Chapter 3 – The Primary Survey
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The role of the primary survey is to identify immediate life-threatening problems and intervene accordingly. This is one aspect of care that should remain “injury-focused”, but requires tailoring to the elderly demographic.

It consists of the following steps:

- Airway and cervical spine control
- Breathing and ventilation
- Circulation and haemorrhage control
- Dysfunction of the CNS
- Exposure and environmental control

Specific aspects of primary survey management are taught well on traditional courses and won’t be covered in full detail. Focus will be placed on the adjustments needed in primary survey assessment when caring for elderly patients.

**Airway and Cervical Spine Control**

**Initial Airway Assessment**

Talking to a patient will quickly allow a clinician to establish rapport whilst at the same time allowing them to assess airway patency. Hospitals are unfamiliar environments and patients with dementia may become distressed by such surroundings, especially if they have their neck immobilised.

Clinicians should introduce themselves to patients at the first point of contact and constantly offer explanation and reassurance about what is happening. When a trauma team has been mobilised, the clinician allocated to airway management should be the point of liaison for the patient and establish a continuous dialogue with them where possible.

If a patient is unresponsive or fails to respond appropriately, the airway should be assessed formally:

- **Look** – any signs of obstruction from dentures, foreign bodies, facial fractures
- **Listen** – snoring, stridor, hoarseness
- **Feel** – is there any air movement?
- **Move** – if concerns arise, attempt jaw thrust in the first instance and consider airway adjuncts (nasopharyngeal, oropharyngeal airways)

**Advanced Airway Management**

Elderly patients may present a greater challenge in terms of rapid sequence induction and intubation. Lifelong development of obesity, altered dentition, reduced neck movement are all predictors of difficult intubation and may develop with advancing age. Once a decision has been made to intubate an elderly patient, it is important that this process is not rushed. Correct procedure should be followed and each patient assessed in terms of predicted difficulty:

**LEMON Predictors for The Difficult Airway**

**LOOK** – facial trauma, large incisors, beard or moustache, dentition, large tongue

**EVALUATE** – 3-3-2 rule (3 fingerbreadths between open incisors; 3 fingerbreadths between chin and hyoid; 2 fingerbreadths between thyroid notch and floor of mouth)
MALLAMPATI SCORE – see below

OBSTRUCTION – presence of any condition that could cause an obstructing airway

NECK MOBILITY – fixed deformity, immobilisation

Equipment should be prepared to ensure that rescue devices (e.g. LMA, quicktrach) are available and senior assistance sought. Choice of induction and paralysing agents will depend on user experience and preference. One of the real concerns for elderly patients is the risk of hyperkalaemia following burns or prolonged immobilisation after a fall. Tissue and muscle damage leading to rhabdomyolysis can elevate the plasma $[K^+]$ which can be made worse by pre-existing renal impairment or dehydration.

Use of suxamethonium in these patients may cause the potassium concentration to increase by up to 0.5 mmol L$^{-1}$. Elderly patients should have a venous blood gas performed to estimate the $[K^+]$ prior to using suxamethonium or consideration should be given to using a different muscle relaxant like rocuronium.

A 2015 study compared pre-hospital rapid sequence induction of patients using etomidate and suxamethonium against fentanyl, ketamine and rocuronium$^1$. Patients in the ketamine group were found to have a higher first pass intubation success (100% vs 95%, $p=0.007$) and a less frequent hypertensive response to laryngoscopy.

