GIPPSLAND HEALTH SERVICES CONSORTIUM

COMPETENCY ASSESSED SELF DIRECTED LEARNING PACKAGES

CARE OF THE PATIENT RECEIVING OXYGEN THERAPY

NAME_____

HEALTH SERVICE / DEPARTMENT_____

April 2008 revised January 2015

GRCE Points 2 for package + 1 for competency assessment
TOTAL 3 POINTS

Approved by the Gippsland Region Nurse Educators Group April 2008
Acknowledgements to Gippsland Health Service Consortium Members for input

CARE OF THE PATIENT RECEIVING OXYGEN THERAPY

AIM:

Following completion of this learning package and after successfully undertaking a competency assessment the Registered Nurse will be able to safely and competently care for patients receiving oxygen therapy incorporating the monitoring of pulse oximetry.

OBJECTIVES:

At the completion of this module, the Registered Nurse will be able to:

- Describe and demonstrate the accurate assessment of a patient for their oxygen requirements
- Differentiate between hypoxia and hypoxaemia
- State the different methods of oxygen delivery and their application
- State the amount of O_2 that can be delivered with each delivery system
- State the complications of oxygen therapy
- Describe and demonstrate ability to assess outcome of oxygen therapy
- Demonstrate ability to accurately record, report and document patient assessment O_2 therapy and outcome

The Registered Nurse will be able to demonstrate on two occasions under direct supervision of a Unit Manager, Clinical Nurse Specialist, Clinical Teacher or an experienced Nurse.

1. Demonstrate utilisation and assessment of oximetry
2. Demonstrate the ability to apply the correct level of oxygen therapy and evaluate the action

RATIONALE

Oxygen therapy is commonly used in the hospital setting. It is prescribed in a number of clinical presentations including but not limited to - treatment of hypoxaemia, ischaemic cardiac disease, shock and post-operatively. Oxygen is considered to be a drug and there are clear indications for its administration and mode of delivery. Inappropriate dose and failure to monitor treatment can have serious consequences.

KEY ABBREVIATIONS

- O_2 = oxygen
- CO_2 = carbon dioxide
- Hb = haemoglobin
- lpm = litres per minute
- SpO_2 = saturation of peripheral oxygen measured by pulse oximetry
- FiO_2 = fraction of inspired oxygen (expressed as a percentage)
- NP = nasal prongs
- WOB = work of breathing
- ABGs = arterial blood gases
- PaO_2 = partial pressure of O_2 in arterial blood
- ↑ = increases
- ↓ = decreases
- → = leads to

BACKGROUND INFORMATION

The normal air that we breathe is termed room air and at sea level it contains 21% oxygen plus other substances as detailed in the table below.

AIR – WHAT'S IN IT	
NITROGEN	78.08%
OXYGEN	20.95%
ARGON	0.93%
CARBON DIOXIDE	0.03%
HYDROGEN, HELIUM, KRYPTON, NEON, OZONE, RADON	TRACES

The oxygen that is provided to patients is **supplemental O_2** which is a tasteless, odourless, colourless and extremely flammable gas that must be treated with respect.

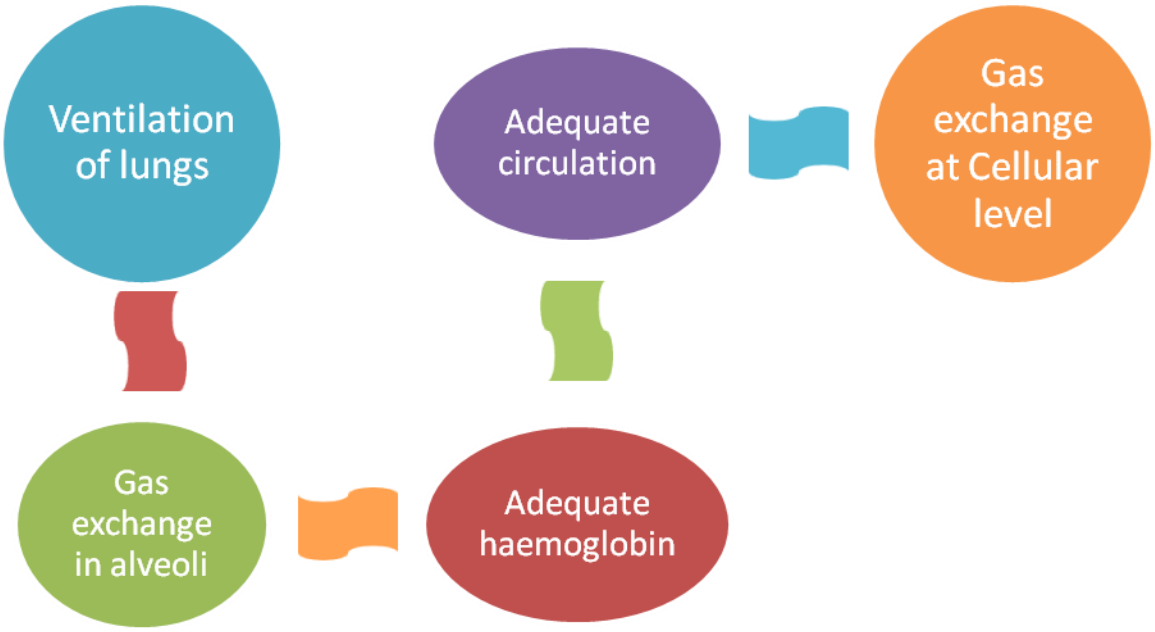
So why is O_2 given?

