# 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 Prevention part of the Clinical Pathway
- Review important components of the Delirium Evaluation and Management part of the Clinical Pathway and order set

# 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

**Table 1. Manifestations of Delirium at Various Life Stages**

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

# 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 1. Manifestations of Delirium at Various Life Stages**

| Life Stage | Hypoactive Delirium | Hyperactive Delirium |
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| Adolescents/adults | Disoriented<br>Inattentive<br>Impairment of sleep-wake cycle<br>Emotional disturbance<br>Falling asleep inappropriately | Disoriented<br>Inattentive<br>Impairment of sleep-wake cycle<br>Emotional disturbance<br>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.

This table may be found in Appendix C of the Delirium Clinical Pathway

# 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 of 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 Pathway

- This pathway can help guide prevention as well as 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

# Delirium Clinical Pathway

## There are 2 parts to the Delirium Clinical Pathway:

### 1. Delirium Prevention

- This part of the pathway is focused on reducing occurrence of delirium in hospitalized patients and guides targeted screening

### 2. Delirium Evaluation and Management

- This part of the pathway guides work-up and management of delirium symptoms and is broken down as follows:
  - Delirium Evaluation: Primary Steps
  - Delirium Evaluation: Secondary Steps
  - Delirium Management

# DELIRIUM PREVENTION

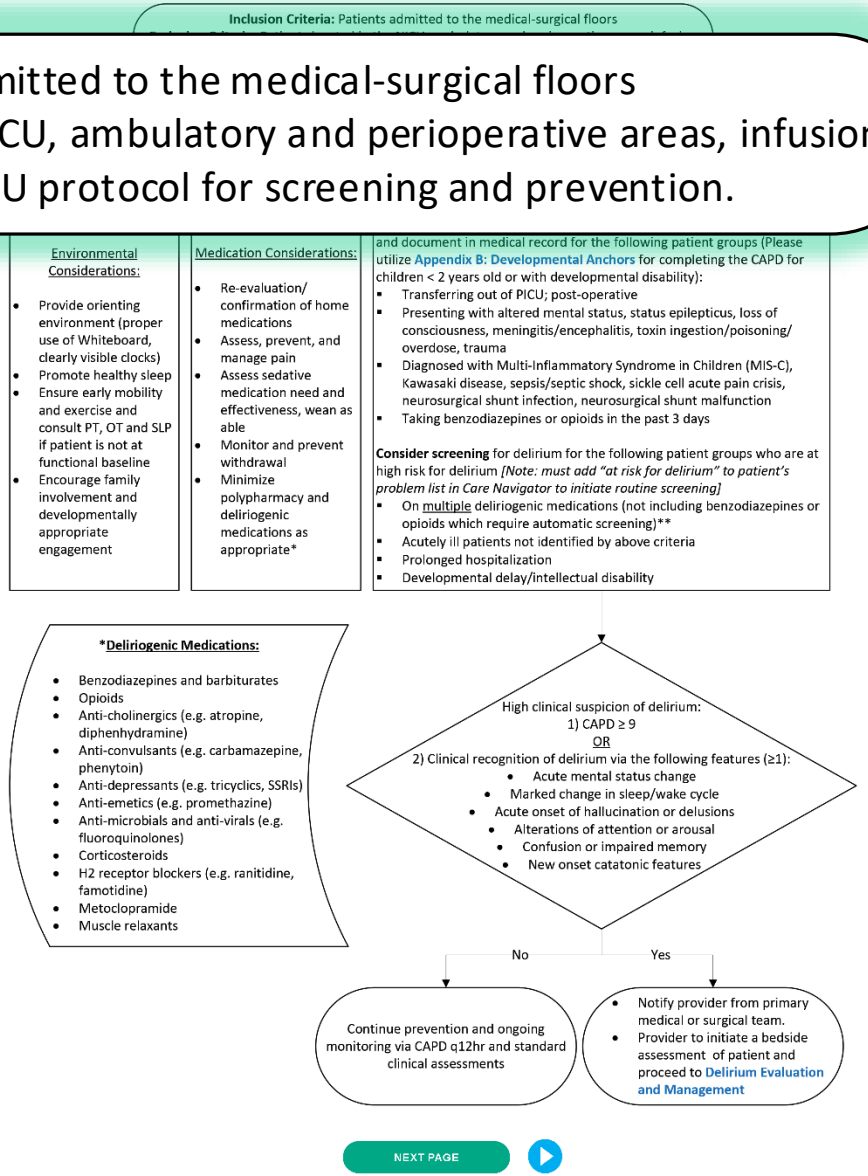
*CLINICAL PATHWAY:*
**Delirium Prevention**

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.

The first page of the pathway addresses delirium prevention

This part of the clinical pathway is intended only for patients on the medical-surgical floors

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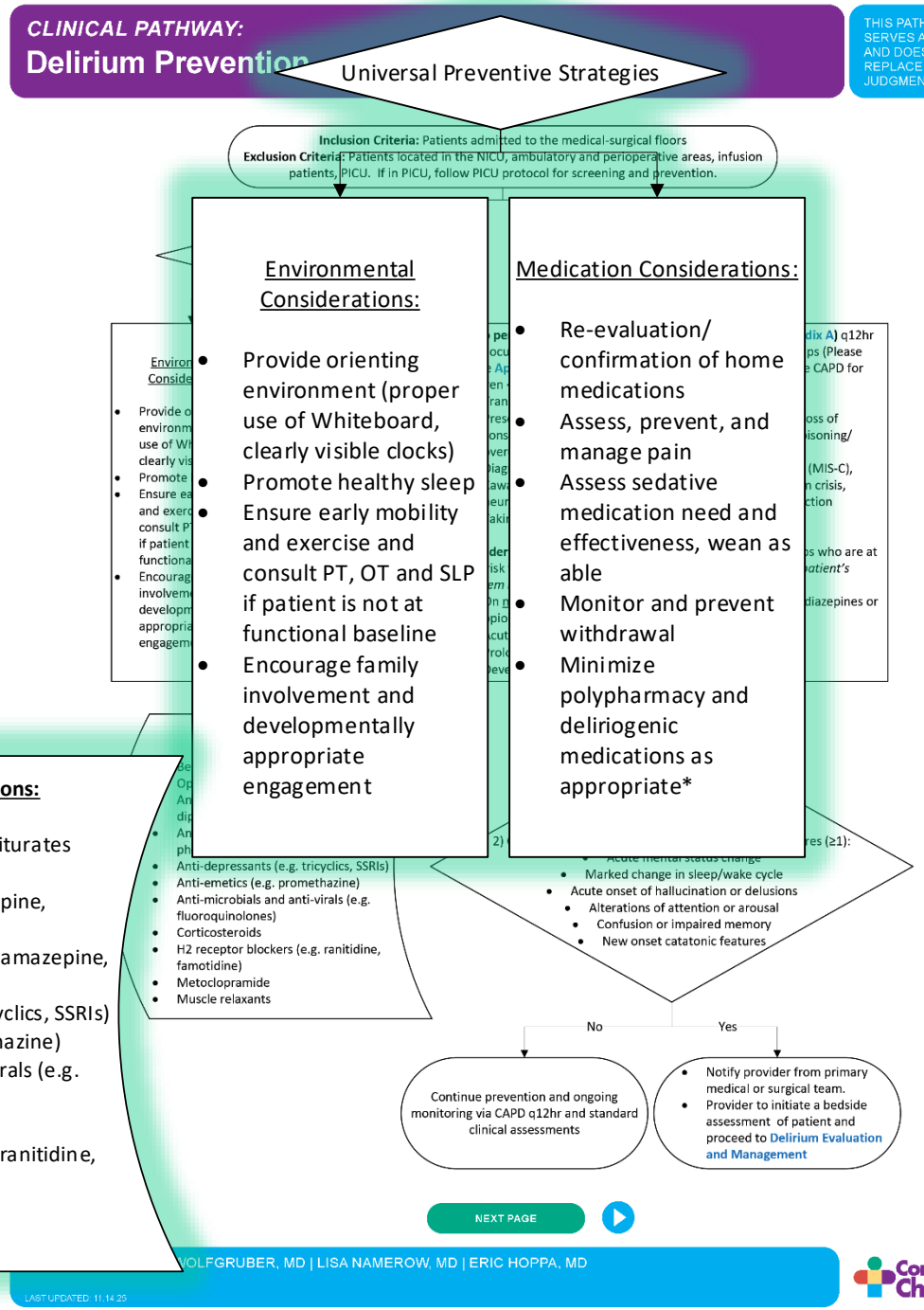
# DELIRIUM PREVENTION

Prevention is key!

