

What Is Laryngomalacia?

Stridor is a high pitched, noisy or squeaky sound that occurs during inspiration (breathing in). Laryngomalacia is the most common cause of chronic stridor in infants. The stridor from laryngomalacia is generally mild but it becomes louder when babies cry or get excited. It can also be heard while feeding. Stridor due to laryngomalacia is usually more noticeable when babies are laying or sleeping on their back (supine), and it may disappear by changing position. In about 10% of cases, symptoms worsen while the babies are asleep.



Laryngomalacia is often noticed during the first weeks or months of life. Symptoms may come-and-go over months depending on growth and level of activity. In most cases, laryngomalacia does not require a specific treatment. Symptoms usually improve by 12 months of age and resolve by 18-24 months of age.

What causes laryngomalacia?

The exact cause of laryngomalacia is unknown, but it may be caused by immaturity and low muscle tone of the upper airway. The voice box is called the larynx and is located behind the tongue and above the windpipe (trachea). The larynx contains the vocal cords that open when talking, crying or breathing, and close when drinking or eating. The larynx also contains cartilage that moves the vocal cords, which protect the windpipe from food or secretions entering when swallowing. This cartilage includes the arytenoids and epiglottis. In laryngomalacia, the arytenoids or the epiglottis is soft and floppy. In fact, the term "laryngomalacia" means "soft larynx".

Signs and symptoms of laryngomalacia

- Stridor (noisy breathing) occurs when the floppy tissue of the voice box gets pulled into the airway when your baby breathes in, causing a temporary partial blockage of the airway. This tissue is pushed back out when the baby breathes out, opening the airway fully again.
- Retractions or "sinking in" of the neck and chest muscles can be seen when your baby breathes in. These retractions are usually mild. This is more obvious because the chest wall in a young child is not as rigid, and this also improves with age.
- Gastroesophageal reflux (GER) is seen in many babies, including those with laryngomalacia. GER occurs when

food or acid from the stomach comes back up the feeding pipe (esophagus) into the throat, or larynx. Stomach contents and acid can irritate and inflame the larynx, which may make the noisy breathing worse. Some infants may require medication to treat GER. GER also tends to improve and often goes away with age.

- Severe laryngomalacia is seen in 5-10% of cases. The infant may experience difficulty breathing, blue spells, apnea (stop breathing), poor feeding, or weight loss. In these cases, treatment is needed.

How is laryngomalacia diagnosed?

- A complete medical history and physical examination is routine. When the history and physical findings are typical of laryngomalacia in an otherwise healthy child, no additional testing may be necessary. In some cases, other studies may be done to confirm the diagnosis.
- In most cases, the diagnosis of laryngomalacia is confirmed by transnasal flexible laryngoscopy or bronchoscopy. During this procedure, a small flexible tube is passed through the nose to examine the upper airway and voice box (larynx). This exam allows your healthcare provider to see the structures of the larynx and how they move, to diagnose laryngomalacia, and exclude other more unusual anatomic causes of stridor. Flexible laryngoscopy can be done in the office while the child is awake. Bronchoscopy is done in the operating room or bronchoscopy suite under sedation or general anesthesia and it examines the voice box area as well as the lower airways and lungs. These procedures are mostly done by the ear-nose-throat (ENT also called otolaryngologists) and pediatric pulmonologist specialists. For more information on Flexible bronchoscopy, see the ATS Patient information handout at www.thoracic.org/patients.

- Other studies that may be done include:
- X-rays of the neck and chest allow healthcare providers to see airway structures below the vocal cords that cannot be seen during the physical examination.
- Airway fluoroscopy is an x-ray video of the airway taken while the child breathes. This can help your healthcare provider see the movement of the airway tissue in real-time. It does have radiation exposure.
- Barium swallow study is a series of x-rays that look at the structures around the airway, esophagus, and stomach while the child is swallowing special liquids with contrast. This allows your healthcare provider to evaluate the swallowing function of your child and examine the anatomical relationships between the airways, blood vessels and other structures in the chest. Sometimes, GER can be seen during the study as well.
- A sleep study may show evidence of how often and severe the airway obstruction is or how it disrupts sleep.

How is laryngomalacia treated?

There is usually no need for aggressive treatment as long as the baby's symptoms are mild, and the baby has no feeding difficulties, good weight gain, and normal development.

GER symptoms may be avoided by frequent burping during feeds, feeding smaller amounts more often, and keeping your child in an upright position for 15-30 minutes after feeding. In some cases, your healthcare provider may recommend to thicken the consistency of the feeds to help reduce vomiting. Your healthcare provider may also prescribe anti-reflux medication to decrease the acidity of the stomach contents or use other medications to help food move more quickly through the digestive system.

Your healthcare provider may suggest use of a decongestant by mouth or inhaled during acute upper respiratory illnesses, even though those medications are not commonly used in otherwise healthy infants.

In children with severe laryngomalacia, surgery may be required. Supraglottoplasty is a procedure done in the operating room under general anesthesia by the ENT specialist to remove some tissue from the floppy larynx to improve breathing. Babies are usually monitored in the hospital overnight after this procedure. Rarely, oxygen, continuous positive pressure or tracheostomy is needed to help the child breathe.

When should I call my healthcare provider?

Bring your baby to a healthcare provider or emergency room if you see your baby having:

- Blue spells or pauses in breathing.
- Respiratory distress: retraction or sinking in of chest or neck muscle for long periods of time.
- Feeding difficulties: choking with feeds, not taking enough formula, or a decrease in wet diapers.
- Poor weight gain or weight loss.

What can I do to help avoid problems from laryngomalacia?

- Watch your baby for signs or symptoms that he or she is getting worse.
- Keep scheduled follow-up with your pediatrician, pulmonologist or ENT specialist.
- Frequent weight checks: Follow-up with your healthcare provider for well child care.
- Monitor for feeding problems: Allow your baby to take brief pauses and breaks while feeding to "catch his or her breath." For more severe problems, speech evaluation may be required to help with swallowing problems.
- Treatment of gastroesophageal reflux (GER): During feeds, burp your baby often. After feeding keep your baby upright or elevated for 15-30 minutes. You may need to give smaller feeds more often or thicken formula. Give any prescribed medications as directed. For more severe problems, a gastroenterology (GI) evaluation may be needed.

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Rx Action Steps

- ✓ Talk to your healthcare provider if your child has noisy breathing and take note of any change with activity, sleep or position.
- ✓ Be sure to alert your healthcare provider if your baby has trouble breathing or difficulty with feedings.
- ✓ Treat GER symptoms with guidance from your healthcare provider.

Healthcare Provider's Contact Number:

Additional Resources:

American Thoracic Society

Patient Information Series pieces:

- <http://www.thoracic.org/patients/patient-resources/resources/flexible-bronchoscopy.pdf>
- <http://www.thoracic.org/patients/patient-resources/resources/Sleep-studies-in-Child.pdf>

Children's Hospital of Philadelphia:

- <http://www.chop.edu/conditions-diseases/laryngomalacia>

Children's Hospital of Vanderbilt:

- <https://www.childrenshospital.vanderbilt.org/services.php?mid=9993>

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