



Dennis Chimich MSc PEng

Senior Biomechanical Engineer

contact

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📍 Vancouver

expertise

Injury Biomechanics

areas of specialization

Injury mechanics/causation

Injury potential

Seat belt effectiveness

Sports injuries

Slip and fall/recreational incidents

Dennis Chimich leads MEA Forensic's Injury Biomechanics group in Vancouver. As a Senior Biomechanical Engineer, Dennis investigates how injuries happen in vehicle collisions, slips and falls, product failures, and sporting events. He has worked on thousands of cases during his forensic career and testified as an expert witness in court many times.

Dennis has a Bachelor's degree in mechanical engineering from the University of Alberta and a Master's degree in civil engineering (biomechanics) from the University of Calgary. For his master's thesis, he studied anterior cruciate ligament injuries in the knee commonly seen in sports. The knowledge he gained from testing ligament, muscle and bone helps Dennis interpret and critique the results of tests described in the scientific literature and use them appropriately in his analysis of injury.

A biomechanical analysis of injury involves developing an understanding of the motions and forces generated during an event and the mechanisms and thresholds for the diagnosed injury. Dennis provides clients with a thorough, unbiased analysis of these factors supported by fundamental engineering principles and applicable data from the scientific literature. "I analyze the injury in the context of the specific event and the specific individual involved. This tailored approach allows me to put together a full picture."

When a particular issue is not adequately addressed in the existing scientific literature, MEA's engineers can conduct their own experiment and provide clients, and ultimately the court, with better scientific answers. "Our research topics are directly related to the questions that come up in the cases we receive," he observes. Dennis is currently studying the accuracy of devices used to measure surface friction when investigating slip and fall incidents. He has also been involved in studying the impact performance of helmets, whiplash, occupant kinematics, and knee injury biomechanics.

education

Masters of Science, Civil Engineering (Biomechanics), University of Calgary, 1993

Bachelor of Science, Mechanical Engineering, University of Alberta, 1986

professional status

Registered Professional Engineer

Engineers and Geoscientists BC (EGBC), License No. 24645.

Association of Professional Engineers, Geologists & Geophysicists of Alberta (APEGGA), Registration No. M44865

Professional Engineers Ontario, License No. 100126489

professional associations

American Association of Automotive Medicine (AAAM) Scientific Program Committee Member, since 2020.

Society of Automotive Engineers (SAE) – Member & Transaction Selection Committee Member/Technical Paper Reviewer, since 1995.

professional experience

MEA Forensic Engineers & Scientists

Principal, Senior Biomechanical Engineer, 1999 to Present

Conducts biomechanical analyses of injury-producing incidents, including assessments of the loads applied to the body, injury mechanics, and the relationship between the applied loads and the injury. Performs seat belt effectiveness analyses to determine the potential for injury with seat belt use. Involved in over 2000 technical investigations related to the biomechanics of injury. Prepares written biomechanical reports and provides expert testimony. Supervises junior biomechanical engineers. Conducts research on biomechanics of injury, low speed collision kinematics, helmet performance and behavior, and slips and falls. Qualified as an Expert Witness in the Supreme Court of British Columbia, the Court of Queen's Bench of Alberta, and the Superior Court of the State of Washington.

Samac Engineering, Ltd., Calgary, AB

Biomechanical/Mechanical Engineer, 1995 to 1999

Performed biomechanical analyses of body motion and impact forces during injury causing incidents. Conducted injury probability assessments, injury mechanism analyses, and seat belt effectiveness investigations. Composed biomechanical reports and provided expert testimony in the Court of Queen's Bench of Alberta. Supervised and instructed junior engineers.

Tenet Medical Engineering, Inc., Calgary, AB

Vice-President, Engineering Operations, 1993 to 1995

Supervised and coordinated all phases of medical device manufacturing. Performed mechanical design and prototyping of numerous medical devices and instruments for surgery. Conducted research and developed new products. Coordinated and designed protocols for clinical trials and testing. Also wrote grant applications to raise finances for product development.

Consultant, Calgary, AB

Biomechanical Engineering Consultant, 1988 to 1995

Provided expertise in medical/legal cases regarding mechanism of soft tissue/bone injury, force analysis and long-term

biomechanical effect of injury. Performed mechanical testing on various soft tissues for an orthopaedic research laboratory.

Northern Alberta Institute of Technology & Alberta Business and Educational Services, Calgary, AB

Instructor, 1995

Instructor for biomechanics course in the Orthotics and Prosthetics Technician Program.