Universal preventative strategies should be taken for ALL patients on med-surg

Proactive measures to prevent delirium include both environmental and medication considerations

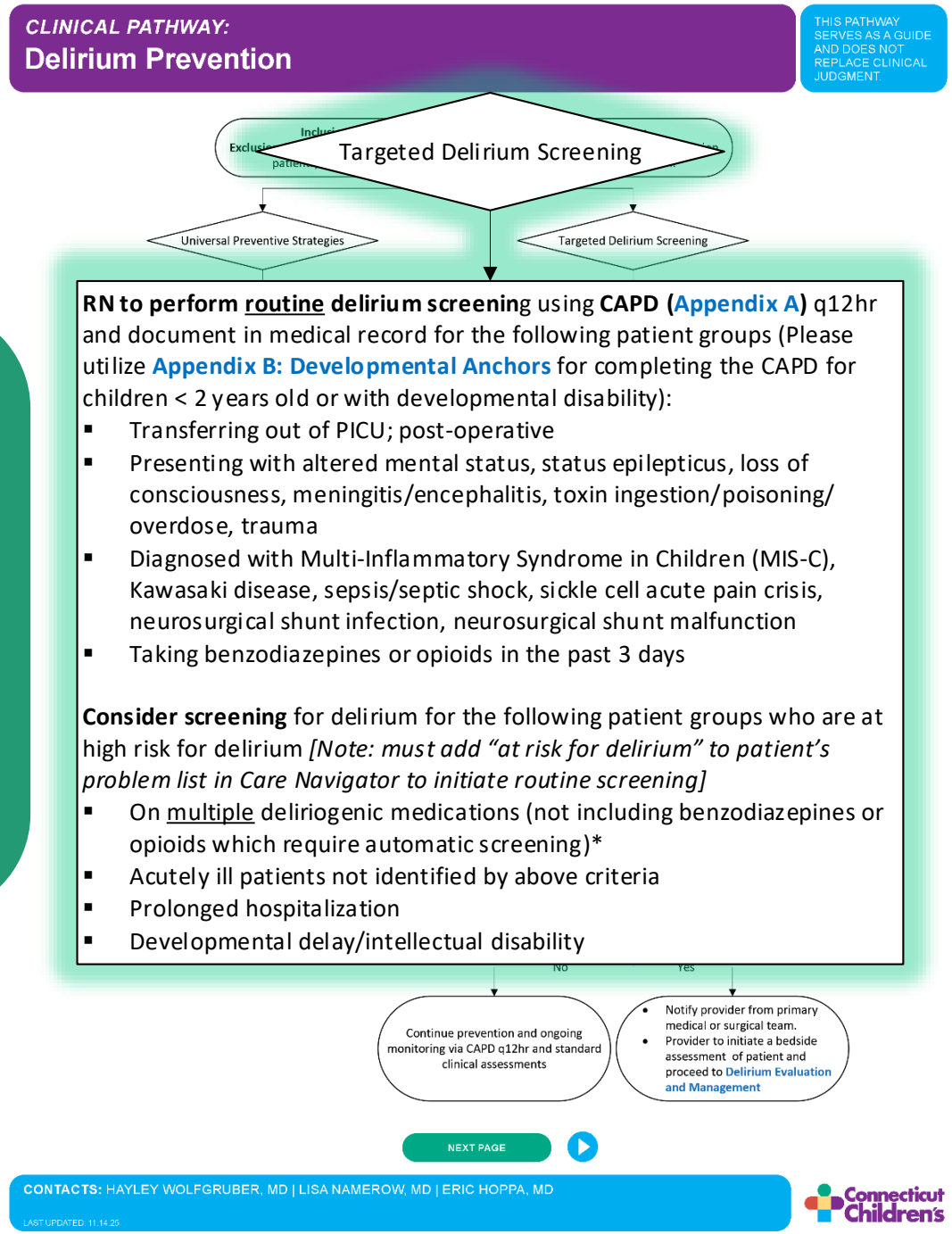


# DELIRIUM PREVENTION

Targeted screening for delirium is **opt in** for certain groups of patients who are **at known higher risk for delirium**:

These diagnoses/patients will be automatically undergo delirium screening

The groups listed under “Consider screening” will require adding “at risk for delirium” (ICD-10 Z91.89) to problem list OR ordering of the delirium pathway order set, which will be reviewed in upcoming slides



# DELIRIUM PREVENTION

CAPD score ≥ 9 is a positive screen

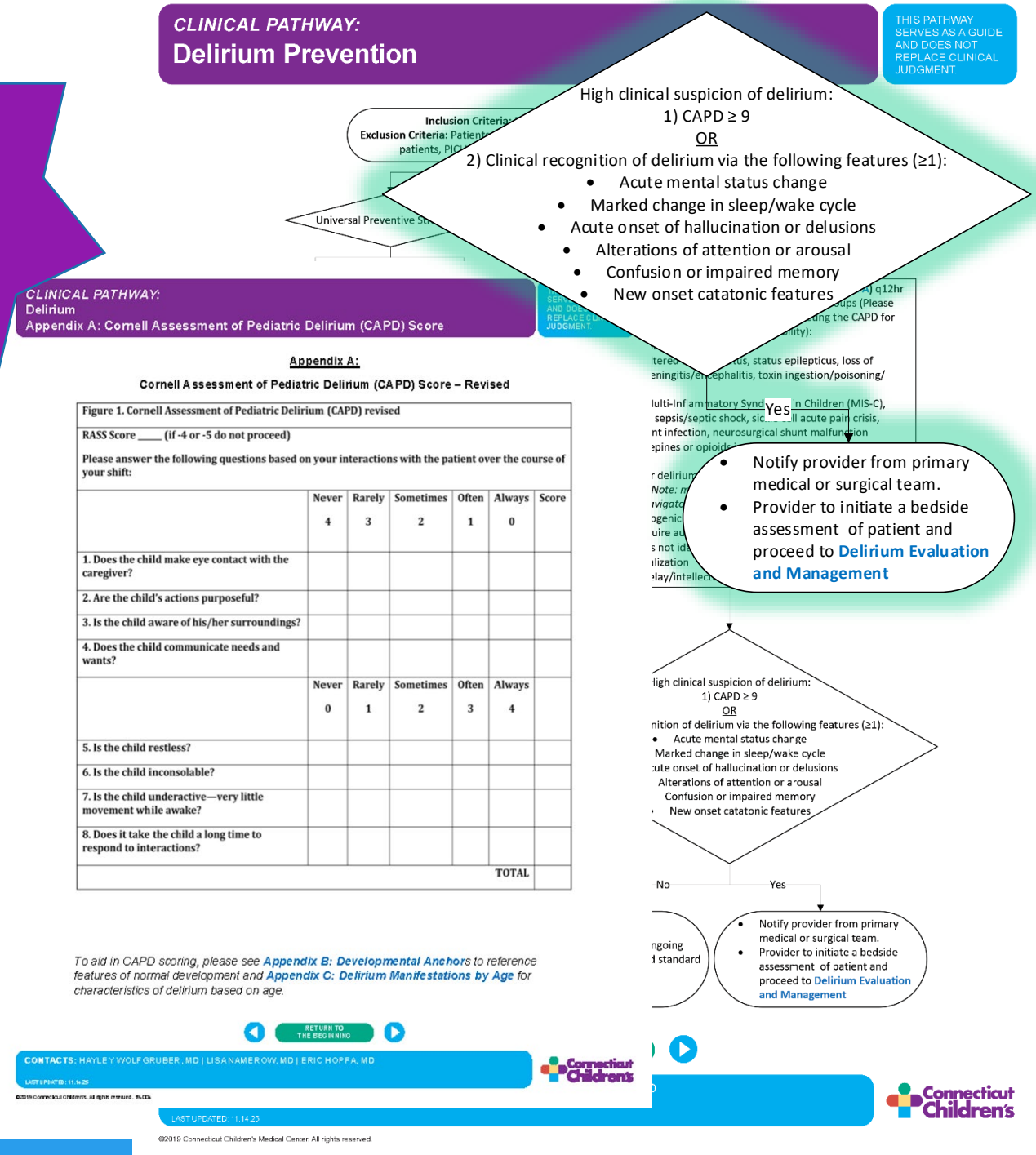
**CAPD Screening Tool** (Appendix A):

- 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%

Of note, can also screen clinically, by ≥1 features

If a patient screens positive, please move onto the **Delirium Evaluation and Management** part of the clinical pathway



# DELIRIUM PREVENTION

**CAPD uses Developmental Anchor Points (Appendix B)**

- 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

*** Use caregivers to help understand what is normal behavior for a patient!**



**Appendix B:**

**Developmental Anchors**

| | 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<br>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<br>Turns to primary caretaker's voice<br>May turn to smell of primary care taker | Increasing awake alert time<br>Turns to primary caretaker's voice<br>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, 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<br>(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 |

