PRACTICAL 4  NEONATAL RESUSCITATION

Structure

4.0 Objectives
4.1 Introduction
4.2 Purpose and Indications of Resuscitation
4.3 Preparation for Resuscitation
4.4 The TABC'S of Resuscitation
4.5 Techniques of Resuscitation
  4.5.1 Signs to Evaluate for Resuscitation
  4.5.2 Routine Care
  4.5.3 Initial Steps of Resuscitation
  4.5.4 Bag and Mask Ventilation
  4.5.5 Chest Compression
  4.5.6 Endotracheal Intubation
  4.5.7 Medications
  4.5.8 When to Terminate Resuscitation
  4.5.9 Don't's of Resuscitation
4.6 Let Us Sum Up

4.0 OBJECTIVES

After completing this practical, you should be able to:

- identify the sign/s that indicate the need for resuscitation;
- assemble the appropriate equipment needed for resuscitation; and
- resuscitate the newborn successfully.

4.1 INTRODUCTION

You have already learnt about the care of newborn in Unit 4, Block 1 of BNS-107 (Paediatric Nursing). One of the major skills you need to develop is how to resuscitate a newborn. As you know, the birth propels the newborn from a cocoon of warm weightless fluid environment to that of cold, dry and highly stressful environment by cutting the umbilical cord. It is the first few minutes of a newborn life that can be critical. This is the time when the newborn is making an abrupt transition from the mother's uterus to the extra-uterine life. The major problem that can arise during this period is birth asphyxia. The way in which an asphyxiated neonate is managed in the first few minutes of life can have consequences over an entire lifetime directly affecting the quality of the individual's life.

Every neonate has the right to have resuscitation performed at a high level of competence. This means that the proper equipment must be immediately available in the delivery room. Remember, majority of the newborns cry spontaneously and require no treatment at all not even suction.
Occasionally newborns who do not cry spontaneously and do not establish effective cardio pulmonary circulation need resuscitative measures based on the newborn's condition. This practical will acquaint you with various skills needed to perform neonatal resuscitation with great competency and will help you to anticipate the need for resuscitation of a newborn, the equipments to be used and kept ready. At the end we shall focus on various drugs used for resuscitation and don'ts of resuscitation. Before you go through this practical it is essential for you to revise Unit 4 and Unit 5, Block 1 of BNS-107.

4.2 PURPOSE AND INDICATIONS OF RESUSCITATION

**Purposes**

The main purpose of resuscitation is to initiate respiration in a newborn, who is asphyxiated or spontaneous breathing has not been initiated.

**Indications**

There are various antepartum and intrapartum factors, which indicate need for resuscitation. We shall briefly acquaint you with antepartum and intrapartum factors as outlined below:

**Antepartum factors include the conditions like:**

<table>
<thead>
<tr>
<th>Antepartum factors</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal diabetes</td>
<td>Severe anemia</td>
</tr>
<tr>
<td>Pregnancy induced hypertension</td>
<td>Chronic hypertension</td>
</tr>
<tr>
<td>Previous Rh sensitization</td>
<td>Previous still birth</td>
</tr>
<tr>
<td>Bleeding in second or third trimester</td>
<td>Maternal infection</td>
</tr>
<tr>
<td>Post term gestation</td>
<td>Size-date discrepancy</td>
</tr>
<tr>
<td>Maternal age less than 16 years or more than 35 years</td>
<td>Mother on drug therapy e.g. Reserpine, Lithium Carbonate etc.</td>
</tr>
<tr>
<td>Multiple pregnancies</td>
<td>Maternal drug abuse</td>
</tr>
</tbody>
</table>

**Intrapartum factors include:**

<table>
<thead>
<tr>
<th>Intrapartum factors</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal presentation</td>
<td>Premature labour</td>
</tr>
<tr>
<td>Rupture of membrane more than 24 hours prior to delivery</td>
<td>Foul smelling amniotic fluid</td>
</tr>
<tr>
<td>Precipitate labour</td>
<td>Prolonged labour either for 1st or 2nd stage</td>
</tr>
<tr>
<td>Prolapsed cord</td>
<td>Non-reasoning fetal heart patterns</td>
</tr>
<tr>
<td>Abruptio placenta</td>
<td></td>
</tr>
<tr>
<td>Meconium stained amniotic fluid</td>
<td>Placenta previa</td>
</tr>
</tbody>
</table>

It is essential to remember the above-mentioned antepartum and intrapartum factors which indicate need for resuscitation. It does not mean that all neonates who were anticipated to have asphyxia will need resuscitation or those that were at risk of asphyxia will need resuscitation, they may do well after delivery.
4.3 PREPARATION FOR RESUSCITATION

Two trained personnel capable of working together to perform all aspects of resuscitation, it may be nurse and paediatrician or two skilled nurses. But one of the two must be skilled in endotracheal intubation.

