Identification and management of the acutely deteriorating patient: Essential actions (2nd Edition)

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Disclaimer

This manual is intended for use only as part of the FIRST^{2}ACT program which is available in face-to-face and web based versions. The authors take no responsibility for any adverse event arising from use of this manual or the course materials. While the actions described in this manual are considered by the authors to represent best practice, users of these resources are advised to check relevant protocols in each clinical setting, as these may vary.

Introduction to the manual

This manual is designed for use in conjunction with the FIRST^{2}ACT program - a simulation-based learning program for healthcare students and professionals that aims to improve skills in recognising and managing acutely deteriorating patients. See http://first2actweb.com/ . The program is primarily designed for the management of hospitalised patients/women but is also applicable for out of hospital emergencies.

Chapter 1 covers the key essentials to help you recognise when a patient is acutely unwell and to initially manage the patient until help arrives.

Chapter 2 provides an overview of the use and monitoring of oxygen therapy in deteriorating patients.

Chapters 3-10 cover some of the most prevalent conditions that lead to acute deterioration; specifically respiratory problems, hypotension, chest pain, an altered conscious state, trauma and hypoglycaemia. Obstetric emergencies are also covered including post-partum haemorrhage and pre-eclampsia/eclampsia. Advice is provided on the recognition and initial management of each condition.

Chapter 11 discusses the teamwork, leadership and communication skills required in an emergency situation.

CONTENTS

Chapter 1: Recognising and managing a deteriorating patient - an overview

Objectives

- ✓ Describe the assessment of a deteriorating patient using the ABCDE framework.
- ✓ Discuss the importance of taking vital signs to assist in the recognition of a deteriorating patient.
- ✓ Identify essential actions in the management of a deteriorating patient.

Background

Managing a deteriorating patient is an agreed practice for the provision of care where a patient's physiological condition is deteriorating. It is acknowledged that such situations can be stressful and that it is possible to forget key essentials.

This chapter therefore describes essential steps and key actions in the recognition and management of a patient who is deteriorating.

The steps to recognising and managing a deteriorating patient are:

1) Recognise (assessment)

- Use **ABCDE** to assess.
- Take full vital signs and compare with prior readings.

2) Manage

- Get help.
- Collect more information.
- Position the patient.
- Consider oxygen therapy.

Recognising a deteriorating patient (assessment)

1. Use ABCDE for a systematic assessment (a 'primary survey').
2. Take a full set of vital signs and compare with earlier readings.

Recognising when a patient is deteriorating - use ABCDE for a systematic assessment (the 'primary survey')

Patients can deteriorate suddenly, or over the space of several hours. Health professionals often miss when something is going wrong because they fail to systematically assess their patients.

Examine your patient using **ABCDE** - this will help you identify when something is not right. Assess in this order:

A. **A**irway

B. **B**reathing

C. **C**irculation

D. **D**isability (neurological function)

E. **E**xposure

If the ABCDE assessment does not indicate anything that is imminently life-threatening, then a more focussed assessment should follow.

A. Assess Airway

The airway must be patent for oxygen to move in and out of the lower respiratory tract. Causes of a compromised airway include:

- mechanical airway obstruction from a foreign body.
- blood or vomit in the upper airway, as a result of trauma or regurgitation.
- oedema of the larynx which may result from burns or anaphylaxis.
- reduced consciousness where airway obstruction may be caused by reduced muscle tone in the soft palate or epiglottis, **not** by the tongue *(Resuscitation Council UK, 2011).*

Recognition of airway obstruction

ASK the patient how they are. No response may indicate a compromised airway or unconscious patient. **LOOK** for symmetrical chest and abdominal movements. **LISTEN** and **FEEL** for airflow at the mouth and nose.	
Airway obstruction can be **partial** or **complete**	
Partial airway obstruction is noisy	**Complete airway obstruction** is silent
• **LOOK…..**The patient will be distressed, complaining of difficulty in breathing, or choking. • **LISTEN** and **FEEL…..** Breathing will be noisy, stridor, snoring or wheeze, or the patient may be choking.	• **LOOK…..** Breathing movements are strenuous, and there will be use of accessory muscles e.g. neck, shoulders, & abdomen. • **LISTEN** and **FEEL…..** You will not hear or feel air movement at the patient's mouth or nose.
! **If the patient's airway is compromised, commence basic life support measures.**	

B. Assess Breathing

Severe respiratory distress can lead to respiratory and cardiac arrest. Respiratory distress can be due to lung disorders, central nervous system depression, or inadequate respiratory effort *(Australian Resuscitation Council, 2011).*

Recognition of breathing difficulties

LOOK…..	For laboured breathing, use of accessory muscles (neck/shoulders/abdomen), nasal flaring, abdominal breathing or central cyanosis - a late sign. For symmetrical chest movements on each side.
LISTEN…..	Does the patient have difficulty speaking? Can they talk in complete sentences? Is there **a rattle**, stridor, or audible wheeze? Ask the patient to cough. Inability to cough is a sign of compromised airway or breathing.
FEEL…..	The chest wall for surgical emphysema which may be indicative of a pneumothorax. Note the position of the trachea as deviation from the midline may suggest a pneumothorax or pleural fluid.
!	**If the patient is not breathing, commence basic life support measures**

C. Assess Circulation

Recognition of compromised circulation

LOOK…..	Are there signs of bleeding? Is the patient's skin pale or mottled?
LISTEN……	Does the patient appear confused? Does the patient have chest pain?
FEEL…..	Do the patient's hands and feet feel cool?
!	**If there is no circulation, commence basic life support measures**

D. Assess Disability (neurological assessment)

An altered conscious state is common in acute illness. A decreased conscious state can be associated with airway compromise. Loss of the gag and cough reflexes can also lead to inhalation of secretions or vomit.

Recognition of decreased conscious state

LOOK…..	Does the patient appear confused, or have a decreased conscious state? Look for facial asymmetry, absent limb movements, or seizures (full or partial). Use AVPU to assess the conscious state; the patient is either **A**lert, responding to **V**oice, responding to **P**ain, or **U**nresponsive and/or the Glasgow Coma Scale (GCS). Pupils – check size, equality, reaction to light. Pupils that are unequal, or have a sluggish or no response to light, indicate the need for urgent medical treatment.

Assess need for Exposure

Fully expose the patient to examine them properly. Focus on the area of concern. For example, look for obvious bleeding in a surgical patient, especially if wounds or drains are present. Keep the patient warm and respect their dignity at all times.

Recognising when a patient is deteriorating - Take a full set of vital signs and compare with earlier readings

A **Full set** of vital signs includes:

1. Respiratory rate
2. Heart rate
3. Blood pressure
4. Temperature
5. Oxygen saturation
6. Capillary refill time
7. Conscious state

FULL vital signs are:

Respiratory rate

Is it increased or decreased from their previous respiratory rate?
A respiratory rate of 9 or less, or more than 30 per minute may indicate a seriously ill adult.*

Heart rate

How does it differ from their usual heart rate?
Normal is 60-100 beats/minute depending on age, medications and exertion.
A heart rate of 49 or less, or more than 121 per minute may indicate a seriously ill adult.*

Blood pressure

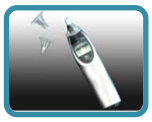
Has it changed from their normal reading?
Patients with chronic hypertension could be hypotensive even with a systolic BP of more than 100mmHg. Check what's normal for each patient.
A systolic BP of less than 100mmHg or over 181mmHg may indicate a seriously ill adult.*

Oxygen saturation

Normally over 95%, but check against usual readings.
Pulse oximeters can be unreliable when tissue perfusion is poor, or if patients are wearing nail varnish or have cold fingers.
An acute drop in oxygen saturation to less than 95% may indicate a seriously ill adult.*

Capillary refill time

Should be <2 seconds.
Anything longer can indicate vasoconstriction and poor peripheral perfusion.



Temperature

What was it previously?
Is the patient cold (less than 36 degrees) or are they hot (great than 38 degrees)?

Conscious state

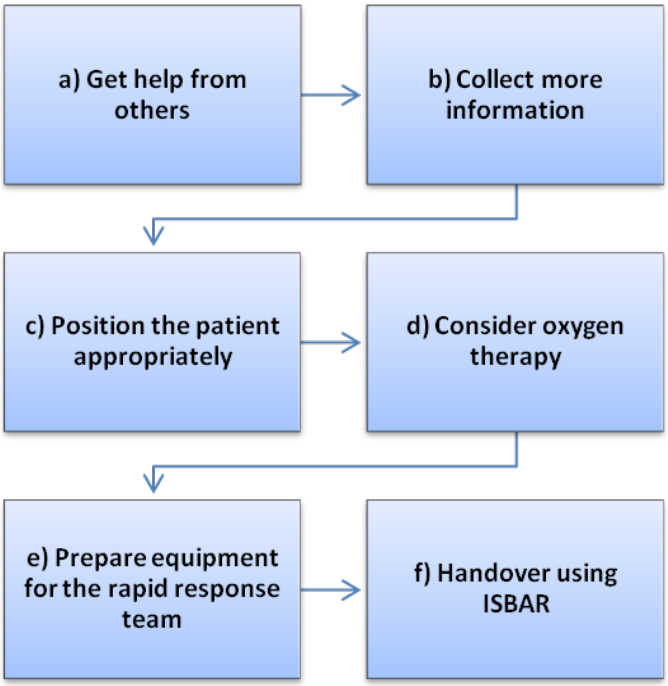
Changes in conscious state can indicate a critically ill adult.
Use A.V.P.U. to assess (Alert, responds to Voice or Pain, Unconscious) and/or the GCS.

