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Results of an owners' questionnaire about brachycephalic airway syndrome

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submitted by
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Abbreviations

BAS	Brachycephalic airway syndrome
BB	Brachycephalic breed
BD	Brachycephalic dog

1. Abstract

1.1. Abstract (English)

Subject: Analysis of the complexity of the brachycephalic airway syndrome, the relationship between upper respiratory signs and upper gastrointestinal complaints in brachycephalic dogs and the detection of possible breed differences by evaluating the results of an owners' questionnaire about brachycephalic airway syndrome.

Hypothesis: Brachycephalic dogs simultaneously show several typical anomalies of brachycephaly and there is a correlation between the severity of gastrointestinal problems and respiratory problems. French bulldogs are more often affected by gastrointestinal problems than Pugs.

Epidemiological data: Owners of 105 dogs completed the questionnaire.

Materials and Methods: An owner questionnaire developed at the University of Veterinary Medicine Vienna was applied and evaluated. The questionnaire was anonymous and included the main reason for the presentation to the clinic and specific questions about anomalies associated with brachycephalic airway syndrome. Respiratory tract, gastrointestinal tract, ocular, dental, ear, skin, neurological and orthopedic diseases were for laity clearly understandable questioned.

Results: 63 % (60/95) of the examined brachycephalic dogs had multiple health problems. French bulldogs had a significantly higher grade of upper gastrointestinal signs than pugs (P =0,031). A significant correlation between the severity of snoring and upper gastrointestinal signs was found in the population of French bulldogs (P =0,014), but not in the population of Pugs (P =0,098). By looking at the whole examined population we found that a higher grade of snoring comes with a higher grade of upper gastrointestinal signs, and vice versa (P =0,003).

Conclusion: Our study demonstrated that brachycephalic breeds have multiple health problems. Furthermore, there is a correlation between the severity of snoring and upper gastrointestinal signs. Compared French bulldogs to Pugs, French bulldogs showed clinical signs of upper gastrointestinal problems more frequently.

1.2. Zusammenfassung (Deutsch)

Thema: Untersuchung der Komplexität des brachyzephalen Atemwegssyndrom, des Zusammenhang zwischen den oberen Atemwegssymptomen und den Beschwerden des oberen Gastrointestinaltrakts bei brachyzephalen Hunden und Ermittlung möglicher Rassenunterschiede anhand der Umfrageergebnisse eines Besitzerfragebogens zum brachyzephalen Atemwegssyndrom.

Hypothese: Die brachyzephalen Hunde zeigen gleichzeitig mehrere typische Anomalien der Brachyzephalie. Es gibt einen Zusammenhang zwischen dem Schwergrad der gastrointestinalen und den respiratorischen Problemen. Französische Bulldoggen sind öfters von gastrointestinalen Problemen betroffen als Möpse.

Epidemiologische Daten: Besitzer von 105 Hunden haben den Fragebogen ausgefüllt.

Material und Methode: Ein an der Veterinärmedizinischen Universität Wien entwickelter Besitzer - Fragebogen wurde angewendet und ausgewertet. Der Fragebogen war anonym und einhielt den Hauptvorstellungsgrund und gezielte Fragen über mit dem brachyzephalen Syndrom assoziierte Anomalien. Atem-, Gastrointestinal-, Augen-, Ohren-, Haut-, Zahn-, neurologische und orthopädische Probleme wurden für Laien leicht verständlich abgefragt.

Resultate: 63% (60/95) der untersuchten brachyzephalen Hunde hatten multiple Gesundheitsprobleme. Französische Bulldoggen hatten einen signifikant höheren Grad an Erbrechen/Regurgitation als Möpse ($P = 0,031$). Eine signifikante Korrelation zwischen dem Schweregrad des Schnarchens und den oberen gastrointestinalen Symptomen (Erbrechen/ Regurgitation) wurde in der Population der französischen Bulldoggen ($P = 0,014$) gefunden, nicht jedoch in der Population der Möpse ($P = 0,098$). Bei Betrachtung der gesamten untersuchten Population zeigte sich, dass ein höherer Grad an Schnarchen mit einem höheren Grad an oberen gastrointestinalen Zeichen einhergeht und vice versa ($P = 0,003$).

Schlussfolgerung: Brachyzephale Rassen sind im Alltag mit vielfältigen Gesundheitsproblemen konfrontiert. Darüber hinaus besteht ein Zusammenhang zwischen dem Schweregrad des Schnarchens und den Zeichen des oberen Gastrointestinaltrakts. Beim Vergleich der Möpse mit den französischen Bulldoggen, zeigten französische Bulldoggen häufiger klinische Anzeichen von Problemen des oberen Gastrointestinaltrakts.

2. Introduction

Brachycephalic dogs (BD) often show several typical anomalies of brachycephaly simultaneously and due to the fact that owners usually seek veterinary support only for a specific problem, it can be challenging to get a comprehensive overview of the signs and diseases of an individual animal in the clinical practice. This is made even more difficult by the fact that certain symptoms are rarely detectable in a veterinary practice (e.g. exercise intolerance). In these cases, the owner's observations represent an important tool for evaluating the patient's health status.

Brachycephalic airway syndrome

Brachycephaly is a skeletal mutation of the skull resulting in shortened craniofacial bones and thus of the nasal cavity (Evans 2007). The brachycephalic airway syndrome (BAS) or upper airway obstruction syndrome comprises multiple primary anatomic abnormalities and secondary sequelae in brachycephalic breeds (BB), such as English and French bulldog, Pug, Pekingese, Shih tzu, Boxer, Lhasa apso, Shar-pei, Boston terrier and others (Fossum 2011).

The primary anatomic components of BAS are stenotic nares, elongated and thickened soft palate, laryngeal collapse, everted saccules, and sometimes, a hypoplastic trachea (Torrez and Hunt 2006, Riecks et al. 2007, Ginn et al. 2008, Grand and Bureau 2011). Furthermore, the shortened skull and nasal cavity causes an abnormal configuration of the conchae (Oechtering 2007), also called "relative conchal hypertrophy" (Oechtering 2010).

The airway resistance (chronic increases of negative pressure in the oropharynx) can lead to secondary problems such as everted laryngeal saccule, laryngeal collaps and everted tonsils (Koch et al. 2003, Pink et al. 2006, Torrez and Hunt 2006, Riecks et al. 2007).

Any combination of respiratory distress, heat and exercise intolerance, gastrointestinal problems and diseases of the eyes, ears, skin or intervertebral discs are frequently observed in BBs. These can cause varying degrees of diverse clinical signs such as snoring, panting, overheating, as well as exercise, stress and heat intolerance, longer recovery from exercise, cyanosis, regurgitation, vomiting, syncope, collapse and disturbed sleep patterns (Torrez and Hunt 2006, Poncet et al. 2006, Riecks et al. 2007, Fasanella et al. 2010, Roedler et al. 2013).

A relationship between upper respiratory tract and gastrointestinal tract diseases is assumed. In a prospective study, Poncet et al. (2005) endoscopically documented the prevalence of

oesophageal, gastric and duodenal anomalies in BDs and found a correlation between the severity of digestive and respiratory signs in French bulldogs. After thorough clinical and endoscopic examination of 73 dogs they found 71 with esophageal, gastric, or duodenal anomalies and 35 from 66 dogs had endoscopic evidence of diffuse inflammation of the duodenum. A study from Lecoindre and Richard (2004) reported that dogs after a surgery of the upper airways showed clinical improvement of their respiratory and digestive signs, which was also associated with endoscopically observable changes in the gastrointestinal tract. The results from Kaye et al. (2018) showed a reduction in gastrointestinal signs after airway surgery in all of the operated brachycephalic dogs, but particularly in French bulldogs.

Brachycephalic breeds suffer frequently from some kind of ocular disease as well, because of the hereditary abnormalities of the ocular adnexa. In a study from Krecny et al. (2015) they authors examined 130 pugs and all pugs were identified with bilateral macroblepharon and nasal entropion. Corneal pigmentation, keratoconjunctivitis sicca, conjunctivitis, corneal ulceration were also commonly observed eye problems.

Furthermore, these dogs are affected by skin conditions, such as atopic dermatitis, demodicosis and malassezia dermatitis that commonly require long-lasting treatment (Fawcett et al. 2018). Because of the shortened skull almost all of the brachycephalic dogs have facial folds, which could cause an abnormal and deep skin-to-skin contact that easily leads to intertrigo (Paterson 2017). These facial folds can be responsible for some ocular diseases too.

As a consequence of selective breeding of short-nosed dogs changes in the normal morphology can affect the ear canal. Mielke et al. (2017) examined the position of the tympanic bullae and the thickness of the bulla wall of brachycephalic dogs on computed tomography (CT) and found significantly more overlap between tympanic bullae and temporomandibular joints in French bulldogs and Pugs compared to other breeds and also reported that almost half of the BBs had middle ear effusion. In a retrospective study from Salgüero et al. (2016) brachycephalic dogs had a significantly thicker bulla wall and smaller luminal volume than non-brachycephalic dogs.

Small BBs have a high prevalence of congenital vertebral malformations, but they are more often incidental findings. Ryan et al. (2017) compared the prevalence of thoracic vertebral malformations in neurologically normal dogs and found that French bulldogs had significantly more thoracic vertebral malformations than Pugs. Intervertebral disc herniation, spinal arachnoid diverticulum and encephalopathies seem to be more likely responsible for most of

the neurological signs observed in these breeds. Mayousse et al. (2017) reported that from 64.7% of 343 French bulldogs, with a confirmed neurological disease and diagnosis, had a myelopathy (most commonly Hansen type I intervertebral disk herniation) and 19.8% had some form of encephalopathy.

The huge number of studies reflects how often and how many types of diseases can occur in brachycephalic animals. The owner's questionnaires can give a comprehensive overview of the clinical signs of an individual animal. Packer et al. (2012) used a structured owner questionnaire focusing on breathing difficulties and breath sounds. The study demonstrated that many owners do not consider the respiratory signs shown by their dogs as a problem. Roedler et al. (2013) constructed a questionnaire, which was divided into six sections about breathing, exercise and heat tolerance, feeding, sleep and welfare. Mishima (2019) developed a questionnaire in English and German (see appendix 1) and validated for applicability, interest of the owners and understanding for lay persons. This questionnaire was divided into eight sections and covered the diseases of respiratory tract, gastrointestinal tract, ears, skin, eyes and teeth and also orthopedic and neurological problems of the dogs. Eight additional questions were added for the evaluation of the questionnaire itself. Owners of 52 brachycephalic dogs (Pugs, French bulldogs, English bulldogs) were asked either at the time of presentation to the clinic or via telephone conversation after their visit. The authors demonstrated that owners of BBs happily participate in such questionnaires about their dog's health and the questions were easy to understand for most of them (78 %, 40/51).

