

GUIDELINES FOR THE MANAGEMENT OF OXYGEN THERAPY

AIM

To supplement oxygen intake using the appropriate equipment in order to correct hypoxia and relieve breathlessness.

SCOPE

This procedure applies to health care workers who have been trained and who are competent to administer oxygen.

PRESCRIPTION

Oxygen should be treated as a drug and should be prescribed by a doctor on the prescription sheet to ensure that oxygen delivery is optimal and non-iabrogenic.

Oxygen may be listed as a discretionary medicine if to be delivered in emergency situation without prescription.

INDICATIONS

The administration of supplementary oxygen is used in the management of conditions, which may result in hypoxia

1. Respiratory failure = failure of oxygen to reach the blood in the lungs et acute infections, chronic airway disease and asthma.
2. Heart failure = failure of oxygen rich blood reaching the tissues.
3. Inadequate ability to transport oxygen eg anaemia, carbon monoxide poisoning.
4. Inability to use oxygen in metabolism eg cyanide poisoning - this is a rare occurrence.

5. Illness affecting the lungs ability to transmit oxygen from Alveoli into the blood stream, inc Fibrosing Alveolitis, Soroidosis.

COMPLICATIONS

1. Suffers of chronic obstructive airways disease with carbon dioxide retention frequently depend on a “hypoxic drive” to maintain ventilation. High concentrations of O₂ may reduce this drive. Oxygen should only be administered in the first instance in low percentages and the patient closely observed for signs of CO₂ retention.
2. Retinal damage (Retrolental Fibroplasia) leading to blindness in neonates may occur with inaccurate oxygenation therapy. All oxygen therapy in the new born should be monitored continuously.
3. Pneumonitis and formation of hyaline membrane within the alveoli may result in reduced gas exchange and atelectasis.

GENERAL POINTS

1. Oxygen is combustible therefore to reduce the danger of fire it is necessary to:-
 - a) Place a NO SMOKING sign in view of patients and relatives and inform them of the dangers.
 - b) Avoid using oils, grease, parafin gel (vaseline) or facial gel on oxygen connections. If lubrication is required KY jelly is preferred.
 - c) Avoid using alcohol and ether based products in the vicinity of oxygen therapy.
 - d) Oxygen cylinders should be secured in an upright position.
 - e) A fire extinguisher should be readily available

2. Oxygen is dispensed from a cylinder or piped system and requires:-
 - a) A reduction gauge to reduce the pressure to that of the atmosphere.
 - b) A flow meter to regulate the control of oxygen in litres per minute.
(NB not always on PD cylinders).
3. Oxygen supplied from cylinders or piped sources is dry and may create drying of mucous membranes of the air passages when using oxygen masks. Ambient air which mixes with oxygen during inspiration contains enough water vapour to prevent drying out of air passages.

Humidification is required when administering oxygen via a tracheostomy; It is occasionally required when using nasal cannulae.

METHOD OF ADMINISTRATION

The equipment used to convey oxygen from the cylinder or pipeline to the patient consists of a pressure gauge, regulator (optional), flow meter, tubing, mask or nasal cannulae and humidifier (if required).

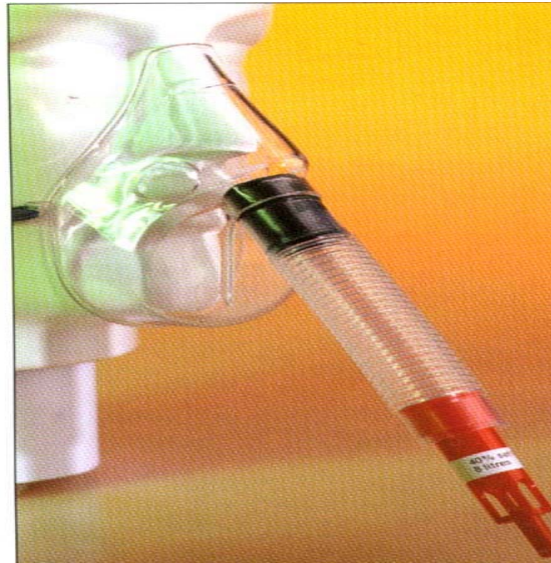
1. **MASKS**

- a) ***Ventimask*** :- These masks have colour coded adapters which by stating the flow rate to be used enable a given concentration of oxygen (as prescribed) to be administered eg 8L per minute of oxygen delivered via a yellow adapter will enable the patient to breath an atmosphere containing 35% oxygen.

