Lec. 2&3

Recognition and management of the critically ill patient-II, III

Circulation

- Quick **head** to **toe survey** to note and **control bleeding**
- **Skin color, moisture, temperature**
- **Pulse quality, rate, regularity, volume**
- **Blood pressure**
- **Capillary refill** (should be < 2 seconds)
- **Chest Compressions** / Positioning etc.

  Rapid initial assessment of circulatory status should concentrate **on tissue perfusion** and not just blood pressure.

  As a result of compensatory mechanisms, **hypotension** is a late feature of cardiovascular dysfunction.

  Evidence of inadequate tissue perfusion (**decreased conscious level, skin mottling, cold peripheries, poor capillary refill, oliguria and metabolic acidosis**) indicates a severely ill patient, even in the absence of hypotension.

  An indication of the type of shock (cardiogenic, distributive etc.) can be obtained by feeling the pulse and the peripheries and examining the jugular venous pressure.2

Conscious state

- A marked reduction in conscious level indicates either that **compensatory homeostatic mechanisms** have been overwhelmed or **severe neurological disease.**
- In either case, the patient is severely ill and requires **urgent supportive therapy.**
- The **pupillary response** should be **checked frequently**.

Investigations

- These should **not delay initial resuscitation** but can be carried out while the patient is being resuscitated.
- **Useful screening investigations include**: (**Pulse oximetry, arterial blood gases, electrolytes, renal function tests, complete blood count and clotting**)

2) Subsequent assessment

Part or all of this assessment may be carried out before initiating any treatment in less severely ill patients.

History

- Often it is not possible to take a full history from the patient and therefore other sources of information became more important.
- These include **medical, nursing and ambulance staff, relatives, and notes and charts**. As well as revealing the history the notes and charts may give useful information on the rate of deterioration. In post-operative patients the operation note may be particularly helpful.

- The history will reveal whether the patient falls into a group that is difficult to assess.These include:
  1. Young adults
  2. Elderly or immunocompromised.
  3. Trauma patients

Groups of patients who are difficult to assess

- The history is invaluable in the assessment of physiological reserve.
- An assessment of cardiopulmonary reserve can be obtained from the patient exercise tolerance.
- In assessing exercise tolerance, it is Important to enquire about both distance covered and speed.

For example:
there is a considerable difference in exercise tolerance between the patient who can walk up one flight of stairs at a normal pace and the patient who takes 5 minutes to walk up one flight of stairs.

Examination

- While the aim of the initial examination is to **detect life threatening physiological abnormalities** and to **determine appropriate supportive therapy,** the focus of subsequent examination is to determine the **underlying cause,** in order to determine the **appropriate definitive therapy**.
- Examination should be repeated frequently to determine the response to therapy and because the clinical signs may change.

Group	Difficulty
Young adults	Compensatory mechanisms in young patients tend to mask signs of severe illness until the illness is very advanced. Significant physiological abnormalities in these patients therefore indicate very severe illness.
Elderly or immuncompromised patients	The inflammatory response may be damped, again hiding signs of severe illness. In addition the physiological reserve of these patients is often severely compromised
Trauma patients	Notoriously difficult to assess due the multitude of possible Injuries and the effect of distracting pain making injuries difficult to localize In these patients a detailed history of the mechanism of Injury provides vital clues to likely injuries.

Investigations

- In **addition to the Investigations carried out during the initial assessment**,
  ✓ Liver function tests,
  ✓ calcium, phosphate, magnesium estimation
  ✓ a chest X-ray
  Are useful screening tests. Other investigations should be ordered on the basis of the history and clinical findings.

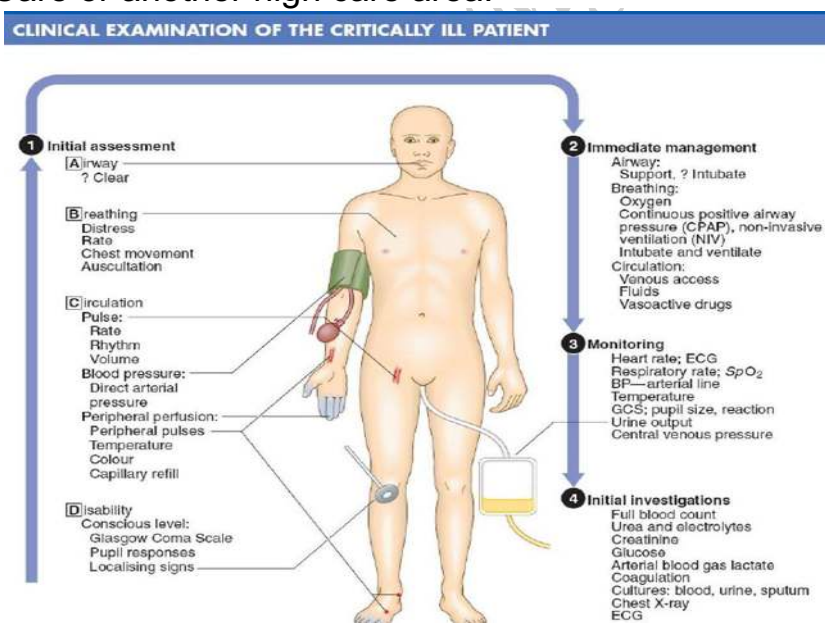
- If advanced radiological imaging is indicated, consideration should be given to ultrasound scanning because of the low risk of adverse effects and because it may obviate the need to **transport** the patient to the radiology department.

