A systematic approach to the critically ill patient (ABCDE approach)

Dr Adhokshaj Joshi

Introduction

- Critically ill patient is a unstable patient with risk of actual or potential threat to life

- Unconscious patients in ongoing arrest (Cardiac or Respiratory)
- Conscious patients needing more advanced assessment and management .

CRITICAL

- Crucial
- Serious , Emergency
- Requiring immediate action
- Thorough and constant observation
- Totally dependent

- Multidisciplinary & Collaborative approach to ICU care
- A team approach : co-responsibility for ICU management

- Use of standard protocol, guidelines, consistent approach to all issues
- Coordination and communication for all aspects of ICU management
- Emphasis on research, education, ethical issues, patient advocacy

EARLY DETECTION AND PROMPT ACTION :

The prognosis of the patient depends on the early detection of problem, prompt and appropriate action to prevent complication.

- Monitoring of cardiac & respiratory functions is of prime importance in assessment.

COMMUNICATION :

Intra professional, inter departmental and inter personal communication has a significant importance in the smooth running of critical care unit . **Collaborative team approach**

Guiding principles:

- Delivery of optimal and appropriate care
- Relief of distress
- Compassion and support
- Dignity
- Rehabilitation
- Care and support of relatives and care givers.

Underlying principles

- Use a systematic approach, based on airway, breathing and circulation (i.e., the ABCDEs) to assess and treat the acutely ill patient.

- Complete initial assessment and re-assessment regularly

- Always correct life-threatening abnormalities before moving on to the next part of assessment.

- The underlying aim of the initial interventions should be seen as a "**holding measure**" that keeps the patient alive, and produces some clinical improvement, in order that definitive treatment may be initiated.

Survey

Has the following components:

- Airway
- Breathing
- Circulation
- Differential Diagnosis

Assess … then perform the actions

First steps

In assessing any patient, a simple question such as "**How are you**" can provide valuable information.

A normal verbal response implies that the patient has a patent airway, is breathing and has brain perfusion.

If the patient **can only speak in short sentences**, they may have **extreme respiratory distress.**

Failure of the patient to respond is a clear marker of serious illness.
Use vital signs monitoring early.

Airway(A)- Assessment

- Is the airway patent?
- Is an advanced airway indicated?
- Is proper placement of airway device confirmed?
- Is tube secured and placement reconfirmed frequently?

Airway-Actions

- Maintain airway patency -
  - ✧use Head-tilt, chin-lift, oropharyngeal airway, nasopharyngeal airway
- Use advanced airway management if needed
  - ✧Laryngeal mask airway, laryngeal tube, esophageal tracheal tube, endotracheal tube

Airway (A)

Treat airway obstruction as a medical emergency and obtain expert help immediately.

Untreated, airway obstruction leads to a lowered PaO_2 and risks hypoxic damage to the brain, kidneys and heart, cardiac arrest, and even death.

Look for the signs of airway obstruction:

Airway obstruction leads to paradoxical chest and **abdominal movements ('see-saw' respirations)** and the **use of the accessory muscles** of respiration.

Central cyanosis is a late sign .

*In **complete airway obstruction, there are no breath sounds** .

* In **partial obstruction, air entry is diminished** and often noisy.

*In the critically ill patient, depressed consciousness often leads to airway obstruction.

In the majority of cases, simple methods of airway clearance are all that are required (e.g., airway opening manoeuvres, airways suction, insertion of an oropharyngeal or nasopharyngeal airway).

Tracheal intubation may be required, where simple airway opening measures fail.

oxygen therapy :

Provide high concentration oxygen using a mask with an oxygen reservoir.

Where intubation has been necessary, high concentration oxygen can be given via a bag-valve-mask system.

In acute respiratory failure, the PaO_2 should be kept as close to 13kPa (100 mmHg) as possible, but at least above 8 kPa (60 mmHg) or 90% saturation on a pulse oximeter.

Breathing- Assessment

- Are ventilation and oxygenation adequate?
- Are quantitative waveform capnography and oxyhemoglobin saturation monitored?

