

SECTION 2

TRAUMA TEAM

	Page
Members, Roles and Responsibilities <i>M. Sugrue</i>	41
Pre-Arrival Preparation <i>S. D'Amours</i>	49
Activation Criteria <i>S. D'Amours</i>	53
Universal Precautions <i>S. D'Amours</i>	55
Team and Resource Management <i>M. Sugrue</i>	57
Multiple Trauma Patients / Disaster Response <i>S. D'Amours</i>	59
Resuscitation Room Documentation <i>S. D'Amours</i>	61

MEMBERS, ROLES AND RESPONSIBILITIES

Chapter 1

SECTION 2

The Liverpool Hospital trauma team consists of the following members:

- Trauma Team Leader
- Airway Doctor
- Procedure / Circulation Doctor
- Airway Nurse
- Procedure / Circulation Nurse
- Scribe Nurse
- Orthopaedic Registrar
- Wardsperson
- Radiographer
- Social Worker



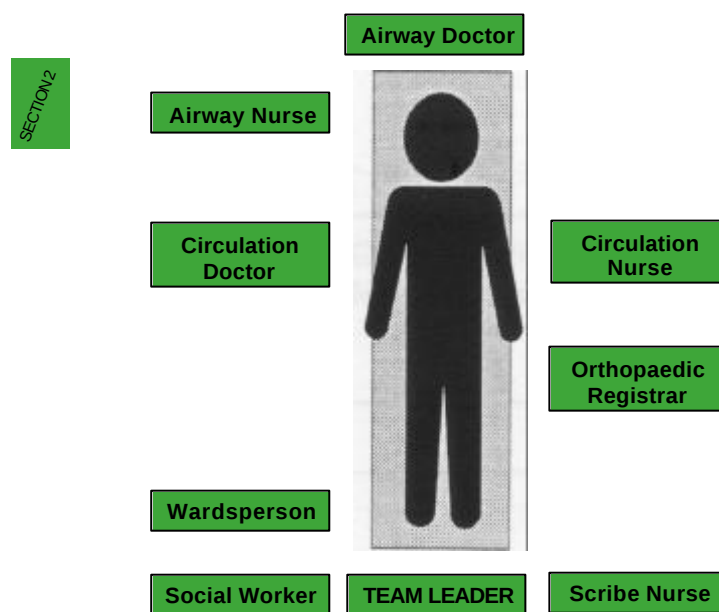
In addition, the following are often present in the resuscitation:

- Trauma Fellow
- Emergency Consultant
- Trauma Medical Student

What's in?: Communicating
Name tags

What's out?: Egos
Hands in pockets
No gowns / gloves

DIAGRAM OF TRAUMA TEAM POSITIONS



TRAUMA TEAM LEADER

The Trauma Team Leader is generally HANDS OFF, acting as a manager of the team, coordinating care preferably from the end of the bed, standing beside the Scribe Nurse. Specifically responsible for ensuring that pre-arrival preparation has taken place with universal precautions, lead gowns, goggles and gloves for all trauma, name tags and clear delineation of roles before the patient arrives ensuring that all members are present. The Trauma Team Leader must ensure that IV fluids are hung and appropriate special requirements such as intraosseous needles are available in specific cases. The Trauma Team Leader

must also ensure that the radiographer has the film cassette in place and is primed, ready for action. The Trauma Team Leader must ensure that communication has occurred beyond the resuscitation room for all serious trauma – have theatre, CT scan and surgical specialists been notified?

It is policy to notify the Trauma Surgeon on call for any patient with a reported pre-hospital SBP < 90mmHg. The Trauma Surgeon must be notified before the patient arrives in the resuscitation room. On arrival of the patient the Trauma Team Leader must ensure adequate hand over in the MIST format (see page 27), ensure the team are working with airway, breathing and circulation simultaneously. The Airway Doctor's role is to perform a check of airway, breathing and circulation with the surgical registrar acting as the Procedure Doctor.

The Trauma Team Leader must complete the following mental check list:

- Pre-arrival preparation?
- Trauma Surgeon notified if SBP < 90mmHg?
- Trauma team activated?
- Name tags worn?
- Universal precautions in place?
- Lead gowns in place?
- X-ray cassette in place?
- Warmed IV fluids hanging?
- Blood "O" negative ready and Level 1™ rapid infuser primed for action, if necessary?
- Theatre notified?
- Radiology notified?

