

Testimony Before The U. S. House Judiciary Committee Hearing on Legal Issues Relating to Football Head Injuries

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Mr. P. David Halstead

Mr. Chairman, members of the Judiciary Committee, I am honored to be here today. I thank you for allowing me to provide this testimony. My name is Dave Halstead. I do not have a lot of initials after my name like many others here today. I am not the typical academic, though I do teach at a major University. I am also the Technical Director of Southern Impact Research Center, (SIRC) in Rockford TN. SIRC is the only Accredited and Certified Independent Testing laboratory in the world, that I am aware of, that has the equipment specified for testing helmets to the latest NFL research program¹. SIRC purchased this equipment approximately five years ago for the purpose of research and standards development².

For the last 25 years I have worked as a Research Scientist, testing, developing and evaluating protective systems for human beings. Most of this work has centered on head protection for athletes and military personnel. I am chairman of the American Society for Testing and Materials Subcommittee F08.53 on Helmets and Headgear. I am not here in that capacity today and wish to make that clear. I am also the Technical Advisory Consultant for the National Operating Committee on Standards in Athletic Equipment (NOCSAE). In this capacity I advise the NOCSAE board of directors, the NOCSAE committee and NOCSAE licensee manufacturers, on the science, research and test methods that NOCSAE promulgates in the interest of athlete safety. I am not here today in that capacity and wish to make clear that I do not speak for NOCSAE, do not serve on the NOCSAE board and further I am not authorized to represent NOCSAE at these meetings. I also wish to make clear that none of the testing conducted by me, my staff at SIRC or anyone involved in the recent NFL test battery was performed on behalf of, in conjunction with or for NOCSAE. In fact NOCSAE has had no involvement or input either directly or through others in the recent testing.

I am familiar with the NFL Committee on MTBI, but I do not and have not served on that committee, and the work completed recently on behalf of the NFL, perhaps even on behalf of the committee, did not require me to meet with the committee, or discuss the protocol with the committee. I worked with another test lab and NFL representative, Dr. David Viano who lives and works here in Michigan. I was given free rein to suggest test modifications, protocols, impact locations and impact velocities.

In the interest of full disclosure, SIRC has at one time or another, served as a technical consultant and/or independent test laboratory to every helmet manufacturer who participated in this test program. I have also served as a technical consultant to the NFLPA. I do not believe this in any way affects the objectivity of this test.

In this recent work for the NFL and its players, we worked as a small task force group of three, we created a test plan to accommodate the best use of time and equipment while still impacting helmets in a manner substantially similar to the testing described in journal publications from many years ago. Those publications outlined the mechanics, impact locations and impact velocities observed in on-field events, resulting in concussion to at least one of the players involved. The observed impacts were almost always involving plays around the ball. It could be asserted that this limited the number of available studied events to what some might call the open field or high profile event. For this, and other reasons, the most recent testing plan included impacts at impact velocities two standard deviations below the mean of 9.3 m/s, as well as one standard deviation below and one above. This resulted in impact target speeds of 5.5, 7.4, 9.3, and 11.2 m/s. The test plan resulted in several impact locations³ to the helmeted head under four different impact speed conditions, with two temperature conditions. The testing of 14 discreet helmet models resulted in over 1200 impacts in the test matrix. At least one of each impact, on each model, was filmed at the rate of 1000 frames per second to capture slow motion video of the events. Details of mechanical failures, helmet dislodging or any unusual outcome was compiled.

¹ SIRC is Accredited by the American Association for Laboratory Accreditation (A2LA) and is Certified as compliant to International Standards Organization 17025 for Testing Laboratories.

