

# **GUIDELINES FOR COMBATING CARDIAC DISEASE**

Approved by the Board of the Finnish Kennel Club on 21 November 2014, valid as of 1 June 2015. Updated points approved by the Board on 27.11.2015 and entered into force on 1.1.2016.

This guideline complements the Programme to combat hereditary diseases and defects (Council 30.11.2008) and the Guideline for the programme to combat hereditary diseases and defects (PEVISA guideline, Board 28.8.2008).

## **1 GENERAL REGULATIONS**

The purpose of the cardiac examination is to study the occurrence of heart disease in dogs and to support prevention. This guideline will determine how the prevention will be implemented in practice. The Finnish Kennel Club (hereinafter Kennel Club) authorises the veterinary certificates issued in accordance with this guideline.

An official cardiological examination sanctioned by the Kennel Club (hereinafter cardiac examination) may be performed on any breed, but for certain breeds the exam or some component of it can be a requirement for breeding use (PEVISA programme).

The cardiac examination includes

- an auscultation, i.e. listening to heart sounds
- echocardiographic examination, which includes an auscultation and an electrocardiogram in addition to a echocardiography

If a cardiac examination is adopted as part of a breed's PEVISA programme or breed-specific breeding strategy (JTO), it will become necessary to determine, in cooperation with the Kennel Club's cardiac working group, which cardiac disease or diseases the prevention measures of that breed shall target. The cardiac disease working group will define the breed's heart disease diagnosis criteria and reference values based on published scientific studies. The diagnosis criteria and reference values will be incorporated into the breed's PEVISA programme or JTO.

Only a veterinary certificate issued as stipulated under this guideline will be accepted in the Kennel Club for dogs, whose owner/holder resides in Finland.

Cardiac examinations performed overseas are not official in Finland. If mating is performed by a foreign male, a cardiac examination report from a foreign veterinarian will be accepted when registering the litter. The report must indicate the male's identification marking. At the time of mating, the report may not be older than acceptable under the breed-specific PEVISA programme. The report must unambiguously indicate that the dog does not suffer from cardiac diseases that the breed's PEVISA programme mentions as excluding it from breeding use.

In case the breed has a PEVISA programme, males loaned to Finland for breeding purposes as well as imported dogs must be examined in Finland. An alternative is to apply for an exemption before a pair is mated.

The owner/holder of the dog must sign an approval of publicity regarding the findings of the cardiac examination before the exam is performed. Examination findings as well as the identity of the party issuing the veterinary certificate will be recorded into the Kennel Club breeding database.

### **1.1 Kennel Club authorisation to perform cardiac examinations**

The Board of the Kennel Club will, based on proposals made by the cardiac working group, name the veterinarians who are authorised to issue cardiac examination veterinary certificates. Veterinarians must meet the requirements presented in this guideline to qualify for Kennel Club

authorisation. The cardiac disease working group will process applications at least two times each year.

### Auscultation authorisation

A Kennel Club-sanctioned heart auscultation may be performed by a veterinarian with a Finnish veterinary specialist degree in small animal diseases or the corresponding international graduate degree in the small animal field (Diplomate certification).

The eligibility of a holder of some other foreign graduate qualification to perform authorised auscultation exams will be assessed by the cardiac working group on application.

Other veterinarians licensed to practice in Finland are required to perform an auscultation examination on 20 dogs under the supervision of a veterinarian with Kennel Club authorisation to perform auscultations. At least ten of these dogs must have a heart murmur. A certificate signed by the veterinarian who supervised these auscultations is then submitted to the Kennel Club's cardiac working group.

### Authorisation to perform echocardiographic examinations

A Kennel Club -sanctioned echocardiography may be performed by a veterinarian licensed to practice in Finland who has passed a skills demonstration test organised by the Kennel Club's cardiac working group. An exception to this applies to veterinarians with European or American Diplomate certification in small animal cardiology who are not required to participate in the test. The eligibility of holders of some other foreign graduate qualification to perform authorised ultrasound cardiac tests will be assessed by the cardiac working group on application.

In order to be granted authorisation to perform ultrasound exams, a veterinarian must submit an application to the Kennel Club's cardiac working group. The application must be accompanied by a resume that shows the veterinarian has adequate work experience in small animal cardiology, has completed relevant post-graduate courses and details what cardiac exam equipment the applicant has access to (ultrasound machine and electrocardiogram system). A full cardiac examination of two patients (one patient must have a valve disease) performed by the veterinarian with the ultrasound machine he or she uses at work must be appended to the application. Instructions for this echocardiographic examination are available from the cardiac working group. The application determines the veterinarian's eligibility to take part in the skills demonstration test organised by the cardiac working group.

## **1.2 Duration of validity of the cardiac examination and minimum age for testing**

The cardiac examination can be performed to identify congenital heart diseases in dogs less than one year old, in which case there is no need to renew the examination later. Pulmonary and aortic stenosis are exceptions to this; an official veterinary certificate of the cardiac examination for these conditions cannot be issued before the dog is at least one year old.

An official cardiac examination certificate for acquired cardiac disease (degenerative mitral valve disease and dilated cardiomyopathy DCM) can be issued once the dog is one year old. The certificate is valid for one year. A heart auscultation does not constitute a sufficient examination for issuing a certificate regarding the occurrence of DCM.

The examination's validity period can be defined more specifically in the breed-specific PEVISA programme.

## **2 PERFORMING THE EXAMINATION AND CERTIFICATE ISSUING PROCEDURE**

Separate instructions regarding the performance of a cardiac examination in practice will be issued to veterinarians. Exam findings shall be noted on the veterinary examination certificate.

