Bertil Aldman Award Lecture
Traffic safety and thirty years of biomechanics research: a personal adventure
D. Mohan - Transportation Res. & Injury Prevention Programme, Indian Institute of Technology (India)

SESSION I – INJURY RISK AND CAR CRASHWORTHINESS

1.1 A comparison of injury risk and pattern of injury between male and female occupants of modern European passenger cars
J. Lenard, R. Welsh, Vehicle Safety Research Centre Loughborough University (UK)

1.2 Injury risk functions in frontal impacts using recorded crash pulses
A. Ydenius, A. Kullgren, Folksam Research and Karolinska Institute (Sweden)

1.3 Trends in Australian vehicle crashworthiness by year of vehicle manufacture within vehicle market groups
S.V. Newstead, M.H. Cameron, Monash University Accident Research Centre (Australia)

1.4 Measurements of vehicle compatibility in front-to-side crashes
K. Digges, A. Eigen, National Crash Analysis Center George Washington University (USA)

1.5 Benefits of a 64 Km/h offset crash test in Australia
B. Fildes (1), K. Digges (2), M. Les (1), C. Tingvall (3)
(1) Monash University Accident Research Centre (Australia)
(2) National Crash Analysis Center George Washington University (USA)
(3) Swedish National Road Administration (Sweden)

SESSION II – VULNERABLE USERS

2.1 How do interface conditions in motor vehicles and the modes of using child Restraint systems (CRS) affect the injury severity of children in crashes?
W. Czernakowski (1), D. Otte (2)
(1) Britax Römer Kindersicherheit GmbH
(2) Accident Research Unit Medical University Hanover (Germany)

2.2 Pedestrian human body validation using detailed real-world accidents
G. Coley (1), R. de Lange (2), P. de Oliveira, C.E. Neal-Sturgess (1), R. Happee (2)
(1) Birmingham Automotive Safety Centre (UK) – (2) TNO-Automotive (The Netherlands)

2.3 Development of child pedestrian mathematical models and evaluation with accident reconstructions
X. Liu, J. Yang, Crash Safety Division Chalmers University of Technology (Sweden)

2.4 Loading rate and torsional moments predict pilon fractures for antipersonnel blast mine loading
L.V. Griffin (1&2), R.M. Harris (2), R.A. Hayda (2), M.S. Rountree (2)
(1) California Polytechnic State University
(2) U.S. Army Institute of Surgical Research (USA)

2.5 Motorcycle-car side impact simulation
2.6 Analysis and load assessment of secondary impact to adult pedestrians after car collisions on roads
D. Otte, T. Pohlemann, Accident Research Unit Medical University Hanover (Germany)

SESSION III – BIOMECHANICS OF HEAD AND NECK

3.1 Consequences of brain size following impact in prediction of subdural Hematoma evaluated with numerical techniques
S. Kleiven (1), H. von Holst (1&2)
(1) Dept of Aeronautics Royal Institute of Technology
(2) Dept of Clinical Neuroscience Karolinska Institute (Sweden)

3.2 Brain injuries in real world accidents – A multidisciplinary investigation
R. Thomson, P. Lövsund, Crash Safety Division Chalmers University of Technology
H. Norin, L. Jakobsson, Volvo Car Corporation
O. Boström, Y. Haland, Autoliv Research (Sweden)

3.3 Biomechanical response of human cervical spine to direct loading of the head
K. Ono (1), K. Kaneoka (2), E.A. Sun (3), E.G. Takhounts (4), R.H. Eppinger (3)
(1) Japan Automobile Research Institute - (2) University of Tsukuba (Japan)
(3) National Highway Traffic Safety Administration – (4) Conrad Technologies Inc. (USA)

3.4 Single rear impact produces lower cervical spine soft tissue injuries
N. Yoganandan, F.A. Pintar, B.D. Stemper, J.F. Cusick, R.D. Rao (1), T.A. Gennarelli
Depts of Neurosurgery and (1) Orthopaedic Surgery Medical College of Wisconsin (USA)

Session IV – OTHER BIOMECHANICS ISSUES

4.1 Restrained Hybrid III dummy-based criteria for thoracic hard-tissue injury prediction
R. Kent, J. Bolton, J. Crandall (1), P. Prasad, G. Nusholtz, H. Mertz (2), D. Kallieris (3)
(1) Automobile Safety Laboratory University of Virginia (USA)
(2) Alliance of Automobile Manufacturers
(3) University of Heidelberg (Germany)