1. To reduce or correct arterial hypoxaemia and cellular hypoxia
2. To reduce or correct the need for the body to compensate through increased workload of the cardiac and pulmonary systems

Hypoxaemia – a reduction in the actual content of oxygen in the blood
The clinical manifestations of hypoxaemia are – changes in mental status (ranging from impaired judgment →agitation →confusion → coma), use of chest & abdominal muscles to breathe & lip pursing, increased blood pressure, tachycardia, arrhythmias, cyanosis (a late sign), diaphoresis and cool extremities.

Hypoxia – refers to a state of inadequate oxygenation and / or perfusion of the bodies cells. It develops when the level of O_2 reaching the cells is inadequate to meet the bodies metabolic needs.

Cellular energy production and metabolic function are dependent upon continuous and adequate supplies of O_2 and nutrients to the cells. It is important to remember that the rate of O_2 consumption at a cellular level is constantly changing according to cellular activity. Metabolic function in the cells and consequently O_2 consumption can be increased by a number of factors including pyrexia, exercise, stress, tissue injury and healing. Metabolic function is decreased during periods of inactivity and sleep. Therefore it is not only the amount of O_2 that is being delivered to the cells that is important but also the amount of O_2 being used by the cells during metabolism.
If prolonged, hypoxia results in impaired cellular metabolism, cellular dysfunction, cellular organ failure and eventually cell death
As you can see all cells in the body require O_2 for survival. The provision of this O_2 to the cells depends on a number of factors which for ease of understanding will be described as links in a chain



Anything which compromises a link in the chain will impact on the amount of oxygen that can reach the cells and therefore cellular metabolism. A number of causes of hypoxia are listed here but this is only a sample.

1. Impaired ventilation of the lungs – asphyxia, hypoventilation, flail chest
2. Impaired gas exchange in the alveoli – pneumonia, acute pulmonary oedema, emphysema, atelectasis & pulmonary embolus
3. Inadequate haemoglobin – anaemia, carbon monoxide poisoning
4. Inadequate circulation – shock (septic, cardiogenic, haemorrhagic),
5. Impaired gas exchange at cellular level – localized blood clot, interstitial oedema, metabolic alkalosis e.g. excessive vomiting
6. Increased oxygen demand beyond availability – sepsis, major tissue injury, excessive muscular activity e.g. epileptic convulsions

Remember that the body has an amazing ability to compensate. When one component of the body is not functioning at its optimal level, another will compensate to maintain homeostasis up to a certain point. It may be that only when this point is reached and exceeded that you will see any signs & symptoms

CAN YOU THINK OF ANY PATIENTS YOU HAVE NURSED WHO HAVE HAD A CONDITION THAT FALLS INTO ANY OF THE ABOVE CATEGORIES?
IF SO DO YOU THINK THEY WERE ADEQUATELY OXYGENATED?

MANAGEMENT OF A PATIENT WITH HYPOXAEMIA

The management of a patient with hypoxaemia is a four step process that is within the domain of nursing practice and can be performed by any Registered Nurse. Completing the four steps will ensure optimal O_2 therapy and patient management to minimise tissue hypoxia.

The 4 steps in caring for a patient with hypoxaemia are

1. Accurate assessment of the need for oxygen.
2. Selection of appropriate oxygen delivery device.
3. Selecting the appropriate flow rate for the device and the clinical context
4. Assessment and manipulation to meet the patients oxygen requirements

Escalate care where appropriate according to your hospital escalation protocol in response to clinical deterioration

AND DON'T FORGET DOCUMENTATION OF ALL OF THE ABOVE

Remember that the rate and depth of breathing in people with normal respiratory function is determined by the level of CO_2 in the blood. When the CO_2 becomes too high breathing is increased and visa-versa. However a person with chronic lung disease e.g. COPD may have lost this form of respiratory drive, as their body is used to functioning with a higher level of CO_2. Therefore they will rely on their level of O_2 to determine their level of breathing (this is called a hypoxic drive) providing these patients with supplemental O_2 may actually depress their respiratory function and worsen their condition. O_2 delivery in these patients must be carefully titrated & monitored

ASSESSMENT OF PATIENTS OXYGEN REQUIREMENTS

It is important to undertake an accurate assessment of all patients, to ascertain their O_2 requirements.