On patient arrival:

- Clear and concise hand over (ALL listening for 30 seconds).
- HANDS OFF approach.
- Clear communication.
- Promoting good teamwork and discussion.
- Staying calm (take a deep breath!).

AIRWAY DOCTOR (ICU OR ED REGISTRAR)

The Airway Doctor's role is to ensure:

1. Adequate pre-arrival preparation of airway equipment, checking of tubes, masks, laryngoscopes, etc.
2. Possible alternative airways, where is the laryngeal mask? What would I use for a cricothyroidotomy?
3. CHECK with the Airway Nurse about drugs if necessary.
4. Evaluation of paediatric chart to ensure correct dosages for kids.

**PROCEDURE / CIRCULATION DOCTOR
(TRAUMA REGISTRAR)**

1. Pre-arrival preparation – know the name of the Procedure Nurse.
2. Venous access and bloods.
3. Ensure only necessary bloods are taken.
4. Urinary catheter or gastric tube ready.
5. Secondary survey.
6. All other procedures.
7. Consider DPL or FAST, only report on FAST when accredited.
8. Liaison with team players, communication with Trauma Surgeon, subspecialist and theatre (extensions 84404 + 84405).

THE NURSE IN THE TRAUMA TEAM

Emergency nurses tend to be a fairly constant group and have an excellent knowledge of policies and procedures in the resuscitation room, ensuring smooth facilitation of trauma care. Trauma nurses play a critical role in the management of the trauma patient. This assessment spans from the time of the patient's arrival at the hospital to discharge home and in the rehabilitation setting. It is important for nurses to be knowledgeable about trauma assessment, mechanism of injury, and the high risk and frequent complications that threaten the trauma patient.

Upon trauma team activation, previously assigned nurses will proceed to the resuscitation room and communicate with the Trauma Team Leader and the other members of the trauma team. In order to avoid confusion and perform efficiently, the trauma team members wear

nametags labelled according to their role. There are three key nurses on the team:

- Airway
- Procedure
- Scribe.

Nurses are allocated to their specific roles at the beginning of each shift and nursing roles are interchangeable from shift to shift. Additional nurses are required for multiple traumas. The nurses' response to trauma team activations is excellent. A recent review of the nursing performance as part of the trauma team at Liverpool found all three nursing members present on arrival of the trauma patient in 94% of daytime activations and 80% after hours ⁽²⁾.

SECTION 2



PRE-ARRIVAL PREPARATION IS VITAL

AIRWAY NURSE

The Airway Nurse is responsible for airway equipment including preparation for emergency airway procedures. Together with the Airway Doctor, the nurse calculates drug dosages and prepares the appropriate drugs. This is especially critical when paediatric trauma is involved. Stabilisation of the cervical spine may not be achieved in the pre-hospital setting and it is the Airway Nurse's responsibility to ensure that the collar is correctly sized and fitted. Once the patient arrives, the nurse assists the doctor with maintaining an airway, drug administration, cricoid pressure, securing the tube and ensuring monitors are connected appropriately. The Airway Nurse ensures all portable equipment is ready if the patient needs to be moved to another facility within the hospital e.g. CT scanner, theatres, etc.

REMEMBER TO REMOVE PATIENT'S EARRINGS AND OTHER JEWELLERY BEFORE X-RAYS ARE TAKEN.

PROCEDURE / CIRCULATION NURSE

The Procedure / Circulation Nurse works in conjunction with the Procedure / Circulation Doctor (trauma registrar). The Circulation Nurse, according to the pre-hospital information, ensures that all equipment is available. Warm fluids are primed in a blood pump set and the Level 1™ rapid infuser is kept on standby. Blood is available in the resuscitation room and should be at hand. Procedures performed in the resuscitation room include:

- emergency cricothyroidotomy
- packing of bleeding from major facial fractures
- saphenous vein cut down
- diagnostic peritoneal lavage
- urinary catheter insertion
- chest drain insertion
- emergency room thoracotomy, and
- stabilisation of fractures.