Now what preparation you need to do for anticipating the need for resuscitating a newborn, you need to keep the following things ready:

- Source of heat either radiant warmer or 200 watt bulb
- Adequate lighting and place to work

Resuscitation equipments required are:

- Minimum two clean dry and warm sheets for each newborn
- Ambubag and mask
- Infant laryngoscope
- Endotracheal tube of three different sizes
- Sterile suction catheter 12 to 14
- Oral mucus suction
- Oxygen source
- Emergency Drugs (Epinephrine, Naloxone hydrochloride, Normal saline)
- Ventilator
- Leucoplast
- Scissor
- Appropriate sized gloves

4.4 THE TABC’S OF RESUSCITATION

The steps in resuscitation follows the well known TABC’s of Cardiopulmonary resuscitation:

T : Temperature maintenance
A : Ensuring/Establishing an open airway
B : Initiating breathing
C : Maintaining circulation

Now how can you maintain this

T : Temperature maintenance is ensured by placing the newborn under preheated radiant warmer or 200 watt bulb.

A : The patency and adequacy of airways is established by proper positioning of the newborn i.e. slight extension of neck by placing a roll or towel under the shoulder. Suction the mouth, nose and in some instances the trachea. If necessary insert an endotracheal tube to ensure an open airway.
B : Breathing can be initiated by using tactile stimulation or positive pressure ventilation can be used if necessary using bag and mask ventilation.

C : Circulation can be maintained by giving chest compression and medication.

### 4.5 TECHNIQUES OF RESUSCITATION

#### 4.5.1 Signs to Evaluate for Resuscitation

As soon as the newborn is delivered, you have to evaluate the newborn’s condition so that you can decide and take the necessary action. It is the continuous process of assessment, action, evaluation, decision and further action.

Initial assessment performed within a few seconds after birth, determines whether some degree of resuscitation is required for the newborn. The five questions to be answered are:

1) Is the amniotic fluid clear of meconium?
2) Is the newborn breathing or crying?
3) Is there good muscle tone?
4) Is the colour pink?
5) Was the newborn born at term?

If the answer is ‘yes’, to all questions i.e. the amniotic fluid is clear, newborn is spontaneously breathing or crying, good muscle tone, pink in colour and is term give routine care to these newborn which shall be discussed in sub-section 4.5.2.

If the answer is ‘no’, to any of these questions i.e. the liquor is meconium stained, newborn is having poor respiratory effort, newborn is flaccid or colour is blue and is preterm then begin initial steps of resuscitation which shall be discussed in sub-section 4.5.3.

#### 4.5.2 Routine Care

You need to follow the routine care for those newborns for which all five questions were answered as yes. The routine care includes placing the newborn directly on the mother’s abdomen, drying and covering with dry and warm linen. Warmth is provided by direct skin-to-skin contact and thus temperature can be maintained. Establish an open airway by wiping the newborn’s mouth with the clean cloth around finger and cleaning nose.

#### 4.5.3 Initial Steps of Resuscitation

If the answer is ‘no’ to any of these question i.e. the liquor is meconium stained, newborn is having poor respiratory effort, newborn is flaccid or colour is blue and is preterm then you need to follow the following initial steps of resuscitation:

- Provision of warmth
- Positioning
- Clearance of the airway
- Tactile stimulation
- Administration of oxygen
Provision of Warmth

- Ensure that radiant warmer is in working condition and preheated and kept ready for use.
- Check and keep warm linen ready to receive the newborn and for drying the newborn. Keep one sheet for drying the newborn and wrap the newborn in another sheet after removing wet sheet.
- As soon as the newborn is delivered, receive in a dry and warm linen.
- Place the newborn under preheated radiant warmer or 200-Watt Bulb whichever is available. (Fig. 4.1)

![Fig. 4.1: Radiant warmer for resuscitating newborn](image)

