# Catastrophic injuries - Towards early intervention and rehabilitation

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Professor Redmond has held research posts in the University of Manchester, Medical College of Virginia USA and MRC Trauma Unit and having trained in Accident and Emergency Medicine developed a special interest in the management of Major Trauma. He was formerly Consultant Trauma Team Leader at the North Staffordshire Trauma Centre and subsequently Medical Director of the University Clinical Centre Kosovo. For the last 15 years he has developed and run a number of overseas aid programmes, focused particularly on the care and rehabilitation of the severely injured.

## Introduction

A code of best practice on rehabilitation has been drawn up between the Insurance Industry and Personal Injury Lawyers and recommends an appropriate independent expert complete an early assessment of the patient, outwith the medicolegal process, and on behalf of "both sides" to identify any immediate interventions or rehabilitation needs[1]. It has been against this background that I have reviewed a number of "catastrophically" injured patients. (In the medicolegal context a catastrophic injury is in general one where the ultimate financial settlement is likely to be in excess of £1million).

## The Patients

I have reviewed 69 patients up to the time of writing - mostly under the code of practice. The majority (61%) had suffered Traumatic Brain Injury following an injury to the head. 25% had Spinal Cord Injury and in all but one this was associated with spinal fracture. The remaining patients had other skeletal injuries. Of course a number of patients had more than one site injured but the principal and most significant injury in terms of disability is detailed in table 1. Not all were life threatening and the catastrophe in some cases was the inability of an unqualified young man to find work following almost complete amputation of their hands.

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|---|---|
| Head injuries | 42 (61%) |
| Spinal cord injuries | 17 (25%) |
| • Cervical # | 4 (6%) |
| • Thoracic # | 12(17%) |
| • Ischaemic | 1 (1%) |
| Multiple injuries | 5 (7%) |
| Hand injuries | 2 (3%) |
| No injury | 2 (3%) |
| Brachial Plexus Injury | 1 (1%) |

**Table 1: Predominant site of injury**

In 14% of cases, review of medical records revealed significant delays in the diagnosis of their principal injury and in a few cases non life threatening but significant injuries in terms of their contribution to overall disability had been overlooked completely. In some cases, had the injury been identified and treated earlier, the "catastrophic" nature of their injury might have been avoided altogether.

In two further cases, the catastrophic injury was at least in part iatrogenic.

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|---|---|
| Cervical spine fracture | 1 |
| Thoracic spine fracture | 3 |
| Wrist fracture | 1 |
| Brachial plexus injury | 1 |
| Hip fracture | 1 |
| Subdural Haematoma | 1 |
| Internal Derangement of the knee | 2 |

**Table 2: Missed Injuries**

A potential difficulty when assessing children with head injury and subsequent behavioral problems was the contribution of pre accident morbidity. Two children had significant behavioural problems before the accident, which may in fact have been a significant contributory factor to the accident itself. In another child, a relatively minor road traffic accident may have coincided with the manifestation of autism.

This latter case is part of another potential difficulty for the assessor. When reviewing a case the mechanism of injury may appear to be incompatible with the injury claimed to be its consequence. In two other cases, interview and review of the records revealed at the very least significant exaggeration and possibly fraud. There is a potential dilemma here for the clinician, not anticipated in the original report. The code of best practice directs the independent assessor not to deal with diagnostic criteria or causation; but recommendations for rehabilitation must surely be placed in the overall clinical context. I believe this aspect needs to be revisited.

## The Process

Initially I was seeing patients several months and sometimes years after the accident. However over these last eighteen months the interval between accident and review has shortened considerably and now I review most cases while they are still in hospital after the index accident.

Liaison with hospital staff and other treating staff is essential. They must be fully aware of the role of the assessor. The patient's solicitors usually request that arrangements be made through the patients themselves or their relatives. It is essential to make contact with ward staff early on so they can check everything with the patient and that an appointment is made that is convenient all round. Prior contact with the supervising consultant is clearly essential and if medical notes are to be reviewed, the treating clinician is specifically consulted in this regard before the visit takes place. I have found all medical and nursing staff to be extremely helpful and cooperative. I have also learned though to check for myself arrangements made with the hospital by others to ensure proper consultation has taken place.

Understandably there remains suspicion about the process in the minds of some. This is changing and hopefully as a result of the potentially beneficial impact of this approach. I have found even the most initially hesitant of solicitors have warmed to the benefits of an independent medical opinion, particularly when advice is given regularly, promptly and paid for by the insurance company! Cases are ideally seen on a joint basis but when instructed solely by the insurance company the report is provided in the spirit of the code of best practice and made available to both sides.

Early assessment of the patient's injuries, review of their progress and an indication of likely prognosis has been generally well received by all concerned. The prognosis is given and accepted as a guide. Definitive prognosis will await later and separate medicolegal reports. The greatest potential benefit is the identification of early interventions. The need for this additional input is usually related to limited NHS resources. The commonest recommendation has been for assessment/treatment by a Clinical Neuropsychologist (39% of cases). While these have usually been head injured patients, five had no head injury and in two additional cases a recommendation was made that their close relative/carer be included. 21% of head injured patients were referred on to Neurorehabilitation programmes, funded by the relevant insurance company. Further Speech and Language

Therapy was sometimes required. Given the limited physiotherapy resources, particularly in the community, it was perhaps surprising that only 10% required additional therapy.

