

# ECG of the Month



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## Timing Isn't Everything!

Below is the ECG of a 61-year-old man with palpitations.

*What is the diagnosis?*

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## This Month's ECG Diagnosis

This ECG shows sinus rhythm with normal intervals and a rhythm which is interrupted by premature wide complex beats of left bundle branch block (LBBB) morphology. The pause following the LBBB beats is variable in duration. The question arises as to whether these premature beats are aberrantly conducted premature atrial contractions (PACs) or premature ventricular contractions (PVCs).

Close inspection of the ECG reveals P waves prior to the wide complex beats. These are best seen in the T wave of the prior beat in  $V_1$ . The PR interval of the premature atrial beat is prolonged in keeping with the normal decremental conduction properties of the atrioventricular node.

The standard teaching in differentiating PVCs from PACs is that PVCs are generally followed by a fully compensatory pause in which the subsequent sinus beat falls on time. PACs, on the other hand, are said to reset the sinus node such that the pause following the premature beat is

only partially compensatory. Although this standard teaching is often true, other factors can often be confounding. For instance, a PVC that conducts retrogradely to the atrium may reset the sinus node. Conversely, a PAC that occurs early enough, and which is unable to enter the sinus node, may not reset the subsequent sinus beat. Furthermore, sinus arrhythmia may make the timing of the compensatory pause difficult to interpret. In this case, there is marked sinus arrhythmia and the pause following the PAC is highly variable.

Thus, the differentiation of atrial versus ventricular ectopy should not be made on the timing of the subsequent beat alone, but must include the search for the P wave. The P wave is often found, as in this case, by a careful search of the previous ST segment and T wave. 