

Unearth the Nature, Extent of Injuries

Biomechanics Still Invaluable

By: Christina Bramlet, published 9/30/09 Claims Magazine

With many bodily injury claims arising from vehicle collisions, slips and falls, product use, and industrial accidents, the alleged injury may seem inconsistent with the conditions of the accident.

To find out what really happened when the loss description seems downright implausible, claim adjusters and investigators increasingly rely on biomechanical engineers. The effective collaboration between these two parties to reveal the true nature and extent of claimed injuries — and thus quell insurance fraud — was the subject of “Injury Causation: Did the Injuries Really Happen Here? Assessing Injury Causation Using Biomechanical Engineering,” a workshop held during the International Association of Special Investigation Units (IASIU) conference last week.

David Gushue, PhD, biomedical engineer at ARCCA Incorporated, hosted the workshop, which was a continuation of the well-received ARCCA IASIU seminars of 2007 and 2008. Dr. Gushue began with the same fundamental framework as past biomechanical seminars, adding fresh examples, data, and video footage to convert scientifically complex concepts into easily digestible morsels for the laymen.

Points for discussion included the customary breadth of expertise of biomechanical engineers and how their multifaceted knowledge can assist with low- and high-impact vehicular accident investigations and other queries. As Dr. Gushue explained, engineers of this kind have a firm grasp of human anatomy and physiology, kinematics, and neuroscience — among other disciplines. Thus, they understand how muscles, tissues, tendons, and bones will react to a given force, such as impact sustained in various types of accidents. All of this can be applied to establish injury causation in a given case. The biomechanical engineer weigh factors, such the mechanism of the accident; the kinematics of the claimant; the nature and magnitude of forces generated; and the tolerance of a particular body part to certain forces applied by a certain mechanism.

As illustrated during the session, biomechanics is increasingly appropriate for analyzing suspicious minor-impact soft-tissue (MIST) bodily injury claims, including those related to low-speed frontal, rear-end, and sideswipe accidents. These can present myriad challenges for adjusters and investigators, partially because they occur so frequently.

“An estimated 2.9 million Americans are injured in car accidents each year,” Dr. Gushue informed attendees. “Of those injuries, 26 percent involve alleged whiplash. In these instances and others, we can examine the damage to the vehicle(s) involved to ascertain if the force of the

crash equates to the probability of injury. We can gauge the severity of an accident by calculating delta-v, the human tolerance, and by factoring the design of the vehicle.”

Dr. Gushue incorporated videos of actual testing for collisions and slip-and-fall cases, using recent case studies to illustrate various biomechanical concepts as they pertain to a range of injuries, from the likely to the unlikely. This included an overview of how much force is required to cause a herniated disc on a lumbar spine, for example, as well as other ailments, such as carpal tunnel; cervical as well as thoracic and lumbar spine strains and sprains; compression fractures, TMJ; rotator cuff; ACL tear; whiplash; vision and hearing loss; and migraines.

The importance of the subtle differences between slips, trips, and falls was also discussed in detail. “A slip causes different injury mechanisms than a trip,” explained Dr. Gushue. “Slips might result in lower back, wrist, and head injuries, whereas trips could involve rotator cuff, wrist, and knee injuries.”

Above all, the session accentuated the role of biomechanics in ensuring separation of the diagnosis from causation, as well as the bogus claimed injury from the legitimate one. Having the proper tools and knowledge in place will enable adjusters and investigators to realize when to take an investigation to the next level.