Therefore, the aim of this study was to evaluate the number of typical brachycephalic disorders by recording all potential clinical signs for each patient with the help of a structured owners' questionnaire. Our hypothesis was that brachycephalic dogs are affected by multiple health problems due to the brachycephalic syndrome. Further purpose of this study was to prove a correlation between the severity of upper gastrointestinal signs and upper respiratory problems. This shall also enable to find specific breed differences (Pug versus French bulldog). Furthermore, this study could help to detect if gastrointestinal problems occur more often in French bulldogs than Pugs.

3. Materials and Methods

Data collection

For this study, the questionnaire developed by Mishima (2018) for the Small Animal clinic of the University of Veterinary Medicine Vienna was used.

Patients included those evaluated by Mishima between January 2018 and August 2018, as well as those presented between April 2019 and September 2019 at the Small Animal clinic of the University of Veterinary Medicine in Vienna. In this study owners of brachycephalic dogs were questioned only at the time of presentation in the waiting room of the Small Animal clinic using an online questionnaire tool (Google Forms; Mishima, 2019) displayed on a tablet. The data were handled anonymously and no personal information about the dog's owners was collected. The study protocol was submitted to the Ethics Commission of the Medical University of Vienna for review. The committee confirmed that no submission to the responsible Ethics Committee was necessary for the purpose of this study.

Questionnaire design

The questionnaire was divided into eight sections. The first part dealt with the main reason for the presentation of their dog to the clinic and also whether the dog had any other health problems or not. The owners could choose from a list of diseases or they could describe it under the option "others/ any other situations". They always had the chance to express the severity and the rapidity of a possible deterioration of a clinical sign and the successfulness of a formerly received treatment with a help of numeric rating scales.The second section was about breathing problems, breath sounds and exercise intolerance. The owners could choose from five different sound-samples (stridor nasalis, stridor pharyngealis, stridor laryngealis, snoring, panting) that they possibly noticed while their dog was at rest, at exercise and in difficulty breathing situations. There were several questions related to snoring *(e.g.: Is the snoring disturbing you?; Do you believe the snoring is stressful for your dog?),* about its loudness, frequency and deterioration. Inquired was also about the possible occurrence of cyanosis and collapse. The next part contained questions about food intolerance, vomiting, regurgitation and diarrhea. The following sections contained clearly understandable questions about ear problems and hearing, skin problems, dental problems, ocular problems, orthopedic and neurological diseases. The duration, the severity, the evolution and the therapy of each specific disease or symptom were asked. The medical terminologies were explained everywhere. See appendix 1 for the questionnaire.

Similar to Poncet et. al. (2005) (see table 1 and table 2) a grading system from grade 1 (moderate) to grade 3 (severe) was used for snoring, collapse, cyanosis and vomiting or regurgitation. Snoring at least once weekly or at least once monthly or only while asleep got grade 1, every day got grade 2, always or both awake and asleep got grade 3. The occurrence of collapse or cyanosis meant grade 3 automatically. Vomiting/regurgitation at least once yearly or at least once monthly got grade 1, while at least once weekly got grade 2 and daily got grade 3.

Nature of the digestive signs	Frequency					
	Never	Occasionally (< once monthly)	Regularly (once weekly)	Daily (once daily)	Often (> once daily)	Constantly
Ptyalism Regurgitation Vomiting						

The grading of the digestive disorders is based on the frequency of different clinical signs and is comprised of three grades. Inclusion of at least one sign in a higher grade determines the actual classification. For example, if an animal was presented with regular ptyalism and regurgitation but daily vomiting, a grade 3 for digestive signs was assigned

1. Table Grading of respiratory clinical signs according to Poncet et al. (2005)

Nature of the respiratory signs	Frequency					
	Never	Occasionally (< once monthly)	Regularly (once weekly)	Daily (once daily)	Often (> once daily)	Constantly
Snoring Inspiratory efforts Stress or exercise intolerance Syncope						

The grading of the respiratory disorders is based on the frequency of different clinical signs and is comprised of three grades. Inclusion of at least one sign in a higher grade determines the actual classification. For example, if an animal was presented with regular snoring, inspiratory difficulty, stress or exercise intolerance but occasional syncope, a grade 3 for respiratory signs was assigned

2. Table Grading of digestive clinical signs according to Poncet et al. (2005)

Statistical methods

A statistical software package SPSS (SPSS, IBM) was used to analyze the data. Mean, median and standard deviation were applied as descriptive statistics. Crosstabs were used to see the difference in the clinical signs between French bulldogs and Pugs. Chi-squared tests were ran to determine whether there is a significant difference in the frequency of clinical signs between French bulldogs and Pugs. The severity of respiratory and upper gastrointestinal signs was analyzed with Mann-Whitney test. The correlation between the grade of upper respiratory signs and the grade of upper gastrointestinal signs was assessed with Spearman's rank correlation coefficient. The significance level was set at $P < 0,05$ for every test.

4. Results

Epidemiological data

One hundred and five owners completed the questionnaire. 58 (55 %) French bulldogs, 34 (32 %) Pugs, 9 (9 %) English bulldogs, 1 (1 %) Boston Terrier, 1 (1 %) Chihuahua, 1 (1 %) Shi Tzu-Mix and 1 (1 %) West Highland White Terrier were included in this study. Age of the dogs ranged from 4 months to 13 years (mean age± SD: 6,0 ± 3,2 years).

Main reason for the presentation

"What is the main reason for the presentation of your dog? (Please choose only ONE *option)"*

Most of the dogs were presented at the clinic because of ocular 28 % (29/103), respiratory 25 % (26/103), orthopedic and/or neurologic 14 % (14/103) and gastrointestinal problems 12 % (12/103). Some of them came because of gynecological conditions 8 % (8/103), skin 7 % (7/103), ear 2 % (2/103), dental 2 % (2/103), endocrinological 1 % (1/103) and cardiological problems 1 % (1/103) (Fig. 1.).

"At what age did you first notice this main problem?"

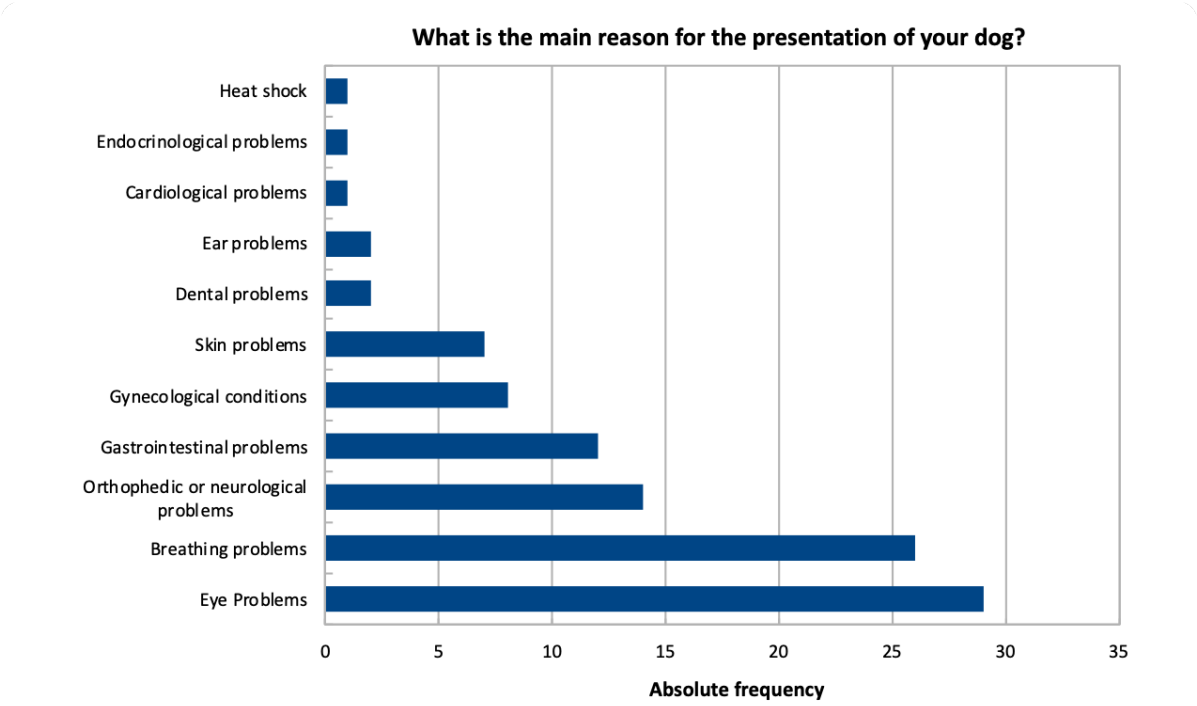
More than half of the dogs 60 % (55/92) had their above mentioned main problem for over one year before presentation.

"Have you noticed a deterioration of this main problem?"

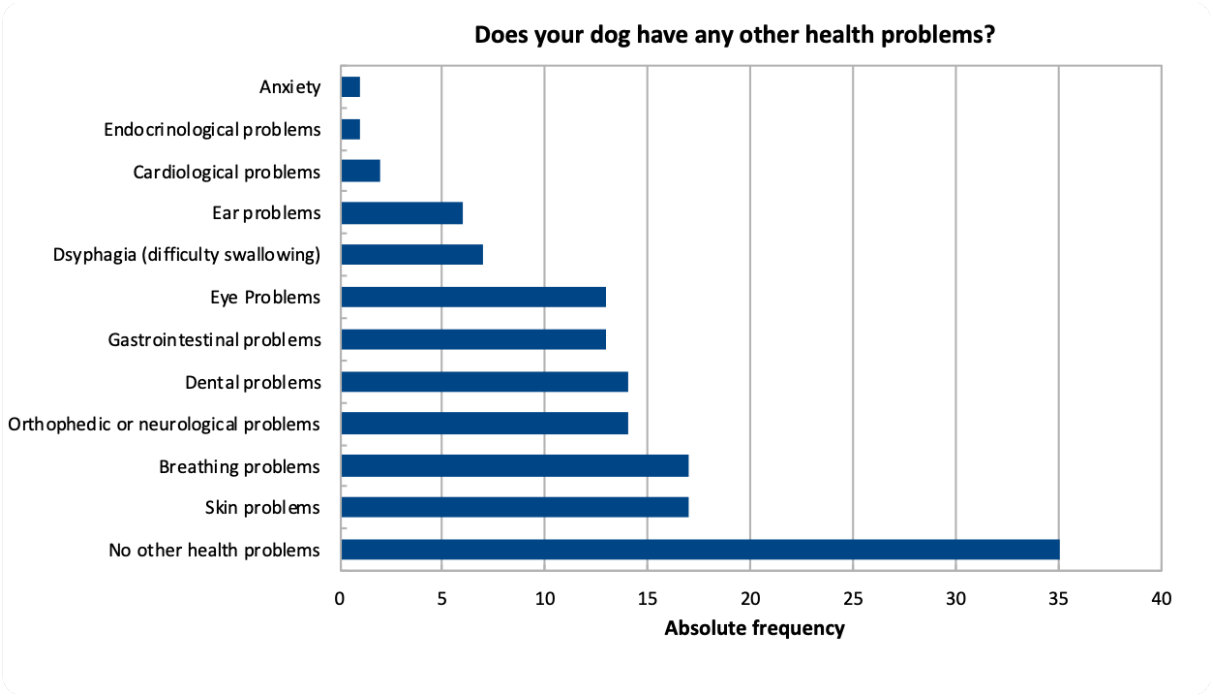
10 % (10/99) of the owners noticed an obvious deterioration of this health problem since the beginning.

