



Youth Helmet Football Standard: Research and Development Update

For more than 10 years, NOCSAE has been researching the science and data specific to youth necessary to support a separate standard for football helmets designed for youth. At the NOCSAE Winter Meeting in January 2020, the Standards Committee voted to formally begin the development process for a youth helmet performance standard. This vote was the culmination of input from NOCSAE's Scientific Advisory Committee and findings from two recent youth football research studies funded by NOCSAE.

At present, NOCSAE has one football helmet standard that applies to helmets of all sizes, worn by players of all sizes from youth to adult. NOCSAE standards use variable-mass biofidelic headforms to account for different-sized players, and helmets that are small enough to be worn by youth players are required to be tested on a headform that replicates a 50th percentile 10-year-old male.

Scientific Advisory Committee

In June 2017, NOCSAE convened its Scientific Advisory Committee (SAC) to identify the scientific issues related to a youth football helmet standard. NOCSAE has gathered leading experts in science and medicine to explore this issue since 2011. The SAC includes leading scientists, physicians, biomechanical engineers and experts in sports equipment testing organizations.

NOCSAE is the only standards organization that has actively pursued a youth football helmet standard through research grants. Previously, there was insufficient data to suggest youth specific performance criteria. Key considerations for NOCSAE include evaluating the performance threshold, impact biomechanics, and others for a youth football helmet standard is feasible and for addressing injury risks specific to the youth player without increasing the risk of other injuries.

Frequently Asked Questions

Does NOCSAE currently use an adult football helmet standard for youth players?

No, this is a misrepresentation of the NOCSAE football helmet standard. NOCSAE does not have an adult or a youth football helmet standard. NOCSAE has **one** football helmet standard that applies to helmets of all sizes, worn by players of all sizes from youth to adult.

How does one football helmet standard apply to youth and adult players?

NOCSAE standards use variable-mass biofidelic headforms to account for different-sized players. Helmets that are small enough to be worn by youth players are required to be tested on a headform that is consistent with a 50th percentile 10-year-old male. As helmet sizes get larger, headforms with more mass are used in the testing protocol. NOCSAE was a pioneer in the use of variable-mass headforms designed to represent different-sized players. The NOCSAE small headform was first developed in 1980. It was tested, evaluated and validated by independent labs and incorporated into NOCSAE standards by 1987.

Is NOCSAE developing a separate youth helmet standard?

Yes, the NOCSAE Standards Committee voted to formally begin the development process for a youth football helmet performance standard at the NOCSAE Winter Meeting in January 2020. The vote was the culmination of input from NOCSAE's Scientific Advisory Committee and findings from two recent youth football research studies funded by NOCSAE.

The proposed new standard (ND006-20) will remain in "proposed" status for a minimum of twelve months, during which NOCSAE invites all interested parties to submit comments, objections and suggestions through its website or by email. NOCSAE expects the proposed standard to undergo significant changes in the development process which will likely take several years. A copy of the proposed standard is available at this [link](#).

In June 2017, the SAC convened to evaluate the latest scientific research relevant to youth helmets, identify areas where additional research was needed, and share professional insights on the potential criteria for a youth helmet standard.

Based on recommendations coming out of the SAC meeting, NOCSAE authorized \$493,000 in funding for two new parallel research initiatives to explore potential performance criteria for a youth helmet football standard. Virginia Tech led one of the research programs to collect biomechanical and clinical data directly from youth football players using helmets instrumented with helmet-mounted accelerometers arrays (HITS) and video capture/analysis. The second research program was conducted by the Neurotrauma Impact Science Laboratory at the University of Ottawa, Ontario, Canada to investigate potential test parameters for a youth football helmet standard based on observed youth football impact dynamics and develop a computational, finite element (FE) model of the youth brain. The two cooperative research programs were designed to do the following:

1 Research initiatives to inform the development of a youth football helmet standard.

Abstract: This research aims to inform the development of a youth football helmet standard by quantifying the biomechanics of concussion in youth football players, matching on-field impact velocities with resulting head accelerations, and relating on-field measures to the proposed pneumatic ram test method. Youth football teams are currently being studied at Virginia Tech and this research will develop data from those teams using helmet accelerometers as well as video from multi-camera arrays to calculate and verify player and helmet impact velocities. (1-SAC-2017)

2 Establish test parameters for youth American football helmets informed by injury surveillance.

Abstract: Develop data from biomechanical analysis of youth head impacts in American football to inform the development of a youth football helmet standard. Head impact events from 60 youth football games will be analyzed, documented and reconstructed using finite element modeling for concussive and non-concussive impacts to establish youth specific risk curves for peak linear accelerations to develop an impact protocol specific to youth players age 14 and under. Video analysis will identify the most common injury mechanisms, levels of impact parameters (velocity, mass, location, compliance) relevant to causing injury, and quantify head dynamic and brain tissue response associated with injury. (2-SAC-2017)

Next Steps

At the NOCSAE Winter Meeting in January 2020, the Standards Committee voted to move forward with developing a football helmet standard specific to youth players, the culmination of input from the SAC and findings from the two youth football research studies. The findings helped the NOCSAE Technical Director develop a preliminary test protocol for a youth football helmet. The proposed new standard (ND006-20) will remain in “proposed” status for a minimum of twelve months, during which NOCSAE invites all interested parties to provide input through its website or by email. NOCSAE expects the proposed standard to undergo significant changes in the development process which will likely take several years. A copy of the proposed standard is available for review at this [link](#).

NOCSAE recognizes there are significant concerns and questions about risks related to youth tackle football shared by diverse stakeholders, as well as ongoing policy discussions across the country about how best to address and manage these risks. In fact, some members of the NOCSAE Standards Committee support recommendations to prohibit tackle football for youth under a certain age to minimize these risks. However, as long as youth continue to play this sport, NOCSAE believes it has an important role to play in advancing the development of a youth helmet football performance standard that is *evidence-based*. The proposed new standard is unlike any new standard NOCSAE has developed before, primarily because it recognizes physiological differences between the intended end users compared to other players in the same sport and premises different performance requirements based on those differences.