Remember that not all patients who require O_2 present with a lung problem or even as dyspnoeic e.g. patients with respiratory depression need supplemental O_2 as well as other interventions

This will ensure that the most appropriate nursing care and treatment can be administered and evaluated effectively. As Basic Life Support providers we are all familiar with the "Look, Listen & Feel", method of assessing adequate ventilation. This term can also be applied when assessing patient's O_2 requirements. With vital signs and oximetry this ensures a thorough and systematic approach.

"Look, Listen & Feel" is often carried out by nurses when performing a patient assessment without the nurse appreciating the importance of the practice. The WOB and the effectiveness of breathing are being evaluated. (WOB is normally quiet and accomplished with a minimum of effort). When a patient becomes dyspnoeic the WOB increases assessment can be broken down into "Look, Listen & Feel", vital signs and SpO_2:

Look

- Rate of breathing
- Respiratory pattern depth and regularity
- Posture - patients with orthopnoea have an inability to breathe when supine
- Use of accessory muscles
- Nasal flaring
- Chest movement
- Sweating
- Restlessness, mental status
- Colour of skin and mucous membranes – cyanosis is a late sign of respiratory insufficiency
- Sputum

Listen

- Abnormal breath sounds
- Can the patient talk in sentences or single words only
- What the patient is telling you – are they orientated or confused, what **they are** saying about their breathing.
- Cough

Feel

- Skin - hot and sweaty or cold and clammy
- Chest movement – equal or not equal
- Fremitus – (ask the patient to say ninety-nine whilst placing your hands over the patients upper back if you can feel the vibrations in your hands as they say the words this is vocal fremitus and indicates consolidation in the lung tissue below)
- How does the patient feel – pain, fatigue, hot and sweaty or cold and clammy

Vital Signs

- Heart rate
- Blood pressure
- Temperature
- Respiratory rate
- SpO_2

How would you measure mental status?
Which is worse, restlessness or lethargy?
Which is worse, a rapid respiratory rate or a low respiratory rate?
Which is worse, tachycardia or bradycardia?
What effect does a low BP have on tissue oxygenation?
When should you take a SpO_2

When observing the above signs and symptoms it is important to analyse trends as well as actual numbers. Therefore baseline observations at the beginning of a shift are vital.

Escalate care where appropriate according to your hospital escalation protocol in response to clinical deterioration

The introduction of track & trigger observation charts facilitates this process.

PULSE OXIMETRY

Pulse oximetry is a simple non-invasive method of measuring the percentage of haemoglobin which is saturated with O_2 it also measures the pulse rate SpO_2 is now broadly considered the fifth vital sign and as such it should be recorded every time vital signs are taken.

A pulse oximeter uses a probe containing LED's with a photoreceptor situated directly apposed. This photoreceptor detects the ratio of absorbed light to transmitted light which gives you the SpO_2 reading.
Oxygen is carried in the blood in 2 ways:

1. Bound to haemoglobin (97%)
    - measured by oximetry, normal SpO_2 94-99%
2. Dissolved in blood (3%)
    - measured by ABG'S, normal PaO_2 80-100 mm Hg

Pulse oximetry measures the percentage of Hb that is saturated with oxygen in arterial blood. Because it measures the oxygen level in arterial blood it is very dependent on the arterial blood flow. Anything which compromises arterial blood flow will affect the SpO_2 reading.
In the lung capillaries the pressure of O_2 is high and Hb becomes almost completely saturated with O_2. At tissue capillaries the O_2 pressure is lower and some of the O_2 ***dissociates*** (leaves) the Hb and diffuses (moves) into the tissues.

Arterial O_2 saturation	normal	94-99%
Venous O_2 saturation	normal	70-75%

Therefore the expected value for a SpO_2 in a normal fit person would be > 95%

A patient with severe, chronic lung disease and a hypoxic drive as mentioned previously may normally have a SpO_2 around 90%. However SpO_2 levels below 88 – 90% are inadequate to maintain oxygenation of the cells, therefore these patients will require supplemental O_2 probably at a lower rate than you would normally consider.

Oxygen-Haemoglobin Dissociation Curve

The oxyhaemoglobin dissociation curve illustrates the relationship between oxygen saturation of hemoglobin (SpO_2) and the partial pressure of arterial oxygen (PaO_2).

