AFFIDAVIT OF CHRIS VAN EE, PH.D.

STATE OF MICHIGAN

COUNTY OF Oakland

I, Chris Van Ee, being duly sworn, state as follows:

1. My name is Chris Van Ee. I hold a Ph.D. in Biomedical Engineering from Duke University and am a licensed Professional Engineer. My address is Design Research Engineering, 46475 Desoto Ct., Novi, Michigan 48377. My academic and scientific research has been focused on determining injury causation and evaluating injury prevention strategies from a biomechanical engineering perspective. Biomechanical engineering is a subdiscipline of biomedical engineering that uses the application of the principles of mechanical engineering and physics to quantify the effects of forces on and within the human body, including tolerance levels and injury mechanisms.

2. My work in biomechanics has been well recognized by the scientific community and the published results of my work have received multiple honors and awards. I have served as a grant reviewer for the National Institutes of Health and as a program reviewer for the US Army Aeromedical Research Laboratory on Head and Spine Injury. I am the former chairman of the Occupant Protection Committee of the Society of Automotive Engineers and the Scientific Program Committee of the Association for the Advancement of Automotive Medicine. I am an adjunct professor in the Department of Biomedical Engineering at Wayne State University and provide graduate student training and conduct academic research in impact, orthopedic, and safety biomechanics.

3. I have specific expertise in the analysis and risk assessment of head injury in the infant and adult populations. I am a co-author of the only peer reviewed publication (Prange et al. 2004) in which the infant head mechanical response to impact was directly measured experimentally and compared to the CRABI-6 infant crash test dummy response. Recently, I first authored two additional publications (Van Ee et al. 2009 and Van Ed et al. 2009), which further refine pediatric head injury tolerance for skull fracture and intracranial trauma.

4. My involvement in head injury research began in 1992 as a PhD graduate student at the Impact and Orthopedic Biomechanics Laboratory at Duke University. Since then, I have been involved in head injury risk assessments involving helmet testing for sports and transportation, design and development of laboratory experiments quantifying infant and adult head response for a variety of loading conditions ranging from shallow water diving to ballistic studies of skull fractures. I have also been involved in the evaluation of crash dummy head and neck response and its relationship to human

EXHIBIT "E"

response and injury. I have performed multiple forensic investigations into infant and adult head injuries in the automotive, marine, industrial, sporting, and domestic environments. My area of expertise and training with respect to head injury is in identifying and quantifying the mechanisms for and the risks of traumatic head injury and the evaluation of injury prevention devices and strategies.

Scope of Review

5. I have been asked to comment on the biomechanical issues in the above captioned case and have been provided with the information contained in paragraphs 6 through 8. I have not performed biomechanical reconstructions; however, the available information is sufficient to comment generally on the biomechanics of shaking v. impact and on whether the incident described by the caretaker is biomechanically consistent with the head injuries described at autopsy.

6. In this case, the caretaker (the mother's boyfriend) has been sentenced to death for causing the death of an infant in his care. In this case, the caretaker described a significant accidental impact in the hours before the baby's collapse. My comments do not address the veracity of the caretaker descriptions but focus instead on whether the described impact is biomechanically consistent with the head injuries described at autopsy.

7. Chloe Britt, the daughter of Jeffrey Havard's girlfriend, died on 2/21/02 when she was six months old (DOB 8/19/01; DOD 2/21/02). Mr. Havard was caring for the child while the mother bought groceries and rented movies. He reported that the baby had been fussy and that, after giving her a bath, he accidentally dropped her on the toilet, where her head hit the tank and her legs hit the seat. The estimated height of the fall was approximately three feet. (Note: this measurement seems somewhat too high for the described fall.) Mr. Havard said the baby looked as if she was in shock. He shook her to produce a response, and the baby began crying and spit up. After that, she reportedly seemed okay and he changed her diaper, cleaned her up and put her to bed. She was found unresponsive in her bed perhaps an hour after the incident. The baby arrived at the hospital at approximately 9:44 p.m. on 2/21/02. There was vigorous resuscitation but she collapsed again and was pronounced dead at 10:50 p.m. The baby was taking antibiotics at the time of death and weighed approximately 22 pounds.