- Then the body and head of the newborn should be dried quickly with a prewarm sheet and the newborn is wrapped in another prewarmed sheet after removing the wet linen. (Fig. 4.2)

![Fig. 4.2: Drying and removing wet linen to prevent heat loss](image)

Position

- Position the newborn’s neck slightly extended by placing a rolled towel under the newborn’s shoulder to raise it about 2 to 2.5 cm above the mattress. Care should be taken to prevent hyperextension or under extension of the neck because this may block the airway and decrease the air entry. (Figs. 4.3 and 4.4)
Clearance of the Airway

- The appropriate method of clearing the airway depends on the presence or absence of meconium and the newborn’s level of activity.

- If no meconium:
  Suction the secretions from the airway by wiping the nose and mouth with the clean gauze piece or with suction catheter 12 or 14 french. If secretions are copious:
  - Turn the head to one side.
  - Suction the mouth, oropharynx and then the nose. (Fig. 4.5). If nose is suctioned first, the newborn may take the breath and secretions from the mouth can easily be aspirated.

  - Avoid vigorous suctioning and stimulation of the posterior pharyngeal wall as this may lead to vagal stimulation and cause bradycardia or apnea.

  - Suction pressure should not exceed 80 to 100 mm Hg.
If meconium is present:

- Suction the mouth, nose and posterior pharynx after the delivery of head and before the delivery of shoulders.

- If newborn is vigorous after birth continue with remaining initial steps of resuscitation.

If newborn is depressed after delivery:

- Suction the residual meconium in the hyper pharynx under direct vision using laryngoscope. Then intubate trachea and suction from the lower airway. Tracheal suction is best done by applying suction directly to an endotracheal tube. Once the endotracheal tube has been inserted, continuous suction is applied to the tube as it is withdrawn. Suction pressure should not exceed 100 mm Hg. Reintubation followed by suctioning should be repeated until returns are nearly free of meconium. To minimize hypoxia free flow oxygen should be provided by oxygen tubing while suctioning. (Fig. 4.6)

![Image of suctioning meconium from the trachea](image.png)

**Fig. 4.6: Visualizing the glottis and suctioning meconium from the trachea using a laryngoscope and endotracheal tube**

Tactile Stimulation

- If the newborn fails to establish spontaneous and effective respiration even after drying, positioning and suctioning stimulate breathing by tactile simulation.

- Safe and appropriate method of providing tactile stimulation is either slapping/flicking the sole of the feet or gently rubbing the back of the newborn. (Fig. 4.7) If after one or two flicks newborn cries it indicates establishment of breathing. If no response occurs, discontinue and immediately start with bag and mask ventilation.
Fig. 4.7: Tactile stimulation

Administration of Oxygen

A new born who has central cyanosis should initially receive high concentration of oxygen. To give free flow oxygen regulate the rate of flow at 6 litre per minute either by oxygen mask or oxygen tubing kept half inch from the newborns face. Slowly the newborn start turning pink. Once the newborn becomes pink the oxygen should be gradually withdrawn, the new born can remain pink while breathing room air. (Figs. 4.8 and 4.9)

Alert:

Remember the initial steps of the resuscitation should not take more than 30 seconds.
After initial steps of resuscitation, check respiration, heart rate and colour. (Fig. 4.10)

Evaluate respirations, heart rate and colour

Count the heart rate for 6 seconds multiply by 10 to get heart rate per minute.

If the newborn is spontaneously breathing with heart rate more than 100 per minute with no central cyanosis, further resuscitation is not required.

If newborn is apneic/gasping respiration after 30 seconds of initial steps, heart rate is below 100 per minute or Cyanosis is present despite 100% free flow oxygen. This indicates need for assisted ventilation by bag and mask.

**Activity 1**

In the labour room, select a mother who is in the first stage of labour. Receive the baby and maintain patency of airway at birth.

**4.5.4 Positive Pressure Ventilation Bag and Mask**

**Indications**

Apnea/gasping respiration after 30 seconds of initial steps of resuscitation Heart rate below 100 per minute Persistent central cyanosis despite 100% free flow oxygen.
Technique of Positive Pressure Ventilation

Ensure that mask of the right size is available. Use cushioned round mask or anatomical mask. Mask should cover the mouth, nose and tip of the chin but not the eyes. (Fig. 4.11)

![Correct-sized mask covers mouth, nose, and tip of chin, but not the eyes](image)

Self-inflating bag does not require a compressed gas source to fill, it is designed to inflate automatically as you release your grip on the bag.