**Jacques, Harrison, McLaws & Kilborn (2006).*

We have talked about the recognition of a deteriorating patient. The next section focusses on the initial management.

Initial management of a deteriorating patient

There are **six essential actions** to help you manage a patient who is deteriorating. These are:



a) Get help from others

Don't feel you are expected to manage a sick patient by yourself, nor that others will think you are incompetent if you call for help.

Most of the time there will be other staff nearby, or you can use the emergency call button to get help.

Most hospitals now have Rapid Reponses Systems in place to get help urgently for seriously ill patients.

Examples of Rapid Reponses Team (RRT) Systems are:

PACE = Pre-Arrest Call criteria for Escalation of therapy

MET = Medical Emergency Teams

Rapid Reponses Systems usually have set criteria in place for when to call for help; for example cut-off points for vital signs.

Know the Rapid Response criteria for the setting you are in. Remember that sometimes a deviation from the patient's normal readings may be a sign of deterioration, even if vital signs do not meet these criteria.

Don't leave the patient unattended. Use the emergency call button or call for assistance as per your practice setting protocol.

b) Collect more information

Take a history from the patient if possible.	History of presenting complaint – ask the patient "what is happening?" – their presenting condition, and take their medical and social history if there is time. Ask other team members if they know the patient's history.
Review charts	
Medications chart	Check usual medications have been given as ordered. Are medications ordered that might help (e.g. Glyceryl Trinitrate [GTN] for ischaemic chest pain).
Fluid balance chart and observations chart	Look for adequate fluid intake and output. For example, a urine output of less than 200ml in 8hrs indicates a serious illness. Look at previous vital signs and compare with current vital signs.
Re-assess patient regularly	Continue to monitor vital signs frequently (every 5 minutes or as requested by your team leader) Look for deterioration trends.
Take 12-lead ECG if patient has chest pain	

c. Position the patient appropriately

The patient's position is generally guided by the patient's symptoms and their vital signs.

Sit breathless patients **upright.** Fowler's or semi-Fowler's position as tolerated, or **orthopnoeic** position. Use the bedside table and pillows.

If patient is hypotensive, lay them flat and elevate their legs.

Patients with suspected acute coronary syndrome should be semi-upright in bed.

Unconscious patients should be placed in the recovery position if no spinal injury is suspected.

d. Consider oxygen for critically ill patients

Critically ill patients may require oxygen, usually at a high flow rate.

Critically **ill** patients may have signs of:

- shock
- acute hypoxaemia
- severe chest pain, **BUT** oxygen should <u>only be given to patients with chest pain</u> if their oxygen saturation is <94% or they have signs of shock (*Australian Resuscitation Council, 2014; Nimmo, 2009; Nolan et al, 2010).*

If the patient is critically ill, give high flow oxygen at 15L/min via a non-rebreather mask.

High Flow Oxygen = 15L/min via non-rebreather mask

High flow oxygen should only be given in the short-term - check the flow rate with rapid response team as soon as they arrive.

If the patient is not critically ill, consider other oxygen masks and titrate the flow rate aiming for O2 saturation levels of 94% or above (*Deakin et al, 2010*). Chapter 3 has more detail.

For patients with chronic obstructive airways disease (COPD) who are critically ill, still give *high-flow oxygen* initially but watch for signs of respiratory depression, and check the oxygen flow rate with the rapid response team as soon as they arrive. Chapter 4 has more detail.

e. Prepare equipment for medical team

Think ahead - what other procedures may be required?

For example:

- intravenous cannulation or fluid bolus.
- medications.
- blood tests.

Remember these tasks can be shared – remind others of what needs to be done.

f. Handover using ISBAR

When the rapid response team or other staff arrive to help, hand over your patient using the **ISBAR** framework:

Identify	• yourself. • your patient.
Situation	• describe the problem. • describe why you need help.
Background	• to the patient's admission. • relevant medical history.
Assessment	• list the vital signs. • findings from ABCDE assessment.
Recommendation	• what will you do next? • what do you want your colleague to do?

ISBAR is discussed in more detail in Chapter 2.

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Chapter 2: Oxygen therapy

Objectives

- ✓ To describe the use of oxygen therapy in patients with respiratory and cardiac conditions.
- ✓ To describe oxygen delivery devices.
- ✓ To identify advantages and limitations of pulse oximetry.

Oxygen therapy for critically ill adults

We noted in Chapter 1 that critically ill patients may require oxygen, usually at a high flow rate - 15L/minute via non-rebreather mask.

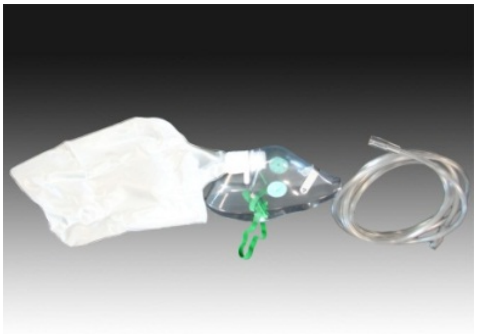
Critically ill patients may have signs of:

- shock,
- acute hypoxaemia,
- severe chest pain, BUT oxygen should only be given to patients with chest pain if their oxygen saturation is <94% or they have signs of shock (*Resuscitation Council UK, 2011; Australian Resuscitation Council, 2014; Nolan et al, 2010; Nimmo, 2009).*

Oxygen delivery devices

Non-rebreather (reservoir) masks

All patients who are critically ill should be initially managed with high flow oxygen from a reservoir mask at 15 litres per minute. These masks deliver an inspired oxygen concentration (FiO2) at approximately 85%.



Inflate the reservoir bag before putting the mask on the patient. The oxygen flow must be enough to keep the reservoir bag from deflating on inspiration.

Non-rebreather masks are for **short-term** use only and alternative devices should be considered to maintain oxygen saturations at ≥94% *(O'Driscoll, Howard, Davison, 2008; Resuscitation Council UK, 2011)*

Other oxygen delivery devices include:

Nasal cannula

These deliver an inspired oxygen concentration (FiO_2) of between 24-40%. The FiO_2 will depend on the rate and depth of the patient's breathing as well as the oxygen flow rate. Nasal cannula are used only when small amounts of supplemental oxygen are required and **are not appropriate for use in the acutely unwell patient.**

- 1-2 litre/minute flow rate = 24-28% inspired oxygen concentration (FiO2).
- 2-4 litre/minute flow rate = 28-34% inspired oxygen concentration (FiO2).

Using a flow rate of more than 4 litres/minute will cause the nasal mucosa to dry, possibly leading to epistaxis.

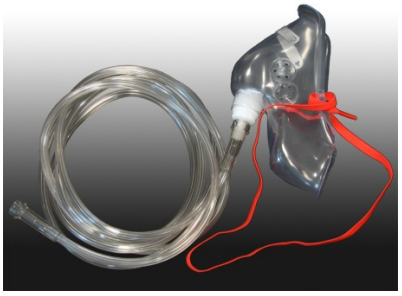
Fixed performance systems (Venturi systems)

These are designed to deliver a fixed percentage of oxygen e.g. 24%, 28%, 35%, 40%, or 50%. **This is generally less than is required for an acutely unwell patient.**

Fixed performance systems operate according to the venturi principle whereby oxygen concentration is determined by the gas flow and the venturi valve used.

Simple (Hudson) face masks

These can be used to provide inspired oxygen concentrations (FiO2) of up to 50-60%. **This is generally less than is required for an acutely unwell patient.**



- 6 litres/minute flow rate = 40% inspired oxygen concentration (Fi02).
- 8 litres/minute flow rate = 50% inspired oxygen concentration (Fi02).
- 10 litres/minute flow rate = 60% inspired oxygen concentration (FiO2).

Please note - using a flow rate of less than 6 litres/minute will cause carbon dioxide retention within the mask. Increasing above 10 litres per minute will not improve the oxygen concentration delivered.

Special considerations in oxygen therapy

Oxygen therapy in respiratory disorders

Patients with respiratory failure can be divided into two groups:

Type 1 respiratory failure: Hypoxia without hypercapnia (hypoxic - low blood oxygen levels; hypercapnia - high levels of carbon dioxide in the blood)

In these patients, give high concentration oxygen initially, with the aim of returning their PaO_2 to normal.

Once clinically stable, adjust the inspired oxygen concentration (FiO_2) to maintain an oxygen saturation of 94-98%.

Type II respiratory failure: Both hypoxia and hypercapnia are present. This is usually caused by Chronic Obstructive Pulmonary Disease (COPD).

If given too much oxygen, these patients may develop worsening respiratory failure leading to unconsciousness, respiratory and cardiac arrest.

If given too little oxygen, they are at risk of organ damage and cardiac arrest.

If the patient is critically ill, give high-flow oxygen initially - 15L/min via a non-rebreather mask and ***monitor carefully*** for signs of respiratory depression e.g. decreasing respiratory rate and drowsiness.