8. The autopsy findings included diffuse bilateral subarachnoid hemorrhage, multifocal cephalohematomas, mild cerebral edema, a torn frenulum, and changes in the eyes consistent with bilateral retinal and perioptic nerve hemorrhage. There were contusions on the forehead, posterior scalp, face and thighs. Anal abnormalities noted at the hospital were not seen at autopsy. The cause of death was listed as changes consistent with shaken baby syndrome and closed head injuries, and the manner of death was listed as homicide. At trial, the Medical Examiner testified that the death was attributable to violent shaking (shaken baby syndrome) and that the type of injuries paralleled those seen in motor vehicle crashes, falls from significant heights and the like. The other findings were viewed as not participatory in the death.

9. Task. The biomechanical issues are whether the described fall is consistent with the head injuries noted at autopsy, and whether manual shaking is likely to have played a significant role in the death.

Head Injury and Short Falls

10. To determine whether the described falls are consistent with the medical findings, it is necessary to have a competent understanding of the tolerance of the infant head to trauma. The forces/exposures required to cause trauma can then be compared to the historical accounts to determine if the accounts are consistent with the medical findings.

11. A number of studies are helpful in identifying the level of trauma necessary to result in different types of pediatric head injury. Most focus on short falls as a means to discover the minimal level of trauma necessary for serious head injuries.

12. Based on the literature and research (some of which is mine), short distance falls of three feet or less can result in serious, and sometimes fatal, head injury. Plunkett (2001) reports case studies of 18 fatal head injuries resulting from short-distance falls. In these studies of short falls, many of which were witnessed by a non-caregiver, the children presented with a range of well-documented injuries including skull fracture, subdural hematoma, bilateral retinal hemorrhage, vitreous hemorrhage, and papilledema. Of the six cases for which a funduscopic examination was reported, four of the six children exhibited bilateral retinal hemorrhage.

13. Other studies also conclude that, although rare, low level falls can result in serious and fatal head trauma including subdural and retinal hemorrhage (Aoki 1984, Hall 1989, Smith 1996, Gardener 2005). Hall describes 18 children who died from falls of three feet or less. Some of these falls occurred from a parent's arms, others occurred while children were running or when they fell from furniture. Two occurred within a medical facility: one child who fell while running down the hall and another who fell from a doctor's chair. One of Hall et al.'s points is that falls regardless of fall height can result in serious head injuries and children should be evaluated for this possibility since it cannot be ruled out in any individual case.

14. Another recent study indicates that skull fractures and intracranial trauma as a consequence of short falls are not as uncommon as many have been led to believe. Ibrahim, from the University of Pennsylvania, recently reported that of the 67 infants (less thanl2 months old) hospitalized for accidental falls of 3 feet or less, 73% suffered skull fracture, and 55% suffered a primary intracranial injury (including epidural, subdural, subarachnoid, intraventricular hemorrhage, and/or parenchymal contusion and hemorrhage) (Ibrahim 2009).

15. While these case studies identify the potential for injury in short distance falls, severe head injury outcomes from domestic type falls are uncommon. In most fall cases, children will impact with

feet, knees, arms, buttocks, or shoulders first. This slows the head prior to impact or may avoid head contact all together. If there is a head impact, the impact surface may be soft (for example, wood chips on a playground), or the impact surface may be obliquely oriented to the head as it impacts, resulting in only a glancing blow. It is in the relatively rare case where the head makes a primary impact, and the impact surface is squarely oriented and firm, that a severe, or fatal, head injury may result from a short distance fall. Pre-existing vulnerabilities (if present) may also play a role.

16. Based on these studies along with those in the reference section, including my own laboratory studies, it is clear that low level falls of even 2-3 feet can result in injurious level head impacts resulting in skull fracture and intracranial hemorrhage. Laboratory testing contained in Van Ee et al. 2009 indicates that 32" falls onto concrete using the CRABI-6 Anthropomorphic Test Device (ATD based on the anthropometry and biomechanics of a 6 month old child) can result in head impact forces over 500 lbs. and angular accelerations exceeding those that are experimentally known to cause subdural hemorrhage in adults (10,000 rad/s2 — see Depreitere et al). These results assume that the impact is occurring to a normal health child. If a particular child has a predisposition or ailment that makes them particularly vulnerable to trauma then lower levels of trauma may very well have disastrous consequences. I do not have any additional information or specific expertise regarding the presence of a possible preexisting health condition(s) which could have been a factor in this scenario; however if some specific medical condition is identified and this medical condition substantially affects the susceptibility of the head to trauma, then this would obviously be an important factor requiring further consideration.

