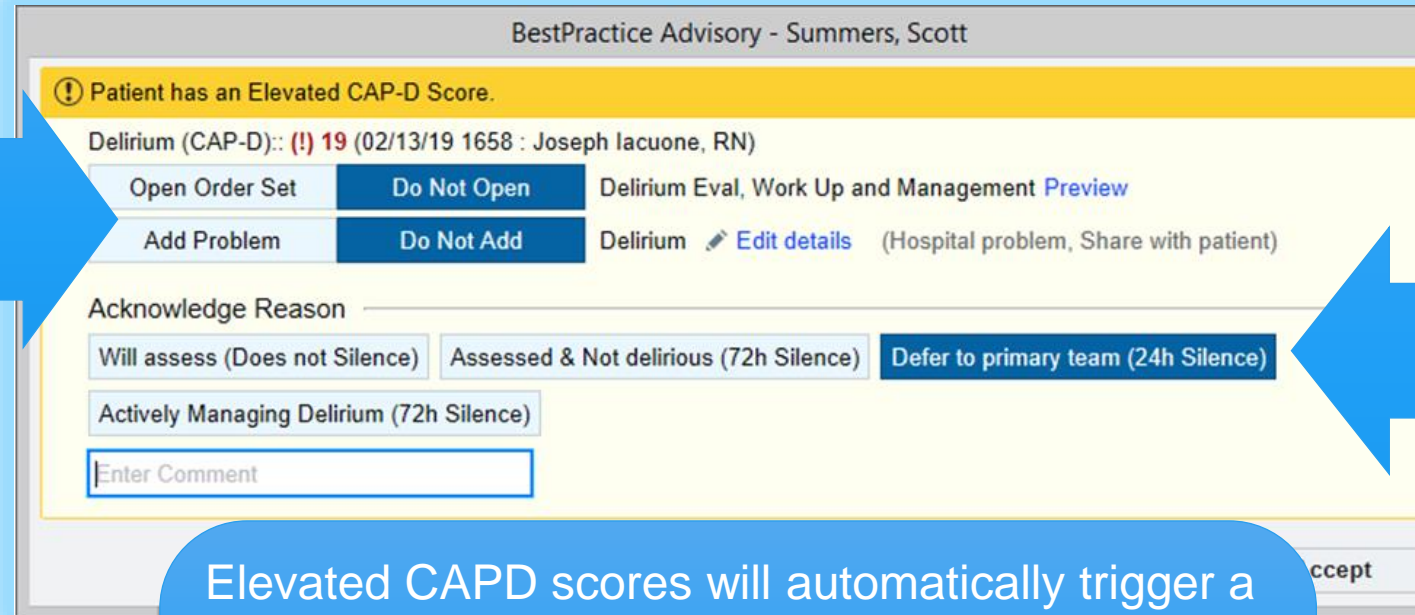
Under the flowsheet "Pedi A&I"

Neuro	
Additional Documentation	
Screening Assessments	
CAP-D Developmental Level	
State Behavioral Scale (PICU)	
Cornell Assessment for Pediatric Delirium *	
Does the child make eye contact with	
Are the child's actions purposeful?	
Is the child aware of his/her	!
Does the child communicate needs and	
Is the child restless?	!
Is the child inconsolable?	
Is the child underactive? (very little	
Does it take the child a long time to	
Calculated Delirium Score (CAPD):	

The CAPD: Best Practice Alerts (BPA)

By selecting to open the order set or add the problem, you are saying that you are performing the appropriate actions.

This means that you DO NOT have to select an acknowledgement reason below



Elevated CAPD scores will automatically trigger a BPA for providers. On the BPA there are two sections.

- On the top you can Open the Order Set and Add Delirium as a Problem
- If you do neither you will need to choose a reason why on the bottom "Acknowledge reason section"

The Acknowledge Reason section should be used when you do not want to perform one of the above two actions.

- Actively Managing Delirium could be used when you have already placed orders and added the problem but it has been 72 hours and the patient is still getting an elevated score.
- When you select one of the acknowledge reasons the top two actions will automatically change to "Do Not...".

