



H191 Elevator-Related Deaths

Joseph A. Prahlow, MD*, Western Michigan University School of Medicine, Kalamazoo, MI 49007; Zuhha Ashraf, MD, Los Angeles County Medical Examiner-Coroner, Los Angeles, CA 90033; Natalie Plaza, MD, Los Angeles County Medical Examiner-Coroner, Los Angeles, CA 90033; Christopher B. Rogers, MD, Los Angeles County Medical Examiner-Coroner, Los Angeles, CA 90033; Pamela A. Ferreira, MD, Columbia, MD 21044; David R. Fowler, MD, Office of the Chief Medical Examiner, Baltimore, MD 21223; Melissa M. Blessing, DO, Harris County Institute of Forensic Sciences, Houston, TX 77054; Dwayne A. Wolf, MD, PhD, Harris County Institute of Forensic Science, Houston, TX 77054; Michael A. Graham, MD, Saint Louis University School of Medicine, St. Louis, MO 63104; Kelly L. Sandberg, MS, Franklin County Coroner's Office, Columbus, OH 43201; Krista L. Timm, MD, Denver, CO 80204; Theodore T. Brown, MD, Kalamazoo, MI 49008; Patrick E. Lantz, MD, Wake Forest School of Medicine, Winston-Salem, NC 27157-1072

Learning Overview: After attending the presentation, attendees will be aware of risk factors associated with elevator-related injury and death, including factors related to the decedent and those associated with the elevator and surrounding environment, as well as factors connected to other persons' actions.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by reviewing multiple deaths associated with elevators, with varying causes and mechanisms of death, occurring in multiple jurisdictions over the past several decades.

Injuries and deaths related to elevators are relatively rare but have been reported in both the medical/scientific literature, as well as the popular press.¹⁻⁴ Mechanisms of injury/death include asphyxia-related injuries, Blunt Force Injuries (BFI), such as those resulting from crushing trauma and falls from heights, avulsion types of injuries, and environmental injuries. Decedents include elevator maintenance personnel, construction workers, elevator users, and those involved in risk-taking behavior. Occasional natural deaths and non-elevator-associated traumatic deaths also occur on elevators.

This study reports on 57 elevator-related deaths, occurring in 8 different jurisdictions, and encompassing cases occurring over the past 40 years. The series of cases does not include every elevator-related case occurring in each of the jurisdictions during the listed time-frame. Therefore, frequency data cannot be calculated based on this study. Rather, the collection of cases represents an attempt to gather a wide variety of case types, to gain an understanding of how such deaths occur, and how elevator-related injuries and deaths may be avoided. In addition to an overall review of the cases, select cases will be highlighted to emphasize important forensic considerations as well as preventive strategies.

Of the 57 cases included in this review, 20 had causes of death which could be categorized as BFI related to falls, 14 could be categorized as traumatic asphyxia, 10 involved crushing types of BFI, 5 involved other blunt force trauma, 1 involved complications of spine trauma, 1 case involved decapitation, 2 involved drowning, and 3 were electrocutions. In one case, a cause of death could not be determined secondary to decomposition. The manner of death in all but two cases was certified as accidental. There was one suicide and one undetermined.

Several important potential preventive strategies are highlighted by the series of cases. For maintenance and construction workers, as well as the general population, elevators, elevator shafts, and all the mechanical and electrical aspects related to them, must always be recognized as potentially dangerous, especially when they are under construction, under repair, or when they are not functioning normally. Constant vigilance and awareness around elevators is necessary to avoid potentially life-threatening accidents. For the general population, suggested strategies to avoid injury and death include the following: do not use improperly functioning elevators; report malfunctioning elevators immediately; do not attempt to forcibly enter or exit an elevator; do not enter or exit a "stuck" elevator; do not attempt to repair a malfunctioning elevator; do not enter an elevator shaft; do not "play" on elevators or in elevator shafts. For construction and maintenance workers, the recognition that elevators are potentially dangerous is even more important, as the nature of work in and around elevators places such persons at greater risk of injury and death. Employing appropriate safety devices, precautions, and protocols can help to avoid accidental injury and death. Examples include wearing safety harnesses; shutting down elevator function while working above, below, or near elevators; and following all industry safety regulations.

Reference(s):

1. Kohr R.M. Elevator Surfing: A Deadly New Form of Joyriding. *J Forensic Sci.* 1992;37:640-5.
2. Verma S.K., Agarwal B.B.L. Accidental Hanging With Delayed Death in a Lift. *Med Sci Law.* 1999;39:342-4.
3. Eren B., Turkmen N., Fedakar R. An Unusual Case of Thorax Compression. *J Aub Med Coll Abbottabad.* 2008;20:134-5.
4. Jacobsen C., Schon C.A., Kneubuehl B., Thali M.J., Aghayev E. Unusually Extensive Head Trauma in a Hydraulic Elevator Accident: Post-Mortem MSCT Findings, Autopsy Results and Scene Reconstruction. *J Forensic Legal Med.* 2008;15:462-6.

Elevator, Death, Forensic