

**Queen's Veterinary School Hospital (QVSH)  
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Brachycephalic Obstructive Airway Syndrome (BOAS) Research Group QVSH Tel: 01223 337621  
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### *BOAS Research Group Study*

#### *Investigating the risk of respiratory disease in different brachycephalic breeds*

The BOAS Research Group at the University of Cambridge is excited to announce a new study into different brachycephalic breeds. We are looking to identify and define the risk of BOAS in a number of breeds, and also assess for symptoms of Chiari-like malformation/syringomyelia (CM/SM). We hope that this research will help us to improve the current health schemes and ultimately improve the welfare of future generations.

#### *What is BOAS?*

BOAS stands for 'brachycephalic obstructive airway syndrome'. The term 'brachycephalic' refers to dogs that have a shortened skull; they have shorter muzzles and flatter faces compared to other breeds, such as Labradors or Greyhounds. The three most extreme brachycephalic (flat-faced) breeds include Pugs, French Bulldogs and Bulldogs.

Symptoms of BOAS include noisy breathing, sleep apnea, exercise and heat intolerance. In severe cases this can lead to collapse and death. Dogs affected by BOAS often have small nostrils and a disproportionately large amount of soft tissue (abnormal nasal passages, large tongue, long and thickened soft palate) within a smaller skull. This reduces the air spaces within the upper airways causing increased resistance to airflow when breathing.

#### *What is the purpose of this research?*

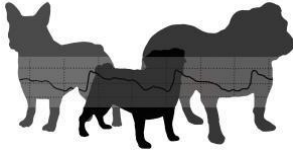
The more extreme brachycephalic breeds (Pugs, French Bulldogs and Bulldogs) are at a greatly increased risk of BOAS. However, in other brachycephalic breeds, BOAS is seen very rarely. It is not possible to determine the risk of BOAS from appearance and conformation alone. Therefore, we are investigating why this is the case and look to define the risk of breathing problems in a greater number of breeds. This will ultimately help us to improve the current breed health schemes and provide more data for future genetic studies so that we will be able to secure the long-term health and welfare for these dogs.

#### *What does the study involve?*

For this study, we will perform respiratory grading assessments, involving a physical examination and short exercise tolerance test. We also use whole-body barometric plethysmography (WBBP) which is a non-invasive clinical method used to assess breathing function. We will also take photographs for conformation measurements and DNA swabs for future genetic studies.

#### *What is Chiari-like malformation?*

Chiari-like malformation is another conformational disorder seen in certain brachycephalic or toy breed dogs. Common symptoms can include vocalization, sensitivity to touch, pain,



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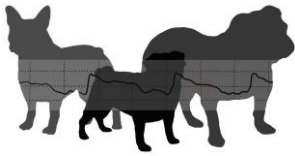
lethargy and behavioural change. Whilst it has been found that certain breeds are more likely to suffer from this disorder, the mechanism of the disease is not yet fully understood. We are interested to investigate whether there is a relationship between the conformation and anatomy of dogs affected by BOAS and CM/SM. At the same time as the respiratory assessment, we will carry out a full clinical assessment to screen for clinical symptoms of these disorders.

*Which breeds are we studying?*

We will be looking to recruit dogs over the age of 12 months from the following breeds; Affenpinscher, Boston Terrier, Boxer, Cavalier King Charles Spaniel, Chihuahua, Dogue de Bordeaux, Griffon Bruxellois, Japanese Chin, King Charles Spaniel, Maltese Terrier, Pekingese, Pomeranian, Shih Tzu.

*How do I get involved?*

Please email Fran Tomlinson ([ft270@cam.ac.uk](mailto:ft270@cam.ac.uk)) for further information. We are happy to provide assessments at the QVSH, or alternatively can travel to you dependent on number of participants.



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## Further Information: Identifying and defining respiratory disease in different brachycephalic breeds – CT Imaging Study

### What are the aims of this study?

This study is being undertaken to evaluate the internal anatomical difference between dogs affected and unaffected by BOAS in different brachycephalic breeds. This will help to improve treatment and for future breed health schemes.

### What does this study involve?

When your dog is admitted to the QVSH for dental treatment, a CT scan will be taken whilst the dog has been given sedation/anaesthesia before the dental treatment begins. CT scans use a rotating X-ray machine and a computer to create detailed internal images of the body. This study will involve CT scan of the airways including the head and chest.

