Universe International Journal of Interdisciplinary Research
(International Peer Reviewed Refereed Journal)
DOI No. – 08.2020-25662434

© UIJIR | ISSN (O) – 2582-6417
June 2023 | Vol. 4 Issue 01
www.uijir.com

NEWBORN RESUSCITATION: A LIFE SAVING TOOL

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ABSTRACT

Newborns are considered to be small and powerless beings, completely dependent on others for their adaptation in the external environment. Every infant presents uniquely and has certain individual needs the most physiological change that takes place in the neonate is transition from fetal circulation to independent survival. The newborn needs proper support to initiate breathing and maintain temperature. Newborn resuscitation is done in order to establish breathing and ensure survival.

Keywords: New Born, Lifesaving Procedure, Resuscitation

DOI Link: https://doi-ds.org/doilink/10.2023-31147446/UIJIR

INTRODUCTION

Neonatal resuscitation skills are essential for all health care providers who are involved in the delivery. The transition from fetus to newborn requires intervention by a skilled individual or team in approximately 10% of all deliveries.

Newborn resuscitation is a series of event that are taken in order to revive an infant immediately after birth so that normal respiration and circulation may be initiated and maintained. It is an action to facilitate the dynamic transition from fetal to neonatal physiology.

Transition to Extrauterine Physiology

To decrease neonatal morbidity and mortality, the care provider must be able to rapidly identify infants whose transition from an intrauterine to extra uterine physiology is delayed. Neonatal transition requires spontaneous breathing and successful cardiopulmonary changes, as well as other changes to independent organ system functions. A thorough understanding of normal transitional physiology leads to a better understanding of the needs of the infant who is experiencing difficulties and thus should result in a more effective resuscitative care.

Table 1. Embryologic Stages of Lung Development.

Stage	Gestational Age	Structure Development
Embryonic	5 wk	Bronchi develop, and airway branching occurs; pulmonary veins return to left atrium
Pseudoglandular	5-17 wk	Lungs take on glandular appearance, and there is continual branching of tracheal bronchial tree (ending at 18-19 wk gestation); blood vessels and lymphatics begin to form, and diaphragm develops
Canalicular	13-25 wk	Rich vascular supply develops, and capillaries are brought closer to airways; primitive respiratory

		bronchioles begin to form
Terminal air sac	24-40 wk	Alveoli appear and begin increasing in number, and blood-gas interface develops; type II alveolar cells appear between 20 and 25 wk and start producing surfactant between 24 and 25 wk, though normal intra-airway concentrations are not reached until ~34 wk
Postnatal	40 wk to 8 y	Thinning of alveolar sac linings and continued alveolar proliferation occur

Rapid assessment

Newborn infants who need extensive resuscitation should be identified as soon as possible. Term infants with clear amniotic fluid, adequate respiratory effort, and good muscle tone should receive routine care, which includes provision of warmth, clearing of the airway (if required), drying of the infant, and assessment of the infant's colour. These infants should keep with their mothers during and after routine care.

Anticipation of potential problems

The goals of resuscitation are to assist with the initiation and maintenance of appropriate ventilation and oxygenation, adequate cardiac output and tissue perfusion, and normal temperature and serum glucose.

These goals may be attained more readily when risk factors are checked early, neonatal problems are identified, equipment is arranged, personnel are qualified and available, and a care plan is desinged.

A maximum number of antepartum and intra partum maternal conditions carry greater risk for intra partum asphyxia.

Respiration equipment includes the following:

-Stethoscope

-Cardiorespiratory leads for neonates and cardiorespiratory monitor

-Pulse oximeter leads (neonatal size) and pulse oximeter monitor

-Oxygen supply with blender, set to 10 L/minute

-Assorted masks (term and preterm mask sizes)

-Positive Pressure Ventilation (PPV) device and tubing connected to the blended oxygen source

-Manometer (or appropriately calibrated T-piece PPV device)

-Endotracheal tubes (sizes 2.5, 3.0, 3.5)

-Tape and scissors or other devices for anchoring endotracheal tubes

-Laryngoscope (Size 0 and 1 straight blades, Size 00 optional)

-Extra bulbs and batteries

-Carbon dioxide detectors

-Stilettos for endotracheal tubes (optional)

-Laryngeal mask airway, Size 1 (optional)

Suction equipment includes the following:

-Bulb syringe

-Regulated mechanical suction (80-100 mm Hg)

-Suction catheters (10F and/or 12 F)

-Suction tubing

-Suction canister

-Salem sump vented suction tubes (10 F - 12F)

-Feeding tube (8 French catheter)

-Syringe, catheter-tipped (20 mL)

-Meconium aspirator

Fluid equipment includes the following:

