

National Operating Committee on Standards for Athletic Equipment (NOCSAE) Scientific Advisory Committee (SAC)- Listing as of February 2020

Kristi Arbogast, Ph.D.

Pat Bishop, Ph.D.

Robert Cantu, M.D. [SAC Chair]

David Camarillo, Ph.D.

Tom Gennarelli, M.D.

Rick Greenwald, Ph.D.

Dave Halstead [NOCSAE Technical Director]

Blaine Hoshizaki, Ph.D.

Fred Mueller, Ph.D. [NOCSAE Research Director]

Mike Oliver [NOCSAE Executive Director]

Steve Olvey, M.D.

Margot Putukian, M.D.

Steve Rowson, Ph.D.

Kelly Sarmiento, M.P.H.

Kristy Arbogast, PhD, is Director of Engineering at the Center for Injury Research and Prevention at Children's Hospital of Philadelphia and co-director of the Center for Child Injury Prevention Studies. Dr. Arbogast served on the Institute of Medicine Committee on Sports Concussion in Youth and co-leads Children's Hospital's clinical research effort in concussions. She also co-leads an initiative for the National Football League and NFL Players Association to design and implement head impact sensors to understand the loading conditions in professional football with the goal of enhancing head protection through improvements in protective equipment.

Pat Bishop, Ph.D. is Professor Emeritus in the Kinesiology Department at the University of Waterloo in Waterloo, ON, Canada. Professor Bishop is a member of the Centre for Applied Health Research and several technical committees of the Canadian Standards Associations. He is an official Canadian delegate to the International Standards Organization Technical Committee on Protective Equipment for Ice Hockey. Dr. Bishop's projects have involved mechanisms and prevention of cervical spine injuries, evaluation of head protection in hockey, football and cycling, injuries occurring in professional hockey, and the development of a computer simulation model for cervical spine injury prevention.

Robert Cantu, M.D., SAC chair, is a Clinical Professor in the Department of Neurosurgery at the Boston University School of Medicine, Boston, MA and a founding member and Chairman on the Medical Advisory Board of the Concussion Legacy Foundation in Boston. Dr. Cantu is medical director of the National Center for Catastrophic Sports Injury Research in Chapel Hill, North Carolina and Medical Director and Director of Clinical Research at the Cantu Concussion Center at Emerson Hospital in Concord, Massachusetts. He is a Neurosurgical Consultant for the Boston Eagles football team, and Neurosurgical Consultant for the Boston Cannons professional

soccer team. An author of numerous scientific publications, Dr. Cantu also consults with numerous NFL, NHL and NBA teams.

David B. Camarillo, Ph.D. is Assistant Professor of Bioengineering, (by courtesy) Mechanical Engineering and Neurosurgery at Stanford University. Dr. Camarillo holds a B.S.E in Mechanical and Aerospace Engineering from Princeton University, a Ph.D. in Mechanical Engineering from Stanford University and completed postdoctoral fellowships in Biophysics at the UCSF and Biodesign Innovation at Stanford. Dr. Camarillo worked in the surgical robotics industry at Intuitive Surgical and Hansen Medical, before launching his laboratory at Stanford in 2012. His current research focuses on precision human measurement for multiple clinical and physiological areas including the brain, heart, lungs, and reproductive system.

Tom Gennarelli, M.D. is a clinician and researcher in the field of traumatic head injuries. He was appointed to the faculty at the Medical College of Wisconsin as a professor in 1999 and fulfilled the administrative duties as chair of the Department during 1999-2008. Board certified in neurological surgery and advanced trauma life support, Dr. Gennarelli founded The Froedtert Hospital and The Medical College of Wisconsin CIREN Center, the tenth center of the Crash Injury Research and Engineering Network (CIREN) of the National Highway Traffic Safety Administration, US Department of Transportation. He has published numerous research papers as well as book chapters in addition to several editions of "The Abbreviated Injury Scale," used to determine the severity of bodily injuries.

Rick Greenwald, Ph.D. is an entrepreneur and biomedical engineer whose expertise includes technology and intellectual property development, evaluation and licensing, strategic financing, and business development. He is the Executive Director of the non-profit National Institute for Sports Science and Safety. Dr. Greenwald has served as vice president of the Hockey Equipment Certification Council (HECC) since 2007, and is a participant in creating national and international standards related to ice hockey via both ASTM and ISO committees. Greenwald is co-director of the NIH-funded Center for Translation of Rehabilitation Engineering Advances and Technology (TREAT), a national rehabilitation infrastructure resource, and co-director of the FDA funded New England Pediatric Device Consortium (NEPDC).

