



BOAS Surgery

Brachycephalic Obstructive Airways Syndrome

Noisy Breathers, Snoring & Snorting

Unfortunately for several breeds of dog it is widely accepted that even at complete rest, they have excessively loud breathing noises.

For many this can be an excessive panting, however for some it more strained with obvious muscle contraction in their abdomen, including true snorting reverberating noises in their throat. These are all signs of obstructions to air flow in the upper part of the breathing pathway.

Any animal at rest and mild exercise should be able to breathe with ease, without making excessive noise or effort. This problem is due to the anatomy of the soft tissue structures at the back of certain breeds throats. Therefore this problem is present at birth but will progress with time due to irritation of the soft tissues and the excessive forces being used to move air in and out of their lungs.

The classic breeds affected are the French Bulldog, Bulldog, Pug, Pekingese, Shih Tzu, Japanese Chin, Boxer and Boston Terrier. The collective term for these dogs is Brachycephalic (latin translation is short skull).



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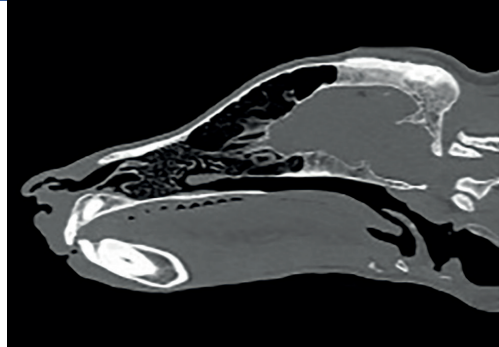


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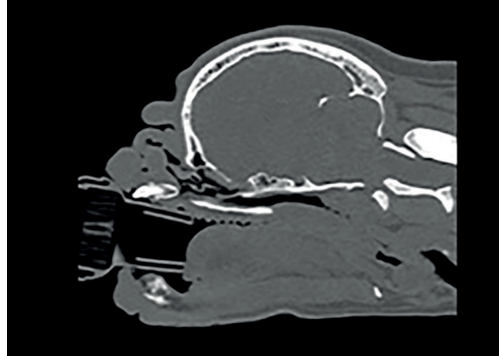


What is causing the obstruction?

On the right are cross-sectional images of a normal dogs skull (Mesocephalic) and a Flat face breeds Skull (Brachycephalic). This gives a true visual representation of the increased amount of soft tissue which can obstruct a dogs' airway, increasing the resistance to breathing and creating these noises. There are 4 main structures of interest.



Mesocephalic Long Skull

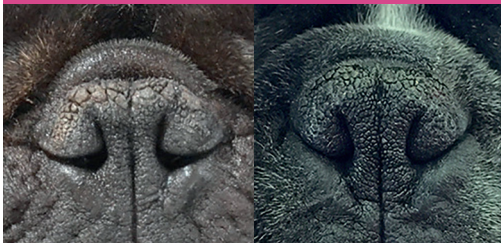


Brachycephalic Short Skull



Good

Mild



Moderate

Severe

1) Nares (Nostrils)

Stenotic (overly closed) nostrils can prevent these breeds breathing through their nose, which is the normal way dogs breathe for over 90% of the time. If the nasal openings are more closed then this greatly increases the effort required to get the same volume of air into their lungs. They can be graded on a 4 point system as seen left.

Overly closed nostrils can prevent certain breeds from breathing through their nose.

2) Nasal turbinates

As evidenced in the picture to the left area directly behind the nostrils lay little scrolls of cartilage. In the longer nosed dog these form smooth channels for the air to flow through, however in our flat nosed breeds this structure can become compressed preventing air flow.

3) Soft palate

The soft palates function at the back of the throat is to separate the breathing and food intake pathways. For this purpose it should extend to the junction of these pathways.

However where evolution has shortened the length of the bones in the skull, it has not shortened the soft palate length nearly as much (in evolution, bony changes occur at a higher speed than soft tissue). This leads to the soft palate overlying the entrance to the breathing pathway producing the snoring/snorting (stertor) that is so commonly heard in the short nose breeds.

4) Hypoplastic trachea

A Hypoplastic trachea is seen in some brachycephalic breeds, particularly in English bulldogs. The windpipe is significantly narrowed requiring more effort to move air in and out of the lungs. The trachea may lose its structural support, making breathing more difficult. It may initiate the development of a chronic cough and respiratory resistance. It can be likened to breathing through a straw.

Normal dogs will breathe through their noses 90% of the time.

Signs

1) Respiratory noise

Snoring both asleep and awake, increased noise at mild to moderate exercise, exercise intolerance, reverse sneezing.

2) Stenosis of the nostrils

Increased and in some cases solely open mouth breathing. Dogs will naturally breathe through their noses at rest and even at mild exercise. Breathing with obvious abdominal effort is commonly seen.

3) Gastrointestinal signs

Due to the increase negative pressures created in the chest to try and suck in air to the lungs past the aforementioned obstacles, it is common for suffers to have a higher incidence of regurgitation of food.

4) Obstructive sleep apnea/ sleep-disordered breathing

Sleeping in strange positions, with a toy in their mouth, with their head raised on a piece of furniture can often be seen. Also seen are the effects of sleep deprivation (falling asleep at strange times or at any given chance but not sleeping for long due problems with breathing).

5) Heat intolerance

Panting moves a lot of hot air out of the lungs to fill again with cool air and hence cool the body. Due the difficulties for these breeds to move air efficiently they often struggle in hot temperatures.

6) Cyanosis and collapse

These are the most extreme signs and we endeavour to catch these cases before we get to this level.

For all of these reasons further investigation is recommended for any dog with increased respiratory noise as the condition does progress.

Early intervention is key to the best outcome.

They all do it so how do we know what is normal' or abnormal?

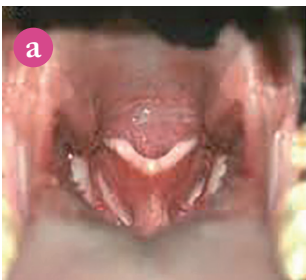
Truth be told any noise when breathing is abnormal. The key factor is how much does it affect the individual. Until a year ago this was a judgement call of the vet you saw. Cambridge University (the leading researchers into BOAS) have now produced two guidelines. The first of which is above. These are the guidelines for whether surgery to increase the size of the nares is required. The second is a short exercise test which examines the effort and noise required to breathe after mild exercise for 2 minutes.



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What can we do?

Despite there being four main concerns two are much more accessible to treatment than the others. These are the elongated soft palate and stenotic (narrow) nares. In a large number of cases especially when treatment is instituted early on in the process only surgery to correct these two parts of the disease is necessary. For the nares, (a) before surgery, two wedge sections are taken to enlarge the opening. Image (b) shows post surgery. For the palate (a), a section of the palate is resected to decrease the amount of soft tissue at the back of the throat (b).



Please visit the Cambridge boas website for more information:
<https://www.vet.cam.ac.uk/boas/about-boas>

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