EKG of the week 08/01/11: 14 yo female presents with 3 months of intermittent palpitations.

1. What is the rate and the rhythm on the baseline ECG?
2. She presents to ED with following rhythm strip (figure 2), she feels unwell and vagal maneuvers fail to terminate her arrhythmia. How does adenosine work (i.e. what is its mechanism of action)?
3. Based on her rhythm in figure 2, could this be ventricular tachycardia? Why or why not?

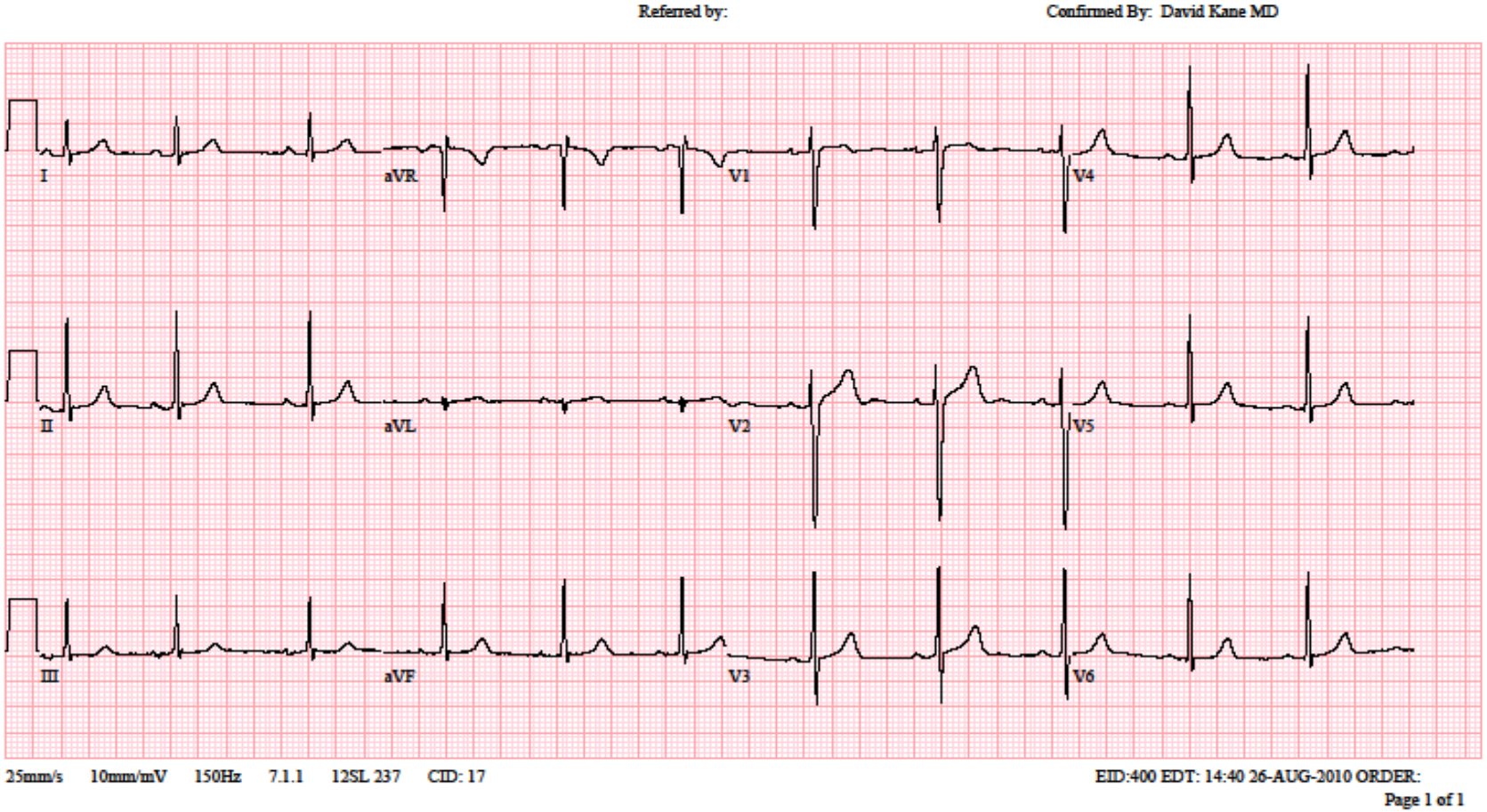
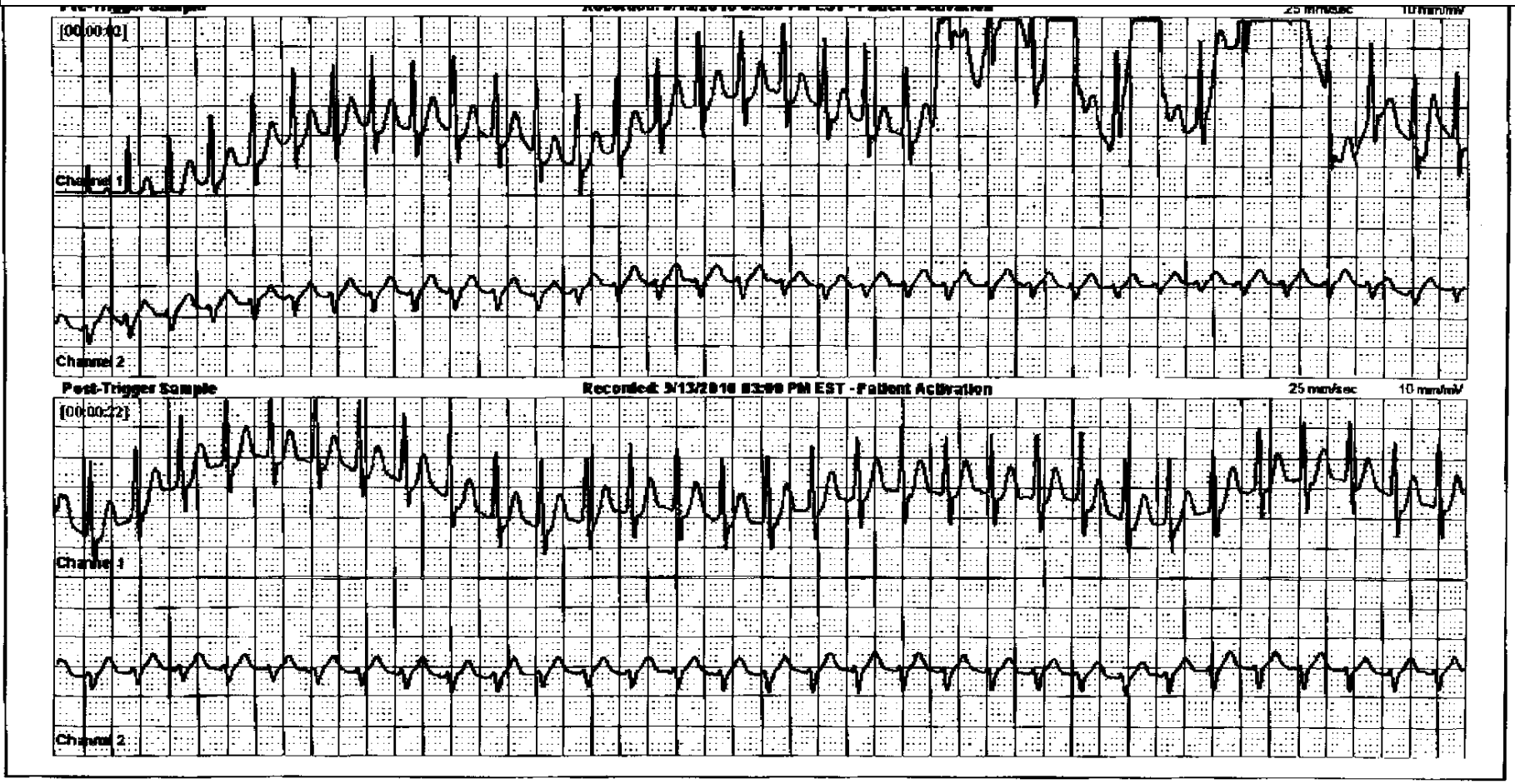