## **2.1 Clinical examination**

A clinical examination shall be performed without exception on all dogs undergoing a cardiac exam. This will focus special attention on identifying possible changes caused by heart failure.

## **2.2 Heart auscultation**

Heart auscultations are performed to identify murmurs. Murmurs are associated with several cardiac conditions, such as degenerative valve disease and congenital heart disease. It is not, however, possible to determine which cardiac condition the case involves on the basis of a murmur. Instead, a cardiac ultrasound is usually recommended as a follow-up test. Murmurs cannot always be detected in association with dilated cardiomyopathy. A murmur can also be the result of some other illness or be benign (not associated with a cardiac condition).

Murmur findings are assessed as follows:

- The timing of the murmur: systolic, diastolic or continuous.
- Location of maximal intensity murmur: mitral valve region, pulmonary artery region, aortic region, tricuspid valve region or non-localised.
- The intensity of a heart murmur is classified according to the following scale:
  - Grade 1 – Very faint murmur with low intensity that can only be heard in a peaceful setting
  - Grade 2 – Localised faint murmur, which can nevertheless be heard immediately
  - Grade 3 – Medium-level murmur, can also be heard from a broader area, own heart sounds audible
  - Grade 4 – Strong murmur, which can be heard from a broad area, own heart sounds become inaudible, no palpable thrill
  - Grade 5 – Strong murmur with a palpable thrill. Readily audible when the stethoscope comes close to the dog's chest
  - Grade 6 – Strong murmur with a palpable thrill. Audible even when the stethoscope is lifted off the dog's chest

## **2.3 Heart rhythm examination (resting ECG and/or long-term ECG monitoring)**

Electrocardiogram (ECG) tests are performed to analyse the electrical activity of the heart and identify any arrhythmia possibly caused by irregularities in this activity. Resting ECG (for 5 minutes) must always be performed when a clinical examination or auscultation identifies irregularities in the rhythm of the heart. In certain breeds, arrhythmia is associated with cardiac diseases like dilated cardiomyopathy (e.g. the Doberman and the Boxer). Long-term ECG monitoring, i.e. the Holter monitoring, is used to identify more transient types of arrhythmia that might not be revealed by a regular, short recording. This involves the recording of the heart's electrical activity for at least 24 hours using a portable ECG monitor.

## **2.4 Echocardiographic examination**

Ultrasound can be used to create images of the heart's structure, enabling analysis of its functioning. Ultrasound is used to diagnose congenital heart defects and so-called acquired heart conditions such as dilated cardiomyopathy and degenerative valve disease. An ultrasound exam

can identify which specific heart disease the patient is suffering from and the seriousness of the condition underlying the detected murmur.

An echocardiographic examination defines many measurements related to the size and functioning of the heart that can be compared to published normal values relative to the dog's breed and weight. The examination is always done to test for all identifiable heart conditions using two-dimensional, M-mode and Doppler ultrasound. All findings are recorded on the cardiac examination certificate.

## **2.5 Conclusions of the cardiac examination**

The veterinarian issuing the certificate shall provide an assessment of the existence and severity of possible cardiac conditions on the basis of the examination findings.

If only an auscultation is performed on the dog, the finding of the exam (murmur) is recorded in the section reserved for auscultation tests on the examination certificate.

If a cardiac ultrasound is performed on the dog, the veterinarian issuing the certificate will also fill in the summary in the bottom part of the form. This summary evaluates, based on the examination findings, whether the dog is showing signs of cardiac disease on the day of the exam and, if so, whether the case involves the symptomatic or asymptomatic (occult, latent) phase of the condition.

Examination findings regarding each cardiac condition (MMVD = myxomatous mitral valve disease; DCM = dilated cardiomyopathy; SAS = subaortic stenosis; PS = pulmonary stenosis, Other heart disease = some other identified cardiac condition) will be noted in the conclusion section using the following abbreviations:

A – no findings point towards a cardiac disease on the day of the examination.

B – the result is inconclusive with regard to this cardiac disease: the findings on the day of the examination do not make it possible to assess without follow-up monitoring whether the dog is, with respect to the cardiac condition in question, healthy or ill.

C – findings point towards the cardiac disease in question on the day of the examination.

More detailed instructions for the diagnostic tests of various cardiac conditions can be obtained from the Kennel Club's cardiac working group.

## **3 VALID EXAMINATION RESULT OF A DOG AND CONTRADICTORY EXAMINATION FINDINGS**

The breed-specific PEVISA programmes will abide by a valid examination result. The breed associations will issue additional instructions on how the results should be observed in breeding.

If an auscultation examination indicates that the dog shows signs of cardiac disease, the result shall remain valid unless it is altered on the basis of an ultrasound examination. In Holter monitoring of ventricular arrhythmias, the most recent examination result shall always be considered valid.

## **4 APPEALS PROCEDURE**

The findings of an auscultation examination cannot be appealed. An ultrasound examination can be performed on the dog to confirm the findings.

A dog owner may appeal against the findings of ultrasound and electrocardiogram examinations. A written appeal must be submitted, with appended copies of all earlier examination certificates issued to the dog.

Appeals are handled by the Kennel Club's cardiac working group. The dog owner must pay a processing fee set by the Kennel Club before the appeal is taken into deliberation. The fee is non-refundable.

A decision made by the Finnish Kennel Club's cardiac working group will be considered a valid examination result for the dog.

## **5 EXCEPTIONAL CASES**

The Scientific Commission of the Kennel Club is entitled to grant an exemption from the regulations presented in this guideline if there is very compelling reason to do so in a one-off exceptional case.