



Animal Specialty Hospital of Florida

Exceptionally skilled. Uniquely compassionate.

Common Arrhythmias in Dogs and Cats:

Nick Schroeder, DVM DACVIM (cardiology)

Arrhythmias are abnormal heart rhythms. Some arrhythmias are normal variants (i.e. respiratory sinus arrhythmia) and completely benign. Some may be abnormal, but not dangerous (i.e. premature beats). Some arrhythmias are associated with alarming clinical signs such as fainting (passing out, *syncope*) and can be life-threatening in certain circumstances. The following covers only the most common arrhythmias and is by no means comprehensive.

Atrial fibrillation

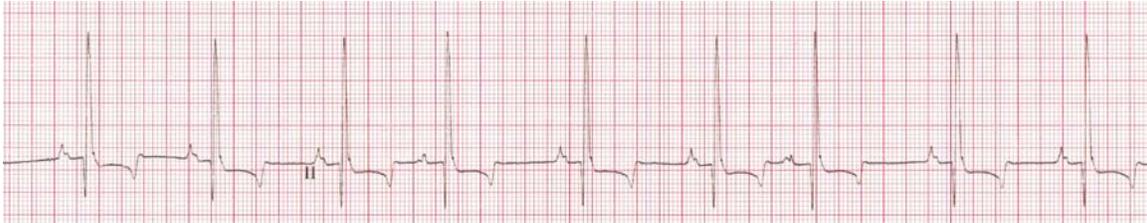
Atrial fibrillation (AF or “A-fib”) is not uncommon in the dog and rare in cats. Typically, atrial fibrillation is associated with underlying structural heart disease with severe secondary heart chamber enlargement (usually left atrial enlargement). The top chambers (the atria) receive the blood from the body and lungs, and their job is to squeeze extra blood into the lower pumping chambers (the ventricles). When the atria fibrillate, the ventricle lose this extra “kick” from the atria, and this will lead to less filling of the ventricles, and less forceful of a contraction. Typically the heart rate is extremely fast and irregular during atrial fibrillation, and patients may have heart rates above 200-220 beats-per-minute. This leads to decreased filling time for the ventricles, and even less cardiac output. Atrial fibrillation may be associated with worsening clinical signs of congestive heart failure or even fainting (syncope). If patients are in or near congestive heart failure, atrial fibrillation may be medically managed with medications such as digoxin and diltiazem. Occasionally, atrial fibrillation may occur in the absence of overt structural heart disease in large or giant-breed dogs, and may be managed better with beta-blockers. This is also referred to as primary AF or “lone AF.” Cardioversion to a normal rhythm is rarely attempted, since most patients have severe underlying heart disease that predisposes them to AF. Treatment is aimed at controlling the heart rate to increase the time the ventricles have to fill with blood in between heart beats, thereby improving cardiac output.



EKG of a dog with atrial fibrillation.

Premature Beats

Premature beats are heart beats that come too early. These may also be known as premature complexes or depolarizations. There are two broad categories of premature beats. Those that arise from the tissue above the main pumping chambers (the ventricles) are known as *supraventricular* premature beats (SVPCs, SVPDs), and include atrial premature complexes (APCs) and junctional premature complexes (JPCs). Those that arise from the ventricles themselves are known as *ventricular* premature beats (VPCs, VPDs, or PVCs). Typically not a big problem in of themselves, premature beats *may* require treatment if patients are having very frequent early beats or are at risk for other arrhythmias, such as atrial fibrillation or ventricular tachycardia. Patients may be having premature beats for reasons other than heart disease. In such cases, further testing (tick serology, abdominal ultrasound, etc.) may be recommended.