Check the oxygen flow rate with the Rapid Response Team as soon as they arrive.

When the patient is stable, give oxygen via a 24% or 28% Venturi mask at 4L/min OR via a Hudson mask to achieve a target oxygen saturation within the range of 88-92% *(Beasley et al 2015; NICE, 2004).*

Oxygen therapy in acute coronary syndromes

In patients with acute coronary syndrome - acute myocardial infarction or unstable angina- give oxygen at 15L/min if oxygen saturation is 93% or less, or the patient is short of breath or in shock. (A Hudson or non-rebreather mask may be used depending on severity). Aim to achieve a saturation level of 94-98%.

Check the oxygen flow rate with the Rapid Response Team (RRT) as soon as they arrive.

In acute coronary syndrome patients who are **not** seriously ill, aim to maintain an oxygen saturation level of 94-98%. This may be achievable on room air only, or the use of an oxygen delivery device. *(Australian Resuscitation Council, 2011; Nolan et al, 2010; Nimmo, 2009)*

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High Flow Oxygen = 15L/ min via non-rebreather mask

Pulse oximetry

Role and uses: Used during oxygen therapy to monitor its effect, when a patient is hypoxic, or at risk of becoming hypoxic.

Principles: Pulse oximeters work by transmitting infrared light waves through body tissue - usually the finger or earlobe. Some of the light is absorbed and some is transmitted through the tissue. The ratio of transmitted to absorbed light is used to determine the peripheral arterial oxygen saturation level.

Oxygen saturation refers to the carriage of oxygen by haemoglobin molecules. This is expressed as a percentage of the total oxygen carrying capacity. A normal saturation range is 95-98% (*Resuscitation Council UK, 2011).*

Advantages	Limitations
• Simple to use and non-invasive.	• Does not measure adequacy of ventilation or tissue oxygenation.
• Generally accurate within +/- 2% when saturation is above 90%.	• Subject to error from: o Motion artefact. o Wearing of dark coloured nail varnish. o Use of blood pressure cuffs above the probe. o Poor tissue perfusion / cold digits.
• Provides an immediate measure of oxygenation.	• Early hypoxaemia - low arterial oxygen concentration - may occur long before low oxygen saturation levels are seen - as per the oxyhaemoglobin dissociation curve.
• Relatively inexpensive.	• Not suitable for use in: o Reduced pulse volume - e.g. hypotension, low cardiac output, hypothermia or vasoconstriction. o Carbon monoxide (CO) poisoning. CO has a greater affinity for haemoglobin than does oxygen. o Patients with low oxygen saturation levels as readings are inaccurate at <82%.

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Chapter 3: The patient with breathing problems

Objectives

- ✓ To list the causes of compromised breathing.
- ✓ To recognise when a patient has breathing difficulties.
- ✓ To manage a patient with breathing problems.

Causes of compromised breathing

- Asthma.
- Exacerbation of chronic obstructive pulmonary disease (COPD).
- Pneumothorax.
- Pulmonary oedema.
- Pulmonary embolus.
- Chest infection.
- Pneumonia.

Recognising the patient with breathing difficulty

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	For laboured breathing; note the use of accessory muscles of the neck and shoulders, nasal flaring, abdominal breathing or sweating. For symmetrical chest movements on each side. *Note: Hypoxemia is indicated by a PaO_2 of less than 60 mmHg [8kpa] or oxygen saturations of less than 88% and hypercapnia by a $PaCO_2$ over 45 mmHg [6kpa] (Lewis, Dirksen, Heitkemper & Bucher 2014)].*
LISTEN……	For whether the patient has difficulty speaking. For rattling, stridor, or wheeze. Using a stethoscope for chest auscultation.
FEEL……	The chest wall for surgical emphysema or crepitus which indicates a pneumothorax. The position of the trachea as deviation suggests pneumothorax or pleural fluid.
VITAL SIGNS…..	Take a full set of vital signs. Count the respiratory rate for 1 minute which should be approximately 12-20 per minute. Pulse oximetry may indicate low oxygenation, but is not a reliable indicator of hypercapnia. The medical team may decide to take blood gases.

Initial management of the breathless patient

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	Take a history from the patient if they can talk – ask "What is happening now?" Review the charts; have usual respiratory medications been given as ordered? Take all vital signs and continue to monitor regularly - every 5 minutes. Pulse oximetry is a useful measure.
3) Position patient appropriately	Position the patient in an upright position. Use pillows for support. The orthopnoeic position may be suitable for patients with COPD - that is leaning forward using an over-bed table and pillows.
4) Consider oxygen	Give oxygen at 15L/min if the patient is in severe respiratory distress **BUT** you must monitor for signs of respiratory depression including drowsiness & a decreased respiratory rate. Check the oxygen flow rate with the medical team as soon as they arrive.
5) Prepare equipment for the rapid response team	For example, the **rapid response team** may decide to insert an intravenous cannula and take blood gases. The resuscitation trolley ('Crash trolley') may be required.
6) Handover using ISBAR	Handover to the **rapid response team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient – this may help reduce anxiety. **Give medications as ordered.** Bronchodilators may have been ordered. Check with other staff as to whether they should be given now.

Management of asthma and COPD

Acute asthma

Asthma is an inflammatory disease of the lungs. This inflammatory process can occur along the entire airway from the nose to the lung. Once the airway becomes swollen and inflamed it narrows allowing less air through to the lung tissue and causing symptoms such as wheezing, coughing, chest tightness, and trouble breathing (*National Institute of Environmental Health Services, 2012*).

Acute asthma attacks are usually caused by triggering agents such as dust, animal hair and moulds. Viral and bacterial infections of the upper respiratory tract infection can worsen asthma *(Baxi & Phipatanakul, 2010).*

The signs and symptoms of an acute asthma attack are shortness of breath, wheezing, and chest tightness. If air motion is significantly impaired, no wheezing is heard. There may be use of accessory muscles of respiration and over-inflation of the chest. The patient may be cyanotic.

Severe acute asthma is a life-threatening emergency.

Management of acute asthma:

1. **Call** for help.
2. **Collect information** from the patient, other staff and the patient charts.
3. **Position patient** upright.
4. **Consider oxygen -** high flow at 15L/min via a non-rebreather mask.
5. **Prepare equipment** including intravenous trolley and medications as ordered.
6. **Handover** using ISBAR.
7. **Other:** give medications as ordered. These will include:
   - *Nebulised beta 2 agonists* e.g. Salbutamol. Frequency will depend on response, but may be continuous in severe asthma that is not responding to the initial dose.
   - *Nebulised ipratropium bromide* e.g. Atrovent is often used for more severe attacks as an adjunct therapy to salbutamol. It has a slow onset (20 mins) and a peak effect after 60 mins. If both medications are used, Salbutamol should be given first 5 minutes prior to Atrovent.
   - *Steroids*: adults with severe attacks may require intravenous steroids (*Barnard, 2005; British Thoracic Society, 2009).*

8. Continue to monitor the patient until help arrives, as further deterioration can rapidly occur.

Acute exacerbation of COPD

COPD occurs secondary to diseases that cause airflow obstruction e.g. emphysema or chronic bronchitis. Patients may have history of smoking or exposure to second-hand smoke. Patients with COPD may be both hypoxic - low blood oxygen levels and hypercapnic - high levels of carbon dioxide in the blood *(Lewis, Dirksen, Heitkemper & Bucher 2014).*

An acute exacerbation of COPD is defined as a sustained worsening of the patient's usual symptoms that is acute in onset. It is usually caused by infection or environmental pollutants. Commonly reported symptoms of acute exacerbation are: worsening breathlessness, cough, increased sputum production, and change in sputum colour (*British Medical Journal, 2004*).

Management of acute exacerbation of COPD:

1. **Call** for help.
2. **Collect information** from the patient, other staff, and the patient's charts.
3. **Position patient** upright or in orthopnoeic position.
4. **Consider oxygen** high flow at 15L/min via a non-rebreather mask if the patient is critically ill (for short term use only – check flow rate with the medical team as soon as they arrive). Aim for oxygen saturation level of 88-92% (*Beasley et al 2015; Resuscitation Council UK, 2011; Lamont, 2010*).
5. **Prepare equipment,** including intravenous trolley and medications as ordered.
6. **Handover** using ISBAR.
7. **Other** give medications as ordered. These will include:

- *Inhaled bronchodilators* e.g. Salbutamol. These can be nebulised or the patient's own hand-held device if there is no medication order for a nebulised bronchodilator *(McKenzie, et al, 2011).*
- *Inhaled anticholinergic agents* e.g. Ipratropium bromide & tiotropium may also be used with bronchodilator therapy (*McKenzie et al, 2011*).
- *Antibiotics and corticosteroids* may also be given if necessary (*McKenzie et al, 2011*).

8. **Reassure** the patient, and continue to monitor until help arrives.

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Chapter 4: The patient with hypotension

Objectives

- ✓ To explain the significance of hypotension.
- ✓ To describe the causes of hypotension.
- ✓ To recognise hypotension in the deteriorating patient.
- ✓ To initially manage hypotension in the deteriorating patient.

Background

Hypotension is generally defined as a systolic blood pressure (BP) of less than 90 mmHg or a diastolic of less than 60 mmHg (*National Heart Lung and Blood Institute 2010*). Some underlying medical conditions lead to a blood pressure that may be "normally" high. In such cases, hypotension may occur even if the BP is higher than 90 mmHg. For this reason, it is important to know your patient's 'normal' blood pressure.

