

## Evaluation of Appropriate Clinical Utilization of Pediatric Stroke Protocol/MRI Examinations

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### Abstract

**Background:** Pediatric stroke is rare with only 1000 pediatric strokes in the United States per year. Despite its infrequency, pediatric stroke remains a major cause of morbidity and mortality in the pediatric population which is often attributed to delays in diagnosis with cases remaining under or misdiagnosed. This is largely due to the lack of focused neurological signs such as focal motor weakness, facial weakness and aphasia in children. Non-specific symptoms such as seizures, lethargy, generalized hypotonia and headache tend to be more frequently encountered with pediatric stroke. While CT head can be a useful first line imaging option, MRI brain may be required in the pediatric age group to arrive at a definitive diagnosis. It is important, however, to recognize the appropriate symptoms which merit the need for evaluation by pediatric stroke MRI due to the high rate of stroke mimics and to avoid overutilization and inappropriate use of urgent MR imaging.

**Objective:** To study the impact of having monthly educational reviews regarding the most recent usage of pediatric stroke protocol and their appropriateness in the context of the patient's presenting symptoms.

### Materials and Methods:

The number of ordered pediatric stroke protocol cases and the number of positive stroke cases and negative stroke cases are logged every month and the data is analyzed to see how many of those cases are true positives. The attendees are then given information regarding each scenario when the protocol was activated, what the final diagnosis was, and whether activating the protocol was beneficial or not in identifying arterial ischemic stroke. Additionally, a 5-question survey utilizing a Likert scale is distributed to conference attendees with questions focused on the impact of monthly educational sessions.

### Results:

Since the initiation of monthly conference sessions, there has been a decrease in the number of false positive pediatric stroke cases identified by emergent MR. Additionally, when surveying conference attendees, 75% of respondents agreed that monthly educational sessions help to decrease the use of unnecessary stroke protocol/MR examinations and 67% of respondents agreed or strongly agreed that monthly conference sessions have been helpful in their decision making regarding when to order a study. Remaining questions were analyzed separately as additional effectiveness assessment tools for conference sessions.

### Conclusion:

Since the initiation of this study, there has been an overall decrease in inappropriate usage of urgent pediatric stroke/MR studies with 75% of conference attendee respondents agreeing that monthly educational sessions help to decrease unnecessary stroke protocol/MR examinations. Further research may look into other educational tools and interventions that promote the appropriate ordering and usage of pediatric stroke protocol/emergent MR studies.