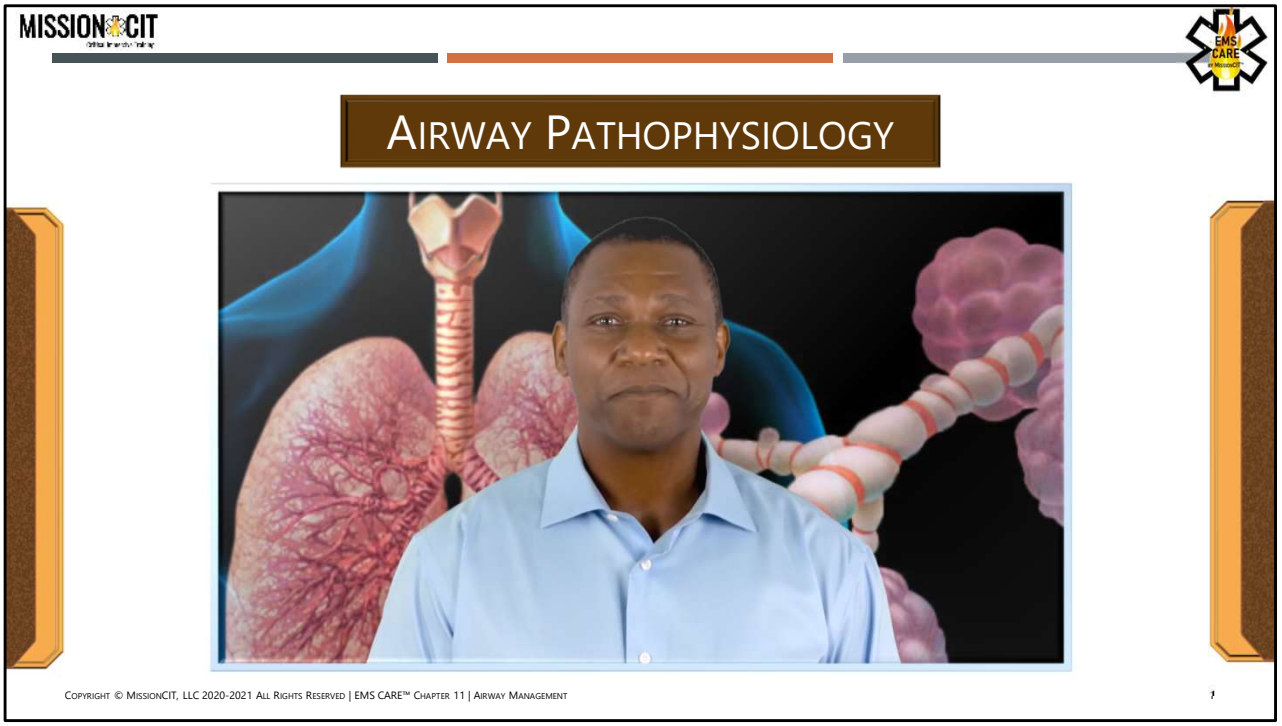
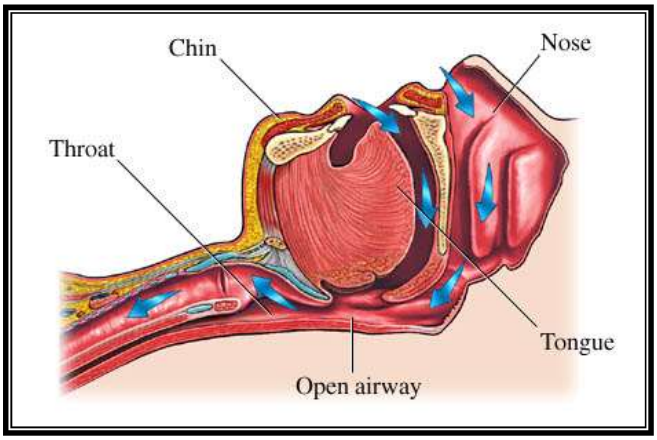



This topic covers the Pathophysiology of the Upper and Lower Airways. In addition to the pathophysiology, we will cover patent and inadequate airways. Pay close attention as airway status may be fluid during a call, requiring constant monitoring. At the end of the topic is a video on Responding to an Adult with an Obstructed Airway.
Good Studying.