Breathing- Actions

- Monitor the adequacy of ventilation and oxygenation by-

✧Clinical criteria (R.rate,chest rise and cyanosis)

✧Quantitative waveform capnography

✧Oxygen saturation

✧ABG

Breathing (B)

It is vital to diagnose and treat immediately life-threatening conditions, e.g., **acute severe asthma, pulmonary oedema, tension pneumothorax, massive haemothorax**.

Look for the general signs of respiratory distress: **sweating, central cyanosis, use of the accessory muscles of respiration, abdominal breathing.**

High rates, and especially increasing rates, are markers of illness and a warning that the patient may suddenly deteriorate. Assess the depth of each breath, the pattern (rhythm) of respiration and whether chest expansion is equal on both sides.

Breathing (B)

*Note any **chest deformity** (may increase the risk of deterioration);

*Look for a **raised JVP** (e.g., in acute severe asthma or a tension pneumothorax);

*Note the presence and **patency of any chest drains;**

*Record the inspired oxygen concentration (**%FiO2**) given to the patient and the **SaO2** reading of the pulse oximeter (normally 94-100%).

However, remember that the pulse oximeter does not detect hypercapnia and that, if the patient is receiving oxygen therapy, the SaO2 may be normal in the presence of a very high PaCO2.

Breathing (B)

Inspection & Listen to the patient's breath sounds: Rattling airway noises indicate the presence of airway secretions, Stridor or wheeze suggests partial, but significant, airway obstruction.

Palpate the chest wall to detect surgical emphysema or crepitus (suggesting a pneumothorax until proven otherwise).

Percuss the chest; hyper-resonance suggests a pneumothorax, dullness suggests consolidation or pleural fluid.

Auscultate the chest: Bronchial breathing indicates lung consolidation; absent or reduced sounds suggest a pneumothorax or pleural fluid.

Check the **position of the trachea** in the suprasternal notch. Deviation to one side indicates mediastinal shift .

In a subgroup of patients with **chronic obstructive pulmonary disease (COPD)**, high concentrations of oxygen may have disadvantages and some limitations in therapy may be warranted. Nevertheless, this group of patients will also sustain end-organ damage or cardiac arrest if their blood oxygen tensions are allowed to decrease.

In this group, aim for **a target PaO_2 of 8 kPa (60 mmHg) or 90% saturation (SaO_2) on pulse oximetry.**

If the depth or rate of breathing of any patient is judged to be inadequate, or absent, use bag-valve-mask ventilation to improve oxygenation and ventilation, consider intubation.

Respiratory care includes:

- Assisting in coughing.
- • Deep Breathing And Alveolar Recruitment Techniques
- • Chest Percussion & physiotherapy.
- • Positioning , **PROWNING**
- • Bronchodilators.
- • Suctioning. (q4h) & SOS
- • tracheostomy care.

Circulation- Assessment

- What is the cardiac rhythm?
- Is defibrillation or cardio version indicated?
- Has IV/IO access been established?
- Is ROSC present?
- Is a patient with a pulse unstable?
- Are chest compressions effective?
- Are medications needed for rhythm or blood pressure?
- Does the patient need volume (fluid) for resuscitation?

Circulation- Action

- Attach monitor/defibrillator for arrythmias or cardiac arrest rhythms (eg, VF, pulseless VT, asystole, PEA)
- Provide defibrillation/ cardioversion
- Obtain IV/IO access
- Give appropriate drugs to manage rhythm and blood pressure

Circulation- Action

- Monitor CPR quality

✧ Quantitative waveform capnography (if $PETCO_2$ is <10 mm Hg, attempt to improve CPR quality)

✧ Intra-arterial pressure (if relaxation phase , diastolic, pressure is <20 mm Hg, attempt to improve CPR quality)

Circulation (C)

In almost all medical and surgical emergencies, consider **hypovoluemia** to be the primary cause of shock, until proven otherwise.

Remember that respiratory pathology, such as a tension pneumothorax, can also compromise a patient's circulatory state.

Circulation (C)

Look at the colour of the hands and digits: are they blue, pink, pale or mottled?

