Appendix 3
OXYGEN ADMINISTRATION AND CONTROLLED VENTILATION

Suffocation

Suffocation (asphyxia) causes a lack of tissue oxygen in the blood. It has many causes other than those arising from chemical poisoning. The latter are principally:

- The air passage may be blocked by vomit, blood or secretions.
- Obstruction to breathing in the throat or the air passage through spasm of the air tubes or by swelling of the linings of the voice box due to irritant fumes.
- Fluid in the lung air spaces (pulmonary oedema) caused by irritant fumes, e.g. by ammonia or chlorine.
- Poisoning of the blood which prevents the carriage or use of oxygen in the body caused by, for example, carbon monoxide, cyanides, or aniline.
- Poisoning of the mechanisms of breathing in the chest (e.g. by organophosphate insecticides) or the brain (chlorinated hydrocarbons).
- Gases which do not support life because they replace oxygen in the atmosphere, e.g. carbon dioxide, nitrogen, hydrogen.

Diagnosis

- There is difficulty in breathing with an increased rate at first (over 30 per minute). Later it may become slow and stop.
- The pulse is rapid, usually over 100 per minute.
- There is blueness of the skin with purple lips and tongue.
- The casualty may be agitated at first but become apathetic, with muscular weakness. Unconsciousness may follow this.
- The pupils of the eyes will react to light at first. If they become large and do not react to light, life is in danger.

Dangers of oxygen

- Spontaneous combustion occurs in the presence of oxygen. For example, a glowing cigarette will burst into flames in an oxygen atmosphere. **Smoking, naked lights or fires must not be allowed in any place where oxygen is being administered because of the fire risk.**
- Oxygen treatment prolonged over many hours can be particularly dangerous to persons with chronic breathing disorders. Too much oxygen impedes the breathing time clock that triggers the natural breathing bellows mechanism.

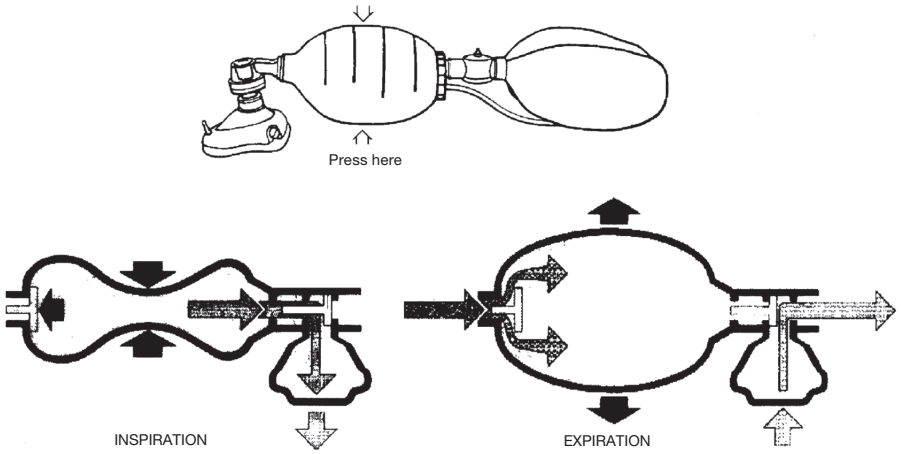
Radio medical advice should always be sought when giving oxygen treatment. Prolonged oxygen treatment should only be given in a shore hospital where laboratory blood gas analysis can be undertaken. Therefore all cases requiring prolonged oxygen treatment should be hospitalized ashore as soon as possible.

Oxygen resuscitation kits

Valve and bag oxygen resuscitation kits are primarily applicable to people who are not breathing. They are intended for use only by trained persons. There are a number of manufacturers marketing these products and training must be related to the manufacturers' instructions relating to the specific model carried on board.

The basic parts of the kit need to be stored assembled correctly in accordance with the manufacturers' instructions and ready for use. Generally they comprise:

- Face mask (sizes varying depending on the size of the face, but for adults usually there are only two sizes, large and small).
- The bag with valve to which the oxygen intake is attached.
- The oxygen reservoir also attached to the bag and valve.



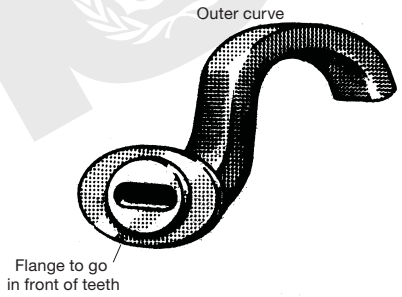
The oxygen supply needs to comprise:

- A cylinder containing medical oxygen (industrial oxygen may contain unsafe impurities).
- A reducing valve with wheel control.
- A pressure gauge and valve with “on” “off” knob.
- Hose connecting the bag to the “on” “off” knob for the valve.