Other health problems according to the owner

To the question: "*Does your dog have any other health problems?"* 37 % (35/95) of the owners answered with no. In addition to the main problem, many of the owners reported other conditions as well. Respiratory signs occurred most frequently (18 %, 17/95), followed by skin (18 %, 17/95), orthopedic and/or neurological (15 %, 14/95), dental (15 %, 14/95), gastrointestinal (14 %, 13/95) and ocular problems (14 %, 13/95). Furthermore, swallowing disorders (7 %, 7/95), ear (6 %, 6/95), cardiological (2 %, 2/95) and endocrinological problems (1 %, 1/95) and anxiety (1 %, 1/95) were reported by the owners (Fig. 2.). The majority of the dogs, 63 % (60/95) had to deal with multiple health problems.



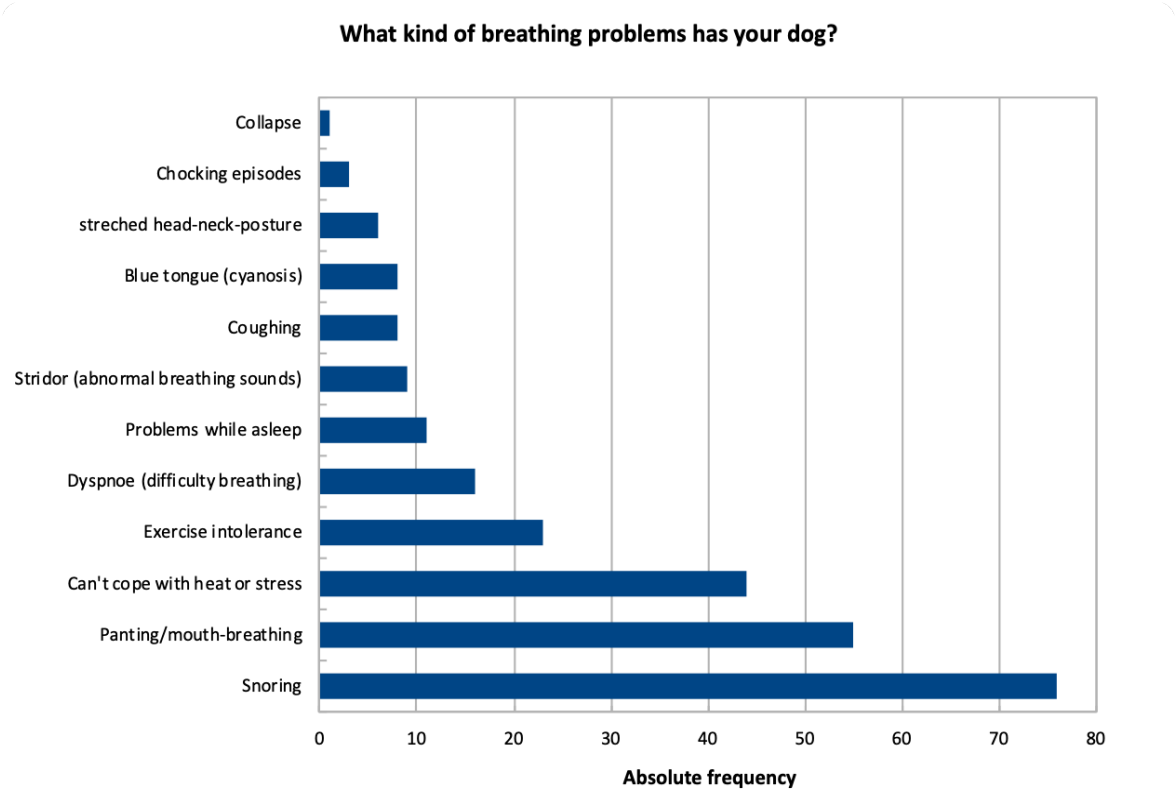
1. Figure Question: "What is the main reason for the presentation of your dog?"



2. Figure Question: "Does your dog have any other health problems? (multiple choice)"

Breathing problems

In the first question: "*What kind of breathing problems has your dog? (multiple choice)"* 80 % (76/95) of the owners selected snoring, 58 % (55/95) panting or mouth-breathing, 46 % (44/95) heat or stress intolerance, 24 % (23/95) exercise intolerance, 17 % (16/95) dyspnea (difficulty breathing), 12 % (11/95) problems while asleep, 9 % (9/95) stridor (abnormal breathing sounds), 8 % (8/95) coughing, 8 % (8/95) blue tongue (cyanosis), 6 % (6/95) stretched head-neck-posture, 3 % (3/95) chocking episodes and 1 % (1/95) collapse (Fig.3.).



3.. Figure Question: "What kind of breathing problems has your dog? (multiple choice)"

Questions about the snoring

"Does your dog snore? (Sound 4)": a large proportion of the owners (85 %, 82/97) said yes, their dog snore. Most of the dogs (87 %, 61/70) have always been snoring and about a half of them (51 %, 45/88) only while asleep, 28 % (25/88) daily and 16% (14/88) have been

snoring continuously (while awake and while asleep). Pugs snored significantly more often (P =0,012) and had a significantly higher grade of snoring than French bulldogs (P =0,046).
20 % (18/89) of the owners believed that snoring is stressful for their dog and 32 % (28/89) of the owners were disturbed for time to time by snoring. According to the owners 8 % (7/89) of the dogs had a very loud snoring.

“Is your dog able to breathe through the nose?”
About half of the dog owners (51 %, 53/104) thought that their dogs can always breath through the nose, 20 % (21/104) answered that they could breathe through the nose only at rest, 7 % (7/104) only for a short time and 3 % (3/104) could not breathe through the nose at all. All of these 3 dogs, who could not breath through the nose, were presented at the clinic because of breathing problems at the time of the questionnaire.

“Has your dog ever had cyanosis (blue tongue)?”; “How often do you notice the cyanosis?”
10 % (10/100) of the animals have already had cyanosis at some point of their lives and two of them had it at least once a month, four of them once a year and one of the owners affirmed to notice cyanosis every day. 40 % (4/10) of these dogs has been previously treated for this condition by a veterinarian.

“Has your dog ever collapsed?”; “How often has your dog collapsed?”
10 % (9/93) of the owners have already witnessed a collapse and two of the owners said that it happens every day. 56 % (5/9) of these dogs has been previously treated for this condition by a veterinarian.

Gastrointestinal problems
“Does your dog have any food intolerance?”; “Has your dog been treated for food intolerance by a veterinarian?”
40 % (41/102) of the dogs had some kind of “food intolerance” (43 % (25/58) of the French bulldogs, 32 % (11/34) of the Pugs) and 43 % (31/72) have already got some kind of treatment because of food intolerance.

“What applies to your dog? 1. My dog drops out the food WITHOUT previous gagging and/or abdominal effect (regurgitation) 2. Vomiting is associated with gagging and/or abdominal effect 3. Both apply to my dog.”
Vomiting and/or regurgitation was observed by 33 % (32/96) of the owners (70 % - 25/36 vomiting, 17 % - 6/36 vomiting and regurgitation, 14 % - 5/36 regurgitation).

“How often does your dog vomit/ regurgitate?”
43 % (15/35) of the dogs vomited at least once a month, 14 % (5/35) every day. 17 % (8/46) of the owners thought that vomiting or regurgitation occurred more often when their dog has breathing problems. French bulldogs had a significantly higher grade of upper gastrointestinal signs than Pugs (French bulldogs mean grade 1,67 ± 0,82; Pugs mean grade 1,09 ± 0,30; P =0,031).

“Has your dog ever had difficulties swallowing (e.g. dropping out food, abnormal movement when swallowing, multiple attempts to swallow)?”
Swallowing complaints were noticed by 6 % (5/82) of the owners.

“Does your dog have diarrhea?”
17 % (16/95) of the animals had diarrhea and 32 % (6/19) of them had it daily. From these 16 dogs 50 % (8/16) has already been treated for diarrhea and 31 % (5/16) were presented to the clinic because of gastrointestinal problems at the time of the questionnaire.

A significant correlation between the severity of snoring and gastrointestinal signs was found in the population of the French bulldogs (P =0,014), but not in the population of the Pugs (P =0,098). By looking the whole examined population we found that a higher grade of snoring comes with a higher grade of upper gastrointestinal signs, and vice versa (P =0,003).

Ear problems
“Does your dog have ear problems?”; “Where is the ear problem localized? (multiple choice)”
30 % (31/103) of the dog owners said their dog has ear problems. According to the owners 62 % (18/29) had otitis externa, 59 % (17/29) had otitis media, 34 % (10/29) had otitis interna. All in all 62 % (18/29) of the dogs with ear problem were affected by otitis media and/ or otitis interna and 33 % (6/18) of these dogs were examined with CT and/or MRT.

42 % (11/26) of the dogs always had ear problems, most of them bilateral (75 %, 21/28) and itchy (85 %, 23/27). 73 % (22/30) of the ear problems were recurrent and 20 % (6/30) never healed completely.

“Do you think that the hearing of your dog is impaired?”
27 % (12/45) of the owners thought that their dog has poor hearing since they first noticed signs of the ear problem and 7% (3/45) said their dog have always had poor hearing (deaf since birth).

“Has your dog neurologic deficits (head tilt, coordination problems) associated with the ear disease?”
According to the owners, 20 % (8/40) of the dogs had some neurological deficits (head tilt, coordination problems) associated with the ear disease.

Skin problems
“Does your dog have any known skin problems?”; “Has a veterinarian diagnosed the skin problem?”; “What kind of diagnostic was made? (multiple choice)”
24 % (24/99) of the dogs had some kind of skin problems and 79 % (19/24) of them were diagnosed by a veterinarian. 61 % (14/23) had adverse food reaction, 35% (8/23) had atopic dermatitis and also other dermatological disorders, like Malassezia dermatitis (26 %, 6/23), facial and/or tail fold intertrigo (13 %, 3/23), demodicosis (13 %, 3/23) and pyoderma (bacterial skin infection) (13 %, 3/23) were reported by the owners.

Dental problems
“Does your dog have any known dental problems?”; “What kind of dental problems does your dog have? (multiple choice)”
Dental problems were reported in 29 % (29/99) of this population, 72 % (21/29) of the dogs had dental plaques, 45 % (13/29) had malocclusion (incorrect relation between teeth) and 21 % (6/29) had gingivitis (inflammation of the gum tissue).

