2003 IRCOBI conference

0.1 Bertil Aldman Lecture
Is Head Injury Caused by Linear or Angular Acceleration?
A.I. King, K.H. Yang, L. Zhang, W. Hardy
Bioengineering Center, Wayne State University
D.C. Viano
Mild Traumatic Brain Injury Subcommittee, National Football League (USA)

SESSION I – HEAD BIOMECHANICS AND INJURY PROTECTION

1.1 Reassessing Bicycle Helmet Impact Protection
N.J. Mills, A. Gilchrist
Metallurgy and Materials, University of Birmingham (UK)

1.2 Effectiveness of the Football Helmet Assessed by Finite Element Modeling and Impact Testing
L. Zhang, D. Ramesh, K.H. Yang, A.I. King
Bioengineering Dept, Wayne State University (USA)

1.3 Influence of the Impact and Restraint Conditions on Human Surrogate Head Response to a Frontal Deceleration
P. Vezin, J.P. Verriest
INRETS - Laboratory of Biomechanics and Impact Mechanics (France)

1.4 Characterization of Pediatric Porcine Skull Properties during Impact
B. Coats, S.S. Margulies
University of Pennsylvania (USA)

1.5 Biomechanics of Lateral Skull Fracture
N. Yoganandan, J. Zhang, F.A. Pintar, T.A. Gennarelli
Medical College of Wisconsin, Dept of Neurosurgery
S. Kuppa, R.H. Eppinger – US DOT (USA)

1.6 Biomechanical Response of the Head, Neck and Torso to Direct Impact on the Back of Male and Female Volunteers
K. Ono, K. Kaneoka, M. Fukushima, H. Uwai, S. Ujihashi
JARI – University of Tsukuba – Technology Institute of Tokyo (Japan)

SESSION II – INJURY MECHANISMS AND RESTRAINT SYSTEMS
2.1 The effects of Seam Design on Airbag Induced Skin Abrasions from High-Rate Shear Loading
S.M. Duma, J.M. Cormier, W.J. Hurst, J.D. Stitzel, I.P. Herring
Virginia Tech, Center for Injury Biomechanics (USA)
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2.2 Identification of Potential Injuries to Occupants on Side-facing Seats in Aircraft Accidents
B. Bhaskaran, H. Nagarajan, H.M. Lankarani
National Institute for Aviation Research, Wichita State University (USA)
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2.3 A Comparison of Mechanisms of Ankle, Knee, Pelvis and Neck Injuries in Pedestrians and in Cyclists According to the Direction of Impact and Type of Vehicle
G. Teresinski, R. Madro
Dept of Forensic Medicine, Medical University of Lublin (Poland)
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SESSION III – BIOMECHANICS OF LOWER LIMBS

3.1 Analysis of Tibial Curvature, Fibular Loading, and the Tibia Index
J.R. Funk
Biodynamic Research Corporation
R.W. Rudd, J.R. Kerrigan, J.R. Crandall
University of Virginia Center for Applied Biomechanics (USA)
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3.2 A Mechanism of Injury to the Forefoot in Car Crashes
B.R. Smith 1, P.C. Begeman 1, R. Leland 2, R.S. Levine 1, K.H. Yang 1, A.I. King 1
1 Bioengineering Center and 2 Dept of Orthopedic Surgery, Wayne State University (USA)
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3.3 Foot and Ankle Safety Evaluation in Real Life Crash Situations
N. Höglund 1, P. Lövsund 1, D. Viano 1, 2, S. Olsén 2
1 Chalmers University of Technology
2 Saab Automobile AB (Sweden)
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3.4 Rate-sensitive Constitutive and Failure Properties of Human Collateral Knee Ligaments
University of Virginia Center for Applied Biomechanics (USA)

SESSION IV – NECK INJURIES AND PROTECTION

4.1 Cervical Spine Distortion Injuries in Various Car Collision Directions and
4.2 Carotid Artery Trauma in Motor Vehicle Crashes: Investigation of the Local Tensile Loading Mechanism
G.P. Sinson, N. Yoganandan, F.A. Pintar, R.M. Morgan 1, D.J. Maiman, K.J. Brasel 2,
T.A. Gennarelli
Depts of Neurosurgery and 2Surgery, Medical College of Wisconsin
1 George Washington University (USA)

4.3 Influence of Seat Geometry and Seating Posture on NICmax and Nkm AIS 1
Neck Injury Predictability
L. Eriksson – Autoliv Sweden & Chalmers University of Technology
A. Kullgren – Folksam Research (Sweden)

