

**PLACEMENT OF LARYNGEAL MASK
AIRWAY (LMA) IN A NEWBORN BY A
REGISTERED NURSE FOR
RESUSCITATION**

Learning Module

Table of Contents

Module Prerequisite.....	3
Module Requirements.....	3
Learning Objectives.....	3
LMA Competency Education.....	3-5
LMA Placement Post-test.....	6
Competency Checklist.....	7-8
References.....	9

Module Prerequisite

RN must hold current NRP Provider or Instructor status.

Module Requirements

RN must successfully complete this learning module, post-test, and competency.

Learning Objectives

Following successful completion of the theory and clinical component of this learning module, the RN will:

- Identify indications for placement of an LMA
- Describe the limitations to placement of an LMA
- Summarize and demonstrate proper technique for placement of an LMA
- Summarize and demonstrate confirmation of correct placement of an LMA
- Demonstrate proper technique for removal of an LMA
- Discuss potential complications associated with the placement of an LMA

LMA Competency Education

Theory Component

The laryngeal mask airway is a supraglottic airway device that is an alternative to a face mask or an endotracheal tube. There are several different designs, including devices with an inflatable cuff and one without. The LMA is inserted into the newborn's mouth and advanced until the tip nearly reaches the esophagus. Unlike an endotracheal tube, which is advanced through the glottis, the LMA mask covers the glottis (laryngeal opening). For those devices with an inflatable cuff, once the mask is fully inserted, the cuff is inflated and creates a seal against the hypopharynx. The i-gel® device has a soft gel cuff made from medical grade thermoplastic elastomer, designed to create a non-inflatable anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures.(7) The airway has a standard 15 mm connector which can be attached to any PPV device. No instruments are needed to insert an LMA, and the vocal cords do not need to be visualized during insertion. Currently, the smallest device available is a size 1 and is intended for newborns ≥ 2 kg (many reports of successful placement in newborns 1.5 kg to 2 kg).

Indications for Placement of an LMA:

- PPV is ineffective with face mask and attempts at intubation are not feasible or have been unsuccessful
- Congenital anomalies involving the mouth, lips, tongue, or palate where achieving a good seal with a face mask is difficult
- Small mandible or large tongue (i.e. Pierre Robin sequence or Trisomy 21)

Limitations of LMA:

- Limited studies on suctioning secretions through LMA or for administering intratracheal medications
- Smallest LMA available is a size 1 and intended for newborns ≥ 2 kg (many reports of successful placement in newborns 1.5 kg to 2 kg)
- If high pressures are needed, air may leak through the seal between the pharynx and the mask, resulting in insufficient pressure to effectively ventilate
- Devices vary by manufacturer; user must be aware of specific equipment limitations for the device used at his/her institution

Placement of an LMA:

Devices vary by manufacturer. Refer to the manufacturer's instructions for the specific device used at your institution. If using a device that does not have a gastric drain port, pass an orogastric tube, aspirate stomach, and remove prior to placing LMA.

- Don gloves and follow standard precautions. Remove size 1 device from package, keeping as clean as possible.
- Quickly inspect device for obvious defects.
- If using a device with an inflatable cuff, test inflation by filling with volume of air recommended by manufacturer. Remove syringe and ensure cuff remains inflated. Reattach syringe and deflate cuff, leaving small amount of air in cuff so it does not fold back on itself.
- Skip above step if using device without an inflatable cuff.
- If necessary, lubricate using a small amount of water-soluble lubricant being careful to keep lubricant away from the openings on inside of mask.
- Stand at baby's head and position the patient in "sniffing" position.
- Hold the device in your dominant hand, as you would a pen, with the mask opening facing the baby's tongue.
- Guide the device along the contour of the hard palate gently until resistance is met. **DO NOT FORCE FURTHER.**
- If using a device which requires inflation, inflate with volume of air recommended by manufacturer. *Note that the LMA will move slightly outward when cuff is inflated.* Remove syringe.
- Attach CO₂ detector and PPV device; begin PPV.

- Secure device appropriately.



QR 4.12 Scan here to see a 2.5-minute video about inserting the laryngeal mask with an inflatable rim.



QR 4.11 Scan here to see a 2-minute video about inserting the laryngeal mask with no inflatable rim.

Confirmation of Correct Placement:

- Chest wall movement is visualized with PPV, and equal air entry is heard with stethoscope.
- CO₂ detector should change color within 8-10 breaths.
- Rapid increase in newborn's heart rate and improvement in saturations.
- You should NOT hear a large leak of air coming from the baby's mouth or see a growing bulge in the baby's neck.
- *Note that you may hear grunting or crying through the device when the baby begins breathing spontaneously as the LMA does not obstruct the vocal cords.*

Removal of LMA:

- The LMA may be removed once the newborn establishes effective spontaneous respirations or when preparing for endotracheal tube placement. The newborn may spontaneously cough out the device or pull it out, if active.
- Prior to planned removal, suction secretions from the mouth and throat.
- If using a device with an inflatable cuff, attach syringe and remove air.
- Remove LMA and monitor respiratory status closely. Be sure to have an alternate method for ventilation readily available if the baby does not tolerate removal.