Comments

17. The biomechanical literature establishes that accidental short falls may cause head injury and, rarely, death in infants and children. The outcome in any particular case may vary depending on a specific child's unique susceptibilities to injury, the exact dynamics of the actual fall and impact, and the course of medical treatment. The short fall described by the caretaker in this matter may fall within the range of impact that can cause such injury however the current information about the fall is relatively scant. From a biomechanical perspective, additional laboratory investigation of the mechanics of the described fall may allow further refinement of the actual ranges of head trauma that the baby may have experienced and allow for comparisons with standard injury reference values to determine if injury is likely for the described fall.

18. In this case, the described fall was from an initial height greater than 3 feet above the floor and estimated to be approximately three feet down onto a particularly hard surface (porcelain toilet). How the child fell and in what orientation she impacted the toilet would be further areas of study which may help rule in or rule out if the reported history is consistent with the head injuries suffered. Any alternative suggested scenario, including shaking, should be subjected to a similar analysis.

19. Based on the current data on short distance falls and head injury mechanics and the information provided to me for this case, it would be biomechanically incorrect to dismiss the history

of fall as a causal factor resulting in the findings described at autopsy. Shaking is a less likely explanation for these findings.

20. I do not have a medical history for this child and will leave to others the identification of possible preexisting vulnerabilities should they exist. Care should also be taken to delineate those autopsy findings which are the primary direct result of the original trauma rather than the results of resuscitative efforts or secondary responses to the original trauma (accidental or otherwise).

Comparing the Trauma in Falls to Manual Shaking

21. The autopsy report in this case suggests that some of the findings may be attributable to shaking. Unfortunately, some medical clinicians and others have come to believe that manual shaking can create rotational acceleration/deceleration forces sufficient to cause the tearing of bridging veins, and that shaking creates greater shear forces within the brain than those produced in low level falls. In this context, statements have been made that baby shaking can produce results similar to those caused by multi-story falls or high speed motor vehicle accidents.

22. A number of landmark papers have been published quantifying the mechanics of shaking and, more recently, low level falls. (Duhaime et al 1987, Prange et al 2003). Based on Prange et al.'s results (shown in Figure 2), the rotational acceleration, and thus the shear forces, for a shake are less than those developed in a one foot fall onto carpet. The rotational forces attained in manual shaking cannot be equated to those occurring as a result of a multistory fall or a high speed motor vehicle accident. To suggest otherwise is without scientific foundation. Given the relative forces, it would be illogical to dismiss a given history of a fall and attribute the injuries to the rotational accelerations of manual shaking, which produces much lower angular accelerations than short falls of 1 foot or less.

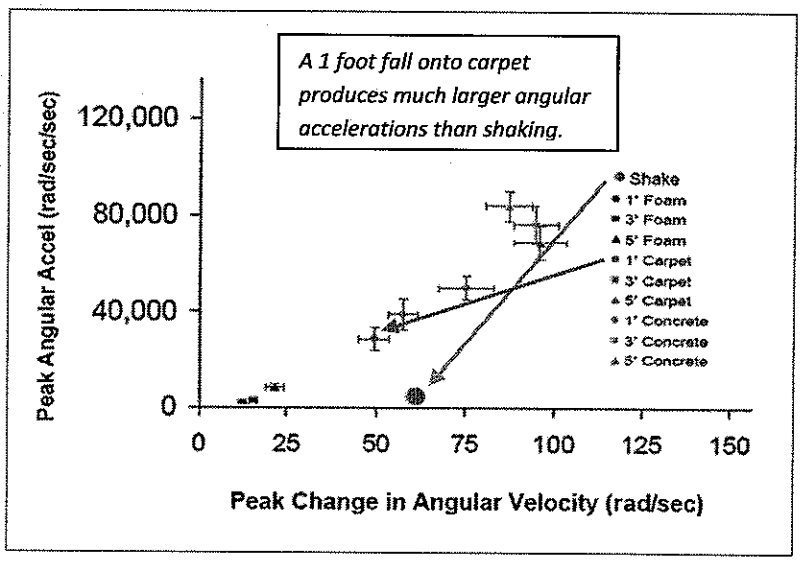

Figure 2: *Comparison of the head trauma exposure for short falls onto different surfaces and shaking. Even a one-foot fall onto carpet produces much larger head angular accelerations than can be produced by maximal effort shaking by an adult. Figure adapted with permission from M. Prange (Biomechanics of traumatic brain injury in the infant, Dissertation: University of Pennsylvania, 2002).*

