

Study suggests youth with concussions may be able to engage in physical and cognitive activity sooner post-concussion

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Concussion, a form of traumatic brain injury, is a common injury among children and teens. Concussions can have adverse effects on physical,

cognitive, emotional and sleep health. Clinical guidelines for managing concussion in children and teens traditionally recommend complete physical and cognitive rest until symptom resolution, followed by a gradual return to activities like school and sports. These guidelines are often disputed and based on expert consensus as opposed to strong evidence. The challenge has been how to quantify the amount of physical and cognitive activity that children and teens should engage in during recovery. A new study by researchers at the Center for Injury Research and Policy, Sports Medicine, and Emergency Medicine at Nationwide Children's Hospital investigated objectively measured, self-paced physical and cognitive activity across the first week post-concussion.

The study, published today in the *Journal of Head Trauma Rehabilitation*, found that self-paced physical and [cognitive activity](#) during the first week after sustaining a concussion alone neither hastened nor prolonged concussion recovery in children and teens. These findings indicate that children and teens with concussion may have some flexibility to determine their own activity levels during recovery. Physicians may encourage safe, non-contact, light [physical activity](#) if it does not make youths' concussion symptoms worse, while also continuing to emphasize appropriate amounts of necessary rest.

Study participants were 11 to 17 years old, seen within 72 hours of injury in the emergency department or a concussion clinic through Nationwide Children's Hospital and received a physician-confirmed diagnosis of concussion. They wore two devices—one to measure their physical activity and sleep around the clock, and one to measure their cognitive activity outside of school. Participants rated their daily concussion symptoms by completing the Postconcussion Symptom Scale during the first week post-injury.

Researchers found that while daily physical and cognitive activity

increased across the first week post-injury, daily post-concussion symptoms decreased. Increased daily step count was associated with an increased likelihood of early [symptom](#) resolution. However, this association was not statistically significant after adjusting for acute post-concussion symptoms and other covariates.

"This study is the first to objectively measure self-paced cognitive activity during the first week post-injury," said Ginger Yang, Ph.D., MPH, lead author of the study and principal investigator in the Center for Injury Research and Policy at Nationwide Children's. "While increased physical and cognitive activity may help reduce post-concussion symptoms, reduced symptoms may also lead to increased physical and cognitive activity levels, highlighting the need for further research to better understand this bi-directional relationship." Such research will provide evidence of when an individual is ready for physical and cognitive activity after concussion and what level of activity is most appropriate. This information could be used by clinicians to inform treatment decisions, including individualized physical and cognitive activity recommendations post-concussion.

"Concussions behave somewhat like snowflakes in that they are not all the same, and the specific effects of concussion on our [young patients](#) varies greatly—one size or treatment does not, necessarily, fit all," said Thomas Pommering, DO, co-author of the study and division chief of sports medicine at Nationwide Children's. "The strength of this study is that it appears that children and adolescents with concussions are generally pretty good at self-pacing their physical and cognitive activity so as to not prolong their recovery. With the guidance of physicians, there may be room for personalized treatment plans based on the symptom burden, while still following important guidelines protecting the patient from repeat head injury during the recovery time."

Data for this study came from youth-parent dyads referred to the study

team by their school athletic trainer or recruited at the Nationwide Children's Hospital emergency department or concussion clinics. Following a physician-confirmed diagnosis of [concussion](#), youth-parent dyads were contacted by research staff and enrolled within 72 hours post-injury after providing written assent and consent. Enrolled dyads were then followed until symptom resolution (defined as being symptom-free or symptoms returned to pre-injury level), or 45 days post-injury, whichever occurred first.

More information: Jingzhen Yang et al. Association of Self-Paced Physical and Cognitive Activities Across the First Week Postconcussion With Symptom Resolution in Youth, *Journal of Head Trauma Rehabilitation* (2021). [DOI: 10.1097/HTR.0000000000000642](https://doi.org/10.1097/HTR.0000000000000642)

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