EXAM
REVIEW

ATLS Cheat Sheet

IMPORTANT CONCEPTS

Initial Assessment

It is conducted in order to **identify and treat imminent life threats and prevent complications.** In a real-life setting, there will be multiple simultaneous activities occurring in order to resuscitate and stabilize the patient. Not necessarily linear.

A B C D E

A - airway + c-spine control

- 1st line - head tilt/chin lift
- 2nd line - Guedel airway or nasopharyngeal
- 3rd line - laryngeal face mask
- 4th line - intubation using an endotracheal tube
- 5th line - tracheostomy if failed intubation
- 6th line - cricothyroidotomy if all else has failed

B - Breathing

- palpation of the chest in all quadrants
- auscultation for breath sounds- axillae
- a mobile chest x-ray should be performed with pelvic and lateral neck x-ray at the earliest opportunity
- oxygen target 94-98% (COPD patients 88-92%)

C - circulation + exsanguinating external hemorrhage

- assess HR, BP, Peripheral circulation
- gain IV access- 2 large bore cannulas
- FAST scan

Control of catastrophic hemorrhage

- Stop bleeding - Tourniquets, pressure, splinting.
  - Replace volume - You start with a hypotensive resuscitation with fluids which means you don't drive up their blood pressure to normal- too much watery blood will dislodge any clots made to stop the bleeding.
- Restore Hb - Blood products.
- Address underlying cause.

D - disability
E - exposure

- assessment of consciousness GCS
- BM
- risk of hypothermia

Airway and Ventilation Management

Advanced Trauma Life Support (ATLS) defines a definitive airway as a **cuffed endotracheal tube**, achieved either by orotracheal intubation, nasotracheal intubation, cricothyrotomy, or tracheostomy.

Induction Agents and Muscle Relaxants

An ideal induction agent should have the following properties:

- rapid onset
- minimal adverse effects (hemodynamic instability)
- improves intubating conditions
- provides sedation and decrease awareness

DA Algorithm in Trauma Patients

- The basic ASA standards of monitoring should be adhered to.
- Supplemental oxygen should be delivered throughout the intubation attempt, if possible.
- The best airway management approach should be considered (awake fiberoptic intubation (AFOI), DL, VAL, invasive techniques, preserving or ablation of spontaneous respirations, etc.).
- Primary and alternative airway management plans should be developed.
- The latest 2022 ASA practice guidelines for the management of the difficult airway specifically emphasize limiting the number of intubation attempts.

Thoracic Trauma

A widely used mnemonic for the 6 killer conditions to think of, and actively search for, during the primary survey is **ATOM-FC:**

Airway obstruction or disruption

- high flow oxygen 15 L/min via non-rebreather mask
- will need bronchoscopy/thoracotomy

Tension pneumothorax

- high flow oxygen to maintain the SpO2 target
- immediate needle thoracocentesis or finger thoracostomy
- proceed to formal intercostal catheter after needle decompression

Open pneumothorax

- high flow oxygen to maintain the SpO2 target
- cover with occlusive 3-sided dressing to form a ‘flutter valve’
- will need formal exploration prior to closing

Massive haemothorax

- high flow oxygen to maintain the SpO2 target
- treat with rapid restoration of blood volume combined with concurrent drainage of the thorax
- hemostatic resuscitation
- thoracotomy

Flail chest

- high flow oxygen to maintain the SpO2 target
- analgesia
- respiratory monitoring and support

Cardiac tamponade

- high flow oxygen 15L/min via non-rebreather mask
- lower the pulse rate to decrease aortic shear forces by commencing beta-blockade then commence GTN infusion