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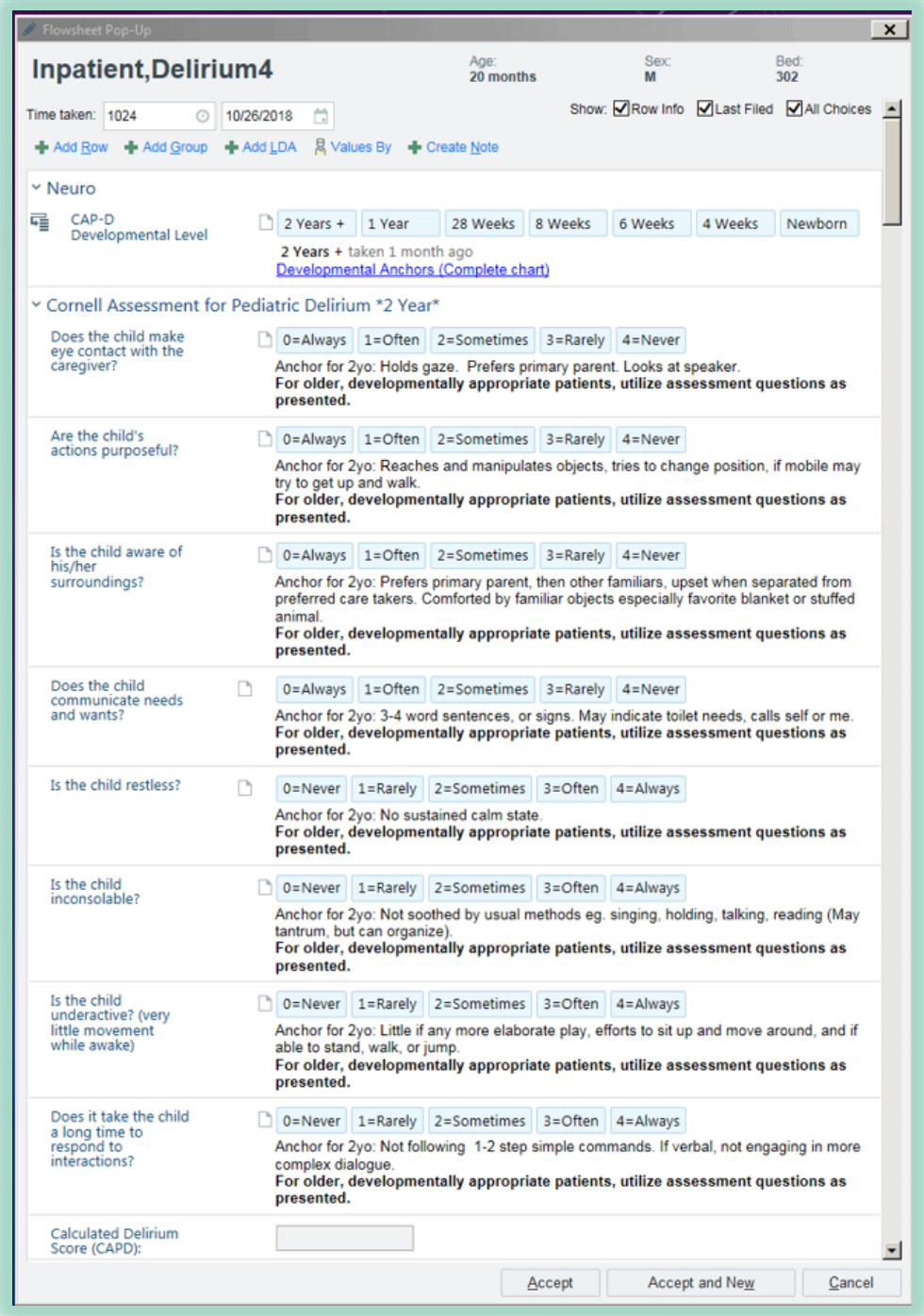
# CAPD: Documenting in the chart

- 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

Alternatively, the Vanderbilt Assessment for Delirium in Infants and Children (VADIC) may be used by Psychiatry/Psychology



# DELIRIUM EVALUATION: PRIMARY STEPS

*CLINICAL PATHWAY:*
**Delirium Evaluation Primary Steps**

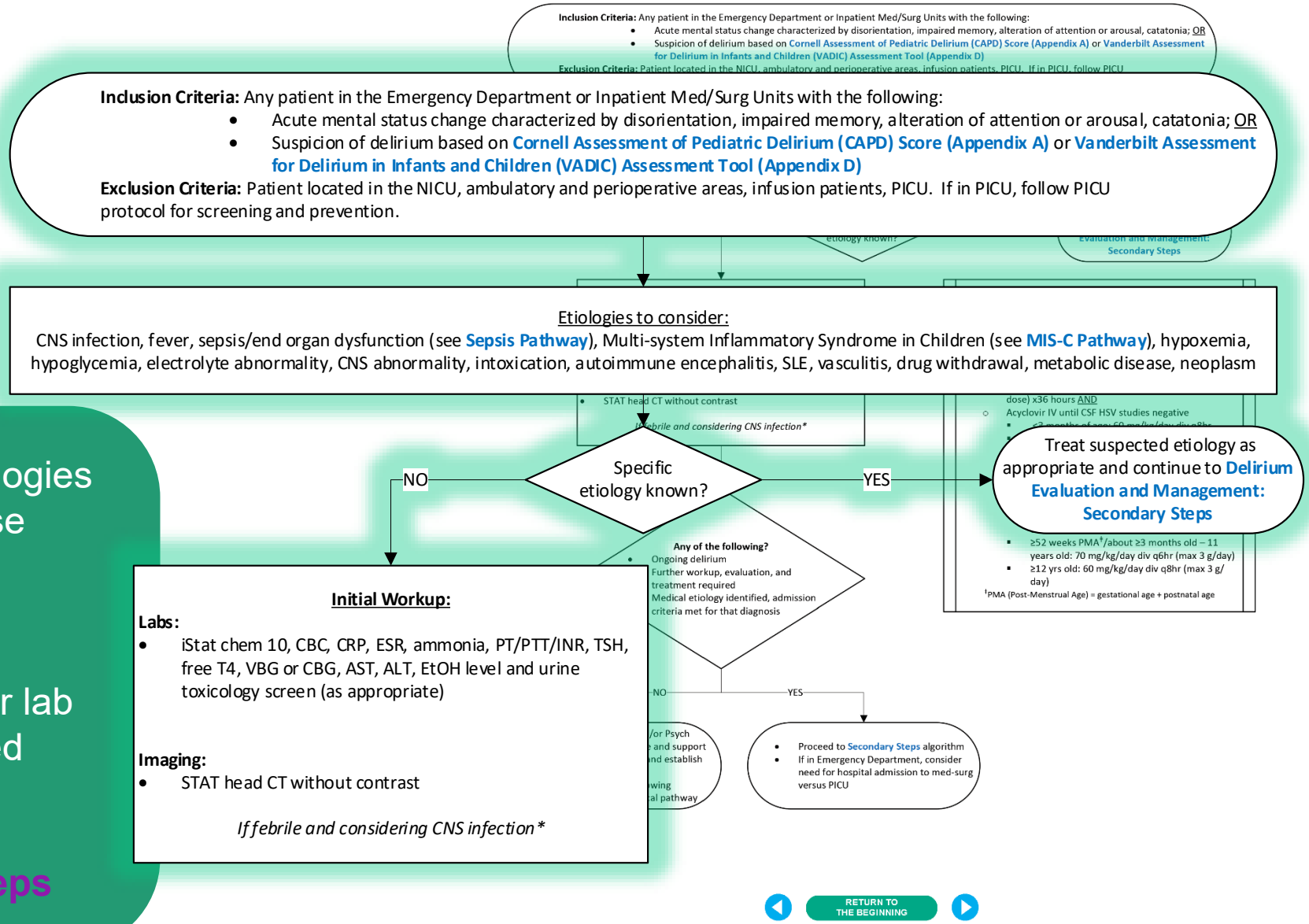
THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

Applies to patients in ED and Med-Surg

It is important to identify potential etiologies of delirium first, and administer disease specific management

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

If etiology is known, may proceed to **Delirium Evaluation: Secondary Steps**

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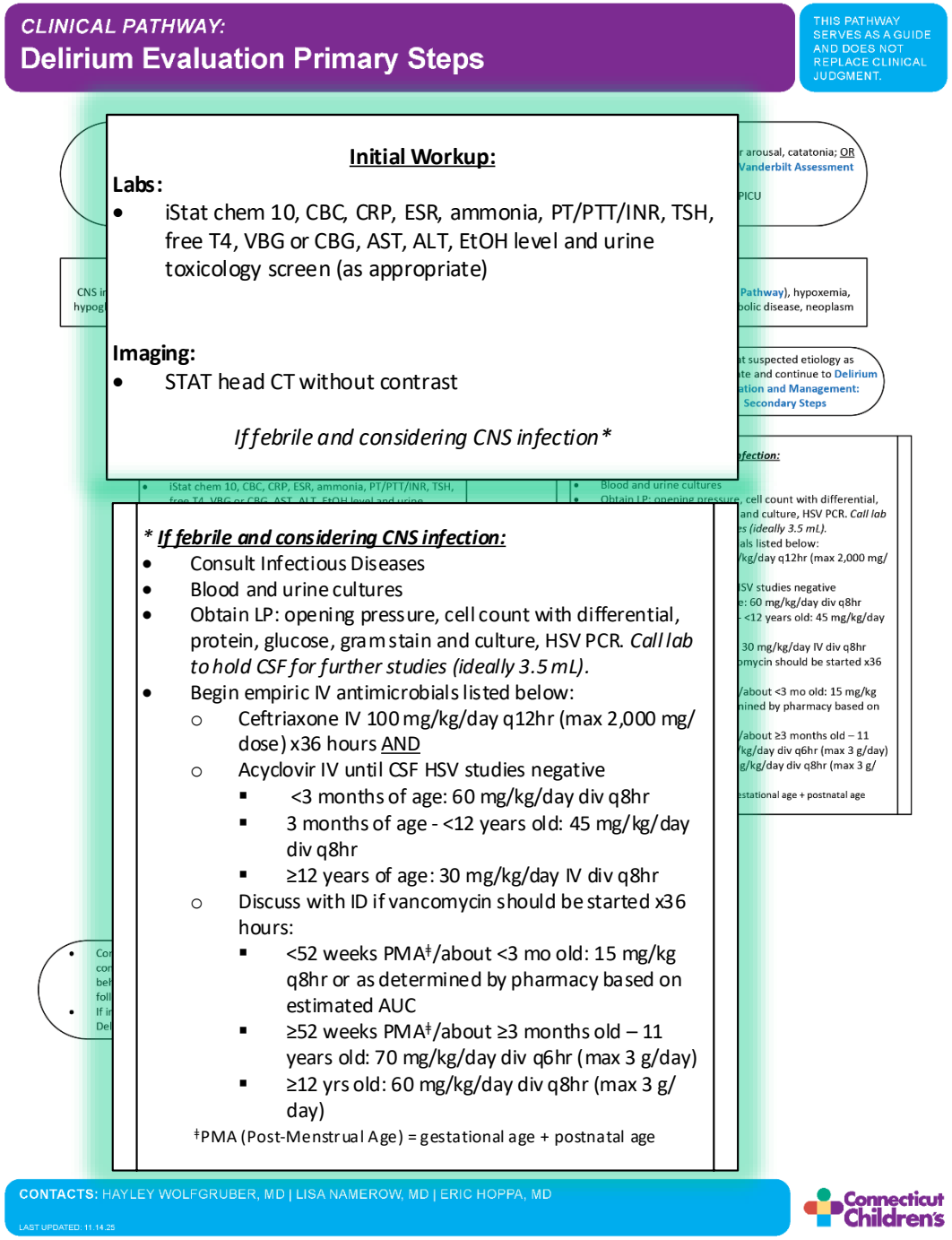
# DELIRIUM EVALUATION: PRIMARY STEPS

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.