Dave Halstead is the technical director for the National Operating Committee on Standards for Athletic Equipment (NOCSAE) as well as the technical director of Southern Impact Research Center (SIRC), an American Association for Laboratory Accreditation (A2LA)-accredited testing lab and facility responsible for technical issues regarding NOCSAE standards development and implementation. He is responsible for the technical and scientific actions of SIRC's test lab, and oversees the technical aspects of all testing, consulting and other services provided by SIRC staff. Mr. Halstead is also the Laboratory Director of the University of Tennessee Sports Biomechanics Impact Research Lab and Principal Scientist with the University's Engineering Institute for Injury and Trauma Prevention in the College of Engineering.

Blaine Hoshizaki, Ph.D. is the Director of the Neurotrauma Impact Science Laboratory at the University of Ottawa. Dr. Hoshizaki's lab's research has focused on decreasing the risk of head

injuries in sport, with a focus on investigating the relationship between the accident event and resulting brain tissue trauma. Dr. Hoshizaki's role is to lead head injury reconstructive research employing physical event reconstructions and computational modelling. He has contributed to numerous scientific publications, presenting his findings at conferences worldwide.

Fred Mueller, Ph.D., is NOCSAE's research director and a longtime professor of physical education at the University of North Carolina at Chapel Hill. Besides his work as a professor, Mueller has served as freshman football coach, physical education instructor, head lacrosse coach, assistant professor, and associate professor. From 1995 to 2005, Dr. Mueller was chairman of the Department of Physical Education, Exercise and Sport Science at UNC. Dr. Mueller has done extensive academic research on injuries in athletics and published numerous works on the topic.

Mike Oliver is the Executive Director and General Counsel for NOCSAE. Serving in these roles since 1995, he manages the day-to-day operations and provides a direct resource for the public on questions regarding equipment performance, safety, and injury prevention in connection with athletic equipment that has been certified to the NOCSAE standard. Mr. Oliver also oversees the multi-million dollar NOCSAE research grant program administered by Dr. Mueller, and the technical services functions of the Southern Impact Research Center. Mr. Oliver also is a trial attorney with 30 years of litigation experience in medicine and science. He has a B.S. in Political Science, and a Juris Doctor in Law.

Steve Olvey, M.D. is an associate professor of clinical Neurology and Neurosurgery at the University of Miami Miller School of Medicine. He is vice chair of the University of Miami Hospitals and Clinics Ethics Committee and the Jackson Health System Adult Ethics Committee. For 25 years, he has served as the Director of the Neuroscience Intensive Care Unit at Jackson Memorial Hospital. He is a member of the Fédération Internationale de l'Automobile Medical Commission, a consultant to Indy Car Series and Motor Sports Director of the University of Miami Concussion Program. He has published several articles on motor sports medicine, and has authored two books, including *Rapid Response*, an autobiography of his career in motor sport medicine.

Margot Putukian, M.D. is the Director of Athletic Medicine, Head Team Physician and Assistant Director of Medical Services at Princeton University. Dr. Putukian is a past president of the American Medical Society for Sports Medicine (AMSSM), and a Team Physician for US Soccer as well as for the US Men's Lacrosse Team. She is board certified in both Internal Medicine and Sports Medicine. Dr. Putukian has been a co-author on several journal articles, including the NATA & AMSSM Position Statements on Concussion, and the Zurich International Concussion Conference documents. She has served as primary care medical consultant for Major League Soccer and has chaired the US Lacrosse Sports Science and Safety Committee. She has also served on several medical advisory committees, including US Soccer, USA Football, and the NFL's Head Neck and Spine Committee.

Steve Rowson, Ph.D. is an Assistant Professor in the Department of Biomedical Engineering and Mechanics at Virginia Tech. He is director of the Virginia Tech Helmet Lab, which conducts basic and applied injury biomechanics research. The author of numerous peer-reviewed articles, Dr. Rowson's focus is on reducing concussion in sports. Along with co-developer Stefan Duma, he runs and maintains the Virginia Tech Helmet Ratings, which aims to provide consumers with an objective assessment of relative helmet performance.

Kelly Sarmiento, M.P.H. serves as a public health advisor for the Centers for Disease Control and Prevention's (CDC's) Division of Injury Prevention's Traumatic Brain Injury Team. She is responsible for leading the HEADS UP campaign, which has a goal to protect kids and teens by raising awareness and informing action to improve prevention, recognition, response to concussion, and other serious brain injuries. Her work with the CDC originated as the health communications team lead within the National Center for Injury Prevention and Control's Division of Injury Response. Ms. Sarmiento received her Bachelor of Arts degree in anthropology and Spanish from the University of California, Santa Barbara and her Masters of Public Health degree from Yale University School of Epidemiology and Public Health.