Intraosseous needles are available for paediatric trauma. On arrival of the injured patient, the Procedure / Circulation Nurse assists with removal of clothing and provides warm blankets to prevent hypothermia. Monitoring is attached to the patient and the nurse assists with securing intravenous lines. Both the Procedure / Circulation Nurse and Doctor liaise regarding procedures. During major trauma, additional assistance may be required to facilitate the use of the Level 1™ rapid infusion device.



**KNOW THE RAPID INFUSER (LEVEL 1™)
INSIDE & OUT!!**

SCRIBE NURSE

The Scribe Nurse has a very complex role. Upon pre-hospital notification of arrival of the trauma patient, it is the Scribe Nurse's responsibility to notify the operating theatres on extension 84404. This number contacts the Operating Theatre Coordinator who will be provided with the following information:

- M - Mechanism
- I - Injury
- S - Signs
- T - Treatment.

This facilitates rapid transportation to the operating theatre when necessary.

It is the Scribe Nurse's responsibility to obtain patient identification labels from the clerical personnel and attach two armband labels to the patient. The Scribe Nurse documents vital signs every 15 minutes (or every 5 minutes in the unstable patient). All fluids and medications are documented and a chronological record of events and procedures of the resuscitation is maintained.

The nursing members of the trauma team are a strong link in trauma care. They must be familiar with roles, which may vary from hospital to hospital.

Remember to document the patient's temperature and respiratory rate.

WARDSPERSON

- Remove trousers, shoes and socks.
- Hold patient as directed by the Trauma Team Leader.
- Check suction and oxygen available.
- Transport console.
- Priority key to lifts and ready to transport patient.

RADIOGRAPHER

- Check with Team Leader before patient arrives regarding possible x-ray.
- Have x-ray plates in place ready to shoot.
- **Put portable x-ray machine on patient's left!**
- Count "5, 4, 3, 2, 1, shoot!"
- Scan all x-rays onto the server.
- Ensure all earrings and other radio-opaque clothing, jewellery removed (brassieres, necklaces, etc).

SOCIAL WORKER

- Liaise with family and friends; provide support.
- Provide additional information when instructed by the Trauma Team Leader.

REFERENCES:

1. Sugrue M, Seger M, Kerridge R, Sloane D, Deane S. A prospective study of the performance of the trauma team leader. *J Trauma* 1995; 38 (1); 79-82.
2. Lu WH, Kolkman K, Seger M, Sugrue M. An evaluation of trauma team response in a major trauma hospital in 100 patients with predominantly minor injuries. *Aust NZ J Surg* 2000; 70 (5); 329-32.

Anticipating the immediate needs of a pending trauma patient arrival is a **critical role played by the Trauma Team Leader**.

Pre-hospital information directly from ambulance crews or via ambulance dispatch can be limited, however, it is important to use these clues to better prepare and equip the trauma team to meet the immediate and urgent needs of the pending arrival.

GENERAL

- Ensure all team members are present in the resuscitation area. If members are absent, alert switchboard operator to send out a specific page to the missing member. Otherwise recruit a replacement team member.
- Ensure the team is appropriately gowned, gloved and wearing eye protection. **THE TEAM LEADER MUST ENSURE THIS OCCURS.**
- Give advance direction to the radiographers so that film cassettes are in position for rapid imaging on patient arrival.
- Ensure that the Trauma Surgeon on call is paged for any patient with a pre-hospital SBP < 90mmHg.
- Ring 84404 (operating theatre coordinator) if pre-hospital information makes urgent operation likely so that an operating theatre, staff and equipment can be prepared.
- Contact subspecialty services as necessary.

AIRWAY

The airway trolley at the head of the patient stretcher should always be stocked and ready to use. The Airway Doctor must ensure everything is ready and in working order. The emergency airway / cricothyroidotomy pack (all you need is a size 10 scalpel and a size 6 ET tube) is beneath the airway trolley and should be prepared in the following situations:

- Massive facial injuries with pre-hospital reports of difficulty ventilating.
- Stridor and suspected laryngeal injury with pre-hospital reports of hypoxia.
- Any pre-hospital reports of hypoxia and difficulty securing airway or failed intubation.
- If pre-hospital information suggests intubation is likely to be required, draw up drugs for a rapid sequence induction.