Despite being conducted in the pre-hospital setting, this study suggests that a simple and standardised RSI protocol may improve the safety of the procedure and should be considered to facilitate definitive airway support. It used a 3:2:1 regime for stable patients and a 1:1:1 regime for patients with haemodynamic compromise (see below)

<table>
<thead>
<tr>
<th></th>
<th>3:2:1</th>
<th>1:1:1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fentanyl</td>
<td>3mcg/kg</td>
<td>1mcg/kg</td>
</tr>
<tr>
<td>Ketamine</td>
<td>2mg/kg</td>
<td>1mg/kg</td>
</tr>
<tr>
<td>Rocuronium</td>
<td>1mg/kg</td>
<td>1mg/kg</td>
</tr>
</tbody>
</table>
Approach to the Cervical Spine

Whilst managing the airway, care must be taken to ensure that the cervical spine is properly assessed. Any patient over the age of 65 years with head / facial injury following trauma must be considered as being at high risk of having a cervical spine injury.

The presence or absence of neck pain will vary for different individuals. Some patients may not be able to communicate (e.g. dementia, delirium, aphasia post CVA), in which case the presence of any type of injury above the clavicles should alert the clinician to the possibility of c-spine trauma.

Degenerative arthritic disease, kyphoscoliosis, Parkinsonism with increased rigidity and steroid-associated “buffalo hump” are all examples of conditions that can make cervical spine immobilisation difficult. In the elderly patient, it is not always possible or practical to apply a hard collar. There are case reports of patients being harmed from the forced application of collars.

Cervical collars may have the effect of: increasing cerebrospinal fluid pressure; causing pressure sores; reducing tidal volume and affecting breathing; and limiting an individual’s ability to swallow. Such complications need to be balanced against the risks of not applying a collar and this need to be assessed on an individualised basis.

HECTOR encourages teams to use collar and block immobilisation if safe to do so and if tolerated by the patient, but if resistance is met by trying to apply such measures. If this is not possible, HECTOR encourages a practice of “minimal movement”.

“Minimal Movement”

- When a cervical spine injury is suspected and application of a hard collar is not practical, attempts should be made to support the neck in its current position.
- **AP Control**: Blankets can be rolled to be inserted behind a patient’s neck if the occiput can not lie flat on the trolley.
- **Lateral Control**: blocks, fluid bags or blankets may be used either side of the patient’s head, to maintain its current position and be secured with trauma tape.
- Log-rolling should be restricted (i.e to prevent aspiration in the vomiting patient, to change soiled bed sheets).

Clearance of the Cervical Spine

Irrespective of the method of cervical spine control, clearance should be performed by an appropriately trained clinician.

The Canadian Cervical Spine criteria categorises age >65 years as a high risk feature and advocates imaging for any elderly patient where there is clinical concern of injury. By contrast, the NEXUS criterion does not include age but stipulates that if patients meet all of the following low-risk criteria then they do not need imaging:

**NEXUS Low Risk Criteria:**

- a. No posterior midline cervical spine tenderness
- b. No evidence of intoxication
- c. Normal level of alertness
Clinical acumen is important as distracting injuries, altered conscious levels, previous stroke and neurological deficit can all cloud the decision-making process.

HECTOR advises the following rules be applied for the initial management of cervical spine injury:

1. **Assessment of Risk:**

   A. Any elderly patient with head or facial injury following a fall should be considered at risk of cervical spine injury

   B. Any elderly patient with new-onset neck pain following a fall or other mechanism of injury should be considered at risk of cervical spine injury

   C. Any elderly patient with a high mechanism of injury (fall from height greater than standing; pedestrian / cyclist vs vehicle collision; road traffic collision) should be considered at risk of cervical spine injury

2. **Clearance of the Cervical Spine:**

   A. If a patient has: a decreased level of consciousness; is intoxicated or confused; has any focal neurological signs or symptoms; or has distracting injuries and has been deemed as being at risk of injury, the cervical spine should not be cleared without imaging

   B. Patients without any of these abnormal features should be asked about the presence of neck pain – movement may be assessed in the absence of pain. Restrictions of movement or pain on movement should trigger imaging.

   C. CT-Cervical Spine is the imaging modality of choice in the first instance when injury is suspected or can’t be excluded.

   D. Imaging should be acquired within 60 minutes of request to prevent prolonged lie, immobilisation and distress and be reported within 60 minutes of image acquisition.