Figure 1. Baseline ECG.

Figure 2. ED Rhythm Strip



# EKG of the Week 8/1/11 Answers

1. What is the rate and the rhythm on the baseline ECG?

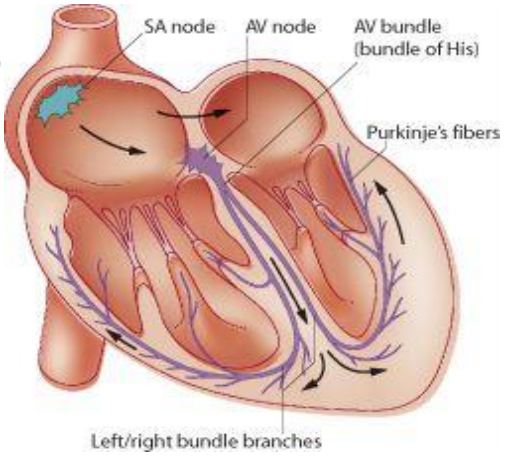
   The rate is 60 bpm. It is normal sinus rhythm. (P before every QRS and a normal P wave axis!)

2. She presents to ED with following rhythm strip, she feels unwell and vagal maneuvers fail to terminate her arrhythmia. How does adenosine work (i.e. what is its mechanism of action)?

   Adenosine works by transiently blocking conduction through the AV node. Therefore, in reentrant supraventricular tachycardia that involves the AV node either orthodromic (down the AV node) or antidromic (up the AV node), AV nodal block terminates the tachycardia by interrupting the circuit. Always remember to have your defibrillator nearby when administering adenosine, in the rare case that atrial fibrillation could be transmitted down an accessory pathway leading to ventricular fibrillation.

3. Based on her rhythm in figure 2, could this be ventricular tachycardia? Why or why not?

   This could not be ventricular tachycardia. One of the first determinations that needs to be made when dealing with tachyarrhythmias is whether the rhythm is a "narrow-complex" or a "wide-complex" tachycardia. Clearly, in figure 2, this is a narrow complex tachyarrhythmia. When you see a narrow QRS complex either in brady or tachyarrhythmias, it means that there is activation of the "His-Purkinje" system. This allows for rapid conduction down the left and right bundles, resulting in a narrow QRS complex. In the setting of a tachyarrhythmia, a narrow complex tachycardia ensures that it is supraventricular in nature. A wide complex tachyarrhythmia suggests that the rhythm disturbance is either (1) originating from the ventricular myocardium (i.e. VT), (2) there is aberrancy, which is when a supraventricular electrical impulse is abnormally conducted through the ventricular conduction system, or (3) there is an underlying bundle branch block.




***A wide complex tachyarrhythmia should always be treated at Ventricular Tachycardia until proven otherwise.***