

Brachycephalic Syndrome in Dogs and Cats

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What does brachycephalic mean?

In dogs and cats, being brachycephalic means that the skull and in particular the face and nose are shortened. "Brachy" means "shortened" and "cephalic" means "head". People may describe it as the face appearing "pushed in." As the face and nose bones are shortened, the anatomy of other tissues change as the amount of space is restricted. Animals that are brachycephalic have a compressed face, with nostrils that are, often times narrowed. Additionally these breeds will have an abnormally shaped nasopharynx (the area where the nasal cavity meets the throat). Some dog breeds that are brachycephalic include the English Bulldog, Boxer, Pekingese, Chinese Pug, Shar Pei, Lhasa Apso, Shih Tzu, King Charles Spaniel, and Boston Terrier. In cats, the Himalayan and Persian breeds are brachycephalic. While the brachycephalic head shape in these dog and cat breeds is desirable, associated anatomical changes can be problematic.

What is brachycephalic syndrome?

Brachycephalic syndrome, also known as "brachycephalic respiratory syndrome" or "congenital obstructive upper-airway disease," is a collection of physical abnormalities that are common in the breeds mentioned above. One or more of these abnormalities may be present in an individual animal, and include.

- **Stenotic nares:** A severe narrowing of the nostrils.
- **Elongated soft palate:** The soft palate extends into the back of the throat and may partially block the airway.
- **Eversion of the laryngeal sacculles:** The laryngeal sacculles are small out-pouchings located in the larynx (voice box). With the increase in respiratory effort, due to stenotic nares and an elongated soft palate, these out-pouchings get sucked into the airway, further restricting air-flow.
- **Narrowing of the trachea :** The trachea (wind pipe) is narrower in diameter.

One or more of these abnormalities makes breathing difficult because of increased airway resistance and the increased effort it requires to inhale. Animals with brachycephalic syndrome, over time, may develop other abnormalities in the airway including: inflammation and swelling of the voice box (laryngitis) and throat (pharyngitis), tonsil eversion (the tonsils protrude into the throat), and collapse of the epiglottis (part of the larynx), larynx and/or trachea.

What are the symptoms of brachycephalic syndrome?

Symptoms of brachycephalic syndrome include:

- Labored breathing
- Noisy breathing
- Exercise intolerance (inability to exercise without becoming "out of breath")
- Gagging
- Coughing
- Snorting
- Cyanosis (turning blue)
- Collapse
- Restlessness

These animals may also exhibit:

- An increased susceptibility to heat stroke
- Difficulty swallowing
- Abnormal body posture as they try to more efficiently move air into their respiratory systems
- Increased incidence of dental and [periodontal disease](#)
- Increased incidence of eye problems
- Infections in the folds of the skin of the face

How is brachycephalic syndrome diagnosed?

In diagnosing brachycephalic syndrome, a veterinarian will use information obtained through:

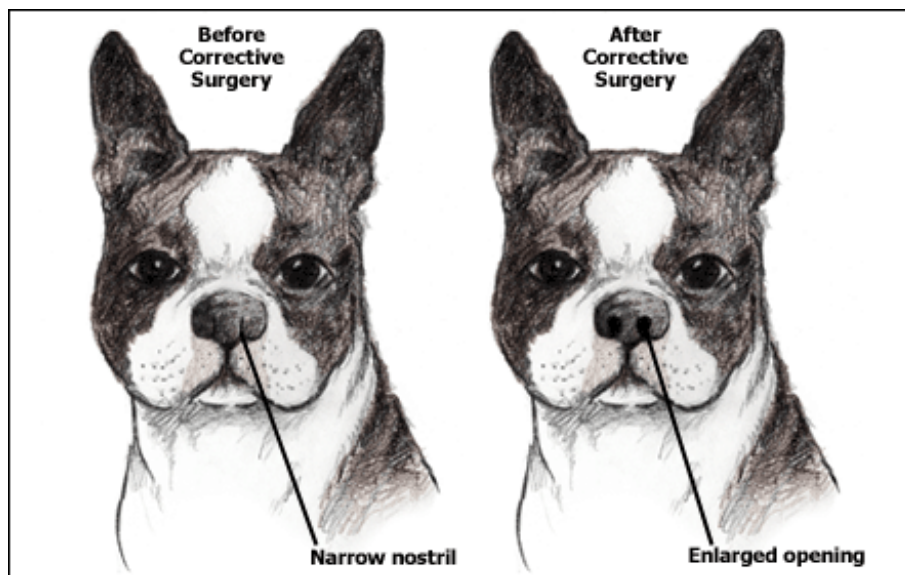
- A complete history
- A physical exam
- Analysis of the animal's blood, especially the pH and CO₂ levels
- Radiographs (x-rays) of the neck and chest to look for evidence of airway problems
- [Endoscopic exam](#) of the upper airway and trachea
- [Bacterial culture](#) and/or a biopsy of the airway

NOTE: If anesthesia is used during any of the diagnostic tests mentioned above, it is extremely important that animals with brachycephalic syndrome be closely monitored until they are fully awake.

Can brachycephalic syndrome be treated?

Fortunately there are things that can be done to reduce the respiratory problems associated with this syndrome. Most of the options are surgical. The veterinarian will usually proceed from "front to back" that is from the nose inward.

[Stenotic nares](#) can be opened surgically by removing a wedge of tissue from the nares allowing better airflow through the nose.



An elongated soft-palate can be shortened surgically so it no longer protrudes into the back of the throat.

Everted laryngeal sacculles can be surgically removed to increase the size of the laryngeal airway.

With today's laser technology some of these procedures can be performed with a minimal amount of bleeding and no need for stitches.

The level of success depends on the age of the animal and when these procedures are performed. The earlier brachycephalic syndrome is diagnosed and treated, the better, since the condition can worsen with time and cause other abnormalities. Everted laryngeal sacculles and a weakening of the trachea can result from a prolonged period with the animal breathing through a restrictive airway. If the surgeon can increase the size of the airway and decrease the inspiratory pressure before the airway is damaged, then a brachycephalic animal can breathe with much greater ease.

Why is it important to know if my pet has brachycephalic syndrome?

A dog or cat with brachycephalic syndrome is predisposed to a number of problems related to the narrowing of the airway. These problems include:

- **Increased susceptibility to heat stroke:** Dogs cool themselves through respiration. During inhalation the dog brings cool air into the lungs. During exhalation the dog removes heat from its body. This process of cooling the body is limited in animals with a narrow airway. Dogs and cats with brachycephalic syndrome need to avoid situations where the temperature is excessively warm.
- **Inability to exercise:** As dogs and cats exercise, their demand for oxygen increases. Their bodies call for oxygen and as a result their respiratory rate increases. It is very difficult to satisfy the demand for oxygen through a narrow airway so these animals will have a limited ability to exert themselves.
- **Increased anesthetic risk:** Because of the narrowing of these animal's airways and the extra tissue in the pharynx, these animals are at greater risk of airway blockage while under anesthesia. Most anesthetic agents have a muscle relaxing property that may allow extra tissue to block their airway. These animals should be monitored very closely while under anesthesia.

The brachycephalic breeds are very popular. Their features give them a unique appearance and add to their personality. Unfortunately it is these very features that may lead to problems with their airway. Fortunately, with care and the skills of a veterinary surgeon, these animals can live a comfortable and full life.