Basic ATLS

The Primary Survey

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Consultant Surgeon
Trauma

- expression comprising a spectrum of severity of mechanical violation of tissues, from a little scratch to a multiply injured patient.
- also surgical intervention.
Dying from Trauma

Lacerations:
- Brain
- Brainstem
- Aorta
- Cord
- Heart

Deaths

Epidural
Subdural
Hemopneumothorax
Pelvic fractures
Long bone fractures
Abdominal injuries

Time

0 1 hour 3 hours 2 weeks 4 weeks

Sepsis
MOF
BIRTH CONTROL

Because If You Aren’t Careful,
One of These Could Be Yours.
An organized consistent approach to the trauma patient → optimal outcome.


The primary focus of ATLS is on the first hour of trauma management - rapid assessment and resuscitation

THE GOLDEN HOUR
Trauma Mx involves:

1. Preparation
2. Triage
3. Primary Survey (ABCDEs)
4. Resuscitation
5. Adjuncts to primary survey & resuscitation
6. Secondary Survey (head to toe evaluation & history)
7. Adjuncts to secondary survey
8. Continued post-resuscitation monitoring & re-evaluation
Primary Survey
- Identifies most life-threatening injuries

Resuscitation
- Airway control
- Ensure oxygenation / ventilation
- Needle / tube thoracostomy
I. PREPARATION

A Pre-hospital phase
Receiving hospital is notified first.
   Send to the closest, appropriate facility.

B In Hospital Phase
Advanced planning for the trauma pt arrival.
   Method to summon extra medical assistance
   Transfer agreement with verified trauma center established.
   Protect from communicable disease.
2. TRIAGE

A Multiple Casualties

no of severity & pt do not exceed the ability of the facility.

B Mass Casualties

no & severity of pt EXCEED the capability of the facility & staff.
Primary survey - immediate life-threats

A - Airway open?  C - C-spine
B - Breathing?    Decompression
C - BP, pulse?   Control bleeding, fluids
D - Disability?  GCS, Pupils
E - Exposure     Keep warm
Adjuncts and tests

- Adjuncts
  - Pulse oximeter
  - Cardiac monitor
  - Foley catheter
  - NG tube

- Diagnostic tests
  - CXR
  - Pelvic x-ray
  - C-spine x-ray
  - ECG
  - Pregnancy test
  - Bloods
PRIMARY SURVEY

- **A**: Airway *with* cervical spine control.
- **B**: Breathing & Ventillation
- **C**: Circulation *with* haemorrhage control.
- **D**: Disability or neurological status
- **E**: Exposure (undress) & Environment (temp control)
Priorities for the care of Adult, Paediatric & Pregnant women are all the same!

During the primary survey life threatening conditions are identified and management is instituted SIMULTANEOUSLY.
A. Airway Maintenance with Cervical Spine Control

- GCS score of 8 or less require the placement of definite airway.
- Protection of the spine & spinal cord is the important management principle.
- Neurological exam alone does not exclude a cervical spine injury.
- Always assume a cervical spine injury in any pt with multi-system trauma, especially with an altered level of consciousness or blunt injury above the clavicle.
A – How To?

- Chin Lift or Jaw thrust??
- Inspect airway?
- Maintain or assist?
- Options:
  - Simply open it!
  - Deliver O2 – as much as possible?
  - Bag Valve mask?
  - Guedel / Nasopharyngeal?
  - Laryngeal mask?
  - Endo/Naso Tracheal tube?
  - Surgical Airway
- And you don’t forget?????????
Airway with Cervical Spine Control
B. Breathing & Ventilation

- Airway patency does not assure adequate ventilation.
- Bag/Valve mask
- High flow $O_2$
B – How to?

- Need an adequate airway
- Provide high flow O2
- Decompress tension pneumo
- Thoracostomy?
- Chest Drain
- Flail Chest?
Primary Survey

- Airway obstruction
- Tension pneumothorax
- Open pneumothorax
- Flail chest
- Massive haemothorax
- Cardiac tamponade
Breathing

Tension Pneumothorax: Signs / Symptoms

- Respiratory distress
- Distended neck veins
- Unilateral ↓ in breath sounds
- Hyper-resonance
- Cyanosis, late
Breathing

**Open Pneumothorax**

- Cover defect
- Chest tube
- Definitive operation
Breathing

Flail Chest

Rib 3 - 2 fractures
Rib 4 - 2 fractures
Rib 5 - 2 fractures
Rib 6 - 2 fractures
C. Circulation with Haemorrhage Control.

- a. consciousness.
- b. skin color
- c. Pulse.

External bleeding is identified & controlled in the primary survey.

Tourniquets should not be used **
C – How to?

- Adequate airway
- Adequate Ventillation
- 2 large bore venflons (Poiseuille Law)
- 2 litres crystalloid
- Control bleeding points
- Resuscitative laparotomy
- Resuscitative thoracotomy

\[
\Phi = \frac{dV}{dt} = v\pi R^2 = \frac{\pi R^4}{8\eta} \left( -\frac{\Delta P}{\Delta x} \right) = \frac{\pi R^4 |\Delta P|}{8\eta L}
\]

\[ F \propto \frac{1}{l} \quad \text{and} \quad F \propto d \]
## Fluid & Blood Loss

<table>
<thead>
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<th></th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
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<tbody>
<tr>
<td>Bld Loss (mls)</td>
<td>750</td>
<td>750-1500</td>
<td>1500-2000</td>
<td>&gt;2000</td>
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<tr>
<td>Bld Loss (% vol)</td>
<td>15%</td>
<td>15-30%</td>
<td>30-40%</td>
<td>&gt;40%</td>
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<tr>
<td>HR</td>
<td>&lt;100</td>
<td>&gt;100</td>
<td>&gt;120</td>
<td>&gt;140</td>
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<tr>
<td>BP</td>
<td>N</td>
<td>N</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>PP</td>
<td>N or ↑</td>
<td>↓</td>
<td>↓</td>
<td>↓</td>
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<tr>
<td>RR</td>
<td>14-20</td>
<td>20-30</td>
<td>30-40</td>
<td>&gt;35</td>
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<tr>
<td>UO</td>
<td>&gt;30</td>
<td>20-30</td>
<td>5-15</td>
<td>--</td>
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<tr>
<td>CNS</td>
<td>Slightly anxious</td>
<td>Mildly anxious</td>
<td>Anxious &amp; confused</td>
<td>Confused &amp; lethargic</td>
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<tr>
<td>Fluid replacement</td>
<td>Crystalloid</td>
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<td>Crystalloid &amp; blood</td>
<td>Crystalloid &amp; blood</td>
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<tr>
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<td>✓</td>
<td>✓/✖</td>
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Circulation – Life Threatening Conditions

- Massive Haemothorax
- Cardiac Tamponade
- Any major vessel
- Any major bone
- Any solid organ
- Pregnant women
D. Disability (Neurological Evaluation)

Simple Mnemonic to describe level of consciousness

- A: Alert
- V: Responds to Vocal stimuli
- P: Responds to Painful stimuli
- U: Unresponsive to all stimuli

Not forget to use also Glasgow Coma Scale (secondary Survey).
E. Exposure / Environmental Control

- It is the pt’s body temp that is most important, not the comfort of the health care provider.
- Intravenous fluid should be warm.
- Warm environment (room tem) should be maintained.
- Early control of hemorrhage.