Eye Problems
“Does your dog have any known eye problems?”; “What kind of eye problems does your dog have? (multiple choice)”
50 % (49/99) of the dogs coped with eye problems. 35 % (17/49) had ocular discharge, 29 % (14/49) had corneal ulceration, 14 % (7/49) had conjunctivitis, 14 % (7/49) had corneal inflammation and 12 % (6/49) had dry eyes.

Orthopedic and Neurological problems

“Does your dog have neck or back pain?”; “Has your dog been treated for this condition by a veterinarian?”

22 % (22/100) of the animals had neck or back pain and from these dogs 95 % (21/22) have received some kind of treatment for this condition.

“Does your dog have any intervertebral disc disease?”; “Has your dog been treated for the intervertebral disc disease by a veterinarian?”

Some type of intervertebral disc disease was present in 29 % (23/79) of this population and 91 % (21/23) of these dogs have been treated for these conditions by a veterinarian. From the 23 affected dogs, 78 % (18/23) were French bulldogs, 17 % (4/23) Pugs, 4 % (1/23) English bulldogs.

“Have you noticed lameness by your dog?”; “Has your dog been treated for the lameness by a veterinarian?”

14 % (10/73) of the owners noticed lameness (70% - 7/10 French bulldogs, 10 % - 1/10 Pugs, 10 % - 1/10 Boston Terrier and 10 % - 1/10 English bulldogs). 90 % (9/10) of the affected dogs have been given some kind of treatment for this problem.

5. Discussion

Based on the results of our study, we were able to confirm our first hypothesis that brachycephalic dogs show several typical anomalies of brachycephaly simultaneously, and there is a correlation between the severity of gastrointestinal and respiratory problems. The complexity of this syndrome is well reflected in our study, where the majority of respondents (63 %, 60/95) had to deal with multiple health issues. In this examined population the most common conditions were diseases of respiratory tract, gastrointestinal tract and diseases of the eyes. The hypothesis that there is a significant relationship between the severity of upper gastrointestinal tract and respiratory signs was proven in French bulldogs (P = 0,014), but not in Pugs. Furthermore, we could statistically confirm that the severity of snoring influences the severity of digestive signs, and vice versa (P =0,003). Our second hypothesis was, that French bulldogs are more often affected by gastrointestinal problems than Pugs. We found no statistical difference between the number of vomiting Pugs and French bulldogs, however French bulldogs presented with vomiting/regurgitation showed signs more frequently than Pugs. Based on our grading system, French bulldogs had a significant higher grade of vomiting/regurgitation than Pugs (French bulldogs mean grade was 1,67 ± 0,82; Pugs mean grade was 1,09 ± 0,30; P =0,031).

To the authors' knowledge, this is the first study using a structured owner's questionnaire about BAS, which beside respiratory tract, gastrointestinal tract, exercise tolerance, heat tolerance, feeding, sleep and welfare also covered problems of the ears, skin, eyes, teeth, as well as orthopedic and neurologic symptoms of the brachycephalic dogs. Mishima (2018) reported that 80 % (41/51) of the owners thought that their dog's every possible health problems were included in this questionnaire, therefore we think that this represents an excellent tool to record many of the clinical signs of brachycephalic dogs.

French bulldogs and Pugs were over-represented in our study, most likely because they have grown in popularity in recent years. The UK Kennel Club listed French bulldog on the first place and Pug was in its top ten most popular breeds in 2018. As a result of this significant increase in the number of BBs, the typical signs of BAS became even more frequent problems in veterinary practices. Our study supports the fact, in several aspects, that brachycephalic dogs are affected by multiple health problems due to brachycephaly. It is presumable that this well-known syndrome has a serious negative impact on health and welfare of brachycephalic animals.

In our study altogether 41 % (43/105) of the owners reported that their dog has/had respiratory problems. In the first section about the breathing problems were some discrepancies in the responses of the owners. 45 % (47/105) of the owners reported some kind of respiratory clinical sign, but did not report that their dog had breathing problems. This could mean that these owners did not perceive these respiratory signs as breathing problems. Th results correspond to the findings of Packer et al. (2012), who presented that many of the owners had a disparity in recognition and perception of their dogs symptoms. In their study 58 % of the owners reported a high frequency and severity of BAS signs, without perceiving them as a problem. In our questionnaire frequently reported breathing problems were: snoring (80 %, 76/95), panting or mouth-breathing (58 %, 55/95), heat or stress intolerance (46 %, 44/95), exercise intolerance (24 %, 23/95), dyspnea (17 %, 16/95), problems while asleep (12 %, 11/95), stridor (9 %, 9/95), coughing (8 %, 8/95), cyanosis (8 %, 8/95), stretched head-neck-posture (6 %, 6/95) and chocking episodes (3 %, 3/95). 80 % (76/95) of the owners chose snoring from a list of respiratory disorders, however 85 % (82/97) of the owners answered to another question (*"Does your dog snore?")* that their dog snore. This difference could be explained by the fact that some of them did not consider snoring as a breathing problem.

In brachycephalic dogs the stenosis of the nares and the obstructed nasal passageway causes a reduction of nasal breathing which decreases the efficiency of inspiration and thermoregulation.The great vascularization of the nasal mucous membrane and a special gland (glandula nasalis lateralis or Steno's gland), in the caudolateral part of the nose, plays a major role in heat exchange in dogs (Oechtering 2010). In our study, the owners were asked if their dog is able to breathe through the nose. Only 51 % (53/104) of the owners thought that their dogs can always breathe through the nose, 20 % (21/104) of the dogs could breathe through the nose only at rest, 7 % (7/104) only for a short time and 3 % (3/104) could not breathe through the nose. Considering the physiology of canine thermoregulation and that dogs belong to those animals who are obligatory nose breathers, we could say it is a major welfare problem that many of these BDs could breathe through the nose only for a short time and some of them could not even breathe through the nose.

Collapse and cyanosis occurred in 10 % of this population, less than reported in a retrospective study from Torrez and Hunt (2006), where 17 % of the dogs were cyanotic and 14 % had syncope or collapse, but it is still an alarming rate.

Regularly reported gastrointestinal clinical signs in brachycephalic breeds are dysphagia, vomiting, and regurgitation (Lecoindre and Richard 2004; Poncet JSAP 2005; Dupré and Heidenreich 2016). A relationship between respiratory and upper gastrointestinal problems is

presumable. As pointed out by Lecoindre and Richard (2004) an abnormally low negative intrathoracic pressure due to an increased inspiratory effort could induce a hiatal hernia and/ or gastroesophageal reflux. On the other hand, gastroesophageal reflux can cause esophageal, pharyngeal and laryngeal inflammation, which can lead to further upper respiratory problems. We came to the same conclusion as Poncet et al. (2005), that there is a significant relationship between the severity of digestive and respiratory signs in French bulldogs (P =0,014). French bulldogs had significantly more frequent upper gastrointestinal problems than Pugs and these results correspond to the findings of Roedler et al. (2013), Haimel and Dupré (2015) and Kaye et al. (2018). Furthermore, we could statistically confirm that the severity of snoring influences the severity of upper digestive signs, and vice versa (P =0,003). A relationship between the respiratory problems and upper gastrointestinal clinical signs was recognized by some of the owners (17 %, 8/46) in our study, who reported that vomiting and/or regurgitation occurred more often if their dog had breathing problems. In our survey food intolerance was also a frequently reported gastrointestinal sign (40 %, 41/102 of the dogs), especially in French bulldogs (43 %, 25/58 of the French bulldogs). The prevalence of disorders among a total of 43,005 live Kennel Club registered pedigree dogs overall was determined in a study from Wiles et al. (2017), who reported that French bulldogs had a significantly higher prevalence of food allergy and persistent vomiting within breed than overall. Clinical signs of a food allergy include pruritus and other skin problems, but also gastrointestinal signs like vomiting and diarrhea. It could be possible that frequent vomiting and/or regurgitation that occurs in many of these breeds is related to respiratory complaints and sometimes it is misinterpreted as food intolerance.

Brachycephalic airway syndrome involves much more than breathing problems, exercise intolerance, dysphagia, regurgitation and vomiting. There are several other disorders in brachycephalic dogs, also originating from the abnormal facial morphology, like the frequently reported ocular diseases in BBs. In our study half of the dogs suffered from some kind of an eye problem and 29 % of them had corneal ulceration. The nasal folds, the prominent eyes and a craniofacial ratio of less than *0.5* increase the risk of corneal ulceration (Packer et al. 2015), which is a painful eye problem and can lead to blindness. On the other hand, ear canal problems are further common complaints in short-muzzled dogs. In our survey 30 % (31/103) of the dogs had some kind of an ear problem. According to the owners 62 % (18/29) of the dogs with ear problem were affected by otitis media and/or otitis interna, but from these dogs only 33 % (6/18) were examined with CT and/or MRT, so these results should be interpreted with caution. 73 % (22/30) of the ear diseases were recurrent, 20 % (6/30) of them never healed and 20 % (8/40) of the dogs had neurological deficits associated

with their ear disease. In addition, 27 % (12/45) of the owners presumed that their dog has poor hearing because of the ear problem. Inflamed, itchy ears and reduced hearing can lead to severe discomfort in animals, especially if they are even associated with neurological symptoms, like head tilt and coordination problems. Another consequence of the foreshortening of the facial skeleton in brachycephalic animals is a maxillary brachygnathism (a class III malocclusion), meaning that the upper jaw is shorter than normal. The reduction of interdental spaces causes abnormal tooth-to-tooth and/or uncomfortable tooth- to-soft tissue contacts, which usually leads to more oral problems. In our study dental diseases, like plaques, malocclusion and gingivitis were reported in 29 % (29/99) of the population.

Further notable conditions that result in reduced quality of life of these breeds are the diseases of the skin. In our study 24 % (22/99) of the dogs had some kind of skin problem, such as adverse food reaction, atopic dermatitis, Malassezia dermatitis, facial and tail fold intertrigo, demodicosis and pyoderma.

The ability to perform normal physical activities is strongly hindered by orthopedic and neurological conditions, which were reported in significant numbers in our study. 22 % (22/100) of the animals had neck or back pain and intervertebral disc diseases were present in 29 % (23/79) of the dogs. 14 % (10/73) of the owners noticed lameness of their dog (70% - 7/10 French bulldogs, 10 % - 1/10 Pugs, 10 % - 1/10 Boston Terrier and 10 % - 1/10 English bulldogs). Compared with an overall prevalence of 1.3%, the French Bulldog is among the breeds with the highest incidence of patellar luxation, with a prevalence of 4 % (O'Neill et al. 2016). Patellar luxation is a potential welfare concern because it can lead to lameness, osteoarthritis and pain.