The amount of O_2 bound to Hb is determined by the PaO_2 in a relationship termed the oxy-Hb dissociation curve. (Figure 1)

An initial decrease in the PaO_2 is not demonstrated by a similar drop in SpO_2 early hypoxaemia may be masked. As you can see from looking at figure 1 the SpO2 is around 90% but the PaO2 may already have dropped to 60mmHg. There is very little increase in saturations for increases in PaO_2 above 60 mmHg, whereas relatively small changes in PaO_2 (partial pressure of oxygen in arterial blood) below 60 lead to large changes in saturations. The PaO_2 of normal venous blood is 75%, corresponding to a PaO_2 of 40 mmHg.

Oxygenation failure is usually defined as an arterial oxygen tension of less than 60 mmHg (arterial oxygen saturation of < 90% SpO_2). Because oxygen delivery to the tissues is a function of cardiac output & haemoglobin oxygen saturations; oxygen delivery drops quickly at these levels, potentially causing tissue hypoxia and death.

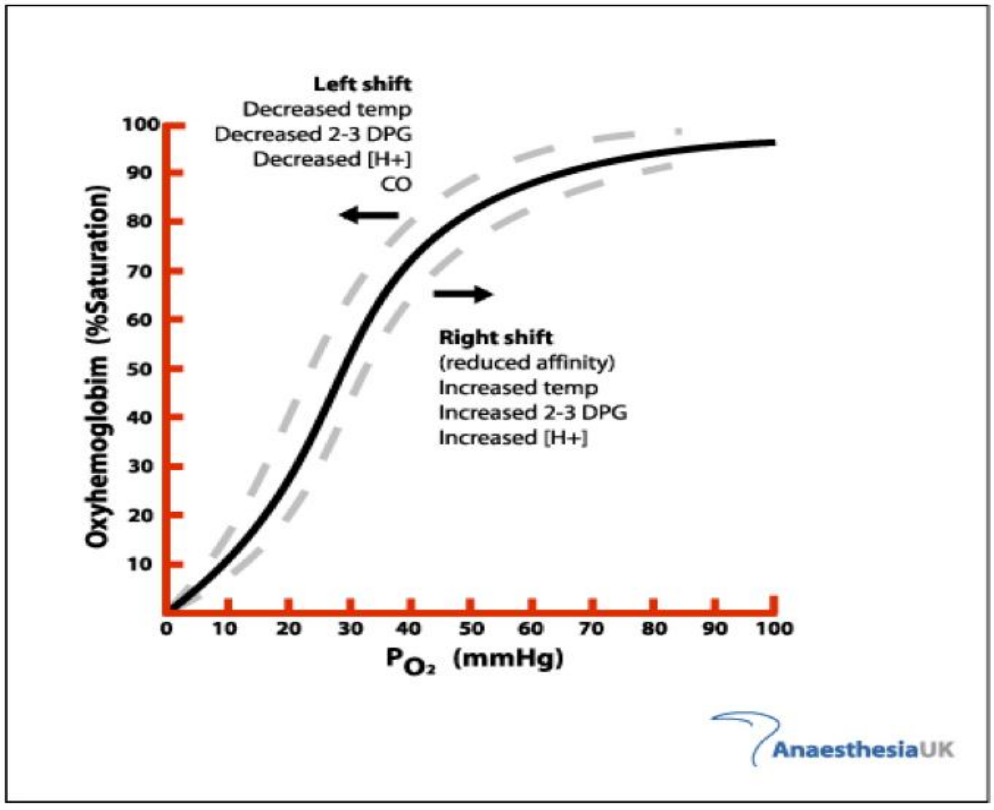


Figure 1: Oxygen-Haemoglobin Dissociation Curve

Other factors may influence the affinity of O2 to Hb causing the curve to move to the right or left as pictured in ***Figure 1***

PERFORMING PULSE OXIMETRY

Each health service will have their own machine and guidelines for use so please refer to these. However the basic principles are the same

Usually pulse oximetry is performed at frequent intervals e.g. with post-operative observations however some patients require continuous monitoring of their SpO_2 for a prolonged period of time. The following instructions are applicable to both situations however some of the steps are only necessary with prolonged monitoring.

