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Infants most at risk among children injured by elevator incidents, Indiana University study finds

INDIANAPOLIS -- In the first large-scale epidemiological study evaluating elevator-related injuries in children throughout the United States, researchers from the Indiana University School of Medicine and a colleague from Ohio State University report on the large number of these preventable injuries. Their findings have been published in an advance online issue of *Clinical Pediatrics*.

Children up to two years of age had the greatest percentage (28.6%) of elevator-related injuries. What really surprised us was the number of infants with head injuries in our study. As the elevator doors closed mothers may not realize the vulnerability of babies in strollers or in their arms, said Joseph O'Neil, M.D., M.P.H., assistant professor of clinical pediatrics at the Indiana University School of Medicine and lead author of the study.

Using U.S. Consumer Product Safety Commission data, the researchers found that an estimated 29,030 elevator-related injuries severe enough to require a visit to the emergency department of a hospital occurred among children in the United States during 1990-2004. Ninety-eight percent were treated and released from the emergency department. The most frequent cause of injury among those children released from the emergency department was the elevator door closing on a body part, the most frequently injured body region was the upper extremity, and soft tissue injuries were the most frequent type of injury. Many of these injuries were caused when a limb (arm or leg) was purposely used in an attempt to stop elevator doors from closing. Of the 2% admitted to a hospital for further treatment, most were diagnosed with closed head injury, or injury to a hand or finger.

Dr. O'Neil, who practices at Riley Hospital for Children of Clarian Health Partners, is a developmental pediatrician and treats the long-term effects of elevator and other injuries in children and adolescents. The injury is a developmentally-based disease and is every bit a medical illness as heart disease, stroke or diabetes. We have to stop thinking of unexpected

injuries as accidents, which implies that they are unpreventable. Elevator injuries, like alcohol related car crashes and many other so-called accidents can be prevented. You can look at the environment and events before the incident and make changes to affect outcome, he says.

When elevators are used appropriately, the number of elevator-related injuries declines significantly. Only 5.4 % of elevator-related injuries in children requiring an emergency room visit were the result of elevator malfunction.

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The study authors call for young children to be closely supervised on or near elevators, and all passengers to use caution when entering or exiting an elevator. Parents and caregivers should be encouraged to set an example for children by not attempting to prevent an elevator door from closing. Sensors on elevator doors should be adjusted so that light pressure from a child could be sensed causing the door to return to the open position. Dr. O'Neil is also concerned about the increasing popularity of the rare but often fatal elevator surfing in which teenagers ride outside the elevator car.

Unintentional injury is the leading cause of death and disability for individuals aged 1 to 44 according to the U.S. Centers for Disease Control data.

In addition to Dr. O'Neil, the paper was authored by Gregory K. Steele, Dr. P.H., M.P.H. and Carrie Huisingsh, M.P.H. of the Department of Public Health of the IU School of Medicine, and Gary A. Smith, M.D., Dr. P.H. of Ohio State University.
