

NOCSAE Advances Integration of Redesigned Headforms and Final Steps for Proposed Youth Football Helmet Standard

OVERLAND PARK, Kan. (July 31, 2024) — The National Operating Committee on Standards for Athletic Equipment (NOCSAE) held its Summer Standards Meeting in Cleveland on July 26. The Standards Committee reported progress on the integration of the redesigned Nine-Array Headforms for athletic equipment testing and an update on final steps for the proposed youth football helmet standard. The Committee also advanced revisions and modifications to athletic equipment standards for baseball, football, lacrosse, soccer and softball.

Scientific Advisory Committee Report

Dr. Robert Cantu, MA, MD, FACS, FACSM, FAANS, NOCSAE vice president, chair of the NOCSAE Scientific Advisory Committee (SAC) and representative of the American College of Sports Medicine, shared the latest research on the challenges of diagnosing Chronic Traumatic Encephalopathy (CTE) in living patients. Dr. Cantu also discussed findings from DIAGNOSE CTE, an eight-year multicenter study that examined data from 150 former NFL and college football players. The study contributed to significant advancements in the understanding of CTE, but additional research is needed to identify methodologies to diagnose CTE in the living and intervene in the progression of the neurodegenerative disease. Diagnosis in the living is critical to advancing clinical trials and developing potential treatments.

Nine-Array Headform Redesign

NOCSAE pioneered the development of variable mass biofidelic headforms, which accurately simulate the biomechanics of a human head. These headforms account for impedance and harmonics resulting from real impacts, enabling more precise testing of helmets and projectiles. Over the last few years, NOCSAE has been working to develop redesigned Nine-Array Headforms with enhanced biofidelity and testing capabilities.

NOCSAE received the first order of the Nine-Array Headforms in May and began testing in June. The new headforms have enhanced instrumentation and biofidelity and may be more sensitive than the current headforms depending on impact location and helmet design. The NOCSAE Technical Director is currently working with other labs to validate the response of the medium headform while proceeding with updates to the small and large headforms. NOCSAE anticipates that the updated small and large Nine-Array Headforms will be validated in the coming months and should be available by the end of 2024. Manufacturing of medium headforms has begun and will be followed by small and large headforms. The timeline for integrating the new headforms into ND002 testing has not been finalized.

Proposed Youth Football Helmet Performance Standard [[ND006-23](#)]

NOCSAE is in the final stages of testing and evaluating the **Proposed Youth Football Helmet Performance Standard**. Based on critical insights from two NOCSAE-funded research studies on the biomechanics of head impacts and injuries in youth players, NOCSAE developed the proposed standard to address the specific needs and different risks youth players are exposed to in tackle football. Designed for football played at a level below high school, key differences in the new youth standard include the mass of the helmet, different impact velocities and the pass/fail threshold. Throughout the development process, NOCSAE has worked to ensure any steps to enhance protection for youth players are grounded in science and do not create other unintended risks.

The NOCSAE Technical Director is currently preparing to advance round-robin testing of the new Nine-Array small headform and youth pneumatic ram equipment to ensure data is consistent. The youth pneumatic ram equipment has been delivered to participating labs and round-robin testing will begin as soon as the new small headform is validated. Once this critical evaluation process is completed, the NOCSAE Standards Committee will vote to finalize the proposed standard and set an effective date.

KME SI Analyzer Replacement Options

NOCSAE has been working to develop a replacement option for the legacy KME SI Analyzer. NOCSAE and the Southern Impact Research Center (SIRC) are currently collaborating with Biokinetics to tailor software for NOCSAE testing which should be complete in the next eight to 12 weeks. Testing labs can choose to develop their own software, but the labs must demonstrate equivalence to the analog KME or one of the NOCSAE recommended systems. SIRC will continue to repair existing KME products.

NOCSAE Standards Updates

Following is an overview of revisions and modifications advanced by the NOCSAE Standards Committee at the Summer Standards Meeting. Detailed information for each standard is available on NOCSAE's website in the [NOCSAE Standards Matrix](#).