BREATHING

Breathing problems can be anticipated in patients suffering massive chest injuries. Chest tube trays should be opened in the following settings:

1. Pre-hospital decompression of a tension pneumothorax.
2. Reports of a flail chest or open pneumothorax.
3. History of a penetrating chest injury.

In the setting of a penetrating chest injury, consideration should also be given to the potential need for an ED thoracotomy. The thoracotomy pack should be readily available. Always consider opening the pack, as an extra 3 minutes taken to prepare after the patient's arrival can be the difference between life and death.

CIRCULATION

The overwhelming principle of this aspect of trauma care is to arrest all bleeding. This must be the focus of resuscitation. Gaining IV access is important but secondary to control of ongoing external haemorrhage. Pressure must be placed on any site of external blood loss. If surgical control of bleeding is likely to be needed, then the appropriate surgeon must be advised as the information is gained.

All major trauma patients require intravenous access. If there are pre-hospital reports of difficult access, either percutaneous large bore access or venous cutdown access should be organised.

- All fluids must be given warmed. Bags should be hung and lines primed just prior to patient arrival.
- All fluids to be given with a pump set.
- Rapid infusing device (Level 1™) to be primed and ready if there has been any history of pre-hospital hypotension.

Type O blood from the resuscitation bay refrigerator is to be hung if the patient remains hypotensive pre-hospital despite fluid administration, or in a situation where massive injury and hypovolaemia is likely (massive pelvic fracture, large haemorrhage at scene, etc).

SECTION 2



**BE CAREFUL WITH ELDERLY PATIENTS:
THEY DO NOT TOLERATE ANAEMIA
VERY WELL.**

DISABILITY

The following pre-hospital information mandates contact with the on-call neurosurgeon before the patient reaches the resuscitation room:

- Open head injuries
- Decreased GCS
- Pupillary asymmetry.

**THE GOAL OF PREPARATION IS TO ANTICIPATE
THE IMMEDIATE NEEDS OF THE PATIENT. (BETTER
TO BE OVER-PREPARED THAN LOOKING FOR
STAFF AND EQUIPMENT IN AN EMERGENCY).**



The following criteria mandate the activation of the Liverpool Hospital trauma team. These are based on specific anatomical injuries and physiological parameters that indicate actual instability or a patient at high risk. In addition, certain specific mechanisms of injury or arrays of symptoms will activate the trauma team because, at this hospital, they have in the past indicated a very high risk of injury. Some of these patients may, after assessment, have no demonstrable injuries and be discharged. A certain number of "false alarms" are required to ensure that potentially unstable patients or patients with occult injury are not undertriaged. It is important to respond immediately to the page so that timely investigation and intervention can optimise patient outcome.

MECHANISM / HISTORY

- Motor vehicle crash with ejection.
- Pedal cyclist, motorcyclist or pedestrian hit by vehicle >30 km/h.
- Fall >5 metres.
- Fatality in same vehicle.
- Interhospital trauma transfer meeting activation criteria.

ANATOMICAL

- Injury to two or more body regions.
- Fracture to two or more long bones.
- Spinal cord injury.
- Amputation of a limb.
- Penetrating injury to head, neck, torso, or proximal limb.
- Burns >15% BSA in adults, >10% in children or airway burns.
- Airway obstruction.

PHYSIOLOGICAL

- Systolic blood pressure <90mmHg or pulse >130 bpm.
- Respiratory rate <10 or >30 per minute.
- Depressed level of consciousness or fitting.
- Deterioration in the Emergency Department.
- Age >70 years WITH chest injury.
- Pregnancy >24 weeks with torso injury.

UNIVERSAL PRECAUTIONS

Chapter 4

SECTION 2

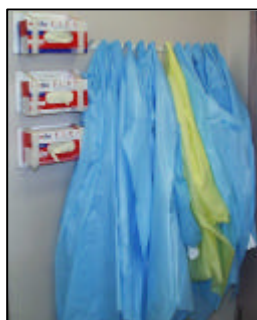
Blood and body fluids can carry disease and cause infection in care providers. In the resuscitation areas of each trauma bay, fluid and blood splashes are common and there is a greater chance of coming into contact with infected fluids. It is imperative and a job requirement that you ensure maximal protection for yourself and others on the trauma team by wearing appropriate protection. All precautions must be in place before crossing the red line into the patient area. Barrier protection is an individual responsibility and the Trauma Team Leader must also ensure that team members are adequately protected. Those without adequate protection are not permitted in the trauma bays.

