

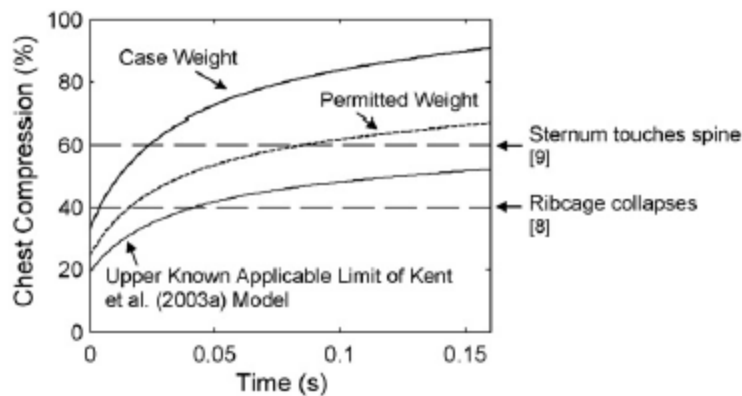


Arregui-Dalmases C, Teijeira R, Forman J. Injury biomechanics as a necessary tool in the field of forensic science. A pedestrian run-over case study. *For Sci Int* 2010 doi:10.1016/j.forsciint.2010.01.008

A 49-year-old male pedestrian was fatally injured when an overloaded truck backed over him and two of the truck's rear wheels rolled over his chest.

An analysis is presented to estimate whether or not the subject would have been severely injured if the truck had been loaded to the maximum-permitted weight. The magnitude of compression of the subject's chest is predicted both for the case weight and the maximum-permitted weight of the vehicle. These predicted magnitudes of chest compression are then used to predict the probability of thoracic injury in both cases.

The analysis suggests that loading by either the case weight or the maximum-permitted weight of the vehicle would have caused very severe compressions of the chest, likely resulting in multiple rib fractures, collapse of the ribcage and injury to the thoracic organs. Thus, this analysis suggests that severe, possibly life-threatening, thoracic injury would have occurred if the vehicle was loaded to its maximum-permitted weight.



Estimations of the time history of chest compression (expressed as a percentage of the initial chest depth) resulting from the loading applied to the subject by the case vehicle and by the hypothetical vehicle with a permitted weight. These are compared to the upper-known applicable limit of the Kent et al. model, the approximate chest compression at which the ribcage loses structural integrity, and the approximate chest compression at which the sternum contacts the spine.

[Adapted from figure 5]

Funding
None