Possible Complications:

- Soft tissue trauma
- Laryngospasm
- Gastric distension from air leaking around mask if there is not a good seal
- Vomiting and regurgitation
- Stridor
- Prolonged use over hours or days has been associated with oropharyngeal nerve damage or tongue swelling in adults; however, no information is available on the incidence of such complications in newborns. (1)

LMA Placement Post-test

True or False

1. LMA's may be used as an alternative to endotracheal intubation if PPV with a face mask is ineffective and attempts at intubation are not feasible or have been unsuccessful. _____
2. LMA's pass through the glottis when properly placed. _____
3. You must utilize a laryngoscope and visualize the vocal cords to insert an LMA. _____
4. The LMA requires a firm seal against the baby's face. _____
5. Use of an LMA is not recommended for suctioning meconium from the airway or for administering intratracheal medications. _____
6. The smallest LMA currently available is a size 0. _____
7. Prior to insertion of an LMA, the infant should be assessed for gastric distention and air/secretions aspirated from stomach. _____
8. All LMA devices have an inflatable cuff. _____
9. The LMA is inserted with the mask opening facing the hard palate. _____
10. The LMA device should be inserted until resistance is met and not forced further. _____
11. The LMA may not be used to provide CPAP. _____
12. If using an LMA with an inflatable cuff, secure the LMA, then inflate the cuff. _____
13. Before removing an LMA, suction secretions from the mouth and throat. _____
14. The LMA may be effective for airway management of an infant with Pierre Robin or cleft palate. _____
15. A possible complication associated with the use of an LMA is soft tissue trauma. _____
16. List at least two methods for confirming correct placement of an LMA:

Name:
Department:

Date:

COMPETENCY: Placement of Laryngeal Mask Airway (LMA) in a Newborn by a Registered Nurse for Resuscitation

BY:
DATE:

Key for Instruction: W: Written D: Demonstration V: Verbal I: Independent Study VT: Videotape VS: Video stream A: Audiotape CBT: Computer based	Key for Age Specific: N: Neonate IN: Infant P1: Pediatric 1-5 P2: Pediatric 5-11 AD: Adolescent 12-18 A: Adult 18-60 G: Geriatric 60+	Key for Feedback: Mechanism: RD: Return Demo V: Verbal Feedback E: Exam
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		INSTRUCTION	FEEDBACK	COMMENTS
A.	Review Policy	W	V	
B.	Study Learning Module and complete LMA placement post-test	I	E	
C.	Include discussion of any age specific criteria. (N)	V	V	
1.	Review indications for LMA placement.	V	V	
2.	Don gloves and follow standard precautions.	D	RD	
3.	Gather appropriate equipment, including size 1 LMA and quickly inspect for obvious defects. If using a device with an inflatable cuff, test inflation by filling with volume of air recommended by manufacturer. Remove syringe and ensure cuff remains inflated. Reattach syringe and deflate cuff, leaving small amount of air in cuff so it does not fold back on itself. Skip above step if using device without an inflatable cuff.	D	RD	
4.	Stand at baby's head and position the patient in "sniffing" position.	D	RD	
5.	Hold the device in your dominant hand, as you would a pen, with the mask opening facing the baby's tongue. Guide the device along the contour of the hard palate gently until resistance is met. DO NOT FORCE FURTHER.	D	RD	

6.	If using a device which requires inflation, inflate with volume of air recommended by manufacturer. <i>Note that the LMA will move slightly outward when cuff is inflated.</i> Remove syringe.	D	RD	
7.	Attach CO ₂ detector and PPV device; begin PPV.	D	RD	
8.	Verbalize/demonstrate methods for confirmation of correct placement.	V D	V RD	
9.	Secure device appropriately.	D	RD	
10.	Review indications for removal of LMA.	V	V	
11.	Prior to planned removal, suction secretions from the mouth and throat. If using a device with an inflatable cuff, attach syringe and remove air. Remove LMA and monitor respiratory status closely.	D	RD	
12.	Verbalize limitations and possible complications of LMA placement.	V	V	

Insertion of Laryngeal Mask Airway (LMA) #1
Date

Validator:

Competency Met:

SIGNATURE VALIDATOR:

Competency Unmet:

*If competency is unmet, indicate action plan below.

Upon completion of this competency initial practice may be under the direct/indirect supervision of a staff person proficient in this skill.

Indicate action plan for unmet competency:

- Remedial education and re-evaluation provided by validator.
- Refer to the unit educator or manager for remedial education and re-evaluation.
- Refer to manager because of performance issue.
- Other:
- Comments:

Validator Signature/Title: _____ Date: ___/___/___

References

1. American Academy of Pediatrics and American Heart Association, (2021): Textbook of Neonatal Resuscitation, 8th Edition.
2. Escobedo MB, Shah BA, Song C, Makkar A, Szyld E. Recent recommendations and emerging science in neonatal resuscitation. *Pediatr Clin N Am*. 2019; 66:309-320.
3. Qureshi MJ, Kumar M. Laryngeal mask airway versus bag-mask ventilation or endotracheal intubation for neonatal resuscitation. *Cochrane Database of Systematic Reviews* 2018; (3):CD003314.
4. Tracy MB, Priyadarshi A, Goel D, et al. How do different brands of size 1 laryngeal mask airway compare with face mask ventilation in a dedicated laryngeal mask airway teaching manikin? *Arch Dis Child Fetal Neonatal Ed* 2018 May; 103(3): F271-276.
5. Bansal SC, Caoci S, Dempsey E, Trevisanuto D, Roehr CC. The laryngeal mask airway and its use in neonatal resuscitation: a critical review of where we are in 2017/2018. *Neonatology* 2018; 113: 152-161.
6. Kayhan GE, Begec Z, Sanli M, Gedik E, Durmus, M. Performance of size 1 i-gel compared with size 1 proseal laryngeal mask in anesthetized infants and neonates. *The Scientific World Journal* 2015; article ID 426186.
7. I-gel® Resuscitation and Emergency Medicine bibliography Volume 1, Issue 2 July 2020
8. Learning Module for Insertion of Laryngeal Mask Airway (LMA) in Newborns by Registered Nurses Beyond Entry Level Competency (MC-LD-030) Developed By: NSHA Provincial Maternal Child Policy Working group