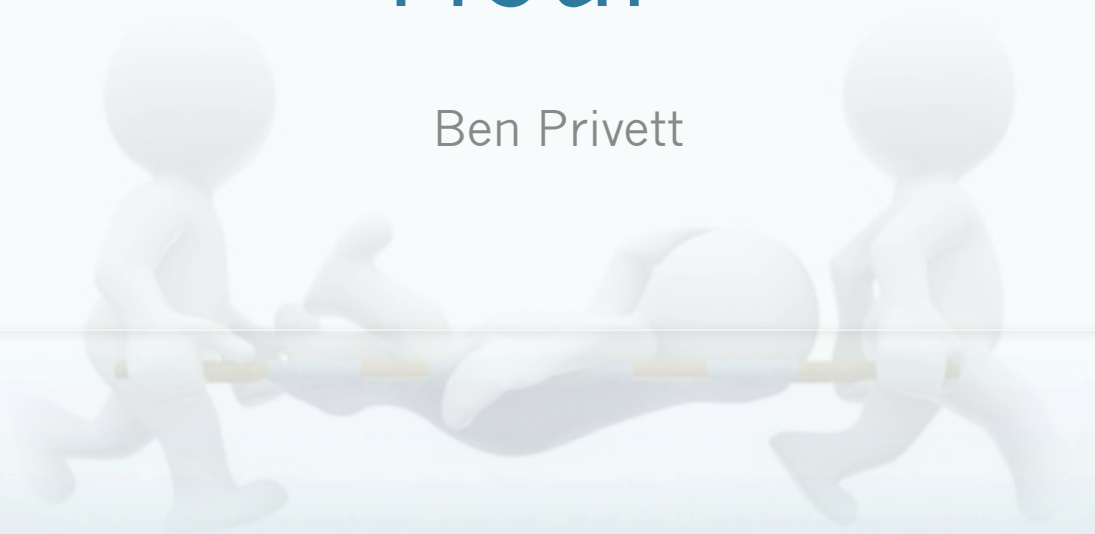


Trauma – The Golden Hour

Ben Privett



References:

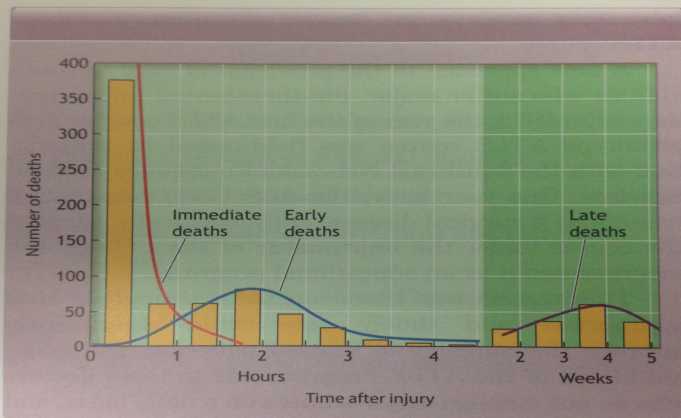
- D'Amours S, Sugrue M, Russell R, Nocera N. Handbook of Trauma Care, 6th ed. Liverpool hospital, 2004
- American College of Surgeons Committee on trauma. ATLS: Advanced Trauma Life Support (Student Course Manual), 9th Edition, 2012

The Golden Hour

- Based on the concept that trauma patients have better outcomes if they are provided definitive care early
- No fixed timeframe of 60min. Limited evidence of improved outcomes from injury time to definitive care.
- A good trauma care system minimises time from injury to definitive care!
(Hot Tip: Handbook of Trauma Care, Liverpool Hosp)
- Minimise the physiological consequence of the injury.

ATLS goals

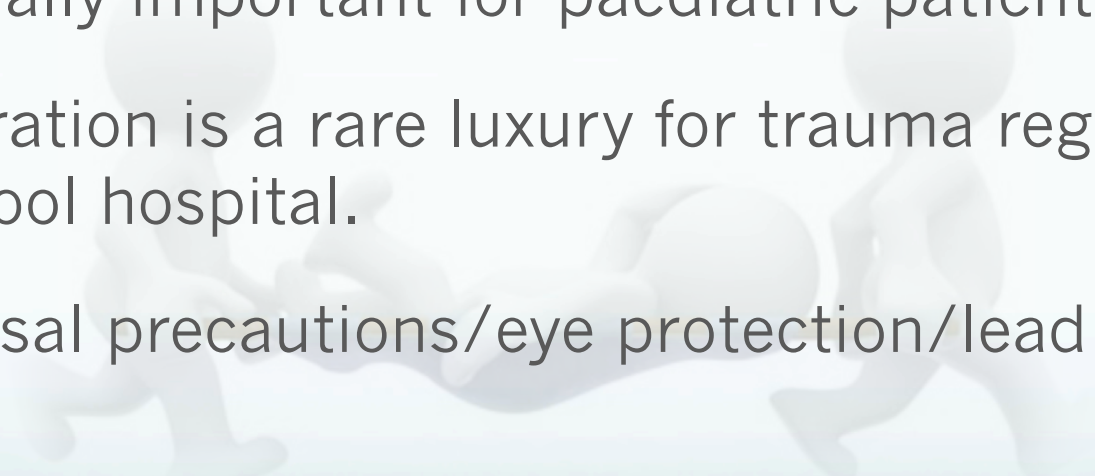
- Rapidly assess patients condition
- Resuscitate and stabilise according to priority
- Determine whether a patient's needs exceed the resources or capabilities of a facility/provider
- Arrange appropriate intra/interhospital transfer.
- Ensure that the level of care does not deteriorate.