Conclusion

23. The science in these fields is currently being disseminated, refined and tested. Rigorous application of the scientific method and further evidence based research will continue to shape our understanding of head injuries and their causes. In light of the above, it is my opinion that the reported accidental fall scenario provided to me as described by the caretaker should not be dismissed without further investigation. Short falls do have the potential to result in impacts to the head consistent with the head injury findings described at autopsy.

24. Based on available biomechanical data, abusive shaking produces angular accelerations less than that produced in falls of only 1 foot. To attribute the injuries of this child to shaking and dismissing the reported history of the accidental fall is not supported by the current science. Any biomechanical analysis should be supplemented by consideration of other risk factors or vulnerabilities.

25. The opinions expressed in this report are to a reasonable degree of biomedical certainty based on information currently available and on the current state of scientific knowledge. They may be supplemented or changed as further data and/or analyses become available. If my opinions change on any material issues I will make a concerted effort to inform all parties and where appropriate the court of those changes. I am willing to conduct a more detailed review of this case if this would be helpful and am also available to answer any questions.

Further affiant sayeth not.

This the 13 day of November, 2013.

Chris Van Ee

Chris Van Ee, Ph.D.

Sworn to and subscribed before me on this the 13th day of November, 2013.

Corrina E. Newman

NOTARY PUBLIC

CORRINA E. NEWMAN
NOTARY PUBLIC - STATE OF MICHIGAN
COUNTY OF OAKLAND
My Commission Expires May 1, 2017
Acting in the County of Oakland

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Professional Specialization

Impact biomechanics and accident reconstruction research to identify mechanisms of injury with application to product safety and design. Injury causation is investigated using a combination of computational modeling, laboratory experimental studies, and investigations of real world accidents to define human kinematics, injury mechanisms, interactions with product components and effectiveness of intervention strategies. Specific areas of focus include automotive and marine accidents, child safety, contact sports injuries, industrial machine accidents, and small power hand tool injury investigations.

Past research and product investigations have included adult and pediatric head and neck injury biomechanics, crash induced injuries to the knee, thigh, and hip; crash induced ruptures of the large vessels of the thorax; injury mechanisms and tolerance of the cervical spine; identifying correlations between thoracic loading, skeletal fractures, and internal organ injuries in crash occupants; identifying injury mechanisms to pregnant automobile occupants, evaluating the performance of current and prototype belt restraint systems; evaluating and refining anthropomorphic test device designs and injury reference values; designing assembly machines for increased operator safety; quantifying the protective performance of football, boxing, and motorcycle helmets; evaluating the effectiveness of protective eyewear in small power tool accidents; quantifying the dynamics of circular, miter, and table saw injuries including blade binding, operator error, and the effectiveness of safety interventions; determination of the sufficiency of machine guarding components; and the cause and nature of slip and fall accidents.

Education

Ph.D. (Biomedical Engineering), Duke University, 2000
Advisor: Barry S. Myers M.D. Ph.D.
B.S. (Mechanical Engineering), Dordt College, 1992

Licensure

Professional Engineer: State of Michigan #6201056733

Professional Background

Principal Engineer: Biomedical and Mechanical Engineering
Design Research Engineering, Novi, Michigan
2009 - Present
Adjunct Assistant Professor
Department of Biomedical Engineering, Wayne State University, Detroit, Michigan
2002 - Present
Senior Biomechanical Engineer
Design Research Engineering, Novi, Michigan
2005 - 2009
Project Engineer
Design Research Engineering, Novi, Michigan
2002 - 2005
Assistant Research Scientist
University of Michigan Transportation Research Institute, Ann Arbor, Michigan
2000 - 2002
Doctoral Candidate
Department of Biomedical Engineering, Duke University, Durham, North Carolina
1998-2000

Research Assistant
Department of Biomedical Engineering, Duke University, Durham, North Carolina
1992-1998
Custom Design Engineer
Pella Corporation, Pella, Iowa
1991 - 1992
Engineering Technician
Vermeer Manufacturing, Pella, Iowa
1990