## Airway Pathophysiology

- Variety of obstructions interfere with air flow
  - ✓ Foreign bodies
    - Food, small toys
  - ✓ Liquids
    - Blood, vomit
- Obstruction may also result from poor muscle tone caused by altered mental status




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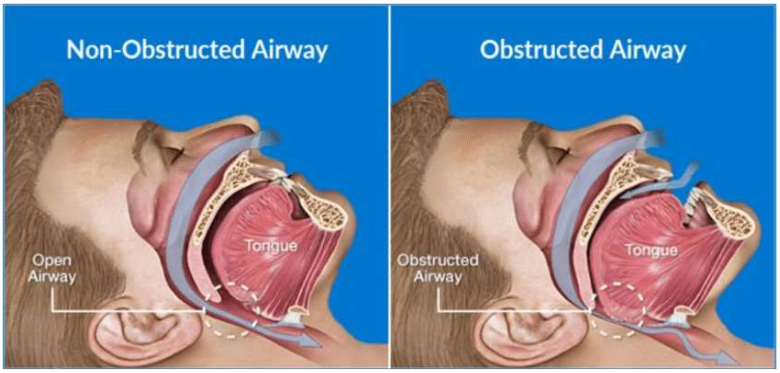
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The sudden onset of respiratory distress and stridor should suggest an upper airway obstruction. However, the causes of upper airway obstruction are numerous. Airway obstructions can be caused by foreign bodies, loss of muscle tone, or swelling in the airway. A variety of obstructions interfere with air flow:

- Foreign bodies such as food, and small toys
- Liquids including Blood, and vomit.
- Obstruction may also result from poor muscle tone caused by altered mental status.

# Airway Pathophysiology (Cont.)

- Obstructions can be acute or chronic
- Providers must initially evaluate airway and monitor patency over time



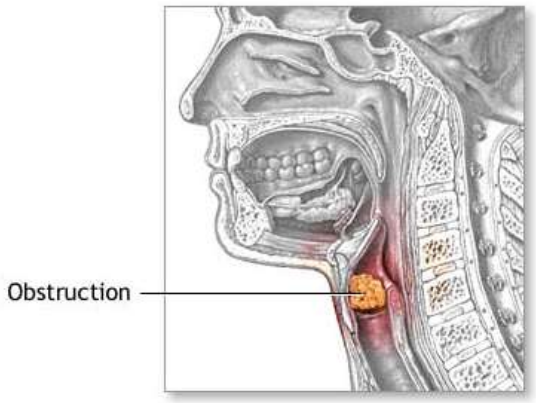

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An airway is called patent whenever there is an open pathway between a patient's lungs and the outside world. An airway obstruction is a blockage in the airway. It may partially or totally prevent air from getting into your lungs.
Under normal conditions, coughing is the main mechanism for clearing the airway. However, the cough may be ineffective in certain situations.
Obstructions can be acute or chronic.
And providers must initially evaluate the airway and purposefully monitor patency over time.

# Airway Pathophysiology (Cont.)

- Airway obstructions
  - ✓ Acute
    - Foreign bodies
    - Vomit
    - Blood
  - ✓ Occurring over time
    - Edema from burns, trauma, or infection
    - Decreasing mental status



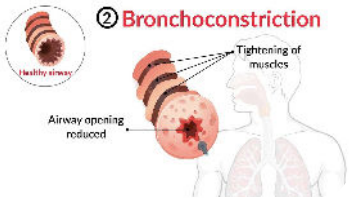

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Airway obstructions may be acute such as from foreign bodies, vomit, or blood. And they may be occurring over time. In addition to Edema from burns, trauma, or infection and decreasing mental status; examples include pain from surgical incisions or trauma, respiratory muscle fatigue, and neuromuscular weakness.