The University of Calgary, Faculty of Medicine, Calgary, AB

Instructor, 1991 TO 1994

Taught biomechanics of bone fracture to first year medical students.

The University of Calgary, McCaig Centre for Joint Injury and Arthritis Research, Calgary, AB

Biomechanical Engineer, 1987 to 1988

Performed and directed the dissection and testing of a variety of soft tissues for a large research team. Contributed to the design, fabrication, testing and use of specialized equipment and instrumentation to measure the structural and material properties of biological tissues. Conducted all phases of testing including data acquisition and reduction, statistical analysis, and writing of scientific manuscripts.

research activities

Lead investigator in a study assessing the variability of walkway tribometers.

Co-investigator in a study investigating the impact performance of helmets at, above and below the test line specified in certification standards.

Co-investigator in a study investigating tribometer performance for slip and fall investigations.

Co-investigator in a study investigating the impact performance of various types of used bicycle helmets.

Principal investigator in a study investigating the relationship between motorcycle helmet damage and impact severity.

Co-investigator in a study assessing bathtub slip and fall during entrance and exit.

Co-investigator in a study comparing the impact performance of various types of motorcycle helmets.

Co-investigator in a study to assess the effect of seatbelt usage during airbag deployment and the risk for brain injury in frontal collisions.

Co-investigator in a study to quantify the relationship between vehicle damage and the potential for neck injury in 20 common vehicles in the BC fleet.

Co-investigator in a study of the effect of seat belt slack and anchor location on the head and lower limb excursion of crash test dummies in frontal collisions.

Co-investigator in a parametric study on the effect of collision pulse shape on the kinematic response of anthropomorphic test dummies in low speed rear end impacts.

Co-investigator in a study of the effect of head restraint placement and seat back stiffness on the kinematic and kinetic response of anthropomorphic test dummies in low speed rear end impacts.

Co-investigator in a study on the response of anthropomorphic test dummies vs human volunteers in low speed rear end impacts.

publications

Contaminant film thickness affects walkway friction measurements

Quantifying the uncertainty in tribometer measurements on walkway surfaces

Variability of friction measurements using three common walkway tribometers

Impact Performance of Certified Bicycle Helmets Below, On and Above the Test Line

Variability of walkway tribometer measurements

The effect of contaminant film thickness on slip resistance

Substandard impact performance of common bicycle helmets

Age has a minimal effect on the impact performance of field-used bicycle helmets

The impact response of traditional and BMX-style bicycle helmets at different impact severities

lectures & presentations

Hundreds of presentations on the biomechanics of injury have been made to law firms and insurance companies. Presentations have been provided throughout British Columbia, Alberta, and Washington State. Below are several invited presentations for legal, medical, and insurance societies.

June 30, 2020 – USC3 Tile Testing, ASTM F13 Committee Meeting, Online.

November 1, 2016 – Injury Biomechanics in Property and Product Liability Cases, The Canadian Bar Association, Insurance Law Section (North), Edmonton, AB.

January 23, 2014 – Co-chair and presenter – Effective Use of Injury Biomechanics, Engineering Evidence in Civil Litigation, Continuing Legal Education Society of British Columbia (CLEBC), Vancouver, BC.

October 17, 2012 – Biomechanical Analysis and Injury Assessment, Medical Issues in Personal injury, Continuing Legal Education Society of British Columbia (CLEBC), Vancouver, BC.

May 10, 2012 – Injury Biomechanics, Canadian Defence Lawyers Boot Camp II, Vancouver, BC.

May 19, 2011 – Injury Biomechanics, Canadian Defence Lawyers Boot Camp, Vancouver, BC.

October 15, 2010 – Motorcycle Helmet Effectiveness, Personal Injury Conference, Continuing Legal Education Society of British Columbia (CLEBC), Vancouver, BC.

June 10, 2010 – Pedestrian and Bicycle Accidents: Injury Based Biomechanical Analyses, Canadian Defence Lawyers Audio Conference, Vancouver, BC.

May 6, 2010 – Injury Biomechanics, Canadian Defence Lawyers Boot Camp, Vancouver, BC.

March 10, 2010 – June 27, 2012 – Slip, Trip and Fall, Insurance Institute of British Columbia (IIBC), Vancouver, Victoria, Kelowna, Kamloops BC. June 23, 2009 – Biomechanics of the Slip, Trip & Fall, Teleseminar & Powerpoint Presentation, Trial Lawyers Association of BC, Vancouver, BC.

April 2008 – Injury Biomechanics. Canadian Defence Lawyers Boot Camp II, Vancouver, BC.

