



Clinical and Ethical Challenges in Pediatric Brain Death Determination

Definition of Pediatric Brain Death

American Academy of Pediatrics (AAP):

Determination of brain death in neonates, infants and children relies on a clinical diagnosis that is based on the absence of neurologic function with a known irreversible cause of coma.

Determination of Brain Death

1. Identify the cause of irreversible brain injury
2. Exclude conditions that can interfere with performing or interpreting the brain death examination
3. Two examinations with observation period
 - **Neonates** (>37 weeks gestational age to 30 days): 24 hours
 - **Infants and Children** (>30 days to 18 years): 12 hours
4. Apnea test accompanying each exam
5. Ancillary tests (if needed)

ADULT	PEDIATRIC
1 Exam	2 Exams • Mandatory Observation Period • 2 Apnea Tests • 2 Different Physicians
Ancillary Testing <i>Required only if the examination and apnea test cannot be completed</i>	Ancillary Testing <i>Required only if</i> • Components of the examination or apnea test cannot be completed • Inconclusive results of the neurological examination • Medication effects • Reduced inter-exam period
Temperature >36°C	Temperature >35°C
PaCO ₂ >60mmHg OR 20mmHg above baseline	PaCO ₂ >60mmHg AND 20mmHg above baseline

Clinical Challenges

The evaluation of patients for brain death can be complicated by specific clinical challenges. These conditions include, but are not limited to, the presence of spinal reflexes, neuromuscular blockade, therapeutic hypothermia, neonatal cerebral physiology, extracorporeal membrane oxygenation (ECMO), and variability of drug metabolism.

Ethical Challenges

Ethical questions are raised when considering brain death and how that affects the diverse population we serve. It's important to remember that brain death is not universally accepted. There are religions and cultures that do not accept brain death as a final diagnosis and, in a couple of states, there are statutes to accommodate those beliefs.

Communicating with Families

For the vast majority of families, it's best to begin communicating early and often after acute brain injury in an effort to be transparent and avoid confusion. When delivering the devastating diagnosis of brain death, it is important to pay close attention to the language used. **Be clear and avoid conflicting language** such as "he/she will die after discontinuation of the ventilator," or the use of the terminology, "life support," when in actuality life is not being supported anymore. Try explaining the clinical definitions of death and emphasizing that brain death equals death. Lastly, do not present the discontinuation of the ventilator as an option, instead, it should be presented as the appropriate next step.



References:

The content of this issue is based on a webinar presentation by Matthew Kirschen, MD, PhD (Assistant Professor of Anesthesiology and Critical Care Medicine, Pediatrics, and Neurology, Children's Hospital of Philadelphia, Pennsylvania, PA) and Wynne Morrison, MD, MBE (Associate Chief for Faculty Affairs in Anesthesiology, Critical Care Medicine, and Pediatrics, Director of Palliative Care, Children's Hospital of Philadelphia, Pennsylvania, PA). **Special thanks to Dr. Kirschen and Dr. Morrison for their contributions to this in-service.**

- Nakagawa T, Ashwal S, et al. (2011) Guidelines for the Determination of Brain Death in Infants and Children. *Critical Care Med.* Peds.2011-1511
- Wijdicks E.F.M., et al. (2010). Evidence-based guideline update: Determining brain death in adults. *Neurology* 74: 1911-1918.
- Additional resources can be found in the Organ Donation Toolbox under the "Pediatric Donation" section. <https://organdonationalliance.org/organ-donation-toolbox-pediatrics/>
- A link to the Brain Death toolkit hosted on the AAN website can also be found in the Organ Donation Toolbox under the "Neurological Determination of Death" section. <https://organdonationalliance.org/organ-donation-toolbox-braindeath/>

This in-service also available on The Alliance Blog:
<https://organdonationalliance.org/education-corner-pedbd-2018>