

Broadsheet on the management of major trauma

Since the publication of the 1988 Royal College of Surgeons report into the management of major trauma, considerable advances have been made in the United Kingdom with regard to the delivery of appropriate care to injured patients, involving the implementation of the Advanced Trauma Life Support (ATLS) system, courtesy of the American College of Surgeons and the Royal College of Surgeons.

The Academic Committee of the British Association of Accident and Emergency Medicine was asked to publish a consensus document on the management of major trauma. The aim of the Committee was to produce a broadsheet presenting an overview of the key components of the initial stages in the resuscitation of trauma cases which would be placed above each bed in the resuscitation room.

The layout and content have been designed so that staff can prepare themselves accordingly, and have an aide-memoir available to check through as the resuscitation proceeds.

The material in the broadsheet has been written to follow the most recent concepts presented in the ATLS system.

The document is designed with several key phases. The initial phase identifies the patient potentially at risk, based on the Triage Revised Trauma Score, injury pattern, and mechanism of injury. This allows patients who may be potentially at risk to be triaged to a resuscitation area for assessment.

The primary survey and resuscitation phase run with a vertical assessment and a horizontal treatment programme, emphasising the A for airway and cervical spine, B for breathing and ventilation, C for circulatory support, D for disability for neurological assessment, and E for exposure, examination, and environmental control.

The three critical x rays are identified in the middle of the broadsheet. As an aid to the inexperienced, doctors are advised to pull down the shoulders to ensure that C.7/T.1 junction is clearly seen.

One of the most important parts of the broadsheet is the clock on the right hand side. This starts at minus 5 minutes when preparations are made for the patient's arrival. The clock starts ticking as the patient arrives with the primary survey and resuscitation phase being optimally completed at 15 minutes.

The centre of the document has some key advice. If there is unresponsive shock it is

almost certain that the patient will require immediate surgical intervention. This should be undertaken by senior surgical staff as quickly as possible.

The secondary survey emphasises a head to toe examination to exclude concomitant injuries. However, it is specifically noted that the A,B,C,D, should be rechecked throughout.

The broadsheet has a bright red 60 minute clock at the bottom right hand corner. This signals that definite management, whether it be operative or intensive therapy support, should be activated by the 60 minute mark. It is again noted that if the patient has not been stabilised, despite aggressive resuscitation, early surgery should be considered. The document also records issues that are pertinent to transfer of the patient to a definitive unit, and provides an aide-mémoire of issues that are often neglected, including tetanus immunisation, analgesia, and information to relatives.

The development of this broadsheet has required the input of many specialists throughout the United Kingdom. The Academic Committee is very grateful for their support and that of the ATLS Committee of the Royal College of Surgeons for their helpful comments.

It is hoped that this broadsheet will be widely publicised throughout all UK accident and emergency departments. It is important, however, that all surgical/anaesthetic staff who deal with trauma cases should be aware of the contents of this broadsheet (particularly the red clock on the right hand side). The broadsheet should provide an aide-mémoire to all staff who deal with major trauma cases, particularly those who have not yet had an opportunity to attend an ATLS course.

MICHAEL McCABE

*Accident and Emergency Department,
Morriston Hospital NHS Trust, Swansea.*

on behalf of:

*Academic Committee,
British Association of Accident and Emergency
Medicine, Royal College of Surgeons,
London WC1A 3PN.*

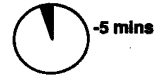
Copies are available from:

British Association of Accident and
Emergency Medicine at the Royal College of
Surgeons of England, 35/43 Lincolns Inn
Fields, London WC1A 3PN

**BRITISH ASSOCIATION FOR ACCIDENT AND EMERGENCY MEDICINE
THE MANAGEMENT OF MAJOR TRAUMA**

The modern management of major trauma requires a disciplined team approach. A didactic set of guidelines is recommended. The Advanced Trauma Life Support System (TM American College of Surgeons) is the most widely adopted system at the present time. The key elements involve the primary survey/resuscitation phase, the secondary survey and the rapid implementation of definitive treatment which may involve early surgery. Life threatening conditions must be detected and treated immediately. IF A SERIOUSLY INJURED PATIENT IS EXPECTED THEN:

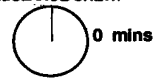
CALL FOR HELP SUMMON TRAUMA TEAM IN ADVANCE IDENTIFY A LEADER
TRIAGE: IDENTIFYING PATIENTS AT PARTICULAR RISK OF DEATH AND SERIOUS MORBIDITY!
MOVE PATIENT INTO THE RESUSCITATION ROOM. FOLLOW THIS SYSTEM TO THE END. OBTAIN AN ACCURATE HISTORY FROM THE AMBULANCE CREW.