### Breathing and Ventilation

**Life-Threatening Injuries**

When breathing is assessed in the primary survey, examination should be focused on looking for the presence of the following life-threatening chest injuries:

- Tension pneumothorax
- Massive haemothorax
- Open sucking chest wound
- Flail chest
- Cardiac tamponade

Such serious conditions should be treated as they are identified with the use of thoracostomy / tube thoracostomy for tension pneumothoraces and haemothoraces; and 3-sided dressings or Ashermann seals for open wounds.

**Respiratory Rate and Ventilation**

Respiratory rate and effort of breathing are valuable signs for detecting the presence of serious injury:

- A raised respiratory rate (>20) should alert the examiner to possible injury or illness.
- Slow rates (<12) may uncover fatigue, exhaustion and the possibility of opiate toxicity from drugs administered in the pre-hospital setting.

Arterial blood gas analysis is a fundamental component for assessing ventilation and should be used to guide oxygen delivery. High flow oxygen (15L/min) should be delivered with caution in the presence of chronic lung disease as it may be more appropriate to aim for a lower target oxygen saturation level (88-92%) for such patients.

The vast majority of elderly patients are not admitted following high energy mechanisms and instead attend following simple falls. In these latter and more common circumstances, high flow oxygen therapy will not be appropriate for every patient.

Initial oxygen saturations should be targeted to 94-98% for cases of major trauma and adjusted following formal arterial blood gas (ABG) analysis. Addition of supplemental oxygen to patients with COPD has been thought to reduce the “hypoxic drive”, thus slowing their respiration and leading to increasing PaCO₂.

If a patient is deemed as being at risk of hypercapnic respiratory failure, (see below), oxygen saturations should be targeted to 88-92%.

Risks Factors for Type 2 Respiratory Failure
- Severe / moderate COPD
- Previous respiratory failure
- Long term oxygen therapy
- Severe chest wall disease
- Severe spinal disease (e.g. kyphoscoliosis)
- Neuromuscular disease
- Severe obesity
- Bronchiectasis
- Previously unrecognised COPD – lifelong smoker, chronic breathlessness on minimal exertion

HECTOR encourages the initial prescription of high flow oxygen to patients with major trauma (multi-system injuries; high mechanisms), until an ABG can be performed to deliver targeted therapy.

In the absence of COPD and risk of hypercapnic failure, oxygen should be then prescribed to achieve saturations of 94 – 98%.

For patients with injuries following simple falls and low energy mechanisms, high flow oxygen therapy should be stopped completely on arrival to the emergency department and adjusted to according to the presence of chronic lung disease.

Circulation & Haemorrhage Control

Traditional trauma courses like ATLS make reference to the American College of Surgeons classification of shock in terms of clearly defined parameters associated with increasing volumes of blood loss.

The descriptors for Class I, II, III and IV shock are based on an average 70kg patient and are not specific for age. Furthermore, they don’t take into account ageing physiology, underlying disease such as hypertension or polypharmacy – all of which can alter cardiovascular physiology.

Existing evidence has suggested that mortality increases in elderly patients.
when their heart rate increases above 90 beats per minute, an association not seen in younger patients until the rate increases above 130 bpm.

Similarly, mortality in elderly patients increases when the systolic blood pressure drops below 110mmHg, although this relationship is seen in younger patients when the blood pressure falls below 90 mmHg.

What this means is that, what in a younger person may be considered as being normal, is abnormal in an older person, and this may lead to a failure to accurately diagnosis shock.

HECTOR believes in a systematic approach for the diagnosis of shock which uses all of the following information:

A. Mechanism of injury
B. Regional clinical assessment
C. Occult hypoperfusion
D. Assessment of coagulation status

A. Mechanism of Injury

The majority of injured elderly patients sustain their injuries from same-level falls. For the vast majority of cases, such mechanisms of injury would not alert the assessing clinician to the possibility of major haemorrhage.

