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LETTERS TO THE EDITOR

To the Editor:

Previous articles and letters in the *Journal of Trauma*[1-6] have debated the question of the likelihood of the death of an infant or young child in a short fall of less than 6 vertical feet. Chadwick et al. and Williams[1,2,5,6] have taken the position that if such deaths occur at all, they are very rare and represent a certain pathologic entity, i.e., epidural hematoma. Hall et al.[3,4] have taken the position that short falls may be lethal, especially if treatment is delayed by a false sense of security.

We have now examined this question from another point of view. We have reviewed a series of serious head injuries brought into a trauma center to determine how many occurred in a situation in which multiple witnesses are almost always present, that is, from day care centers with multiple caretakers. We compared this number with the number of cases originating in the community at large.

Our study identified the records of children brought to the Trauma Center at the Children's Hospital-San Diego from August 1984 to March 1992 with head injuries and an Abbreviated Injury Scale score (for head) ≥ 3. Children involved in motor vehicle crashes were excluded. All other records were reviewed to determine the functional site of injury and whether or not it was a day care center as defined.

Three hundred thirty-eight records were reviewed. The functional sites of injury included homes, home-based day care sites with lone providers, and a few hotels and other buildings. Only one child had incurred a "serious" head injury at a large day care center. A 2½-year-old climbed a tree and fell 5 feet to a concrete walk. He was unconscious for a period of about 1 minute and was hospitalized, but a CT scan of the head produced negative results and he recovered completely in an hour or two.

The general population of children from birth to 6 years of age from which the injury sample was drawn was 232,084 in the last year of the study. The population of children attending large day care centers in the same period was approximately 35,000. The San Diego Emergency Care System requires that all seriously injured children be taken to the Children's Hospital and compliance with this policy is very high. Using a correction for the 40 hours per week of exposure for the day care children, the risk of a serious head injury occurring in this type of care is 0.19/10,000 children/year. The risk in the general population is 2.27/10,000/year.

The 338 cases from the general population included 41 deaths and 191 cases with an AIS score for the head of 4 or 5, compared with the single case from day care which barely qualified for an AIS score of 3.

Since short falls and minor injuries abound in day care centers we believe that these data strengthen the conclusion that short falls do not cause serious or fatal head injury except in extremely rare circumstances.

David L. Chadwick, MD
Constance Salerno, RN, PNP
Center for Child Protection
Children's Hospital
San Diego, California

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To the Editor:

We read with interest the recent paper by Moore et al.[1] on oxygen transport (O_2T) variables in the early phase following injury. Their findings are endorsed by the results of two of our own recent studies,[2,3] in which we were able to measure O_2T variables within 3 hours of injury. We also found that inadequate levels of oxygen delivery (Do_2) resulting from lower values of cardiac output, after apparent adequate resuscitation, guided by vital signs predicted onset of organ failure (in particular acute renal failure) and death. Likewise there were no differences in Injury Severity Score between survivors and nonsurvivors. Oxygen consumption (Vo_2) was frequently maintained at normal, or even supranormal values by increases in oxygen extraction ratio. In terms of Vo_2 the original concept of an "ebb phase" followed by a "flow phase" as proposed by Cuthbertson, cannot be substantiated in clinical practice. The original data to support this proposition were unconvincing. Furthermore, Do_2 and Vo_2 can be calculated from the original data provided by Cournand et al.,[4] and this shows quite clearly that as Do_2 fell because of uncorrected hypovolemia and hemorrhage, Vo_2 was maintained.

Do_2 and Vo_2 following major trauma. (From Cournand et al.[4])

Condition	MAP	Do_2	Vo_2	CI
"No shock"	94	556	184	3.57
"Mild shock"	54	303	174	2.46
"Moderate shock"	44	243	176	2.06

We concur with Moore and colleagues on the confusion caused by multiple definitions of organ failure, and consensus on this aspect of trauma care is urgently needed to assess the efficacy of newer modes of management.

Finally, we would like to put two questions to the authors. Was Vo_2 in any way related to core temperature and what were the hospital survival figures for the various subgroups?

We would like to congratulate Moore et al. on an important and clinically relevant study.

J. Denis Edwards
Consultant Physician
P. Nightingale
Consultant Anaesthetist
Intensive Care Unit
University Hospital of South Manchester
Manchester, United Kingdom

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