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Children with Concussions Require Follow-up Care Before Returning to Play, Say Researchers

Children hospitalized with concussions should wait until they are seen by a clinician in a follow-up exam before returning to regular sports or playtime activities, according to researchers at The Children's Hospital of Philadelphia (see also [Pediatrics](#)).

Rather than only consulting a doctor when there are obvious trouble signs after the initial treatment, the Children's Hospital researchers recommend that a qualified healthcare provider perform a formal assessment after hospital discharge but before child resumes exertional activities. The study team used a computer-based testing program created to assess athletes with concussions and determine when it was safe to return to play. The authors found that nearly all the children admitted to the hospital with a concussion had some abnormal brain function during initial testing.

"Head injuries that occur during regular activities, such as riding a bike or in a car crash, are more common than sports injuries and yet the same issues arise, the children want to go back to sports, or to school or outside to play," said Michael L. Nance, M.D., lead author of the study and director of the Trauma Program at Children's Hospital. "The old recommendation would be to go see your pediatrician if you are having trouble, but sometimes families don't recognize there is trouble until six months later. We think they should be seen again by a qualified healthcare provider before returning to play."

The researchers' article appears in the May issue of the journal *Annals of Surgery*.

Mild traumatic brain injury, commonly referred to as a concussion, is a head injury that typically does not cause any visible physical damage, but frequently has symptoms such as headache, vomiting, loss of consciousness, or fatigue. Mild traumatic brain injury is a common injury in children yet only about 12 percent of those resulting in hospitalization occur during athletic activities.

Prior research has demonstrated that children are more likely to sustain another concussion if they return to play or exertional activities prematurely. In addition, high school athletes recover more slowly than college or professional athletes. Presumably the same is true for children with concussion from non-sports related causes.

The study, which looked at 116 children ages 11 through 17 at an urban Level 1

trauma center over two years, set out to determine if measurable impairments existed in children admitted to the hospital with a concussion and if the computer-based testing program could be easily used in the hospital setting. The computer assessment is administered bedside and takes about 25 minutes.

The test results revealed an alarmingly high rate of cognitive deficits in nearly all patients. It tests specific abilities, such as attention span, memory, nonverbal problem solving and reaction time. Almost all patients tested below the 25 percentile in at least one area; the majority demonstrated significant impairment for all four subtests.

The test also assesses the degree of concussion symptoms and the majority of children with concussions demonstrated an abnormal symptom score. The follow-up group demonstrated significant improvement in neurocognitive performance on all four subtests as well as an improvement in their symptom scores.

"This computer test is a useful tool both in initial hospital evaluation and in performing follow-up evaluations," said Nance.

One challenge is to have patients return for follow-up appointments. Despite the best efforts of the health care team, just over half the patients returned for scheduled visits. Dangers of resuming activity after concussion include prolonging symptoms, repeat concussions and even death.

"We suspect that the patients electing not to follow-up were at risk as well, and would have benefited from a formal assessment before returning to physically exertive activity," Nance said. "It is this misconception of not feeling injured that places the patient at additional risk."

Dr. Nance's co-authors are Alison Polk-Williams, B.A., from The Children's Hospital of Philadelphia; Michael Collins, Ph.D., University of Pittsburgh Medical Center Sports Concussion Program; and Douglas Wiebe, Ph.D., Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania. The study was supported in part from the Josephine J. and John M. Templeton, Jr., Endowed Chair in Pediatric Trauma.

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