Taken in isolation, this may be the case, but if you consider a patient with a fractured shaft of femur who is on warfarin, haemorrhagic shock can develop quickly. Looking at any of these factors in isolation is meaningless – the global picture is important in assessing the possibility of hypovolaemic shock.

Higher energy mechanisms of injury such as falls from height; road traffic collisions and penetrating trauma may lead the examiner to be more vigilant for the possibility of major injury and hence have a lower threshold for suspecting shock.

Again, the global picture is essential to determine the underlying state.

<table>
<thead>
<tr>
<th>Mechanisms of Injury That Cause Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fall from height</td>
</tr>
<tr>
<td>• Fall downstairs</td>
</tr>
<tr>
<td>• Vehicular collision &gt;30mph</td>
</tr>
<tr>
<td>• Pedestrian vs Vehicle</td>
</tr>
<tr>
<td>• Ejection from Vehicle</td>
</tr>
<tr>
<td>• Penetrating trauma chest / abdomen</td>
</tr>
</tbody>
</table>

B. Regional Assessment

A set of observations must be taken to ensure that baseline heart rate, blood pressure, respiratory rate and Glasgow Coma Score are documented.

Abnormal vital signs might be difficult to distinguish in the elderly patient. Increases in heart rate may be limited by a lack of sympathetic tone or the prescription of beta blockers. Such patients may not mount a tachycardic response to blood loss and a seemingly normal heart rate could conceal overt blood loss.

In terms of blood pressure, if an elderly patient suffers from hypertension and has a resting systolic blood pressure of 180mmHg for example, a drop in pressure to 150mmHg may not be interpreted as significant yet there could be underlying blood loss.

HECTOR advocates that a lower limit of
heart rate and a higher level of systolic blood pressure be used to highlight concern to the examining clinician:

Consider the Possibility of Overt / Occult Blood Loss if:

**Heart Rate > 90 bpm**

and /or

**Systolic Blood Pressure <110mmHg**

In isolation, abnormal observations may be due to trauma but could equally be a consequence of underlying illness which may have precipitated the incident in the first place. This stresses the importance of a global view in the diagnosis of shock and an assessment of its severity.

Other features such as skin colour, clamminess, sweating, and capillary refill time should be considered during an assessment of circulation.

Having performed routine observations, the assessing clinician should perform a head-to-toe assessment of circulation, looking at specific areas of the body.

Overt bleeding is relatively straightforward to identify on external examination – this could be from scalp lacerations, deformed limbs or facial injuries (e.g. epistaxis).

As soon as overt bleeding is identified, measures should be taken to halt the bleeding, (i.e. splintage of limbs, suturing of wounds, cautious nasal packing).

Patients with bleeding into the chest, abdomen, pelvis and retroperitoneum might be harder to identify. Ultrasound can be used to assess for free fluid in the chest or abdomen and also to quantify abdominal aortic calibre. HECTOR recommends the visualisation and assessment of the abdominal aorta by trained personnel if FAST is being used.

Extended FAST scanning has high specificity but a low sensitivity which is user dependent. It should only be used as a mode of “rule in” for significant injury and not used for its exclusion.

Retroperitoneal bleeding should be considered if hypovolaemic shock is suspected and no obvious cause is identified. In such circumstances, CT imaging would be appropriate to identify the source of bleeding.
C. Occult Hypoperfusion

Occult hypoperfusion can be defined as the presence of reduced organ perfusion in the absence of abnormal vital signs. In the context of trauma, this reduced perfusion should be suspected as resulting from haemorrhagic shock until proven otherwise.

A raised venous lactate could predict mortality (OR 2.62; p<0.001) whereas abnormal vital signs (HR >120; SBP <90) and a shock index (HR/SBP) > 1 may not (OR 1.71; p = 0.21 and OR 1.18; p = 0.78 respectively)\(^5\)

A venous lactate > 2.5 equates to a two-fold increase in mortality compared to patients with normal vital signs and a normal lactate.