² See Photo 1 page 3

³ See photo 2 page 3

I can speak with confidence that this testing protocol was not biased or skewed towards any helmet model, brand or type. All helmets were sized to fit the Hybrid III headform and were models available to the NFL at the time of testing. The measured performance parameters we compared against helmet models developed and in use prior to 1999. Samples from archives and samples of "old style" helmets (pre 1999 designs) were obtained from the field of play. These helmets were tested in rotation with the other or "new style" helmets. The performance of the old helmets was averaged across all samples from both labs to establish a baseline of performance. This baseline is the reference point upon which a comparison can be made to determine if the "new" models managed more or less energy than the "old" helmets in these test conditions. The data is still being reviewed; in fact I have not seen the data from the other lab, only our own data and the compiled data which shows a low standard deviation indicating good repeatability.

While specific data cannot be discussed until another, independent analysis has been completed, the results did show many "new" helmets performing better than baseline, some no better than baseline and some actually worse than baseline. The data will allow the evaluation of helmet performance in discreet locations, impact velocity conditions as well as each of the two temperature conditions.

It is clear that specific observations about helmet performance in this protocol will yield statistically valid differences in many cases. With that said the test laboratories have not been, and will not be, involved in data analysis.

Helmet manufacturers have been invited to submit additional models for a retest prior to final data analysis and publication of results.

As a test laboratory not involved in the data analysis and not being a member of any NFL committee I am not sure how the data will be disseminated or in what format.

Though I believe the data to be valid and relevant, the application of these results to the potential for reducing on-field injuries should, in my view, be approached with caution. Further, the news that a particular helmet performed well on some part of this test is likely to be widely disseminated. It must be noted that given the material and design approaches available to helmet designers today, the best, if not only, way to improve the performance of helmets in this protocol will result in larger and heavier helmets. This is not likely a concern for the professional player, but could be a much less desirable product for other levels of play.

In closing, while understanding and optimizing helmet performance is a worthwhile and necessary endeavourer, the helmet should always be considered a last resort for injury prevention, as the helmet only functions when there is an impact to the head. Helmets are indispensable devices in the prevention of catastrophic head injuries, and they work very well to reduce impact forces that are involved in concussive injuries, but helmets likely will never "prevent" concussions. Reduction in forces that may cause or contribute to concussive injury remains a goal, not a foregone conclusion.

Photo 1

Linear Impactor

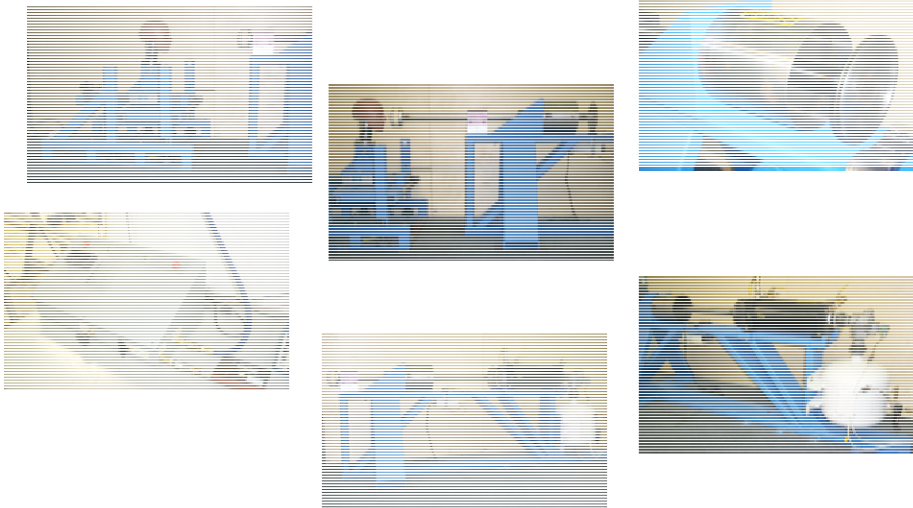


Photo 2

8 Impact Sites:

- A'** low center face guard
- A** off center face guard mid-level
- B** upper face guard near temple
- UT** jaw pad
- F** center forehead
- C** direct side
- D** offset rear
- R** direct low rear