Assess the limb temperature by feeling the patient's hands: are they cool or warm?

Measure the capillary refill time (CRT). It is assessed by applying cutaneous pressure for five seconds on a fingertip held at heart level (or just above) and counting the time it takes for capillary refill after the pressure has been released. **The normal value for CRT is usually less than two seconds.**

Assess the state of the veins: they may be under-filled or collapsed when hypovolaemia is present.

Count the patient's pulse rate.

Palpate all the peripheral and central pulses.Barely palpable pulses suggest a poor cardiac output, whilst a bounding pulse may indicate sepsis.

Measure the patient's blood pressure . Even in shock, the blood pressure may be entirely normal, as compensatory mechanisms increase peripheral resistance in response to reduced cardiac output.

A low diastolic BP suggests arterial vasodilatation (as in anaphylaxis or sepsis).

A narrowed pulse pressure (difference between systolic and diastolic pressures; normally ~ 35-45 mmHg) suggests arterial vasoconstriction (cardiogenic shock or hypovolaemia).

Look for other signs of a poor cardiac output, such as **reduced level of consciousness and, oliguria (urine volume < 0.5 ml kg-1 hour-1).**

The specific treatment of cardiovascular collapse will be determined by the cause, but should be directed at fluid replacement, haemorrhage control **and restoration of tissue perfusion.**

Seek out the signs of immediately life threatening conditions, e.g., cardiac tamponade,massive haemorrhage, septicaemic shock, and treat them urgently.

Take blood from the cannula for routine haematological, biochemical, coagulation and microbiological investigations, and cross-matching.

Give a rapid fluid challenge (over 5-10 minutes) of 500 ml of warmed crystalloid solution if the patient is hypotensive. Use smaller volumes (e.g., 250 ml) for patients with known cardiac failure and use closer monitoring (listen to the chest for crepitations after each bolus, consider a CVP line).

Reassess the pulse rate and BP regularly (every 5 minutes)

If symptoms and signs of cardiac failure (dyspnoea, increased heart rate, raised JVP, a third heart sound and pulmonary crepitations on auscultation) occur, decrease the fluid infusion rate or stop the fluids altogether.

Seek alternative means of improving tissue perfusion (e.g., inotropes or vasopressors).

Differential Diagnosis- Action

- Search for, find, and treat reversible causes
  (definitive care)

cardio vascular care:

Prolonged immobility impairs autonomic vasomotor responses to sitting and standing causing profound postural hypotension. tilt table may be beneficial prior to mobilization.

- DVT prophylaxis

Disability (D) UNCONCIOUSNESS

Common causes of unconsciousness include profound hypoxaemia, hypercapnia, cerebral hypoperfusion, or the recent administration of sedatives drugs.

Examine the pupils (size, equality and reaction to light).
Assess the patient's conscious level using either the AVPU or Glasgow Coma Scales.

Measure the blood glucose using a rapid glucose meter or stick method to exclude hypoglycaemia. If below 3 mmol l-1, give 25-50 ml of 50% glucose solution intravenously.

Exposure / Examination (E)

In order that patients are examined properly, and detail is not missed, full exposure of the body may be necessary.

Do this in a way that respects the dignity of the patient and prevents heat loss.

Additional information

Take a full clinical history from the patient, his relatives , and other staff.

Review the patient notes and charts

a.) Study both absolute and trended values of vital signs.

b.) Check that important routine medications are prescribed and being administered.

Review the results of laboratory or radiological investigations.

Make complete entries in the patient's notes of your finding, assessment and treatment. Record the patient's response to therapy.

Consider definitive treatment of the patient's underlying condition.

Additional management of critically ill patient:

Complete monitoring

- Respiratory care & Cardio vascular care
- Gastrointestinal & Nutritional care
- Neuro muscular care
- Comfort and reassurance
- Venous thrombosis prophylaxis
- Infection control skin care ,
- General hygiene and mouth care
- Fluid, electrolyte and glucose balance
- Bladder care
- Dressing and wound care
- Communication with relatives & communication with the patient

Gastro intestinal/ Nutritional care

The supine position predisposes to gastro oesophageal reflux and aspiration pneumonia .