■ FIGURE 3 Trimodal Death Distribution.



Preparation

- Pre-arrival preparation is vital
 - Assign team roles.
 - Know your procedure\circulation nurse
 - Especially important for paediatric patients
 - Preparation is a rare luxury for trauma registrars at Liverpool hospital.
 - Universal precautions/eye protection/lead gowns
- 

Airway (and cervical spine)

Signs of airway trauma

Hoarseness

Subcut emphysema

Palpable # of the larynx

Agitation

Stridor

Assess need for definitive airway

Need for airway protection

1. Maxillofacial #s
2. Pending obstruction – neck haematoma, stridor,
Burns
Laryngeal/tracheal injury.

3. Risk of aspiration

4. Unconscious

Need for oxygenation

1. Inadequate resp effort
2. Massive bloodloss
3. Severe closed head injury

28yo M gunshot wound to the neck

Audible stridor, speaking in single words, confused

Describe your initial decision making and airway management

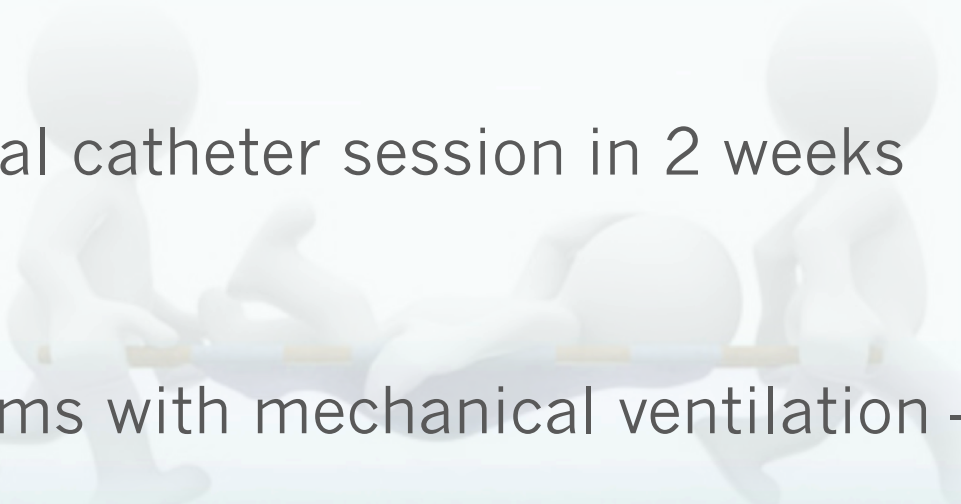
Describe the steps of a surgical airway

- On oxygen
- Simple airway maneuvers in unconscious patient
chin lift, jaw thrust
- Oropharyngeal airway – sized corner of mouth to ear lobe.
- Nasopharyngeal airway
- Bag mask (one or two person)
- LMA (can be used as a bridge to surgical airway)
- Needle cricothyroidotomy
 - prepare oxygen tubing
 - Prep neck
 - Stabilise trachea at cricothyroid.
 - 14G cannula in at 45deg angle aspirating 10ml syringe
 - Intermittent ventilation 1sec :4 sec

Surgical cricothyroidotomy

1. Supine position, palpate thyroid notch, cricothyroid and sternal notch.
2. Prep and anaesthetise the area
3. Stabilised the thyroid cartilage with nondominant hand.
4. Incise skin transversely and incise through membrane transversely
5. Insert forcep and spread longitudinally
6. Insert tube (5 or 6) direct distal and inflate cuff
7. Secure tube

Breathing and ventilation

- Ask patient to take a deep breath
 - Inspect the chest
 - Assess clinically for tension pneumothorax
 - Intercostal catheter session in 2 weeks
 - If problems with mechanical ventilation – bag mask
 - e-FAST is an adjunct to C
- 

Circulation

- The first step in shock in trauma is to recognise its presence
- The second step is to identify the probable cause. **Hypovolemia**, obstructive, neurogenic, cardiogenic, (septic)