Inpatient and Zone C:

1. Prevention and Identification

2. Evaluation and Work up

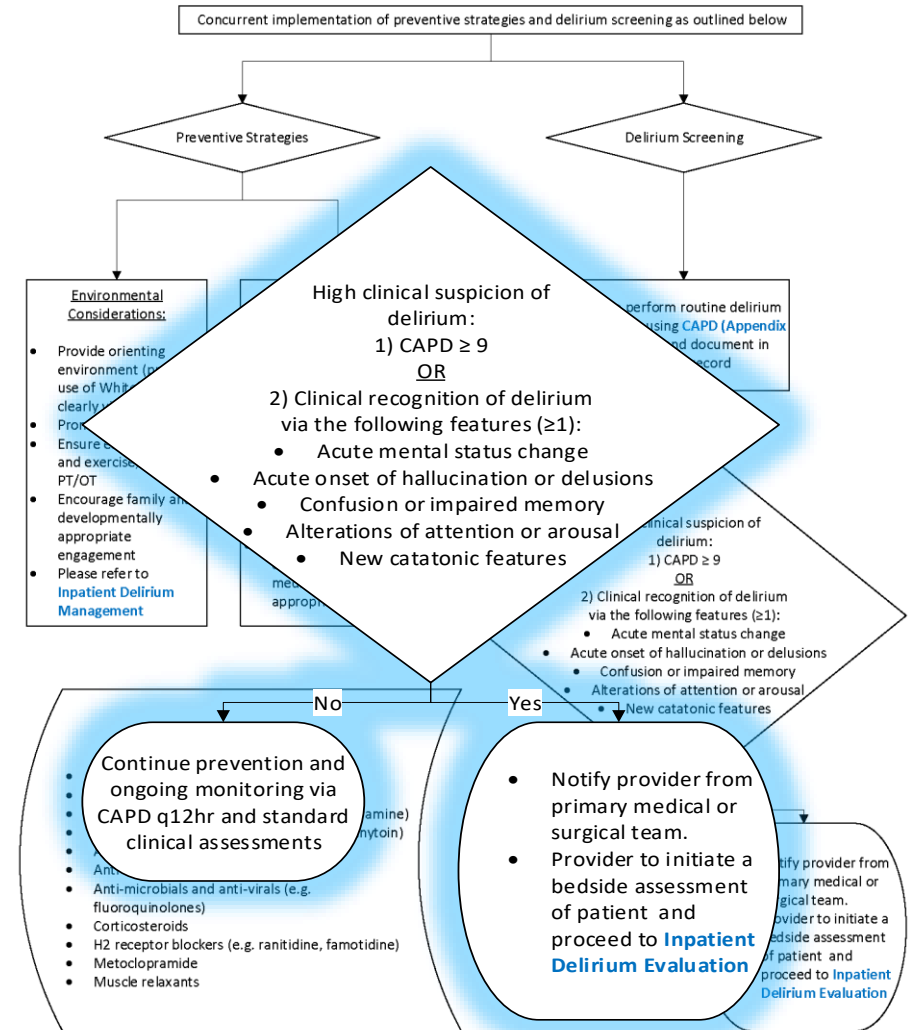
If there is a high clinical suspicion of delirium, proceed to the Inpatient Delirium Evaluation and Work Up.

If not, continual assessment, and optimization of environment/medications should occur.

CLINICAL PATHWAY:

Delirium - Inpatient Prevention and Screening

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Inpatient and Zone C:

1. Prevention and Identification
2. Evaluation and Work up

Once a patient has been identified as having delirium due to clinical presentation and/ or elevated CAPD score, the primary provider should perform a bedside assessment of the patient.

