PEDIATRIC DELIRIUM

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Delirium is a term which describes ACUTE BRAIN DYSFUNCTION.

The brain may not be getting enough oxygen or blood flow, may have been exposed to infection, may have suffered trauma, may suffer from sleep deprivation or anxiety, and may have mixed messages from action of multiple psychoactive drugs.
→ No matter what the cause or the reason…**Delirium means the brain is NOT working at its BASELINE.**

Why should I care?

Because we know that up to **50% of critically ill children** suffer from some degree of delirium. Delirium in critically ill adults has been shown to lead to problems thinking, paying attention, and becoming "themselves" again even when the critical illness is over. We are studying these outcomes in critically ill children.

What should I expect when someone has delirium?

The brain suffers from critical illness similarly to other organs.

For example: A patient with septic shock may suffer from acute renal failure, lung injury, or cardiomyopathy. **It is not a surprise when the creatinine rises and UOP falls.** Treatment begins by dealing with the main cause of disease (septic shock) while not doing further harm. Antibiotics are started, though drugs like vancomycin which may make the **sick kidney sicker** are avoided if able. If the infection requires vancomycin then the dose or frequency is **expected to be changed** to decrease kidney exposure.

This parallels what you will experience with the therapeutic algorithm for delirium….

Acute Brain Failure

The most susceptible areas of the brain to "acute failure" are responsible for: **Attention, Calming oneself, Clear thinking, Orientation, Memory, etc**. When the brain is sick, it may have abnormal electrical activity, release too much or too little of neurotransmitters (NTs). Electrical messages require release of NTs and then interaction with various receptors. Three main NTs are **GABA, dopamine, and ACh**. The benzodiazepines and propofol are "sedatives" and work through stimulating **GABA**. Haldol and Olanzapine also have sedative and anti-anxiety properties but work by blocking **dopamine and serotonin**. Risperdal is a neuron membrane stabilizer and works through numerous NTs. When therapy for anxiety/agitation is needed and benzodiazepines are used in excess on the already sick brain, it leads to ongoing dysfunction of the brain even when the critical illness is over. (Vancomycin and sick kidneys) However, if anxiety/agitation is treated or supplemented with alternative drugs such as olanzapine in the same setting, patients seem to do better.

→ **So, a different drug for the same goal may have a better outcome for that organ…**

What will happen when my patient has delirium?

Presence or absence of delirium should be treated as a **vital sign**, and the response to delirium being present should follow the same approach you have for other vital sign abnormalities.

For example:

When the **blood pressure** is alarming 80/40 how do you expect the team to respond? Based on the patient and situation the response may vary from reassessment, to a fluid resuscitation, giving blood products, or starting a vasopressor, etc.

When the **heart rate** alarm goes off how do you expect the team to respond? Again based on the situation, treatment may include reassessment, fluid resuscitation, treating fever or SVT, even getting a cardiology consult.

When you have a patient who is pCAM-ICU positive and therefore **delirium present**, you can help the team determine the correct course for the patient. This may include reassessment, treatment of a new problem like hypoxia, fever, or hypotension, starting a schedule to improve a normal environment or improve sleep and day-night cycle, decrease medications the patient does not really need, or add medications which may modulate brain dysfunction and its negative expressions of agitation. The brain cells are struggling in the setting of critical illness to function at baseline. We want to optimize their ability to regain or maintain their function.

Do we always need to get a psychiatry consult?

We all get stuck on "**psychiatric consult**" and use of "**anti-psychotic**" drugs. The psychiatrists are physicians of the brain and behavior. When the brain does not work it expresses this with different behaviors: **an agitated and confused patient, a withdrawn and depressed patient, or a calm patient who is just "not themselves."** We get psychiatry involved because they specialize in the sick brain and use of alternative drugs to help our patients. This is similar to getting nephrology involved when a patient has ARF or a cardiology consult for SVT. The psychiatry team continues to see the patient until back to baseline or through discharge, which we do not. The goal is to provide symptomatic treatment of the "expressions" of the sick brain **AND** improve delirium. Most children have gross return of organ function upon discharge. Just like most children with ARF or SVT do not see a nephrologist or cardiologist after discharge; neither does the patient with **resolved delirium** see the psychiatrist after discharge.