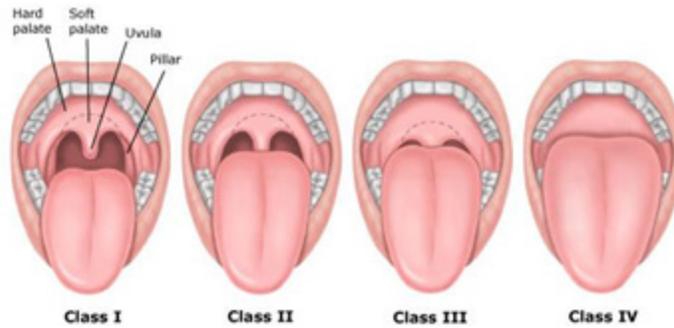


20 Questions – Airway and Intubation

1. On a 'short of breath' you encounter a patient in respiratory failure due to pulmonary edema. He is cyanotic and obtunded. You note that he is obese. What other factors should you assess to determine how difficult an intubation he will be?
2. What are usual reasons to intubate that you will encounter (basically three classes)?
3. What percentage of intubations are considered 'difficult' in the emergency setting?
4. What's the difference between the curved (Mac) and straight (Miller) blades?
5. What are the two most common ways people make DL intubations harder than they need to be?
6. You wisely try to pre-oxygenate the patient prior to intubation but are having trouble getting a mask seal due to his beard. What can you do?
7. You are able to assist ventilations with the bag-valve-mask, and the oxygen saturations climb to 100%. Once you stop bagging, on average how long until the saturations start to drop significantly?
8. Following pre-oxygenation, you attempt to intubate the patient. What can you partner do to assist your visualization of the cords?
9. How hard should you apply cricoid pressure?
10. Because your view of the cords is incomplete, you elect to use the gum elastic bougie to aid intubation. After passing the bougie through the cords, when do you remove the laryngoscope blade?
11. Your end-tidal CO₂ detector is detecting CO₂. Does this assure tracheal placement in the first few breaths after intubation?
12. Breath sounds are clear bilaterally. Is this enough to confirm placement?
13. At what depth should the tube be secured in this patient (assuming 'normal' male depth)?
14. Following intubation, the patient's oxygen saturations improve markedly, and he becomes agitated. What medications may be used to sedate intubated patients according to the new SOPs?
15. You are called to a choking, and find a 2 year old in respiratory arrest. What are the next steps you would follow in caring for this patient?
16. How would you estimate the tube size to intubate this child?
17. How will intubating a young child differ from intubating an adult?
18. How deep would you place the tube?
19. When intubating a trauma patient, is a curved, or straight blade usually preferred?
20. When should we use the King, I-gel, LMA, etc?

20 Answers – Airway and Intubation

1. Think of the mnemonic 'LEMON' to determine difficulty of intubation:
Look – at the anatomy – thick, short neck, high palate, narrow face, trauma, large tongue, teeth, or dentures. Be careful as most men with small jaws grow beards to hide them!
Evaluate – The 3-3-2 rule. 3 fingerbreadths of mouth opening (between teeth), 3 fingerbreadths between chin and hyoid bone, and 2 finger-breadths from the angle of the jaw to the top of the thyroid cartilage indicate a normal anatomy.
Mallampati Score – How much of the uvula and tonsils can you see with mouth opening? If you can see the tip of the uvula and tonsils (Class 1), no problem. If the tip of the uvula is visible, but the tonsils (or tonsillar pillars) poorly seen (Class 2), no problem. If you can only see the base of the uvula (Class 3), expect some difficulty, and if all you see is tongue and a little hard palate, (Class 4), expect lots of difficulty!

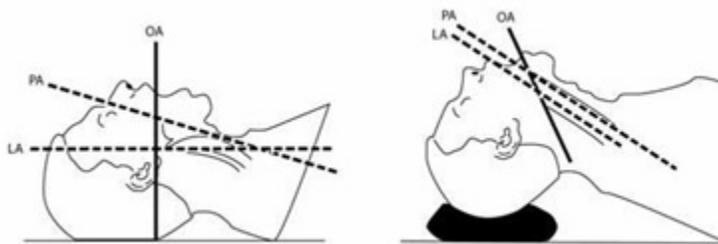


Obstruction – Foreign body, dentures, epiglottitis, croup, tumor, etc.

Neck Mobility – Some older patients have fusion of the neck vertebrae, kyphosis, or unstable neck vertebrae and may have very limited mobility. Also, trauma patients should be minimally extended for intubation (in-line immobilization should be maintained)

****No matter what have your backup plans in place and be ready for the next step.****

2. Three main reasons to control the airway: 1Respiratory Failure – unable to oxygenate (hypoxia) or ventilate (hypercarbia), 2Airway protection - failure to protect the airway (decreased level of consciousness, GCS <8), or 3Anticipated clinical course / impending clinical deterioration (e.g. worsening angioedema or burns, penetrating neck trauma, etc.)
3. Rates up to 20% for intubations that are considered difficult in the emergency setting. The actual rate of failed intubations in the emergency setting is estimated at 1% or less.
4. The Mac, or curved blade inserts into the vallecula and does not compress the epiglottis, but lifts it indirectly via pressure on the hyo-epiglottic ligament. The Miller is intended to lift the epiglottis directly to expose the cords.
5. One way people can make a DL look harder is to put their face closer to the airway when things are hard to see. The better course is to lean back further (thus extending the angle between your eyes and the larynx).
The second common issue to hold your elbow out laterally. You lose a lot of strength when doing this. If your goal is to lift the soft tissue up towards the opposite corner of the room you will get much more strength keeping your elbow in line with your wrist and shoulder.