The CT images are very useful for assessment of dental health and indicate whether extractions will be needed. We then will also use these CT images for this study to compare BOAS affected dogs to unaffected dogs. This will allow us to identify the abnormalities that cause BOAS and CM/SM in different breeds and allow us to compare the anatomical features which could indicate risk factors for disease.

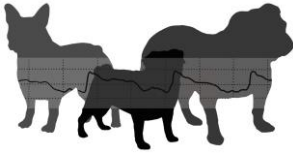
### Who is eligible to take part?

Dogs presenting to the QVSH for dental treatment will be eligible to take part in the study. Dogs must be 12 months and over. We also require your dog to have taken part in our ongoing study into different brachycephalic breeds in order to have undertaken a BOAS assessment prior to this procedure so that we know their BOAS status. We also request a clinical history sent from your primary practice vets in order to ensure your dogs health status for the procedure.

### What is BOAS?

The term brachycephalic refers to a shortened skull; brachycephalic dogs have shorter muzzles and flatter faces compared to other average or long muzzled dogs such as Labradors and Greyhounds. The three most extreme brachycephalic (flat-faced) breeds include Pugs, French Bulldogs and Bulldogs. Recent research has been carried out in these breeds due to a greater prevalence of brachycephalic obstructive airway syndrome (BOAS). Symptoms of BOAS include noisy breathing, exercise or heat intolerance, sleep apnea and in severe cases collapse and death.

This syndrome is the result of abnormalities in the upper airways that cause obstructions to the airflow in breathing. This includes small or closed nostrils, a large tongue, a thick and long soft palate, excessive tissue in the nasal cavities and a small trachea (windpipe). Different breeds are prone to



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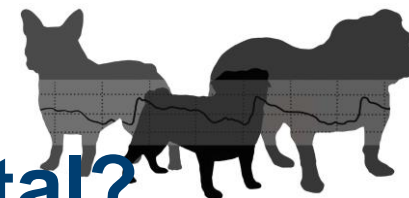
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different abnormalities. Currently most research carried out so far has focused on the three most extreme brachycephalic breeds. We would like to investigate BOAS in more brachycephalic breeds to understand the breed-specific abnormalities which will further the knowledge of the disease and help to tailor treatment. Also, by further understanding the anatomical differences between affected and unaffected dogs of the same breed, it will enable us to improve the current breed health schemes and provide data for future genetic studies.

### **What is Chiari-like malformation/syringomyelia (CM/SM)?**

Chiari-like malformation is another conformational disorder (disease caused by the shape or size of a body part) seen in certain brachycephalic or toy breed dogs. The term refers to an abnormal formation of the back of the skull, reducing the space for the brain to sit in. This can have secondary consequences leading to disruption of the normal circulation of fluid surrounding the brain, resulting in accumulation of small pockets of fluid in the spinal cord of the neck (termed syringomyelia). Common symptoms can include vocalization, sensitivity to touch, pain, lethargy and behavioural change. There have been studies that have shown certain breeds are more prone to Chiari-like malformation and secondary syringomyelia. This tends to be in some short nosed and toy breed dogs, but the mechanism of the disease is not yet fully understood. We may also use the imaging data collected for comparative studies into the skull conformation of brachycephalic breeds to understand risk factors for CM/SM.

*Thank you for reading! Please do not hesitate to let us know if you have any questions or concerns and we will be happy to address those for you.*



# Does your dog need a dental?

## Take part in our BOAS Research CT Study!

### *What does this study involve?*

Dogs with dental disease are admitted to the QVSH for a short general anaesthetic, imaging and dental treatment. We are offering **free of charge** dentals and CT scans (including scale/polish +/- extractions if necessary) for those who take part in the study. The CT scans will be used to assess the health of the teeth prior to treatment, and these images will also then be used in our research into BOAS and Chiari-like malformation/syringomyelia.

### *Who can take part?*

Dogs from the **below breeds** that require a dental procedure. If you are uncertain whether your dog requires a dental, please get in touch and we would be happy to examine and advise. We undertake a full physical examination as part of our ongoing Study into Different Brachycephalic Breeds. Alternatively, we would be happy to accept a referral from your own veterinary surgeon.

**Affenpinscher, Boston Terrier, Boxer, Cavalier King Charles Spaniel, Chihuahua, Dogue de Bordeaux, Griffon Bruxellois, Japanese Chin, King Charles Spaniel, Maltese Terrier, Pekingese, Pomeranian, Shih Tzu**

For further information or any questions please contact Fran Tomlinson on [ft270@cam.ac.uk](mailto:ft270@cam.ac.uk)