

# Elective Report - Trauma Surgery

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*Groote Schuur Hospital, Cape Town, South Africa*

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## **Elective Report 2014 – Trauma Surgery Groote Schuur Hospital, Cape Town, South Africa**

### **Objective 1: Prevalence and mechanism of traumatic injury in Cape Town, South Africa.**

South Africa is well recognised as a country with a high burden of mortality resulting from traumatic injury. The high number of trauma cases seen within the hospitals of South Africa makes estimation of mortality and study of specific traumatic causes very difficult. In 2010 the World Health Organisation released a bulletin investigating the lack of reliable statistics relating to premature mortality specifically related to traumatic injury. South Africa's recent history and current socioeconomic status have led to protracted high levels of violence between individuals reflected in the high rates of premature mortality directly associated with traumatic injury (1). The WHO bulletin estimates approximately 60000 deaths occurred in 2000 as a result of traumatic injury, 46% of which were homicides, 25.7% were related to road traffic accidents and 9.1% were self-inflicted. Homicide, most often involving young men ages 15 - 29, was the lead cause of mortality in men whilst road traffic collision was the second most common cause. The most common cause in women was road traffic collision with homicide second (most commonly women aged 30 – 44). The high rates of homicide related mortality are comparable to some of the most dangerous countries in the world (1).

More recently the South African Medical Research Council has released a report focusing on injury mortality of South Africa and specifically Cape Town itself. Over the year period of 2007 data from 3909 cases were examined for the external cause of death resulting from injury. The most common mechanism of injury was by sharp force making up 28.6% of cases. Other causes included firearms (20.2%), pedestrian (16.3%), blunt force (9.0%), burns (7.5%), hanging (4.9%), passenger (4.5%) and driving (3.8%). The report concludes that Cape Town has the highest total injury mortality rates (144.9 deaths per 100000 population) and highest violence rates (63.5 per 100000 population) compared to the other three South African municipalities in the report (Johannesburg, Tshwane and eThekweni) (2).

### **Objective 2: Management of traumatic injury and the composition of the trauma team in Groote Schuur hospital, Cape Town, in comparison with a Major Trauma Centre in London, England.**

There are several distinct differences between the management of injury in the UK and South Africa, specifically The Royal London Hospital and Groote Schuur Hospital. In South Africa the prevalence of traumatic injury is such that it warrants a dedicated hospital department focused purely on injury, whilst medical emergencies are managed within a separate emergency department. The trauma services are also such that they have designated trauma surgeons that work only within trauma. Within Groote Schuur the trauma department consists of a green, yellow and red zone. Patients are triaged to the correct area and each area is managed by doctors of varying grades. The red zone is equivalent to the resuscitation department of a Major Trauma Centre in the UK. The three remaining areas of the trauma department are the radiological suite, the trauma surgical theatres and the inpatient wards. Imaging available within the department includes ultrasound, basic X-Ray and full body X-ray. Patients requiring CT and MRI imaging are rapidly transferred to and from the scanners by a dedicated team of porters. The dedicated trauma theatres within the department are used for emergency procedures such as thoracotomy, emergency laparotomy and limb saving surgery.

In comparison, the London Trauma Centres employ a system of one central emergency department with a highly resourced resuscitation suite complete with bedside X-ray and CT scanning within the department or close at hand. Complex intervention is often carried out by senior emergency medics however surgical management is directed by different surgical teams with different specialities. In

Groote Schuur patients that present to the department are managed by the Trauma Department whilst in The Royal London Hospital the 'Trauma Team' meets trauma patients received in the Emergency Department. This team consists of the senior emergency doctor, anaesthetist and assistant, two general surgeons, two orthopaedic surgeons, two nurses and the radiographer. The assembly of this team requires a streamlined process of information transfer from pre-hospital teams and the hospital, alerting the resuscitation suite to assemble the appropriate trauma team to manage to the patient. Whilst communication between prehospital teams and the hospital do occur in South Africa it's most commonly only for inter-hospital transfers or severe injury, otherwise patients are presented by the ambulance crews as they arrive in the trauma department.

**Objective 3: Gain experience in the assessment of critically unwell patients using ABCDE approach whilst building on skills of airway a management and resuscitation.**

The elective placement in Groote Schuur has been an excellent opportunity to develop my patient assessment skills, especially in an acute setting. In particular reflecting on a difficult resuscitation I was involved in has given me experience that I will take with me when I start work as a doctor in the UK.