I remain available to patients and their advisors after my initial assessment and this aspect of the work has grown as the caseload has grown. It is the element probably most appreciated by the patients and their families. Facilitating referral to other specialists and/or arranging scans and x-rays has become an important component of the work. Providing a medical liaison and at times advocacy for the patient can help and if in tandem with the treating clinicians can sometimes reinforce treatment goals. In a small number of cases other previously unrecognised injuries have been identified and addressed. In others it has been possible to circumvent NHS waiting times by arranging further surgery on a private basis.

Although clearly within the remit of others, issues such as accommodation, transport and care assistance could be reinforced to help secure their early implementation. It is clear there is a need for carers and "buddies" that is difficult to meet. One can and often does make such recommendations but identifying suitable candidates is another matter.

One simple immediate improvement to the lives of the injured has been to facilitate the immediate purchase of a laptop computer. This has provided Internet access to relieve isolation and in one case enabled the patient to carry on their professional training at home and in others to begin the process of retraining.

**Table 3. Examples where ATLS protocols were not applied**

**Case 1**
A motorcyclist was admitted to hospital with a number of serious injuries. Having been thrown from his motorbike at speed, the mechanism of injury (as emphasised by ATLS) strongly suggested a very high risk of injury to the spine. However in spite of complaining of numbness in the legs each time he was sat up, his spinal fracture was not diagnosed until 3 days later when sitting him up caused paralysis of the lower limbs. Fortunately substantial neurological recovery was secured.

**Case 2**
A motorcyclist was thrown from his motorbike at speed and admitted to hospital with limb fractures. He did not complain of neck pain but ATLS protocols would demand the mechanism of injury required him to have a neck X ray before discharge. He was not x-rayed. His GP subsequently diagnosed an unstable neck fracture 5 weeks later. He has had neurosurgery with fortunately a good although not complete recovery.

**Case 3**
A man was ejected from a vehicle on a motorway. This is taught by ATLS as carrying a very high risk of severe injury particularly spinal injury. Nevertheless, in spite of complaining of back pain he was discharged home after a few hours and his multiple spinal fractures ultimately diagnosed by his GP.

**Case 4**
A man was ejected from a vehicle at speed and incurred a fracture to his forearm. Again the mechanism of injury suggested a very high risk of severe injury. However he was not examined in sufficient detail and his brachial plexus injury missed completely. By the time it was diagnosed at another hospital it was too late to improve the outcome.

**Case 5**
A young woman was found at the foot of a flight of stairs. She was not moved by bystanders. It is claimed that although now conscious the paramedic sat her up without first checking her neurological status or asking her if she had pain or tenderness in her spine. When upright she complained of severe pain in her back and that she could now not feel or move her legs. She remains permanently paralysed below the waist. Witnesses suggest she was moving her legs prior to being sat up by the paramedic.

## Discussion

Having migrated gradually from the resuscitation of the severely injured at the roadside, through their treatment in A&E and now to their discharge into the community, I understand better the gulf perceived by victims and their relatives between the initial acute high-tech curative approach delivered in hospital and their long term care received in the community. Those in the acute sector must manage their expectations better to help bridge this gap. While much of this is a matter of perception there can be a significant hiatus between discharge from acute care to the establishment of a focused rehabilitation programme. The additional funding that insurance companies can bring to certain cases can be used to fill this gap; meeting an individual need and reinforcing the need for more public resources in this area.

While cancer and heart disease are the biggest killers in the western world, these are largely diseases of the middle-aged and elderly. Trauma however is largely a disease of the young[2]. If we look at years of productive life lost rather than crude mortality, trauma dwarfs all other diseases in its impact on society.

This effect is also seen in developing countries where rapid urbanisation is adding a similar burden of injury to an already heavy load of disease. Yet facilities for its mitigation seem woefully poor. By improving the initial care of injured patients we have decreased mortality and reduced morbidity. But head injury is the major component of severe injury in the UK and while more people now survive more severe injuries to the head, inevitably more people will survive with disability. As many of these are victims of accidents, greater cooperation between the NHS and the Insurance industry can lead to benefits all round.

To the outside observer there is an obvious diversity between the duration and content of rehabilitation programmes, including to some extent Neurorehabilitation programmes, offered in the private sector. This can only engender caution about their benefit. When a long expensive programme fails to deliver measurable benefit and this failure then used to justify another, concern is only increased. From my current perspective there appears to be a need for agreed standards and a national framework, which if already established, needs much greater visibility.

There is a particular need for more and shorter early intensive rehabilitation programmes for trauma victims available across the UK. The Insurance Industry and the NHS should find this an area of mutual interest and benefit.

The problems in initial diagnosis I have identified seem to represent similar concerns raised in 1988 when the Royal College of Surgeons published the results of a study into 1000 trauma deaths[3]. The inexperience of the doctors who first saw the patient led to the severity of their injuries being initially underestimated in a significant number of cases. To raise standards the Advanced Trauma Life Support (ATLS) teaching programme was imported from the USA and became a requirement for all those working in A&E.

The purpose of my work has not been to study the standard of initial care of the severely injured and my findings must be viewed with caution. However, the nature of the failure in each case was related to inexperience, and covered within the ATLS programme. Over time it seems the spotlight on trauma has moved away and onto other areas in the NHS. It may be time it was moved back.

**References**

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