December 07, 2006 – Injury biomechanics and soft tissue injuries. Medical Issues in Personal Injury Conference, The Continuing Legal Education Society of British Columbia, Vancouver, BC.

June 02, 2006 – Effects of head restraint position on occupant response in rear-end collisions. Personal Injury Conference, The Continuing Legal Education Society of British Columbia, Vancouver, BC.

September 19, 2002 – Injury biomechanics, Washington Association of Independent Medical Examiners, Seattle, WA.

April 24, 2002 – Injury biomechanics, Washington Defense Trial Lawyers, Seattle, WA.

August 15, 2001 – The biomechanics of cervical spine fractures. The Fourth International Conference on Accident Investigation, Reconstruction, Interpretation and the Law, Vancouver, BC.

October 26, 2000 – The biomechanics of injury, Lindsay Kenney Insurance Law Seminar, Vancouver, BC.

September 27-28, 1997 – Vehicle and biomechanical analysis of low speed collisions, Whiplash seminar, The College of Chiropractors of Alberta, Calgary, AB.

April 25, 1996 – Biomechanics of injury and low speed collisions, The low speed package, sponsored by The Insurance Institute of Southern Alberta, Calgary, AB.

April 2, 1996 – Low speed impact investigation and biomechanics of injury, Personal injury section of the Alberta Branch of the Canadian Bar Association, Calgary, AB.

training and professional development

March 22-25, 2021 – INPUT-ACE Video Evidence Symposium 2021, Online.

February 2, 2021 – Footwear ASTM F13 Research Subcommittee Meeting, online.

October 27-28, 2020 – 48th NHTSA Workshop on Human Subjects for Biomechanical Research.

December 15, 2020 – Behind the scenes look at an Insurance Institute of Highway Safety (IIHS) crash test, Association for the Advancement of Automotive Medicine, Webinar.

July 30, 2020 -Pedestrian walking safety and posture, ASTM F-13 Research, Subcommittee Meeting, online.

January 9– March 26, 2020 – BLDC 1500 – Building Code: Part 9 (SFD), British Columbia Institute of Technology.

September 11-13, 2019 – International Research Conference on Biomechanics of Injury Conference, Florence, Italy.

February 5, 2019 – Building Smart with 2018 BC Building Code Changes – Vancouver, Seminar, BC Housing Webinar.

July 8-12, 2018 – 8th World Congress of Biomechanics, Dublin, Ireland.

June 25, 2018 – ASTM Standards Development Meeting of Committee F13 – Pedestrian/Walkway Safety and Footwear, San Diego, CA.

February 2, 2018 – AIS Analysis Tips and Tricks for Proper Use, Association for the Advancement of Automotive Medicine, Webinar.

January 22, 2018 – ASTM Standards Development Meeting of Committee F13 – Pedestrian/Walkway Safety and Footwear, New Orleans, LA.

June 15-16, 2017 – Slips, Trips, and Falls International Conference 2017, Toronto, ON.

January 31, 2017 – ASTM Standards Development Meeting of Committee F13 – Pedestrian/Walkway Safety and Footwear, West Conshohocken, PA.

January 30, 2017 – Workshop on Multifactorial Analysis of Slip and Fall Events: Implications for Forensic and Safety Professionals. West Conshohocken, PA.

November 7-9, 2016 – 60th Stapp Car Crash Conference, Washington DC.

November 9-11, 2015 – 59th Stapp Car Crash Conference, New Orleans, LA.

November 8, 2015 – 43rd International Workshop on Human Subjects for Biomechanical Research, New Orleans, LA.

July 6, 2015 – Ontario Building Code Part 9: An Overview, Ontario Society of Professional Engineers, Mississauga, ON.

November 10-12, 2014 – 58th Stapp Car Crash Conference, San Diego, CA.

November 9, 2014 – 42nd International Workshop on Human Subjects for Biomechanical Research, San Diego, CA.

July 6-11, 2014 – 7th World Congress of Biomechanics, Boston, MA.

November 11-13, 2013 – 57th Stapp Car Crash Conference, Orlando, FL.

November 10, 2013 – 41st International Workshop on Human Subjects for Biomechanical Research, Orlando, FL.

October 29-31, 2012 – 56th Stapp Car Crash Conference, Savannah, GA.

October 28, 2012 – 40th International Workshop on Human Subjects for Biomechanical Research, Savannah, GA.

July 12, 2012 – The Pathophysiology of Traumatic Brain Injury Conference, Vancouver, BC.