Abdominal and Pelvic Trauma	**Blunt abdominal injury** ‣ Trauma series (e.g. CXR, pelvis XR, c-spine XR). ‣ Trauma blood panel (e.g. FBC, UEC, LFTs, lipase, coags, group and hold, BHCG). ‣ Imaging (bedside FAST scan, +/- CT if hemodynamically stable and imaging warranted). **Penetrating abdominal injury** ‣ CT abdomen (97% sensitive for peritoneal violation) is usually performed to look for evidence of peritoneal penetration and intraperitoneal injury. ‣ Laparotomy if there is an intraperitoneal injury requiring operative repair (e.g. colon perforation). **Pelvic fractures** ‣ commence hemostatic resuscitation if appropriate ‣ pelvic stabilization ‣ apply a pelvic binder ‣ perform an abdominopelvic CT with IV contrast +/- CT cystography to identify abdominal and pelvic injuries
Spine and Spinal Cord Trauma	**Asia Impairment Scale** A = Complete - No motor or sensory function is preserved in the sacral segments S4-S5. B = Incomplete - Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5. C = Incomplete - Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade of less than 3. D = Incomplete - Motor function is preserved below the neurological level, and at least half of the key muscles below the neurological level have a muscle grade of 3 or more. E = Normal - Motor and sensory function are normal.
Musculoskeletal Trauma	‣ remove all external pressure (dressings, casts, splints, restrictive clothing) ‣ consult your surgeon to see if the patient should be taken to the OR right away ‣ give supplemental oxygen and fluid boluses if needed to avoid hypotension ‣ the limbs should not be elevated or placed in a dependent position **Fasciotomy** - A procedure in which the fascia is cut to relieve pressure in the muscle compartment.
Thermal Injury	‣ Look for **clinical indications of inhalation injury.** ‣ After securing the airway and the patient is hemodynamically normalized, confirm inhalation injury by direct airway examination: • *direct laryngoscopy to check the upper airway* • *fiberoptic bronchoscopy to check the lower airway* ‣ Patients **who do not require intubation** should get 100% humidified oxygen by facemask. ‣ If there is a concern for oxygen-induced hypercapnia, you have a low threshold for using BiPAP. ‣ Carbon monoxide poisoning should be assumed in any patient who has experienced smoke inhalation until it is ruled out with a normal carboxyl hemoglobin level.

Pediatric Trauma	‣ If the child is younger than 12, and you are unable to intubate or secure the airway, you need to do a **needle cricothyrotomy.** ‣ Directly connect the O2 tubing to your catheter. ‣ When you place an oral airway in kids, do not do the 180-degree twist commonly done in adults. Instead, use a tongue depressor. ‣ **For intubation - 3 time ETT size.**
Geriatric Trauma	‣ Older patients may have **decreased pain perception** or decreased ability to localize pain. ‣ Pay close attention to **medications.** ‣ **Mechanism of injury** - Consider that even minor falls could cause serious injury in elderly patients. ‣ Could potentially risk poor or slow rates of healing due to poor nutrition or other pre-existing conditions. ‣ Could present an **increased risk for infection** due to poor nutrition. ‣ **Increased risk of multiple organ system failure.**
Trauma in Pregnancy	‣ Increased plasma volume during pregnancy can lead to significant blood loss, **even before signs of hypovolemia occur.** ‣ Cardiac output increases by 20% at 8 weeks, and up to 50% at term. ‣ An isolated cardiac murmur in a stable pregnant trauma patient does not indicate cardiac injury. ‣ **EKG changes** - 15 to 20 degrees axis deviation, transient ST segment, and T- Wave changes, Q Wave in lead 3 and AVF, inverted T Waves in lead 3, V1, V2, and V3.
Head Trauma	**Glasgow trauma scale:** eye-opening response, verbal response, motor response. **GCS score = E + V + M** Signs of **basilar skull fracture:** ‣ raccoon eyes ‣ battle's sign ‣ rhinorrhea ‣ otorrhea ‣ facial paralysis ‣ hearing loss Keep in mind that an **open, compound, or depressed skull fracture may need to be addressed surgically.** The dura should be closed to prevent cerebral spinal fluid leakage, and depressions greater than the thickness of the skull should be elevated surgically.