1. Collect Pulse Oximeter
    - Most health services will have a pulse oximeter as part of the non – invasive blood pressure monitor
    - Or it may be a stand-alone unit
    - Check that the machine is working and the battery is charged, attach to a power source if necessary
2. Select and prepare site
    - Select site – usually finger, feet or hands in babies, ear lobe or bridge of nose
    - Check that the patient has an adequate pulse to the selected limb and good capillary refill
    - Check skin is not broken, oedematous or hypothermic and remove nail polish and clean the skin if necessary
    - If possible avoid limbs with a pressure dressing, arterial or intravenous line or a BP cuff
    - It may be necessary to warm a hand to obtain accurate readings
3. Attach the sensor probe according to the manufacturer's instructions and the health services guidelines
    - Ensure the probe is the right way up on the finger
    - Only use tape to hold in place if necessary e.g. young children
4. Take the patients pulse manually and check that it corresponds with the waveform or the beep
    - If different check probe placements or change sites if patient is peripherally shutdown.
5. If appropriate set alarm limits according to the patient's condition, doctors' orders or the health services policy
6. Monitor the patient appropriately
    - Document the SpO_2 as required for the patient's condition
    - Escalate care in response to any decreases in SpO_2
    - Check probe site and rotate as required, usually 2 hourly for probes and 4 hourly for adhesive sensors
7. Once monitoring is completed remove sensor and clean according to manufacturer's instructions, some machines have disposable probes
8. Document – SpO_2 should be documented every time the vital signs are taken with the time and date. If the patient is being monitored continuously the location of sensor and condition of skin should be noted on progress notes

Tips for Oximetry

- Check pulse rate on oximeter with palpable pulse rate. Both pulse rates should be the same. If not the SaO_2 will be inaccurate
- Good contact between top and bottom of probe with patient's digit is essential
- If the patient is cold and or peripherally shut down it will be difficult to get a reliable reading from a peripheral site e.g. fingers; try the earlobe or bridge of nose instead.
- Inaccurate readings can result when the digits are stained (nail polish, nicotine, bruising) or thick nails.

Troubleshooting

1. Unable to pick up signal
   - Evidenced by - flattened waveform, pulse bar not travelling all the way to the top, SpO_2 reading flashing
   - May be due to reduced peripheral blood flow (hypovolaemia, severe hypotension, cold, cardiac failure, some cardiac arrhythmias) or peripheral vascular disease
   - Warm limb if cold; change probe site may need to use more central site e.g. earlobe or bridge of nose
2. Reading lower than expected – may be due to venous congestion from restriction of blood flow <u>from</u> the limb this can be caused by an intravenous infusion
   - Change probe site to limb without IV

   May also be due to badly positioned probe
   - **<u>Ensure the right type of probe is being used for the site</u>** and reposition if necessary.

   Nail varnish may cause falsely low readings
   - Remove nail varnish
3. Bright overhead lights e.g. phototherapy lights, procedure lights, may interfere with some probes
   - Cover probe with an opaque material to cut out excessive light
4. High/normal reading – not corresponding to the patients clinical picture
   - Low haemoglobin, if the patient is anaemic the machine will record an inaccurately high reading as the small amount of available haemoglobin in the blood may be saturated. Therefore an anaemic patient may have a normal SpO_2 but will still be suffering hypoxaemia
   - Pulse oximetry cannot differentiate between normal oxygen saturated haemoglobin and carboxyhaemaglobin (haemoglobin combined with carbon monoxide). In this case the machine will overestimate the saturation. This can happen in patients with carbon monoxide poisoning **<u>and immediately post cigarette smoking.</u>**

Limitations of pulse oximetry
Pulse oximeters only monitor the patients SpO_2 without measuring CO_2 and considering Hb. Therefore it is limited in the assessment of patients developing respiratory failure due to CO_2 retention.

Remember pulse oximetry is only one tool in assessment of patients' respiratory status. To get an accurate assessment of the patients' condition the nurse must consider all observations that assess ventilation, circulation, gas exchange and O_2 carrying capacity. An accurate thorough assessment needs to include "Look, Listen & Feel", vital signs, SpO_2 and a patients' Hb.

Now that we have ascertained that the patient requires O_2 therapy we need to choose the best method for providing it.

OXYGEN THERAPY

Aim of oxygen therapy
The goal with O_2 therapy is to keep the patients -

- PaO_2 > 60 (normal 75-100 mmHg)
- SpO_2 > 95% (normal > 94%)

Correct hypoxaemia
↓ WOB
Provide adequate O_2 delivery to the tissues

Myths and facts about o_2 therapy
1. High concentrations of O_2 therapy can cause O_2 toxicity.

