Obtaining a Proper Mask Seal with the Patient's Face

We recommend mask ventilation be performed by two providers. Usually as the critical care fellow managing the event you will prefer to be informed by the “feel of the bag” while another provider seals the mask to the patient's face and provides mechanical assistance for opening the airway. You may need to manage the mask to assess a problem with fit or to open the airway, or to demonstrate to the faculty member your capacity to do so.

The first step is placing the mask on the patient's face. The tapered, "V" portion of the mask is placed high on the bridge of the nose; placement too low on a long face is a common error that establishes leak at the nasal bridge. The rubber cushion of the mask is spread to maximize the contact with the patient's face and improve the seal. The patient's face is drawn up into the mask rather than the mask pushed down onto the patient's face.

Next, the airway is opened mechanically. While maintaining the seal with the first and second digits, the third, fourth, and fifth digits maintain head tilt and press against the lower edge of the mandible, pulling skin against the mask to aid seal. Typically the mouth is closed under the mask. If a jaw thrust is required it is possible to place the fifth and perhaps the fourth finger behind the ramus of the mandible and used to perform a jaw thrust and head tilt, Keeping the jaw thrust forward can require a different grip. The thumbs and thenar eminances may be used to hold the mask on the face while the third, fourth and fifth fingers are used to pull the mandible and face up into the mask. Usually the index finger will not fit behind the ramus; care should be taken that it not reduce the subluxated jaw. Figures 1 and 2 provide additional detail.

Figure 1. Thenar grip. Hand positioning to optimize the seal against the patient's face with least stress to the hands. The thenar eminences and proximal thumbs rest on the mask while the 3rd, 4th and 5th digits are positioned behind the angle of the mandible. The mouth is held open by the lower cushion of the mask. Another benefit of this position is the low likelihood of inadvertently obstructing the airway by compressing submandibular tissues.
The patient with facial hair, the edentulous patient, or abnormal craniofacial structures may prove challenging to obtaining an adequate seal. A clear, adherent biological dressing (like Opsite-TM) can improve the seal in patients with facial hair. A hole for the mouth is made by cutting with scissors prior to removal from the base paper. The hole is centered over the mouth; initial placement can cover the nose, then peeled down off the nares to admit gas flow. Application of water soluble lubricant may be applied to the beard and the mask placed over the lubricant, but this entails significant risk of making equipment slippery.

Use of airway adjuncts (nasopharyngeal or oropharyngeal airways) are expected by basic protocols and can be helpful but may be contraindicated (hemorrhagic diathesis, gag risk), impossible (clenched jaw), resisted or unavailable. This airway training program emphasizes skilled airway maintenance without adjuncts.

Edentulous patients often require jaw thrust (and open mouth, as is always required for jaw thrust) to keep their airway open; the sunken cheeks may be “popped” open by a burst of pressure from the bag, then sustained by CPAP, or may require a tightly-folded gauze pad stuffed in each cheek. Meticulous positioning of the mask, tempered by the clinician’s judgement, will often allow successful ventilation of or the patient with craniofacial abnormalities.

The adequacy of the seal is confirmed between ventilation attempts. Although the provider performing the seal may detect a large leak by feel or sound, tactile feedback from the bag is more sensitive. Testing for leak is most sensitive at or near end-exhalation, when a “flip” squeeze of the bag fails to establish end-expiratory pressure, or maintaining a steady low pressure requires progressive collapse of the bag. Testing for leak during inspiration is difficult because of difficulty discriminating loss of resistance due to leak from loss of resistance due to the patient’s effort. Testing early in exhalation prematurely closes the expiratory valve and blocks exhalation. The pressure-response patterns used to assess leak and confirm seal are fundamental to gaining tactile feedback from the bag. A habit of frequently confirming
the seal is important when conscious attention must be shared, as during codes. A section of the first simulation lab is set up to enable multiple trainees ample time to practice.