Professional Affiliations, Service, Certifications

Association for the Advancement of Automotive Medicine
- Membership Committee (2012-Present)
- Scientific Program Committee (2006-2011)
- Chairman of the Scientific Program Committee (2009-2010)

Society of Automotive Engineers Occupant Protection Committee (2005-Present)
- Chairman of the Automobile Body Activity of the Land and Sea Group (2010-2013)
- Vice-Chairman of the Automobile Body Activity of the Land and Sea Group (2009-2010)
- Chairman of the Occupant Protection Committee (2008-2009)
- Vice-Chairman of Occupant Protection Committee (2006-2008)

Organizer of the Occupant Restraints Session: SAE World Congress (2006-Present)
Co-chairperson of the Biomechanics Session: SAE World Congress 2006
Session Organizer: Dynamics and Control of Biomechanical Systems III, 2009 ASME International Mechanical Engineering Congress & Exposition
Traffic Accident Reconstruction, Northwestern University Center for Public Safety
Child Passenger Safety Technician - The National Standardized Child Passenger Safety Training Program (June 2006 - June 2010)
Associate Editor: Journal of Passenger Cars – Mechanical Systems (2010-Present)
Associate Editor: Journal of Forensic Biomechanics (2010-2013)
Editor: SAE Occupant Protection and Crashworthiness Technology Collection (2009-2012)
Review Panel Member: American Institute of Biological Sciences review of United States Army Aeromedical Research Laboratory (February 2008)
Reviewer for American Institute of Biological Sciences: review of proposal submitted to US Army Medical Research and Materiel Command
Reviewer and Review Panel Member, National Institutes of Health (2003-2008, 2012, 2013)
- Special Emphasis Panel/Scientific Review Group ZRG1 MOSS-F, Musculoskeletal, Oral and Skin Sciences
- Study Section ZRG1 BDCN-K Clinical Neurophysiology, Devices and Neuroprosthetics / Brain Disorders and Clinical Neuroscience
- Study Section ZRG1-GRM, Geriatrics and Rehabilitation Medicine
- Study Section MRS, Musculoskeletal Rehabilitation Sciences
- Study Section ZRG1-SBDD, Rehabilitative Medicine

Reviewer, SAE Congress:
- Biomechanics
- Occupant Restraints

- Side Impact, Rear Impact and Rollover

Reviewer: Annals of Biomedical Engineering
Reviewer: Accident Analysis and Prevention
Reviewer: Traffic Injury Prevention
Reviewer: ASME: Occupant Protection & Biomechanics
Reviewer: Journal of Biomechanics
Reviewer: Journal of Biomechanical Engineering
Reviewer: Medical Engineering & Physics
Invited Reviewer: Stapp Car Crash Journal 2009
Judge, ASME PhD Student Paper Competition (Summer 2007)
Member, American Society of Biomechanics (ASB)
Member, American Society of Mechanical Engineers (ASME)
Member, Society of Automotive Engineering Society (SAE)
Member, Association for the Advancement of Automotive Medicine (AAAM)

Honors and Awards

John Paul Stapp Award
Best paper at the 2008 Stapp Car Crash Conference

UMTRI Best Publication Award
University of Michigan Transportation Research Institute best publication award for 2004

UMTRI Best Publication Award
University of Michigan Transportation Research Institute best publication award for 2003

John Paul Stapp Award
Best paper at the 2000 Stapp Car Crash Conference. The paper was voted the most significant contribution in the field of impact biomechanics relating to the reduction of injuries in automotive transportation.

Stapp Association Student Award
Most outstanding student presentation at the 2000 Stapp Car Crash conference.

Ralph H. Isbrandt Automotive Safety Award
Best paper presented to the Society of Automotive Engineers on the subject of Automotive Safety Engineering for the year 1995.

Arnold W. Siegel Award
Society of Automotive Engineers' award for the most outstanding paper presented at the 1995 Stapp Car Crash Conference.

Duke University Research Fellowship
National Science Foundation Fellowship Committee Honorable Mention
Dordt College Merit Scholarship

Publications

"Towards a More Robust Lower Neck Compressive Injury Tolerance - An Approach Combining Multiple Test Methodologies," Traffic Injury Prevention, Accepted, (with D. Toomey, K. Yang, N. Yoganandan, F. Pintar)

"Biomechanical Evaluation of Frangible Skull Surrogates to Blunt Ballistic Temporo-parietal Head Impact" (Abstract) American Academy of Forensic Sciences 65th Annual Meeting, February 18-23, 2013 (with D. Raymond, G. Crawford, and C. Bir).