Hypotension is a medical emergency, and must be treated promptly as it leads to poor perfusion of the major organs. Most organs of the body need a blood pressure of at least 70 mmHg to maintain normal function.

Causes of hypotension

Blood pressure = cardiac output x peripheral vascular resistance.
Hypotension is due to low cardiac output and/or low peripheral vascular resistance

Low cardiac output ***OR*** **Low peripheral vascular resistance**

Cardiac output is determined by:

1. **Preload** -cardiac filling, effected by venous return to the heart.
2. **Cardiac contractility** -strength of cardiac contraction.
3. **Afterload** -resistance to blood ejected from the ventricle.

A fall in peripheral vascular resistance (vasodilation) will lead to hypotension.

Reduced ***pre-load*** will decrease cardiac output.

Causes of decreased pre-load include:

- Fluid loss (e.g. bleeding, severe diarrhoea/ vomiting, burns).
- Sepsis.

Low ***contractility*** will decrease cardiac output.

Causes of decreased contractility include:

- AMI, Heart failure.
- Arrhythmias.
- Cardiac tamponade.
- Medications e.g. beta-blockers.

Higher ***afterload*** will lower cardiac output.

Causes of increased afterload include:

- Aortic stenosis.
- Pulmonary hypertension.

Causes of decreased peripheral vascular resistance include:

- Sepsis.
- Epidural analgesia.
- Vasodilators e.g. ace-inhibitors, some anaesthetic agents.
- High spinal cord damage.

(Resuscitation Council UK, 2011).

Recognising the hypotensive patient

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	Is the patient's skin pale or mottled? Are there obvious signs of bleeding or fluid loss? Check wound sites, drain tubes and bed for excess blood loss. Has there been a fall in urine output? If cause is cardiac such as AMI, arrhythmias or cardiac tamponade a patient may have signs of acute heart failure including breathlessness, tachycardia & pink frothy sputum.
LISTEN……..	Does the patient appear confused or have a decreased conscious state? Do they complain of dizziness? What is their pain score?
FEEL……..	Is the patient's skin or peripheries cool to touch? If hypotension is due to a fall in peripheral vascular resistance e.g. vasodilation, peripheries may be warm to touch.
VITAL SIGNS…..	Take a full set of vital signs. A blood pressure of less than 90 mmHg usually requires a RRT call depending on the criteria for the clinical setting. Tachycardia, raised respiratory rate, and prolonged capillary refill times may be present and may trigger a RRT call. Temperature may be raised if there is sepsis.

Initial management of hypotension

The management of hypotension depend on the cause (**low cardiac output** or a **fall in peripheral vascular resistance**).

Low cardiac output -due to either a fall in pre-load or contractility.			**Fall in peripheral vascular resistance (vasodilation)**
Fall in pre-load A history of fluid loss through, for example, bleeding, vomiting, diarrhoea, or burns. The patient may be dizzy, with cool, mottled peripheries and tachycardia.		***Fall in contractility*** Patient may have chest pain or acute heart failure and may be breathless & tachycardic with pink frothy sputum.	The patient may have tachycardia, peripheries will be warm to touch, and they may be confused.
1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.		
2) Collect more information	Take a history from the patient if conscious – ask "What is happening now?" Review the charts; what is the fluid intake? Has the patient been passing urine? Note a urine output of less than 200ml in 8hrs indicates a seriously ill patient. Check output from drain tubes and any wounds. Take all vital signs and continue to monitor regularly e.g. every 5 minutes, including neurological status.		
3) Position patient appropriately	Bed position should be flat with legs elevated.	Position patient in semi-upright position if short of breath, otherwise lay flat.	Lay patient flat with legs elevated.
4) Consider oxygen	Give oxygen 15L/minute via a non-rebreather mask.		
5) Prepare equipment for the rapid response team	Set up for intravenous cannula and intravenous fluids as ordered. Two large-bore cannulae will be required.	Do ECG if available. Set up for intravenous cannula if required/ordered.	Set up for intravenous cannula if required and intravenous fluids as ordered.
6) Handover using ISBAR	Handover to the **Rapid Response Team** or more experienced staff as soon as they arrive.		
Other	Reassure patient. A 500ml bolus of intravenous fluid should be ordered by the doctor, given via a large bore cannula (14 or 16 gauge). Observe response. The BP should increase and tachycardia decrease. Rapid intravenous fluid replacement should continue until the desired response.	Reassure patient. DO NOT GIVE fluid replacement if cause appears to be cardiac i.e. the patient describes chest pain or has signs of heart failure.	Reassure patient. Fluid challenge – A 250ml bolus of intravenous Normal Saline should be ordered by the doctor. Observe response. The BP should increase and tachycardia decrease. Fluid challenge should be continued until the desired response.

(Murgo & Leslie 2012; Nimmo, 2009)

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Chapter 5: The patient with chest pain - Acute Coronary Syndrome – ACS.

Objectives

- ✓ To describe the different types of acute coronary syndrome.
- ✓ To recognise when a patient has an acute coronary syndrome.
- ✓ To implement initial management of a patient with acute coronary syndrome.

Background

Causes of chest pain can include non-cardiac causes such as musculoskeletal, gastrointestinal or pulmonary disorders, stable angina, or acute coronary syndrome.

Acute coronary syndrome (ACS) refers to any one of the following:

1. Unstable angina.
2. Non-ST segment elevation myocardial infarction (NSTEMI).
3. ST segment elevation myocardial infarction (STEMI).

1. Unstable angina: Angina is pain or discomfort caused when coronary arteries are partially blocked, leading to insufficient blood flow to the heart muscle. The pain is more likely to be felt during exertion, and may be felt in the central chest, the arms, neck, back, jaw or shoulders.

Angina that settles when exertion stops is generally referred to as stable angina and is not an ACS. Unstable angina tends to have a pattern of unpredictability or increasing frequency and may occur at rest. The ECG may be normal or may show signs of ST-segment depression or T-wave inversion, but cardiac enzymes are usually normal.

2. Non-ST segment elevation myocardial infarction (NSTEMI) This occurs when there is partial blockage of a coronary artery by a thrombus that causes damage to the cardiac muscle. Because there is partial occlusion of the coronary artery, only a portion of the heart muscle is damaged. The patient will usually experience pain or discomfort which is often described as "pressure", "heaviness" or "tightness"- most commonly in the central chest, the arms, neck, back, jaw or shoulders.

The NSTEMI produces non-specific changes to the 12-lead ECG, such as ST-segment depression or T-wave inversion. NSTEMI's are differentiated from unstable angina by a rise in the cardiac Troponin levels. Patients with NSTEMIs are at risk of progressing to a STEMI.

3. ST segment elevation myocardial infarction (STEMI) In a STEMI, the coronary artery is completely blocked by a thrombus. As a result all the heart muscle that is supplied by the affected artery is damaged. This more severe type of heart attack produces characteristic changes on the 12-lead ECG. These include acute elevation of the ST-segment or a new left bundle branch block. The patient will usually experience pain or discomfort which is often described as "pressure", "heaviness" or "tightness"- in the central chest, the arms, neck, back, jaw or shoulders. The patient with an acute STEMI is at increased risk of arrhythmias such as ventricular tachycardia or ventricular fibrillation (*Gallagher & Driscoll, 2012*).

Recognising the patient with ACS

There are several differential diagnoses for chest pain, including musculoskeletal, gastrointestinal or pulmonary disorders. The following actions will enable early recognition of acute coronary syndrome.

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	Is the patient distressed or restless? Does the patient look pale?
LISTEN……	Ask about the **patient's pain.** Use the **P Q R S T** mnemonic: **P= Provoking factors:** What was the patient doing when the pain started? Does anything make the pain worse or better such as sitting forward or taking a deep breath in? If so, the pain is less likely to be cardiac. **Q=Quality:** What does the pain feel like? Ask the patient open ended questions such as: "Describe the pain to me". Does coughing or deep breathing change the quality of the pain? Sharp, burning pain is less likely to be cardiac. Dull, heavy, pressure or tightness are more likely to be cardiac. **R=Radiation /Region** Does the pain go anywhere else? Cardiac pain may radiate to neck, jaw, back or arms. Ask the patient to point to where the pain is, if they can. **S=Severity:** Rate the pain on a scale between 0 and 10, with 10 being the worst pain ever experienced. Tell the patient the number they give doesn't matter, as the number is only used to see if treatment is making them better, or worse. **T=Timing** When did the pain start? Is it there all the time? Did it come on suddenly or gradually? Ask about associated symptoms such as nausea and vomiting, shortness of breath, sweatiness, cough, and palpitations.
FEEL……	Is the patient's skin sweaty?
VITAL SIGNS……	Take a full set of vital signs. Note the strength and rhythm of the radial pulse and whether or not it is 'normal' for that patient.