- 30 degree head up prevents this and early enternal feeding reduces infection, stress ulceration and GI bleeding.
- immobility is associated with gastric stasis and constipation, gastric stimulants and laxatives are essential.

Neuromuscular care:

- immobility, prolonged neuro muscular blockage and sedation promotes atrophy ,
- • joint contractures and foot drops may occur.
- • physiotherapy and splints may be required.

comfort and reassurance

- • **Anxiety, discomfort and pain** must be recognized and relieved with reassurance, physical measures, analgesics and sedatives.
- In particular, endotracheal or nasogastric tubes, bladder or bowel distension, bed sores , line sites, painful joints and urinary catheters often causes discomfort, and are often overlooked.
- visible clocks helps patients maintain circadian rhythms(i.e. day- night patterns)

Infection control:

- Infection control: hand washing and sanitizers is vital to prevent transmission of organisms between patients. disposable aprons are recommended. sterile technique (e.g. gloves, masks, gowns, sterile field) is essential for all invasive procedures.
- Isolation for transmissible infections ,thorough cleaning of bed spaces(e.g. routinely and after patient discharge)

Skin care, general hygiene and mouth care

- cutaneous pressure sores are due to local pressure(e.g. bony prominences). friction malnutrition oedema ischaemia damaged related to moist or soiled skin.
- Turn patient every 2 hours and protect susceptible areas. special beds relieves pressure and assist turning. mouth care and general hygiene is essential

Fluid electrolytes and glucose balance

Regularly assess fluid and electrolytes balance. **insulin resistence and hyperglycaemia are common but maintaining normo-glycaemia improves outcomes**

Pain: –

- The control of pain in the ICU patient is paramount as inadequate pain control is often linked with agitation and anxiety and can contribute to the stress response. – ICU patients at high risk for pain include patients
- (1) who have medical conditions that include ischemic, infectious, or inflammatory processes;
- 2)who have invasive monitoring devices, including endotracheal tubes;

Continuous intravenous sedation and an analgesic agent are a practical and effective strategy for sedation and pain control.

Delirium

Sudden onset of disturbances in cognition, attention, and perception

- • Manifest as hyperactive, hypoactive, or mixed • Mixed type is most prevalent in ICU – Delirium in ICU patients ranges from 15% to 40%
- Demographic factors predisposing the patient to delirium include 1.advanced age, 2. preexisting cerebral illnesses, 3.Environmental factors that can contribute to delirium include sleep deprivation, anxiety, sensory overload, and immobilization

Management of Delirium

- The ICU caregiver must identify predisposing Physical conditions such as hemodynamic instability, hypoxemia, hypercarbia, electrolyte disturbances, and severe infections can precipitate delirium addressing these improve the patient's mental clarity and cooperation with appropriate therapy (e.g., correction of oxygenation, use of clocks and calendars).
- If the patient demonstrates unsafe behavior, hyperactivity, insomnia, or delusions, symptoms may be managed with neuroleptic drugs
- The presence of family members may help reorient the patient and reduce agitation.

communication with relatives:

- family members receive information from many care givers with different perspectives and knowledge
- critical care teams must aim to be consistent in their assessments and honest about uncertainties.
- all conversation should be documented.
- compassionated care of relatives is always appreciated, avoids anger and is one of the best indicators of a well-functioning units.
- each activity about the patient should be in formed to the relatives and explained to their knowledge level and informed consent must be obtained

Needs of Families of Critically Ill Patients

- • Personnel care about the patients
- • Believe there is hope
- • Called when changes in the patient occur
- • Know the prognosis
- • Have questions answered honestly
- • Know specific facts about patient's progress
- • Provide full information
- • Discuss patient goals
- • Written instructional guidelines to provide information about critical care
- • Open visiting hours ,Waiting room near the patient
- • Good communication

conclusion:

- Providing total care prevents complications
- Must remember to provide psychological support to patient and their family members in this hour of need.