Stand at the head end or on the side of the newborn. Observe that the bag does not block your view of the neonate chest. Allow you to observe the rise and fall of the chest during the resuscitation.

The mask should be applied with slight pressure to avoid the leakage. Hold the mask using thumb, index and the middle finger of the left hand while supporting the chin with the ring and the little finger. Ensure air tight seal is achieved. (Fig. 4.12) Compress the bag using finger tip. Avoid compressing the bag using your palm of the hand.

![Correctly positioning mask on the face](image)

Compress the bag to cause visible expansion of the chest. The best guide to adequate pressure during bag and mask ventilation is an easy rise and fall of the chest with each breath.

The rate of positive pressure ventilation should be 40 to 60 per minute and while compressing the bag say squeeze and while releasing the pressure count two three. This sequence will give a rate of 40 to 60 breaths per minute.

Observe that the rise and fall of the chest is noticeable as it indicates the mask is sealed and the lungs are getting inflated.
If there is no improvement in colour, heart rate or breathing, it is possible that the chest is not expanding adequately. It can be due to following reasons:

- Inadequate seal that there is a leak from the mask. The mask may not be of the right size or not properly applied.
- Blocked airway due to wrong position or accumulation of secretion.
- Inadequate pressure.

The corrective action for inadequate or no chest rise during bag and mask ventilation are as follows:

- Reapply mask using slight downward pressure.
- Reposition the head.
- Check for secretion, suction mouth and nose.
- Ventilate with mouth slightly open.
- Increase pressure of ventilation.
- Recheck or replace the resuscitation bag.

Check for improvement, which is indicated by:

- Increased heart rate
- Spontaneous breathing
- Improvement in colour

After 30 seconds of positive pressure ventilation assess the heart rate, colour and breathing.

If colour is improving and also spontaneous respiration is seen with heart rate more than 100 beats per minute, then stop positive pressure ventilation but continue free flow oxygen.

If heart rate is between 60 to 100 per minute, continue positive pressure ventilation.

If heart rate is below 60 per minute, continue positive pressure ventilation and start chest compression.

Bag and mask ventilation causes abdominal distention as air not only enters the lungs but also escapes into stomach via esophagus. Distended abdomen presses from the diaphragm and compromise ventilation. Thereafter, if ventilation continues for more than two minutes, an orogastric tube (feeding tube size 6 to 8 french) should be inserted and left to decompress the stomach.

Activity 2

In labour room select a newborn requiring bag and mask ventilation and perform of bag and mask ventilation.

4.5.5 Chest Compression

The decision to initiate chest compression is based on neonate heart rate. Chest compression is indicated when heart rate is below 60 beats per minute after 30 seconds of positive pressure ventilation with 100 per cent oxygen. Now how do you give chest compression?
Technique of Chest Compression

Ensure that the neonate’s back is firmly supported so that heart can be compressed between the sternum and spine. Two trained personnel are needed i.e. one for chest compression and another for positive pressure ventilation. (Fig. 4.13)

There are two ways for chest compression: (Fig. 4.14)

**Two finger method:** The tip of the middle and the index finger should be used for compression. Other hand can be placed under the back of the neonate to provide support.

**Thumb technique:** Thumbs of both hands are placed either side by side or one over the other with fingers encircling the ribcage.
Site: Lower one third of the sternum i.e. the area just below the inter nipple line and above the xiphisternum. [Fig.4.15(a) and (b)].

**Rate of compression:** The sternum should be compressed at the rate of 120 beats per minute and the ventilation is given at the rate of 40 to 60 breaths per minute. Rate of cardiac massage should be coordinated with ventilatory support i.e. three chest compression and one breath.

One and two and three and squeeze should be the sequence followed for chest compression and positive pressure ventilation.

Compress the chest to a depth of one third of the anterior posterior diameter of the chest.

After 30 seconds of chest compression and ventilation evaluate heart rate and make your decision based on the heart rate:

If heart rate is below 60 per minute, continue chest compression and ventilation.

If heart rate is above 60 per minute, discontinue chest compression whereas ventilation should be continued till the heart rate is above 100 per minute and neonate is breathing spontaneously.