Initial management of the patient with acute coronary syndrome

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	Take a history from the patient– ask "What is happening now?" Use the PQRST mnemonic to assess pain. Review the charts; have usual cardiac medications been given as ordered? Take a 12-lead ECG if there is time. Take all vital signs and continue to monitor regularly - e.g. every 5 minutes.
3) Position patient appropriately	Position the patient in a semi-upright position in bed. If their blood pressure is low, then lay them flat.
4) Consider oxygen	Give oxygen at 15L/min if oxygen saturation is 93% or less, or the patient is short of breath or in shock. Use a Hudson or non-rebreather mask depending on severity. Aim to achieve a saturation level of 94-98%. Check the oxygen flow rate with the medical team as soon as they arrive.
5) Prepare equipment for the rapid response team	For example, the **rapid response team** may decide to insert an intravenous cannula to give intravenous Morphine. The resuscitation trolley ('Crash trolley') may be required.
6) Handover using ISBAR	Handover to the **Rapid Response Team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient – this may help reduce anxiety. **Give medications as ordered:** check patient medication chart for a Glyceryl Trinitrate order and give if patient is not hypotensive. Other medication may include Morphine and Aspirin. Check with other staff as to whether medications should be given now.

(Gallagher & Driscoll, 2012; Nimmo, 2009; National Heart Foundation, 2006)

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Chapter 6: The patient with an altered conscious state

Objectives

- ✓ To describe the common causes of an altered conscious state.
- ✓ To recognise the signs of an altered conscious state.
- ✓ To initially manage an altered conscious state.

Background

An altered conscious state can commonly occur in acute illness.

A decreased conscious state can mean a compromised airway – including loss of the gag and cough reflexes with subsequent risk of inhalation of secretions or vomit.

Assess the airway first, and if it is compromised, commence basic life support.

(Jacques et al, 2009)

Causes of an altered conscious state

The two main reasons for an altered conscious state are intracranial or systemic causes.

Intracranial causes of altered conscious states	Systemic causes of altered conscious states
• Stroke. • Seizures. • Meningitis / encephalitis. • Central nervous system infection. • Head injury / haemorrhage (intracranial, epidural, subdural).	• Hypoxia or hypercapnia. • Hypoglycaemia / hyperglycaemia. • Hypotension. • Drugs (sedatives, opiates, overdoses). • System failure (cardiac, respiratory, liver, renal or endocrine failure). • Hypo / hyperthermia.

(Resuscitation Council UK, 2011; Jacques, et al, 2009)

Recognising the patient with an altered conscious state

Remember - always do an ABCDE primary survey first, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……..	Pupils – check size, equality, reaction to light. Pupils that are unequal or that have a sluggish or no response to light, are a sign of intracranial problems, and indicate the need for urgent medical treatment.
LISTEN……..	Does the patient appear confused or have a decreased conscious state? What is their pain score?
VITAL SIGNS…..	Take a full set of vital signs. During a primary ABCDE assessment use AVPU (**A**lert, responding to **V**oice, responding to **P**ain, **U**nresponsive) to initially assess the patient's level of consciousness. The GCS (Glasgow Coma Scale) can also be used and it measures; best motor responses - e.g. response to commands or pain; best verbal response - e.g. oriented, confused, no response; and eye opening - e.g. spontaneous or to pain. Pupil reactions may be part of a neurological assessment but they are not part of GCS scoring which reduces as consciousness decreases. Any sudden decrease in level of consciousness on either AVPU or GCS – i.e. a fall of >2 points, requires an emergency call. A GCS score of less than or equal to 8 is associated with a compromised airway, so call for help immediately (RRT) *(Chamberlain & Corkill 2012; Jacques, et al. 2009).*

Initial management of the patient with an altered conscious state

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	**Check ABCD:** **A. Check airway is patent** – if not provide basic life support measures - e.g. head tilt, jaw thrust, an oropharyngeal or nasopharyngeal airway. **B. Check patient is breathing spontaneously** – provide basic life support measures if not. **C. Check for adequate circulation** – provide basic life support measures if not. Take all vital signs and continue to monitor regularly - e.g. every 5 minutes.

	D. Monitor conscious state including AVPU, GCS, pupil reactions. Where, for example, a stroke is suspected monitor for unilateral weakness in face and limbs and any difficulty with speaking (*Stroke Foundation 2010; Ambulance Victoria 2014).* **Don't forget the Glucose!** Check blood glucose levels: Blood glucose levels less than 3.0 mmol/L are associated with altered conscious state – call for help. **Take a full set of vital signs at regular intervals**.
3) Position patient appropriately	Position the patient on their side, the lateral recovery position, if the airway is patent and patient is breathing and no spinal injury is suspected.
4) Consider oxygen	Give oxygen at 10L/min via a Hudson mask or alternatives as required. Check the oxygen flow rate with the medical team as soon as they arrive.
5) Prepare equipment for the rapid response team	Patient may need intravenous access, blood tests.
6) Handover using ISBAR	Handover to the **rapid response team** or more experienced staff as soon as they arrive.

(Chamberlain & Corkill, 2012; Nimmo, 2009)

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Chapter 7: The traumatised patient - Fractured Neck of Femur (#NOF)

Objectives

- ✓ To describe the clinical manifestations of a patient presenting with a # NOF.
- ✓ To identify initial management priorities of care for a patient with a #NOF.

Background

The femoral bone is the long bone of the thigh. A partial or complete fracture of the neck of the femur - #NOF - is a common fracture, especially among the elderly. Hip fractures may occur as a result of a fall or a motor vehicle accident and are more likely where the patient has osteoporosis, diabetes mellitus, bone cancer, or rheumatoid arthritis *(Lewis, Heitkemper & Dirkson, 2004).*

Identification of a #NOF

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK.....	Is the patient's skin pale or mottled? Are there obvious signs of bleeding or fluid loss? Has there been a fall in urine output? How does the affected limb appear - there may also be some shortening of the affected limb? Note: A fractured NOF is classified according to the Garden system ranging from Type 1 - an incomplete fracture - to Type IV - a complete fracture with displacement.
LISTEN.....	Does the patient appear confused or have a decreased conscious state? What is their pain score – which may be related to their hip/leg injury?
FEEL.....	Is the patient's skin or peripheries cool to touch?
VITAL SIGNS.....	Take a full set of vital signs. A low BP, tachycardia, raised respiratory rate, and prolonged capillary refill times may indicate hypovolaemia and trigger a RRT call.

Initial management of a #NOF

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	**History:** take a history of the presenting condition, event or incident which resulted in the fracture, past medical conditions and note all current medications. **Physical exam**: Assess for colour, warmth, movement and sensation in the affected limb, including pedal pulses. Note any areas of oedema, swelling, bruising, discolouration, skin tears or lacerations. Gently assess the range of motion of the limb, note any pain. Take a full set of vital signs. Inform medical staff immediately of abnormal findings.
3) Position patient appropriately	Position the patient flat in bed. Stabilise the limb using a back slab plaster or rolled towels and slightly elevate to reduce swelling.
4) Consider oxygen	Oxygen saturations should be assessed from admission and oxygen administered as required.
5) Prepare equipment for the rapid response team	**Warming techniques** –as applicable including blankets and space blankets. **Insertion of an intravenous catheter** – for routine pathology and fluid replacement. **X-rays** – transfer to X-ray department if stable. **An indwelling urinary catheter** – may be required, but avoid where possible. Maintain urine output >30mls / hr.
6) Handover using ISBAR	Handover to the **rapid response team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient. **Give medications as ordered** – pain relief medication, tetanus vaccine, antibiotics, thromboprophylaxis. Consider pressure sore prevention and pressure gradient stockings. Prepare patient for transfer to the operating theatre.

(Curtis & Ramsden 2011; Lews, Heitkemper, &Dirksen, 2004; Mak, Cameron, & March, 2010)

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Chapter 8: The patient with hypoglycaemia

Objectives

- ✓ To identify the clinical manifestations of hypoglycaemia.
- ✓ To describe the causes of hypoglycaemia.
- ✓ To identify the initial management priorities of a hypoglycaemic patient.

Background

Diabetes mellitus (DM) is currently the leading cause of heart disease, stroke, adult blindness and lower limb amputations. The actual cause of DM is unknown; current theories suggest that genetic, autoimmune, viral and environmental factors such as obesity and stress are all contributing factors (*Lewis, Heitkemper & Dirksen, 2004*). Patients with DM, a multisystem disease, have impaired insulin utilization and/or insulin production. Insulin is a hormone produced in the pancreas and pumped into the blood stream in small increments as food is being ingested, regulating blood glucose levels.

Hypoglycaemia occurs when blood glucose levels fall below the normal blood glucose range of 3.9 to 6.6 mmol/l (*Lewis, Heitkemper, & Dirksen, 2004*). Blood glucose levels between 3.5 mmol/l and 2.5 mmol/l are considered to be moderate hypoglycaemia and >2.5 mmol/l as severe (*Curtis & Ramsden, 2011*). A patient with diabetes who is receiving diabetes medication will become hypoglycaemic if their food intake is too low, diabetic medication is too high, or when weight is lost or exercise is excessive (*Curtis & Ramsden, 2011*).

Identification of a patient with hypoglycaemia

Remember - always do an ABCDE primary survey first, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	Does the patient have: • Unsteady gait. • Seizures, coma.
LISTEN……	Does the patient appear confused or have a decreased conscious state? • Slurred speech. • Numbness of fingers, toes, mouth. • Emotional changes. • Headache. • Nervousness, dizziness. • Hunger. • Changes in vision.
FEEL……	Is the patient's skin or peripheries cool to touch?
VITAL SIGNS…..	Take a full set of vital signs. Is the heart rate increased?