TRIAGE REVISED TRAUMA SCORE
GLASGOW COMA SCORE <13
SYSTOLIC BLOOD PRESSURE <90
RESPIRATORY RATE <12 OR >29

INJURY PATTERN
Penetrating injury to head, neck, chest, abdomen, groin.
Two or more proximal long bone #
Flail chest.
Burn >15% and/or facial/airway/ chest involvement.
Pedestrians or motorcyclists
History of alcohol or drugs

MECHANISM
Fall >6 metres,
Ejection of patient from vehicle.
Roll over of vehicle.
Death of same car occupant
Rearward displacement of front axle
Passenger compartment intrusion



Beware of patients Age <5/>55 and/or known cardiorespiratory disease.

PRIMARY SURVEY AND RESUSCITATION PHASE.

- A ---- CLEAR THE AIRWAY. USE CHIN LIFT/AJAW THRUST. IMMOBILISE THE CERVICAL SPINE WITH COLLAR/SANDBAGS/TAPE.
- B ---- CHECK VENTILATION. ADMINISTER O₂ AT 15L/MIN. USE TIGHT FITTING MASK WITH RESERVOIR OR USE BAG AND MASK.
- C ---- CHECK FOR PULSES. SKIN PERFUSION. LEVEL OF CONSCIOUSNESS. IDENTIFY OBVIOUS SITES OF BLOOD LOSS.
- D ---- LEVEL OF CONSCIOUSNESS. A (ALERT); V (RESPONDS TO VOCAL STIMULI); P (RESPONDS ONLY TO PAIN); U (UNCONSCIOUS).
- E ---- EXPOSE AND EXAMINE THOROUGHLY.



DETECT AND TREAT LIFE THREATENING INJURIES

A	B	C	D	E
Compromised airway? Consider: Oro-pharyngeal or nasopharyngeal airway. If no response, consider: Intubate using endotracheal or nasotracheal technique. If unable, consider: Cricothyroidotomy.	Ventilate by bag and mask or tube. Use O ₂ . Needle thoracostomy for tension pneumothorax. Seal open pneumothorax. Identify flail chest. Insert chest drain for massive haemothorax. The Oximeter reading should be 95% or greater.	Arrest obvious external loss. Predict bleeding and pre-empt shock. Insert two large bore lines. Infuse 2L (20ml/kg in children) of crystalloid/Colloid prior to transfusion of warmed blood. The latter may be O neg/Group compatible/Full cross match. Drain haemopericardium. Use cutdown or intraseous lines if necessary.	Assess level of consciousness. Use AVPU. Look at the pupils. Can the patient move all limbs?	Undress completely. Avoid hypothermia. Attach ECG monitor. Insert NG tube and urinary catheter. BEWARE OF CONTRAINDICATIONS! Blood for U/E, ABG, FBC, XM.

X ray the cervical spine (Pull down the shoulders to see C7/T1), chest and pelvis in the resuscitation room.

UNRESPONSIVE SHOCK = GO TO THEATRE NOW, WITH SENIOR HELP!
SECONDARY SURVEY Recheck A/B/C/D. PROCEED IF STABLE.
SECONDARY SURVEY IS A HEAD TO TOE CHECK.



Ask AMPLE. A: Allergies M: Medications P: Previous history L: Last meal time E: Events surrounding the incident

HEAD	FACE	NECK	CHEST
Assess for wounds, and fractures. Examine the eyes and for base of skull fracture	Examine mouth, mandible, zygoma, nose and ears. Exclude midfacial # and airway obstruction.	Assume a fracture. Use collar, tape and sandbag immobilisation. Palpate the spine. Wounds deeper than platysma need exploration by a surgeon in theatre.	Look, listen and feel. Look at the chest x-ray. Exclude: Pulmonary and cardiac contusion, aortic rupture, diaphragmatic hernia, tracheal, bronchial or oesophageal injury. Exclude minor thoracic trauma. Exclude pneumothorax!
NEUROLOGIC	ABDOMEN	FRACTURES	
GCS. Full CNS examination. Evidence of paralysis or sensory deficit requires full spinal stabilisation. Decreasing GCS levels not responding to resuscitation measures indicate need for head CT and neurosurgical consultation.	Both peritoneal and retroperitoneal injuries may present with normal signs. Rectal and perineal examination is essential. Either peritoneal lavage and/or ultrasound may help in excluding abdominal injury.	Check for malalignment, crepitus, tenderness. Assess neurovascular and tendon function. Log roll the patient to assess thoracolumbar injuries. Exclude minor fractures, dislocations, glass or other foreign bodies. EXAMINE THE BACK!	

DEFINITIVE MANAGEMENT. OPERATIVE/INTENSIVE THERAPY UNIT.

Pain: Morphine : 0.1 - 0.2 mg/Kg iv in diluted incremental doses.
Get senior help to define treatment objectives and formulate plan of action, which may include further resuscitation, investigation, and theatre. DO NOT WASTE TIME.

DOCUMENT ALL EVENTS AND TREATMENTS

TRANSFER ARRANGEMENTS: Stabilise patient before transfer. Send anaesthetist.

Always patient and stable? Intubate before transfer. Life saving surgery (eg. splenectomy) may be needed locally before transfer to regional trauma unit.



REMEMBER: Tetanus prophylaxis. Antibiotics. Information to relatives.

Academic Committee
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