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Required Skills:

- Ability to read and make enhancements to existing code
- Front –end web development , back end development, web servers
- Interest in improving the health of pediatric populations
- Interest in SMART or FHIR

Preferred Team Communications:

WEBEX, Skype or Conference call

Data Sources:

Georgia Tech synthetic data will be sufficient for the project.

Other Items:

Project has timezone flexibility.
Mentors and students will determine a good time for virtual meeting

PEDIATRIC TBI- CLINICAL DECISION SUPPORT FOR IDENTIFICATION AND MANAGEMENT

Project Background: As attention to concussion and traumatic brain injury (TBI) has grown in recent years, there has been an increase in the number of pediatric patients with concussion (also known as mild TBI, or mTBI) seen in a variety of healthcare settings that include emergency departments, urgent care setting and primary care providers. However, many providers have insufficient time and training to systematically assess and manage patients with suspected mTBI, thus limiting adoption of best practices to ensure diagnosis and management consistency. The consequence of missing mTBI diagnosis includes the failure to recommend appropriate treatment and management; this may contribute to prolongation of symptoms and increased risk of re-injury. Even when mTBI diagnosis is made, there are inconsistencies in TBI assessment, the comprehensiveness of discharge recommendations, and substantial variation in management protocols. Research is needed to identify the best ways to educate providers and support clinical decision making at the point of care to facilitate pediatric mTBI diagnosis, management, and treatment, to improve patient outcomes.

Children with TBI navigate two systems of care - health systems and school systems. There are challenges, inconsistencies, and gaps in current systems of care for children with TBI, particularly for children who are transitioning to school after acute care. Communication of medical information to parents and school personnel is inconsistent and requires parent authorization, which contributes to gaps in care and potentially poorer health, education, and social outcomes for children. In particular, primary care providers, who are seeing and increasing number of children with mild TBI, have demonstrated difficulty in translating important management concepts such as return to school into clinical practice. A recent study suggests that intervention using clinical decision support embedded in electronic health records along with in-person training can effectively change provider behavior. Further research indicates that parents frequently make errors related to the knowledge and execution of discharge instructions, especially for complex discharge instructions, limited English proficiency and if they have public insurance.

Although The Health Information Technology For Economic and Clinical Health Act (HITECH) Act of 2009 provided incentives for EHR adoption and were influential in accelerating the pace, rural hospitals and physician practices have still been slower to adopt this technology due to limited resources and practice barriers compared to urban and teaching school hospitals. Further, many rural hospitals have adopted electronic health records but have difficulty achieving the meaningful use phase which requires more comprehensive reporting and discharge instructions for patients.

Intellectual Property: Project involves a government agency so the resulting project is made available to the public. Students do not own IP. Students will be recognized as contributors

The CDC National Center for Injury Prevention and Control's Board of Scientific Counselors (BSC) provided recommendations to CDC on the diagnosis and management of pediatric mTBI. Specifically, the BSC established the Pediatric mTBI Guideline workgroup to conduct a systematic review of the literature and draft clinical recommendations for the diagnosis and management of mTBI in children ages 18 years and younger. Evidence-based clinical recommendations such as the ones offered by this workgroup can serve as a foundation for training and tools to improve clinical decisions for mTBI. For example, the report provides information about risk factor identification and imaging, neuropsychological tools, tools for and counseling on prognosis, patient education and reassurance, psychosocial support, return to school, and symptom management. In addition we have developed several tools for TBI symptom recognition that can be used for parents.

CDC's Division of Unintentional Injury aims to assess the feasibility of using Fast Healthcare Interoperability Resources (FHIR) to promote evidence-based diagnosis and management of TBI in children. The aim is to improve medical diagnosis at the time of injury by using evidence based guidelines made more available to clinicians. Another goal is to improve communication between clinicians, families, and schools in order to improve post injury management. We are particularly interested in the applicability of this technology in rural health systems and primary care providers' practices.

PROJECT OBJECTIVES

1) To increase functionality of a provider facing app developed in Fall 2017 that includes user testing and 2) devise a parent/patient app that alerts parents about symptom monitoring and follow-up, and aids in communication between parents and the healthcare and school settings.

SUCCESSFUL PROJECT

1) Provider Facing App-Evaluate functionality of a provider interface using evidence based guidelines that can be inserted into any system of electronic health records (in hospital, urgent care or provider practices) for physician diagnosis and management of mild TBI.

2) Patient-Parent Facing App-This app can be given to parents at the time of the injury care visit to provide symptom monitoring information and provide alerts for follow-up. A goal is to create a platform for multiple phone types to ensure application for a diverse range of demographic considerations. phone types to ensure application for a diverse range of demographic considerations.