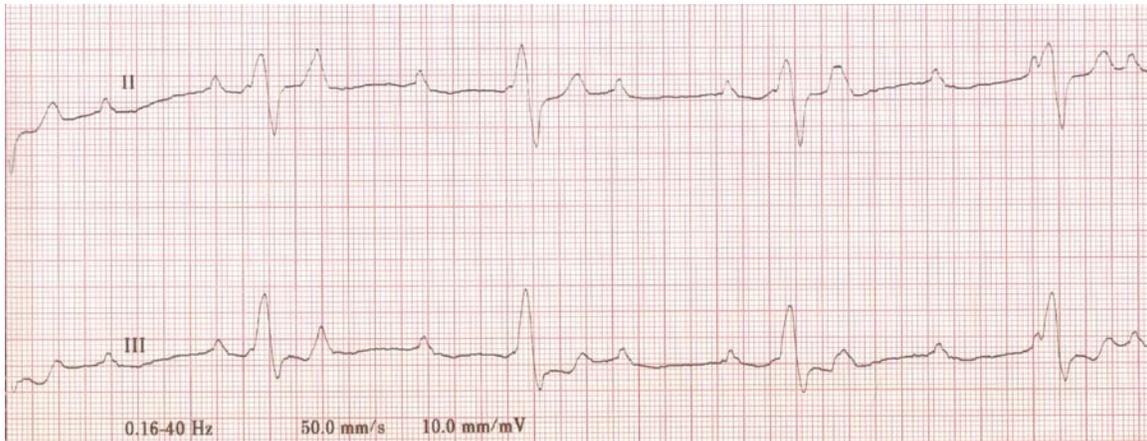
EKG of a dog with supraventricular premature beats.



EKG of a dog with ventricular premature beats.

Atrioventricular Block

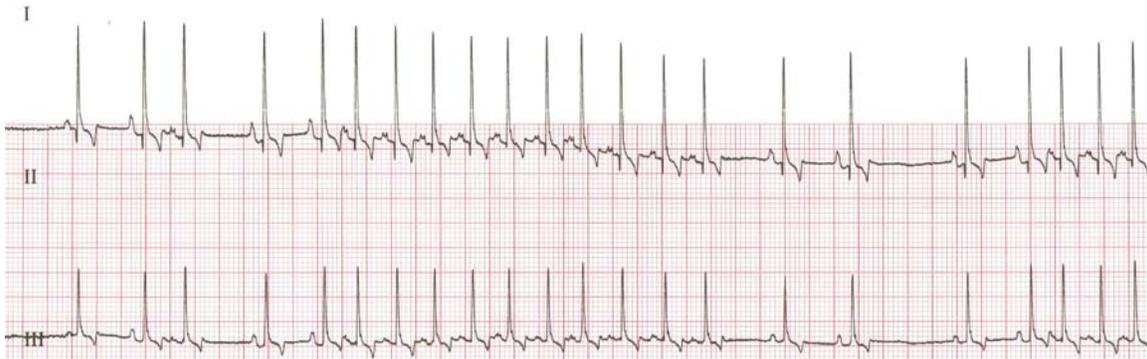
Atrioventricular (AV) block occurs when the normal electrical impulse is unable to cross from the priming chambers (the atria) into the pumping chambers (the ventricles). There are varying degrees of atrioventricular block. Patients that have 1st degree AV block require no specific therapy. Second degree AV block is incomplete, which means that sometimes conduction occurs, and sometimes it fails. Third degree AV block is complete, and no conduction is present from the atria to the ventricles. An escape rhythm keeps the heart beating, albeit at too slow a rate. Patients that have a high grade (Type II 2nd degree or 3rd degree) AVB may require interventional therapy, which typically includes placement of a permanent pacemaker. Some patients can be managed with medication. Patients that are symptomatic for AV block may have collapse, weakness, fainting or develop congestive heart failure from a chronic slow heart rate.



EKG of a dog with 3rd degree AV block.

Supraventricular Tachycardia

Supraventricular tachycardia (SVT) is a type of fast heart rate (tachycardia) that originates or is maintained in the receiving chambers of the heart (atria). This tissue is situated above the pumping chambers (ventricles), and thus tachycardias coming from this region are termed *supraventricular*. Rapid SVT may produce symptoms including excessive/inappropriate panting, shortness of breath, weakness or even collapse and/or fainting (syncope). Patients suffering from symptomatic SVT may respond to specific antiarrhythmic medications. Supraventricular tachycardia may occur in patients with or without structural heart disease.



EKG of a dog with paroxysmal supraventricular tachycardia.

Ventricular Tachycardia

Ventricular tachycardia (VT or "V-tach") is a serious arrhythmia that can become life-threatening. When a tachycardia comes from the pumping chambers of the heart (ventricles), it is known as a *ventricular* tachycardia. Most of the time, treatment with antiarrhythmic medication is indicated. Patients with severe, rapid VT are at increased risk for sudden cardiac death, so this arrhythmia can be life-threatening. Symptoms associated with VT may include excessive/inappropriate panting, shortness of breath, or even collapse and/or fainting (syncope). Patients may develop ventricular tachycardia with or without structural heart disease.



EKG of a dog with paroxysmal ventricular tachycardia.