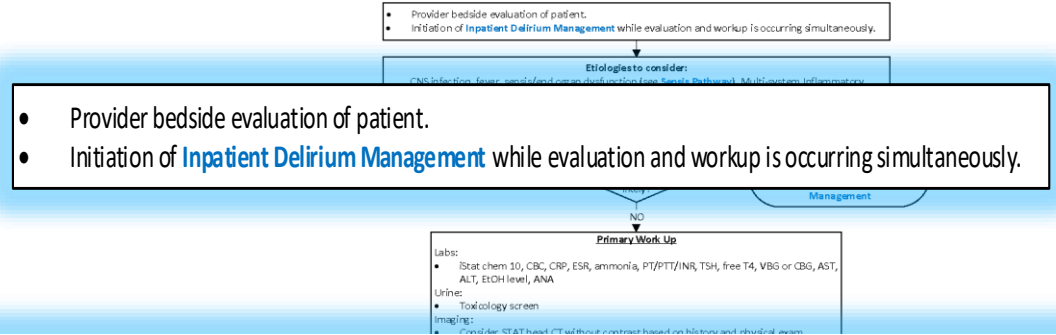
Notify the primary attending if a patient is confirmed to have delirium based on the bedside evaluation.

Inpatient delirium management should occur simultaneously as the work up. Management is the same as Zone C management – as previously discussed.

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

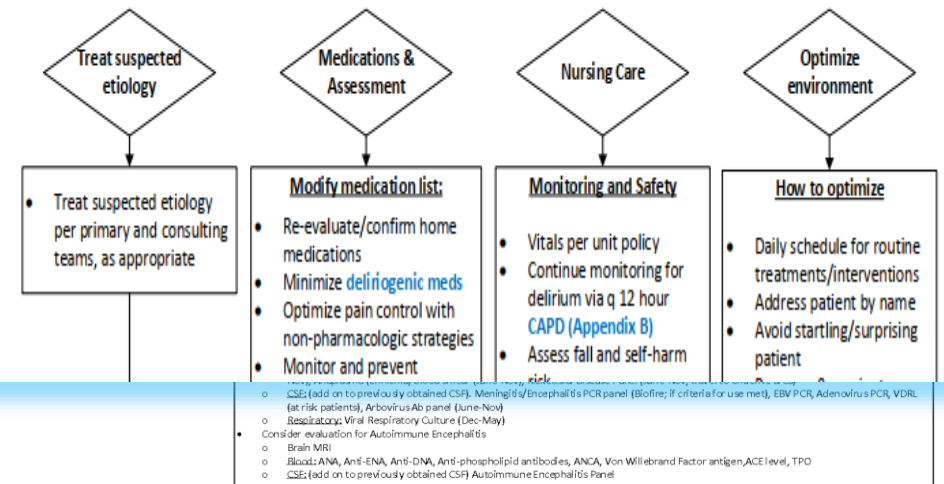
THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



CLINICAL PATHWAY:

Delirium - Inpatient and Zone C Management

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Inpatient and Zone C:

1. Prevention and Identification
2. Evaluation and Work up

If etiology not clear, work up should follow a tiered evaluation including:

- Lab testing
- Imaging
- Consult services

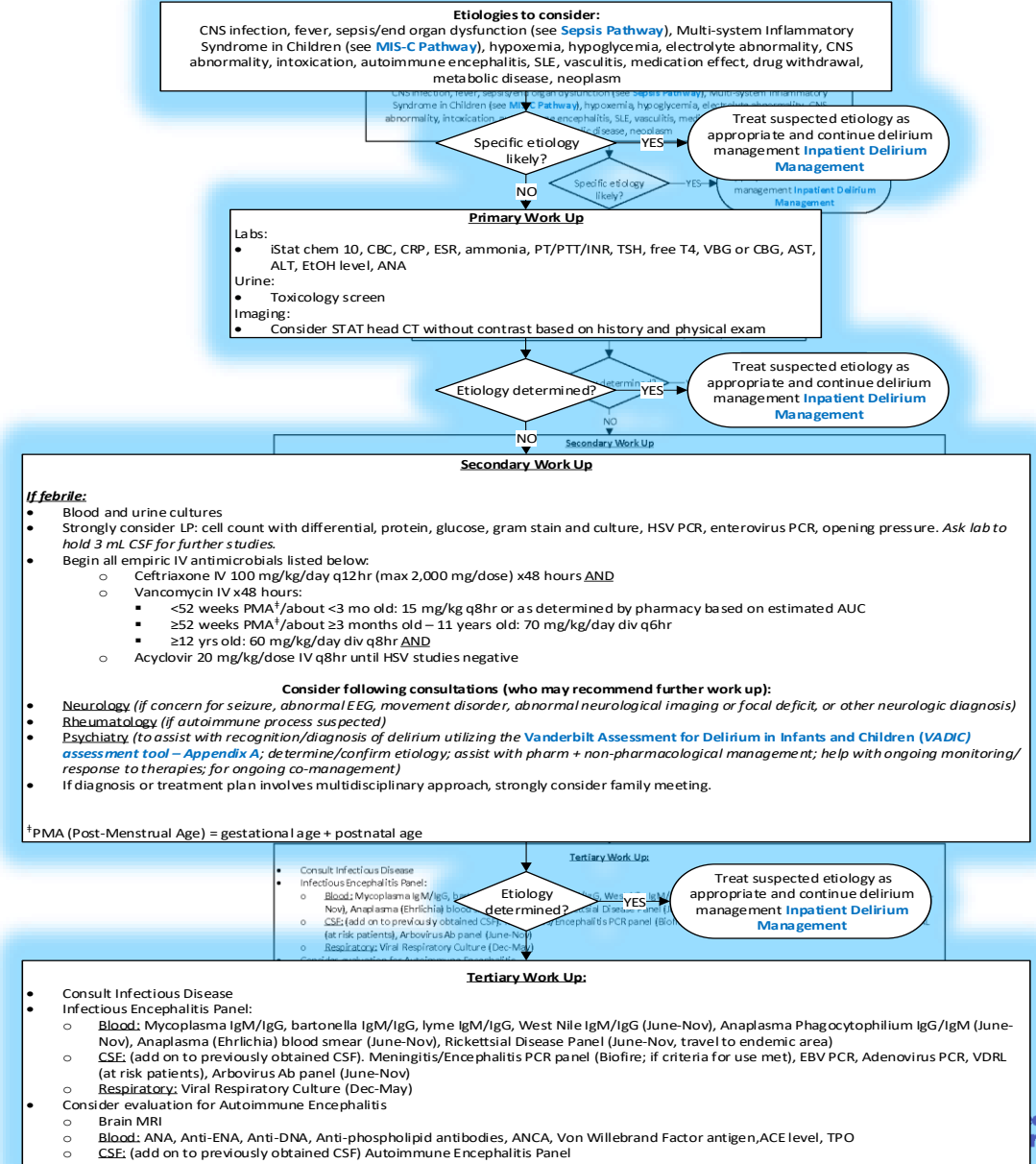
Overall evaluation and escalation of work up should involve a multidisciplinary team approach

Non pharmacologic interventions should start as soon as delirium identified

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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Inpatient and Zone C:

1. Prevention and Identification
2. Evaluation and Work up

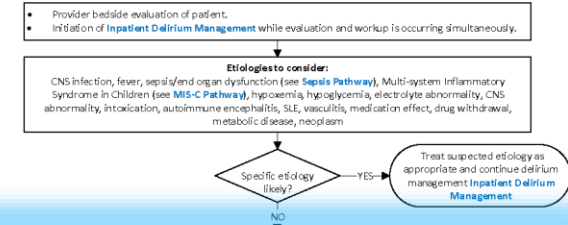
Primary work up is intended to screen for easily identifiable sources of delirium.

As soon as an etiology is positively identified, it should be treated as appropriate, while continuing to manage delirium.