If the technique of chest compression is incorrect it can cause trauma to the heart, lungs or liver. Excessive pressure over the ribs and xiphoid can lead to broken ribs, laceration of liver and pneumothorax.

**Activity 3**

Take a maniquine and practice chest compression using thumb technique and finger technique.

**4.5.6 Endotracheal Intubation**

Most of the neonates are managed by initial steps and positive pressure ventilation. Only less than 1.5 per cent of births may need chest compression or endotracheal intubation. Intubation is a relatively difficult skill to acquire and it requires frequent practice to master the skill. Indications for endotracheal intubation are:

- To suction treachea in presence of meconium when the new born is not vigourous.
- Suspected congenital diaphragmatic hernia requiring ventilation.
Nursing Techniques in Paediatric Care-I

- Non response to bag and mask ventilation.
- Prolonged positive pressure ventilation is required.
- To administer epinephrine if required to stimulate the heart.

**Technique of Intubation**

Select the correct size of endotracheal tube and ensure availability of straight blade laryngoscope of size zero for preterm and one for term neonate. The appropriate diameter of the endotracheal tube on the basis of weight of neonate is given below:

<table>
<thead>
<tr>
<th>Internal diameter of endotracheal Tube (mm)</th>
<th>Weight of neonate in grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>Less than 1000</td>
</tr>
<tr>
<td>3.0</td>
<td>1000 to 2000</td>
</tr>
<tr>
<td>3.5</td>
<td>2000 to 3000</td>
</tr>
<tr>
<td>4.0</td>
<td>More than 3000</td>
</tr>
</tbody>
</table>

With the help of laryngoscope, introduce the endotracheal tube to a level so that the vocal cord guide is placed at the level of vocal cord.

Confirm the tube placement by ventilating the neonate. With correctly placed tube air entry is heard on both sides of the chest and air is not heard entering the stomach.

After confirmation of correct placement of tube, endotracheal tube length outside should be around 4 centimeter.

**Purpose and Indications**

Before we focus on purposes it is worth while to remember that this type of intubation requires a lot of practice. So do not miss any chance of practicing this procedure.

Endotracheal intubation is performed when it is felt that bag and mask does not provide adequate ventilation. Intubation is also carried out when assisted ventilation is to be continued for a prolonged period of time.

**Indications**

1) Bag and mask ventilation is ineffective to resuscitate the asphyxiated baby.
ii) Tracheal suctioning (meconium or milk aspiration).

iii) Ventilation of infants with diaphragmatic hernia.

iv) Prolonged positive-pressure ventilation (hypoxic-ischemic encephalopathy, hyaline membrane disease, persistent fetal circulation, prolonged apneic attacks).

Procedure

The equipment needed for procedure are:

- Pencil handle laryngoscope with straight blade (0 and 1 size) with extra set of batteries and bulbs.
- Disposable gamma-irradiated endotracheal tubes with an internal diameter of 2.5 mm, 3.0 mm, and 4.0 mm.
- Suctioning equipment.
- Shoulder roll, adhesive tape, scissors.
- Resuscitation bag and mask.

The endotracheal tubes with a uniform diameter throughout the length (as opposed to tubes with tapered end) are preferred. The presence of a vocal cord guide, as a black line near the tip of the tube, is useful to ensure that the tip of the endotracheal tube is at the optimal level. When the vocal cord guide is placed at the level of vocal cords, the tip of the tube shall be just above the bifurcation of the trachea.

Guidelines for Endotracheal Tube Size and Length

The following table gives guidelines for the appropriate size and length of endotracheal tubes required in babies of different sizes.

<table>
<thead>
<tr>
<th>Birth weight (gms)</th>
<th>Internal diameter (mm)</th>
<th>Tube length to be inserted from lips (cm)</th>
<th>Tube length to inserted beyond vocal cords (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1000</td>
<td>2.5</td>
<td>6.0</td>
<td>2.2</td>
</tr>
<tr>
<td>1000</td>
<td>3.0</td>
<td>6.5</td>
<td>2.4</td>
</tr>
<tr>
<td>1500</td>
<td>3.0</td>
<td>7.5</td>
<td>2.4</td>
</tr>
<tr>
<td>2000</td>
<td>3.5</td>
<td>8.0</td>
<td>2.6</td>
</tr>
<tr>
<td>2500</td>
<td>3.5</td>
<td>8.5</td>
<td>2.6</td>
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<tr>
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<td>4.0</td>
<td>9.0</td>
<td>2.8</td>
</tr>
<tr>
<td>4000</td>
<td>4.0</td>
<td>10.0</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Procedure of Endotracheal Intubation