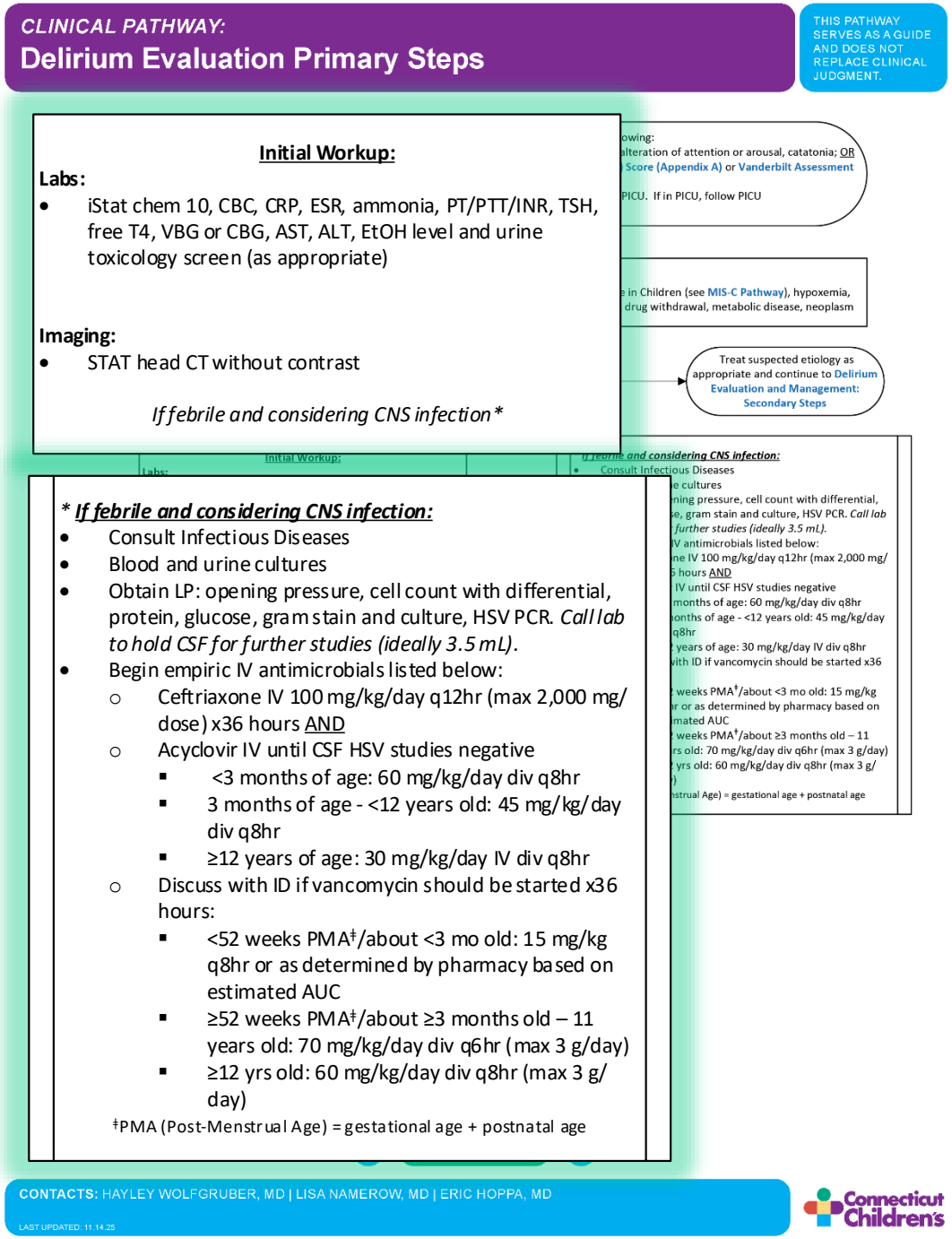
* **Ideally a minimum of 3.5 ml of CSF should be saved, but as much as 6 ml may be needed for some panels**
* **Please call the lab to confirm CSF is being held**



# DELIRIUM EVALUATION: PRIMARY STEPS

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

Addition of vancomycin should be discussed with ID



# DELIRIUM EVALUATION: PRIMARY STEPS

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 intervention

If being admitted or need for further workup, proceed to **Delirium Evaluation: Secondary Steps**

*CLINICAL PATHWAY:*
**Delirium Evaluation Primary Steps**

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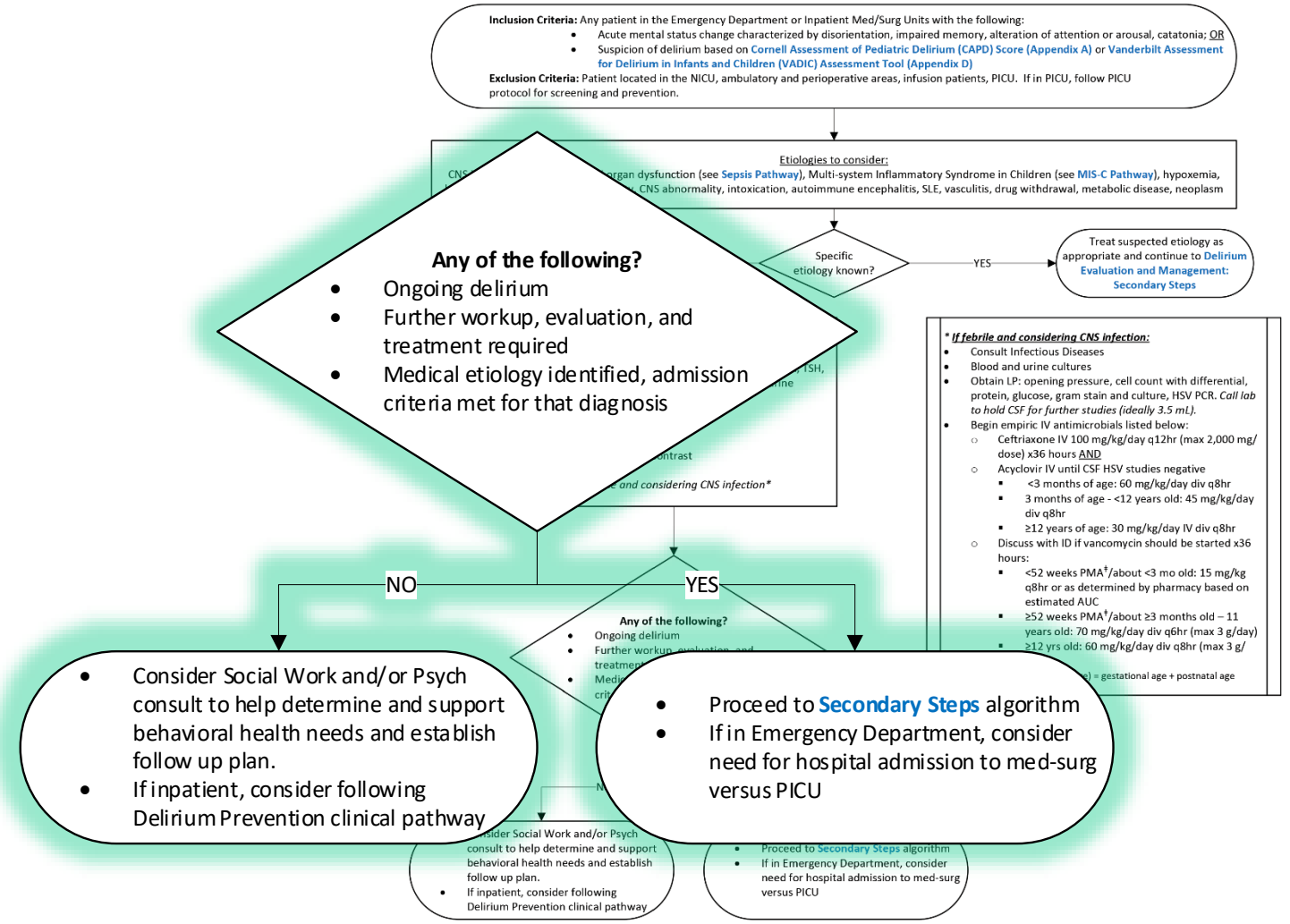