HECTOR proposes that all injured elderly patients have blood gas analysis to assess lactate. If this is above 2.5, then the initial response should be to seek sources of haemorrhage.
If no sources of haemorrhage are identified, the assessing team should review the patient and assess for the possibility of sepsis, dehydration, and polypharmacy (e.g. metformin), and the patient treated with intravenous fluid rehydration as appropriate.

D. Assessment of Coagulopathy

Iatrogenic Coagulopathy

One of the first questions to ask any injured elderly patient should be: IS THIS PATIENT ON WARFARIN OR OTHER NOVEL ANTICOAGULANT AGENTS? Relatively minor trauma can have a profound effect if a patient has been prescribed warfarin. Any such patient should be deemed as being at high risk for occult and overt haemorrhage and vigilance taken for assessing all regional areas.

Warfarin is a coumarin that is commonly prescribed for: stroke prevention in patients with atrial fibrillation; patients with metallic heart valves; and for patients with a history of DVT / PE. Warfarin inhibits the vitamin K-dependent synthesis of clotting factors II, VII, IX and X. The International Normalised Ratio (INR), is used to measure dose adequacy with high levels corresponding to risk of bleeding and low levels increasing the risk of thrombosis.

Warfarin may be reversed through the use of intravenous vitamin K, Fresh Frozen Plasma or Prothrombin Complex Concentrate (beriplex, octaplex). In the context of acute trauma with major or life-threatening bleeding identified, a target INR < 1.5 should be maintained. The risk of acute bleeding should supercede the risk of thromboembolism in acute situations as this risk can be mitigated later.

<table>
<thead>
<tr>
<th>Anticoagulant</th>
<th>Indication</th>
<th>Monitoring</th>
<th>Reversal Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>Stroke Prevention in Atrial Fibrillation; Metallic heart valves; History of DVT / PE</td>
<td>INR</td>
<td>Life-Threatening Bleed (e.g. intracranial, intra-abdominal/thoracic): - Vitamin K 5mg iv - Prothrombin complex concentrate (as per INR): e.g. beriplex</td>
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<tr>
<td></td>
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<td></td>
<td>INR 2- 3.9 25 u/kg</td>
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<td></td>
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<td>INR 4- 5.9 35 u/kg</td>
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<td></td>
<td>INR &gt;/= 6 50 u/kg</td>
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<td></td>
<td></td>
<td></td>
<td>Major Bleed</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Vitamin K 5mg iv</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Fresh Frozen Plasma (15mls/kg)</td>
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</tr>
<tr>
<td>Dabigatran</td>
<td>Recent Acute Coronary Syndrome</td>
<td>None available</td>
<td>No reversal agent but consider PCC</td>
</tr>
<tr>
<td>Direct Thrombin Factor IIa inhibitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Indications</td>
<td>None available</td>
<td>No reversal agent</td>
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<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>Stroke Prevention in Atrial Fibrillation; Thromboprophylaxis in Total Hip / Knee Replacement</td>
<td>None available</td>
<td>No reversal agent</td>
</tr>
<tr>
<td></td>
<td>Xa levels normalise within 24 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>Thromboprophylaxis and Treatment of Thromboembolism; Acute Coronary Syndrome; Abdominal Surgery</td>
<td>Anti-Factor Xa not usually recorded</td>
<td>Protamine can cause ~60% of antithrombin III effect</td>
</tr>
<tr>
<td></td>
<td>Binds to antithrombin III, thus inhibiting factors Xa and IIa</td>
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<td></td>
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<tr>
<td></td>
<td>Half-life 4.5 hours</td>
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**Acute Traumatic Coagulopathy**

A high proportion of patients present to major trauma centres with established coagulopathy on their arrival. Trauma leads to tissue factor exposure and a subsequent cascade of coagulopathy. Different models exist but essentially comprise a mixture of clot formation, clotting factor consumption and hyperfibrinolysis.

