

# Perioperative Monitoring of Heart Rate and Rhythm

Mark A. Oyama, DVM

## KEYWORDS

• Arrhythmia • Antiarrhythmics • Electrocardiography

## KEY POINTS

- When assessing perioperative arrhythmias, it is important to obtain an accurate electrocardiographic diagnosis, assess patient hemodynamic status during the arrhythmia, and determine whether underlying primary cardiac disease is present.
- The decision on whether to treat a specific arrhythmia should be based on the presence or absence of hemodynamic signs and risk of sudden death.
- If antiarrhythmic therapy is deemed necessary, consider the likely mechanisms of arrhythmia, address transient imbalances that contribute to arrhythmia formation, and select antiarrhythmic agents based on mechanism of action and arrhythmia diagnosis.
- Whether or not treatment is initiated, continuous and careful monitoring of electrocardiogram rhythm and hemodynamics is advisable.

## NATURE OF THE PROBLEM

### *Introduction*

Disorders of heart rate and rhythms in the perioperative period are common and can occur in animals with or without underlying primary cardiac or conduction system disease. Primary cardiac diseases that are associated with high baseline risk for clinically important arrhythmias include myocardial diseases such as hypertrophic, dilated, and arrhythmogenic cardiomyopathy; pericardial disorders; conduction system diseases such as sick sinus syndrome or atrioventricular (AV) nodal block; and, to a lesser extent, myxomatous mitral valve disease. Observational studies reveal that perioperative arrhythmias are commonly encountered in noncardiac conditions (**Box 1**) such as gastric dilatation-volvulus (GDV), hemoabdomen, and splenic mass, wherein the incidence of ventricular arrhythmias is 50.6% to 77.4%,<sup>1,2</sup> 32%,<sup>3</sup> and 28.4%,<sup>4</sup> respectively. Some of these studies indicate that the presence of perioperative arrhythmias is associated with an increase in mortality,<sup>3,4</sup> whereas others do not.<sup>1</sup> Although these observational studies provide evidence that perioperative arrhythmias are a common

---

Disclosure: The author has nothing to disclose.

Department of Clinical Studies-Philadelphia, Ryan Veterinary Hospital, University of Pennsylvania, 3900 Delancey Street, Philadelphia, PA 19104, USA

E-mail address: [maoyama@vet.upenn.edu](mailto:maoyama@vet.upenn.edu)

Vet Clin Small Anim ■ (2015) ■-■

<http://dx.doi.org/10.1016/j.cvsm.2015.04.002>

[vetsmall.theclinics.com](http://vetsmall.theclinics.com)

0195-5616/15/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

**Box 1****Diseases commonly associated with perioperative arrhythmias**

- Splenic or hepatic masses or neoplasia
- Gastric dilatation and volvulus
- Pericardial disease requiring pericardiectomy
- Pulmonary disease requiring lung lobectomy
- Pulmonic stenosis undergoing balloon valvuloplasty

clinical occurrence, they are unable to indicate whether intervention to suppress these arrhythmias improves outcome. In one retrospective study of dogs undergoing surgery for GDV, prophylactic perioperative lidocaine administration was not associated with reduced mortality.<sup>5</sup> Important aspects of the problem include the following:

- Perioperative cardiac arrhythmias are common.
- Their effect on morbidity and mortality is largely unknown.
- The benefit in treating or not treating perioperative arrhythmias is likely influenced by many different factors including the following:
  - Presence or absence of underlying primary cardiac disease
  - Presence or absence of underlying extracardiac disease
  - Nature of the cardiac arrhythmia (eg, rhythm, rate, frequency)
  - Presence or absence of aggravating factors or transient physiologic imbalances (discussed later)
- The precise effect of these and other factors in overall survival is unknown, which makes decision making around when and what to treat extremely difficult.

***Mechanisms of Arrhythmia Formation***

Arrhythmias arise from disorders of impulse formation or conduction (**Box 2**). Injury to cardiac tissue and arrhythmogenesis can occur from a variety of insults, including ischemia, fibrosis, inflammation, necrosis, or oxidative stress. In many patients with perioperative arrhythmias, the exact nature of the cardiac injury is unknown. Careful inspection of the electrocardiogram (ECG) and cardiac blood tests such as cardiac

**Box 2****Mechanisms of arrhythmogenesis and examples of commonly associated arrhythmias**

- Disorders of impulse formation
  - Enhanced or suppressed normal automaticity: examples include sinus bradycardia, sinus arrest, sinus tachycardia, accelerated junctional or ventricular escape rhythms.
  - Abnormal automaticity: examples include supraventricular or ventricular premature beats or tachycardia.
  - Triggered activity (early or late afterdepolarizations): examples include supraventricular or ventricular premature beats or tachycardia.
- Disorders of impulse conduction
  - Bundle branch blocks: examples include right or left bundle branch block, which do not require treatment in the absence of other arrhythmias or ECG abnormalities.
  - Reentry circuits: examples include supraventricular or ventricular premature beats or tachycardia.

Download English Version:

<https://daneshyari.com/en/article/2460104>

Download Persian Version:

<https://daneshyari.com/article/2460104>

[Daneshyari.com](https://daneshyari.com)