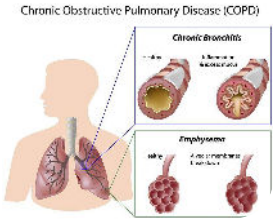
# Airway Pathophysiology (Cont.)

- Airway obstructions
  - ✓ Bronchoconstriction
    - Disorder of lower airway
    - Smooth muscle constricts internal diameter of airway










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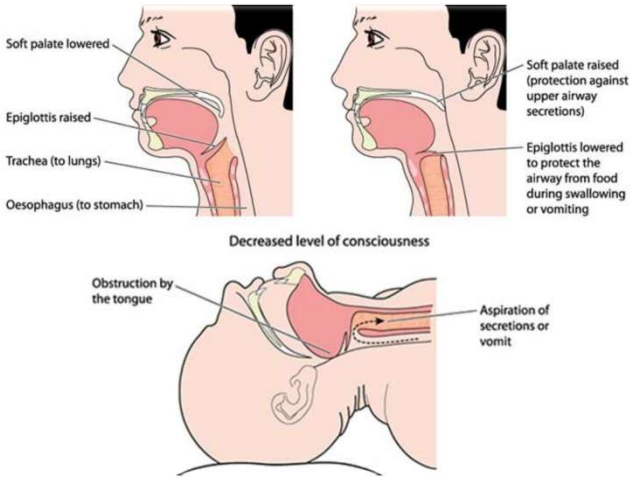


Airway obstructions include Bronchoconstriction, disorders of the lower airway and when smooth muscle constricts internal diameter of the airway.
Bronchoconstriction is a condition in which the smooth muscles of the bronchus, contracts. The bronchus is the pathway that moves air to and from your lungs. This muscle contraction causes the bronchus to narrow and restrict the amount of air passing into and out of your lungs.
Bronchoconstriction usually occurs in asthma, emphysema, and other lung diseases. However, bronchoconstriction can also happen to those without any lung disease during intense exercise.
Chronic obstructive pulmonary disease (COPD) include diseases such as emphysema, bronchitis, and black lung disease. A common feature is the breakdown of the alveoli which greatly reduces the surface area for respiratory exchange.
Asthma is an episodic disease and is not classified as a COPD. Asthma attacks may be triggered by allergic reactions to something injected, inhaled, or swallowed by the patient.
Now, think about what types of infectious diseases might present a threat to the airway.

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# Patient Assessment

- Addressed in primary assessment
- Two questions must be answered
  - ✓ Is airway open?
  - ✓ Will airway stay open?



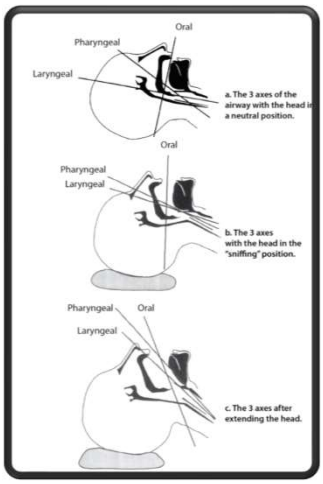

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The aim of the airway assessment is to establish the patency of the airway and assess the risk of deterioration in the patient's ability to protect their airways.
This is always addressed in every primary assessment. Assessment of the airway must consider both the immediate and long-term patency. And there are two questions that must be answered:
First, is the airway open.
And second, will the airway stay open.
The patient's airway can be clear (if the patient is talking), partially obstructed (if air entry is diminished and often noisy) or completely obstructed (if there are no breath sounds at the mouth or nose)
Observe patients for signs of airway obstruction: such as paradoxical chest and abdominal movements. This refers to a state whereby the chest and abdomen rise and fall alternatively and vigorously to attempt to overcome the obstruction.
Also, look to identify whether skin color is blue or mottled.
Airway assessment is a high priority. As we know, without the ability to move air, the patient will die. In most cases, the airway is the first area checked during the primary assessment.