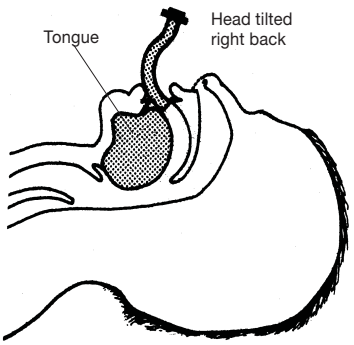
Note: When the kit is operating successfully, oxygen will be heard to be flowing through the tubing. If the cylinder is empty or there is a kink in the oxygen supply tube, the casualty receives air only (21% oxygen). But this is similar to giving ordinary mouth-to-mouth ventilation.

Insertion of Guedel airway

This airway is for use in an unconscious casualty. Select the appropriate size; males usually require the largest size. The function of the airway is to ensure a clear passage between the lips and the back of the throat.

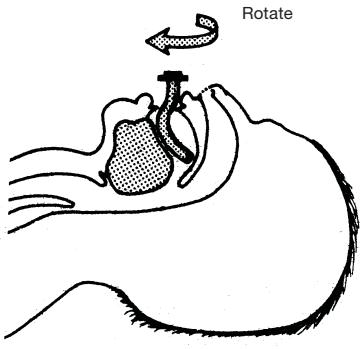


- First remove any dentures and any debris or vomit from the mouth with the fingers. If an electric or manual suction pump with catheter attached is immediately available, use this to clear the air passage. Then, with the head fully back, slide the airway gently into the mouth with the outer curve of the airway towards the tongue. This operation will be easier if the airway is wetted.

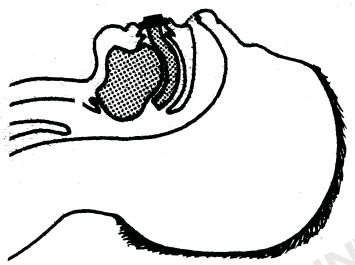


- If there is any attempt by the casualty to gag, retch or vomit, it is better not to proceed with the insertion of the airway. If necessary, try again later to insert it.

- Continue to slide the airway in until the flange of the airway reaches the lips. Then rotate the airway through 180° so that the outer curve is towards the roof of the mouth.

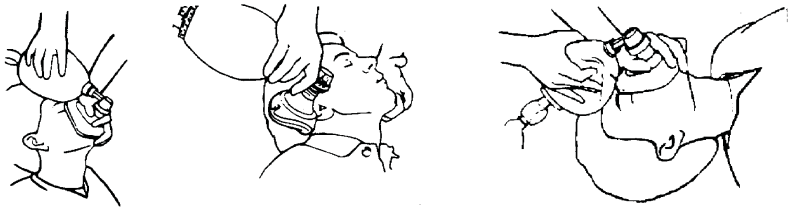


- Bring the jaw upwards and push the airway in until the flange at the end of the airway is outside the teeth (or gums) and inside the lips. If necessary, tape one or both lips so that the end of the airway is not covered by them.



Oxygen for the casualty who is not breathing

- If the casualty does not have a pulse or heart beat, CPR should be performed immediately by a second rescuer. Administration of oxygen as soon as possible is critical.
- A Guedel airway should be inserted. If insertion of an airway cannot be achieved, the chin should be pulled forward throughout the administration of oxygen. If the casualty has seizures due to the lack of oxygen, administration of oxygen may be difficult but is essential.
- Use a positive-pressure manual operated oxygen resuscitator in accordance with manufacturer's instruction. It makes assisted or controlled ventilation possible.
- Oxygen should be used at a flow rate of 8 L per minute. The bag should be squeezed steadily and firmly and released about 12 times a minute. As the bag is squeezed, watch the chest rise and listen for the sound of escaping air which indicates that the face mask seal needs adjusting. It is essential that the face mask is held firmly in place so as to avoid leakage.



- If gagging occurs, remove the airway. Always maintain a regular check on the pulse in the neck. The absence of a pulse indicates the need for 15 chest compressions to every two inflations. Once the casualty is breathing spontaneously, put him in the recovery position.

Oxygen for the casualty who has difficulty in breathing

- Make sure difficulty in breathing is not due to airway obstruction (see **appendix 2**).
- The casualty should be connected to an oxygen-giving set through a simple disposable face mask (non-venturi type) placed securely over the face.
- Oxygen should be used at a flow rate of 6 to 8 L per minute (see appropriate table for recommended setting).
- Oxygen should be continued until the casualty no longer has difficulty in breathing and has a normal healthy colour.