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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Primary Work Up

Labs:

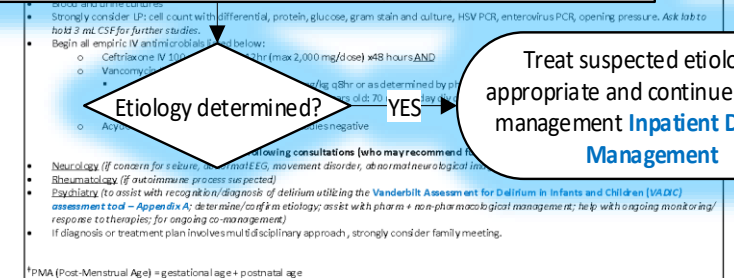
- iStat chem 10, CBC, CRP, ESR, ammonia, PT/PTT/INR, TSH, free T4, VBG or CBG, AST, ALT, EtOH level, ANA

Urine:

- Toxicology screen

Imaging:

- Consider STAT head CT without contrast based on history and physical exam



Tertiary Work Up:

- Consult Infectious Disease
- Infectious Encephalitis Panel:
 - o Blood: Mycoplasma IgM/IgG, bartonella IgM/IgG, Lyme IgM/IgG, West Nile IgM/IgG (June-Nov), Anaplasma Phagocytophilum IgG/IgM (June-Nov), Anaplasma (Ehrlichia) blood smear (June-Nov), Rickettsial Disease Panel (June-Nov, travel to endemic area)
 - o CSF: (add on to previously obtained CSF), Meningitis/Encephalitis PCR panel (Biofire; if criteria for use met), EBV PCR, Adenovirus PCR, VZV (for risk patients), Arbovirus Ab panel (June-Nov)
 - o Respiratory: Viral Respiratory Culture (Dec-May)
- Consider evaluation for Autoimmune Encephalitis
 - o Brain MRI
 - o Blood: ANA, Anti-ENA, Anti-DNA, Anti-phospholipid antibodies, ANCA, Von Willebrand Factor antigen, ACE level, TPO
 - o CSF: (add on to previously obtained CSF) Autoimmune Encephalitis Panel



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Inpatient and Zone C:

1. Prevention and Identification
2. Evaluation and Work up

If febrile, further evaluation (including an LP) and empiric antimicrobials is warranted. Specialists may be consulted depending on specific concerns.

**

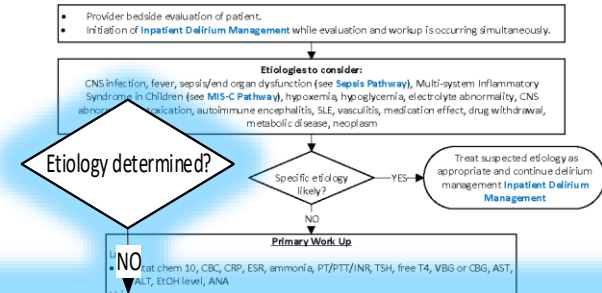
When performing the LP, please send as much CSF possible to the lab to be saved for potential future studies.

- * **Minimum of 3ml of CSF should be saved, but as much as 6ml may be needed for some panels.**
- * **Please call the lab to confirm CSF is being held**

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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Secondary Work Up

If febrile:

- Blood and urine cultures
- Strongly consider LP: cell count with differential, protein, glucose, gram stain and culture, HSV PCR, enterovirus PCR, opening pressure. *Ask lab to hold 3 mL CSF for further studies.*
- Begin all empiric IV antimicrobials listed below:
 - Ceftriaxone IV 100 mg/kg/day q12hr (max 2,000 mg/dose) x48 hours **AND**
 - Vancomycin IV x48 hours:
 - <52 weeks PMA[†]/about <3 mo old: 15 mg/kg q8hr or as determined by pharmacy based on estimated AUC
 - ≥52 weeks PMA[†]/about ≥3 months old – 11 years old: 70 mg/kg/day div q6hr
 - ≥12 yrs old: 60 mg/kg/day div q8hr **AND**
 - Acyclovir 20 mg/kg/dose IV q8hr until HSV studies negative

Consider following consultations (who may recommend further work up):

- Neurology (if concern for seizure, abnormal EEG, movement disorder, abnormal neurological imaging or focal deficit, or other neurologic diagnosis)
- Rheumatology (if autoimmune process suspected)
- Psychiatry (to assist with recognition/diagnosis of delirium utilizing the [Vanderbilt Assessment for Delirium in Infants and Children \(VADIC\) assessment tool – Appendix A](#); determine/confirm etiology; assist with pharm + non-pharmacological management; help with ongoing monitoring/response to therapies; for ongoing co-management)
- If diagnosis or treatment plan involves multidisciplinary approach, strongly consider family meeting.