Oxygen enters the mask through a narrow jet opening, thereby increasing the speed of the flow. Room air is drawn through the ports, mixing with the steam of oxygen giving the desired oxygen concentration.

(see diagram 1)

Diagram 1



- c) **M C Mask**:- This is a soft plastic mask with a central bore and is connected via oxygen tubing to the oxygen supply. Vent holes are incorporated into the design to allow the clearance of expired carbon dioxide and to prevent the development of high pressures. This mask **MUST NOT** be used if accurate percentages are required. This mask delivers an oxygen concentration between 40 and 60%, but concentration is not always accurate. (see diagram 2)

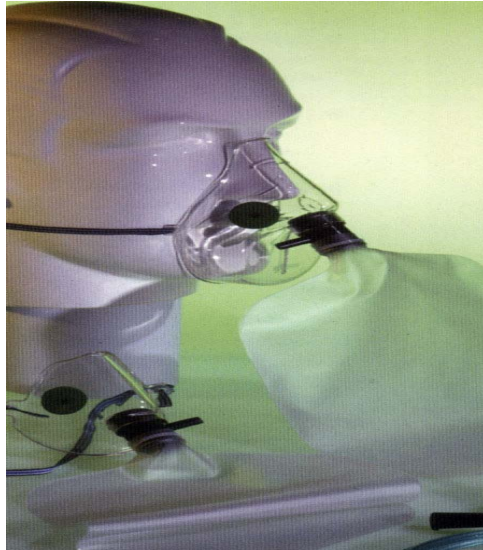
Diagram 2



High Concentration Mask / Non re breathing (trauma mask)

This mask delivers an oxygen concentration of between 60 and 90% (see diagram 3)

Diagram 3



NASAL CANNULAE

These consist of a pair of tubes approximately 2cm long, placed in the patients nostrils and the tubing connected directly to the oxygen flow meter. They may be used as an alternative to masks, especially if used in patients who require a low supplement of oxygen. However, they do not deliver as predictable a percentage of oxygen as the ventimask. They may also be used for patients who cannot tolerate facial masks. Nasal cannulae are the preferred choice for patients receiving long term oxygen therapy. (see diagram 4)

Diagram 4



3. **AMBU BAG**

A self inflating rubber bag. One end is fitted with a one way air valve and a connection for attaching tubing to the oxygen supply. The other end is connected either via an angle mount to a face mask , or a catheter mount to a tracheal tube.

The percentages of oxygen delivered will depend on the flow rate and volume of bag. This method is usually used for resuscitation procedures.

4. **WATERS CIRCUIT**

Usually consists of a 2 litre rubber bag fitted to an adjustable release valve attached to the oxygen supply and to the patient via a catheter mount and tracheal tube, or angle mount and face mask. This will deliver 100% oxygen and require additional training in it use.

5. **MECHANICAL VENTILATION**

This is a specialised area, and has therefore not been covered by this procedure.

6 HUMIDIFICATION

Humidification of oxygen is desirable as the administration of oxygen without humidification can result in the retention of secretions with small areas of the lung collapsing.

Humidification can be achieved using either a hot or cold water system or in some cases a heat and moisture exchanger (HME). Advice should be sought from either the Respiratory Nurse Specialist or Medical staff on which option is the preferred system to be utilised.

REFERENCES

1. The Royal Marsden Hospital (2000). Manual of Clinical Policies and Procedures. Blackwell Science.
2. The why, where and how of Oxygen Therapy, Lifecare Hospital Supplies.

REVIEW

As national, regional, local or professional bodies require.

NB: Photographs kindly reproduced with agreement with Lifecare Hospital Supplies