"Skull Biomechanics" Orthopaedic Biomechanics, ed. B.A. Winkelstein, Boca Raton: CRC Press Taylor and Francis Group, 2013. (with C.R. Bass, A.M. Lloyd, B.S. Myers, M.B. Panzer).

"Exploring the Role of Lateral Bending Postures and Asymmetric Loading on Cervical Spine Compression Responses", 2009 ASME International Mechanical Engineering Congress & Exposition, IMECE2009-12911, (with D Toomey, M Mason, W Hardy, K Yang, J Kopacz).

"Evaluation and Refinement of the CRABI-6 Anthropomorphic Test Device Injury Criteria for Skull Fracture", Proceedings 2009 ASME International Mechanical Engineering Congress & Exposition, IMECE2009-12973, (with B Moroski-Browne, D Raymond, K Thibault, W Hardy, J Plunkett).

"Child ATD Reconstruction of a Fatal Pediatric Fall", 2009 ASME International Mechanical Engineering Congress & Exposition, IMECE2009-12994, (with D Raymond, K Thibault, W Hardy, J Plunkett).

"Development of Biomechanical Response Corridors of the Head to Blunt Ballistic Temporo-Parietal Impact," Journal of Biomechanical Engineering, September 2009, Vol. 131 (with DE Raymond, GS Crawford, CA Bir).

"Tolerance of the Skull to Blunt Ballistic Temporo-parietal Impact", Journal of Biomechanics, In Press (with DE Raymond, GS Crawford, CA Bir).

"Mechanisms of Traumatic Rupture of the Aorta and Associated Peri-isthmic Motion and Deformation" Stapp Car Crash Journal, Vol. 52, November 2008. (with W. Hardy, CS Shaw, MJ Mason, JM Kopacz, KH Yang, AI King, JL Bishop, RF Banglmaier, MJ Bey, RM Morgan, KH Digges).

"Use of Computational Models in Marine Accident Reconstruction", 2008 TASS Americas MADYMO Users Meeting, April, Detroit, MI (with Robert Taylor).

"The Effect of Soft Tissue On The Biomechanics Of Skull Fracture Due To Blunt Ballistic Impact: Preliminary Analysis and Findings" (Abstract) 2008 Summer Bioengineering Conference, June 25-29, 2008 (with D. Raymond, G. Crawford, C. Bir).

"Biomechanics of Temporo-Parietal Skull Fracture From Blunt Ballistic Impact" (Abstract) 2008 Summer Bioengineering Conference, June 25-29, 2008 (with D. Raymond, G. Crawford, C. Bir).

"Biomechanics of Blunt Ballistic Impacts to the Head and Fracture-Specific Injury Criteria Development" (Abstract) American Academy of Forensic Sciences 60th Annual Meeting, February 18-23, 2008 (with D. Raymond, G. Crawford, and C. Bir).

"Biomechanics of Blunt Ballistic Impacts to the Forehead and Zygoma" (Abstract-Poster) American Academy of Forensic Sciences 60th Annual Meeting, February 18-23, 2008 (with G. Crawford, D. Raymond, and C. Bir).

"Head Exposure Levels in Pediatric Falls" (abstract-poster) National Neurotrauma Society Meeting, 2007 (with K. Monson, C. Sparrey, L. Cheng, and G. Manley).

"Dynamic Biaxial Tissue Properties of the Human Cadaver Aorta," Stapp Car Crash Journal, Vol. 50, November 2006 (with C.S. Shah, W.N. Hardy, M.J. Mason, and K.H. Yang, R. Morgan, and K. Digges).

"Study of Potential Mechanisms of Traumatic Rupture of the Aorta Using In Situ Experiments," Stapp Car Crash Journal, Vol. 50, November 2006 (W.N. Hardy, C.S. Shah, J.M. Kopacz, K.H. Yang, R. Morgan and K. Digges).

"Investigation of Potential Mechanisms of Traumatic Rupture of the Aorta" (Abstract #5245) Proceedings of the World Congress of Biomechanics – Munich, Germany August 2006 (with W.N. Hardy, C.S. Shah, M.J. Mason, K.H.Yang, and K. Digges).