[†]PMA (Post-Menstrual Age) = gestational age + postnatal age

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Inpatient and Zone C:

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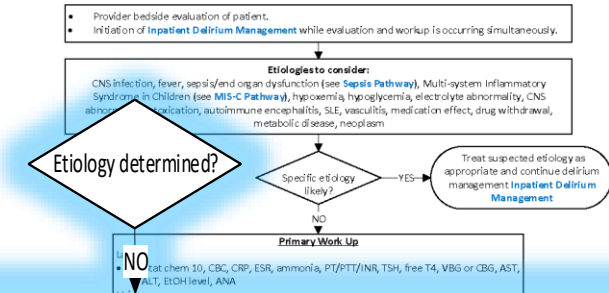
The pharmacy's vancomycin protocol was updated in Feb 2021.

- All patients who have vancomycin IV ordered will be followed by the clinical pharmacist to help determine appropriate dosing parameters.
- Providers will order initial doses per pathway/order set and provide indication within the order.
- IV vancomycin dosing and recommended labs will be managed by pharmacy in conjunction with primary teams.

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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Secondary Work Up

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Inpatient and Zone C:

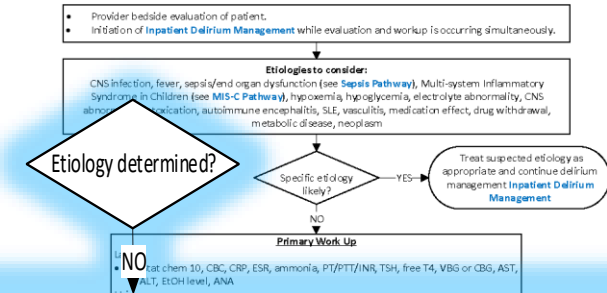
1. Prevention and Identification
2. Evaluation and Work up

Note that the VADIC assessment tool will again be used by Psychiatry to provide consistent standardized assessment of patients with concern for Delirium

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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Secondary Work Up

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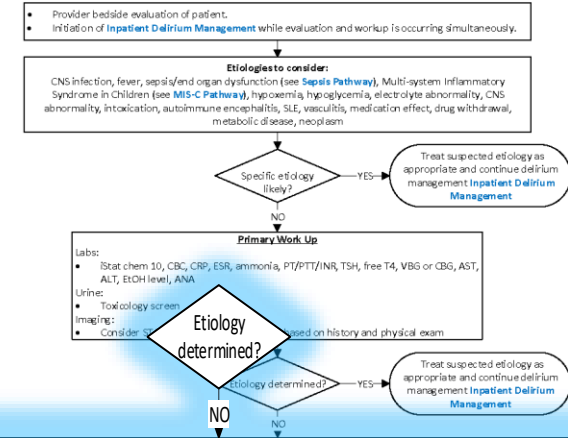
Inpatient and Zone C:

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2. Evaluation and Work up

CLINICAL PATHWAY:

Delirium – Inpatient Evaluation and Work Up

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- Tertiary Work Up:**
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 - Infectious Encephalitis Panel:
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 - **Respiratory:** Viral Respiratory Culture (Dec-May)
 - Consider evaluation for Autoimmune Encephalitis
 - Brain MRI
 - **Blood:** ANA, Anti-ENA, Anti-DNA, Anti-phospholipid antibodies, ANCA, Von Willebrand Factor antigen, ACE level, TPO
 - **CSF:** (add on to previously obtained CSF) Autoimmune Encephalitis Panel

Etiology determined? YES → appropriate and continue delirium management **Inpatient Delirium Management**

