



Is an ECG enough to appropriately diagnose and treat an arrhythmia?

by Janet Olson, DVM, DACVIM (Cardiology)

The diagnostic and therapeutic approach to an arrhythmia can be daunting at times. Moreover, basing a diagnosis and therapy on an ECG alone can potentially cause more harm than good. But no worries, let's break down the beat!

Important Diagnostic Tests

- 6 lead ECG
- Thoracic radiographs
- Echocardiogram
- Screening blood work
- +/- Abdominal ultrasound
- +/- Holter monitor

Why are multiple tests necessary?

Keep in mind that arrhythmias may be due to primary heart disease such as dilated cardiomyopathy (DCM) or arrhythmogenic right ventricular cardiomyopathy (ARVC) and that many of these patients may have poor contractile ability associated with their disease or may even be in heart failure >> important considerations in choosing a therapeutic approach - considerations that can not be ascertained by an ECG alone. Arrhythmias may also be due to non-cardiac disease such as toxins, electrolyte abnormalities (i.e. high potassium levels in a blocked cat), paraneoplastic syndromes (i.e. splenic hemangiosarcoma) or secondary to trauma or post surgical manipulation of the spleen (accelerated idioventricular rhythms).

Therapeutic Options:

- Treat the primary disorder if identified (i.e. hyperkalemia in a blocked cat)
- Anti-arrhythmic drugs (i.e. sotalol, atenolol, mexilitine, lidocaine, amiodarone, digoxin, diltiazem)
- Pacemaker

Which Option is right for my patient?

- If a primary, non-cardiac disease process is identified, the answer is easy >> treat it.
- If a patient is bradycardic with a high grade 2nd degree or 3rd degree AV block >> pacemaker is probably indicated, but infectious, toxic, inflammatory, neoplastic and immune etiologies must be ruled out
- If the arrhythmia is ventricular in origin, the chosen drugs are usually lidocaine (if used in a hospital setting), mexilitine (the oral equivalent of lidocaine for home use) or sotalol (the drug of choice for dogs with ARVC without systolic dysfunction).

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● If the arrhythmia is a tachycardia and supraventricular in origin, the chosen drugs are usually a B-Blocker (i.e. atenolol), Calcium Channel Blocker (i.e. diltiazem) or Digoxin****.

****But CHOOSE WISELY as they are not the same. Did you know that B-Blockers and Calcium Channel Blockers decrease the heart's contractile ability, but Digoxin actually helps increase it? Choosing the wrong drug for your patient's condition could be very harmful.

So keep in mind, similar arrhythmias can have very different etiologies which require differing therapeutic approaches. An ECG is only a small piece of the diagnostic puzzle. and provides little, if any information regarding the heart's myocardial structure or function. Therefore, next time you hear an irregular rhythm, don't miss a beat and be sure to offer your client all the important diagnostic tools necessary to best assess and treat their pet.

Important Diagnostic Tests

- 6 lead ECG: to identify the rhythm
- Thoracic radiographs: to look for cardiac remodeling and rule out heart failure
- Echocardiogram: to evaluate for structural, functional or infiltrative myocardial heart disease
- Screening blood work: to rule out electrolyte abnormalities
- +/- Abdominal ultrasound: to rule out other non-cardiac causes if a cardiac cause is not evident or radiographs or echocardiography
- +/- Holter monitor: to catch the elusive arrhythmia or to evaluate response to therapy

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