Introduction
BVNS recently held an Anesthesia Symposium for our support staff. One session focused on exploring and identifying arrhythmias that originated from the ventricles and the atria. Understanding cardiology can provide the anesthetist with the ability to trouble shoot and treat various problems. Knowing when and how to treat a bradycardia versus a tachycardia can ensure a smooth anesthetic event.

Origin of the Heartbeat
Understanding the origin of the heartbeat can help the anesthetist know when and how to identify a potential problem. An ECG complex consists of a PQRST complex. The sinoatrial node (SA) is the pacemaker of the heart and produces the P wave. The QRS wave is produced by the atrioventricular node (AV). The P wave in an ECG complex indicates atrial depolarization. The QRS is responsible for ventricular depolarization and the T wave is ventricular repolarization.

If a P wave is absent there is a lack of atrial depolarization. This is also known as atrial standstill. P waves that are combined in the QRS complexes are indicative of ventricular tachycardia or a junctional tachycardia. Present P waves that are without a QRS are indicative of an atrial depolarization that has not been conducted through the AV node. A QRS complex without a P wave demonstrates premature or escape beats.

Essentials
Arrhythmias can be identified with ease if several essentials are in place. ECG leads should be placed correctly:

- **WHITE** – Right forelimb
- **BLACK** – Left forelimb
- **GREEN** – Right hind limb
- **RED** – Left hind limb

Determining the paper speed (25mm/sec vs 50mm/sec) will also help the anesthetist determine if a bradycardia or tachycardia is present.
**ECG Interpretation**

Furthermore, using a set of criteria can assist the anesthetist in determining the type of arrhythmia present. The following questions can identify a sinus rhythm versus a supraventricular rhythm:

- *Is there a P wave present?*
- *Is there a P wave for every QRS, and a QRS for every P wave?*
- *What is the relationship between the P waves and QRS complexes?*
- *What is the shape of the QRS complexes? Are they narrow or wide and bizarre?*
- *Is the rhythm regular or irregular?*
- *Are the complexes the same?*
- *Is bradycardia or tachycardia present?*

After assessing the ECG by answering these questions, it should be possible to identify the rhythm or rhythms. The waveforms should be measured in detail, selecting sinus complexes from a lead II recording.

**Sinus rhythms**  
(rhythms originating from the sinoatrial node)

**Categorized by:**

Normal P waves, normal QRS complexes
- Regular sinus rhythm
- Sinus arrhythmia
- Sinus tachycardia
- Sinus bradycardia

**Supraventricular rhythms**  
(rhythms not originating from the sinoatrial node, but from above the ventricles)

**Categorized by:**

Abnormal or absent P waves, normal QRS complexes
- Atrial premature complexes
- Atrial tachycardia
- Supraventricular tachycardia
- Atrial fibrillation

**Ventricular rhythms**  
(rhythms originating from the ventricles)

**Categorized by:**

Wide and bizarre QRS complexes
- Ventricular premature complexes
- Ventricular tachycardia
- Ventricular fibrillation
- Ventricular escape complexes

**Conclusion**

A systematic approach to ECG understanding assists the anesthetist in identification and treatment of arrhythmias. An understanding of the difference between an atrial arrhythmia and a ventricular arrhythmia changes the treatment and potential outcome. Utilizing the criteria, an anesthetist can differentiate arrhythmias that originate in the atrium versus arrhythmias that originate in the ventricles.

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- Faxed Referral Letter (with call to confirm receipt).
- Desire to discuss any case, whether it is a referred case or a consultation.
- Dedication to provide superior service to you and your clients.

For more information on services offered, please visit us at [www.bvns.net](http://www.bvns.net).

Appointments available. Call now to schedule.

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**REFERENCES**


Lehman, S. (2015, 3). Personal Interview with Heather Carter