- Tertiary Work Up:**
- Consult Infectious Disease
 - Infectious Encephalitis Panel:
 - **Blood:** Mycoplasma IgM/IgG, bartonella IgM/IgG, lyme IgM/IgG, West Nile IgM/IgG (June-Nov), Anaplasma Phagocytophilum IgG/IgM (June-Nov), Anaplasma (Ehrlichia) blood smear (June-Nov), Rickettsial Disease Panel (June-Nov, travel to endemic area)
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Order Set

Order Sets

Delirium Eval, Work Up and Management Manage My Version ▾ ⤴

▼ **General**

▼ **Pathway**

Initiate Clinical Pathway: Delirium
Until discontinued starting Today at 1438 Until Specified

▼ **Nursing**

▼ **Activity**

Activity, as tolerated

Up with assistance

Activity, strict bed rest

▶ **Safety Risk Protocol**

▼ **Nursing Delirium Management**

Seizure precautions
Continuous starting Today at 1438 Until Specified

Implement Daily Schedule
Until discontinued starting Today at 1438 Until Specified
Please specify: Implement Daily Schedule to incorporate routine treatments and interventions. Post schedule in room.

Implement Toileting Schedule
Until discontinued starting Today at 1438 Until Specified
Please specify: Implement toileting schedule to facilitate regular bowel function.

Lights On/Lights Off
Until discontinued starting Today at 1438 Until Specified
Lights on by **, Lights out by ** to facilitate normalization of day and night routine.
Please specify: Lights on/Lights off to facilitate normalization of day/night routine.

Sequential compression device

Peripheral IV

▼ **Delirium Specific Work Up and Management**

Delirium Tier 1

Delirium Tier 2

Delirium Tier 3

▼ **Medications**

Nursing orders are prefilled out and preselected for ease of ordering

Notice the orders are broken down into Tiers

There are two order sets for inpatient use:

1. Admit to MS – Delirium
- And
2. Delirium Evaluation, Work up, and Management

Either can be used at any time, but the second is meant for patients already admitted.

Review of Key Points



- Pediatric delirium is an under-recognized and high-risk diagnosis in pediatric patients that can lead to several complications
- Delirium is a condition caused by a medical etiology, it is not a psychiatric illness
- Many factors contribute to the development of delirium, including underlying illness, medications and disruption of normal routine
- CAPD screening tool can help earlier identify patients with delirium in the inpatient and ICU setting
- New Clinical Pathways for Pediatric Delirium Evaluation, Work-up and Management provides a consistent approach to preventing, screening, evaluating, and managing delirium

Quality Metrics



- Percentage of patients on medical surgical units who were not screened with the CAPD
- Percent of patients who were screened with CAPD tool twice daily
- Percent of patients with CAPD score ≥ 9 with delirium pathway order set usage
- Average time from CAPD score ≥ 9 to the initiation of the delirium pathway order set
- Number of PICU transfers following CAPD score ≥ 9
- Number of MET activations following CAPD score ≥ 9
- Percent of patients with CAPD score ≥ 9 who have delirium ICD-10 codes applied
- Percent of patients with CAPD score ≥ 9 who have a psychiatry evaluation
- Percent of patients with CAPD score ≥ 9 who have a CT scan
- ALOS for patients with a CAPD score ≥ 9 (days)

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Thank You!



About Connecticut Children's Clinical Pathways Program

The Clinical Pathways Program at Connecticut Children's aims to improve the quality of care our patients receive, across both ambulatory and acute care settings. We have implemented a standardized process for clinical pathway development and maintenance to ensure meaningful improvements to patient care as well as systematic continual improvement. Development of a clinical pathway includes a multidisciplinary team, which may include doctors, advanced practitioners, nurses, pharmacists, other specialists, and even patients/families. Each clinical pathway has a flow algorithm, an educational module for end-user education, associated order set(s) in the electronic medical record, and quality metrics that are evaluated regularly to measure the pathway's effectiveness. Additionally, clinical pathways are reviewed annually and updated to ensure alignment with the most up to date evidence. These pathways serve as a guide for providers and do not replace clinical judgment.