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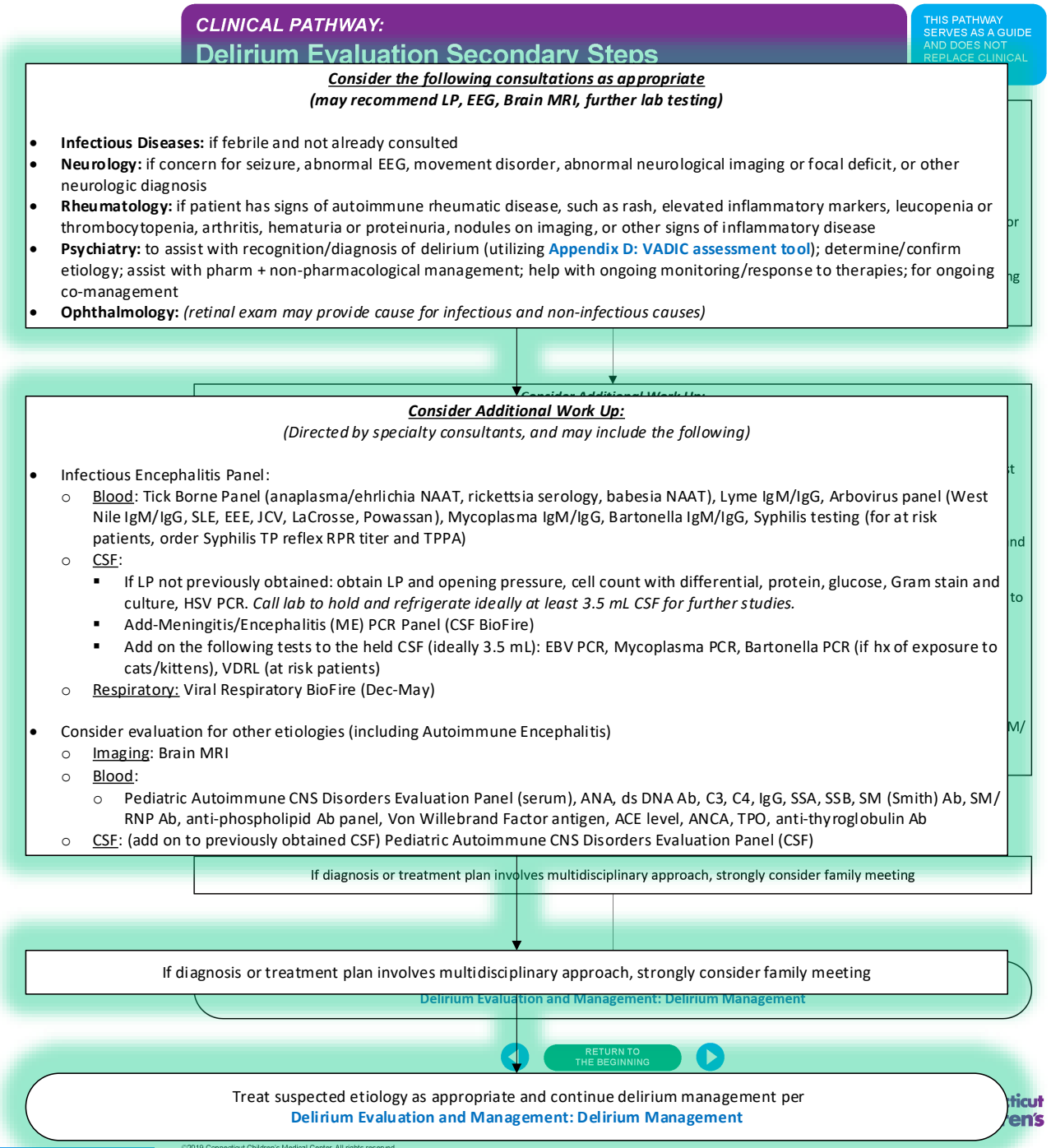
# DELIRIUM EVALUATION: SECONDARY STEPS

Secondary workup should happen in consultation with the appropriate specialties

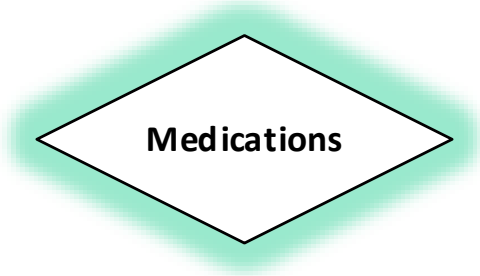
- Examples for indications to consult these specialties are listed on the pathway

Delirium often requires a multidisciplinary approach, and a family-team meeting can be helpful to delineate the management plan

The pathway continues with **Delirium Management**



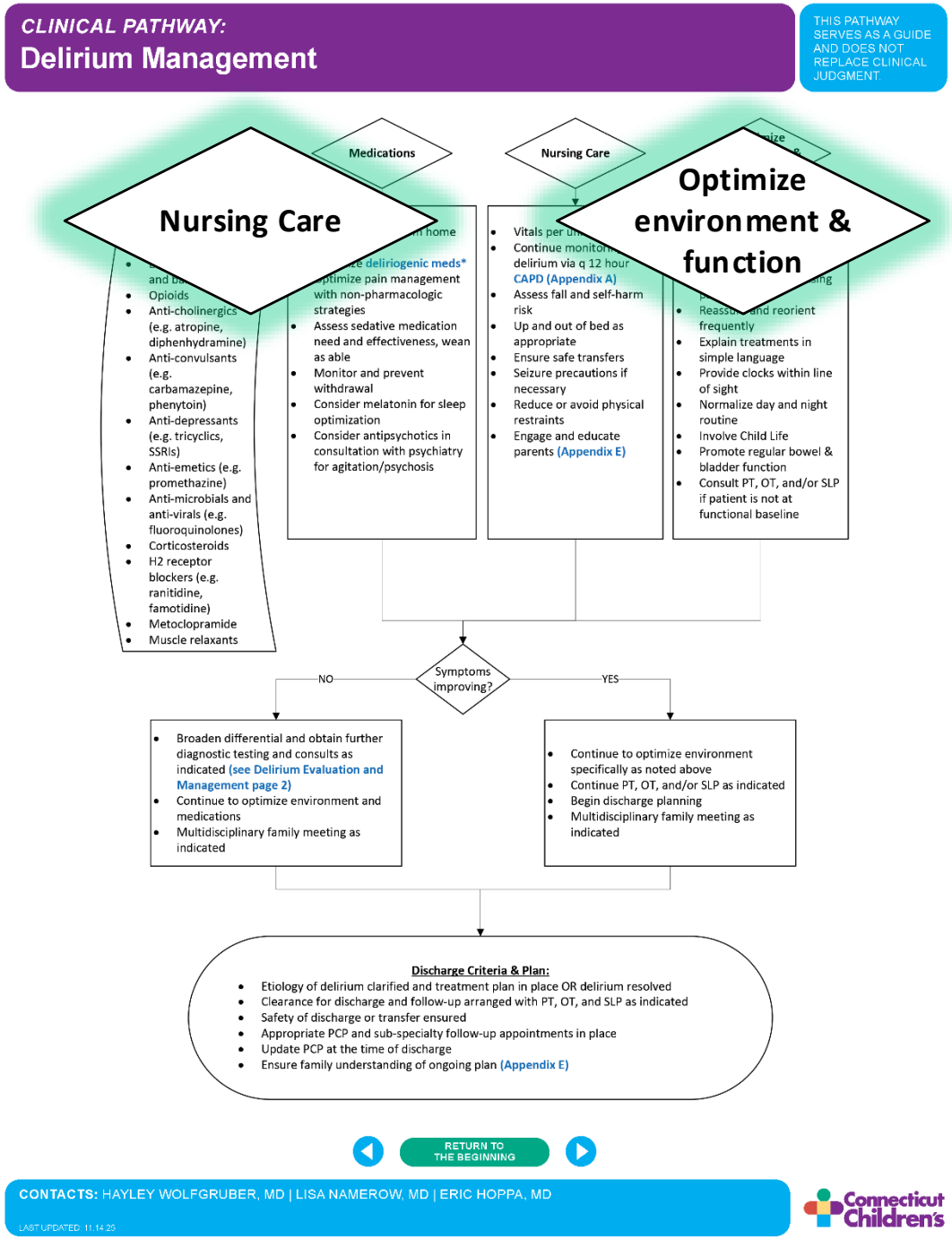
# DELIRIUM MANAGEMENT




Management of delirium encompasses 4 key categories:

- Treating the suspected etiology
- Medications
- Nursing care
- Optimizing environment and patient function