# Is the Airway Open?

- In most patients, can be determined by simply saying hello
- "Sniffing position" seen when swelling obstructs airflow through upper airway




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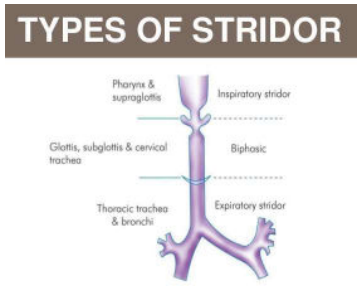
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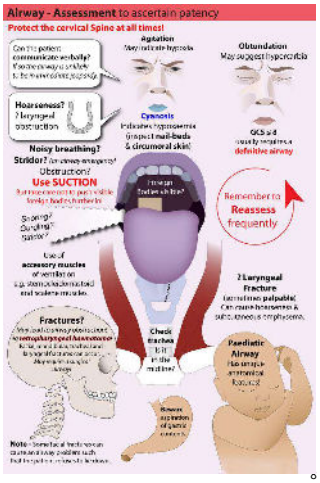
So, how do you determine if the airway is open.
In most patients, this can be determined by simply saying hello.
Be sure to listen for signs of airway obstruction: certain sounds will assist you in localizing the level of the obstruction. For example, noises such as snoring, expiratory wheezing, or gurgling, may indicate a sign of a partially obstructed airway.
Listen and feel for airway obstruction: If the breath sounds are quiet, then air entry should be confirmed, by placing your face or hand in front of the patient's mouth and nose to determine airflow. And then by observing the chest and abdomen for symmetrical chest expansion. Or then listening for breath sounds with a stethoscope.
Be sure to understand the "Sniffing position" as shown in the diagram. It is used when swelling obstructs airflow through the upper airway.

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# IS THE AIRWAY OPEN? (CONT.)

- Findings indicating breathing problems:
  - ✓ Inability to speak
  - ✓ Unusual raspy quality to voice
  - ✓ Stridor
  - ✓ Snoring
  - ✓ Gurgling



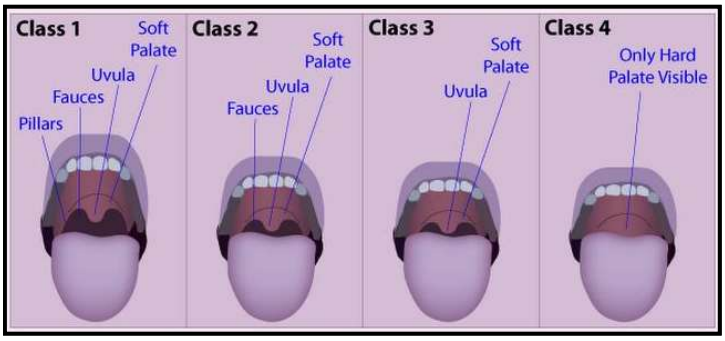

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Here is more about how to determine if the Airway is open.
Any of these five findings may indicate breathing problems: First, the inability to speak; second, unusual raspy quality to voice; third, Stridor. Fourth is Snoring. And fifth is Gurgling.
Stridor is a high-pitched, wheezing sound caused by disrupted airflow. Stridor may also be called musical breathing or extra thoracic airway obstruction. Airflow is usually disrupted by a blockage in the larynx or trachea.

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# Will the Airway Stay Open?

- Airway assessment is not just a moment in time
- Must give constant consideration




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And now, how do you determine if the airway will remain open?
Airway assessment is not just a moment in time. You must give constant consideration throughout a call. If possible, an airway history from the patient will aid in determining if there has been a previous airway problem.
A thorough, but brief, airway assessment is essential to manage patients requiring advanced airway management. Indications for the use of airway management are: (1) failure to oxygenate; (2) failure to ventilate; (3) failure to maintain a patent airway.
A patient in need of airway management needs to be assessed for a difficult airway. A difficult airway is one where the patient will be hard to mask, ventilate, or intubation is likely to fail.
Many disease states have been associated with a difficult airway. Pulmonary problems such as asthma, pneumonia, and chronic obstructive pulmonary disease may affect oxygenation and ventilation.

