INJURY BIOMECHANICS RESEARCH

TWENTY SEVENTH INTERNATIONAL WORKSHOP

October 24, 1999
San Deigo, California

Editor

Faris A. Bandak, Ph.D.

National Transportation Biomechanics Research Center

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National Highway Traffic Safety Administration
U.S. Department of Transportation
Washington, DC

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Preface

THE FIELD OF INJURY BIOMECHANICS is evolving into a unique area of interdisciplinary research that is requiring an ever increasing need for cooperation amongst the various fields of science. The Twenty-Seventh International Workshop on Human Subject Biomechanics was held in the spirit of this cooperation demonstrating, by the breadth of the presented papers, the scientific demands of the field.

This year's contributions involved research on cervical spine injury including new methods for testing the ligamentous cervical spine, characterization of the tensile and compressive strength of the pediatric cervical spine, and effects of alignment on cervical spine injury. Contributions also involved advancements in experimental biomechanics and instrumentation. These included the assessment of the External Peripheral Instrument for Deformation Measurement (chestband), evaluation of directly-measured vs. computed tomographic calculated head masses, centers of gravity and moments of inertia of the human head, and a technique for the alignment of low-velocity rear-impact head sensors using laser beams. Additional contributions were made in the areas of computational and experimental biomechanics. These included the development of a finite element model of the Thor dummy, a study of the influence of the subarachnoidal cerebrospinal fluid layer on the brain, and a nonlinear Green-Rivlin representation of the shear properties of brain. Additional contributions included a method for the assessment of tethered and untethered child restraint systems using the Hybrid III three-year-old dummy and a study of shoulder trauma in lateral impacts.

The proceedings of this workshop are documented here in twelve submitted papers that have not been peer reviewed with that responsibility for these preliminary works, left to the individual authors.

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The Twenty-Seventh International Workshop could not have been successfully held without the help of several people. On behalf of the Workshop Administrator Planner, T. Nguyen and myself, I would like to thank the NHTSA and Conrad Technologies staff for their assistance in the preparation for and conduct of the Workshop. I would also like to express my appreciation to Wendy Barhydt, Meeting Planner for the Society of Automotive Engineers, and Leda Ricci, the Executive Director of the Stapp Crash Conference Advisory Committee, for their help in the Workshop coordination.

Many thanks are also extended to the Authors and Presenters for their contributions that made this Workshop a very useful and beneficial experience for all the participants.

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Chair

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