"Safety Restraint System Physical Evidence and Biomechanical Injury Potential Due to Belt Entanglement," SAE Paper 2006-01-1670, 2006 SAE World Congress (with D.E. Toomey and M.E. Klima).

"High-Speed Biaxial Tissue Properties of the Human Cadaver Aorta," Proceedings of IMECE05 - 2005 ASME International Mechanical Engineering Congress, November 2005. (with C.S. Shah, M.J. Mason, K.H. Yang, W.N. Hardy, R. Morgan, and K. Digges).

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"Use of Computer Models in Forensic Investigations of Human Kinematics: Examples from Alpine Skiing and Marine Accident Reconstruction", Proceedings of AmeriPAM 2004 (Abstract) (with E. Morphy and R. Taylor).

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"Cervical-spine Geometry in the Automotive Seated Posture: Variations with Age, Stature, and Gender," Stapp Car Crash Journal, 2004 (with K. D. Klinich, S. Ebert, C. Flannagan, M. Prasad, M. P. Reed, and L. W. Schneider).

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"Tensile Properties of the Human Muscular and Ligamentous Cervical Spine." Ph.D. Thesis, Duke Universty, 2000.

"Quantifying Skeletal Muscle Properties in Cadaveric Test Specimens: Effects of Mechanical Loading, Postmortem Time, and Freezer Storage." Journal of Biomechanical Engineering, 122:9-14, February 2000 (with A. L. Chasse, and B. S. Myers).

"Understanding and Minimizing Error in Cervical Spine Tensile Testing," Proceedings: The 28th International Workshop on Human Subjects for Biomechanical Research, 2000 (with V. C. Chancey, R. W. Nightingale, D. L. A. Camacho, B. S. Myers).

"Tensile Testing of the Ligamentous Cervical Spine: Biomechanical Considerations for a Proposed Testing Methodology." Proceedings: The 27th International Workshop on Human Subjects for Biomechanical Research, 1999 (with R. W. Nightingale, and B. S. Myers).

"Muscle Fixation Methods to Increase Cadaveric Biofidelity: Results of a Single Fiber Muscle Model," The 9th Injury Prevention Through Biomechanics Symposium Proceedings, Detroit, MI, 1999 (with M. R. Larochelle, W. Feng, M. K. Reedy, F. H. Schachat, and B. S. Myers).

"The Effects of Postmortem Time and Freezer Storage on the Mechanical Properties of Skeletal Muscle." The 8th Injury Prevention Through Biomechanics Symposium Proceedings, Detroit, MI, 1998 (with A.L Chasse, B. S. Myers).

"Injury Mechanisms in the Pediatric Cervical Spine During Out-of-Position Airbag Deployments." Proceedings of the 42nd Association of the Advancement of Automotive Medicine, 1998 (with R. W. Nightingale, B. A. Winkelstein, and B. S. Myers).

"The Effects of Postmortem Time and Freezer Storage on the Mechanical Properties of Skeletal Muscle." Society of Automotive Engineers, J. Passenger Cars, SAE Paper #983155, 1998 (with A. L. Chasse, and B. S. Myers).

"Measurement of Human Neck Muscle Volume Geometry and Physiologic Cross Sectional Area in 5th, 50th and 95th Percentile Subjects using Cadaveric Dissection and MRI." 25th Annual International Workshop for Human Subjects for Biomechanical Research, 1997 (with K. E. Knaub, C. Cheng, B. Poon , C. Spritzer, and B. S. Myers).

"On the Structural and Material Properties of Mammalian Skeletal Muscle and its Relevance to Human Cervical Impact Dynamics." Society of Automotive Engineers, J. Passenger Cars, SAE Paper #952723, 1995 (with B. S. Myers, D. L. A. Camacho, C. T. Woolley, and T. M. Best).

"Measurement of the Structural and Material Properties of Mammalian Skeletal Muscle." The 5th Injury Prevention Through Biomechanics Symposium Proceedings, Detroit, MI, 1995 (with D. L. A. Camacho, C. T. Woolley, T. M. Best, and B. S. Myers).

Presentations

"Biomechanics of Pediatric Head Injury," Invited Lecturer, Center for Forensic Science and Medicine, University of Toronto, March 22, 2013.

