



Lessons Learned

To: All Prehospital Providers

From: David Ghilarducci, MD EMS Medical Director *D. Ghilarducci MD*

Date: May 1, 2008

The following information is related to EMS Agency review of Prehospital care. The lessons learned from these reviews are applicable to all paramedic providers. Please review this important information and incorporate it into your practice.

Elderly Fall Victims

Generally speaking, a patient who falls from a standing height will not need to be evaluated at a trauma center and in many cases will not require c-spine precautions. Of course there are always exceptions to every rule and we rely on the judgment of field EMS personnel to determine when patients may be at higher risk of serious head or spinal trauma. For example, those who fall after a syncopal episode or seizure are at higher risk because they may not be able to give a good history and because they may not have had the opportunity to break their fall with an outstretched hand as a person who is awake would reflexively do. Other high risk groups for head injury are those with impaired blood clotting function such as those on coumadin - a medication that impairs the activity of clotting factors - or chronic alcoholics whose impaired livers do not produce sufficient amounts of these clotting factors.

Probably the highest and fastest growing risk group for missed head and spinal injury are elderly patients (defined as those at or above 75 years of age) and this is the focus of this paper. It is estimated that some 3.4 million, or 34 percent, of all calls for emergency medical services involve older patients. The rising pressure on our emergency medical system is of growing concern as the nation's 76 million baby boomers near retirement age. In just 30 years, 70 million Americans-one-fifth of the population-will be older than age 65. In Santa Clara County we transport approximately 30,000 patients in this age group per year, or 35% of our total call volume.

It is well known that elderly patients are much more likely to sustain serious head and spinal injuries from relatively minor falls. A number of studies have examined the mortality and

morbidity of falls from a standing height in the elderly. As much as 32% of all falls result in serious injury. Same level falls resulted in serious injury in the older age group vs. the younger age group 30% vs. 4% (Sterling, O'Connor, and Bonadies).

There a number of factors which contribute to higher risk in elderly patients. The normal process of aging slows reflexes and impairs the ability of the patient to “cushion” their fall by grabbing a rail or reaching down to break their fall. It is more likely that the full energy of the fall is transmitted directly to the head and spine. Aging also has a profound impact on bone density and strength making fractures more likely. Finally, elderly patients are more likely to have some dementia and/or are on medications that can impair judgment, cloud the history and physical exam, and increase the risk of bleeding.

Assessing the Elderly Patient

When assessing a fall patient, a good history and physical exam is essential to determine the presence of a significant injury. Unfortunately, for many reasons, an elderly person may not be able to give a detailed history or answer questions about their fall, their medical history, medications or conditions. They may become unsettled and confused when faced with a crisis situation. They may not know the actual names of the medications that they take. They may rely on someone else to manage their health care concerns. Their cognitive skills may be diminished by their health conditions or even the medications that they take.

One effective strategy is to use a targeted questioning technique when asking about medications. When encountering an elderly fall victim, the primary medication that the paramedic needs to know about is Coumadin. So rather than asking “what medications are you taking?” the paramedic should ask “are you taking any medication to thin your blood?” Give examples like Coumadin, Warfarin, ASA or Plavix. If the patient simply doesn't know then try to determine if the patient has a history of an irregular heart beat (atrial fibrillation). Many of these patients will be prescribed Coumadin, Plavix or Aspirin to prevent strokes.

In all cases if the patient is elderly, has had a fall but seems well, has a history of Coumadin in particular (to a lesser extent ASA or Plavix), AND has obvious facial or external head trauma related to the fall, the paramedic will call the base to assist with destination decisions.

Report to the Base Hospital should be complete, and descriptive of the patient's injuries and current status. As is the case in all trauma patients, use of the MIVT format is required. .

Elderly Falls and Spinal Immobilization

The decision to apply spinal precautions in the field is an important one and there are many examples of patients suffering spinal cord injury when proper c-spine precautions were not employed. Unfortunately c-spine precautions are not without their own risks; back boards cause significant pain and c-collars may interfere with assessment and treatment.

Obviously EMS personnel do not have x-ray equipment in the field to help them determine who and who doesn't need c-spine precautions. There is a study involving a large number of injured patients in emergency departments that can be of use in the pre-hospital arena.

The National Emergency X-Radiography Utilization Study (NEXUS) reported by Hoffman et al (1) in the Annals of Emergency Medicine in 1992 was designed to validate the ability of 5 simple criteria to identify who was a greatest risk of spinal injury and therefore needed x-rays of the c-spine. Using these criteria only 2.4% of patients (818/34,069) that met all 5 criteria were found to have any abnormalities on x-rays and most of these were of low clinical significance. If any of the 5 criteria were not met then the risk of spinal injury is much higher.

The 5 NEXUS criteria for clearing the c-spine are:

1. No altered level of consciousness (dementia)
2. No intoxication from drugs or alcohol
3. No posterior midline cervical spine pain
4. No distracting painful injuries (extremity fractures or strains)
5. No focal neurologic deficit (numbness or weakness in extremity or face, no vision or speech changes)

Unfortunately, while these criteria were found to be useful for adolescents and adults **they were not reliable to exclude spinal cord injuries in the elderly or very young.**

Conclusion:

Elderly fall patients are at far higher risk of head and spinal injury even after minor falls. Multiple factors can impair the EMS provider's ability to obtain a reliable history and physical exam further increasing the risk of a missed injury. EMS personnel must maintain a high level of suspicion for head and spinal injuries in elderly patients. A low threshold for applying c-spine precautions should be maintained. NEXUS criteria may be helpful for determining whether or not spinal immobilization should be applied in the field but are not reliable for excluding significant injury in elderly or very young patients. If **any** of the criteria do not apply to your patient spinal immobilization must be applied.

(1)Hoffman JR, Schriger DL, Mower W, Luo JS, Zucker M. Low-risk criteria for cervical-spine radiography in blunt trauma: a prospective study. Ann Emerg Med 1992; 21:1454-60

(2) Hendley, G.W., Wolfson, A.B., Mower, W.R., et al, (2002, July). "Spinal cord injury without radiographic abnormality: Results of the National Emergency X-Radiographic Utilization Study in blunt cervical trauma" Journal of Trauma Injury, Infection, and Critical Care, 53, 1-4

(3) Russell, M. The NEXUS Study. www.fieldmedics.com

(4) Touger, M., Gennis. P., Nathanson, N., et al., Validity of a decision to reduce cervical spine radiography in elderly patients with blunt trauma" Ann Emerg Med 40(3) 287-293