(*Lewis, Heitkemper & Dirksen, 2004*)

Initial management of the hypoglycaemic patient

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	Take a full set of vital signs. Record blood glucose levels at regular intervals. **Cardiovascular** – accurate monitoring of fluid, hydration and electrolyte status. Inform medical staff immediately if abnormal findings.
3) Position patient appropriately	Position the patient flat in bed.
4) Consider oxygen	Oxygen saturations should be assessed and oxygen administered as required.
5) Prepare equipment for the rapid response team	**Insertion of an intravenous catheter** – for routine pathology and fluid replacement. **Cardiac monitoring** – as electrolyte imbalances can result in cardiac complications. **An indwelling catheter** – may be required, but avoid where possible. Maintain urine output >30mls / hr.
6) Handover using ISBAR	Handover to the **rapid response team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient. **Mild to moderate hypoglycaemia** - if the patient is conscious and cooperative, give a fast acting glucose-containing food or drink such as jelly beans, lemonade or honey followed by a carbohydrate meal - e.g. a sandwich. **Severe hypoglycaemia** – the patient is likely to be unconscious or confused. Treat with intravenous glucose 50%, or 1 mg (1 Unit) Glucagon subcutaneous/intramuscular/intravenous.

(Curtis & Ramsden, 2011; Lewis, Heitkemper & Dirksen, 2004; Diabetes Australia, 2014)

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Chapter 9: The women with postpartum haemorrhage (PPH)

Objectives

- ✓ To identify the common causes of postpartum haemorrhage using the four "Ts" approach.
- ✓ To identify the initial management priorities of a patient presenting with PPH.
- ✓ To identify the ongoing management priorities of a patient presenting with PPH.

Background

For the majority of women, childbirth is a healthy event, however, some women experience complications which may be life threatening. Worldwide, obstetric haemorrhage is responsible for 25% of the estimated 358,000 maternal deaths each year *(Mclintock & James, 2011).* Blood loss greater than 500ml is considered a postpartum haemorrhage (PPH) and severe PPH as blood loss of great than 1000mls *(Royal Australian and New Zealand College of Obstetricians and Gynaecologists, 2011).*

Obstetric haemorrhage may occur before delivery (antepartum), or after delivery (postpartum), with more than 80% of cases occurring postpartum (Pairman, Tracy, Thorogood, et al, 2010). Postpartum is further divided into categories: primary (within 24 hours of delivery) or secondary: 24 hours to 6 weeks post-delivery.

Causes of PPH

Causes of postpartum haemorrhage include uterine atony, trauma, retained placenta and coagulopathy - which are often referred to as the "four Ts" used for the assessment of primary PPH causes. These are: Tone (the inability of the uterus to contract - uterine atony), Trauma (cervical and genital tract damage during delivery), Tissue (retained products), and Thrombin (coagulation disorders). The most common causes of secondary PPH include uterine atony, retained products, genital tract trauma and uterine inversion *(Pairman, Tracy, Thorogood, & Pincombe, 2010).*

Recognising the patient with PPH

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	Is the patient's skin pale or mottled? Are there obvious signs of bleeding or fluid loss? Weigh drapes, pads and swabs to give an accurate measurement of the total blood loss. Has there been a fall in urine output?
LISTEN……	Does the patient appear confused or have a decreased conscious state? Do they complain of dizziness? What is their pain score?
FEEL……	Is the patient's skin or peripheries cool to touch?
VITAL SIGNS…..	Take a full set of vital signs. Check fundal tone and position, and vaginal loss. A low BP, tachycardia, raised respiratory rate, and prolonged capillary refill times may be present and may require a RRT call.

Initial management of the patient with PPH

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	**Take a full set of vital signs.** Check fundal tone and position, and vaginal loss at least every 15 mins. **Neurological:** assess using AVPU and/or make regular GCS records to assess changes in level of consciousness. **Cardiovascular**: weigh all perineal pads hourly and record on a fluid balance chart. Insert two large bore cannulae and consider fluid and or blood transfusion. Watch for signs of clotting and/or bleeding from cannula insertion sites. Inform medical staff immediately of abnormal findings.
3) Position patient appropriately	Position the patient flat in bed. Elevation of the legs is not recommended as it may result in blood pooling in the pelvis, increasing congestion and impeding uterine contraction.
4) Consider oxygen	Give oxygen at 15L/min via a non-rebreather mask.
5) Prepare equipment for the rapid response team	**Warming techniques** – as applicable, including blankets and space blankets. **Insertion of an indwelling catheter** – and aim to maintain urine output at >30mls / hr. **Insertion of an intravenous catheter** – for routine pathology and fluid replacement.
6) Handover using ISBAR	Handover to the **Rapid Response Team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient. **Give medications as ordered:** e.g. Syntocinon (synthetic oxytocin) 10 units intramuscular, or 40 units intravenously in 1 litre of Hartmann's solution (250mls/hr). A dose of Misoprostol PR may also be prescribed. **Fundal massage**: use the fingertips to assess the fundus through the abdominal wall, firmly massaging in a smooth, circular motion, but keeping hand still during contractions. If bleeding continues, consider uterine packs or a Bakri Balloon. **Bimanual compression** may also be requested. One hand is placed in the vagina and pushes against the body of the uterus whilst the other hand compresses the fundus through the abdominal wall from above. Prepare patient for transfer to the operating theatre.

(Pairman, Tracy, Thorogood, & Pincombe, 2010; Fraser & Cooper, 2009; The Royal Women's Hospital 2013)

Ongoing management of the patient with PPH:

Please refer to the following guidelines:

The Royal Women's Hospital, Australia – Postpartum Care: Major PPH flowchart (2013). At: https://thewomens.r.worldssl.net/images/uploads/downloadable-records/clinical-guidelines/postpartum-haemorrhage-immediate-and-ongoing-postnatal-care-after-major-pph.pdf

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Chapter 10: The women with pre-eclampsia/ eclampsia

Objectives

- ✓ To identify the common causes of pre-eclampsia.
- ✓ To identify the initial management priorities of a patient presenting with pre-eclampsia/eclampsia.
- ✓ To identify the ongoing management priorities of a patient presenting with pre-eclampsia/eclampsia.

Background

Pre-eclampsia is a serious disorder of pregnancy normally occurring after 20 weeks of gestation. It affects approximately 5-10% of women in a mild form *(Brennecke, East, Moses & Blangero 2014)* and 1% of women in a severe form, leading to significant increases in complications, maternal and neonatal morbidity *(Zhang, Meikle &Trumble 2003; Khan, Wojdyla, Say, Gulmezoglu, & Van Look, 2006)*. The condition is characterised by hypertension, kidney dysfunction and leaking of protein into the urine (proteinuria). Eclampsia is a complication of severe pre-eclampsia and is defined as one or more grand mal seizures.

Causes of pre-eclampsia

It is likely that there is a genetic predisposition to pre-eclampsia and causes may include uterine ischemia, angiogenesis and prostacyclin / thromboxane imbalances *(Preeclampsia Foundation 2015).* The risk is increased, for example, in teenage pregnancy, those over 35-40 years, primigravida, obesity, gestational diabetes, chronic hypertension and renal disease *(Mattar & Sibai 1990).*

Recognising the patient with pre-eclampsia

Remember - <u>always do an ABCDE primary survey first</u>, then if there are no imminent threats to life, complete a more focused assessment.

LOOK……	Are the following signs/symptoms of pre-eclampsia present? • Oedema to feet, hands and face. • Epigastric pain/vomiting. • Visual disturbances/headache. • Reduced foetal movements. Signs/symptoms of severe pre-eclampsia may also include: • Pitting oedema. • Papilloedema. • Liver tenderness. • Increased signs of clonus (abnormal reflexes).
LISTEN……..	Does the patient appear confused or have a decreased conscious state? What is their pain score?
VITAL SIGNS…..	Take a full set of vital signs. Also perform an urinalyses and ensure continuous foetal heart rate monitoring.

	Following blood pressure (BP) measurement on two consecutive occasions: • Mild to moderate pre-eclampsia is defined as a systolic BP of 140mmHg and/or a diastolic BP of 90mmHg or higher combined with proteinuria of >300 mg total protein in a 24 hour period. • Severe pre-eclampsia is defined as a systolic BP of 160mmHg and/or a diastolic BP of 110mmHg or higher combined with proteinuria of >300 mg total protein in a 24 hour period.