6. If you have time, shave the patient, with nice hot lather and a straight blade. If you can't make time for this, try putting Surgilube or Vaseline on the beard under the mask seal. Another described technique is to use a large Tegaderm with a hold cut over the mouth (this is also fairly time consuming). Don't forget your supraglottic airways if you're having trouble.
7. Usually, if the patient has been pre-oxygenated well, healthy patients will have between three and five minutes until the O2 sat falls below 90%. This will vary greatly depending on the patient, their degree of ventilatory difficulty, pulmonary reserve, etc. Obesity is another factor that can decrease this time as well.
8. Your partner can BURP. That stands for Backward, Upward, Rightward (the patient's right), Pressure on the cricoid cartilage. This is optimal for getting the vocal cords into the view of the intubator.
9. Place two fingers on the bridge of your nose, and press down until it becomes uncomfortable. This is approximately the pressure you should use when BURPing.

10. Continue to maintain your view of the cords with the blade as you place the tube and advance it over the bougie and into the trachea. You may need to rotate the ET tube counterclockwise at the cords/arytenoids if it gets hung up, this will help it to pass (it changes the angle of the bevel at the end of the tube). Remove the laryngoscope only after the ET is within the trachea.
11. No. Carbonated beverage consumption and gastric distension may cause false positive CO₂ within the first few breaths after esophageal intubation. Typically in the esophagus the reading is still low (in the neighborhood of 12 or less) and decreases to zero fairly quickly. CO₂ may not be present in cardiac arrest, of course.
12. No way. This should be a piece of the puzzle. Other ways to suggest correct or incorrect placement are: Wee aspirator, fogging in the tube (less reliable), breath sounds absent over the epigastrium (less reliable). Anymore, continuous end tidal capnography with the appropriate waveform has become the gold standard.
13. Average tube position at the teeth is 23cm for males, 21cm for females.
14. Ketamine, Midazolam, Haldol, and Dilaudid are sedative agents and may be ordered post-intubation according to our protocols (their use to facilitate intubation is NOT allowed, and has been shown to increase the risk of complications such as aspiration). Of these agents, Ketamine would be preferred. It's often used to induce intubation with RSI and typically gives you 20 minutes of adequate sedation.
15. Back to the basics! Open the airway with a jaw thrust or chin-lift head-tilt, assess ventilations, and attempt to ventilate with a bag-valve-mask. If you are unable to ventilate, perform abdominal thrusts x5 and sweep the mouth, then re-attempt ventilation. Repeat until able to ventilate. If a foreign body is strongly suspected, you may try the ET tube suction trick. Cut off the ET tube above the 'eye', straight across (flat surface). Connect the Wee. Place the tube deeply through the cords, and aspirate on the way out with the Wee. You may be able to trap the foreign body against the ET tube cut end with suction. As a last resort, re-intubate deeply, attempting to push the obstruction into the right mainstem, leaving the left lung available for ventilation. Then intubate and ventilate as usual. Remember these are fairly desperate techniques when ventilation is impossible in a patient with a persistently obstructing foreign body.
16. Measure a tube the width of the nail of the 5th finger, or use the formula $4 + (\text{age}/4) = \text{tube size}$ means $4 + (2/4) = 4.5$ tube.
17. Children have larger heads, larger tongues, a floppier epiglottis, and the narrowest point of the airway is at the cricoid, not the cords (so don't try to force a tube in that appears able to pass the cords, but gets hung up). Also, far less head extension is needed to intubate (which is good, because the differences in distance are so small that once the head is placed back in neutral position, you may be right mainstem if you extended too much).
18. Place the tube just beyond the cords (sometimes will have a double ring on the tube which should sit at the cords). Otherwise, 3 x the ET tube size is the usual place to position the tube at the lips/gums (for this child $4.5 \times 3 = 13.5\text{cm}$)
19. The preferred blade is probably the one that you are most comfortable with, but try using both straight and curved when you have the chance. Generally, a straight blade will give you the best view, as it may help to lever a fractured jaw or swollen tissues out of the way, in some cases a curved blade may be helpful as it gives you a broader blade to lift the tongue with.
20. Think about your supraglottic airways in situations that you feel the airway is going to be excessively difficult, you're having trouble getting the BVM to seal appropriately, or anytime you need a rescue airway. They're work excellently and can get you out of a lot of tough situations. Think of them as having a BVM that fits right over the epiglottis. Just don't forget that if the pt is at all awake it may trigger their gag.