"ATV Rollover, Operator Response, and Determinants of Injury: Implications for Crush Protection Devices," US Consumer Product Safety Commission: ATV Safety Summit, Bethesda, MD, October 12, 2012.

"Evaluation and Refinement of the CRABI-6 Anthropomorphic Test Device Injury Criteria for Skull Fracture", 2009 ASME International Mechanical Engineering Congress & Exposition, November 18, 2009.

"Child ATD Reconstruction of a Fatal Pediatric Fall", 2009 ASME International Mechanical Engineering Congress & Exposition, November 18, 2009.

"Use of Computational Models in Marine Accident Reconstruction", 2008 TASS Americas MADYMO Users Meeting, April, Detroit, MI

"Pediatric Head Injury: Injury Mechanisms and Injury Tolerance", Invited Lecturer for BME 7810 – Forensic Bioengineering, Wayne State University, November, 2007.

"Principles of the Biomechanical Analysis of Infant Brain Injury" and "Case Studies in Infant Brain Injury Analysis," co-presenter with Kirk Thibault at the EBMS Symposium – An Evidence-Based Analysis of Infant Brain and Skeletal Injury, May 2007.

"Characterizing Pediatric Head Injury Risk: Automotive Accidents, Falls, and Shaking," Invited Keynote Speaker: 15th Annual Meeting of the Rachidian Society, Kona, HI, February 2007.

"Tensile Tolerance of the Cervical Spine" Invited Keynote Speaker: 15th Annual Meeting of the Rachidian Society, Kona, HI, February 2007.

"Safety Restraint System Physical Evidence and Biomechanical Injury Potential Due to Belt Entanglement," co-presenter with M. Klima, SAE World Congress, Detroit, MI, April 2006.

"Biomechanics, Falls, and Shaken Baby Syndrome," Guest Lecturer for BME 7995 – Forensic Bioengineering, Wayne State University, October, 2005.

"Trial Techniques and Strategies: Making the Most of Your Experts," co-presenter with Jeffrey Weiner, Florida Bar Continuing Legal Education Seminar, Miami, FL, January 21, 2005.

"Use of Computer Models in Forensic Investigations of Human Kinematics: Examples from Alpine Skiing and Marine Accident Reconstruction", AmeriPAM Nov 3, 2004.

"Marine Accident Reconstruction: Forensic Engineering and Biomechanics" Wayne State University, June 7, 2004.

"Biomechanics and Physical Restraint, An Analysis of the Mandt System." Dallas, TX, April 22, 2004.

"Rollovers, Neck Injury, and Defining the Role of Lateral Bending in Compressive Neck Injury." Wayne State University, March 15, 2004.

"Development of an Experimental Protocol to Quantify the Tolerance of the Hip to Axial Femur Loading." The 29th International Workshop on Human Subjects for Biomechanical Research. San Antonio, TX, November, 2001.

"Head and Cervical Spine Geometry in the Automotive Neutral, Flexion, and Extension Postures." Ford Motor Company, Dearborn, MI, September, 2001.

"Tensile Properties of the Human Muscular and Ligamentous Cervical Spine." 2000 Stapp Car Crash Conference, Atlanta, GA, November, 2000.

"Development of an Experimental Model of Tensile Neck Injury." The 27th International Workshop on Human Subjects for Biomechanical Research, San Diego, CA, October, 1999.

"A Combined Experimental and Computational Study of Tensile Neck Injury." National Highway Traffic Safety Administration, Durham, NC, July, 1999.

"Neck Surrogates: A Systematic Experimental and Computational Study Designed to Provide Anthropometric Test Device Injury Reference Values." National Highway Traffic Safety Administration, Washington, DC, December, 1998.

"The Effects of Postmortem Time and Freezer Storage on the Mechanical Properties of Skeletal Muscle." The 42nd Annual Stapp Car Crash Conference, Phoenix, AZ, November 2-4, 1998.

"The Effects of Postmortem Time and Freezer Storage on the Mechanical Properties of Skeletal Muscle." The 8th Injury Prevention Through Biomechanics Symposium, Detroit, MI, May 7-8, 1998.

"Measurement of the Structural and Material Properties of Mammalian Skeletal Muscle." The 5th Injury Prevention Through Biomechanics Symposium, Detroit, MI, May 4-5, 1995.

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