In most situation, orotracheal intubation is done which is easier, but it can get dislodged readily. Nasotracheal intubation is more difficult and cumbersome, but is useful when prolonged ventilation is required. The availability and working of all the equipment required should be checked. An appropriate size endotracheal tube should be selected and shortened to 13 cm size so that not more than 4 to 5 cm of the tube projects beyond the infant’s lips. The shortening of the tube reduces dead space and prevents kinking. The endotracheal tube connector should be fitted on the cut end of the tube. The suction source should be readily available to provide 100 cm H₂O negative pressure.
Orotracheal Intubation

— Place the infant supine with slightly extended by placing a roll of towel under the shoulders.

— Stand beyond the head end of the baby which is placed near the edge of the table.

— Before intubation, improve the oxygenation and condition of the baby by administration of 100 per cent oxygen through bag and mask ventilation for 3-4 minutes.

— Turn on the laryngoscope light and hold the laryngoscope in your left hand with the blade pointing away from you.

— Stabilize the infant’s head with your right hand.

— The laryngoscope blade is inserted and slid over the tongue.

— The tip of the blade is advanced beyond the base of the tongue till it rests in the vellecula (area between the base of the tongue and the epiglottis).

— At this point, the entire blade is lifted by pulling it forwards in the direction of the handle and not by tilting the handle backwards.

— By lifting the epiglottis with the tip of the blade and by applying gentle pressure over the cricoid area (by the little and ring finger of the hand holding the laryngoscope or by an assistant) the glottic opening with all its landmarks is exposed to the view.

— The secretions, if any, should be sucked before the endotracheal tube is inserted.

— Hold the endotracheal tube in your right hand and introduce it into the right side of the infant’s mouth.

— Keep the glottis in view and insert the tube until the vocal cord guide is at the level of the vocal cords.

— Hold the tube firmly at the lips with fingers of your right hand while keeping the baby’s head stabilized.

— Gently remove the laryngoscope without displacing the tube.

— Note the centimeter mark on the tube at the level of the lips as future guide so that it is readily identified when the tube slips out.

— Connect the endotracheal tube to a bag and ventilate the infant.

— There should be a slight rise of the chest with each ventilation with equal breath sounds on both sides of the chest (at the level of the nipples) and without any air entering the stomach or abdominal distension.

— If the breath sounds are unilateral or unequal on two sides, the tube should be withdrawn by 1 cm and its placement is rechecked.

— It is not unusual for the endotracheal tube to enter the oesophagus when no breath sounds are heard in the chest and air is heard entering the stomach and causing abdominal distension.

— The procedure should be repeated again to insert the tube into the trachea.

— In order to minimize the dangers of hypoxia, intubation attempts should be limited to 20 seconds.
The infant should be stabilized in between the attempts by ventilating with a bag and mask.

**Nasotracheal Intubation**

It is technically more difficult but may be required when prolonged ventilation is anticipated. A polyvinyl endotracheal tube is inserted through one of the nostrils and visualized in the pharynx with the help of the laryngoscope. The glottis and its landmarks are indentified as for orotracheal *intubation*. The endotracheal tube is grasped with McGill forceps and guided through the glottis into the trachea for the desired length.

**Complications**

In experienced hands, endotracheal *intubation* is a safe procedure.

- Trauma to soft structures in the mouth, hypopharynx, larynx and esophagus may occur by rough handling, especially in large, struggling infants.

- The procedure is technically easier and less likely to cause any trauma in hypoxic depressed infants. Hypoxia may be perpetuated by unsuccessful attempts at intubation.

- Reflex bradycardia and apnea may occur due to vagal stimulation.

- Overzealous attempts at ventilation especially when the tube is placed on one of the main bronchus (usually the right) may lead to pneumothorax.

- Strict asepsis and use of disposable endotracheal tubes is mandatory, otherwise infection may be introduced by hands and equipment. The laryngoscope blade must be sterilized before it is used for the next patient.

**Activity 4**

i) Using the manikin, practice the various steps of nasogastric *intubation*.

ii) Using the manikin, identify the landmarks to be observed when inserting the endotracheal tube.