Coagulopathy is worsened in the presence of the “lethal triad” of:

- hypothermia,
- acidosis and
- worsening coagulopathy.

Attempts should be made to limit the detrimental effects of this “lethal triad” by a combination of the following actions:

A. Rapidly identify any haemorrhagic focus and control this appropriately;

B. Warm the patient by removing wet clothes, using Bair huggers / blankets and using warm intravenous fluids;

C. Correcting acidosis whether due to respiratory or metabolic causes

All elderly patients should have a temperature recorded in the primary survey with the aim of targeting an ideal temperature range of 35 – 37°C. Some elderly patients may present following a long-lie and may have become hypothermic due to immobility or underlying conditions such as hypothyroidism. In such circumstances, clinical staff must ensure that warming occurs as soon as possible.
Diagnosis of Coagulopathy

In order to recognise the possibility of acute traumatic coagulopathy, all patients should have standardised tests performed with the aim of targeting specific levels.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>&gt; 80 g/L</td>
</tr>
<tr>
<td>Platelets</td>
<td>&gt;100 x 10⁹/L</td>
</tr>
<tr>
<td>INR</td>
<td>&lt; 1.5</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>&gt;2.0 g/L</td>
</tr>
</tbody>
</table>

Patients with blood results outside these parameters should be discussed with the on-call haematologist. If massive transfusion protocols are not being activated, targeted transfusion regimes may lessen the impact of coagulopathy.

Responding to Hypovolaemic Shock

If haemorrhagic shock has been identified, immediate action should be taken to arrest the source of bleeding whilst ensuring adequate resuscitation. Haemodynamic instability and/or occult hypoperfusion with evidence or suspicion of major bleeding should merit massive transfusion activation.

All patients needing blood transfusion following trauma should be given 1g tranexamic acid iv, (unless contra-indicated), within 3 hours of the injury. This initial bolus may need to be followed by a further infusion over 8 hours.

Blood products should be given as per regional guidelines, with some centres offering a ratio 1 PRC: 1 FFP: 1 Platelets and some offering 1.5 PRC: 1 FFP with platelet infusion dependent on initial levels. Such processes may be stood down or altered in light of haematological parameters and the patient’s underlying status.

Methods of stemming sources of bleeding include anything from: simple pressure to tourniquets to sutures for external wounds; splinting of long limb fractures; pelvic splintage; interventional radiology for internal bleeding; and damage control surgery.

Primary Survey Assessment of Circulation in the Injured Elderly Patient

*Assessment of circulation must take into account the following features in combination*

A. MECHANISM OF INJURY

- Higher mechanisms of injury should warrant higher levels of vigilance for the possibility of major haemorrhage
- Low mechanisms of injury may be significant if the individual has coagulopathy (e.g. warfarin, anticoagulant use)
B. REGIONAL ASSESSMENT:

- Baseline observations should be performed for all patients as soon as possible
- Heart Rate > 90 bpm should be considered significant
- Systolic Blood Pressure < 110 mmHg should be considered significant
- An ECG must be performed if any arrhythmias are identified
- All body regions should be examined for occult and overt haemorrhage and any bleeding source controlled as soon as it is identified
- A suspicion of haemorrhagic shock and no obvious source should raise concerns about retroperitoneal and/or pelvic bleeding

C. OCCULT HYPOPERFUSION:

- A raised lactate (>2.5) in the presence of trauma should alert the examiner to the possibility of haemorrhage
- After thorough assessment and imaging, if haemorrhage is not identified, alternative causes for raised lactate should be sought – sepsis, dehydration, pharmacy (metformin)

D. COAGULOPATHY:

- The following question must be asked “Is The Patient On Anticoagulant medication?”
- All patients to have Hb, Platelets, INR and Fibrinogen levels assessed and acted on appropriately.

