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Engineering & Scientific Consulting

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Professional Profile

Dr. Dibb focuses on issues involving human injury biomechanics to evaluate the severity and mechanisms of injury in traumatic events. He also evaluates occupant kinematics and injuries during motor vehicle crashes, including: frontal, rear-end, side, and rollover impacts. His fields of expertise include injury tolerance and kinematics of the adult and pediatric head and neck as well as the biofidelity of crash test dummies. Dr. Dibb's research experience includes cadaveric and computational studies of the head and neck in response dynamic frontal deceleration, compression, and tension modes of crash induced loading. His research efforts also include evaluations of automotive restraints and the performance of laminated glass.

Prior to joining Exponent, Dr. Dibb was a Research Assistant of the Department of Biomedical Engineering at Duke University, working in the Injury and Orthopaedic Biomechanics Lab.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, Duke University, 2011

B.S., Mechanical Engineering, Brigham Young University, cum laude, 2003

Licenses and Certifications

Licensed Professional Engineer, Arizona, #58581

Certified Child Passenger Safety (CPS) Technician, #T715315

Northwestern University Center for Public Safety, Traffic Crash Reconstruction, August 2011

Professional Affiliations

Society of Automotive Engineers — SAE

American Society of Mechanical Engineers — ASME

American Society of Biomechanics — ASB

Publications

Parenteau C, Smedley J, Carhart M, Dibb A. The effect of obesity on rollover ejection and injury risks. SAE World Congress, 2020-01-1219, Society of Automotive Engineers, Warrendale, PA, 2020.

Toney-Bolger M, Sherman S, Isaacs J, Garman C, Dibb A. An evaluation of near-and far-side occupant responses to low-to moderate-speed side impacts. SAE World Congress, 2020-01-1218, Society of Automotive Engineers, Warrendale, PA, 2020.

Heller M, Sharpe S, Newberry W, Dibb A, Zolock J, Croteau J, Carhart M, Kerrigan J, Clauser M. Occupant kinematics and injury response in steer maneuver-induced furrow tripped rollover testing. SAE International Journal of Transportation Safety 3.2015-01-1478, 2015.

Newberry W, Imler S, Carhart M, Dibb A, Balavich K, Croteau J, Cooper E. Belted occupant kinematics and head excursion during the airborne phase of vehicle rollover: Evaluation of the effects of rollover deployed curtain airbags. SAE World Congress, 2014-01- 0527, Society of Automotive Engineers, Warrendale, PA, 2014.

Dibb AT, Cutcliffe CC, Luck JF, Cox CA, Myers BS, Bass CR, Arbogast KB, Seacrist T, Nightingale RW. Pediatric head and neck dynamics in frontal impact: Analysis of important mechanical factors and proposed neck performance corridors for 6-and 10-year-old ATDs. Traffic Injury Prevention 2014; 15(4).

Cox CA, Dibb AT, Cutcliffe HC, Nightingale RW, Myers BS, Vasavada AN, Suderman BL, Bass CR. The influence of muscle modeling methods and paths on head and neck response. In Proceedings of the 11th World Congress on Computational Mechanics, 5th European Conference on Computational Mechanics and 6th European Conference on Computational Fluid Dynamics, Barcelona, Spain, pp. 20-25, 2014.

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Moralde M, Dibb A, Smedley J, Carhart M, Cooper E. Seat belt restraint evidence generated in the presence of fractured glass. SAE World Congress, 2012-01-0084, Society of Automotive Engineers, Warrendale, PA, 2012.

Dibb AT. Pediatric head and neck dynamic response: A computational study. Ph.D. Dissertation, Duke University, Durham, NC, 2011.

Dibb AT, Nightingale RW, Luck JF, Chancey VC, Fronheiser LE, Myers BS. Tension and combined tension-extension structural response and tolerance properties of the human male ligamentous cervical spine. Journal of Biomechanical Engineering 2009; 131:081008.

Luck JF, Nightingale RW, Loyd AM, Prange MT, Dibb AT, Song Y, Fronheiser LE, Myers BS. Tensile mechanical properties of the perinatal and pediatric PMHS osteoligamentous cervical spine. Stapp Car Crash Journal 2008; 52:107-134.

Dibb AT, Nightingale RW, Chancey VC, Fronheiser LE, Tran LN, Myers BS. Comparative structural neck responses of the THOR-NT, Hybrid III, and human in tension and bending. Stapp Car Crash Journal 2006; 50:567-583.

Prange MT, Luck JF, Dibb A, Van Ee CA, Nightingale RW, Myers BS. Mechanical properties and anthropometry of the human infant head. Stapp Car Crash Journal 2004; 48:1-21.

Presentations and Published Abstracts

Dibb AT, Nightingale RW, Loyd AM, Luck JF, Bass CR, Myers BS. Examination of pediatric head and neck dynamics during frontal impact using a validated multibody dynamics model. 6th World Congress of Biomechanics, Singapore, 2010.

Loyd AM, Nightingale RW, Bass CR, Luck JF, Dibb AT, Myers. Pediatric head impact response. 6th World Congress of Biomechanics, Singapore, 2010.

Panzer M, Bass CR, presented by Dibb AT. Parametric study on the modeling aspects of blast brain injury. 6th World Congress of Biomechanics, Singapore, 2010.

Dibb AT, Nightingale RW, Myers BS. A comparison of methods for modeling neck muscle wrapping in finite element models. Proceedings, 35th International Workshop on Human Subjects for Biomechanical Research, San Diego, CA, 2007.

Dibb AT, Nightingale RW, Myers BS. Modeling and optimization of the neck musculature. SAE Government/Industry Meeting, Washington, D.C., 2007.

Luck JF, Prange M, Nightingale RW, Loyd A, Dibb A, Ottaviano D, Tran L, Myers BS. Tensile mechanical properties of the pediatric human osteoligamentous cervical spine. 5th World Congress of Biomechanics, Munich, Germany, 2006.

Myers BS, Dibb A, Luck J, Alexander P, Loyd A, Frush D, Nightingale R. Biomechanics of the pediatric head and spine: Applying the lessons learned from adults. Southern Consortium for Injury Biomechanics: 4th Annual Meeting, Homewood, AL, 2006.

Nightingale RW, Prange MT, Luck JF, Alexander P, Loyd AM, Dibb A, Ottaviano D, Tran LN, Myers BS. Mechanical properties of the human pediatric head and cervical spine. Southern Consortium for Injury Biomechanics: 3rd Annual Meeting, Birmingham, AL, 2005.

Technical Reports

Nightingale R, Dibb A, Hasija V, Huang A, Takhounts E. The effect of the THOR upper neck load cell mass on head kinematics and injury measures. Requested Report Docket to the SAE THOR Evaluation Task Group, 2007.