There are some limitations in this study. Firstly, recording more epidemiological data (e.g. sex and weight) of the dogs, may lead us to additional conclusions, knowing that obesity is often associated with BOAS. Secondly, interviewing some owners of a control group of healthy non-brachycephalic dogs could have served as a comparison to determine if the prevalence of clinical signs and diseases differ from those of brachycephalic dogs and whether owners of these non-brachycephalic dogs have different interpretations of certain symptoms. Thirdly, the owners could omit questions, this led to different response rates at many questions and also important questions remained unanswered. Furthermore, the only inclusion criteria was that the dog is from brachycephalic breed, there was no targeted question about a brachycephalic operation that may have already been performed before this survey. Also, we could not determine for some of the diseases reported by the owners (e.g. intervertebral disc

disease), if they were based on an existing veterinary diagnosis or not, so these results should be interpreted with caution. Other limitations were the free text questions (e.g. about exercise intolerance), which could not be evaluated objectively, because of the wide variety of the answers. Also, the questionnaire could have been further expanded. Looking at the study from O'Neill et al. (2019), where Pug was one of the most common breeds among the dystocia cases, adding some questions about gynecological problems, especially about the occurrence of dystocia in BBs, may have improved this questionnaire. Other limitation of our study is that it is based on the observation, knowledge, honesty and memory of dog owners, who have differing opinions of normal dog's behavior. It is possible that owners of BDs are more tolerant of signs of obstructive airway disease than owners of non-brachycephalic breeds (Torrez and Hunt 2006).

In summary, brachycephalic dogs have to deal with multiple hereditary problems throughout their lives, which hinder them from performing normal functions and behavior. Most of the BBs have difficulty breathing, they can barely cope with heat or stress and they are exercise intolerant. Respiratory complaints are often accompanied by upper gastrointestinal problems, hence vomiting and/or regurgitation are frequent clinical signs. Swallowing disorders and oral problems may prevent them from eating properly. Painful eyes, ears, dental and orthopedic problems can accompany most of their lives or require surgical intervention. They often need to receive long-term treatments for their skin problems.
The breed standards of all breeds should support primarily the physical well-being of the animals and should not be based only on a desired appearance. An urgent intervention is required.

6. Conclusion

As our study demonstrates, brachycephalic breeds have to cope with multiple health problems in their everyday life. The list of diseases, that have been reported to be more common in these BBs, is long. Their upper respiratory and their upper gastrointestinal signs could generate each other. Such questionnaires could be helpful for dog breeders to see the complexity of the clinical signs and to select less affected animals in their breeding programs. Selecting individuals with fewer symptoms could help reduce the risk of common anomalies in brachycephalic breeds over time. In the meantime, the suffering of these BBs can be greatly reduced by appropriate surgical treatments. Furthermore, a structured owner questionnaire could be used for evaluating the severity of other diseases, to determine the urgency of surgical intervention and to appreciate the results of an operative treatment.

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9. List of figures and tables

10. Appendix 1 - English

Owner Questionnaire

1. What is the main reason for the presentation of your dog? (Please choose only **ONE** option)

- ☐ Breathing problems
- ☐ Gastrointestinal problems
- ☐ Skin disease
- ☐ Eye disease
- ☐ Dental disease
- ☐ Neurologic problems
- ☐ Lameness
- ☐ Collapse or cyanosis
- ☐ Any other health problems: _____

2. At what age did you first notice this main problem?

- ☐ Since birth
- ☐ _____years
- ☐ _____months
- ☐ _____ weeks

3. Have you noticed a deterioration of this main problem?

No change				obvious deterioration
1	2	3	4	5
❍	❍	❍	❍	❍

4. How rapidly has this condition deteriorated?

- ☐ Within the last years
- ☐ Within the last months
- ☐ Within some weeks

5. Has your dog previously been treated for this condition by another veterinarian?

- ☐ No
- ☐ Yes

If yes:

5.1. What treatment has been performed?	☐ Medication: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
5.2. The outcome of the treatment:	Very unsatisfied … very satisfied 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍

5.3. What kind of treatment/ which medication had the best outcome?	

6. Does your dog have any other health problems? (multiple choice)

- ☐ No other health problems
- ☐ Breathing problems
- ☐ Gastrointestinal problems
- ☐ Skin problems
- ☐ Eye problems
- ☐ Dental problems
- ☐ Neurologic problems
- ☐ Lameness
- ☐ Collapse or cyanosis (going blue)
- ☐ Dysphagia (difficulty swallowing)
- ☐ Others: _____

Breathing problems

7. What kind of breathing problems has your dog? (multiple choice)

- ☐ Panting/ mouth-breathing
- ☐ Snoring
- ☐ Coughing
- ☐ Stridor (abnormal breathing sounds)
- ☐ Dyspnoea (difficulty breathing)
- ☐ Blue tongue (cyanosis)
- ☐ Exercise intolerance (can't exercise a lot
- ☐ Can't cope with heat or stress
- ☐ Problems while asleep

  If yes, what is the problem: _____
- ☐ Stretched head-neck-posture
- ☐ Collapse
- ☐ Choking episodes

8. What kind of breathing sounds do you notice at rest (e.g. while lying, while sleeping)? (multiple choice, compare with attached sounds)

- ☐ Nasal stridor (sound 1)
- ☐ Pharyngeal stridor (sound 2)
- ☐ Laryngeal stridor (sound 3)
- ☐ Snoring (sound 4)
- ☐ Panting (sound 5)

9. What kind of breathing sound did you notice at strenuous exercise? (multiple choice)

- ☐ Nasal stridor (sound 1)
- ☐ Pharyngeal stridor (sound 2)
- ☐ Laryngeal stridor (sound 3)
- ☐ Snoring (sound 4)
- ☐ Panting (sound 5)

10. What kind of sound did you notice in difficulty breathing situations? (multiple choice)	
☐ Nasal stridor (sound 1)	☐ Snoring (sound 4)
☐ Pharyngeal stridor (sound 2)	☐ Panting (sound 5)
☐ Laryngeal stridor (sound 3)	☐ My dog never had respiratory distress

11. Does your dog snore? (Sound 4)					
☐ No					
☐ Yes					
If yes:					
11.1. At what age did you first notice the snoring?	☐ Since birth ☐ _____years ☐ _____months ☐ _____ weeks				
11.2. How often does your dog snore?	☐ Always ☐ Only while sleeping ☐ Awake and asleep	☐ Every day ☐ At least once weekly ☐ At least once monthly			
11.3. Has the snoring become more severe over time?	No change				obvious deterioration
	1	2	3	4	5
	❍	❍	❍	❍	❍
11.4. How rapidly has the breathing problem worsened?	☐ Within the last years ☐ Within the last months ☐ Within some weeks				
11.5. Would you agree to share sound-samples of your dog's breathing with us?	☐ No ☐ Yes				
11.6. Is the snoring disturbing you?	☐ No ☐ Yes ☐ From time to time				
11.7. Do you believe the snoring is stressful for your dog?	☐ No ☐ Yes				

11.8. How loud is the snoring?	Very quiet				Very loud
	1	2	3	4	5
	❍	❍	❍	❍	❍

12. Does your dog have a laryngeal stridor (sound3)?	
☐ No ☐ Yes	
If yes:	
12.1. At what age did you first notice it?	☐ Since birth ☐ _____years ☐ _____months ☐ _____weeks
12.2. How often do you notice this breathing sound 3?	☐ Every day ☐ At least once weekly ☐ At least once monthly ☐ In the following situation: _____
12.3. Has the laryngeal stridor sound worsened over time?	No change ... marked worsening 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
12.4. How rapidly has the condition worsened?	☐ Within the last years ☐ Within the last months ☐ Within some weeks

13. In what situations does your dog pant (sound 5)? (multiple choice)	
☐ Only in agitation/ fear	☐ While dog-sports/exercising (e.g. agility, running)
☐ When the temperature is above: _____ °C	☐ While walking
	☐ Always

14. Is your dog able to breathe through the nose?	
☐ Yes, always even when walking	☐ Only at rest (e.g. while lying)
☐ Yes, always even when exercising/ running	☐ No
☐ Only for a short time	

15. How much running or walking is possible for your dog in the summer (over 25°C)?
☐ Distance: _____km in _____min
☐ Mainly walking
☐ Mainly running

16. How much running or walking is possible for your dog in the winter?
☐ Distance: _____km in _____min
☐ Mainly walking
☐ Mainly running

17. How much time does your dog need to recover after the following exercise? (in **min**)	
In summer:	
17.1. After dog-sports/ running	
17.2. After walking	
In winter:	
17.3. After dog-sports/ running	
17.4. After walking	

18. Has your dog ever had cyanosis (blue tongue)?					
☐ No ☐ Yes					
If yes:					
18.1. At what age did you first notice the cyanosis?	☐ Since birth ☐ _____years ☐ _____months ☐ _____weeks				
18.2. How often do you notice the cyanosis?	☐ Every day ☐ At least once a week	☐ At least once a month ☐ At least once a year			
18.3. Do the cyanotic episodes become more severe over time?	No change				obvious deterioration
	1 ❍	2 ❍	3 ❍	4 ❍	5 ❍
18.4. How rapidly has the condition deteriorated?	☐ Within the last years ☐ Within the last months ☐ Within some weeks				
18.5. When was the last cyanotic episode?	☐ A few years ago ☐ A few months ago	☐ A few weeks ago ☐ A few days ago			
18.6. In what situations does your dog get cyanotic? (multiple choice)	☐ While sleeping ☐ At rest ☐ While or after walking	☐ While or after running ☐ Any other situations: _____			

19. Has your dog ever collapsed?
☐ No ☐ Yes

If yes:	
19.1. At what age did the first collapse occur?	☐ _____years ☐ _____months ☐ _____weeks
19.2. How often has your dog collapsed?	☐ Every day ☐ At least once a month ☐ At least once a week ☐ At least once a year
19.3. Have the collapsing episodes become worse over time?	No change ... obvious deterioration 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
19.4. How rapidly has the condition worsened?	☐ Within the last years ☐ Within the last months ☐ Within some weeks
19.5. When was the last collapsing episode?	☐ A few years ago ☐ A few weeks ago ☐ A few months ago ☐ A few days ago
19.6. In what situations does your dog collapse? (multiple choice)	☐ While sleeping ☐ While or after running ☐ At rest ☐ Any other situations: _____ ☐ While or after walking

20. Has your dog previously been treated for the following conditions by a veterinarian? (multiple choice)	
☐ Snoring ☐ Stridor ☐ Can't cope with heat or stress ☐ Can't exercise a lot ☐ Cyanosis (going blue) ☐ Collapse ☐ None	
If yes:	
20.1. What treatment has your dog received?	☐ Medication: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
20.2. The outcome of the treatment:	Very unsatisfied ... Very satisfied 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍

Gastrointestinal problems

21. Does your dog have any food intolerance?	
☐ No ☐ Yes	
If yes:	
21.1. Does your dog get any special food? If yes, please specify:	☐ No ☐ Yes: _____ _____
21.2. Has your dog been treated for food intolerance by a veterinarian?	☐ No ☐ Yes