The resuscitation in question occurred early in the morning at approximately 8am. An intern doctor and I were asked to step out of the ward round in order to take a blood gas sample and ECG from a deteriorating patient. On approaching the bed I could see this patient appeared unwell. Following an ABCDE approach I could tell this patient had a patent airway as she was able to tell us she was very short of breath. She was also receiving high flow oxygen through a hudson mask. Before we were able to get a full set of observations it was clear from her cold peripheries and weak peripheral pulse that this lady's circulation was potentially compromised. In an initial assessment this lady had a GCS of 15 but was clearly unwell. A full set of observations showed the patient to be shocked with a blood pressure between 50mmHg and 60mmHg systolic and a heart rate of approximately 120bpm. It was noted that the patient had no palpable peripheral pulse but had a central pulse.

At this point the intern and I had been with the patient for approximately 15 minutes. Whilst assisting with the investigations I was able to observe for the first time how quickly a patient can deteriorate. I felt I was able to see the signs that made both myself and the rest of the team concerned and I feel encouraged that in a similar situation I would be able to respond appropriately.

Following this initial assessment the immediate management required gaining intravenous access to proceed with a fluid challenge. Due to this patient's shocked status peripheral access was not possible and the team began preparing to insert a central line. Before the central line could be sited the patient arrested resulting in the commencement of resuscitation and CPR. Immediately upon arrest the team assembled, monitoring was attached and the crash trolley was fetched.

Members of the team took turns doing CPR whilst the senior doctors sited emergency access in the femoral vein in order to proceed with giving fluid as soon as possible. The patient was then intubated and hand ventilated whilst rounds of CPR continued. The patient achieved approximately four returns of spontaneous circulation and required two shocks during the resus. Whilst the resus was in process the patient received crystalloid and colloid fluid, IV adrenaline infusion and amiodarone. During the final ROSC episode the patient was transferred to a side room for mechanical ventilation however the subsequent arrest was unrecoverable and the resuscitation attempt was terminated. The final decision was made by the senior doctor present based on the clinical situation and the final blood gas recording a significant lactic acidosis (approx. pH 6.5 and a lactate of 14), severe anaemia (Hb4), hyperkalaemia and hyponatremia.

Having studied my intermediate life support course in the UK I understand that with the onset of cardiac arrest resuscitation should begin immediately, help should be called for, the airway should be secured and the defibrillator should be attached as soon as possible (the UK Resuscitation Council recommends within 3 minutes at the longest) (5). I found this initial stage of resuscitation to be quite chaotic with no designated leader to control the resuscitation. I found the situation be very challenging but focused on performing good quality CPR and assisting the doctor as much as possible. My role in the resuscitation included the initial ECG investigations, multiple cycles of CPR and facilitating the arterial blood gas analysis. On reflection I found the resuscitation to be quite stressful and certainly very tiring with protracted cycles of CPR. Having previously learnt the resuscitation algorithms used in the UK I was able to follow the protocol used through the resuscitation and gained more insight seeing it put into practice (5). Overall being part of and observing all aspects of this resuscitation I believe the experience will help me when I am faced with a similar situation in my future career.

**Objective 4: Reflect on how patient care differs in a low resource high volume trauma system including how our participation will aid our future practice.**

During my elective period in South Africa I believe I was able to gain good experience from both participating and observing a relatively low resource high volume trauma system. What initially surprised me was that the system was not vastly different from the one employed in the UK. The high volume of trauma patients warrants the dedicated trauma department and advanced imaging may not always be readily available however the biggest difference is in the number of patients presenting. The high volume of patients makes fast but thorough triage to the green, yellow or red zone essential. The result of this triage ultimately determines waiting time, senior doctor intervention and sometimes patient outcome. The major concern is that once the system becomes excessively busy patients with low apparent low priority are left prolonged periods of times before they are managed. Once a patient in any section is clerked the management of that patient is your responsibility until discharge. From a personal point of view as a medical student this amounts of quite a lot of responsibility and management planning, something I found very invigorating. It has encouraged me to look forward to being in a responsible position working as a foundation doctor.

An example of triage that I found challenging was a man who had near complete amputation of several fingers on his left hand. He had been sat in the waiting area with his hand in a bowl of water and not visible to anyone to see. He waited several hours to be clerked as he was in the green zone at which time his injury was identified and it was most likely too late to save his fingers. The learning I took from this situation was that good communication is essential between individuals. Had the person who triaged him passed on a brief handover of this patient he would have been managed much sooner. It also emphasized the need for good prioritisation, identifying tasks and jobs that need immediate attention and realising which can be managed later. Both of these learning points are things that I think will be invaluable next year in my work as a foundation doctor and I will strive to accomplish them.

**References:**

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