



University of
Ottawa Heart Institute

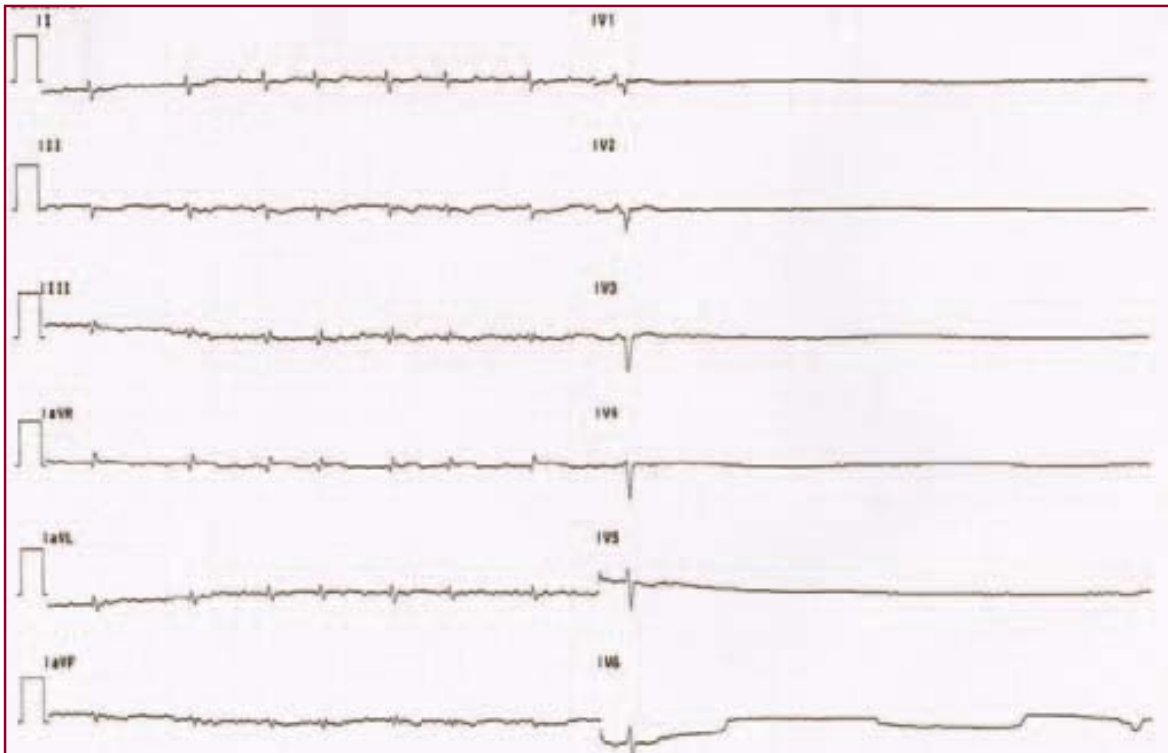
ECG of the Month

Prepared by Martin S. Green, MD, FRCPC

Ups and Downs

A 91-year-old woman presents with palpitations and syncope.

What is the diagnosis? _____





University of
Ottawa Heart Institute

ECG of the Month

This Month's ECG Diagnosis

This ECG shows a uniquely irregular rhythm. There are no distinct P waves. There is fine undulation of the baseline. The QRS's are of low voltage and there is poor R wave progression in the one beat seen in the precordial leads following termination of the atrial rhythm; there is a long pause with neither atrial nor ventricular activation.

The initial portion of the ECG demonstrates atrial fibrillation with a rapid ventricular response at a rate of about 110 beats per minute. The poor R wave progression in the precordial leads could be due to anterior infarction, but could be due to a variant of right ventricular enlargement. The diagnosis of right ventricular hypertrophy is supported by the presence of S waves in leads I, II and III. There are prominent S waves seen in V5 and V6.

Following termination of atrial fibrillation, the ECG documents a sinus pause of at least six seconds in duration. A significant proportion of patients with atrial fibrillation have significant sinus node dysfunction. A rapid atrial rhythm suppresses sinus node function by the mechanism of overdrive suppression, and with the termination of these atrial arrhythmias, there is a pause before recovery of sinus node function. Pauses in excess of several seconds are clearly abnormal and pauses as long as the

one documented on the ECG often are associated with symptoms. Patients may be symptomatic due to the pauses that occur with termination of the arrhythmia.

While the term "sick sinus syndrome" is commonly applied to these findings, the pause is a result of failed pacemaker activity, not just in the sinus node but in other atrial sites. Sites include: the AV node, and pacemaker sites residing within the His-Purkinje system. In such patients, it is, therefore, more correct to refer to a failure of pacemaker activity within a large part of the cardiac electrical system, rather than purely a failure of sinus node function.

A proportion of patients with sick sinus syndrome are not only troubled by atrial arrhythmias but bradycardia. These patients may have a blunted chronotropic response and fail to elevate sinus rates appropriately in response to exercise and other stimuli. Patients are labelled as having features of the "tachycardia/bradycardia" syndrome although this certainly does not include all such patients.

This particular patient underwent implantation of a VVIR pacemaker for management of her pauses and will require long-term anticoagulation with warfarin for effective stroke prophylaxis. 