

11 EMERGENCY PROCEDURES

11.6 NEONATAL RESUSCITATION

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11.6.2 Airway Management and Mask Ventilation
Section B
Clinical Guidelines
King Edward Memorial Hospital
Perth Western Australia

11.6.2 AIRWAY MANAGEMENT AND MANUAL VENTILATION

This guideline should be used in conjunction with the [NCCU Clinical Guideline – Neonatal Resuscitation Program Algorithm](#). It is recommended that all staff who may be involved in neonatal resuscitation attend a Neonatal Resuscitation Programme course.

KEY POINTS

1. Routine suctioning of the nose, mouth and pharynx at birth is not required.
2. If meconium is present and the infant is not vigorous (absent or depressed respirations and decreased muscle tone), suction with direct laryngoscopy should be performed.
3. Evidence suggests resuscitation with air should be initially used, and supplemented oxygen reserved for infants who do not improve after effective ventilation.¹ The current supply for oxygen blenders at KEMH is initially set at 30% oxygen.
4. Positive pressure ventilation with manual ventilation devices should be initiated when the neonate remains apnoeic after stimulation, or the breathing is inadequate, or when the heart rate is less than 100 beats per minute.^{2,3}

TYPES OF MANUAL VENTILATION DEVICES USED AT KEMH

Self-inflating bag – fills spontaneously after squeezing, drawing in gas (oxygen, air or both) into the bag. Bags used on term neonates require only 15 to 25 mL gas with each ventilation.³

T-piece resuscitator (Neopuff) – works when air from a compressed source flows into the device. The gas can be directed into the surrounding environment or directly to the neonate by occluding or releasing the opening on a T-shaped tube with the finger or thumb. Peak inspiratory pressure (PIP) and positive end-expiratory (PEEP) are set manually with adjustable controls.³

[See NCCU Clinical Guideline The Neopuff](#) regarding settings and use of a T-piece device (referred to as the Neopuff in KEMH).

CHECKING EQUIPMENT

All ventilation devices at KEHM should be checked:

- At a minimum daily, or during each shift (in some areas).
- As part of the routine checking of all neonatal resuscitation equipment in preparation for birth.
- After each use following a resuscitation

Oxygen / Air Supply

- The gas supplied on the Resusitaire cot is a gas mix via a blender to supply 30% oxygen. The gas flow rate is administered at 6 – 8 L/minute.
- See [NCCU Clinical Guideline Air or Oxygen](#)
- The oxygen and air cylinders should be at least half full when checked.

Self inflating bag

Check:

- the device is correctly assembled²
- the reservoir bag is attached²
- function – obstruct the open end where the face mask is attached, squeeze the bag to ensure the pressure is achieved, and the pressure blow off valve opens.²
- to ensure at the completion of the inflation test the bag reinflates quickly²

T piece device (Neopuff)

Check:

- correct function by obstructing the open end where the face mask attaches. Test pressures levels according to the [NCCU Clinical Guidelines The Neopuff](#).

