Thank you to all I wrote and talked to during the last weeks, who explained medical details or recommended new material to cause new confusions in my brain. 😉 *Most of all, a very warm thank you to all people whose dogs died of Wheezer and who agreed to the publication of the photos.* ❤️ ❤️ ❤️

Sarah Cochrane
When I asked for help with the translation of my "summary" 😂 *in the Eurohound group, I had no idea I would find such a dedicated vet, who immediately attended to the topic and, on top, brought her colleagues (thank you, Frederic & Co.!) into the team. Thank you so much!!! I wouldn't have wanted to do this without you.* 🍀 🍀 🍀

Ragna Runenweg
Thank you, my love, that in many discussions, we came closer to the logic in this chaos. And thanks for the key document that helped me to unravel the alphabet soup JLPP/NVSA/NVSD/POANV and to draw conclusions from it. 😘

Wheezer – Congenital Laryngeal Paralysis in Sleddogs

1. How can you rule out the possibility of puppies being born with the wheezer disease?

By never mating two dogs with blue eyes.

2. Synonyms:

The wheezer disease, also known as Wheezer, is caused by the paralysis of the larynx, and hence is often referred to as “Laryngeal Paralysis” and abbreviated to LARPAR, LP or CLP (“congenital Laryngeal Paralysis”). If the paralysis is incomplete, the problem may be referred to as laryngeal paresis or occasionally laryngeal palsy.

Horse owners may be familiar with a similar disease called roaring or whistling.

French: paralysie laryngée congénitale and parésie laryngée congénitale
Russian: врожденный паралич гортани and врожденный парéз гортани
What is it called in your language? Additions very welcome in the commentaries! :-)

3. What are the symptoms of Wheezer? Which organs are affected?

- The word “Wheezer” refers to the sound the puppies make when they breathe: the vocal cords are drawn into the airways during inhalation and mostly block them, creating a rattling, whistling or wheezing sound.

- As the name suggests, it is the larynx that is affected, and more specifically the recurrent laryngeal nerve on either or both of the left and right sides. This means that the larynx muscles which connect to the cartilage supporting the vocal folds can no longer be controlled and moved. As a result, the dog cannot open the laryngeal cartilage when inhaling, and therefore there is no round, large opening through which sufficient air can flow into the lung, but only a narrow gap. To the dogs, it feels like they're breathing through a straw. They try to compensate for this by increasing abdominal breathing. In the worst cases, affected dogs suffer from acute shortness of breath and the mucous membranes turn blue due to lack of oxygen. There may even be a brief loss of consciousness. Such puppies may be stabilized by giving them oxygen in the short term, but this does not eliminate the cause.
  The larynx nerves are one of the longest nerves in the body, running from the brain stem down the neck, along the windpipe, around the first rib, and back up to the larynx. Because of this length, a particular susceptibility of these nerves to damage is understandable.

- In addition to the physical symptoms, Wheezer puppies can suffer from behavioural anxiety linked to the fear of a "Wheezer's episode". As a secondary effect, during the Wheezer's episode the puppy can also become very anxious due to the decreased availability of oxygen; this can exacerbate the problem by causing hyperventilating and inflammation to the tissues of the airways.

- The ability of the dog to dissipate body heat via panting is affected, resulting in an increased danger of overheating.

- The larynx is the connection between muzzle, nose, oesophagus, and windpipe. Wheezer puppies can't properly close the larynx when they swallow, so food or water can be inhaled into the windpipe and thus into the lung, instead of going into the oesophagus. This can result in aspiration pneumonia and death. Similarly, when they are swimming, dogs affected by Wheezer can drown because they can't prevent the passage of water into the lung.

4. When do the symptoms occur?

- Severely affected puppies have difficulties to breathe from birth.

- In other affected puppies, the symptoms don't become obvious until they begin to increase their activity levels at around 6 weeks old.

- Von Pfeil et al have shown that the first symptoms can occur up to an age of 13 months. It appears that in more severely affected dogs there is an earlier onset of symptoms.

5. How is Wheezer diagnosed?

Usually via an endoscopic examination under a light sedation. This examination shows if the arytenoid cartilage is able to open and close normally during inhalation. Sometimes, only a diagnosis by exclusion is possible, i.e. if AHE and JLPP/NVSA/NVSD/POANV (see below) can be ruled out, the symptoms may be attributed to Wheezer.

