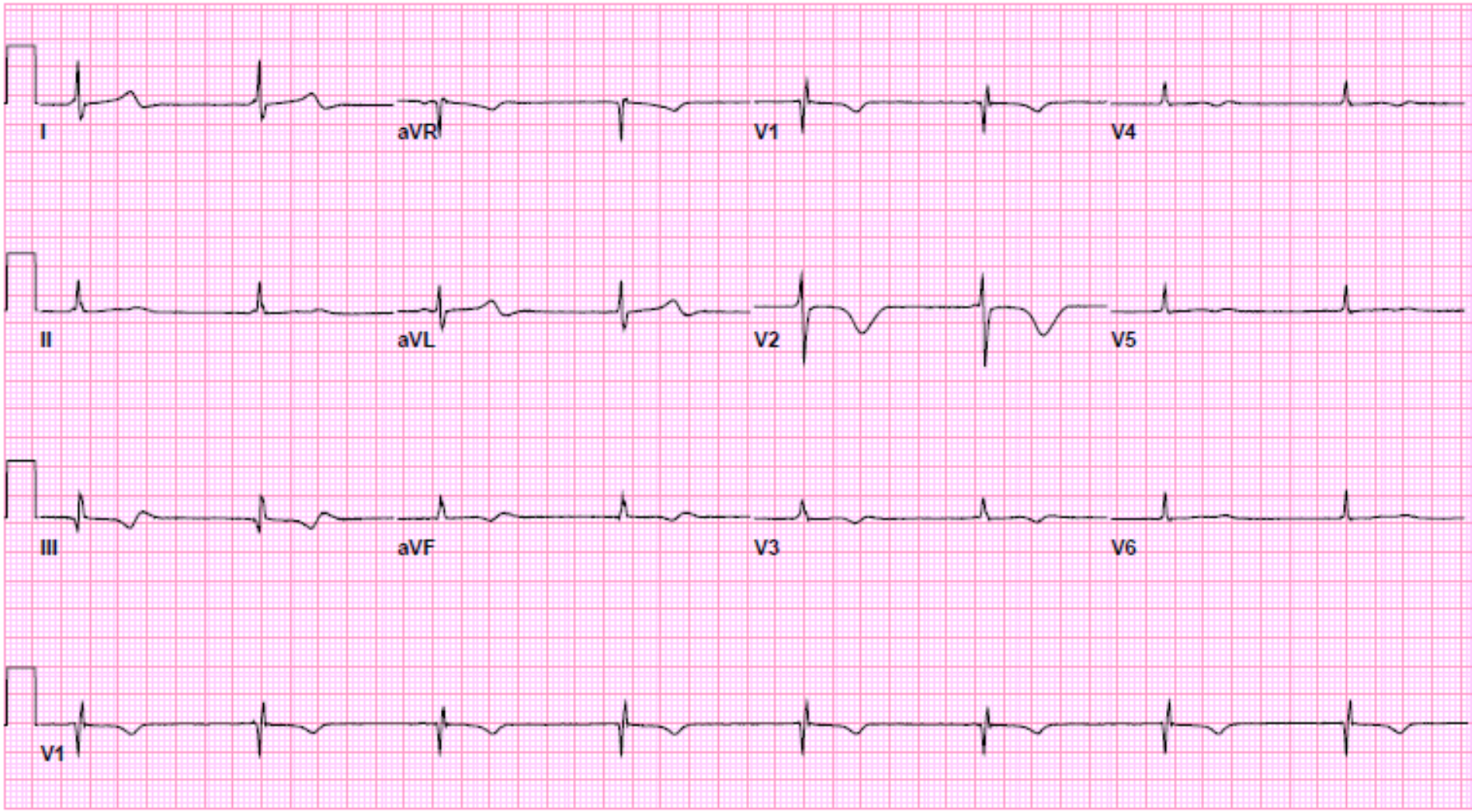
This is an ECG on an 18 year old with a history of a ventricular septal defect that is status post surgical closure during infancy. She was admitted with pneumonia, but an ECG was obtained when she was found to be bradycardic. She is hemodynamically stable.

1) What is the rhythm (1 point)?
2) Besides the rhythm, are there any other abnormalities on this ECG (1 point)?
3) What would you do for this patient (1 point)?



Here is the solution to the ECG of the week for 5/3/10:

1) What is the rhythm (1 point)?

The rhythm is a junctional escape rhythm. A "junctional" rhythm is one that originates from the AV node. In other words, rather than the sinus node acting as the pacemaker for the heart, the AV node has taken over this role. We know this is a junctional rhythm because we see a narrow QRS (thus ventricles are depolarized via the his-Purkinje system), but no evidence of P waves associated with the QRS complexes. This can occur for 2 reasons: first, if the sinus rate is sufficiently slow, the natural automaticity of the AV node may surpass the automaticity of the sinus node--this is known as a "junctional escape rhythm". Remember that all cardiac cells have intrinsic automaticity, it's just that the sinus node tends to depolarize on a much more frequent basis than the other cells because of the way they are designed. The other reason the AV node can take over the rhythm is if the AV automaticity is sufficiently elevated, so the AV node is depolarizing more frequently than the sinus node. This is known as an "accelerated junctional rhythm". In this ECG of the week, I see no evidence of P waves. This implies a very low sinus rate, and this ECG therefore shows a junctional escape rhythm.

2) Besides the rhythm, are there any other abnormalities on this ECG (1 point)?

This ECG has a prolonged QTc and diffusely flattened T waves. Both are rather non-specific but could be consistent with myocardial disease (e.g. cardiomyopathy), drug effect, or electrolyte imbalance. Based on the quality of the ECG that was sent out, you may have noticed what appears to be a qR pattern in lead V1 which would be suggestive of RVH. Looking at a high-definition copy of the ECG, there is a tiny r wave so in reality an rSR' pattern is present, and this is a likely normal variant.

3) What would you do for this patient (1 point)?

If the patient is hemodynamically stable, don't do anything! Bradycardia won't kill you unless your cardiac output is compromised, and there will be other signs of that before you get into trouble. One could consider obtaining a 24-Hour Holter monitor or observe the patient in hospital on telemetry to ensure that the patient isn't having any long pauses in rhythm or other potentially dangerous arrhythmias that rear their heads with such a slow sinus rate.