Clinical and laboratory features suggestive of severe illness

System	Feature
Cardiovascular	Tachycardia, hypotension, cold peripheries, skin mottling. Bradycardia may indicate a pre-terminal state.
Respiratory	Tachypnea, recession, use of accessory muscles of respiration, low oxygen saturation. Low respiratory rate may indicate impending respiratory arrest.
Renal	Oliguria
Nervous system	Decreased consciousness, confusion agitation, aggressive behavior
Metabolic	Acidosis, severe electrolyte abnormalities (particularly severe hyperkalemia and severe hyponatremia), severe anemia, thrombocytopenia, coagulopathy, elevated lactate.
Miscellaneous	Sweating

Review

- Following the primary assessment, initiation of emergency treatment and full assessment, a working diagnosis and plan for the subsequent management should be developed.
- This plan should include an ongoing review of the response to treatment, and a consideration of the appropriate placement of the patient, possibly in Intensive Care or another high care area.



ICU admission criteria

- Life support technology is intended to provide temporary support for patients with potentially reversible organ failure and is not a measure to conquer (defeat) death (advanced or terminally ill cases).

System approach

- Airway: compromise or impending compromise (e.g., burn).
- Respiratory failure: (not responding to conservative treatment).
  - ✓ Type I Respiratory failure (hypoxia).
  - ✓ Type II Respiratory failure (hypercapnia).
- Circulatory failure:
  - ✓ Hypovolemic shock:
  - ✓ Distributive shock: (e.g., septic, most common type in ICU).
  - ✓ Cardiogenic shock: (usually treated in CCU).
  - ✓ Obstructive shock:
- CNS emergency:
  - ✓ Severe traumatic brain injury.
  - ✓ Encephalitis.
  - ✓ Refractory status epilepticus.
  - ✓ Brain tumor (post operative).
  - ✓ Stroke (post operative or post tPA).
  - ✓ Altered LOC (poisoning or toxicity).9
- Endocrine emergency:
  - ✓ Diabetic: (severe DKA, HHS, recurrent hypoglycemia).
  - ✓ Adrenal: (adrenal crisis).
  - ✓ Thyroid: (thyrotoxicosis and myxedema coma).
- Visceral and metabolic:
  - ✓ Acute liver failure or acute on chronic liver failure.
  - ✓ Acute kidney injury (complicating sepsis or rhabdomyolysis).
  - ✓ Severe electrolyte imbalance (requiring close monitoring).
- Obstetric emergency: (e.g., eclampsia & its complications).
- Postoperative cases:
  - ✓ Major general surgery (e.g., large fluid shift).
  - ✓ Major vascular surgery.
  - ✓ Neurosurgery (brain tumor).
- Massive blood transfusion.

ICU Discharge Criteria

- **Stable** respiratory status.
- No or minimal oxygen support.
- Stable hemodynamic parameters.
- Inotropic support, vasodilators and antiarrhythmic drugs, and intracranial pressure monitoring are **no longer required.**
- Neurologic stability with control of Seizures.
- Close monitoring is **no longer required**.

Selects the best single choice

1- Which one is true regarding chest sounds?
   a) Inspiratory stridor is a rasping sound is a result of obstruction above or involving the larynx
   b) Wheeze is usually heard on expiration as a result of the lower airways collapsing
   c) Gurgling occurs when secretion or liquid is present in the upper airways
   d) Snoring occurs during partial occlusion of the oropharynx.
   e) Crepitation is usually normal sound.
2- Tachypnea in critically ill patient (all true except one)
   a) marked tachypnea is a useful marker of a severely ill patient
   b) tachypnea is usually a more obvious than cyanosis.
   c) It is a sign of compensatory mechanism
   d) Could be caused by metabolic acidosis
   e) Not caused by sepsis.
3- Evidence of inadequate tissue perfusion (all true except one)
   a) decreased conscious level
   b) skin mottling
   c) hot peripheries
   d) capillary refill more than 5 second
   e) Oliguria
4- Which one is false regarding difficult assessing of this patient?
   a) In young adults' compensatory mechanism is mask sign
   b) In Elderly patient the inflammatory response is inhibited
   c) Immunocompromised also difficult to assess
   d) Trauma patients difficult due to pain and multiple injury
   e) Female more difficult than male
5- Clinical and laboratory features suggestive of severe illness (all true except one)
   a) low lactate level
   b) Tachypnea
   c) Oliguria
   d) Agitation
   e) Sweating
6- All the following are ICU admission criteria except one
   a) adrenal crisis
   b) sever hyperkalemia
   c) diabetic ketoacidosis
   d) blood transfusion
   e) eclampsia12
7- discharge criteria from ICU (all true except one)
   a) Stable respiratory status.
   b) No or minimal oxygen support .
   c) Stable hemodynamic parameters .
   d) Inotropic support is longer required.
   e) Neurologic stability with control of Seizures.

GOOD LUCK

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