



3. BAG AND MASK VENTILATION

3.1 Equipment

3.2 Ventilation

3.1 Equipment

It is important that you become completely familiar with the specific equipment used where you work.

3.1.1. Self-inflating bag

The self-inflating bag is designed to inflate automatically as you release your grip on the bag. It does not require a compressed gas source to fill. You should be able to identify various parts of a self-inflating bag.

As the bag re-expands following compression, gas is drawn into the bag through a one-way valve that may be located at either end of the bag depending on the design. This valve is called the air inlet.

Every self-inflating bag has an oxygen inlet, which is usually located near the air inlet. The outlet is a small nipple or projection to which oxygen tubing can be attached when oxygen is needed.

The patient outlet is where gas exits from the bag to the infant and where the mask or ET tube attaches.

In many self-inflating bags, the valve assembly allows gas to flow from the bag through the patient outlet only while bag is being compressed. Since oxygen flow is not continuous, these bags cannot be used to provide free-flow oxygen.

An oxygen reservoir is an appliance that can be placed over the bag's air inlet. It helps in delivering a high concentration of oxygen to the baby and allows oxygen to be administered in a concentration as high as 90% to 100%.

A resuscitation bag used in neonatal resuscitation has a safety mechanism in the form of a pressure release valve to guard against inadvertent transmission of excess pressure to the baby's lungs. Pressure release valves on self-inflating bags are generally set to release at 30 to 40 cm H₂O. If pressures greater than 30 to 40 cm H₂O are generated as the bag is compressed, the valve opens, limiting the pressure being transmitted to the lungs of infant. The ideal size of the bag for neonates is 240 to 500ml capacity.

3.1.2. Resuscitation masks

Masks come in a variety of shapes, sizes and materials. Resuscitation masks should have cushioned rim for

Fitting mask over face

Right size and position of mask



Right

Mask head too low



Wrong

Mask too small



Wrong

Mask too Large



Wrong



better seal. The rim conforms more easily to the shape of the infant's face, making it easier to form a seal. It requires less pressure on the infant's face to obtain a seal. There is less chance of damaging the infant's eyes if the mask is correctly positioned. Masks come in several sizes. Masks suitable for small, premature infants as well as for term infants should be available for use. For the mask to be of correct size, the rim will cover tip of the chin, the mouth and the nose but not the eyes.

3.1.3 Assembling equipment

The bag should be assembled and connected to oxygen so that it will provide the necessary 90% to 100%. If a self-inflating bag is used, be sure the oxygen reservoir is attached. Connect the mask to the bag.

3.1.4 Testing equipment

To check a self-inflating bag, block the mask or patient outlet by making an airtight seal with the palm of your hand. Then squeeze the bag:

- Do you feel pressure against you hand?
- Can you force the pressure-release valve open?
- Is the valve assembly present and moving as it should?

If not :

- Is there a crack or leak in the bag?
- Is the pressure-release valve missing or stuck or closed?
- Is the patient outlet completely blocked?

If your bag generates adequate pressure and the safety features are working, while the mask-patient outlet is blocked, check to see :

- Does the bag re-inflate quickly when you release your grip?

3.2.1 Preparation

The need for possible resuscitation of a neonate should be anticipated.

Bag -mask ventilation may be attempted in the spontaneously breathing infant who remains cyanotic despite administration of 100% free-flow oxygen.

Bag and mask ventilation is indicated if after tactile stimulation:

- The infant is apneic or gasping*
- Respiration is spontaneous but heart rate is below 100 beats per minute.*

In diaphragmatic hernia, bag and mask ventilation is contraindicated. In meconium stained non-vigorous baby bag and mask ventilation is carried out after tracheal suction (skilled professional is required).

Non vigorous baby: Presence of any one of three signs - limp, cyanotic, HR<100/mt



3.2.4 Select equipment

The first step is to select the appropriate equipment:

- Obtain a resuscitation bag with oxygen reservoir and connect it to any oxygen source.
- Select a mask of the proper size.
- Quickly check the bag to be sure it functions properly (if you did not do so previously).

3.2.5 Position mask and obtain seal

The infant's neck should be slightly extended to ensure an open airway.

Place the mask in position and check the seal by ventilating two or three times. Observe for an appropriate rise of the chest.



If chest does not rise:

Action	Condition corrected
1. Reapply mask	Inadequate seal
2. Reposition infant's head	Blocked airway
3. Check for secretions, suction if present	Blocked airway
4. Ventilate with mouth slightly open	Blocked airway
5. Increase pressure slightly	Inadequate pressure

If chest does not rise, get a new bag, check it, and try again.

Normal Rise: When a normal rise of the chest is observed, begin ventilating.

3.2.6 Ventilate the infant

Rate: 40 to 60 breaths per minute.

Pressure: The best guide to adequate pressure during bag and mask ventilation is an easy rise and fall of the chest with each breath. Usual pressure required for the first breath is 30-40 cm of water. For subsequent breaths, pressures of 15-20 cm of water are adequate.





3.2.7 *Check heart rate*

After the infant received 30 seconds of ventilation with 100% oxygen, check the heart rate. Is the heart rate below 60, between 60 to 100, or above 100 beats per minute?

Heart Rate	Action
Above 100	If spontaneous respirations are present, monitor heart rate, respiration, and color. If not breathing or if gasping, continue ventilation
60 to 100	Continue ventilation
Below 60	Continue to ventilate Begin chest compressions

3.2.8 *Signs of improvement*

Three signs indicate improvement in the condition of an infant undergoing resuscitation:

- Increasing heart rate
- Spontaneous respirations
- Improving color