## Signs of an Inadequate Airway

- No signs of breathing or air movement
- Evidence of foreign bodies in airway
- No air felt or heard
- Inability or difficulty speaking
- Unusual hoarse or raspy voice
- Absent, minimal, or uneven chest movement



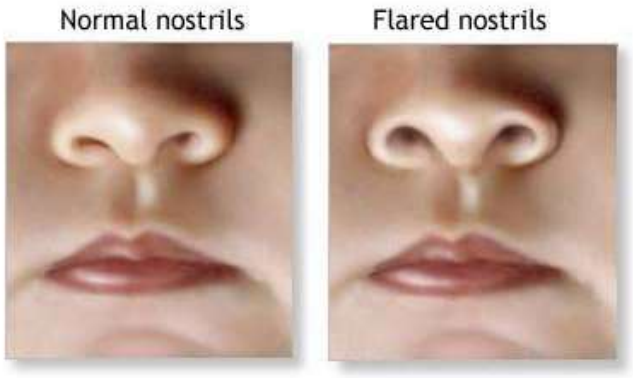
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So, what are the signs of an inadequate airway?
Remember, a difficult airway is one where the patient will be hard to mask, ventilate, or intubation is likely to fail. Indications are:
First, no signs of breathing or air movement.
Second, clear evidence of foreign bodies in the airway.
Third; no air felt or heard.
Fourth, there is an inability or difficulty speaking.
Fifth: The patient exhibits an unusual hoarse or raspy voice.
And sixth; the patient is absent, minimal, or uneven chest movement.

## Signs of an Inadequate Airway (Cont.)

- Abdominal breathing
- Diminished or absent breath sounds
- Abnormal noises such as wheezing, crowing, stridor, snoring, gurgling, or gasping during breathing
- In children and infants, nasal flaring
- In children, retractions above the clavicles




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And here are some more signs of an Inadequate Airway…
Number 1: Abdominal breathing.
Number 2: Diminished or absent breath sounds.
Number 3: Abnormal noises such as wheezing, crowing, stridor, snoring, gurgling, or gasping during breathing.
Number 4: In children and infants, nasal flaring.
Number 5: In children, retractions above the clavicles.
Note that nasal flaring is a symptom of breathing difficulties. It may also be an attempt to widen the nasal opening to reduce airway resistance. In most cases, these difficulties will worsen until the cause is diagnosed and treated. Nasal flaring can be serious, especially in children, and may require emergency medical treatment.
There are multiple types of chest retractions to watch for.
Subcostal retractions: When the belly pulls in beneath the ribcage.
Substernal retractions: If the belly pulls beneath the breastbone.
Suprasternal retractions: When the skin in the middle of the neck sucks in. It's also called a tracheal tug.
Super clavicle retractions: These happen on the part of the neck above the collarbone.
Intercostal retractions: And these happen between each rib.

Wherever they're happening, chest retractions mean the body's not getting enough air.

## Responding to an Adult with an Obstructed Airway Video

- What is the most common foreign object on which adults choke?
- Differentiate between a partial and a complete airway obstruction
- Why is it important to ask for permission to help a choking victim?
- Describe how to provide emergency care for an adult with a foreign body airway obstruction
- What modifications should an EMT utilize when providing emergency care to a choking patient who is pregnant?



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Now, you will watch a video on responding to an Adult with an Obstructed Airway. As you watch the video, pay close attention to the following:
What is the most common foreign object on which adults choke.
How to differentiate between a partial and a complete airway obstruction.
Why is it important to ask for permission to help a choking victim.
Be prepared to describe how to provide emergency care for an adult with a foreign body airway obstruction.
What modifications should an EMT utilize when providing emergency care to a choking patient who is pregnant.