

**Kerry Knapp**  
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## **EDUCATION**

- 2003 Ph.D. Union Institute and University, Cincinnati, OH (Forensic Biomechanics)  
**Coursework Emphasis:** Human Anatomy (focus on head and brain), Trauma Pathology, Injury Causation and Human Tissue Tolerance
- 1995 M.A. Northern Arizona University, Flagstaff, AZ (Biomechanics/Human Anatomy)  
**Coursework Emphasis:** Human Anatomy and Physiology, Biomechanics, Kinesiology, and computer modeling.
- 1980-1983 NOVA University, Fort Lauderdale, FL (abd: Doctorate in Public Admin.)  
**Coursework Emphasis:** Qualitative and Quantitative Analysis, Analytical Research, Operational Research and Modeling
- 1979 M.S. University of Arizona, Tucson, Arizona (Hydrology).  
**Coursework Emphasis:** Analytical and Quantitative Coursework in Mathematics, Statistics and Engineering Sciences
- 1969 B.S. University of Arizona, Tucson Arizona (Hydrology)  
**Coursework Emphasis:** Mathematics, Statistics and Engineering Sciences

## **PROFESSIONAL**

- 1994 - Present Consultant, Injury Biomechanics, Flagstaff, Arizona
- 1983 - 1994 Consulting Hydrologist/Analyst, Tucson, Arizona.
- 1969 - 1983 Hydrologist/Analyst, U.S. Dept of Agriculture: United States.

### **Injury Biomechanics and Accident Reconstruction Expert Witness Work:**

1994-Present: Over 1,000 cases. Motor vehicle accidents include single and multiple vehicle accidents at speed ranges from <5 mph to >70 mph, rollovers of cars and trucks, commercial truck accidents, seat belt issues, motorcycles and motorized scooters. Case experience also includes pedestrian/motor vehicle accidents, slip/trip/fall injuries, falls from heights, industrial accidents, sports injuries, wrongful death, shootings, stabbings, beatings and criminal forensics. My work in criminal forensics includes analysis and testimony as an expert witness for the United States Department of Justice, the State of Arizona, and local jurisdictions.

## **EXPERIENCE**

Since 1999 I have owned and managed Northstar Biokinetics, Inc., a Flagstaff-based Arizona corporation providing consulting services, detailed biomechanical analyses and expert witness testimony on cases where human motion, human response to external loading and/or tissue damage are issues. As the owner and manager I assign all work as well as reviewing and approving all opinions issued by the firm. My most recent and current academic work has been focused on human anatomy, human biomechanics, injury causation and human tissue tolerance with special emphasis on the head, neck and brain.

### **Narrative Summary of Research, Work and Teaching**

My experience includes 25 years working in the physical sciences and computer modeling. The application of mathematics, physics and engineering science provides the technical foundation for my current work in injury biomechanics. Research activities include field investigation, laboratory experiments and computer simulation development. I have taught hydrology and analytical techniques in the formal setting (University of Arizona, 1972) and in seminar format both for the U.S. Dept. of Agriculture and Northern Arizona University, as well as extensive lecturing and formal presentations to both technical staff and the public.

Since 1994 my attention has been focused entirely on human injury biomechanics. Research includes comparative studies in human anatomy (complete human dissections as well as multiple human prosections), investigation of foot and ankle mechanics, and modeling the low impact rear collision.

Current research is focused on improving analysis techniques applicable to trauma- induced fatalities in humans; structural and functional relationships of the human head and brain; head/brain response to linear and angular acceleration loading; and the response of human tissues to external loading. I continue to improve my understanding of human structural and functional anatomy through work in the cadaver laboratory.

## **BIOMECHANICS PRESENTATIONS**

Application of The Articulated Total Body Model to Low Impact Motor Vehicle Accidents,  
Northern Arizona University Faculty Seminar, spring 1995

Foot and Ankle Seminar, Arizona Physical Therapy Association, July 1995

The Articulated Total Body Model as an Investigative Tool in Injury Biomechanics, Northern  
Arizona University Graduate Seminar, fall 1995

Prosecution work for Foot and Ankle seminar, Association of Physical Therapists, Indianapolis,  
Indiana, July, 1996

Problem Solving/Reconstruction - The Practice of Applying Injury Biomechanics, Faculty  
Seminar, Northern Arizona University, September 1997

The Application of Functional Anatomy and Biomechanics to Technical Accident  
Reconstruction, Southwestern Association of Technical Accident Investigators, Newport  
Beach, California, November 4, 2000

Beyond Motor Vehicle Accidents, Nevada Claims Conference, Las Vegas, Nevada, May 2002.

