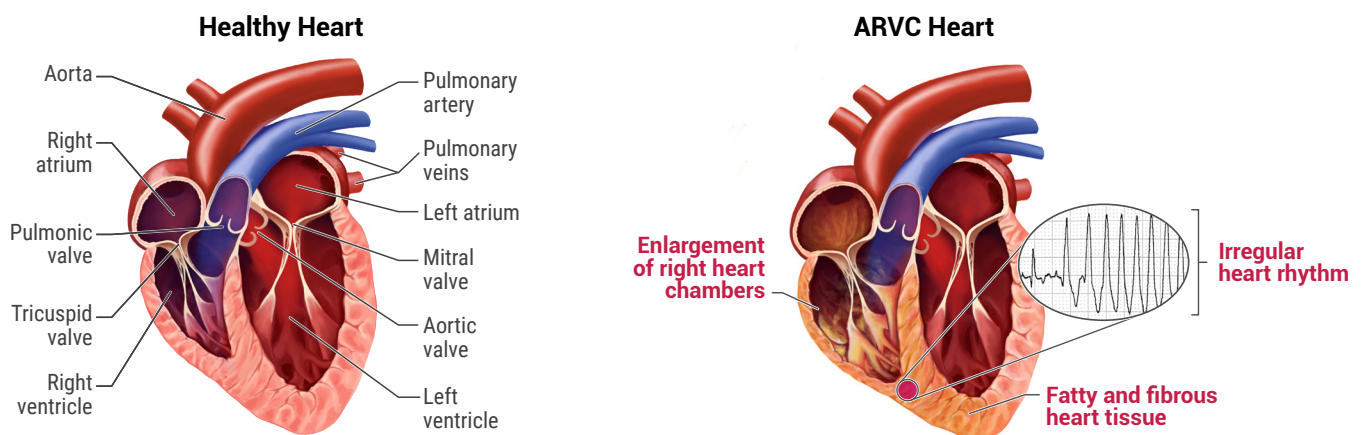


# Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC) in Dogs

## What is Arrhythmogenic Right Ventricular Cardiomyopathy?

Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC) is a genetic disease in boxer dogs and related breeds (primarily bulldogs). This condition has also been called boxer cardiomyopathy. ARVC affects the heart muscle and causes replacement of the normal muscle with fatty and fibrous tissue. This change leads to electrical instability and results in arrhythmias, and in some cases, heart muscle weakness. An arrhythmia is an irregular heart rhythm that can often, but not always, be detected on a physical exam in affected patients. Arrhythmias frequently arise from the right ventricle in dogs with ARVC, but the electrical instability can extend to other chambers of the heart.

Ventricular tachycardia refers to an abnormal heart rhythm that is diagnosed when abnormal electrical signals from the ventricles occur consecutively, without interruption by normal electrical signals. Ventricular tachycardia can result in clinical symptoms of weakness or fainting and sometimes, sudden death. In addition, some patients may develop a dilated, poorly contracting heart and associated signs of congestive heart failure.



## How is ARVC diagnosed?

Patients with this condition may be detected when an irregular heart rhythm is noted on a routine physical examination. Sometimes the condition is diagnosed after an episode of collapse or fainting. Patients suspected of having ARVC should have a thorough physical exam and diagnostic procedures including an electrocardiogram (ECG) and ultrasound of the heart (echocardiogram). In order to best evaluate the severity of any arrhythmias, a Holter (24-hour ECG) monitor can be worn by the patient, allowing the cardiologist to evaluate the heart rhythm and rate during normal activity at home by reviewing a 24- or 48-hour recording. Holter monitoring is also used to evaluate the efficacy of treatment. Blood or cheek swabs can be submitted for genetic testing to help screen breeding dogs or to augment the clinical diagnosis.

## How is ARVC treated?

The treatment for ARVC will depend on the severity of the arrhythmias and other findings from diagnostic testing. If the patient has severe arrhythmias, antiarrhythmic medications may be recommended with a goal of controlling or improving the arrhythmias. This type of treatment requires monitoring to ensure that the therapy is effective and does not alter the electrical activity of the heart in a detrimental way. Dogs that experience congestive heart failure require additional medications (diuretics, ACE inhibitors, pimobendan), and some dogs may need to be hospitalized for a while for urgent treatment of heart failure or severe arrhythmias. Medications are aimed at controlling the clinical signs of heart failure or any arrhythmia and do not treat the primary condition.

## How is ARVC monitored by my veterinarian and my cardiologist?

In patients diagnosed with ARVC that do not have clinical signs, recheck ECGs, Holter monitoring, and serial echocardiograms are often recommended to assess the need for therapy or changes in treatment as the disease progresses. In symptomatic patients, Holter monitoring or other testing may be more frequent until the patient is stabilized. If patients are treated for congestive heart failure, recheck lab work and thoracic radiographs may also be recommended to monitor for side effects or the recurrence of congestion.

## How can I tell how my dog is doing at home?

In patients treated for ARVC, any episode of collapse or weakness should be reported to your veterinarian. Home monitoring is also important to identify early signs of progression and early heart failure. Signs of heart failure often include shortness of breath, not eating, easy fatigue/exercise intolerance, episodes of weakness or collapse, or coughing. These signs should prompt a call and usually a visit to your veterinarian. Monitoring the breathing rate during sleep or complete rest provides a sensitive indicator of possible early heart failure. Normal breathing rate at home is 30 breaths per minute or less. There are two smart phone apps that simplify obtaining and tracking the breathing rate. (Cardalis, My Pet's Heart2Heart).

## Is diet important?

Avoiding non-traditional diets rich in legumes, such as lentils, chickpeas or green peas/green pea products, is advised. Vegetarian or vegan diets should be avoided. While some salt restriction (e.g., avoidance of high salt treats) is ideal for most dogs with significant heart disease, and moderate salt restriction aids CHF treatment, it is important that your dog's appetite remains good and that his or her caloric and protein needs are met. In one family of boxer dogs, this condition was also linked to a deficiency in dietary carnitine, so supplementation with this non-essential amino acid is sometimes recommended.

## What is the prognosis of ARVC?

The prognosis varies with the stage of disease and rate of progression. Many patients diagnosed early and treated with antiarrhythmic medications can live for many years, sometimes to a normal lifespan. However, patients with more severe arrhythmias can have continued episodes of collapse and sudden death, even with appropriate treatment.

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