6. Differential diagnostics – further additions very welcome!

- infections of the airways
- pneumonia
- tracheobronchitis (infection of the windpipe and bronchi)
- heart disease
- hypothyroidism
- intoxication
- neoplasia (e.g. tumors)
- neuropathy of non-congenital original
- canine eosinophilic bronchopneumopathy (EBP)

7. Is Wheezer always lethal?

It is possible that less severely affected animals can survive with a degree of impairment, but for all except the mildest cases, a surgical solution is strongly recommended. Unfortunately, most severe cases end with the death of the dog, generally before 6 months of age, either through asphyxiation or euthanasia on welfare grounds.

8. Is Wheezer congenital?

This summary is about the congenital form of Wheezer – which can be avoided by wise pairing of stud animals. Acquired forms also exist, occuring mostly in older dogs (10 years or older) or can be caused by trauma e.g. by too heavy pulling on the collar, which damages the laryngeal nerves and causes a paralysis. Dogs with laryngeal paralysis should wear a harness instead of a collar, to avoid further damage of the larynx.

9. Can Wheezer be cured through surgery?

In older dogs with acquired laryngeal paralysis, this is sometimes possible, a so-called “tieback”. In puppies with severe congenital laryngeal paralysis, this operation has a low chance of success, because the cartilage in the larynx is fixed in place to constantly keep the windpipe open. This produces an extremely high lifelong risk that the dog inhales water or food, which can be deadly.
If such a dog is working as a sleddog and runs with his muzzle wide open, there is an especially high risk that it will get saliva, foam, dirt, or snow into its lung.

Another surgical possibility is to create a permanent tracheostoma, where a pipe is inserted from outside the neck directly into the windpipe. This comes with an even higher risk of extraneous material getting into the lung.

10. How is Wheezer connected to Alaskan Husky Encephalopathy (AHE)?

AHE is a congenital disease of the brain, in which dysphagia can arise, as well as additional symptoms including impaired vision or movement disorder. Thus, AHE and Wheezer are different diseases with different causes, which can, however, cause similar symptoms. Sometimes, only a diagnosis by exclusion is possible, i.e. if AHE and JLPP/NVSA/NVSD/POANV (see below) can be ruled out, the symptoms may be attributed to Wheezer. AHE can be diagnosed by a genetic testing. AHE carriers should be excluded from breeding.

The mother of puppies B and C and the father of B (shown in the photos) have been tested negative for AHE.

11. How is Wheezer connected to
Juvenile Larynx Paralysis & Polyneuropathy (JLPP),
Neuronal Vacuolation and Spinocerebellar Ataxia (NVSA),
Neuronal Vacuolation and Spinocerebellar Degeneration (NVSD) and
Polyneuropathy with Ocular Abnormalities and Neuronal Vacuolation (POANV)?

JLPP, NVSA, NVSD, and POANV are different terms for the same disease (see www.rcnsw.com.au/wp-content/uploads/2017/05/rottweiler-jlpp.pdf) that, so far, has been found in Rottweilers, Black Russian Terriers, and Bouvier des Flandres. Laryngeal paralysis is one of the symptoms of JLPP/NVSA/NVSD/POANV.

The results of a Norwegian group of scientists hypothesize that Wheezer is a separate disease: Adult sleddogs with Wheezer symptoms showed none of the other symptoms of JLPP/NVSA/NVSD/POANV.

If the laryngeal paralysis in sleddogs called Wheezer is identical to the laryngeal paralysis in JLPP/NVSA/NVSD/POANV or if it is a separate disease, will only be determined by genetic testing. So far, the connection between the similar neurological diseases in different breeds has not been clarified scientifically.

12. Can Wheezer be diagnosed by a genetic testing?

The Norwegian team of scientists is working on a Wheezer test which could be used for breeding animals, to prevent further mating of carriers. They still need blood samples!

1st call to action:

If you can provide blood of sleddogs affected with Wheezer or of their parents, please contact Prof Frode Lingaas of the Veterinary College in Oslo: dogdna@nmbu.no.

13. How is Wheezer passed on?

It is thought to be passed on via an autosomal recessive heredity:
N/N = free, can't pass on Wheezer
N/w = carrier, can pass on Wheezer with a 50% chance
w/w = falls ill, would pass on Wheezer with a 100% chance
(if they reach reproductive age)
This is what makes it so difficult – nobody would breed obviously ill animals, but externally healthy parents can carry this disease, nevertheless.

14. Can puppies of healthy parents be affected by Wheezer?

Yes, because the parents can, even if they don't fall ill themselves, be carriers of the wheezer disease and pass it on to their puppies. If a puppy inherites Wheezer from both parents, it will fall ill.