SESSION V – BIOMECHANICS OF HUMAN THORAX AND SHOULDERS

5.1 Biomechanical properties of the Male and Female Chest Subjected to Frontal and Lateral Impacts
H. Kimpara, M. Iwamoto, K. Miki - Toyota Central R&D Labs., Inc. (Japan)
J.B. Lee, P.C. Begeman, K.H. Yang, A.I. King
Bioengineering Center, Wayne State University (USA)

5.2 Age-related Changes in the Effective Stiffness of the Human Thorax Using Four Loading Conditions
R. Kent, C. Sherwood, D. Lessley, B. Overby – University of Virginia (USA)
F. Matsuoka - Toyota Motor Corporation (Japan)

5.3 Lateral and Oblique Impact Loading of the Human Shoulder 3D Acceleration and Force-Deflection Data
S. Compigne 1, 2, Y. Caire 2, T. Quesnel 2, J.P. Verriest 2
1 INSAVALOR SA – LMSO, INSA
2 INRETS – Laboratory of Biomechanics and Impact Mechanics (France)

SESSION VI – ACCIDENT METHODOLOGY AND CAR SAFETY

6.1 Some Injury Scaling Issues in UK Crash Research
A. Morris 1, M. Mackay 2, E. Wodzin 3, J. Barnes 1
1 Vehicle Safety Research Centre, Loughborough University - 2 University of
6.2 Real-world Crash Performance of Recent Model Cars – Next Steps in Injury Prevention
P. Thomas, R. Frampton
Vehicle Safety Research Centre, Loughborough University (UK)

SESSION VII – DUMMY RESPONSES

7.1 Biofidelity and Repeatability Evaluation of the THOR Dummy Thorax, Abdomen and Femur, through a Set of Tests
L. Martinez, G. Ferichola, L.J. Guerra – INSIA (Spain)
M. van Ratingen – TNO (NL)
D. Hynd – TRL (UK)

7.2 The Influence of Crash Pulse Shape on BioRID Response
D.S. Zuby, C.M. Farmer
Insurance Institute for Highway Safety (USA)
M. Avery - Motor Insurance Repair Research Center (UK)

SESSION VIII - SHORT PRESENTATIONS

8.1 Optimization of Single Skin Surfaces for Head Injury Prevention – A Comparison of Optima Calculated for Global versus Local Injury Thresholds
S. Kleiven, R. Juntikka - Royal Institute of Technology and Karolinska Institute (Sweden)

8.2 Investigations into Finite Element Modelling Aspects of the Human Head
T.J. Horgan, M.D. Gilchrist – Dept of Mechanical Engineering, University College Dublin (Ireland)

8.3 Injury Criteria for Oblique Helmet Impacts
M. Aare, S. Kleiven, P. Halldin – Royal Institute of Technology and Karolinska Institute (Sweden)

8.4 Helmet Optimisation against Biomechanical Criteria
C. Deck, R. Willinger, D. Baumgartner, F. Meyer – Strasbourg University (France)

8.5 Evaluation of Hybrid-III and THOR Dummy Head/Neck Responses to Airbag Load at Close Proximity
8.6 Relationship between Cervical Spine Curvature and Risk of Injury in the Case of Sagittal Impact: A Finite Element Analysis
B. Fréchêde 1, G. Saillant 2, F. Lavaste 1, W. Skalli 1
1 Laboratoire de BioMécanique, ENSAM – 2 CHU Pitié-Salpêtrière (France)

8.7 Validation of a MADYMO Mathematical Human Body Model with Detailed Neck in Low Speed Lateral Impacts
R. Meijer 1, C. Parenteau 2, J. van Hoff 1, M. Gopal 2
1 TNO Automotive (NL) - 2 Delphi Corporation (USA)

8.8 Comparison between Hybrid III Dummy and Cadaver Knee Response in Frontal Impact
C. Masson, C. Cavallero – INRETS – Laboratory of Applied Biomechanics (France)

8.9 Knee Airbag Effects on 5%ile Female
A. Malczyk, I. Kalliske – Takata-Petri AG (Germany)

8.10 Initial Field Experience of Side Airbag Protection Systems in the UK
A. Kirk, A. Morris - Vehicle Safety Research Centre, Loughborough University (UK)

8.11 Interaction of Child Restraint Systems and Side Airbags
C. Gehre 1, R. Schäfer 2, V. Schindler 1
1 Technical University of Berlin - 2 Federal Highway Research Institute (Germany)

8.12 Modelling of Body Parts Consisting of Bones as well as Soft Tissue: An Experimental and Finite Element Study
S. Mukherjee, A. Chawla, D. Mohan, M. Metri – Indian Institute of Technology (India)