



Development, Implementation, and Education Regarding a Pediatric Stroke Protocol in a Children's Hospital

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Introduction

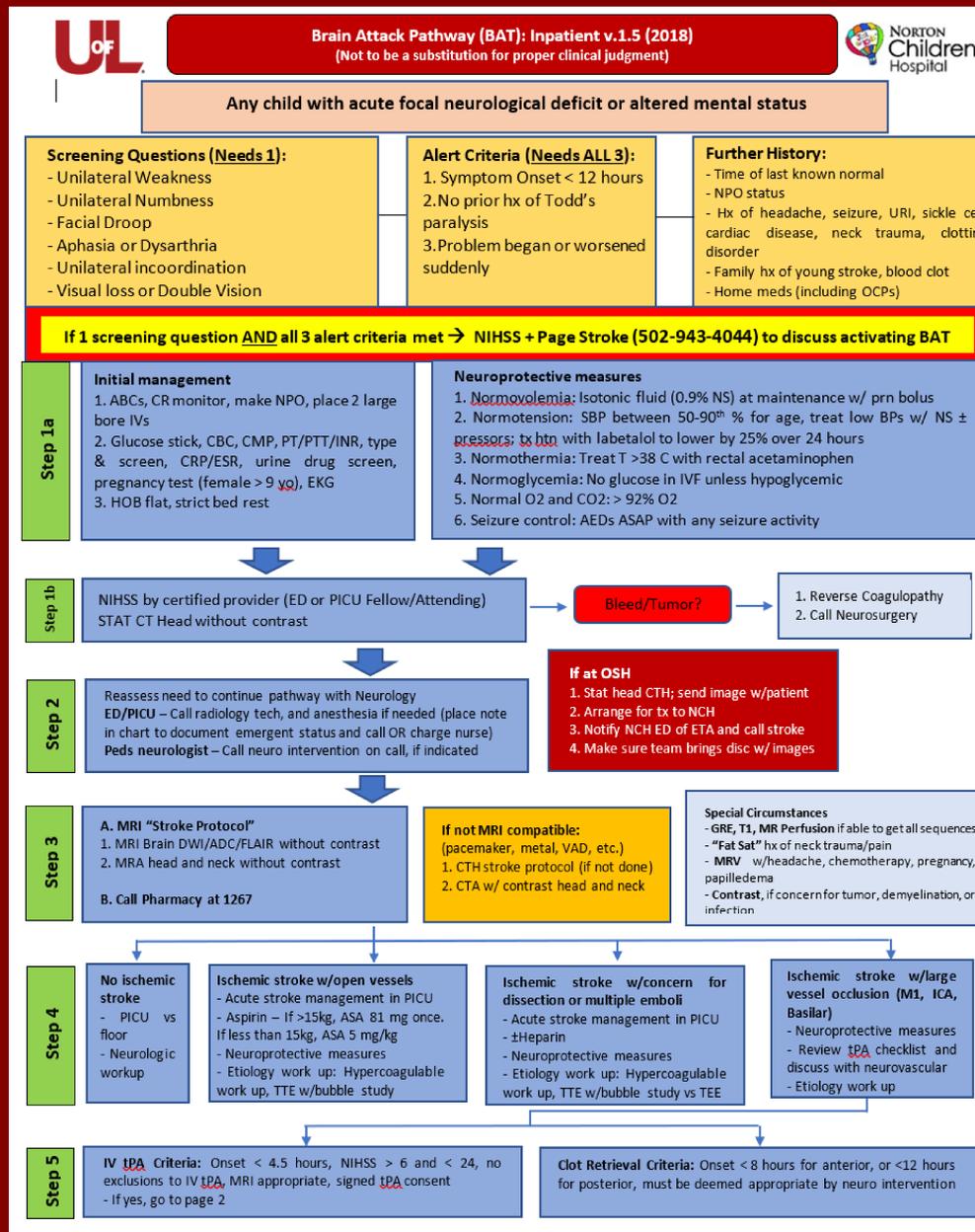
Pediatric arterial ischemic stroke occurs in 1-2 out of 100,000 children in developed countries. Pediatric stroke can be difficult to diagnose and recognize due to its varied presentation compared to adults, lack of awareness among parents and providers, and a wide array of mimickers. Studies have shown an average delay in diagnosis from onset of symptoms of 22.7 hours and an 8.5 hour delay in imaging. There are currently no FDA approved treatments for pediatric stroke.