## **BIOMECHANICS PRESENTATIONS (Continued)**

Homicide or Suicide? A Case study, Coconino County Medical Examiners Seminar, Death Investigation, December 6, 2002  
Meeting the Daubert Challenge: A Proposed Model to Test the Relevance and Reliability of Expert Testimony, American Academy of Forensic Sciences, Dallas, TX February 20, 2004

### **In Progress research publications:**

Knapp K. Hannon P, Loverich G, and Nesbitt, M, "Modelling the low impact rear collision"  
Funded by the Northern Arizona University Grants Office  
Gebhart A, Moreland A, Hannon P, Knapp K. "Temporomandibular joint dysfunction: a review of anatomy and etiology"  
Hannon P, Arasz J, Fladeland R, Shaft J, Knapp K. "A descriptive study of peak head accelerations during daily activities in humans"

### **Books and Book Chapters**

Hannon P and Knapp K. Causes of Injury: A review of the low-impact, human subject literature. Ch. 18; 3<sup>rd</sup> Ed. of Low Speed Automobile Accidents, Watts, A.J., Atkinson, D. and Hennessy, C., Lawyers and Judges Publishing Co., Tucson, Arizona  
Hannon P and Knapp K. Forensic Biomechanics, Lawyers and Judges Publishing Co., Tucson, Arizona  
Hannon P, Cornwall M and Knapp K. Forensic Biomechanics Second Edition. Lawyers and Judges Publishing Co., Tucson, Arizona.

## **WORKSHOPS AND CONFERENCES**

### **Biomechanics**

Musculo-Skeletal Biomechanics, Prosthetics, and Robotics Workshop, Feb. 19, 1994, College of Medicine, University of Arizona  
Symposium for experienced users of the Articulated Total Body Computer Model, June 1995, Dayton, Ohio  
Users symposium for experienced users of the Articulated Total Body Model, February, 1996, Phoenix, Arizona  
Southwestern Association of Technical Accident Investigators Symposium March 1996, Las Vegas, Nevada  
Southwestern Association of Technical Accident Investigators Symposium July, 1996, Phoenix, Arizona  
Southwestern Association of Technical Accident Investigators Symposium April, 1997 Las Vegas, Nevada  
Southwestern Association of Technical Accident Investigators Symposium March, 1998, Laughlin, Nevada

### **WORKSHOPS AND CONFERENCES (Continued)**

Southwestern Association of Technical Accident Investigators Symposium July, 1998  
(Staged Collision Sequence #17/Motor cycle Dynamics/Vehicle Aerodynamics)  
International Conference on Whiplash Injury- Tempe, Arizona November, 1998  
Southwestern Association of Technical Accident Investigators Symposium November 1998  
(Occupant Kinematics) San Diego, California  
Southwestern Association of Technical Accident Investigators Symposium July 1999  
(Staged Collision Sequence Vehicle/truck Underride Data Collection, Sleep Apnea and MVAs,  
and Antilock Brake Performance), Phoenix, Arizona  
Southwestern Association of Technical Accident Investigators Symposium March 2000,  
Laughlin, Nevada (vehicle yaw dynamics during braking and uncontrolled acceleration)  
Southwestern Association of Technical Accident Investigators Symposium, July 2000, Phoenix,  
Arizona (Crash Testing and Occupant Protection)  
Southwestern Association of Technical Accident Investigators Symposium, November 2000,  
Newport Beach, California (Analytical techniques in technical accident reconstruction)  
Southwestern Association of Traffic Accident Investigators Symposium March 2001 Las Vegas,  
Nevada, Tire construction and failure; Momentum analyses  
Arizona Homicide Investigators Association, Inc. August 2001, Payson, Arizona, Blunt Force  
Trauma, Speaker: Dr. Mark Fischione  
Southwestern Association of Traffic Accident Investigators Symposium March 2002 Las Vegas,  
Nevada- Commercial vehicle braking and human factors analysis.  
American Academy of Forensic Sciences, Dallas, Texas, February 20, 2004  
Southwestern Association of Technical Accident Investigators Symposium March 2006  
Laughlin, Nevada. (Biomechanics/human factors)

### **PAST TEACHING RESPONSIBILITIES**

1. Anatomical Kinesiology (laboratory)
2. Anatomical Kinesiology guest lectures
3. Biomechanics (Undergraduate and Graduate level)
4. Neural Control of Movement guest lectures (Undergraduate and Graduate level)

### **PROFESSIONAL ASSOCIATIONS**

1. American College of Sports Medicine-National
2. Society of Automotive Engineers-National
3. Southwestern Association of Technical Accident Reconstructionist
4. Articulated Total Body Model User's Group-National
5. Arizona Homicide Investigator Association
6. American Academy of Forensic Sciences-National