SUCTIONING TO CLEAR THE AIRWAY

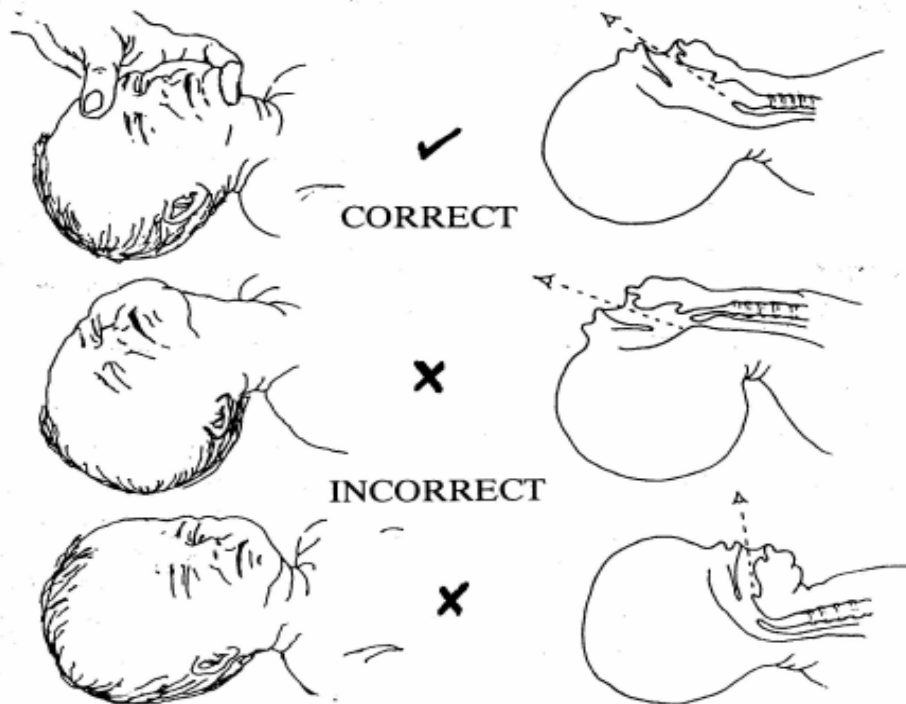
Routine suctioning is no longer recommended at birth.²

MECONIUM STAINED LIQUOR

Immediately after birth in the presence of thick meconium perform direct laryngoscopy and suctioning of residual meconium from the pharynx on neonates who are not vigorous (with absent or depressed respirations and decreased muscle tone).²

POSITION OF THE NEONATE HEAD

Position the neonate's neck in a slightly extended position referred to as the "sniffing position" to maintain an open airway.³



APPROPRIATE MASK SELECTION

- Cushioned faced masks are preferable. The appropriate sized mask should create a seal around the mouth and nose, but not cover the eyes or overlap the chin.
- The mask may be held on the face with the thumb, index, and/or middle finger encircling much of the mask, while the ring and fifth finger lift the chin forward to maintain the airway.³

OPERATOR POSITIONING TO PERFORM VENTILATION

The appropriate position to use the ventilation device effectively is by person perform ventilation positioning themselves at the neonate's side or head. This position allows clear visualisation of the chest and abdomen.³

TECHNIQUE FOR MASK VENTILATION

1. Ensure the airway is open by²:
 - Correctly adjusting the head/neck position to ensure the airway is open
 - Clearing the airway as required
2. Inflate the lungs with sufficient pressure and volume that the chest and upper abdomen move slightly, ensuring chest wall movement appears the same as a normal quiet respiration.² The gas flow rate is administered at 6 - 8 L/minute.
3. The Neopuff ventilation works by placing a finger over the outlet aperture and removing it. This is done approximately 40 - 60 times a minute.²
4. Perform ventilation at a rate of 40-60 breaths per minute.²

SIGNS OF EFFECTIVE VENTILATION

Effective ventilation is observed when²:

- a rise in the chest and upper abdomen is observed with each inflation
- the heart rate is above 100/ min
- the colour of the baby looks pink

If signs of effective ventilation are **not** present:

- airway is not blocked- reposition the head, check for secretions and perform suction as required.³
- ensure the mask is the appropriate size and correct fit.
- reapply the mask and lift the jaw forward^{2,3}
- reassess the ventilation technique
- recheck the device to ensure it is correctly fitted and working. Ensure there are no leaks in the circuit or device.²
- check the gas supply is working
- ensure enough pressure is being given
- consider the use of a Guedal's airway
- reassess the ventilation technique

Prepare for endotracheal intubation if no signs of physiological improvement or adequate chest movement is achieved.³

REFERENCES

1. Morley C. New Australian Neonatal Resuscitation guidelines. **Journal of Paediatrics and Child Health.** 2007;43:6-8.
2. Australian Resuscitation Council. Airway management and mask ventilation of the newborn infant. **Australian Resuscitation Council Guidelines;** 2006.
3. American Academy of Pediatrics & American Heart Association. **Neonatal Resuscitation textbook.** 5th ed; 2006.