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## STILL ANOTHER NEW LOW SPEED IMPACT ARTICLE PUBLISHED IN PEER REVIEWED MEDICAL LITERATURE

Another new article regarding low speed impacts was recently published in the literature: "Significant Spinal Injury Resulting From Low-Level Accelerations: A Case Series of Roller Coaster Injuries." Freeman MD, Croft AC, Nicodemus CN, Centeno CJ, Elkins WL. *Archives of Physical Medicine and Rehabilitation*, Volume 86, November 2005, p. 2126-2130.

The objective of the study was to describe a group of significantly injured roller coaster riders and the likely levels of acceleration at which the injuries occurred, and to compare these data with contemporary efforts to define a lower limit of acceleration below which no significant spinal injury is likely to occur. Injury incident records and emergency medical service records were evaluated for 932,000 riders of a San Antonio, Texas roller coaster.

The study found a total of 656 neck and back injuries during the study period, and 39 were considered significant by the study inclusion criteria. Injuries included cervical and lumbar disc bulges and herniations which in some cases required surgery.

The conclusion of the study: "The results of this study suggest that there is no established minimum threshold of significant spine injury. The greatest explanation for injury from traumatic loading of the spine is individual susceptibility to injury, an unpredictable variable."

In addition: "Experimental rear-impact no-damage collisions have been shown to produce more than 15g peak head acceleration, more than 3 times the amount of the peak head acceleration measured on the roller coaster. (22) Based on the results of this study, it is apparent that in a susceptible subset of the relatively healthy general population, significant spinal injury can result from low-level accelerations."

Because this article was peer reviewed prior to publication in an Index Medicus journal, it can be considered the state of the art regarding scientific knowledge about low speed impacts and resultant injuries.

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