22. Does your dog vomit/regurgitate?					
☐ No ☐ Yes					
If yes:					
22.1. What applies to your dog?	☐ My dog drops out the food WITHOUT previous gagging and/or abdominal effect (regurgitation) ☐ Vomiting is associated with gagging and/or abdominal effect ☐ Both apply to my dog				
22.2. What does your dog vomit/ regurgitate? (multiple choice)	☐ Food ☐ Mucus/ saliva ☐ Blood ☐ Others: _____				
22.3. Does vomiting/ regurgitation occur more often when your dog has breathing problems?	☐ No ☐ Yes				
22.4. At what age have you first noticed the vomiting/ regurgitation?	☐ Since birth ☐ _____years ☐ _____months ☐ _____weeks				
22.5. How often does your dog vomit/ regurgitate?	☐ Every day ☐ At least once a week ☐ At least once a month ☐ At least once a year				
22.6. Has the vomiting become worse over time?	Obvious improvement				obvious deterioration
	1	2	3	4	5
	❍	❍	❍	❍	❍

22.7. How rapidly did the condition change?	☐ Over more than 1 year ☐ Within 1 year ☐ Within 1month ☐ Within 1 week

23. Has your dog been treated for the vomiting/ regurgitation by a veterinarian?

☐ No
☐ Yes

If yes:

23.1. What treatment has your dog received?	☐ Medication: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
23.2. Did the vomiting/ regurgitation improve after treatment?	☐ No ☐ Yes, but only for a short time ☐ Yes

24. Has your dog ever had difficulties swallowing (e.g. dropping out food, abnormal movement when swallowing, multiple attempts to swallow)?

☐ No
☐ Yes

25. Does your dog have diarrhoea?

☐ No
☐ Yes

If yes:

25.1. At what age did you first notice the diarrhoea?	☐ Since birth ☐ _____years ☐ _____months ☐ _____weeks
25.2. How often have you noticed the diarrhoea?	☐ Every day ❍ 1 to 3 times ❍ 3 to 5 times ❍ More than 5 times ☐ At least once weekly ☐ At least once monthly
25.3. Do you think the diarrhoea is related to any type of food?	☐ No ☐ Yes

25.4. Do you notice any of the following in the diarrhoea? (multiple choice)	☐ No ☐ Mucus ☐ Blood ☐ Others: _____
25.5. Do you notice rectal tenesmus (pressing during defecation) while your dog has diarrhoea?	☐ No ☐ Yes
25.6. How much diarrhoea does your dog defecate? (per defecation)	Small amount … large amount 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
25.7. Does the diarrhoea become worse over time?	obvious improvement … obvious deterioration 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
25.8. How rapidly did the condition change?	☐ Over more than 1 year ☐ Within 1 year ☐ Within 1 month ☐ Within 1 week

26. Has your dog been treated for the diarrhoea by a veterinarian?
☐ No ☐ Yes

If yes:

26.1. What treatment has your dog received?	☐ Medication: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
26.2. Has the diarrhea improved after treatment?	☐ No ☐ Yes, but only for a short time ☐ Yes

Ear problems

27. Does your dog have ear problems?
☐ No ☐ Yes

If yes:	
27.1. Where is the ear problem localized? (multiple choice)	☐ Outer ear ☐ Ear canal (Otitis externa) ☐ Middle ear (Otitis media) ☐ Inner ear (Otitis interna)
27.2. At what age did you first notice this problem?	☐ Since birth ☐ _____years ☐ _____months ☐ _____weeks
27.3. The ear problem/ ear problems occur:(multiple choice)	☐ 1 ear affected ❍ Left side ☐ Bilateral (both ears affected simultaneously) ❍ Right side ❍ Alternating
27.4. Is the ear problem/ are the ear problems:(multiple choice)	☐ Itchy ☐ Others: ☐ painful _____
27.5. What kind of ear discharge did you see?	☐ No discharge from ear ☐ Brown, fatty "wax" ☐ Green or black purulent discharge ☐ Yellow slimy discharge
27.6. Do you think that the hearing of your dog is impaired?	☐ No, my dog hears normally ☐ Yes, my dog always had poor hearing (deaf since birth) ☐ Yes, my dog is deaf since the ear problem ☐ Yes, my dog has poor hearing since the ear problem
27.7. Has your dog neurologic deficits (head tilt, coordination problems) associated with the ear disease.	☐ No ☐ Yes
27.8. Have you noticed any proliferation/ mass from the ear canal /outer ear (it often looks like a cauliflower)?	☐ No ☐ Yes
27.9. Has the ear problem become worse over time?	No change ... obvious deterioration 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
27.10. How rapidly did the condition change?	☐ Over more than 1 year ☐ Within 1 year ☐ Within 1 month ☐ Within 1 week
27.11. The ear problems:	☐ Come and go (recurrent) ☐ The ear problem never went away ☐ The ear problem was present only once, now the ears are ok

27.12. Has your dog been treated for the ear problem by a veterinarian?	☐ No ☐ Yes
If yes:	
27.13. What treatment has your dog received? (multiple choice)	☐ Ear-drops ☐ Ear-cleaner ☐ Antibiotic treatment (Tablets) ☐ Ear-rinsing under anesthesia ☐ Operation: _____ ☐ Others: _____
27.14. Has the ear problem improved after treatment?	☐ No ☐ Yes, but only for a short period ☐ Yes
27.15. (If applicable) What kind of examinations have already been done? (multiple choice)	☐ Cytologic (microscopic examination) ☐ Bacteriologic examination ☐ Videootoscopy under anesthesia ☐ CT scan (computed tomography scan) for screening of the middle ear/inner ear ☐ MRI (magnetic resonance imaging) for screening of the middle ear/inner ear

Skin problems

28. Does your dog have any known skin problems?	
☐ No ☐ Yes	
If yes:	
28.1. Has a veterinarian diagnosed the skin problem?	☐ No ☐ Yes
If yes:	
28.2. What kind of diagnostic was made? (multiple choice)	☐ Atopicdermatitis (inflammation of the skin caused allergens from the environment) ☐ Adverse food reaction ☐ Flea allergy dermatitis ☐ Otitis externa ☐ Bacterial infection of the skin ☐ Malassezia dermatitis (fungal infection) ☐ Intertrigo (inflammation between the skin folds) ❍ Nose folds ❍ Tail folds ☐ Demodicosis ☐ Others: _____

28.3. At what age has the skin problems begun?	☐ Under 3 months ☐ Between 3 and 12 months ☐ Between 1 to 3 years ☐ Between 3 to 8 years ☐ At the age of over 8 years
28.4. Where is the skin problem localized? (multiple choice)	☐ Back ☐ Ears ☐ One or more of the following localization/s: ❍ Armpit ❍ Inner thigh ❍ Under neck area ❍ Paws ❍ In flexion position of the limbs ☐ Mainly on the skin folds ❍ Nose folds ❍ Tail folds ❍ Another area (please specify): _____
28.5. Has your dog been treated for the skin problem by a veterinarian?	☐ No ☐ Yes

Dental problems

29. Does your dog have any known dental problems?	
☐ No ☐ Yes	
If yes:	
29.1. What kind of dental problems does your dog have? (multiple choice)	☐ Malocclusion (incorrect relation between teeth) ☐ Dental plaques ☐ Gingivitis (inflammation of the gum tissue) ☐ Others: _____

Eye problems

30. Does your dog have any known eye problems?
☐ No ☐ Yes

If yes:	
30.1. What kind of eye problems does your dog have? (multiple choice)	☐ Ocular discharge ☐ Conjunctivitis (inflammation of the conjunctiva) ☐ Dry eye ☐ Corneal inflammation ☐ Corneal ulceration ☐ Others: _____

Orthopedic/ Neurologic problems

31. Does your dog have neck or back pain?	
☐ No ☐ Yes	
If yes:	
31.1. Has your dog been treated for this condition by a veterinarian?	☐ No ☐ Yes

32. Does your dog have any intervertebral disc disease?	
☐ No ☐ Yes	
If yes:	
32.1. Has your dog been treated for the intervertebral disc disease by a veterinarian?	☐ No ☐ Yes

33. Have you noticed lameness by your dog?	
☐ No ☐ yes	
If yes:	
33.1. Has your dog been treated for the lameness by a veterinarian?	☐ No ☐ yes
If yes:	
33.2. What treatment has your dog received?	☐ Medication: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____

Evaluation for this questionnaire

1.1. The questionnaire was intelligible:	true				false
	1	2	3	4	5
	❍	❍	❍	❍	❍
1.2. Which question was/ questions were unclear? (please write the numbers of questions down)					

2.1. The expenditure of time for this questionnaire was:	adequate				too long
	1	2	3	4	5
	❍	❍	❍	❍	❍
2.2. How long did you take to complete this questionnaire?					

3. The sounds were helpful:	true				false
	1	2	3	4	5
	❍	❍	❍	❍	❍

4. All health problems my dog has/ had were listed in this questionnaire.	true				false
	1	2	3	4	5
	❍	❍	❍	❍	❍

5. I think such questionnaires are significant for the advancement of science/ medicine.	true				false
	1	2	3	4	5
	❍	❍	❍	❍	❍

6. I gladly participate in questionnaire regarding my dog`s health.	true				false
	1	2	3	4	5
	❍	❍	❍	❍	❍

11. Appendix 2 - Deutsch

Angaben zu Ihrer Hündin/Ihrem Hund

Rasse:

_____

Alter oder Geburtsdatum:

_____

Dauer des Besitzes:

_____

Ihre Hündin/ Ihr Hund ist:

- ☐ Begleithund/Familienmitglied
- ☐ Bestimmte Nutzung (z.B.: Sporthund):

_____

Besitzerfragebogen

1. Was ist der Hauptgrund für Ihren Klinikbesuch? (Bitte nur **EINEN** Grund ankreuzen)	
☐ Atembeschwerden	☐ Neurologische Probleme
☐ Magen-, Darmbeschwerden	☐ Lahmheit
☐ Hautprobleme	☐ Ohnmachtsanfälle
☐ Augenprobleme	☐ Sonstiges:
☐ Zahnprobleme	_____

2. Seit wann hat Ihr Hund das oben genannte Hauptproblem?
☐ Seit der Geburt
☐ Seit einigen Jahren: _____Jahre
☐ Seit einigen Monaten: _____Monate
☐ Seit einigen Wochen: _____Wochen

3. Gibt es eine Verschlechterung des Hauptproblems seit Ihrer Beobachtung?				
keine Veränderung				extreme Verschlechterung
1	2	3	4	5
❍	❍	❍	❍	❍

4. Wie schnell hat sich die Verschlechterung entwickelt?
☐ Innerhalb der vergangenen Jahre
☐ Innerhalb einiger Monate
☐ Innerhalb einiger Wochen