Initial management of the patient with severe pre-eclampsia/eclampsia

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team if the calling criteria is met, **OR** if you are seriously concerned and there is no-one to help.
2) Collect more information	Take a full set of vital signs including continuous foetal heart rate monitoring. **Neurological:** assess using AVPU and/or make regular GCS records to assess changes in level of consciousness; record reflexes regularly (*see note below**). **Urine output measurements and regular urinalyses.** Inform medical staff immediately of abnormal findings.
3) Position patient appropriately	The women should be enabled to position herself where she is most comfortable, ideally upright - but in the recovery position should she suffer a seizure.
4) Consider oxygen	Oxygen may be required if the oxygen saturations are low. Supplementary oxygen should be given during a seizure at 15L/min via a non-rebreather mask.
5) Prepare equipment for the rapid response team	**Insertion of an intravenous catheter** – for routine pathology and fluid management.
6) Handover using ISBAR	Handover to the **Rapid Response Team** or more experienced staff as soon as they arrive.
Other	**Reassure** the patient. **Give medications as ordered:** e.g. Magnesium Sulphate is the primary choice for blood pressure control and the anticonvulsant of choice. Intravenous loading does: 4 grams given over 10 minutes. (*The Royal Women's Hospital 2015a)* Note: Calcium Gluconate should be available in case of magnesium sulphate toxicity. **Note:** Following magnesium sulphate administration blood pressure should be allowed to stabilise before other anti-hypertensives are considered. Labetalol may be required for acute control of severe hypertension. Initial intravenous bolus - 20mg over two (2) minutes. (*Hydralazine is the drug of choice when Labetalol is contraindicated e.g. in asthma or congestive heart failure)* (*The Royal Women's Hospital 2015b*)

* Reflexes: *"Clonus at the ankle is tested by rapidly flexing the foot into dorsiflexion (upward), inducing a stretch to the gastrocnemius muscle. Subsequent beating of the foot will result, however only a sustained clonus (3 beats or more) is considered abnormal. This may indicate nervous system excitability sufficient to indicate possible risk of seizure (eclampsia). Its presence along with others symptoms indicates a need for seizure prophylaxis". (The Royal Women's Hospital, 2014. Page 1)*

Management of eclamptic seizures

1) Get help from others	Ask other staff to help **NOW**. Use the emergency call bell or call the rapid response team,
2) Position patient appropriately	Position and maintain the women in the left lateral position
3) ABC assessment	Assess and re-assess airway, breathing and circulation (ABCs)
4) Give oxygen	Oxygen should be given at 15L/min via a non-rebreather mask.
5) Other	• Secure intravenous access • Regularly re-assess maternal heart rate, BP and oxygen saturations etc. • Ensure prescribed magnesium sulphate is delivered -as this is likely to be the most effective medication for seizure treatment. • Medications such as Diazepam IV / IM / Rectal (5-10mg) may be prescribed for acute management of seizures.

Ongoing management of the patient with pre-eclampsia:

Please refer to the following guidelines:

The Royal Women's Hospital (2014, Oct.) – Guideline. Pre-Eclampsia: Management. Retrieved from: https://thewomens.r.worldssl.net/images/uploads/downloadable-records/clinical-guidelines/pre-eclampsia-management1.pdf

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Khan KS, Wojdyla D, Say L, Gulmezoglu AM & Van Look PFA (2006) WHO analysis of causes of maternal death: a systematic review Lancet 367, 1066–1074

Mattar, F & Sibai BM. (1990) Eclampsia. VIII. Risk Factors for maternal morbidity. *Am J Obstet Gynecol*. 163:1049-55

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The Royal Women's Hospital (2014, Oct.) – Guideline. Pre-Eclampsia: Management. Retrieved from: https://thewomens.r.worldssl.net/images/uploads/downloadable-records/clinical-guidelines/pre-eclampsia-management1.pdf

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The Royal Women's Hospital (2015b, Feb.) – Guideline. Hypertension: Management of acute. Retrieved from: https://thewomens.r.worldssl.net/images/uploads/downloadable-records/clinical-guidelines/hypertension-management-of-acute1.pdf

Chapter 11: Teamwork

Objectives

- ✓ To identify key components of effective emergency teamwork.
- ✓ To describe approaches to effective teamwork.
- ✓ To discuss methods of teamwork assessment.

Background

Good leadership and teamwork are an essential component of effective and safe healthcare *(Flin & Maran 2008; Draycott et al, 2008).* Leadership and teamwork are often referred to as human factors, or non-technical skills, and also include situation awareness and decision-making. Originally developed from aircraft cockpit crew training, developments in training have been produced in anaesthesia *(Fletcher et al, 2003)* and for resuscitation teams *(Sisssakos, Crofts, Winter, Weiner & Draycott, 2009).* In an emergency situation, time is of the essence and clear communication strategies are essential. A clearly defined directive leader should allocate tasks applicably and co-ordinate activity to maximise productivity. A leader's cognitive resources (intellectual abilities, technical competence and job relevant knowledge) are a key determinant of leadership ability *(Fiedler & Garcia, 1987).* Team members who are made aware of essential tasks and who communicate effectively are likely to be quicker and safer. Individuals who are situationally aware and who have insight into decision-making strategies are also likely to perform better.

Leading an emergency situation is quite different to the management of colleagues on a day-to-day basis and requires a 'command and control' style that is directive and forthright. In other words leadership style should be adapted to the needs of the situation: i.e. the complexity of the task and/or the skills of employees. In the following sections we describe in detail leadership and teamwork, decision making, and situation awareness. This is followed by best practice handover techniques and team assessment measures.

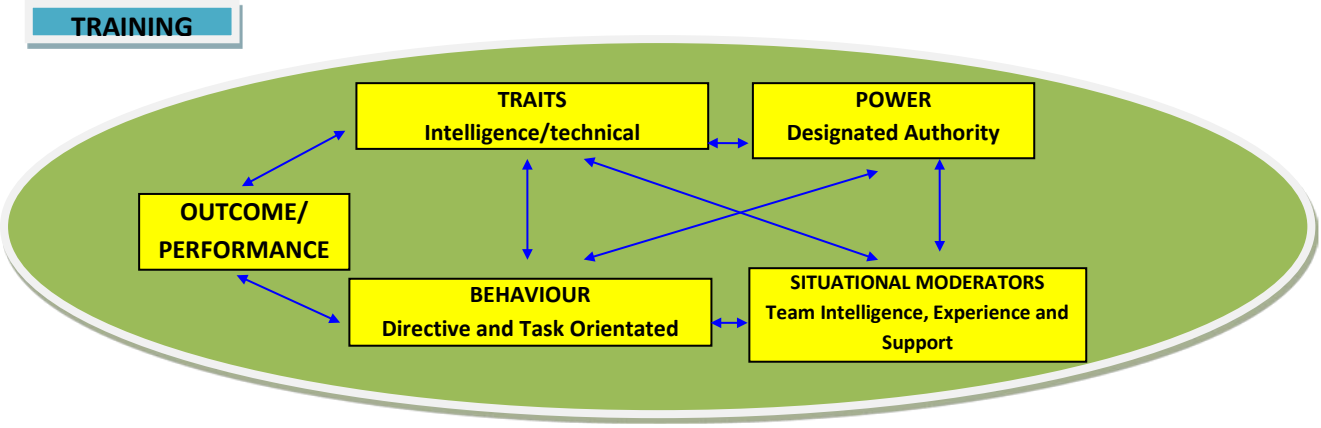
Leadership and Teamwork

Leadership and teamwork are influenced by a number of factors (Figure 1) *(Cooper & Wakelam, 1999)* including personal traits (intelligence, technical expertise and experience). In emergencies it is important to have a clearly defined leader from the outset. For unplanned resuscitation emergencies, an individual should be allocated at the start of each shift in order that those who are responding first can be led effectively. Resuscitation and **rapid response teams** (RRT) also need a designated leader with a clearly defined role. In both situations the leadership role is best allocated to an individual with the most relevant personal traits - which is not necessarily the most senior member of staff. Where a leader has not been designated, one normally emerges – this however takes time so a formal allocation prior to any event is best.

Leaders need to adapt to the time-bound demands of an emergency, requiring a directive and forthright communication style. Ideally they should be positioned at the patient's feet and remain 'hands off' throughout. This global perspective is described as 'Lighthouse Leadership' - the analogy of a lighthouse's guiding light without leaving the sanctity of the rocks unless absolutely essential

(Cooper & Wakelam, 1999). Clear direction is essential: referring to team members by name or by direct eye contact e.g. 'please can you put on a non-rebreather mask with a flow rate of 15 litres a minute'. This overcomes common communication errors where leaders ask more generally for an action, without direct allocation. For example, asking 'can I have some Ventolin' so that three members of the team rush off independently. Teamwork is also moderated by team members' experience, intelligence, and the level of support that they receive (internally and externally).

Figure 1: Core influences on emergency teamwork



There are a number of requirements when developing team skills, including the following:

- ✓ Two way verbal and non-verbal communication.
- ✓ Allocation of tasks to specified team members.
- ✓ Co-operation and co-ordination to complete tasks in a timely manner.
- ✓ A positive team climate demonstrating composure and control and positive morale.
- ✓ Individuals who are adaptable within the roles of their profession.
- ✓ An ability to prioritise tasks, and
- ✓ To maintain clinical standards and guidelines.

These are all factors that can be improved through training and experience. The latter is often hard to come by, so contemporary education approaches use simulation-based scenarios to mirror the clinical setting. Using patient simulators or patient actors it is possible to replicate emergencies thus enabling health care staff to practice technical and teamwork skills in a safe setting *(Flin & Maran, 2008; Cant & Cooper 2010).*

Situation Awareness

Situation awareness is the perception and awareness of environmental elements such as equipment, the patient and team members. When broken down into 'perception', 'understanding' and 'prediction', individual and team performance can be described and developed *(Cooper et al, 2012; McKenna, Cooper, Bogossian & First²Act Team, 2014).* High levels of individual and global perception will help you to understand the situation and to improve prediction of future events. So, for example it is important to:

- ✓ Become orientated to your environment and available equipment prior to any emergency.
- ✓ Consider your own and other's safety as you approach the patient in any setting.
- ✓ Quickly ascertain the patient's history through handover and examination (*this is primarily a leader's role with cascade of information to team members as they arrive).*
- ✓ Be aware of the team members present, and their skills and attributes.
- ✓ Be aware of monitoring equipment and alarms but not to be transfixed by them – 'treat the patient not the monitor' is the saying.

