



## Veterinary Specialists of Alaska, P.C. Client Information Sheet: Brachycephalic Airway Syndrome (BAS)

### **Brachycephalic Airway Syndrome (BAS)**

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“Brachycephalic” means having a short face. Such breeds include the English bulldog, Pug, Boston terrier, Shih Tzu and many others. Brachycephalic Airway Syndrome (BAS) refers to a combination of anatomic abnormalities attributable to brachycephalic conformation. Those abnormalities are stenosis (narrowing) of the nares (nasal openings), soft palate elongation, laryngeal sacculae eversion and tracheal hypoplasia or narrowing. BAS is present from birth, but many patients don't develop alarming clinical signs until they are 2-4 years old.



Dog with stenotic nares (narrowed nasal openings)  
(Picture taken by Dr. Joe Hauptman, DVM, DACVS)

**Clinical signs:** Most patients with this disorder usually have noisy, difficult breathing. They can also experience retching or gagging up phlegm and difficulty swallowing. If they become overexcited, breathing can become more difficult and they can collapse. If the nares are stenotic, air cannot pass easily and can cause the dog to struggle to breathe through the nose or to breathe through the mouth instead. The soft palate is the fleshy part of the roof of the mouth in back of the hard palate. Many brachycephalic dogs are born with an overlong soft palate. The result is that the excessive soft palate can get sucked into the larynx when the dog inhales. This obstructs breathing and results in increased effort. For better understanding, please see the picture below and click on the following link to see a movie of this condition.



Dog with elongated soft palate. The area below the white dashed line obstructs the airway when the dog is breathing.



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Consequences of BAS: Because of stenosis of the nares and elongation of the soft palate, inspiratory effort is increased and a vacuum is actually created at the laryngeal level. The laryngeal saccules are structures to the sides of the vocal cords. This vacuum can actually suck the laryngeal saccules inside out causing them to protrude into the laryngeal opening thus further limiting air flow into the trachea.

If BAS is severe enough and is untreated, the laryngeal cartilages may soften and the entire larynx can be sucked inward when the dog inhales. This is called laryngeal collapse. This is a terrible condition in that the prognosis is guarded. In severe cases of laryngeal collapse, the most appropriate therapy is a permanent tracheostomy.

Treatment: It is important to understand that patients with BAS cannot be made normal. However, surgery can help improve their ability to breathe.

*In a crisis situation*, sedation and supplemental oxygen will be necessary. In extreme cases, a temporary tracheostomy (breathing tube passing through the skin and into the trachea) may be necessary.

*Weight management:* Obesity compounds airway problems in dogs in two important ways. Obesity increases oxygen demand, causing the dog to breathe harder for the same level of exercise. Furthermore, fatty tissue can compress the airway and diaphragm, further compromising delivery of air to the lungs. Please consult your veterinarian regarding the most appropriate weight control program for your dog.

*Stenotic nares:* The nasal openings, or the nares, can be widened by performing a surgical procedure called an alar fold resection. The alar folds are the “wings” of tissue being sucked into the nasal opening. By removing them, they are no longer obstructing air flow. The cosmetic results following this procedure are favorable once healing is complete.



Same dog as above after alar fold resection.  
(Picture taken by Dr. Joe Hauptman, DVM, DACVS)



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*Soft palate elongation:* Excessive soft palate can be removed surgically. It is important to understand that the soft palate, when functioning normally, has an important role in swallowing as it helps keep food and water from going up into the nasal cavity. There is often a fine line between removing enough soft palate and removing too much. If an insufficient amount of soft palate is removed (resected), abnormal breathing will persist. If too much soft palate is resected, food and water may enter the back of the nasal cavity during swallowing, resulting in chronic nasal inflammation. Because one can always remove more but cannot put it back, it is better to err on the side of removing too little than too much.

*Laryngeal sacculle eversion:* In some instances it is necessary to remove the everted sacculles. However, they may normalize once the nares and soft palate are sufficiently corrected.

*Tracheal stenosis or hypoplasia (narrowing of the wind pipe):* There is currently no appropriate therapy for this condition.

Post-Operative Care: Patients exhibiting difficult breathing immediately after surgery should be taken to a 24-hour care facility for overnight observation.

Limit activity to brief leash walks for urination and defecation for 2 weeks post-operatively.

Administer oral antibiotics for 1-2 weeks following surgery.

Feed a soft diet for one week following surgery

Return to Veterinary Specialists of Alaska, P.C. 10-14 days following surgery to assess progress.

Post-Operative Complications: The most noteworthy complication is acute swelling of the soft palate leading to severe respiratory distress. For that reason, the tissues are handled carefully during surgery and anti-inflammatory medications (steroids) are administered prior to surgery.

Prognosis: The prognosis is good if the only problems are stenotic nares and an overlong soft palate. Unfortunately, these patients often have multiple problems. Even so, it is appropriate to correct the correctable because the vast majority of patients benefit greatly from such interventions. The prognosis is more guarded if laryngeal collapse is present because it appears that this condition is progressive.

Prevention: Early identification and treatment of stenotic nares may help prevent eversion of the laryngeal sacculles, excessive elongation of the soft palate, and laryngeal collapse.

We hope that this information pamphlet was helpful to help you. Please do not hesitate to call or ask at your next appointment if you have any questions or concerns.

Your VSOAK Team