



JENNIFER A. SHULTZ, B.S.B.M.E. PROFESSIONAL BIOGRAPHICAL OUTLINE

BACKGROUND

Jennifer Shultz earned a B.S. in Biomedical Engineering with a minor in Mechanical Engineering at Drexel University, in Philadelphia, Pennsylvania. Ms. Shultz has completed advanced coursework in the fundamental principles of engineering and physics, as well as human physiology and biomechanics. While a student at Drexel University, Ms. Shultz worked in conjunction with Temple University's School of Podiatric Medicine on the research and development of an improved marker system to characterize and evaluate foot and ankle kinematics using advanced engineering techniques. She gained experience in their clinical gait analysis laboratory capturing and analyzing three-dimensional human subject motion data and assisted with the design of anatomical instrumentation to facilitate data capture. In addition to fulfilling her engineering requirements at Drexel University, Ms. Shultz gained valuable experience while working for a manufacturer of bone substitute products and she served as an integral part of an interdisciplinary team that developed bone substitute materials for the clinical environment.

As a Biomechanist for ARCCA, Inc., Ms. Shultz uses her biomechanical skills to conduct the research and analysis of the relationships between crash injuries and crash forces, occupant kinematics and human tolerance, and forensic investigations. She participates in investigations of injury causation in low speed and high speed impacts. In addition, she has participated in testing using occupants restrained in automotive seating and seat belts in various crash orientations. These tests and research studies have added to her formal education in biomechanics and injury causation. More specifically, she has participated in vehicle-to-vehicle crash tests and sled tests to scientifically investigate the kinematic and kinetic responses of the body in automobile collisions. As such, she is very familiar with the theory and application of human tolerance to inertial and impact loading, as well as the scientifically accepted techniques and processes for evaluating motion of the human body within a crash environment, mechanisms of injury, and the potential for injury during a particular incident.

Ms. Shultz has worked on a program with the National Institute for Occupation Safety and Health (NIOSH) to research, develop, simulate, evaluate and ultimately test occupant crash protection systems for the rear occupants of ambulances. A specific emphasis was placed on analyses of occupant kinematics, impact loading with interior structures of the vehicle, evaluations of injury mechanisms, and the methods and techniques to prevent such injuries. Further work with NIOSH has included a large test program to evaluate and de-lethalize the patient compartment of ambulances. This research included identification and analysis of typically-used patient care equipment and crashworthy mounting hardware, as well as evaluations of structural performance and integrity of the mounting systems when subjected to real-world crash pulses.

EDUCATION

- Bachelors of Science in Biomedical Engineering, Drexel University, 2004
- Minor in Mechanical Engineering, Drexel University, 2004

PROFESSIONAL EXPERIENCE

June 2005 – Present | ARCCA, Incorporated | Biomechanist

- Technical Quality Assurance Specialist
- Applies scientific and biomechanical principles to evaluate injury causation
- Utilizes medical records, testing, computer modeling and knowledge of human injury tolerance to determine whether a claimed injury is consistent with a specific set of actions or exposure to a specific incident environment

2004 – 2005 | Biometric Imaging, Inc. | Assistant

- Assisted with clinical studies in collaboration with Wills Eye Hospital to assess the utility of metabolic mapping in early diagnosis of the glaucomas, diabetic retinopathy, and age-related macular degeneration

2002 – 2003 | Therics | Research Assistant

- Participated in research for the development of a bone substitute material to be used in craniofacial and bone void filler applications
- Performed compression testing on samples to determine mechanical properties
- Utilized scanning electron microscopy (SEM) and mercury intrusion porosimetry to determine the porosity characteristics of various engineering materials

PROFESSIONAL AFFILIATIONS

- Biomedical Engineering Society (BMES)
- Association for the Advancement of Automotive Medicine
- Society of Automotive Engineers (SAE)

PUBLICATIONS

Green, J. (NIOSH), Moore, P. (NIOSH), Current, R. (NIOSH), Harrington, S. (ARCCA), Sicher, L. (ARCCA), Whitman, G. (ARCCA) and **Shultz, J.** (ARCCA). *Civilian Ambulance Patient Compartment Delethalization*. (In Progress)

Hunsberger, G., **Shultz, J.**, Rock, D., Zheng, Y., Heilman, B., Hillstrom, H. (2004). *A Floating Axis Based Solution for Hindfoot, Forefoot, and 1st MTP Joint Motion*. J. Orthop Sports Phys Ther. 34:9.

- Published abstract – presented at the Foot and Ankle Research Retreat II [April 30-May1, 2004; Los Angeles, CA].