**ECG PUZZLER**

A regular feature of the *American Journal of Critical Care*, the ECG Puzzler addresses ECG interpretation for clinical practice. We welcome letters to the Editors regarding this feature.

---

**Rhythmic Premature Ventricular Contractions**

Mary G. (Adams) Carey, RN, PhD, and Michele M. Pelter, RN, PhD. From the School of Nursing at State University of New York at Buffalo (MGA), and the Washoe Health System and the School of Nursing, University of Nevada, Reno, NV (MMP).

*Scenario:* This is a bedside ECG strip of lead I and the accompanying arterial waveform in a 24-year-old female trauma patient. She presented 24 hours earlier to the emergency department after an all-terrain vehicle accident in which she sustained multiple injuries to her head, neck, torso, abdomen, and limbs.

---

For every ECG, we recommend you systematically examine the following 9 features (check all that apply):

1. **Rate**
   - Normal (60-90 beats per minute)
   - Bradycardia (<60 beats per minute)
   - Tachycardia (>90 beats per minute)

2. **Rhythm**
   - Regular
   - Irregular

3. **P waves**
   - One P wave for every QRS complex
   - Fewer P waves than QRS complexes
   - More P waves than QRS complexes

4. **PR interval**
   - Normal (≤0.20 seconds)
   - Short (<0.08 seconds)
   - Lengthened (>0.20 seconds)

5. **QRS complex duration**
   - Normal (≤0.12 seconds)
   - Wide (>0.12 seconds)

6. **QRS complex direction lead V1**
   - Negative and ≤0.12 seconds (normal)
   - Negative and >0.12 seconds (left bundle branch block)
   - Not applicable

7. **ST segments**
   - Normal
   - Elevated (>2 mm)
   - Depressed (>2 mm)

8. **T Wave**
   - Normal
   - Inverted

9. **QTc**
   - Normal
   - Lengthened (>0.47 seconds)
Interpretation: Sinus rhythm, with bigeminal premature ventricular contractions (PVCs), and a ventricular couplet.

Rationale
The underlying rhythm is sinus with distinct P waves that initiate a normal QRS followed by a premature QRS complex that is ≥0.12 seconds in duration and not preceded by a premature P wave (as seen in the first sinus beats). The wide, premature QRS complexes are PVCs and because there is a sustained pattern of 2, the rhythm is called ventricular bigeminy. A ventricular couplet, seen after the fifth sinus beat, is the presence of 2 consecutive PVCs. In this case, all of the QRS complexes have a similar morphology, thus they are referred to as monomorphic PVCs. If there were different QRS morphologies, they would be termed polymorphic PVCs. Upon careful evaluation of the arterial waveform, it is easy to appreciate that the premature ventricular contractions have a diminished waveform due to the shortened filling time in the ventricles; this is especially true in the case of the second beat of the couplet. Of note, evaluation of the compensatory pauses is difficult in the absence of 2 normal consecutive sinus cycles.

Nursing Actions
As with most critically injured patients, this patient was intubated and sedated, and thus not able to report symptoms. However, there were no signs of compromised hemodynamic status as seen by her overall heart rate and blood pressure. Given the extent of the patient’s injuries, there could be numerous reasons for her cardiac dysrhythmias, including electrolyte imbalance, cerebral injury, or cardiac contusions. Nursing considerations include monitoring the patient for hemodynamic instability. Although this rhythm is not likely to degenerate into a sustained ventricular arrhythmia requiring immediate intervention, diligent continuous cardiac monitoring should be maintained.
Rhythmic Premature Ventricular Contractions
Mary G. (Adams) Carey and Michele M. Pelter

Am J Crit Care 2005;14 441-442
Copyright © 2005 by the American Association of Critical-Care Nurses
Published online http://ajcc.aacnjournals.org/

Personal use only. For copyright permission information:
http://ajcc.aacnjournals.org/cgi/external_ref?link_type=PERMISSIONDIRECT