

53rd NHTSA Workshop on Human Subjects for Biomechanical Research

National Highway Traffic Safety Administration
Zoom Webinar

Elizabeth McNeil and Rodney W. Rudd, Co-Chairs
Tuesday and Wednesday, October 28 and 29, 2025

PROGRAM

TUESDAY, OCTOBER 28 – DAY 1

ALL TIMES EDT, UTC -4

9:00-9:10 WELCOME AND HOUSEKEEPING – RODNEY RUDD AND ELIZABETH MCNEIL, NHTSA

9:10-10:10 SESSION I

Preliminary Material Properties of Pelvic Cortical Bone

Devon Albert¹, R. Hunter², A. Agnew²

¹ Virginia Tech Transportation Institute, ² Injury Biomechanics Research Center, The Ohio State University

Frontal Impact Sled Tests with Varied Anthropometry Post-Mortem Human Subjects in a Simplified Restraint Environment: Preliminary Outcomes

Molly Gallaher, J. Donlon, R. Hollar, S. Sochor, J. Noss, I. Nazari, J. Forman
Center for Applied Biomechanics, University of Virginia

Thoracic and Lumbar Spine and Sacrum Acceleration Response corridors of Small Female Surrogates in Frontal Oblique Impact

J. Koser, Tyler Rooks, N. Yoganandan
Medical College of Wisconsin

10:10-10:30 BREAK

10:30-11:30 SESSION II

Challenges with HBM Chest Injury Metric from Product Development Perspective

Renuka Jagadish, T. Arora, G. Velmurugan, P. Kulavi, U. Kumar, D. Kumar, S. Fu, A. Soni, C. Shah
Humanetics Group

A Virtual Testing Framework Using Parametric Occupant and Seat Models in Rear-End Impacts

Mizuho Takayama¹, Yang-Shen Lin¹, Vinayak Srinivas Narayanan¹, J. Hu¹, K. Boyle¹, S. Khandale¹, J. Hallman², Z. Sun²

¹ University of Michigan Transportation Research Institute, ² Toyota Motor Engineering and Manufacturing North America

Validation and Submarining Assessment of 50th Percentile Male Simplified GHBM Models in Upright and Reclined Postures during Frontal Impacts

Alex Kalmar-Gonzalo¹, B. Koya¹, K. Devane¹, F.C. Hsu², D. Sherman³, D. Bass³, C. Bir³, F.S. Gayzik¹

¹ Biomedical Engineering, Wake Forest University School of Medicine, ² Biostatistics and Data Science, Wake Forest University School of Medicine, ³ Biomedical Engineering, Wayne State University

11:30

ADJOURN DAY 1

To register for this Zoom webinar, go to:

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WEDNESDAY, OCTOBER 29 – DAY 2

ALL TIMES EDT, UTC -4

9:00-9:05 WELCOME AND HOUSEKEEPING – RODNEY RUDD AND ELIZABETH MCNEIL, NHTSA

9:05-9:45 SESSION III

Improved Brain Injury Metrics of THUMS Model Through GISSMO-Based Multi-Axial Damage Modeling

Runzhou Zhou, N. Zhang
Toyoda Gosei North America

Mitigation of Crush Induced Pedestrian Injuries by Pyrotechnic Hood Lifter

Jay Zhao¹, J. George¹, M. Hussain², V. Gupta², H. Cruz³, L.R. Marentes³, K. Nino³
¹ Joyson Safety Systems Inc., USA, ² General Motors, ³ Joyson Safety Systems, Inc., Mexico

9:45-10:00 BREAK

10:00-11:00 SESSION IV

Rear-facing child restraint systems (CRS) in rear impacts: Interactions between CRS and front row seat back deformation

Julie Mansfield¹, D. Patton², Y. Kang¹
¹ Injury Biomechanics Research Center, The Ohio State University, ² Center for Injury Research and Prevention, Children's Hospital of Philadelphia

Predictors of Seat Belt Fit Quality Among Pregnant Vehicle Occupants

Keri-Anne Lue¹, L. Dorathy¹, J. Forman¹, P. Chernyavskiy²
¹ Center for Applied Biomechanics, University of Virginia, ² Department of Public Health Sciences, University of Virginia

Linear Acceleration is a Primary Risk Factor for Concussion

J.A. Towns¹, F.F. Abayazid², J.W. Hickey³, W.T. O'Brien³, S.S.H. Roberts⁴, N.S. Pritchard^{5,6}, J. E. Urban^{5,6}, J.D. Stitzel^{5,6}, G.A. Grant⁷, M.M. Zeineh⁸, S.J. McDonald^{3,9}, **David Camarillo**¹
¹ Department of Bioengineering, Stanford University, ² Dyson School of Design Engineering, Imperial College London, ³ Department of Neuroscience, School of Translational Medicine, Monash University, ⁴ Centre for Sport Research, Institute for Physical Activity and Nutrition, Deakin University, ⁵ Center for Injury Biomechanics, Virginia Tech-Wake Forest University, ⁶ Wake Forest University School of Medicine, ⁷ Department of Neurosurgery, Duke University, ⁸ Department of Radiology, Stanford University, ⁹ Department of Neurology, Alfred Health

11:00-11:15 BREAK

11:15-12:00 SESSION V – CRASH INJURY RESEARCH AND ENGINEERING NETWORK (CIREN)

Analysis of the AIS Severity for Thoracic Injuries

Thomas Hartka, C. Shaw, P. Chernyavskiy, M. Noorbakhsh, G. Glass
University of Virginia Center for Applied Biomechanics CIREN Center

Bone Microarchitecture, Density, and Strength Assessment in CIREN: A High-Resolution Peripheral Quantitative Computed Tomography (HRpQCT) Study

Ashley Weaver, G. Guerrero-Sanchez, B. Davidson, K. Cattell, W. Armstrong, D. Madrid, A. Taylor, J. Sink, A. Scott, J. Stitzel
Wake Forest School of Medicine, Virginia Tech-Wake Forest School Center for Injury Biomechanics CIREN Center

12:00 ADJOURN DAY 2 AND CONCLUDING REMARKS

Note to attendees: Please use the Questions section of your Zoom Webinar control panel to submit questions. Workshop organizers will relay the questions to the speaker during the discussion phase of each presentation.

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