Occasionally, patients are brought in after exposure to various chemicals and environmental hazards. This situation also mandates careful attention to team member protection from exposure to these potentially hazardous substances. Special filtration masks are available in the resuscitation room for this purpose.

EYE PROTECTION

Adequate protection means wearing a curved eye shield or full facial shield. Both are available by the scrub sink in the resuscitation area. Eyeglasses alone are not adequately protective.





GOWNS

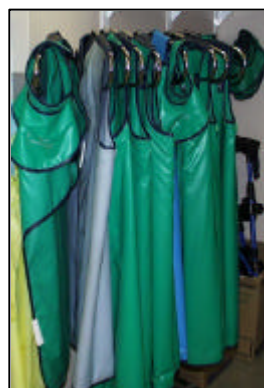
Disposable fluid-resistant gowns are available on racks in the resuscitation area. These must be used to protect body and clothing from fluid contamination and splashes. If contaminated, they must be thrown away.

GLOVES

Available throughout the resuscitation room and must be used as with all other patient contact. Hypoallergenic gloves are available for those with a latex allergy.

LEAD GOWNS

Must be worn by Airway Doctor and Nurse, Procedure Doctor and Nurse, trauma registrar and anyone else required to remain within the trauma bay during resuscitation. Thyroid lead protection is also available. For those not within the immediate resuscitation area, a distance of 3 metres from the portable radiology equipment is considered safe for care providers.



BE PREPARED FOR ANYTHING AND EVERYTHING BY PROTECTING YOURSELF AS THE FIRST PRIORITY. ENSURE ALL GEAR IS ON BEFORE THE PATIENT ARRIVES.

Smooth functioning of the trauma team is associated with improved survival, reduction of mortality and morbidity. This requires prioritisation and resource management by all members of the team in conjunction with the Trauma Team Leader.

TEAM LEADER ROLE IN DETERMINING INVESTIGATIONS

The Trauma Team Leader should have a clear plan, after consultation with the surgical registrar and the Airway Doctor, about the patient's planned investigations.

TIPS

- Be clear about instructions / management plan.
- Be willing to change your mind.
- Ensure adequate communication.
- Ensure you are thinking of the next stage after the investigation.
- Ensure the relevant speciality is notified.
- Use the clock.
- Set your goals and targets.
- Make sure anaesthesia and theatre are aware.



All seriously injured trauma patients should have c-spine, chest and pelvic x-rays. The order of this should be:

1. chest x-ray
2. pelvis x-ray
3. c-spine x-ray.

In a critically ill patient, request that the radiographer not scan the films until after the trauma team has reviewed them. Occasionally, but rarely, patients will need urgent surgery without any radiology. This is exceptional and usually relates to penetrating trauma. It is important

that investigations such as cystograms and urethrograms are prioritised to their place after stabilisation and control of circulation.

Patients travelling to radiology must be haemodynamically stable. There is no role for CT in the unstable patient.

SECTION 2

In relation to team management, the Trauma Team Leader is ultimately responsible for ensuring that the patient is progressing. This includes ensuring adequate input and response from surgical and intensive care teams. In the event of any concern, the Trauma Surgeon should be notified. It is policy to notify the Trauma Surgeon via switchboard, the anaesthetic registrar on extension 84405 (speed dial 2927 after hours) and the Operating Theatre Coordinator on extension 84404 of the impending arrival of a patient with pre-hospital hypotension.

MULTIPLE TRAUMA PATIENTS / DISASTER RESPONSE

Chapter 6

MULTIPLE TRAUMA PATIENTS

The concurrent arrival of two trauma patients to the resuscitation room is not an infrequent occurrence. Most often this situation can be managed by the team in attendance with the Trauma Team Leader and emergency physician triaging both patients and dividing the available doctors and recruiting further nursing staff from the emergency department.