- Need 50% O_2 concentration > 24/24 (100% > 6/24)
- More common in ventilated patients with high O_2 concentrations over extended period of time

- Nitrogen, which stays in alveolus & keeps them open during expiration, is washed out. Causes partial alveolus collapse = ↓*absorption and atelectasis*
- Exposure of pulmonary tissue to high O_2 concentrations
  → O_2 free radicals
  → Pulmonary tissue damage. Prolonged exposure
  → ARDS (Acute Respiratory Distress Syndrome)
- Termination of high O_2 concentration allows cellular repair to begin

2. Giving chronic respiratory patient high concentrations of O_2 will decrease their respiratory drive.

- Due to chronic high CO_2 levels respiratory drive stimulated by ↓ O_2 level
- If a chronic respiratory patient SpO_2< 90% = PaO_2 < 60 mmHg
- PaO_2 < 60 mmHg is inadequate for tissue oxygenation

Commence O_2 < 30% and observe response. If oxygenation remains inadequate need close observation (generally require to HDU/CCU or another hospital with these facilities), an ↑ O_2 percentage may need ventilation (non-invasive/invasive)

Never withhold O_2 therapy from an obviously hypoxic patient
Lowest O_2 percentage to achieve sufficient SpO_2 is the right amount.

METHODS OF OXYGEN DELIVERY

Method of delivery depends on:

- Concentration of O_2 required
- Patient's compliance
- Underlying disease process

Low flow systems

Patient entrains (breaths in) room air as well as inspiring O_2 enriched gas from a reservoir.

Nasal Prongs

- 24-40% @ 1-4 lpm
- Need clean nares & minimal mouth breathing
- Flow rate > 4 lpm → nasal irritation, epistaxis
- Advantages
  - simple to use
  - able to talk
  - able to eat & drink
- Disadvantages
  - Nasal irritation
  - Difficult to predict exact O_2% delivered
- Indications
  - Long term O_2 therapy
  - Meal times if clinical condition and SpO_2 allow

Hudson Mask or Medium Concentration Oxygen Mask

- ↑ O_2 reservoir
- 40-60% @ 6-8 lpm
- Flow rate needs to be > 6 lpm to prevent collection of expired gases → rebreathing of expired CO_2 (CO_2 retention)
- Vent holes on side for entrainment of room air & release of exhaled gases
- Advantages
  - higher O_2 concentrations possible
  - more accurate
  - economical
  - quick, convenient
- Disadvantages
  - < 6 lpm risk of CO_2 retention
  - claustrophobic
- Indications
  - post operatively
  - chest pain (only if SpO2 ↓93% or in the event of shock symptoms)

High flow system

Venturi Mask

- O_2 % set at 24-50% according to dial on mask attachment
- Flow rate according to lpm
- Entrained air ↓ as O_2 % and flow rate ↑

Advantages

- Precise O_2 concentration
- Able to use a mask on COPD patients

Disadvantages

- Cost
- Set up

Indications

- COPD patients requiring > 28% O_2

Recommended flow rates for the Gabe Med brand of Venturi masks (other brands may use different colours and flow rates)

OXYGEN %	FLOW RATE	DILUTER COLOUR
24%	4 LPM	BLUE
28%	4 lpm	YELLOW
31%	6 LPM	WHITE
35%	8 LPM	GREEN
40%	8 LPM	RED
50%	8 LPM	ORANGE

Non- rebreathing mask

- Face mask with O_2 reservoir bag attached (similar to an air viva)
- Has one way valves between reservoir bag & mask & over exhalation ports of mask
- Prevents exhaled gases from entering reservoir bag & the entrainment of room air
- Flow rate adjusted to prevent reservoir bag from deflating on inspiration
- Short term 24 hours or less
- FiO_2 80-90%

Advantages

- Able to achieve high O_2 concentration quickly
- Minimal equipment required

Disadvantages

- Never let bag deflate
- Requires high flow rate to avoid CO_2 retention

Indications

- Whenever a high O_2 concentration is required in a hurry e.g. Trauma, shock, pulmonary embolism
- Commonly used by ambulance officers and emergency departments

OXYGEN PERCENTAGE	FLOW RATE
80%	10 LPM
85%	11LPM
90 -95%	12 LPM

All methods using a facemask require a snug fitting mask to achieve prescribed O_2

Nursing considerations

Irrespective of the type of O_2 delivery system used there are some fundamental nursing considerations that apply to all patients receiving O_2 therapy

- Check SaO_2 and patient's condition / response to therapy regularly to ensure O_2 level is adequate
- Frequently check tops of ears (and nares with nasal O_2) for signs of pressure
- Ensure adequate seal of mask to face to minimise air entrainment

<u>Humidification</u>

Humidification is recommended, as O_2 is dry and irritating and can cause the mucous membranes lining the respiratory tract to become dry. Lack of humidification can cause tenacious sputum and sputum retention and inflame mucous membranes leading to sputum production.