4.2 A biomechanical and MRI analysis of back pain among drivers exposed to tractor vibrations
M. Varghese (1), A. Kumar (2), D. Mohan (3), P. Mahajan (4)
(1) Dept. of Orthopaedics, St. Stephen’s Hospital -
(2) Indian Agricultural Research Institute
(3) Transportation Res. & Injury Prevention Programme, Indian Institute of Technology
(4) Dept of Applied Mechanics, Indian Institute of Technology (India)
4.3 **Spinal kinematics of restrained occupants in frontal impacts**  
G. Shaw, R. Kent, E. Sieveka, J. Crandall, Automobile Safety Laboratory University of Virginia (USA)

4.4 **Finite element simulation of the biomechanical response of the human body**  
R. Jost, G.N. Nurick, Dept of Mechanical Engineering University of Cape Town (South Africa)

**SESSION V – RESTRAINT SYSTEMS AND PROTECTION DEVICES**

5.1 **Multiple impact crashes – Consequences for occupant protection measures**  
P.A. Fay, R. Sferco, Ford Motor Company, UK and Germany  
R. Frampton, Vehicle Safety Research Centre Loughborough University (UK)

5.2 **Laminated side glazing – Implications for vehicle occupant safety**  
A.M. Hassan, M. Mackay (1), J.Y. Foret-Bruno, J.F. Huere (2), K. Langwieder (3)  
(1) Automotive Safety Centre Birmingham University (UK)  
(2) Laboratory of Accidentology and Biomechanics, PSA Peugeot-Citroën RENAULT (France)  
(3) Institute for Vehicle Safety – GDV (Germany)

5.3 **Head, neck, and body coupling in reconstructions of helmeted head impacts**  
M. Beusenberg, N. Schewchenko, J.A. Newman (1) - R. de Lange, H. Cappon (2)  
(1) Biokinetics and Associates Ltd. (Canada) -  
(2) TNO-Automotive (The Netherlands)

5.4 **Volunteer tests on human tolerance levels of pretension for reversible seatbelt tensioners in the pre-crash-phase.**  
Phase I results: tests using a stationary vehicle  
B. Lorenz, D. Kalieris, P. Strohbeck-Kuehner, R. Mattern, Institute of Legal and Traffic Medicine University of Heidelberg  
U. Class, M. Lueders, TRW Occupant Safety Systems (Germany)

5.5 **The potential effectiveness of adaptive restraints**  
R. Cuerden (1), J. Hill, A. Kirk (2), M. Mackay (1)  
(1) Automotive Safety Centre Birmingham University  
(2) Vehicle Safety Research Centre Loughborough University (UK)

**POSTER SESSION**

**PS.1 Benefit from a neck protection system for aftermarket fitting**  
H. Zellmer, M. Stamm, A. Seidenschwang, Autoliv GmbH (Germany)  
A. Brunner, Winterthur Insurance Corp. (Switzerland)

**PS.2 Compatibility of trucks and cars in frontal collisions - Benefit of an energyabsorbing front underride guard**  
F.A. Berg, F. Lauer, DEKRA Automobil GmbH  
L. Riebeck, U. Breitling, MAN Nutzfahrzeuge AG (Germany)

**PS.3 An analysis of pedestrian dummy throw characteristics for forward projection pedestrian collisions**
PS.4 A new oblique impact test for motorcycle helmets
P. Halldin, Dept of Aeronautics, Royal Institute of Technology (Sweden)
A. Gilchrist, N.J. Mills, School of Metallurgy & Materials University of Birmingham (UK)

PS.5 Development of a humanlike pelvis for a mid-sized male side impact dummy
M. van Ratingen, B. Been, H. Boucher, TNO-Automotive (The Netherlands)
S. Compigne, Y. Caire, R. Bouquet, J.P. Verriest, INRETS-LBMC Biomechanics and Impact Mechanics Laboratory (France)
A. Roberts, D. Hynd, A. Sampson, C. Oakley, Transport Research Laboratory (UK)

PS.6 Sharing of collision energy between cars in frontal impacts
D. Wood, D. Walsh, Denis Wood Associates (Ireland)
C. Simms, TNO-Automotive (The Netherlands)

PS.7 Tolerance limits for mild traumatic brain injury derived from numerical head impact replication
D. Baumgartner, R. Willinger, Strasbourg University (France)
N. Schewchenko, M. Beusenberg, Biokinetics and Associates Ltd. (Canada)

PS.8 Evaluation of vehicle body stiffness/strength for car-to-car crash compatibility
Y. Kitagawa, C. Pal, Nissan Motor Co. Ltd. Vehicle Research Laboratory (Japan)