Each team must have a Trauma Team Leader, an Airway Doctor and Airway Nurse, Procedure Nurse and Scribe Nurse. The role of Procedure Doctor can be taken by a single surgical registrar who starts with the patient triaged as having the most urgent needs. The second patient is seen as soon as the first patient has been adequately assessed and treated. Recognising that trauma patient needs can quickly change, it is the responsibility of each Trauma Team Leader to frequently assess the urgent needs of their patient. If more help is required, another surgical registrar, the Trauma Fellow or Trauma Surgeon can be recruited to assist.

If three or more patients arrive concurrently, or if two patients have critical injuries and require urgent treatment, the Trauma Surgeon on-call must be in attendance to assist. The call to request assistance must be made early and without hesitation.

**LIVERPOOL HOSPITAL SURGEONS ARE ALWAYS HAPPY
TO COME IN. YOU MUST CALL THEM EARLY. CALL IN THE
TRAUMA FELLOW AS WELL IF AFTER HOURS.**

SECTION 2

DISASTER RESPONSE

Liverpool Hospital has defined specific responses to both external and internal disasters. These are available in the Liverpool Health Service Corporate Manual - Administrative Volume A-Section 5.

In short, the disaster plan for trauma is set into action when the emergency department and resuscitation bays are expected to be overwhelmed by the impending arrival of multiple injured patients. The exact number of patients to trigger this response depends on the severity of injuries and the number of staff required and available. It should be seriously considered with the arrival of more than 5 patients with significant injury. The disaster response is initiated by the Emergency Physician in consultation with the nurse in charge. The Corporate Manual has further details as to the chain of notification and decision making.

The Trauma Surgeon on-call should be alerted and on-site as should the duty anaesthetist. Further surgeons and anaesthetists can be recruited as seen fit. The Operating Theatre Coordinator must be kept apprised of operating theatre requirements to permit preparation of staff and equipment. Nursing staff can be recruited for the emergency department and resuscitation bays from the ICU, operating theatres and wards as required.



1. There is no substitute for common sense and good judgement! It is critical to make the decision to call an internal disaster early to allow for maximum team preparation and briefing.
2. Disaster response decisions are often made based on limited and occasionally erroneous information. It is better to be over-prepared and send extra staff away if not required, than to try to manage multiple seriously injured patients all at once whilst trying to recruit assistance!

RESUSCITATION ROOM DOCUMENTATION

Chapter 7

SECTION 2

All members of the trauma team must carefully make notes regarding injuries found and interventions required during the resuscitative phase of care.

The Trauma Team Leader completes the detailed trauma assessment form based on information obtained during primary and secondary surveys. The surgical registrar makes detailed notes and diagrams of injuries found during the secondary survey and makes additional notes about any interventions required.

The other critical information gatherer is the Scribe Nurse who makes detailed notes whilst the resuscitation is in progress. The detail of these notations and times is a critically important element of trauma care. Accuracy, speed and detail are absolute requirements.

**ENSURE TEMPERATURE AND PRE-INTUBATION
RESPIRATORY RATE ARE RECORDED.**

It is important that the Trauma Team Leader reviews all information at the end of the secondary survey including the trauma series of x-rays and, after reviewing the findings with the Trauma Registrar, Trauma Fellow and any subspecialty consultants, formulates and documents a detailed plan for patient investigation and care. Whilst recognising that trauma care is a dynamic process and priorities change based on changes in the patient, it is still important to document these changes and the consequent changes to a plan of investigation or treatment.

Good trauma patient care and management often requires input and treatment from numerous subspecialists. The patient's notes (chart) are the critical link that allows each carer to know the plans of each involved consultant. Without detailed notes, care can become fragmented - creating delays, errors and potentially increasing patient morbidity.



1. Ensure all notes in the patient's chart are written clearly with a detailed plan for investigations and treatment.
2. Write the date and time with each note.
3. Contact subspecialty consultants directly if there is conflict or confusion about another team's plan for investigations or management.
4. Write down laboratory results in the notes.
5. Ensure all radiographs are reviewed and note the name of the consultant radiologist who reviewed them along with the results in the patient notes. Others will then not need to waste their time and that of another (or the same!) radiologist to learn the same thing.