June 7-9 2012 Canadian Society of Biomechanics 17th Biannual Meeting, Vancouver BC.

June 6-9, 2012 – 17th Biennial Conference Canadian Society for Biomechanics (CSB-SCB), Vancouver, BC.

November 3-5, 2010 – 54th Stapp Car Crash Conference, Scottsdale, AZ.

November 2, 2010 – 38th International Workshop on Human Subjects for Biomechanical Research, Scottsdale AZ.

November 2-4, 2009 – 53rd Stapp Car Crash Conference, Savannah, GA

November 3-5, 2008 – 52nd Stapp Car Crash Conference, San Antonio, TX.

November 2, 2008 – 36th International Workshop on Human Subjects for Biomechanical Research, San Antonio, TX.

October 29-31, 2007 – 51st Stapp Car Crash Conference, San Diego, CA.

October 28, 2007 – 35th International Workshop on Human Subjects for Biomechanical Research, San Diego, CA.

June 6, 2006 – Tribometer Workshop, Sponsored by the ASTM Committee F-13 on Pedestrian/Walkway Safety and Footwear, Pasadena CA.

November 9-11, 2005 – 49th Stapp Car Crash Conference, Washington, DC.

November 8, 2005 – 33rd International Workshop on Human Subjects for Biomechanical Research, Washington, DC.

November 1-3, 2004 – 48th Stapp Car Crash Conference, Nashville, TN.

October 31, 2004 – 32nd International Workshop on Human Subjects for Biomechanical Research, Nashville, TN.

October 27-29, 2003 – 47th Stapp Car Crash Conference, San Diego, CA.

October 9-10, 2003 – International Whiplash Trauma Congress, Denver, CO.

June 29, 2003 – Tribometer Workshop, sponsored by the ASTM Committee F-13 on Pedestrian/Walkway Safety and Footwear, Pasadena, CA.

June 28, 2003 – Symposium on the Biomechanics of Slip and Fall, sponsored by the ASTM Committee F-13 on Pedestrian/Walkway Safety and Footwear, Pasadena, CA.

November 11-13, 2002 – 46th STAPP Car Crash Conference, Ponte Vedra Beach, FL.

November 10, 2002 – 30th International Workshop on Human Subjects for Biomechanical Research, Ponte Vedra Beach, FL.

August 4-9, 2002 – 4th World Congress of Biomechanics, Calgary, AB.

November 6-8, 2000 – 44th STAPP Car Crash Conference, Atlanta, GA.

November 4-5, 2000 – Clinical and Biomechanical Aspects of Lower Extremity Injuries, Wayne State University, School of Medicine, Atlanta, GA.

October 25-27, 1999 – 43rd STAPP Car Crash Conference, San Diego, CA.

October 24, 1999 – 27th International Workshop on Human Subjects for Biomechanical Research, San Diego, CA.

August 8-13, 1999 – International Society of Biomechanics XVIIth Congress, Calgary AB.

February 7-11, 1999 – World Congress on Whiplash-Associated Disorders, Vancouver, BC.

November 5-6, 1998 – Whiplash 98, SAE, Tempe, AZ.

November 2-4, 1998 – 42nd STAPP Car Crash Conference, SAE, Tempe, AZ.

November 15, 1997 – 25th International Workshop in Human Subjects for Biomechanical Research, Lake Buena Vista, FL.

November 13-14, 1997 – 41st STAPP Car Crash Conference, SAE, Orlando, FL.

November 12, 1997 – 2nd Child Occupant Protection Symposium, SAE, Orlando, FL.

November 10-11, 1997 – 41st Association for the Advancement of Automotive Medicine Conference, Orlando, FL.

August 14-15, 1997 – Airbag Design and Performance TOPTEC Workshop, SAE, Costa Mesa, CA.

November 7-8, 1996 – AGARD Specialists' Meeting, NATO, Impact Head Injury, Mescalero, NM.

November 4-6, 1996 – 40th STAPP Car Crash Conference, SAE, Albuquerque, NM.

November 3, 1996 – 24th International Workshop on Human Subjects for Biomechanical Research, Albuquerque, NM.

August 19-20, 1996 – Low Speed Collision TOPTEC Workshop, SAE, Vancouver, BC.

November 11-12, 1995 – Accidental Injury: Biomechanics & Prevention, University of California at San Diego, School of Medicine, San Diego, CA.

November 8-10, 1995 – 39th STAPP Car Crash Conference, SAE, San Diego, CA.

Numerous Canadian and International orthopedic research conferences have been attended since 1988.