Revisions

Revisions below will become effective in July 2025.

Standard Performance Specification for Newly Manufactured Baseball/Softball Catcher's Helmets

[\[ND024-24\]](#)

- Revision #1: Added faceguard test parameters for softball specific helmets.
- Revision #2: Requires permanent label on the exterior of the helmet shell that states "Softball Only" for softball specific helmets.
- Revision #3: Requires permanent warning attachment for softball batter faceguards, noting that faceguards should only be used with 11-inch or larger softballs (not baseballs).

Modifications

Modifications to standards are effective immediately.

Standard Test Method and Equipment Used in Evaluating Performance Characteristics of Headgear/Equipment (Drop Test Method)

[\[ND001-17m24a\]](#)

- Modifications include updated required specifications for digital SI analyzers in the Impact Recording Equipment (section 15.4) and replacing a drawing depicting impact locations on the headform rather than the helmet.

Standard Performance Specification for Newly Manufactured Football Helmets

[\[ND002-17m24\]](#)

Standard Performance Specification for Newly Manufactured Baseball + Softball Batter's Helmets

[\[ND022-21m24\]](#)

Standard Performance Specification for Newly Manufactured Lacrosse Helmets with Faceguard

[\[ND041-15m24\]](#)

Standard Performance Specification for Newly Manufactured Lacrosse Face Protectors

[\[ND045-17m24\]](#)

- Modifications for these standards include replacing illustrations with impact locations on the headform rather than the helmet.
- Additional modifications include replacing/adding references, conditional environmental information, equipment construction and materials requirements and general formatting updates.

Standard Performance Specification for Newly Manufactured Baseball/Softball Batter's Helmet Mounted Face Protector

[\[ND072-21m24\]](#)

- Modifications include replacing/adding references, conditional environmental information, equipment construction and materials requirements and general formatting updates.

Test Method and Performance Specification for Newly Manufactured Soccer Shin Guards

[\[ND090-06m24\]](#)

- Modification replaced Performance Requirements that were unintentionally removed from January 2024 document.

Standards Reaffirmations

Under NOCSAE's rules, all standards which have not had action taken for five years must be submitted to a Reaffirmation vote. The Standards Committee voted to reaffirm the following standards in their current form:

Standard Test Method and Performance Specification for Newly Manufactured Football Player's Hand Coverings [\[ND019-10m15a\]](#)

Standard Performance Specification for Newly Manufactured Polo Helmets [\[ND050-11m19\]](#)

Standard Performance Specification for Helmet Mounted Polo Eye Protection [\[ND055-11m19\]](#)

Standard Performance Specification for Newly Manufactured Field Hockey Headgear [\[ND061-14\]](#)

Information about all NOCSAE standards and future Standards Committee meetings is available at nocsae.org. Interested parties are invited to submit comments and questions to NOCASE Executive Director Mike Oliver at mike.oliver@nocsae.org. The next NOCSAE Standards Committee Meeting will be held in Litchfield Park, Arizona, on Feb. 7, 2025.

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About NOCSAE

NOCSAE, the National Operating Committee on Standards for Athletic Equipment, is an independent and nonprofit standards development body with the mission to enhance athletic safety through scientific research and the creation of performance standards for athletic equipment. Formed in 1970, NOCSAE is a leading force in the effort to improve athletic equipment and, as a result, reduce injuries. NOCSAE efforts include the development of performance and test standards for football helmets, gloves and facemasks, baseball and softball batter's and catcher's helmets, baseballs and softballs, ice hockey helmets, soccer shin guards, lacrosse helmets and facemasks, and polo helmets. NOCSAE is comprised of a board of directors representing stakeholders from a number of groups – including consumer and end users, equipment manufacturers and reconditioners, athletic trainers, coaches, equipment managers, and academic and sports medicine associations. These diverse interests have joined forces in an attempt to arrive at a common goal of reducing sports-related injuries. NOCSAE is a nonprofit, charitable organization supported by individuals and organizations with an interest in athletics. For more information, please visit www.nocsae.org.