Disability & Environmental Control

In the primary survey, the clinician responsible for airway assessment should record pupil size, reactivity and Glasgow Coma Score. Attempts should be made to clarify if there are any pre-existing disease states that have affected pupillary size / response, (e.g. cataracts).

A gross neurological examination should be conducted to look for any signs of weakness, with the caveat of questioning for the presence of existing weakness and previous stroke / degenerative conditions.

All patients should be placed in hospital gowns and have wet clothes removed. Temperature control is vital at this point and all elderly patients should have blankets to maintain an adequate...
temperature.

A significant proportion of elderly patients may have been exposed to low ambient temperatures after a fall, or their level of activity may have been significantly reduced causing a drop in their core temperature. Hypothyroidism and myxoedema coma are diagnoses that should be considered if patients present following a fall with a low core temperature.

Efforts taken to raise the core temperature above 35°C, (ideally 36°C – 37.4°C) should start early during the primary survey. Blankets and Bair Huggers may be used and efforts taken to ensure that patients are not left exposed on a hospital trolley for longer than is necessary.

Summary

- The Primary Survey is conducted to identify any immediately life-threatening conditions and to manage them as they are found.

Airway

- Patients needing definitive airway management should be managed in a controlled manner. Recent pre-hospital evidence suggests that standardised RSI protocols (fentanyl, ketamine, rocuronium), can help to provide safe and effective care.

- Elderly patients with injuries in need of RSI are likely to have multi-system or head and neck trauma. They should be assumed to have a cervical injury until proven otherwise and care should be taken to minimise neck movement during the intubation process. Difficult airway equipment should be at hand for any elderly patient requiring urgent or immediate intubation.

Cervical Spine

- Cervical spine injuries may arise from relatively low mechanisms of injury. Patients with new onset neck pain; midline tenderness; facial / head trauma; and high mechanisms of injury should be considered as being at risk of cervical spine injury.

- CT-cervical spine is the imaging modality of choice for elderly patients with suspected neck injury.

- Cervical spine immobilisation may be impractical in patients with underlying disease causing musculoskeletal rigidity. Patients should never be forced into movements just to position a cervical collar.

- The process of “Minimal Movement” should be adopted to prevent unnecessary collar application whilst ensuring attempts are made to limit movement of the cervical spine.

Breathing

- High flow oxygen is appropriate in the early stages of care for patients with the potential for major multi-system trauma (e.g. following a road traffic collision), but may not be appropriate for all patients following same-level falls.

- Oxygen delivery should be adjusted to take into account the risk of type II respiratory failure. Oxygen saturations should be targeted to 88-92% in such circumstances

Circulation

- Assessment of circulation requires a global oversight into features that
could herald underlying haemorrhagic shock.

- A systematic approach that assesses the following areas should be adopted for all patients, irrespective of mechanism of injury:

  A. MECHANISM OF INJURY
  B. REGIONAL ASSESSMENT (& VITAL SIGNS)
  C. OCCULT HYPOPERFUSION
  D. COAGULOPATHY

- All four categories should be considered concurrently, and not in isolation.

- Crystalloid infusions should be restricted and if volume replacement is needed for acute haemorrhage, blood products should be used in the first instance.

Disability & Environmental Control

- In addition to recording GCS and blood glucose, attempts should be made to correct core temperature to between 35-37°C as soon as possible

- Patients may present in a hypothermic state due to a long lie, underlying disease (e.g. myxoedema coma), or external environmental conditions and the assessing team should be aware that they will be at risk of trauma coagulopathy. Such patients should be actively rewarmed as soon as possible and not be left exposed on the hospital trolley.

References


5. Salottolo KM, Mains CW, Offner PJ. A retrospective analysis of geriatric trauma patients: venous lactate is a better predictor of mortality than traditional vital signs. Scand J Trauma, Resus & Emerg Med 2013; 21(7)