Indications

1. Patients requiring O_2 therapy at flow rates > 4 lpm for 6 hours or longer
2. All asthmatic patients requiring O_2 therapy
3. Patients requiring O_2 therapy via a tracheostomy tube
4. Patients with thick, tenacious sputum

THINK ABOUT PATIENTS YOU HAVE NURSED WHO FIT THIS CRITERIA HAVE THEY RECEIVED HUMIDIFIED O_2?

<u>Fisher-Paykel Humidifier/ Aquapak</u>

- O_2 28- 90%
- High flow needed

Advantages

- Provides heat & humidity
- Allows high O_2 concentration

Disadvantages

- Time to set up
- Expense
- Flow compromised at high O_2 percentages

Indications

- Sputum retention
- Hypoxia needing higher O_2 percentages
- Tracheostomy

% O_2	Recommended O_2 Flow (lpm)	Total Flow to patient (lpm)
28%	4 lpm	45 lpm
29%	4 lpm	40 lpm
30%	5 lpm	44 lpm
40%	10 lpm	42 lpm
50%	15 lpm	42 lpm
60%	15 lpm	30 lpm
70%	15 lpm	24 lpm
80%	15 lpm	20 lpm
90%	15 lpm	17 lpm

For the Fisher-Paykel Humidifier/ Aquapak the range for adults is 28 – 50 % and for children it is 28 – 90 %

Nursing considerations

- Assess patients breathing frequently including SpO_2
- Ascertain patients comfort level with mask and heat level
- Check tubing for kinking or excessive condensation. Excessive condensation is defined as more than one quarter of the tube blocked with water. Drain the condensation back to the chamber and turn the heater control setting down
- Change water bag when empty
- Change circuit tubing every 7 days.
- Always mount humidifiers lower than the patient, to enable condensation to run back into the water chamber to prevent tracking back to the oxygen delivery interface

EVALUATING THE EFFECTIVENESS OF O_2 THERAPY

When a patient has been prescribed O_2 therapy the nurse needs to evaluate the effectiveness of the O_2 therapy as the patients' needs for O_2 may fluctuate as their conditions changes. Regular observations need to be performed to detect patient compliance with the O_2 therapy and reassessment of the signs and symptoms of hypoxaemia. O_2 therapy should be discontinued when no longer required.

Compliance

The patient will not benefit from any form of O_2 therapy if they are non-compliant. Ways to ensure compliance are:

- Education of patient and family
- Reassurance
- Comfort
- Position

- Adequate flow
- Adequate length of tubing
- Oral hygiene

Assessment
- Look, Listen & Feel
- Vital signs
- SpO_2

Remember we are looking for signs of improvement and deterioration. Escalate care in response to clinical deterioration according to hospital protocol

DISCONTINUING O_2 THERAPY

Patients should have their O_2 therapy discontinued when their clinical condition demonstrates that it is no longer required. However if the patient has been receiving high O_2 concentrations this should be weaned down slowly with continuous or at least very frequent measurements of their SpO_2. This frequent monitoring should continue once the patient is on room air in case their condition deteriorates again.
The criteria for discontinuation is

1. Underlying condition has been treated
2. Dyspnoea improved/resolved
3. SpO_2 > 95 % or predicted value on room air
4. Signs of hypoxaemia are no longer present
5. Vital signs are within expected limits for that patient

Consultation amongst the treating team should also occur prior to discontinuing oxygen therapy.

REPORTING & DOCUMENTATION

As with all nursing observations, management and careful assessment of patients oxygen therapy requires accurate documentation and escalation of care in response to clinical deterioration. Documentation is required not only as a record of what care has been given but also to communicate what has been done to other members of the health care team caring for the patient. If it is not accurate and legible it may be misinterpreted or ignored. Do not use inappropriate abbreviations.

- Ensure **all** observations are recorded on the observation chart
- Any **variances** need to be written in progress notes
- When applicable increase frequency of observations
- Document all interventions and patient response to those interventions
- Documentation of escalation of care if applicable
- Clear documentation of escalation process & responses

Example of variance

Patient noted to be severely dyspnoeic at 1000 hours.

- T 37.4^{C}
- P 112
- RR 28
- BP 172/98
- SpO_2 85%
- Obvious use of accessory muscles
- Patient sweating, anxious and distressed.

Nurse immediately initiates O_2 via Hudson Mask @ 6 lpm (patient does not have COPD). Patient reassured. Care escalated and patient monitored for response to O_2 therapy, observation frequency increased & medical review requested (as per escalation protocol). Medical review & chest x-ray ordered.

At 1015 hrs

- T 37.4^{c}
- P90
- RR 20
- BP160/92
- SpO_2 96%
- Minimal use of accessory muscles, patient no longer distressed or sweating.

Patient carefully monitored for further deterioration/improvement. Further medical review planned following chest x-ray.