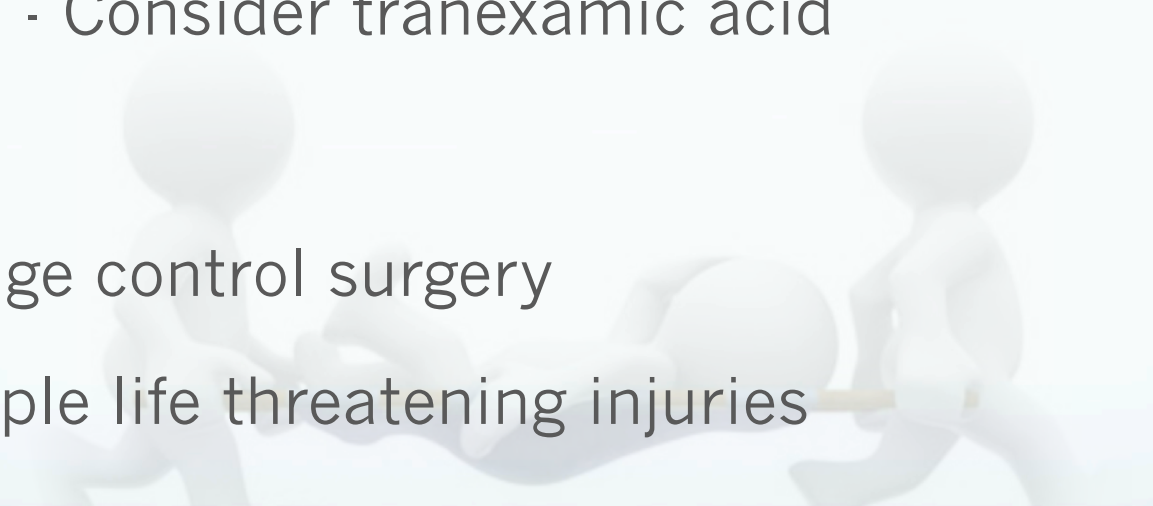
	Class I	Class II	Class III	Class IV
HR	<100	100-120	120-140	>140
BP	Normal	Normal	Decreased	Decreased
RR	14-20	20-30	30-40	>35
UO	>30	20-30	5-15	Minimal
Mental state	Slightly anxious	Mildly anxious	Confused	Lethargic

- Priority is controlling major haemorrhage

Circulation

- Assess haemodynamics and tissue perfusion.
- Identify possible sites - blood on the floor and 4 more.
- Logroll
- Medical history important at this stage.
- 1-2L warmed crystalloid, rapid infuser primed.
- Haemodynamically stable vs haemodynamically normal
- Rapid responders / Transient responders / Non-responders.
- Excessive fluid can exacerbate lethal triad
- Failure to respond to initial resuscitation dictates the need for definitive intervention.

Lethal triad

- Hypothermia – Temp $<34^{\circ}\text{C}$
 - Acidosis pH <7.25
 - Coagulopathy – early activation of MTP
 - Consider tranexamic acid
 - Damage control surgery
 - Multiple life threatening injuries
 - Combined vascular and hollow viscous injury
 - Multi-trauma
- 

29yo F gunshot wound to abdomen. HR 140 BP 80/- RR 35
Given 1L Nsaline en route

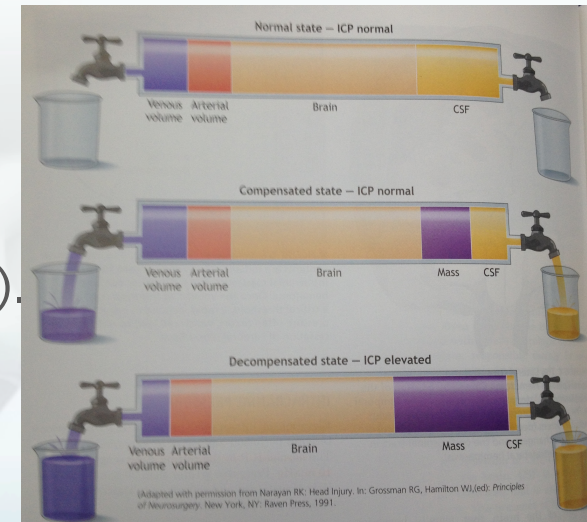
Trauma laparotomy

- Patient position (warm theatre)
- Long midline laparotomy incision with knife
- Incise to fascia and then enter with knife
- Enter the peritoneum with a finger quickly
- Evacuate blood into a bowl
- Eviscerate the bowel
- Pack methodically. RUQ – nondominant hand over liver pulling it gently down placing packs above and then below.
- Right paracolic gutter, LUQ over spleen and medial to spleen, left paracolic gutter and pelvis
- Deal with mesenteric bleeds directly
- Deal with penetrating trauma directly
- Limited, targeted retroperitoneal exploration



Disability

- Assess pupillary size and reaction
- Assess GCS, Limited peripheral neuro exam if GCS 13-15
- Monro-Kellie Doctrine – total volume of cranial contents must remain constant.
- Uncal herniation – ipsilateral pupillary dilation and contralateral weakness.
- Resuscitate patient (hypovolemia is harmful).
- Hyperventilation (normocarbia)
- Mannitol (1mg/kg)
- Hypertonic saline
- Surgical management



Conclusion

- A (and Cspine)
- B
- C
- D
- E (also important)

