

Vision and balance issues are common in elementary school-age children with a concussion

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Christina L. Master, MD, FAAP, CAQSM, FACSM, is a sports medicine pediatrician at CHOP with expertise in primary care sports medicine and brain injury medicine. Credit: Children's Hospital of Philadelphia

Head injuries that lead to concussions can happen at any age, and children impacted by concussions have different needs and recovery

patterns. In a new study, researchers at Children's Hospital of Philadelphia (CHOP) have performed the most comprehensive characterization of elementary school-age concussions to date, revealing an opportunity to improve outcomes for this age group through more consistent visio-vestibular assessments at the initial health care visit. The findings were published today in the *Journal of Pediatrics*.

Many recent studies on pediatric concussions have focused on adolescent athletes, leading to changes in how clinicians diagnose and actively manage their concussions. But little is known about delivery of clinical care for young [children](#) with concussion who are different developmentally and in their goals for recovery than older youth.

"Since one-third of pediatric and adolescent concussion injuries occur in elementary school-age children, we set out to provide a comprehensive description of children ages 5-11 years who were diagnosed with concussion to pinpoint opportunities to improve the quality of diagnosis and care for this age group," said lead author Christina L. Master, MD, a sports medicine pediatrician at CHOP, a senior fellow at the Center for Injury Research and Prevention (CIRP), and Co-Director of the CHOP's Minds Matter Program.

The Minds Matter team collaborated with colleagues from with the U.S. Centers for Disease Control and Prevention (CDC), utilizing CHOP's single, linked electronic health records (EHR) system to analyse retrospective data on more than 1,500 patients ages 5-11 years and diagnosed with a concussion over a recent one-year period.

The study found that vision and balance issues were as common in this population as they are in adolescents. However, specific visio-vestibular assessments were not consistently performed at the time of diagnosis. In particular, these assessments occurred much less frequently outside of specialty care practices. Initial visits were evenly split between a primary

care physician (49%) and an emergency department or urgent care (49%), with the remaining 2.1% seen in specialty care first, although it's important to note that 24.7% of all patients saw a specialist at some point in their care. Additionally, 21% of patients saw a school nurse, highlighting the important role nurses play in the identification and proper monitoring and management of these patients.

Approximately two-thirds of patients in this study (66.1%) self-reported visio-vestibular problems. Overall, 74.3% of patients had a visio-vestibular assessment at some point in their care and among these patients, 62.7% had identifiable deficits.

When it comes to providing concussion recovery planning to families, less than half (43.8%) of all concussed patients were provided with a letter recommending school accommodations, such as taking breaks for symptoms, extra time for assignments, or use of larger print or audio books. The vast majority (95%) of patients seen only in the [emergency department](#) were not provided with a letter for school accommodations.

In total, 56.2% of patients received documentation of clearance to return to play or [recreational activities](#). While this may represent the proportion of children participating in organized sports, virtually all of these children are returning to physical activity of some type, like [free play](#) or gym class, and therefore all concussed children in this age group would benefit from guidance on how to return to physical activity.

"Children ages 5 to 11 years diagnosed with a concussion had similar rates of visio-vestibular deficits to adolescents and we know that adolescents who have visio-vestibular deficits also have a greater likelihood of persistent symptoms and poorer outcomes," Master said. "Our older youth really benefit from early intervention in the form of school accommodations, return to school and physical activity plans, and vestibular or vision therapy. We believe intervening early can also

improve outcomes for younger children diagnosed with visio-vestibular deficits."

Master and her co-authors recommend that clinicians conduct visio-vestibular assessments at the initial health care visit and let the results guide the next steps for [concussion](#) management, such as providing a letter or discharge instructions specifying targeted school accommodations, return to physical activity plans and referrals to specialists for patients who have deficits and are therefore at risk of persistent symptoms and longer recovery times. Additionally, the researchers stressed the need to develop proper clinical support tools that aid clinicians in closing the gap to improve early identification and management of these deficits for younger children who have suffered concussions.

More information: Master et al. "Characteristics of Concussion in Elementary School-aged Children: Implications for Clinical Management." *J Pediatr*. Online 4 June 2020. [DOI: 10.1016/j.jpeds.2020.04.001](#)

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