Each health service will have their own requirements regarding the documentation required for a patient receiving O_2 therapy so please refer to your individual hospitals guideline. However the basic principles are the same.

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Written Assessment

Administering oxygen therapy

Student Name:

Please circle the correct answer

1. **What is the major component of room air?**

a) Argon
b) Carbon dioxide
c) Oxygen
d) Nitrogen

2. **What is a late sign of hypoxaemia**

a) Change in mental state
b) Cyanosis
c) Dyspnoea
d) Increased blood pressure

3. **Which of the following is not a cause of impaired gas exchange at the alveoli**

a) Atelectasis
b) Flail Chest
c) Pneumonia
d) Pulmonary embolus

4. **A patient who has what is termed a "hypoxic drive"**

a) Their level of breathing determined by their oxygen level
b) Their level of breathing determined by their CO_2 level
c) Can hold their breath for a long period of time
d) Does not get puffed when they run

5. **The minimum expected SpO_2 of a fit person with normal respiratory function would be**

a) 85%
b) 90%
c) 94%
d) 98%

6. **Which of the following would not cause a false high SpO_2 reading**

a) Carbon monoxide poisoning
b) Cigarette smoking
c) Low haemoglobin
d) Black nail varnish on the finger on which the probe is situated

7. If a patient with COPD is becoming increasingly dyspnoeic and showing signs of hypoxaemia should commence O_2 therapy

a) At a lower level and monitor closely
b) In an ICU so they can be intubated quickly if they stop breathing
c) Never give them O_2 under any circumstances as it will make them stop breathing
d) If the O_2 can be provided with a humidifier as they have dry secretions

8. The highest percentage of O_2 that can be delivered with any mask delivery system is

a) 50%
b) 70%
c) 90%
d) 100%

9. Which of the following patients should always receive humidified O_2

a) Patients with COPD
b) Patients with pulmonary embolus
c) Patients with asthma
d) Patients with acute pulmonary oedema

10. O_2 therapy can be discontinued on a patient when

a) When the patient feels they have had enough
b) When the patient can maintain an adequate SpO_2 on room air
c) When the patient wants to talk to their visitors
d) When the oxygen cylinder runs out

CLINICAL SKILLS COMPETENCY: Care of the patient receiving oxygen therapy

NAME:_____ **DATE**:_____

DEMONSTRATES: The ability to provide oxygen therapy and evaluate the effectiveness	**CRITERIA** **C** = Competent **S** = Requires supervision **D** = Requires development		
PERFORMANCE CRITERIA	**C**	**S**	**D**
Assesses patient to ascertain level of O_2 therapy required			
Identifies indication for O_2 therapy			
Obtains necessary equipment – pulse oximeter, correct mask etc. for level of O_2 required			
Gives patient a clear explanation of procedure			
Hand hygiene performed throughout			
Selects and prepares appropriate site for pulse oximetry sensor			
Attaches sensor probe			
Obtains a valid reading of SpO_2			
Demonstrates ability to troubleshoot e.g. chooses a different site if having difficulty obtaining a reading.			
Provides O_2 to patient with the appropriate mask and flow rate			
Takes measures to ensure patient compliance – e.g. education, ensuring comfort, oral & nasal hygiene			
Monitors patient appropriately			
Evaluates effectiveness of O_2 therapy			
Cleans, replaces and disposes of equipment appropriately			
Documents and reports relevant information			
Demonstrates ability to link theory to practice			

COMMENTS_____
_____
_____
_____

COMPETENT **YES**

NOT YET – REQUIRES FURTHER SUPERVISION

NOT YET – REQUIRES FURTHER DEVELOPMENT I.E. RE READING THE PACKAGE

Registered Nurse_____

Educator_____

CARE OF PATIENT RECEIVING O_2 THERAPY

Date: _____ How long did this Module take to complete? _____

Please indicate your response to each of these statements
by ticking the appropriate box and return to Nurse Educator

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Overall, I found this learning module worth while	❑	❑	❑	❑	❑
2. The way in which the learning module presented made it easy to understand	❑	❑	❑	❑	❑
1. My knowledge of this topic was improved after completing this learning module	❑	❑	❑	❑	❑
2. My skills in this area have been enhanced since completing this learning module	❑	❑	❑	❑	❑
3. The resources provided were sufficient for me to answer the test adequately	❑	❑	❑	❑	❑
4. I would recommend the Care of patient receiving O_2 therapy learning module to others	❑	❑	❑	❑	❑
5. I will be able to apply knowledge and skills acquired in my clinical practice	❑	❑	❑	❑	❑

Comments (Optional)

_____

_____

Thank you for taking the time to complete this evaluation. Your comments are valued and appreciated. Please return this form to your Nurse Educator