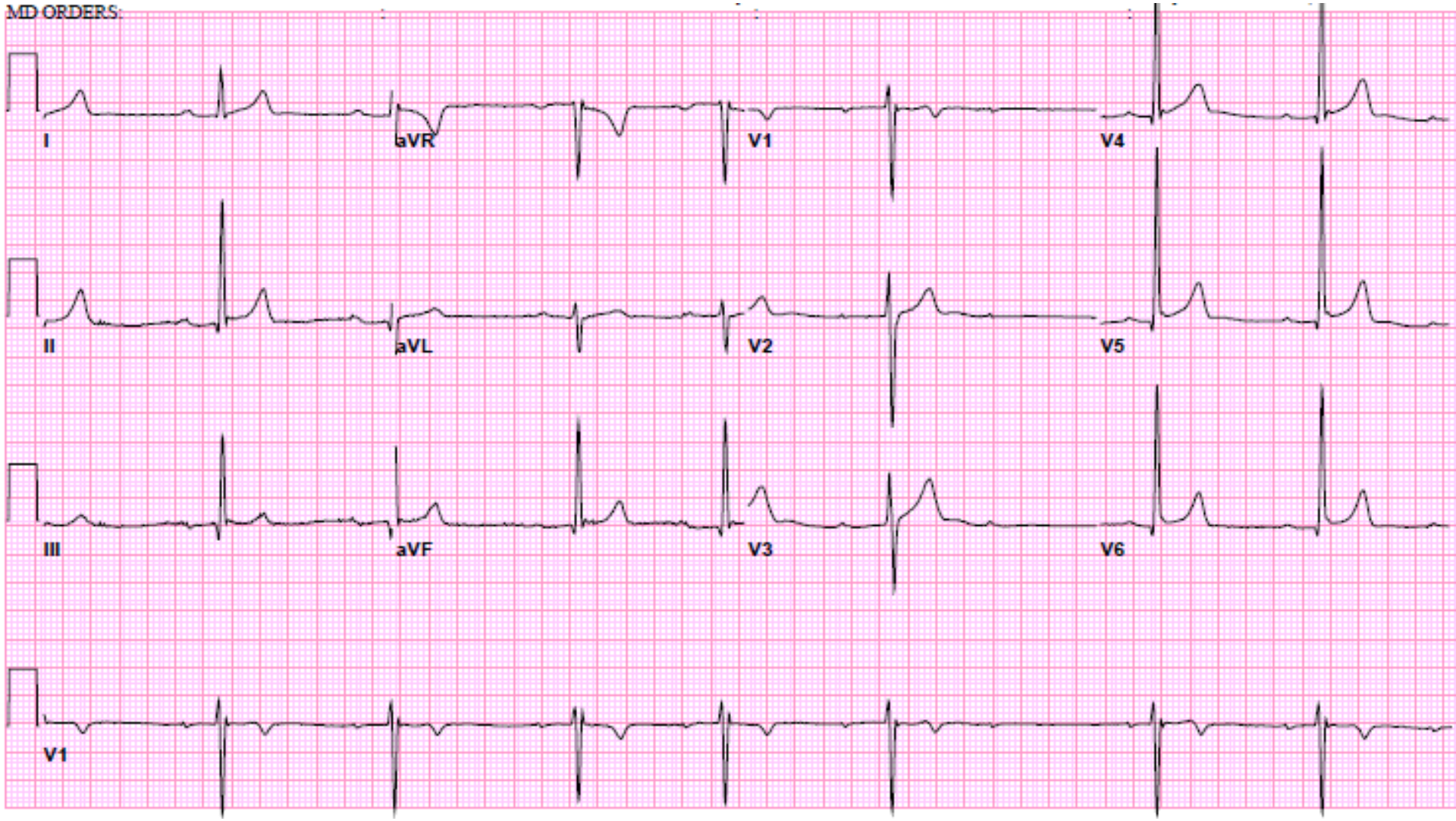
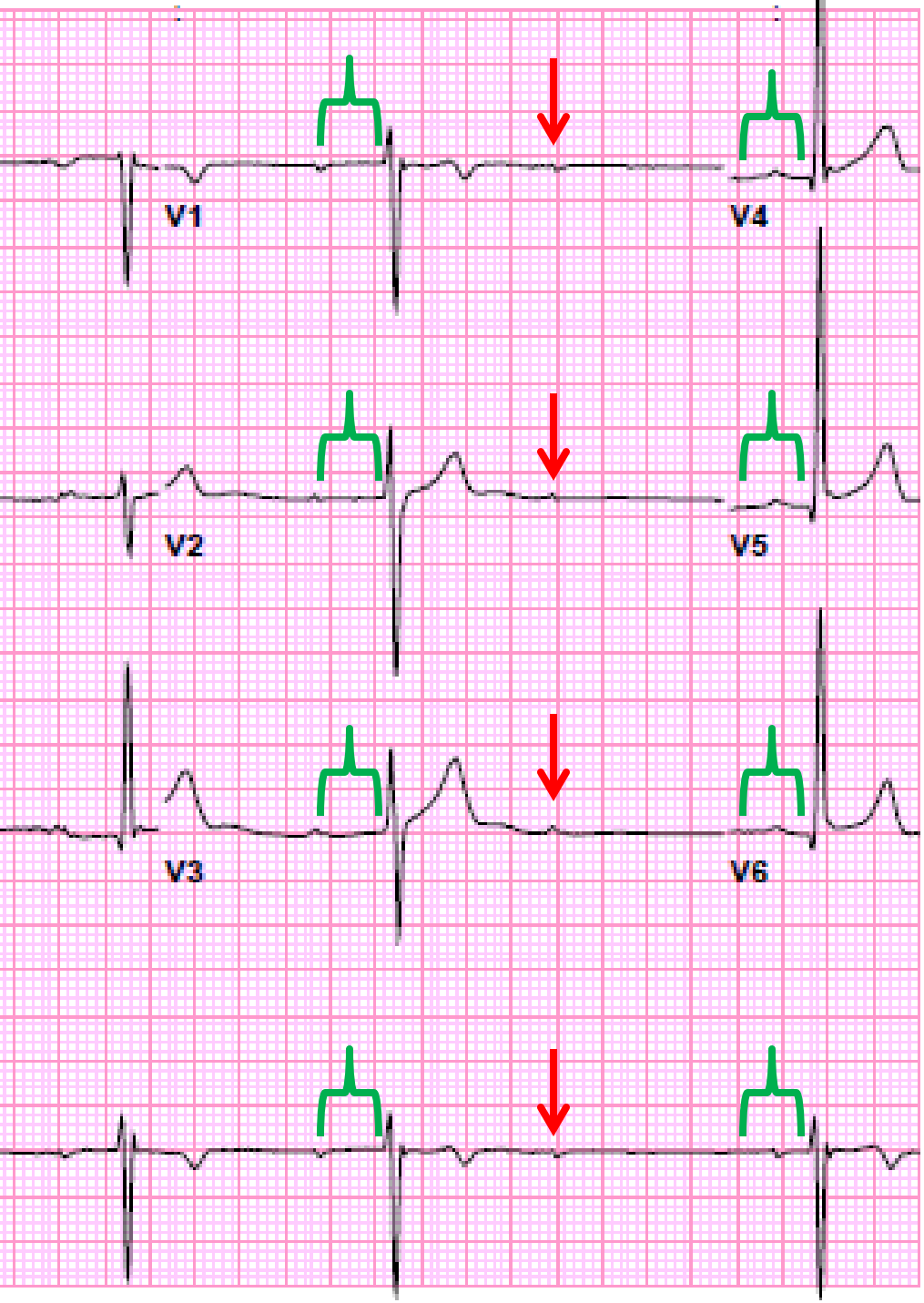
You are seeing a 16 year old male in your clinic with a chief complaint of a fainting episode. He got up quickly from a seated position after competing in a cross-country race in 90 degree weather, felt very dizzy and passed out. He quickly regained consciousness and now comes to see you. On exam, he has an athletic build, and his cardiac exam shows a bradycardic rate with a slightly irregular rhythm. His ECG is shown below.

1) What is the rate and QRS axis?
2) What is the name for this rhythm (it may help to expand the slide to full screen)?
3) Is any other workup necessary given this patient's history?





1) The heart rate is about 42 beats per minute (7 beats over a 10 second period of time). The QRS axis is normal (upright in leads I and aVF), about 70 degrees.

2) The rhythm is sinus rhythm with second degree heart block, more specifically Wenckebach or "Mobitz I" second degree heart block. You can tell because of the "dropped" sinus beat (red arrows), in conjunction with a PR interval that gets progressively longer prior to the dropped beat. Also note that after the blocked sinus beat, the PR interval shortens considerably (green brackets measure the PR interval prior to the dropped beat, which is way longer than the next PR interval measured), typical of Wenckebach. This is a very common phenomenon, particularly during sleep or in well-trained athletes who have high resting vagal tone.

3) While the patient's story is very consistent with vasovagal syncope, one might consider getting a Holter monitor or an exercise test. The Holter would be to look for any higher-grade AV block that could result in syncope, and the exercise test would ensure the AV block goes away at higher heart rates, which it should. Some people would argue that this is so common that no other testing is necessary, however, and this is a reasonable point of view in a patient with no prior history who is not fainting frequently.