15. Are all puppies from a litter affected?

If both parents are carriers of the wheezer disease, statistically, only one quarter of their puppies will be free of this disease (N/N). One half will be carriers (N/w & w/N) and one quarter will fall ill from Wheezer (w/w):

	N	**w**
N	N/N	N/w
w	w/N	w/w

It is often recommended to pair a carrier only to a dog that does not carry this disease. For the short term, there will be no obviously ill puppies from such a mating. It seems to be less known that, statistically, half of the puppies will be carriers (N/w), as well:

	N	**w**
N	N/N	N/w
N	N/N	N/w

To prevent the problematic mating of carriers, it is important that breeders don't conceal it if a puppy died from Wheezer.

16. How can Wheezer carriers be recognized?

In their study, O'Brien & Hendriks (1986) say that Wheezer “has been known among the racing community for more than 20 years” (thus, since the 1960s) and that “knowledgeable racing dog owners avoid breeding two white dogs with blue eyes to avoid producing 'wheezers'”. Three features are described for all Wheezer affected dogs of this study:
1. blue eyes
2. a white face
3. “freckles”

In the study of Dr von Pfeil & Co. (2018), three typical features of affected dogs are described:
1. blue eyes
2. white facial markings
3. oral mucosal tags or tissue bands (looks like the human frenulum)

Additional features observed by the racing community: Many puppies affected with the wheezer disease seem to be born with a white blaze and grey patches around their eyes and the parents of affected puppies show such markings, as well.

The photos of puppies who died of the wheezer disease show a strikingly similar phenotype (outer appearance). By collecting more photos of affected dogs and their parents, we could get an overview of whether all Wheezer carriers have a similar phenotype, how accurately the features already described denote Wheezers and if further phenotypical features indicate Wheezer.

2nd call to action:

If you know someone whose dog died of Wheezer, maybe you could ask if you may share a photo of the dog and photos of its parents?

If you send me the photos, I will share them anonymously. This way, we can collect valuable evidence to actively prevent a further spreading of this disease even before a genetic test is available!

It is not certain yet if Wheezer can be detected by the existing test for JLPP/NVSA/NVSD/POANV or if a separate genetic testing for Wheezer has to be developed.

THIS IS WHY THE COLLECTED COMMON KNOWLEDGE ABOUT OUTER RECOGNITION FEATURES IS SO IMPORTANT, BECAUSE CURRENTLY, ONLY THIS WAY POSSIBLE CARRIERS OF THIS DISEASE CAN BE PREVENTED FROM BREEDING OR, AT LEAST, A PAIRING OF TWO POSSIBLE CARRIERS CAN BE PREVENTED!!!

One thing is for sure: Never mate two dogs with blue eyes and you can nearly rule out the possibility of puppies being born with the wheezer disease. Nearly all Wheezer puppies come from breeding two blue-eyed dogs.

... and now, take a moment to consider:
How important is it for you that a dog has blue eyes?

17. How is the merle factor connected to Wheezer?

- The merle factor is a coat colouration gene. Puppies might be born deaf and/or blind, if they get the merle factor from both parents.
- Alaskan Huskies and thus, European/Scandinavian Hounds can carry the merle factor, purebred Siberian Huskies and pointers can't.
- Wheezer carriers have been tested negative for merle factor, so there seems to be no causal connection.

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This document has been created by a couple of interested hound owners who are scientists but not geneticists. We are still awaiting input from several people with expertise in the field and anticipate that there will be corrections and updates to this information in the future.

Corrections and additions are more than welcome, the more knowledge based on facts we can collect, the better!!! Please add a source.

We'd also like to get the meme text on the photo in your language.

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Sources:

www.facebook.com/groups/230165397107610/permalink/609939535796859
My most favourite facebook group. Thank you all for this great discussion! Here, I found out about Wheezer.

Until now, there are indeed only two scientific studies about the wheezer disease.

The first study of O'Brien & Hendriks from the year 1986 (2 pages):
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The second study of Dr von Pfeil & Co. from the year 2018 (8 pages):
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This is a wonderful unraveling of the "alphabet soup" JLPP/NVSA/NVSD/POANV:
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www.chvcordeliers.com/paralysie-larynx
www.genodog.fr/maladies-affections/paralysie-laryngee

... as well as personal exchange with scientists and with people whose dogs were affected by Wheezer.

We do not intend to start a discussion about purebred Siberian versus Alaskan Huskies/Hounds. Evidence for congenital laryngeal paralyses in Siberian Huskies you find in the study of von Pfeil et al (http://35.8.208.155/about-the-college/news-and-events/publications/vth-messenger/2010/vth-messenger-summer-2010/201cwheezers201dstudied – 3rd passage, 1st sentence) and in this article of the Iditarod vet Stuart Nelson: https://iditarod.com/laryngeal-hemiplegia-a-disorder-affecting-husky-breeds.