**4.5.7 Medications**

The role of drug is very limited in Neonatal resuscitation. In few neonate who fail to improve with ventilation and chest compression the medication becomes necessary. Adrenaline, Naloxone and volume expander should be available in the labour room. Dexamethasone, Atropine, Calcium, Dextrose etc. are not indicated for resuscitation in the labour room.

Adrenaline is indicated when the heart rate is below 60 per minute, despite chest compression and positive pressure ventilation for 30 seconds. It is given through intratracheal or intravenous route but never through cardiac route. Administer 0.1 to 0.2 ml per kg. of 1:10000 dilution.

Naloxone Hydrochloride is indicated in neonate with poor respiratory effort but good heart rate (more than 100 per minute) and who is pink and there is history of Narcotic administration (morphine or pethidine) to the mother within past four hours of delivery. Administer 0.1 ml per kg.

Volume Expander is indicated if there is evidence of acute blood loss. Administer 10 ml per kg. through umbilical vein over 5 to 10 minute.
4.5.8 When to Terminate Resuscitation

If heart rate does not improve despite positive pressure ventilation accompanied with chest compression and administration of adrenaline for 15 minutes after birth.

If there is no heartbeat or spontaneous breathing at birth and does not come even after 10 minutes of active resuscitation.

The prognosis of such neonate should be discussed with the parents before discontinuing resuscitation.

4.5.9 Don’ts of Resuscitation

- Don’t give heavy sedation to the mother.
- Don’t keep head too low for too long.
- Don’t do vigorous and continuous suction.
- Don’t allow the baby to become hypothermic.
- Don’t persist with unsuccessful attempts of intubations.
- Don’t delay endotracheal intubation in an apneic baby.
- Don’t hyperflex or hyper extend the neck of neonate.
- Don’t leave an open endotracheal tube in place.
- Don’t continue with tactile simulation if baby does not respond to flicks.
- Don’t blow your lungs into babies mouth.
- Don’t delay for calling for assistance if in difficulty.
- Don’t use full palmar grasp for giving bag and mask ventilation.
- Don’t give respiratory stimulants.
- Don’t give sodium bicarbonate through endotracheal tube.
- Don’t give sodium bicarbonate till ventilation is established effectively.

Guideline for Resuscitation of Newborn

Identification Data

Name of the Body : 
Date of Time of Birth : 
Name of Father : 
Educational status of Mother : 
Educational status of Father : 
LMP
EDD

Antenatal history
Status of Registration—booked/unbooked
T.T. immunization
Health status during pregnancy
Natal History
Date & Time onset of Labour pains
Duration of 1st stage, IIInd stage IIIrd status.

Assessment of Neonatal status

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>Is the amnionic fluid clear of meconium.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the newborn breathing or crying.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there good muscle tone.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the colour pink.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the newborn born at term.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Steps of resuscitation planned based on interpretation of findings.

Routine Care

Initial steps and Resuscitation

Newborn status after 30 sec. of Resuscitation Evaluate Resp. Heart rate of colour.

Positive Pressure Ventilation

Evaluate Resp. HR and colour after 30 sec of PPV.

Chest compression

Evaluate Resp. Heart rate and colour after 30 sec. of chest compression medication.

4.6 LET US SUM UP

In this practical you have learnt about steps of neonatal resuscitation. Resuscitation is one of the most important skill to be learnt by all the nursing personnel working in labour room and neonatal care unit. The need is to anticipate high risk deliveries and transfer these babies in utero to institutions where neonatal services are available. The resuscitation equipment should be available in functioning order before the delivery. The outcome of the neonate depends upon the correct sequence followed with right technique.
Nursing Techniques in Paediatric Care-I

Approximate Time

Birth

- Clear of meconium?
- Breathing or crying?
- Good muscle tone?
- Colour pink?
- Term gestation?

No

- Provide warmth
- Position; clear airway* (as necessary)
- Dry, stimulate, reposition
- Give O2 (as necessary)

Evaluate respiration, heart rate, and colour

Apnea or HR < 100

- Provide positive-pressure ventilation*

HR < 60

- Provide positive-pressure ventilation*
- Administer chest compressions

HR > 60

- Administer epinephrine*

HR < 60

* Endotracheal intubation may be considered at several steps.

Fig. 4.17: Sequence of neonatal resuscitation