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

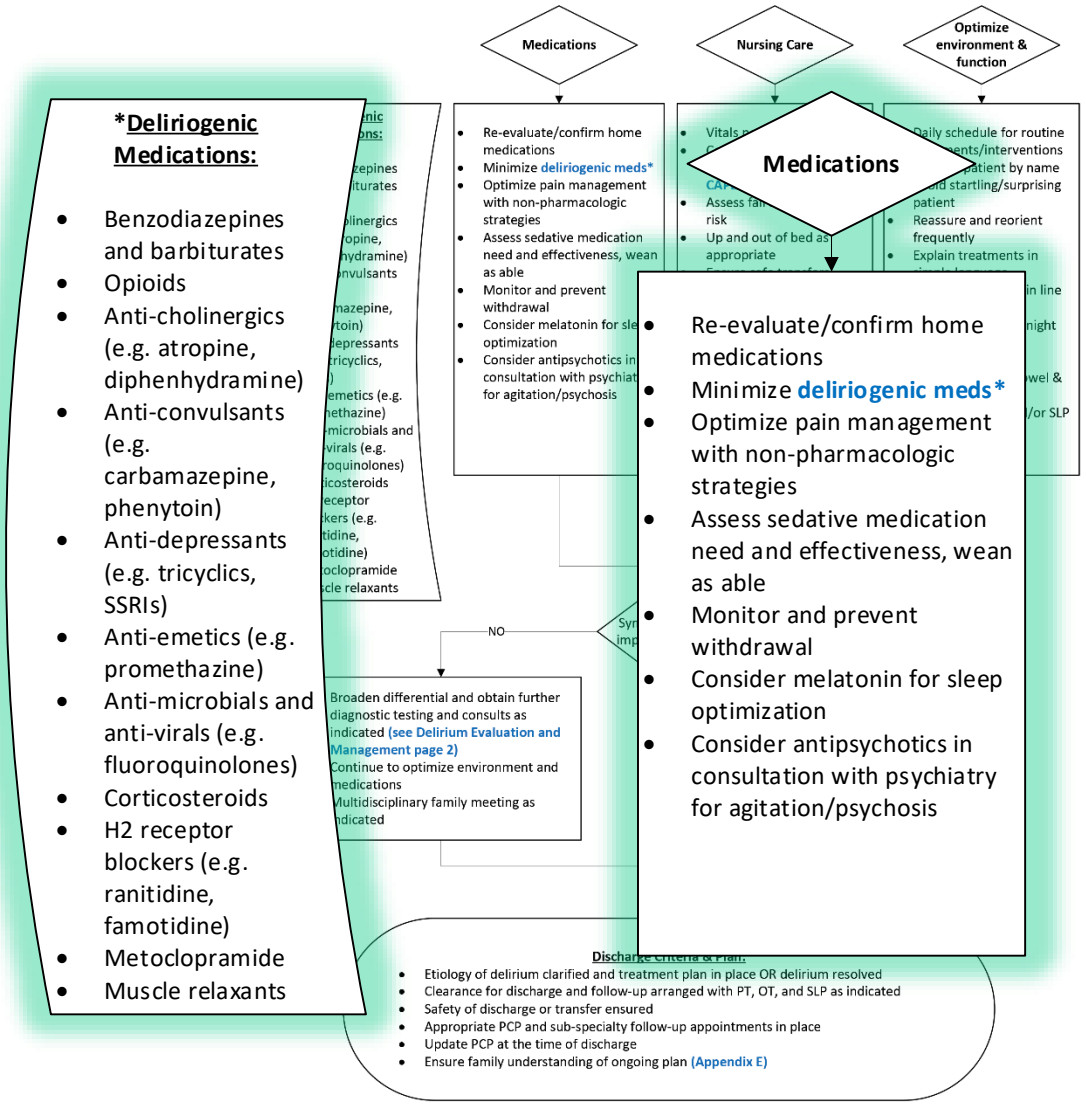


# DELIRIUM MANAGEMENT

Because certain medications can contribute to delirium, it is important to re-evaluate medications and minimize exposure to any deliriogenic medications

A list of deliriogenic medications is included on the clinical pathway

Psychiatry may assist with medical treatment of agitation and delirium

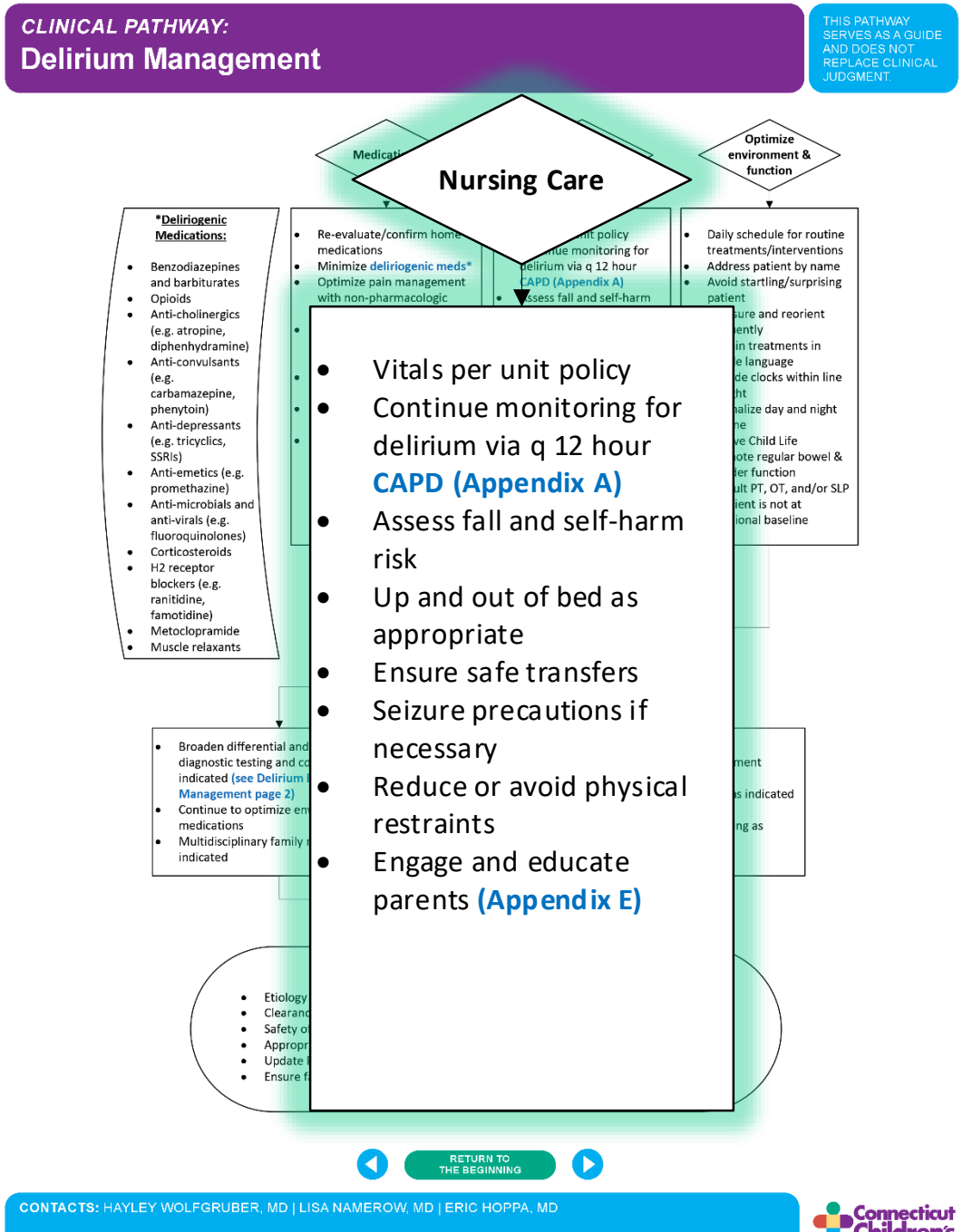


# DELIRIUM MANAGEMENT

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

Please provide families with the Caregiver Handout (Appendix E)



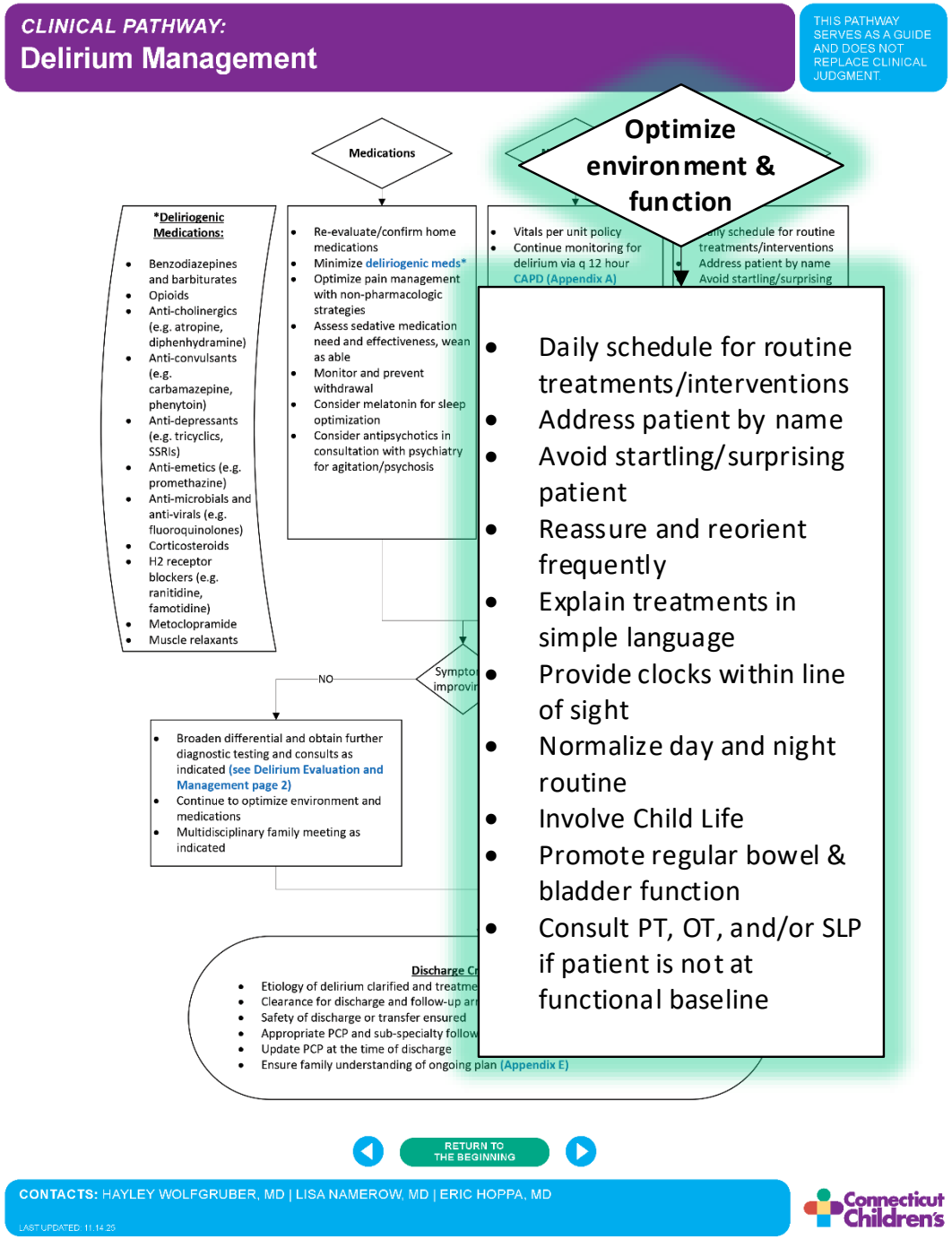
# DELIRIUM MANAGEMENT

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

Physical/Occupational/Speech Therapy and Child Life should become involved as early as it is safe to do so

