

## **“Stealth trauma” in the young and the old: the next challenge for major trauma networks?**

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Amongst many societal and medical traits that the very young and the very old have in common<sup>[1]</sup>, both age groups have a tendency to present to hospitals with “stealth trauma”. In the UK reports from the Trauma Audit Research Network (TARN) <sup>[3-5]</sup> have shown that the very young and the very old now outnumber higher profile trauma groups, such as road accidents and stabbings. Other countries have seen similar demographic shifts.

Many countries have established Major Trauma networks (Cochrane, Gabbe), with the English system showing incremental improvements in patient outcome <sup>[2]</sup>. However, these systems rely on early identification by pre-hospital services of the “major trauma patient” (usually by application of a trauma triage tool by ambulance staff). This identifies patients for immediate transfer to a Major Trauma Centre (MTC), however this system does not work at the extremes of age. The TARN reports show that the old and the very young have a delayed process of care.

The mechanism of injury (MOI) has traditionally been the starting point for activation. However, in the elderly significant injury can occur from low energy transfer injury<sup>[6]</sup>, the commonest MOI being a fall from standing height. The MOI may be unwitnessed or unclear (delirium, dementia). Similarly there is a group of children where the true MOI is confusing, as it is concealed. The biggest peak in severe injury in childhood is in the under one age group (REF 4), caused by non-accidental injury (NAI). 80% of serious NAI is in this age group, median age 3.5 months. In both infants and the elderly, staff are “on the back foot” in identifying serious injury early in the patient journey.

Major trauma at the extremes of age is a disease that presents mainly to local hospitals (Trauma Units), not specialist Major Trauma Centres. A third of children with Injury Severity Score (ISS) over 15 are taken to hospital by car, so there is no opportunity for pre-hospital triage to bypass the nearest hospital. Only half of severely injured children are taken primarily to an MTC (and only 28% in children with abusive severe injury).

Even within the hospital, early identification as “a major trauma patient” can be delayed. The symptoms and signs of severe injury in both age groups can be hard to identify at both ends of the age spectrum, particularly for inexperienced staff. Assessment of older patients can be hindered by focussing on the cause of the fall, the complexity of medical comorbidities and pitfalls in pain assessment. Due to the concealed history, infants with NAI may present as a medical condition (no injury mentioned), with symptoms such as drowsiness, vomiting or fitting (from intracranial injuries). On clinical examination it can be difficult to identify significant head and chest injury in the elderly, bleeding in children, and any

injury in infants. These patients are often under the care of geriatricians / paediatricians, whose training curriculum has little injury content.

Once major injury is suspected or diagnosed, the quality of care received by the patient should not depend on their location in the hospital. In other words the speed and quality of trauma specialist input should be the same as in the ED resuscitation room. It seems logical that staff on geriatric or paediatric wards should be able to obtain a rapid review by a senior trauma specialist, be granted easy access to CT imaging, and should have knowledge of the major trauma network and MTC contact points. Inter-hospital transfer, if indicated, should be prompt and non-negotiable.

The improvement in major trauma outcomes in recent years is welcome news. However, given the change in the trauma demographic “stealth trauma” of the elderly or child patient, is the next big challenge for trauma care systems.

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