Basic Airway Management

**Brief Overview:** This module is designed for junior students and provides instruction in the techniques of basic airway assessment and management, including basic bedside maneuvers to establish and maintain a patent airway.

I. **Objectives**

At the end of this training session the medical student will be able to:

1. Demonstrate an understanding of:
   - The common causes of airway obstruction
   - The alleviation of airway obstruction through the head-tilt, chin-lift, jaw-thrust maneuvers
   - The alleviation of airway obstruction through the oropharyngeal and nasopharyngeal airway adjuncts
   - Common errors in basic airway management and contraindications to maneuvers and adjuncts used to alleviate airway obstruction

2. Perform the following maneuvers using an inanimate human airway simulator with efficiency and good effect:
   - Head-tilt, chin-lift, jaw-thrust maneuvers
   - Insertion of an oropharyngeal airway and nasopharyngeal airway
   - One- and two-person methods of bag-mask ventilation

II. **Assumptions**

Participants will be expected to have a basic knowledge of airway anatomy.

III. **Suggested Readings**


IV. **Description of the Laboratory Module**

After an overview of the principles of airway obstruction and respiratory failure and a review of the indications for basic airway management, the participants will practice the techniques of basic airway management using suitable models. The participants will rotate through the following skills stations:

- Head-tilt, chin-lift, and jaw-thrust positioning
- Oropharyngeal airway and nasopharyngeal airway
- One- and two-person bag-mask ventilation
V. Description of Techniques and Procedure

Head Positioning

Head positioning is the most important technique of airway management. The goal is to align the axis of the airway and reposition the airway soft tissues to alleviate obstruction.

Steps as follows:
1. Place the patient’s head in a sniffing position with a small pillow or folded towel under the head.
2. Place an additional pillow or towel under the shoulders of an obese patient to prevent head flexion.
3. Correct any flexion or extension.

Technique for Head-Tilt, Chin-Lift

This technique is less desirable than the two-handed jaw-thrust technique.

Steps as follows:
1. Stand or kneel at the patient’s right side.
2. Position your left hand on forehead and apply pressure to extend the neck (fig.1).

3. Use the tips of the right index and middle finger to elevate the mandible by lifting the tongue off of the pharynx.

![fig. 1](image-url)
Technique for Jaw-Thrust

This technique is the best option when there is a suspected cervical spine injury.

Steps as follows:
1. Stand or kneel at the head of the patient.
2. Position the middle finger of each hand under the angle of the patient’s mandible on each side and apply upward pressure to move the jaw and lower one-third of face forward (fig. 2).

3. Move the lower teeth forward relative to the lower teeth.

Technique for Oropharyngeal Airway Insertion

Steps as follows:
1. Choose the correct size tube.
2. Hold it beside the patient’s mandible and flange at the patient’s mouth. The tip should just reach the tragus of the ear. Insert the tube through the patient’s mouth with the curve of the airway inverted (inner curve up; tips up).
3. Insert the tube halfway and then rotate 180 degrees. This technique avoids pushing the patient’s tongue back (fig. 3).

![fig. 3]

4. A tongue depressor can be used to hold the tongue forward while the airway is inserted. If the patient does not tolerate it, then it probably is not needed.

**Technique for Nasopharyngeal Airway Insertion**

1. Choose the correct size tube. The length runs from the nare to the tragus of the ear.
2. The length corresponds with the internal diameter (ID); the smaller the ID, the shorter the tube.
   - ID 8.0–9.0 = large adult
   - ID 7.0–8.0 = medium adult
   - ID 6.0–7.0 = small adult
3. Apply lubricant to the tube.
4. Insert the tube along the floor of the nostril into the posterior pharynx (the tip will sit behind the tongue) (fig. 4).

![fig. 4]

5. A tongue depressor can be used to hold the tongue forward while the airway is inserted. If the patient does not tolerate it, then it probably is not needed.

**Techniques for Bag-Mask Ventilation**

Ventilation is often overrated and overused. If a patient is breathing spontaneously, assisted ventilation often isn’t beneficial. The objective is to force oxygen into the lungs (positive pressure ventilation). These techniques are difficult and require practice to master.
One-Person Bag-Mask Ventilation

1. Select a mask size to cover over the bridge of the nose and the space between the lower lip and the jaw with a tight seal.
2. Attach the bag to the mask.
3. Set oxygen to high flow (15 L/min). The reservoir bag should be fully inflated.
4. Secure the mask to the patient’s face with your left hand while holding the bag in your right hand (or vice versa) (fig. 5).

5. Maintain a tight seal between the mask and the patient’s face while simultaneously elevating the mandible to maintain an open airway.
6. Hook the fifth finger under the angle of the mandible. The third and fourth fingers hold the body of the mandible and the index finger and thumb hold the mask firmly against the patient’s face.
7. Fully squeeze the bag with the right hand and observe the chest rise. Relax the right hand, allowing the bag to re-inflate.
8. Observe the chest fall. If properly done, the chest should easily rise and fall.
9. Reposition the hand holding the mask repeatedly until a position that works well is found. Using an oropharyngeal or nasopharyngeal airway may help.
10. Avoid ventilating too fast. With an adult patient, squeeze the bag and then say, “Release, release, release,” before ventilating again. This will deliver eight to 10 breaths per minute.

Two-Person Bag-Mask Ventilation

It is difficult to hold the mask sealed to the face and simultaneously hold open the airway with one hand. With the two person technique, one person can manage the mask while the other person manages the bag.

Steps as follows:
1. The person applying the mask should be at the patient’s head.
2. Place the thumbs on the top surface of the mask over the bridge of the nose. Place the index fingers on the bottom surface of the mask. Use the remaining fingers of both hands to hold and elevate the mandible to open the airway (fig. 6).
3. Reposition hands repeatedly if you need to get a better seal. Allow for the chest to easily rise and fall.

VI. Common Errors

- Positioning of the fingers is improper for an effective jaw thrust.
- Choice of an oropharyngeal or nasopharyngeal tube is too short.
- Inadequate seal is obtained between the patient’s face and the mask for effective bag-mask ventilation.
- Ventilation is too fast.
- Use of head-tilt, chin-lift or any maneuver that extends/flexes the cervical spine (C-spine) is contraindicated when a C-spine injury is suspect or confirmed (for example, in trauma victims).
- Use of nasopharyngeal airway adjuncts is contraindicated when mid-face or craniofacial trauma is suspected or confirmed (for example, in trauma victims).

VII. Expert Performance Video

- Basic Airway Management Volume 1
- Basic Airway Management Volume 2

VIII. Supplies and Station Set-Up

A. Classroom with Internet access and digital projection to view the online video

B. Skill Stations

- Experienced physician to coach the participant and to evaluate skills
- Table for the setup of manikin and equipment
- Inanimate airway simulator
- Various sized oral and nasal airways
- Gloves
- Lubricant
- Various sized masks
- Self-inflating bag
IX. Suggested Module Length

A. The introduction is approximately 30 minutes.
   - Introduction of module and review of the principles of airway management
   - Review of the expert performance video

B. Each skill station will take 20 to 30 minutes for each participant.

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