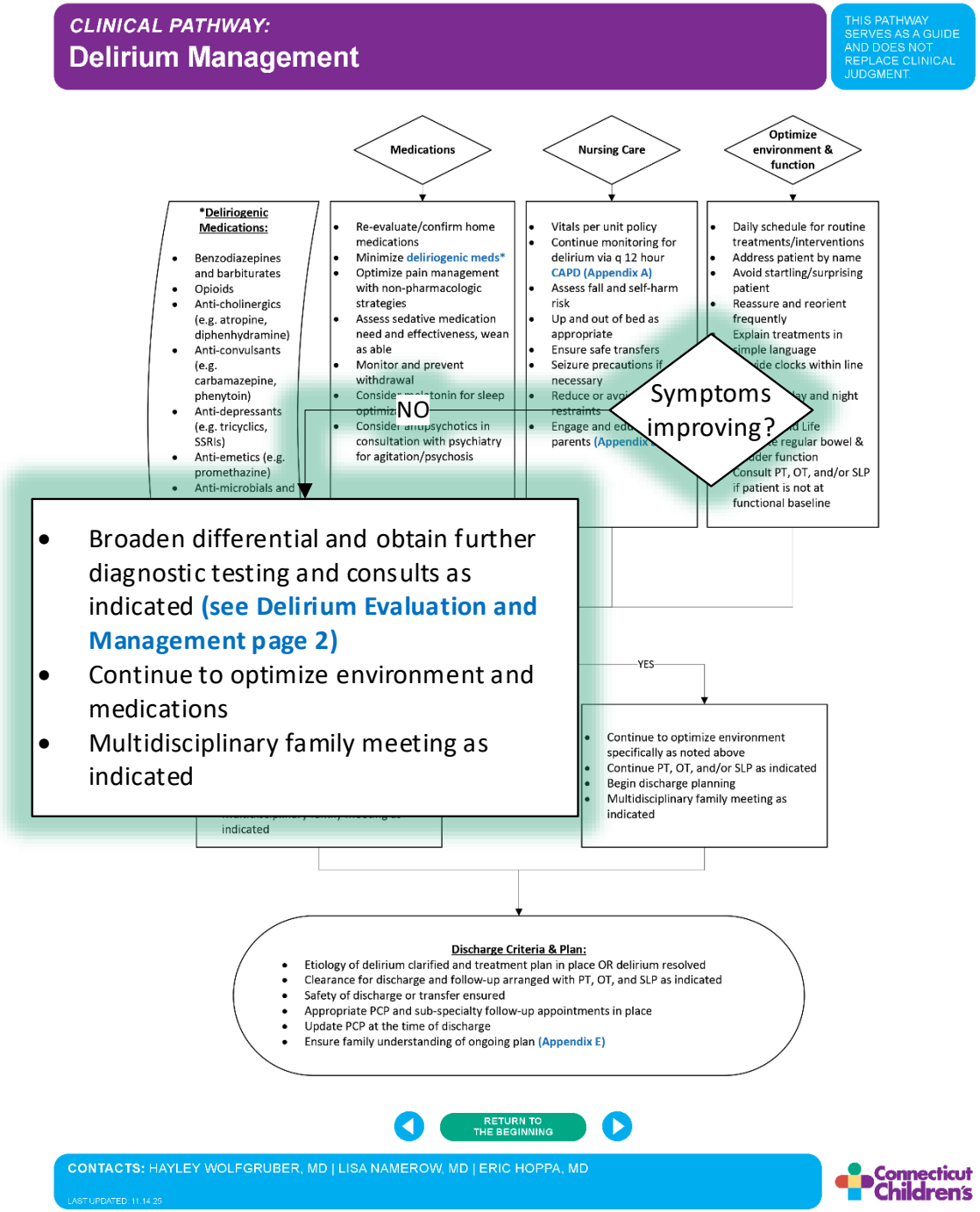
Child Life is helpful for creating a functional plan to help normalize day time and night time routines



# DELIRIUM MANAGEMENT

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

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

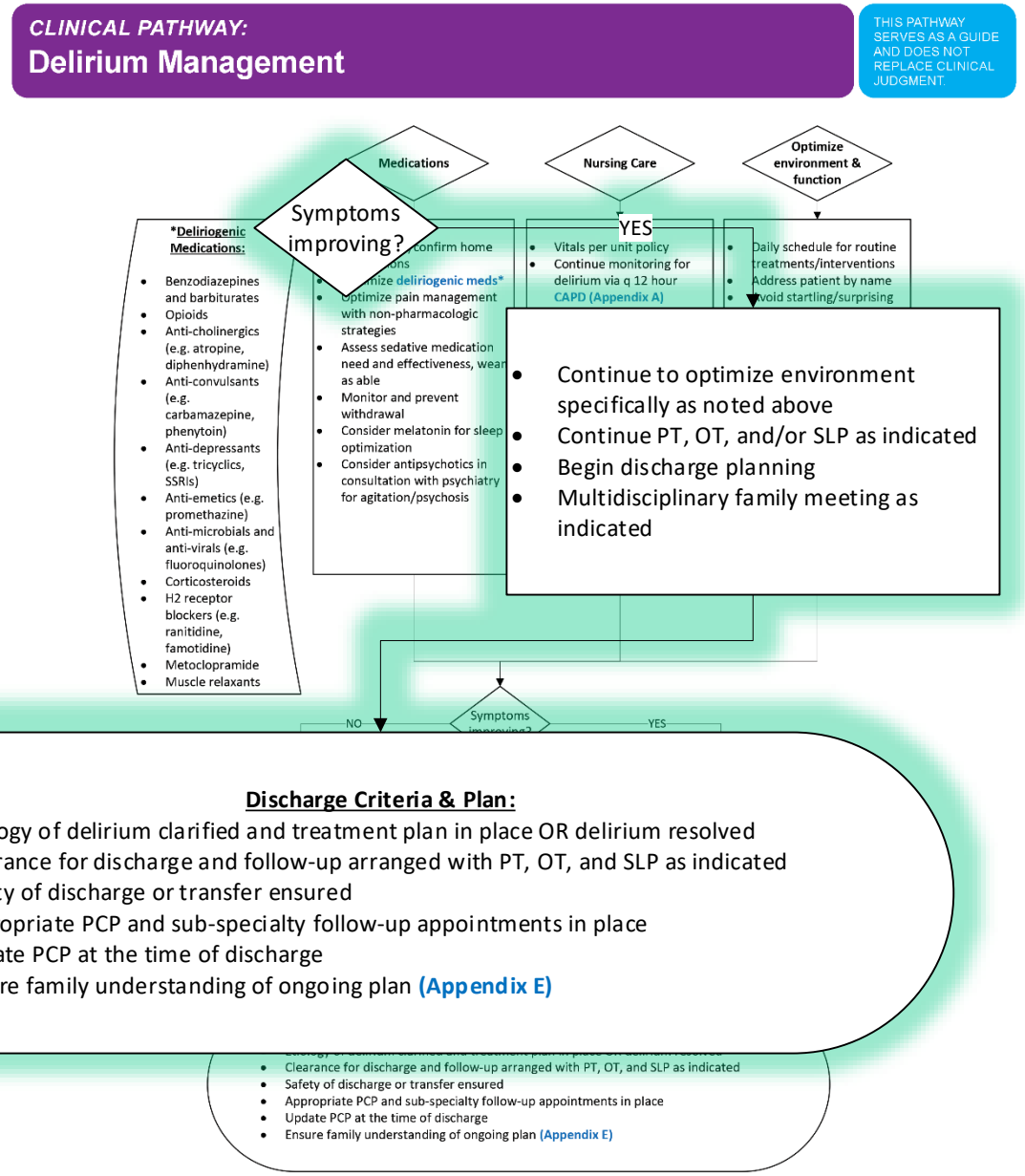


# DELIRIUM MANAGEMENT

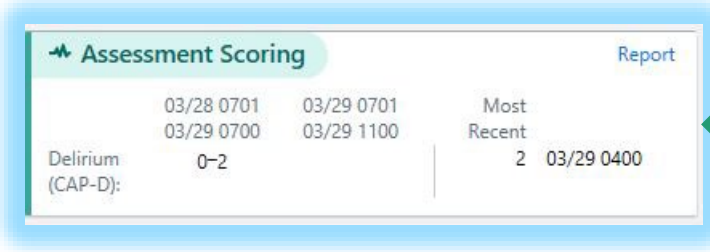
If symptoms of delirium are improving, management strategies to continue while planning towards discharge.

