

O₂ therapy has saved many animals! It is cheap, effective when properly administered and generally does not cause harm. Applications include distressed neonates, animals with upper airway obstruction, cardiac dysfunction (low blood flow), respiratory problems including trauma, acute blood loss (> 30% blood volume), low PCV (< 20%), septicemia and intoxications resulting in respiratory dysfunction, such as snake bite or tick paralysis.

Pulmonary dysfunction can cause two problems:

1. Tissue Hypoxia (lack of O₂ delivery to tissue). Causes include low haemoglobin saturation SpO₂ < 90%, low PCV < 20% , lack of blood flow (low O₂ delivery) or a combination of these problems. See AAS Guide to Pulse Oximetry. O₂ Therapy WILL help.

2. Hypoventilation (high arterial CO₂ > 45 to 50 mm Hg or low Minute Ventilation = RR x Tidal Vol. [10 ml/kg/ breath]). Causes include inability to expand the lungs (e.g. pulmonary oedema, open chest wall, pneumothorax, muscle paralysis) or lack of CNS drive for ventilation (e.g. sedation, anesthesia, CNS depression) See AAS Guide to ET CO₂ monitoring. O₂ Therapy MAY help but can further depress ventilation.

Methods for O₂ administration that work



Conventional Face masks:

Simple, quick and effective if O₂ is administered via a **tight fitting** face mask connected to an Anesthetic breathing circuit with O₂ flows around 200 ml/kg/min for at least 5 min. The inspired O₂ concentrations (FiO₂) will be 50% to 90%. If the animal won't tolerate a tight fitting mask, use a larger size mask, remove the diaphragm and place it over the animal's head. Double the O₂ flow and shut the pop-off valve to ensure O₂ flows out of the mask & over the animal's head (a tent effect).

Darvall ZDS Face Masks: Zero dead space

masks don't have to be tight fitting because uni-directional flow eliminates rebreathing of CO₂ (dead space). ZDS masks are ideal for very small animals, reptiles and birds.



Flow 200 ml/kg/min O₂ (FiO₂ 50% - 90%).

Nasal oxygen: Is slow to set-up but most suitable for longer term therapy. In stressed animals provide O₂ via a facemask for 5 min. to reduce distress. Instill 2% lignocaine up to 0.1 ml/kg into one nostril. Typically use a 3.5 to 5.0 Fr vinyl infant feeding tube with female luer end and pre-mark the distance from nares to the medial canthus of the eye. Insert the tube into the ventral nasal passage and glue it to skin beside the nares and then onto the nasal bridge (use a tab of cloth or electrical tape & superglue), then over the head and attach to the collar. Connect to an O₂ flowmeter, preferably with a humidifier via tubing (an old IV set works) & flow 60-100 ml/kg/min (FiO₂ 30% - 50%). Nasal tubes placed prior to the end of anesthesia won't be effective until after extubation. AAS supplies 0 to 2.5 lpm O₂ flowmeters with humidifiers to facilitate nasal O₂ therapy in dogs & cats.

Oxygen via anaesthesia induction chambers:

Potentially dangerous! Long term O₂ cages require airconditioning, CO₂ extractors and humidification.

Animals in sealed boxes rebreathe CO₂ and become hyperthermic so high O₂ flows are required: 0.5 to 1 L/kg/min - FiO₂ will rise over 5 min. > 50%. However O₂ flowing through anaesthesia induction chambers can be useful for acute management of distressed, hypoxic small animals for brief periods. FiO₂ rapidly falls if the chamber is opened.



Nasal O₂ tube in place in a dog with protection from an Elizabethan collar - connects to humidifier



O₂ flowmeter with humidifier

Manual Resuscitators:

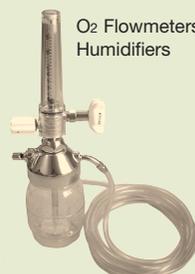
Designed for emergency resuscitation or ambulatory ventilation in intubated animals. Flowing O₂ @ 50 to 100 ml/kg/min into the resuscitator reservoir increases FiO₂ > 50%. Alternatively a conventional face mask can be attached to the resuscitator to provide O₂ in ambulatory or emergency situations.



**1 big ✓
4 O₂ Tx**



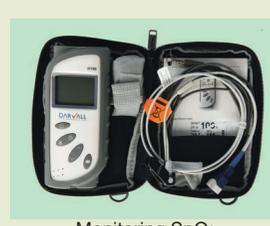
Face Masks
Conventional & ZDS



O₂ Flowmeters &
Humidifiers



Resuscitators



Monitoring SpO₂



Anaesthesia Induction &
O₂ therapy Chambers