Furthermore, a lack of national data for pediatric stroke can result in a delay regarding decision making. As a result, many centers have created uniformed stroke protocols based on hospital consensus among hospital experts to assist in management decisions. We sought to create a similar standardized pediatric stroke protocol for our institution.

Methods

Multiple standardized stroke protocols were reviewed from various centers across the country. A pediatric stroke protocol was then developed in association with a pediatric attending neurologist. The Norton Children's Hospital Pediatric Stroke Committee was then formed to review, discuss, and approve the new Brain Attack Pathway (BAT). This committee included representatives from Child Neurology, Neurosurgery, Radiology, Emergency Medicine, Anesthesia, Pharmacy, Intensive Care, and the Transport team. Education and training was provided to the Intensive Care faculty and fellows, Emergency Medicine faculty and fellows, and Norton Children's Hospital transport division in the form of 1 hour lecture sessions. A 10 question pre- and post-lecture assessment on pediatric stroke and the new protocol was conducted among the Intensive Care and Neurology faculty, nurse practitioners, and fellows.

Norton Children's Hospital Brain Attack Pathway



Results

Creations of the Norton Children's Hospital Pediatric Stroke Committee

Norton Children's Hospital Brain Attack Pathway

Official pharmacy tPA order set and protocol

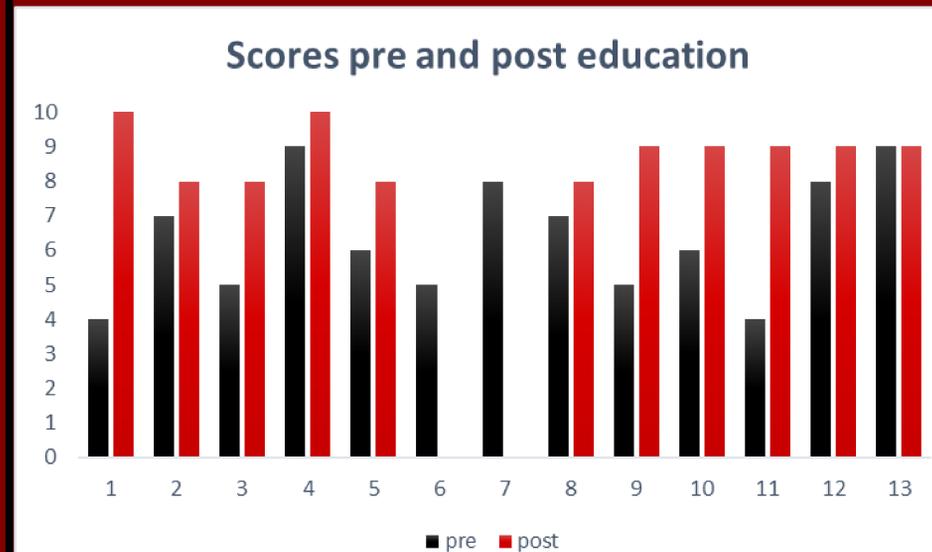
Emergency room stroke order set

Stroke sedation anesthesia guidelines

Pediatric stroke imaging protocols

Education for emergency room, intensive care, and transport teams

Score improvement after education



Scores on a pre and post test are reflective above. Pre-test average was 6.4 and increased to 8.8, leading to an average score increase of 2.4. Of note, two tests did not have completed post tests.

Discussion

- Pediatric stroke is an underrecognized and underdiagnosed condition in children leading to lifelong disability.
- Many centers have developed and implemented a standardized stroke protocol approved by expert consensus to guide treatment.
- The Norton Children's Hospital Brain Attack Pathway (BAT) was approved and implemented on October 1st, 2018.
- Next steps include a quality improvement project assessing door to MRI times in patients with concern for pediatric stroke, as well as further education for pediatric residents and nursing staff including a lecture training session and mock brain attack alert format.

References

- Ferriero DM et al. Management of Stroke in Neonates and Children: A Scientific Statement From the American Heart Association/American Stroke Association. Stroke. (2019).
- Rivkin MJ et al. Guidelines for urgent management of stroke in children. Pediatric Neurology. 2016. 56:8-17.