

A Matter of Degree

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A 58-year-old man is found to have a slow pulse rate during a routine periodic health assessment by his primary care physician. He gives no history of cardiac problems and denies symptoms such as dizziness, light-headedness or syncope. He is not taking any medications. His ECG is shown (Figure 1).

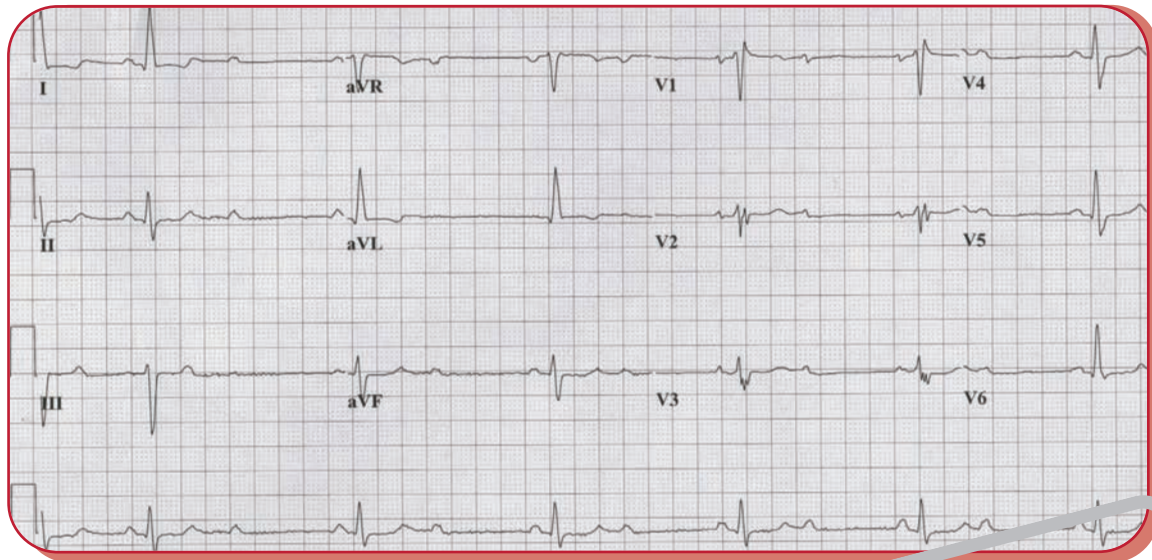


Figure 1. ECG on presentation.

1. What is his cardiac rhythm?

2. What action is required?

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ECG


of the Month

ECG Diagnosis

1. His ECG shows sinus rhythm; the ventricular rate is 40 bpm. A sinus bradycardia of 40 bpm would not be unusual or a cause for concern in a young or athletic individual, but the atrial rate in this patient is 80 bpm. He is in 2:1 second-degree heart block, with a non-conducted P wave occurring shortly after each T wave. The QRS duration is within normal limits, although an incomplete right bundle branch block pattern is present. It is not possible to determine with

confidence whether the level of block is within the AV node, or distally in the His-Purkinje system. A normal QRS duration is usually an indicator of block at the AV node level; this patient's QRS is not completely normal. The accurate determination of the site of the block is important, because heart block within the His-Purkinje system is an indication for pacemaker implantation, even in the absence of symptoms.

2. The patient is referred to a cardiologist, who performs carotid sinus massage as part of his assessment of the patient. Second-degree heart block at the AV node level may worsen transiently during carotid massage, while His-Purkinje system block will persist unchanged, or even appear to improve if the sinus rate slows sufficiently. In this patient there was no response to carotid sinus massage. A 24-hour Holter monitor recording was arranged.

Several episodes of asymptomatic high-grade second-degree block (Figure 2a) and occasional episodes of third-degree heart block were recorded (Figure 2b). During third-degree block there is an idioventricular escape rhythm at 30 bpm confirming that in this patient, the conduction disturbance lies within the His-Purkinje system. A permanent pacemaker was implanted uneventfully. 

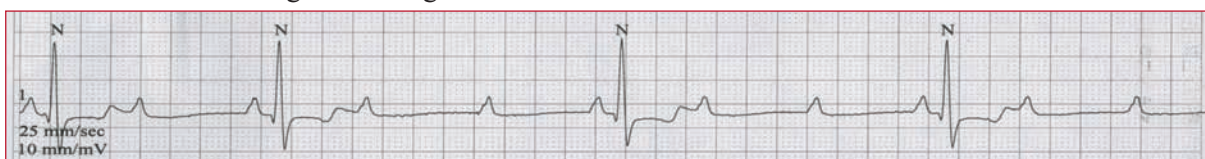




Figure 2a: Several episodes of asymptomatic high-grade second-degree block.



Figure 2b: Occasional episodes of third-degree heart block.




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