5. Wurde das oben ausgewählte Hauptproblem schon einmal von einem Tierarzt oder mehreren Tierärzten behandelt?					
☐ Nein					
☐ Ja					
Falls Ja:					
5.1. Wie wurde Ihr Hund behandelt?	☐ Mit Medikamenten namens: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____				
5.2. Gab es durch die Behandlung eine Verbesserung?	keine Verbesserung				deutliche Verbesserung
	1	2	3	4	5
	❍	❍	❍	❍	❍

5.3. Welche Art der Therapie/welches Medikament war Ihrer Meinung nach am erfolgreichsten?	

6. Hat Ihr Hund neben den oben ausgewählten Hauptbeschwerden noch weitere Gesundheitsprobleme? (mehrfaches Ankreuzen möglich)

- ☐ Nein
- ☐ Atembeschwerden
- ☐ Magen-, Darmbeschwerden
- ☐ Hautprobleme
- ☐ Augenprobleme
- ☐ Zahnprobleme
- ☐ Neurologische Probleme
- ☐ Lahmheit
- ☐ Ohnmachtsanfälle
- ☐ Schluckstörungen, Verschlucken
- ☐ Sonstiges: _____

Atemproblematik

7. Welche Atemsymptome zeigt Ihr Hund? (mehrfaches Ankreuzen möglich)

- ☐ Maulatmung/ Hecheln
- ☐ Schnarchen
- ☐ Husten
- ☐ Pfeifendes Atemgeräusch
- ☐ Atemnot-Anfälle mit nach Luft schnappen
- ☐ Blaue Zunge (Blausucht)
- ☐ Leistungseinschränkung
- ☐ Hitze- oder Stressintoleranz
- ☐ Probleme beim Schlafen

  Wenn ja, welche: _____
- ☐ Gestreckte Kopf-Hals-Haltung
- ☐ Ohnmacht
- ☐ Erstickungsanfälle

8. Welches Geräusch beobachten Sie bei Ihrem Hund in Ruhe (z.B. beim Liegen, beim Schlafen)? (mehrfaches Ankreuzen möglich, bitte mit Tonbeispiel vergleichen)

- ☐ Stridor nasalis (Ton 1)
- ☐ Stridor pharyngealis (Ton 2)
- ☐ Stridor laryngealis (Ton 3)
- ☐ Schnarchen (Ton 4)
- ☐ Hecheln (Ton 5)

9. Welches Geräusch beobachten Sie bei Ihrem Hund bei angestrengter Atmung? (mehrfaches Ankreuzen möglich)

- ☐ Stridor nasalis (Ton 1)
- ☐ Stridor pharyngealis (Ton 2)
- ☐ Stridor laryngealis (Ton 3)
- ☐ Schnarchen (Ton 4)
- ☐ Hecheln (Ton 5)

10. Welches Geräusch beobachten Sie bei Ihrem Hund bei Atemnot? (mehrfaches Ankreuzen möglich)	
☐ Stridor nasalis (Ton 1)	☐ Schnarchen (Ton 4)
☐ Stridor pharyngealis (Ton 2)	☐ Hecheln (Ton 5)
☐ Stridor laryngealis (Ton 3)	☐ Mein Hund hatte noch nie Atemnot

11. Schnarcht Ihr Hund? (Ton 4)					
☐ Nein ☐ Ja					
Falls Ja:					
11.1. Seit wann beobachten Sie das Schnarchen?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen				
11.2. Wie oft beobachten Sie das Schnarchen?	☐ dauernd ☐ Nur im Schlaf ☐ Wachzustand und Schlaf	☐ täglich ☐ einmal in der Woche ☐ einmal im Monat			
11.3. Ist das Schnarchen mit der Zeit schlimmer geworden?	keine Verschlechterung				deutliche Verschlechterung
	1	2	3	4	5
	❍	❍	❍	❍	❍
11.4. Wie schnell hat sich die Verschlechterung entwickelt?	☐ Innerhalb der vergangenen Jahre ☐ Innerhalb einiger Monate ☐ Innerhalb einiger Wochen				
11.5. Wären Sie bereit eine Tonaufnahme bereit zu stellen?	☐ Nein ☐ Ja				
11.6. Stört Sie das Schnarchen?	☐ Nein ☐ Ja ☐ ab und zu				
11.7. Haben Sie das Gefühl, dass das Schnarchen Ihren Hund belastet?	☐ Nein ☐ Ja				

11.8. Wie laut ist das Schnarchen?	Leise				sehr laut
	1	2	3	4	5
	❍	❍	❍	❍	❍

12. Beobachten Sie an Ihrem Hund ein pfeifendes Atemgeräusch (Ton 3)?	
☐ Nein ☐ Ja	
Falls Ja:	
12.1. Seit wann beobachten Sie es?	☐ Seit der Geburt ☐ Seit einigen Wochen: _____Wochen ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Jahren: _____Jahre
12.2. Wie oft beobachten Sie es?	☐ täglich ☐ einmal in der Woche ☐ einmal im Monat ☐ In folgenden Situationen: _____
12.3. Ist das Pfeifen mit der Zeit schlimmer geworden?	keine Verschlechterung — deutliche Verschlechterung 1 ○ 2 ○ 3 ○ 4 ○ 5 ○
12.4. Wie schnell hat sich die Verschlechterung entwickelt?	☐ Innerhalb der vergangenen Jahre ☐ Innerhalb einiger Monate ☐ Innerhalb einiger Wochen

13. In welcher Situation/ welche Situationen hechelt Ihr Hund? (mehrfaches Ankreuzen möglich)	
☐ Nur bei Aufregung/ Angst	☐ Beim Hundesport (z.B. Agility, Laufen)
☐ Ab einer Außentemperatur von: _____ °C	☐ Beim Gassigehen
	☐ Immer

14. Kann Ihr Hund durch die Nase atmen?	
☐ Ja, immer	☐ Nur kurz
☐ Auch beim Gehen	☐ Nur in Ruhe
☐ Auch beim Laufen	☐ Gar nicht

15. Wie viel körperliche Bewegung kann Ihr Hund im Sommer (bei über 25°C) machen?
☐ Distanz: _____km in _____min
☐ Vor allem Gassigehen
☐ Vor allem Laufen

16. Wie viel körperliche Bewegung kann Ihr Hund im Winter machen?
☐ Distanz: _____km in _____min
☐ Vor allem Gassigehen
☐ Vor allem Laufen

17. Wie lange dauert die Erholungsphase nach körperlicher Bewegung? (in **min**)	
Im Sommer	
17.1. Nach Hundesport/ Laufen	
17.2. Nach Gassigehen	
Im Winter	
17.3. Nach Hundesport/ Laufen	
17.4. Nach Gassigehen	

18. Hatte Ihr Hund schon einmal eine Blausucht (Blaue Zunge, blasse Maulschleimhaut) gehabt?					
☐ Nein ☐ Ja					
Falls Ja:					
18.1. Seit wann beobachten Sie es?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen				
18.2. Wie oft beobachten Sie die Blausucht?	☐ täglich ☐ einmal in der Woche		☐ einmal im Monat ☐ einmal im Jahr		
18.3. Ist die Blausucht mit der Zeit schlimmer geworden?	keine Verschlechterung				deutliche Verschlechterung
	1	2	3	4	5
	❍	❍	❍	❍	❍
18.4. Wie schnell hat sich die Verschlechterung entwickelt?	☐ Innerhalb der vergangenen Jahre ☐ Innerhalb einiger Monate ☐ Innerhalb einiger Wochen				
18.5. Wann war die letzte Beobachtung der Blausucht?	☐ Vor einigen Jahren ☐ Vor einigen Monaten		☐ Vor einigen Wochen ☐ Vor einigen Tagen		
18.6. Bei welcher der folgenden Situationen beobachten Sie die Blausucht? (mehrfaches Ankreuzen möglich)	☐ Beim Schlafen ☐ In Ruhe ☐ Während oder nach dem Gassigehen		☐ Während oder nach einer sportlichen Aktivität (z.B. Agility, Laufen) ☐ Andere Situation: _____ _____		

19. Hatte Ihr Hund schon einmal einen Kollaps (Schwächeanfall, Zusammenbruch, Bewusstseinsverlust) gehabt?	
☐ Nein ☐ Ja	
Falls Ja:	
19.1. Seit wann beobachten Sie es?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen
19.2. Wie oft beobachten Sie den Kollaps?	☐ täglich ☐ einmal im Monat ☐ einmal in der Woche ☐ einmal im Jahr
19.3. Ist der Kollaps mit der Zeit schlimmer geworden?	keine Verschlechterung — deutliche Verschlechterung 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
19.4. Wie schnell hat sich die Verschlechterung entwickelt?	☐ Innerhalb der vergangenen Jahre ☐ Innerhalb einiger Monate ☐ Innerhalb einiger Wochen
19.5. Wann war die letzte Beobachtung des Kollapses?	☐ Vor einigen Jahren ☐ Vor einigen Wochen ☐ Vor einigen Monaten ☐ Vor einigen Tagen
19.6. Bei welcher der folgenden Situationen beobachten Sie den Kollaps? (mehrfaches Ankreuzen möglich)	☐ Beim Schlafen ☐ In Ruhe ☐ Während oder nach dem Gassigehen ☐ Während oder nach einer sportlichen Aktivität (z.B. Agility, Laufen) ☐ Andere Situation: _____

20. Wurde Ihr Hund schon mal wegen der nachfolgenden Ursachen von einem Tierarzt behandelt? (mehrfaches Ankreuzen möglich)	
☐ Schnarchen ☐ Pfeifen/Keuchen ☐ Hitze- oder Stressintoleranz ☐ Leistungseinschränkung ☐ Blausucht ☐ Kollaps ☐ Nein	
Falls Ja:	
20.1. Wie wurde Ihr Hund behandelt?	☐ Mit Medikamenten namens: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____

20.2. Gab es durch die Behandlung eine Verbesserung?	keine Verbesserung				deutliche Verbesserung
	1	2	3	4	5
	❍	❍	❍	❍	❍

Magen-Darm-Beschwerden

21. Hat Ihr Hund eine Futtermittelunverträglichkeit?	
☐ Nein ☐ Ja	
Falls Ja:	
21.1. Bekommt Ihr Hund ein spezielles Futter? Falls ja, welches Futter?	☐ Nein ☐ Ja: _____ _____
21.2. Wurde Ihr Hund wegen der Futtermittelunverträglichkeit schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja: _____

22. Beobachten Sie bei Ihrem Hund Erbrechen?	
☐ Nein ☐ Ja	
Falls Ja:	
22.1. Was trifft zu?	☐ Mein Hund lässt das Futter OHNE vorheriges Würgen und/oder Bauchpresse aus dem Maul fallen (Regurgitation) ☐ Erbrechen wird mit Würgen und/oder Bauchpresse assoziiert ☐ Wir beobachten beide Varianten
22.2. Was erbricht Ihr Hund? (mehrfaches Ankreuzen möglich)	☐ Futter ☐ Schleim ☐ Blut ☐ Sonstiges: _____
22.3. Sehen Sie einen Zusammenhang zwischen Atembeschwerden und Erbrechen/Regurgitation?	☐ Nein ☐ Ja
22.4. Seit wann beobachten Sie Erbrechen/Regurgitation?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen

22.5. Wie oft beobachten Sie es?	☐ täglich ☐ mindestens einmal in der Woche ☐ mindestens einmal im Monat ☐ mindestens einmal im Jahr
22.6. Wie hat sich das Erbrechen/ die Regurgitation mit der Zeit entwickelt?	Deutliche Verbesserung — deutliche Verschlechterung 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
22.7. Wie schnell hat sich die Verbesserung bzw. Verschlechterung entwickelt?	☐ Über mehrere Jahre ☐ Innerhalb eines Jahres ☐ Innerhalb von einem Monat ☐ Innerhalb einer Woche

23. Wurde das Erbrechen/ die Regurgitation schon einmal von einem Tierarzt behandelt?
☐ Nein ☐ Ja
Falls Ja:

23.1. Wie wurde Ihr Hund behandelt?	☐ Mit Medikamenten namens: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
23.2. Wurde das Erbrechen nach der Behandlung besser?	☐ Nein ☐ Ja, aber nur kurzzeitig ☐ Ja

24. Hat Ihr Hund Schluckbeschwerden (z.B. Fallenlassen von Futter, merkwürdige Bewegung beim Schlucken, mehrfaches Versuchen zu schlucken)?
☐ Nein ☐ Ja

25. Hat Ihr Hund Durchfall?
☐ Nein ☐ Ja
Falls Ja:

25.1. Seit wann beobachten Sie den Durchfall?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen

25.2. Wie oft beobachten Sie es?	☐ Täglich ❍ 1 bis 3 Mal ❍ 3 bis 5 Mal ❍ Mehr als 5 Mal ☐ mindestens einmal in der Woche ☐ mindestens einmal im Monat
25.3. Ist der Durchfall futterabhängig?	☐ Nein ☐ Ja ☐ Ab und zu
25.4. Beobachten Sie beim Durchfallkot folgende Beimengungen? (mehrfaches Ankreuzen möglich)	☐ Nein ☐ Schleim ☐ Blut ☐ Sonstiges: _____
25.5. Beobachten Sie beim Durchfall Kotpressen?	☐ Nein ☐ Ja
25.6. Wie viel Durchfallkot setzt Ihr Hund ab? (pro Kotabsatz)	Kleine Mengen … große Mengen 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
25.7. Wie hat sich der Durchfall mit der Zeit entwickelt?	Deutliche Verbesserung … deutliche Verschlechterung 1 ❍ 2 ❍ 3 ❍ 4 ❍ 5 ❍
25.8. Wie schnell hat sich die Verbesserung bzw. Verschlechterung entwickelt?	☐ Über mehrere Jahre ☐ Innerhalb eines Jahres ☐ Innerhalb von einem Monat ☐ Innerhalb einer Woche

26. Wurde der Durchfall schon einmal von einem Tierarzt behandelt?

☐ Nein
☐ Ja

Falls Ja:

26.1. Wie wurde Ihr Hund behandelt?	☐ Mit Medikamenten namens: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____
26.2. Wurde der Durchfall nach der Behandlung besser?	☐ Nein ☐ Ja, aber nur kurzzeitig ☐ Ja

Ohrenprobleme

27. Hat Ihr Hund Ohrenprobleme?	
☐ Nein ☐ Ja	
Falls Ja:	
27.1. Wo hat Ihr Hund das Ohrproblem/ die Ohrenprobleme? (mehrfaches Ankreuzen möglich)	☐ Ohrlappen ☐ Gehörgang (Otitis externa) ☐ Mittelohr (Otitis media) ☐ Innenohr (Otitis interna)
27.2. Seit wann beobachten Sie das Ohrproblem/ die Ohrenprobleme?	☐ Seit der Geburt ☐ Seit einigen Jahren: _____Jahre ☐ Seit einigen Monaten: _____Monate ☐ Seit einigen Wochen: _____Wochen
27.3. Das Ohrproblem ist/ Die Ohrenprobleme sind: (mehrfaches Ankreuzen möglich)	☐ einseitig ❍ Linkes Ohr ☐ beidseitig ❍ Rechtes Ohr ❍ Abwechselnd
27.4. Ist das Ohrproblem/ Sind die Ohrenprobleme: (mehrfaches Ankreuzen möglich)	☐ juckend ☐ Andere: ☐ schmerzhaft _____
27.5. Welche Art vom Ohrenausfluss haben Sie beobachtet?	☐ Kein Ausfluss ☐ Braunes fettiges „Ohrenschmalz“ ☐ Grüner oder schwarzer eitriger Ausfluss ☐ Gelber schmieriger Ausfluss
27.6. Ist Ihrer Meinung nach das Gehör Ihres Hundes beeinträchtigt?	☐ Nein, mein Hund hört normal ☐ Ja, mein Hund hat noch nie normal gehört (taub von Geburt an) ☐ Ja, seit dem Ohrproblem hört mein Hund nichts mehr ☐ Ja, seit dem Ohrproblem hört mein Hund schlechter
27.7. Wurden im Zusammenhang mit dem Ohrproblem bereits neurologische Defizite (Kopfschiefhaltung, Koordinationsprobleme) beobachtet?	☐ Nein ☐ Ja
27.8. Wurden bereits Wucherungen (Zubildungen, meist blumenkohlartig/ karfiolartig) in den Gehörgängen/ am Ohrlappen beobachtet?	☐ Nein ☐ Ja

27.9. Ist das Ohrproblem / Sind die Ohrprobleme mit der Zeit schlimmer geworden?	keine Verschlechterung				deutliche Verschlechterung
	1	2	3	4	5
	❍	❍	❍	❍	❍
27.10. Wie schnell hat sich die Verschlechterung entwickelt?	☐ Über mehrere Jahre ☐ Innerhalb eines Jahres ☐ Innerhalb von einem Monat ☐ Innerhalb einer Woche				
27.11. Das Ohrproblem/ die Ohrenprobleme:	☐ Kommen und gehen (sind rezidivierend) ☐ Seit Beginn der Ohrenerkrankung waren die Ohren nie mehr gesund ☐ Das Ohrproblem war nur einmal präsent, jetzt ist uns kein Ohrproblem mehr bewusst				
27.12. Wurde das Ohrproblem schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja				
Falls Ja:					
27.13. Wie wurde Ihr Hund behandelt? (mehrfaches Ankreuzen möglich)	☐ Mit Ohrentropfen ☐ Nur mit einem Ohrreiniger ☐ Mit Antibiotika in Tablettenform ☐ Mit einer Ohrspülung in Narkose ☐ Operation: _____ ☐ Sonstiges: _____				
27.14. Wurde das Ohrproblem nach der Behandlung besser?	☐ Nein ☐ Ja, aber nur kurzzeitig ☐ Ja				
27.15. Falls zutreffend, welche der genannten Untersuchungen wurden bereits durchgeführt? (mehrfaches Ankreuzen möglich)	☐ Zytologie (Untersuchung unter Mikroskop) ☐ Bakteriologische Untersuchung ☐ Videootoskopie in Narkose ☐ CT (Computertomographie) für die Darstellung vom Mittelohr/ Innenohr ☐ MRT (Magnetresonanztomographie) für die Darstellung vom Mittelohr/ Innenohr				

Hautprobleme

28. Hat Ihr Hund bekannte Hauterkrankungen?	
☐ Nein ☐ Ja	
Falls Ja:	
28.1. Gibt es von einem Tierarzt eine bereits gestellte Diagnose?	☐ Nein ☐ Ja
Falls Ja:	
28.2. Welche Diagnose wurde gestellt? (mehrfaches Ankreuzen möglich)	☐ Atopische Dermatitis (Umweltallergie mit Hautsymptomatik) ☐ Futtermittelallergie ☐ Flohallergie ☐ Otitis externa (Entzündung äußerer Gehörgang) ☐ Bakterielle Hautinfektion ☐ Malasseziendermatitis (Hefepilzinfektion) ☐ Hautfaltendermatitis ❍ Nasenfalte ❍ Schwanzfalte ☐ Demodikose ☐ Andere: _____
28.3. In welchem Alter haben die Hautprobleme begonnen?	☐ Unter 3 Monate ☐ Zwischen 3 und 12 Monaten ☐ Zwischen 1 bis 3 Jahren ☐ Zwischen 3 bis 8 Jahren ☐ Über 8 Jahren
28.4. An welcher Körperstelle hat Ihr Hund Hautprobleme? (mehrfaches Ankreuzen möglich)	☐ Rücken ☐ Ohren ☐ In einer bzw. mehrerer folgenden Lokalisationen: ❍ Achseln ❍ Innenschenkel ❍ Untere Halsbereich ❍ Pfoten ❍ Im Bereich der Beugestellen der Gliedmaßen ☐ Vorwiegend an den Hautfalten ❍ Nasenfalte ❍ Schwanzfalte ❍ Anderer Bereich: _____
28.5. Wurde das Hautproblem schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja

Zahnprobleme

29. Hat Ihr Hund bekannte Zahnprobleme?	
☐ Nein ☐ Ja	
Falls Ja:	
29.1. Was für ein Zahnproblem hat Ihr Hund? (mehrfaches Ankreuzen möglich)	☐ Zahnfehlstellung ☐ Zahnstein ☐ Zahnfleischentzündung ☐ Andere: _____

Augenprobleme

30. Hat Ihr Hund bekannte Augenprobleme?	
☐ Nein ☐ Ja	
Falls Ja:	
30.1. Was für ein Augenproblem hat Ihr Hund? (mehrfaches Ankreuzen möglich)	☐ Augenausfluss ☐ Bindehautentzündung ☐ Trockenes Auge ☐ Hornhautentzündung ☐ Hornhautdefekt ☐ Andere: _____

Orthopädische/ Neurologische Probleme

31. Hat Ihr Hund Hals- /oder Rückenschmerzen?	
☐ Nein ☐ Ja	
Falls Ja:	
31.1. Wurden die Hals- /oder Rückenschmerzen schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja

32. Hat Ihr Hund Bandscheibenprobleme?	
☐ Nein ☐ Ja	
Falls Ja:	
32.1. Wurde das Bandscheibenproblem schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja

33. Beobachten Sie bei Ihrem Hund eine Lahmheit?	
☐ Nein ☐ Ja	
Falls Ja:	
33.1. Wurde Ihr Hund wegen einer Lahmheit schon einmal von einem Tierarzt behandelt?	☐ Nein ☐ Ja
Falls Ja:	
33.2. Wie wurde Ihr Hund behandelt?	☐ Mit Medikamenten namens: ➢ _____ ➢ _____ ➢ _____ ☐ Operation: _____