Decision Making

Decision making (choosing between alternatives) can be described through models such as hypothetico-deductive, intuition and cognitive continuum *(Thompson & Dowding, 2002).* Information processing such as hypothetico-deductive processing includes activating possible diagnostic explanations (hypotheses), patient examination, considering the possible diagnoses for goodness of fit, and balancing all for a final diagnosis. In emergencies experienced clinicians are unlikely to processes information so formulaically and it is likely that they rely on intuition or 'gut reaction'. This is described as 'recognition primed decision-making' *(Bond & Cooper, 2006)*; the process whereby clinicians recognise aspects of their experience in the current situation and rapidly test out in their mind the 'best' action. Unlike hypothetico-deductive reasoning, the whole process is rapid and appears not to be 'thought through' but leads to an appropriate compromise between time and decision accuracy. Making decisions, especially in emergencies, is difficult, and can at times be stressful. As in most situations, education and experience will make a difference. The tips below will help develop your decision-making skills:

- ✓ Look for what does not fit – are their things that don't feel quite right?
- ✓ Reframe the situation by changing the perspective e.g. 'how inactive is the patient?' to 'how active is the patient'?
- ✓ Repeatedly review what you consider to be the cause of the problem.
- ✓ Respect ambiguity – remain open – e.g. don't fix too early on a single diagnoses.
- ✓ Consider possible reasons why you may be incorrect.
- ✓ Be specific - estimate probability – don't say "quite restless" – instead say "moving 80% of time".
- ✓ Involve others - use peers to analyse adverse occurrences.

- ✓ Discuss (with peers) your decisions and judgments.
- ✓ Repeat assessments such as airway, breathing and circulation and correct abnormalities before progressing to the next stage.
- ✓ Learn and make use of clinical guidelines e.g. management of COPD and resuscitation guidelines.
- ✓ Make use of coloured observation charts which indicate deterioration and the need for assistance (see examples at http://www.safetyandquality.gov.au/our-work/recognising-and-responding-to-clinical-deterioration/observation-and-response-charts/

Handover

A useful mnemonic to aid in the transfer of critical information is ISBAR *(South Australia Health, 2012).* Remember the process below to aid handovers in all situations:

- ✓ Identify:
  - Introduce yourself and your role.
  - Identify the patient you are referring to.
- ✓ Situation: Describe the current problem and why you need assistance.
- ✓ Background: Describe the background to the patients admission and their relevant medical and social history.
- ✓ Assessment: List the vital signs and findings from the ABCDE assessment.
- ✓ Recommendation:
  - Be clear about what you will do.
  - Be explicit about what you want your colleague to do.
  - Check back and summarise for shared understanding.

Teamwork Assessment and Training

In order to understand the key criteria for effective emergency teamwork and to rate performance in simulated and clinical settings, a measure of performance has been developed *(Cooper et al, 2010; Cant & Cooper 2014)*. The Teamwork Emergency Assessment Measure (*TEAM*) is a valid and reliable assessment tool that can be used in most emergency situations. The assessment template is provided below. Detailed instructions on how to rate team members can be found by logging onto the following website: http://medicalemergencyteam.com/

Team Emergency Assessment Measure

Introduction

This non- technical skills questionnaire has been designed as an observational rating score for valid, reliable and feasible ratings of emergency medical teams (e.g. resuscitation and trauma teams). The questionnaire should be completed by expert clinicians to enable accurate performance rating and feedback of leadership, team work, situation awareness and task management. Rating prompts are included where applicable. The following scale should be used for each rating:

Never/Hardly ever	seldom	About as often as not	Often	Always/Nearly always
0	1	2	3	4

Team Identification

Date: Time: Place:

Team Leader: Team: ……

Leadership: it is assumed that the leader is either designated, has emerged or is the most senior - if no leader emerges allocate a '0' to question 1 and 2.	**0**	**1**	**2**	**3**	**4**
1.The team leader let the team know what was expected of them through direction and command	☐	☐	☐	☐	☐
2. The team leader maintained a global perspective *Prompts: Monitoring clinical procedures and the environment? Remaining 'hands off' as applicable? Appropriate delegation.*	☐	☐	☐	☐	☐
Team Work: ratings should include the team as a whole i.e. the leader and the team as a collective (to a greater or lesser extent).	**0**	**1**	**2**	**3**	**4**
3. The team communicated effectively *Prompts: Verbal, non-verbal and written forms of communication?*	☐	☐	☐	☐	☐
4. The team worked together to complete the tasks in a timely manner	☐	☐	☐	☐	☐
5. The team acted with composure and control *Prompts: Applicable emotions? Conflict management issues?*	☐	☐	☐	☐	☐
6. The team morale was positive *Prompts: Appropriate support, confidence, spirit, optimism, determination?*	☐	☐	☐	☐	☐
7. The team adapted to changing situations *Prompts: Adaptation within the roles of their profession?* *Situation changes: Patient deterioration? Team changes?*	☐	☐	☐	☐	☐
8. The team monitored and reassessed the situation	☐	☐	☐	☐	☐
9. The team anticipated potential actions *Prompts: Preparation of defibrillator, drugs, airway equipment?*	☐	☐	☐	☐	☐
Task Management:	**0**	**1**	**2**	**3**	**4**
10. The team prioritised tasks	☐	☐	☐	☐	☐
11.The team followed approved standards and guidelines *Prompt: Some deviation may be appropriate?*	☐	☐	☐	☐	☐

Overall:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
12. On a scale of 1-10 give your global rating of the team's non-technical performance	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Chapter summary

Effective emergency teamwork is dependent on a number of factors including:

- Directive clear and commanding leadership.
- Specified team roles with individuals prioritising tasks collaboratively.
- An understanding of the situation including the environment and equipment available.
- An understanding of how decisions can be improved with an open collaborative approach.

Multiple Choice Questions

1. Non-technical skills are described as:
    a. Leadership, teamwork, situation awareness, decision making.
    b. Teamwork, personal traits, situation awareness.
    c. Situation awareness, decision making, teamwork, communication.
    d. Communication, teamwork, leadership, decision making.

2. Core influences on emergency teamwork are:
    a. Behaviour, traits, experience, support.
    b. Traits, technical expertise, designated power.
    c. Traits, designated power, situation moderators, directive behaviour.
    d. Experience, designated authority, team intelligence.

3. The following factors positively influence teamwork:
    a. Non-verbal communication, adaptability, low morale, co-ordination.
    b. Communication, co-operation, positive morale, adaptability.
    c. Prioritisation, adaptability, autocracy, standard setting.
    d. Democracy, prioritisation, standard setting, communication.

4. Strategies to improve decisions include:
    a. Intuition, hypothetico-deductive reasoning, autonomous decisions.
    b. Look for what fits, involve peers, change the perspective, remain open.
    c. Involve peers, review problems, repeat ABC's, alter the perspective.
    d. Involve peers, remain open, follow guidelines, review each case once.

Scenarios

ONE

It is your first day on a busy medical ward and you have just received handover. You have been allocated a mentor who indicates they will make time for a formal meeting with you later in the day. In the mean time she asks if you have any burning questions. What are the essential things that you need to know before you start work?

TWO

You have been placed on a surgical ward for the last 3 months and have today been asked to care for Mrs Jones who has chest pain. This female has been admitted for removal of her varicose veins later in the day. You have a few minutes in which to prepare your plan of care – what are your priorities?

Answers to these multiple choice questions and scenarios can be found below

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Answers to Multiple Choice Questions from Chapter 11

1. [answer a]
2. [answer c]
3. [answer b]
4. [answer c]

Answers to Scenarios from Chapter 11

ONE

Answer: Wherever you work there are some key things that you should know including fire and resuscitation procedures. Your patient's safety depends on you knowing the correct procedures, for example where alarms are, where the resuscitation trolley is, and what number to call for a **rapid response team**. You should also find out who is the most senior and experienced member of staff in your area so that you can call for immediate assistance.

TWO

Answer: The most serious concern is that she is complaining of chest pain so a rapid primary assessment is essential ensuring that she has an adequate airway, ventilation and circulation and her level of consciousness. If she is conscious, talking to her whilst you are taking her vital signs will help you identify her past medical and social history. Recording her vital signs and looking for trends of deterioration will help you make a decision on the direct interventions required e.g. oxygen and analgesia, and whether to call for assistance. Assessing pain is also important – the pneumonic **PQRST** will help – ask the following questions:

- **P**rovoking factors: How did the pain start? What were you doing at the time?
- **Q**uality: Is the pain burning, stabbing, sharp?
- **R**adiation: Does the pain move or stay in one place?
- **S**everity/**S**ymptoms: How bad is the pain (score 1-10). Are there other symptoms associated with the pain?
- **T**iming/**T**riggers: When did the pain start? What makes it worse? Is it continuous or intermittent?