-IV catheters (22 g, 24 g)

-Tape and sterile dressing material

-Dextrose 10% in water (D10W)

-Normal Saline solution

-T-connectors

-Syringes, assorted (1-20 mL)

Drugs:

-Epinephrine (1:10,000 - 0.1 mg/ml)

-Note: This should be the ONLY epinephrine concentration available

-Normal Saline

Procedural equipment includes the following:

-Umbilical catheters (2.5 F and 5 F)

-Chest tube (10 French catheters)

-Sterile procedure trays (e.g., scalpels, haemostats, forceps)

Resuscitation of Neonates

Thermoregulation

Preventing heat loss during resuscitation is crucial. Intrauterine thermoregulation is passive, with no use of calories or oxygen by the fetus. This passive thermoregulation process allows the fetus to attain maximal intrauterine growth without having to expend energy on thermal homeostasis. Brown fat storage begins during the third trimester. Brown fat may be used for heat production in the newborn period. Contact with cold surface is also responsible for heat loss in newborn to prevent heat loss keep the baby warm. Functional redient warmer should be kept ready for newborn baby who is not breathing or crying like a normal newborn.

Table 2. Axillary Temperatures in Infants Weighing Less Than 1500 g

Ranges	Temperature	Action Needed
Normal	36.5-37.5^{o} C	Continue
Potential cold stress	36-36.5^{o} C	Cause for concern
Moderate hypothermia	32-36^{o} C	Danger; immediate CONTROLLED warming of baby needed
Severe hypothermia	< 32^{o} C	Outlook grave; skilled care urgently needed

Airway management

Once in a warm environment, the infant should be positioned so as to open the airway, and the mouth and nose should be suctioned. A bulb syringe may be used for the initial suctioning, taking care not to arouse a Brady cardiac response with vigorous suctioning.

Stimulation

Drying and suctioning often provide enough stimulation to initiate breathing; however, if more vigorous stimulation is necessary, slapping the soles of the feet or rubbing the back may be

effective.

Supplemental oxygen

Infants who do not meet the criteria for routine care or who have difficulties with respiratory effort, tone, or colour need further intervention. Further resuscitative efforts should be guided by assessment of respirations, heart rate, and colour.

Positive-pressure ventilation

There are number of reasons (see Transition to Extra uterine Physiology), it can be difficult for the infant to clear fluid from the airways and establish air-filled lungs. Initial respiratory efforts may have to be augmented by the addition of either continuous positive airway pressure (CPAP) or PPV.

Intubation

Infants may need tracheal intubation if direct tracheal suctioning is required, effective bag mask ventilation cannot be provided, chest compressions are performed, endotracheal (ET) administration of medications is required, congenital diaphragmatic hernia is suspected, or a prolonged need for assisted ventilation exists.

Table 3. Endotracheal Tube Size and Measurement at Lip According to Infant Weight (Open Table in a new window)

Infant Weight	Endotracheal Tube Size	Endotracheal Tube Measurement at Lip
< 1000 g	2.5	7 cm
1000-2000 g	2.5-3	8 cm
2000-3000 g	3-3.5	9 cm
> 3000 g	3.5	10 cm

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Chest compressions

Chest compressions should be performed by circling the chest with both hands and using the thumbs to compress the sternum. This thumb technique is recommended because it allows better depth control during compressions.

To be effective, the chest should be compressed approximately one-third of the anterior-posterior (AP) diameter of the chest. This technique is capable of generating adequate peak systolic pressures and coronary perfusion.

CONCLUSION

Many research showed that there is inadequate knowledge and lack of skill in newborn resuscitation.Neonatal resuscitation is useful for newborn baby with birth asphyxia and save the life of the baby. While the vast majority of infants transition without problems, some present with anatomical, physiological, infectious and developmental issues that must be addressed.

Newborn resuscitation is a combination of complex procedure that requires the use of specialized knowledge and skills in an emotionally charged and stressful situation. Knowledge about newborn resuscitation, frequent performance of skills and comfort level with skill performance is dimensions of quality implementation of newborn resuscitation.

REFERENCES

1. https://doi.org/10.3389/fped.2020.00059
2. https://www.uptodate.com/contents/neonatal-resuscitation-in-the-delivery-room
3. https://doi.org/10.1161/CIRCULATIONAHA.110.971127
4. https://doi.org/10.1016/j.resuscitation.2006.04.009
5. https://link.springer.com/article/10.1186/1471-2458-11-S3-S12
6. https://pediatrics.aappublications.org/content/126/5/e1259
7. https://link.springer.com/article/10.1186/1471-2393-15-S2-S4
8. https://europepmc.org/article/med/16533635
9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2991653/
10. https://europepmc.org/article/med/11077947