

Biomechanical Investigation of Unwitnessed Slip, Trip and Falls

Dr. David Jamison: Exigent Forensic Consulting
Biomechanical Engineering Expert

Slip, trip and fall events are quite common in occupational, recreational and residential settings. Slip and falls in particular result in over one million hospitalizations every year in the United States¹. Slip, trip and fall events in general are the leading cause of non-fatal hospital emergency visits and represent over 21% of total visits to the ER. The elderly population is largely affected – slip, trip and fall events are the second leading cause of injury-related death for individuals age 65-84.

What is an Unwitnessed Slip, Trip or Fall?

When a slip, trip or fall event occurs, it can be difficult for counsel to establish a fact pattern when there is no third-party witness to the event and surveillance footage of the scene is not available. The matter may be further complicated by the plaintiff's inability to recall the event.

Re-engineering an unwitnessed slip, trip or fall event to determine its causal relationship to the plaintiff's injuries is a complex issue that requires experts with specialized knowledge, training, and expertise in the area of human biomechanics and injury causation. A biomechanical engineering expert relies on a combination of established principles of physics and mechanics, knowledge of injury mechanisms, and experience investigating slips, trips and falls following the scientific method to determine whether the event generated the forces necessary to cause the diagnosed injuries.

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Establishing relevant details about the physical space where the event occurred are important, particularly in unwitnessed slip, trip and falls. An inspection can be conducted to record physical measurements (e.g.: height of riser where a misstep occurred; width of walkway where slip occurred) and determine the spatial relationship between the plaintiff and other physical landmarks at the scene and how their body interacted with the physical space.

A biomechanical engineering expert uses the diagnoses provided by the treating physicians along with knowledge of human tissue responses to forces to determine the mechanism of each injury. A force is characterized by both magnitude and direction. This informs the expert what types of forces were necessary to cause the diagnosed injuries (e.g.: twisting versus compression). Having established the mechanisms of injury and relevant details of the physical space, the expert re-engineers the human

¹ National Floor Safety Institute. *Slip & Fall Quick Facts*. Retrieved from <https://nfsi.org/nfsi-research/quick-facts/>

kinematics (motions) during the fall event. It can then be determined whether the unwitnessed event was a slip-and-fall versus a trip-and-fall, where in the physical space of the incident scene the fall event initiated, and the causal relationship between the unwitnessed event and the diagnosed injuries.

Biomechanical engineers utilize their experience, training, and expertise to provide value to your personal injury litigation matters by determining whether the injuries being claimed were causally related to the subject incident. A biomechanical investigation follows the scientific method and applies the principles of mechanics and mechanical engineering to the human body. If you have a case where the mechanism of injury is unknown or in dispute and would like to speak with one of our experts, [contact us now](#).