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)

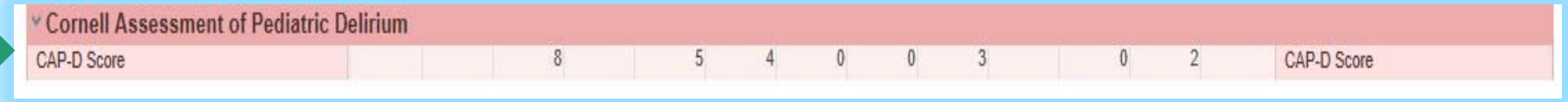


# The CAPD: Where is it in the Chart?

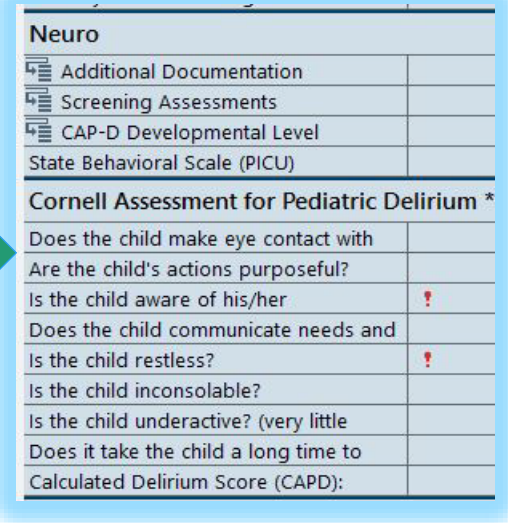



On the patient's Summary screen under "Assessment Scoring"

On the Vital Signs screen listed under the vitals signs




Under the flowsheet "Pedi A&I"

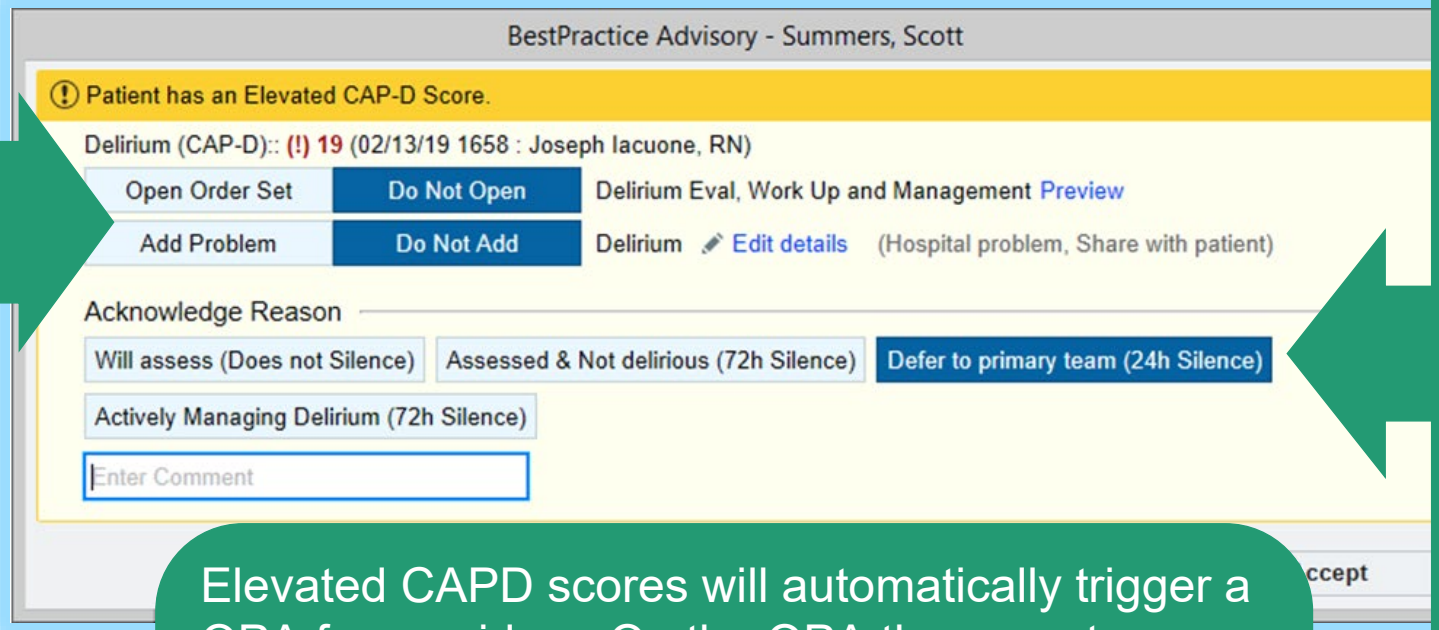



**You can also add a column for the CAPD to "My List" for easy viewing when looking at your patient list**

# The CAPD: Our Practice Advisory (OPA)

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 OPA for providers. On the OPA 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 chose a reason why on the bottom “Acknowledge reason section”

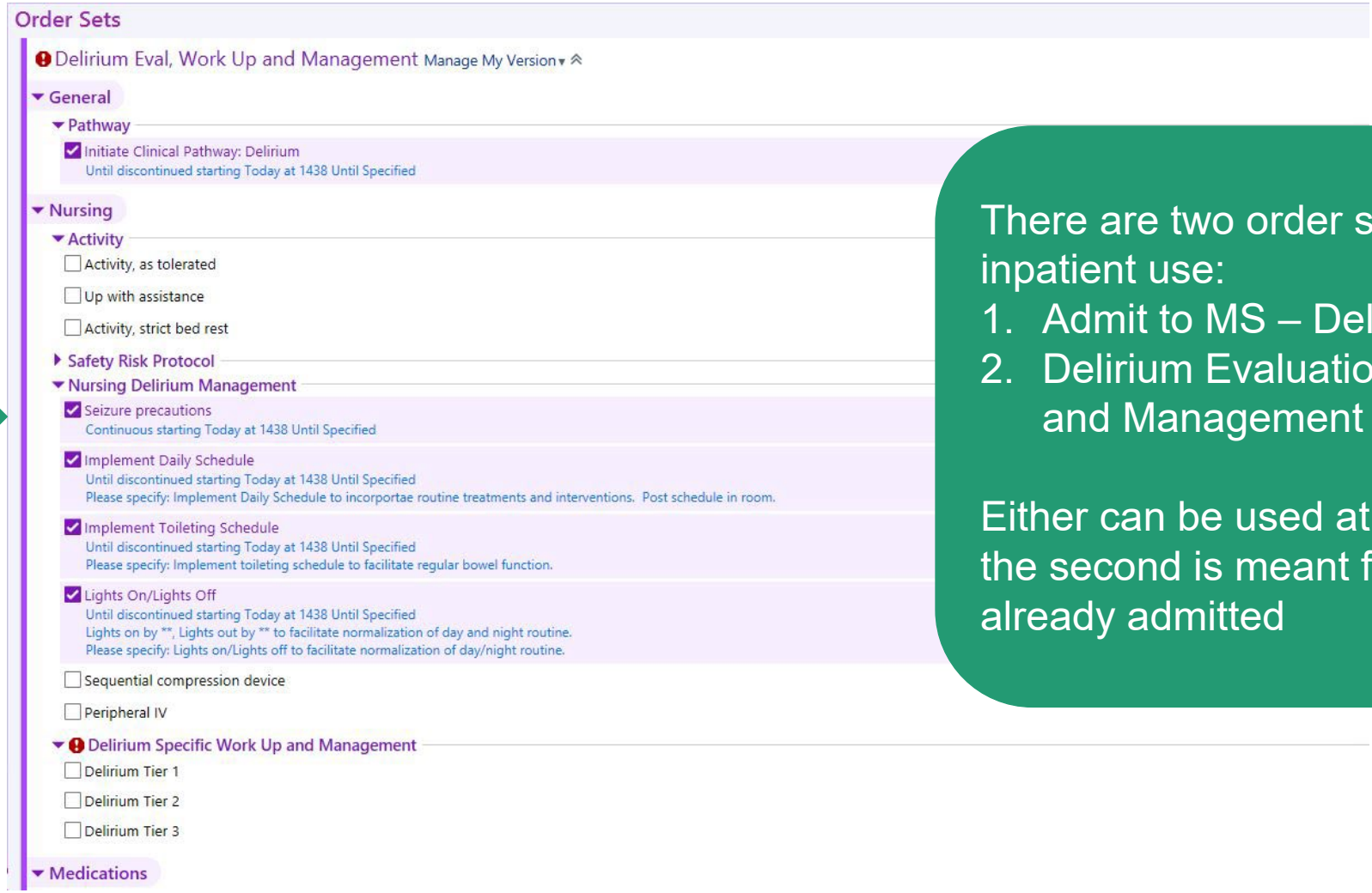
The Acknowledge Reason section should be used when you do not want to perform one of the above two actions.

- 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…”.

# Order Set

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
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
- Our Clinical Pathway provides a consistent approach to preventing, screening, evaluating, and managing delirium **for those patients at risk of developing, or already exhibiting, delirium**

# Quality Metrics

- Percent patients with pathway order set
- Percent patients with at least one screening done
- Percent patients with a delirium ICD10 code and have at least one screening done
- Percent patients with at least one CAPD >=9
- Percent patients with a CAPD >= 9 who are transferred to PICU
- Percent patients with a CAPD >= 9 who have a MET activation
- Percent patients with CAPD >=9 who have delirium ICD10 code
- Percent patients with CAPD >=9 who are being evaluated by Psychiatry.
- Percent patients with CAPD >=9 who have a CT Scan
- Percent patients with CAPD >=9 who have developmental delay, developmental disability and/or intellectual disability code
- Average Length of Stay (days) for patients with CAPD >=9
- Average Length of Stay (days)

# Pathway Contacts

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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.