

## Science commentary: Pacemakers

Cardiac pacing began in the 1950s with the aim of preventing symptomatic bradycardia. Single chamber pacemakers, in which one lead is introduced into the ventricle, achieve this but they cannot increase the heart rate when people take exercise. They also fail to ensure that the atria and ventricles contract in synchrony.

Modern pacemakers now include dual chamber and "rate responsive" devices. With dual chamber pacemakers, leads enter the right atrium and ventricle, allowing both atrium and ventricle to be paced and sensed. If the sinus node is working dual chamber pacing enables atrial activity to be tracked by the ventricle. If the sinus node is diseased extrinsic sensors can supply additional information to decide an appropriate pacing rate. This means that when patient demand goes up, the pacemaker responds accordingly.

For example, some pacemakers contain a piezoelectric crystal to detect motion. When the crystal vibrates—in response to body activity—it produces a tiny voltage which feeds into the circuit, triggering an increase in pacing rate. Other sensors detect the release of catecholamines due to exercise or emotion. Catecholamines shorten the QT interval on the electrocardiograph, which can be monitored easily by

the device. Other sensors can detect respiratory rate and acceleration.

Many devices also include safety features to avoid inappropriate rate rises. Some rely on a number of sensors as a cross checking mechanism. These can detect the difference between false positive movements caused, for example, by external motion around a person sitting in a train and true movements caused by walking or running.

Other pacemakers include mode switching devices which are designed to detect atrial arrhythmias. These can distinguish the onset of paroxysmal atrial fibrillation from the sudden onset of exercise and will reset the ventricular rate to a non-tracking mode of 70 beats per minute during the period of the arrhythmia.

The average age of patients receiving pacemakers in Britain is 73. Younger patients are likely to get more sophisticated devices. Several multicentre trials have been set up to establish the best policy, including the UKPACE trial which will assess the clinical impact and the cost utility (the value of quality of life benefits) of dual chamber pacing in elderly patients with heart block.

Abi Berger, *science editor, BMJ*

## Rapid resolution of symptoms and signs of intracerebral haemorrhage: case reports

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Although intracerebral haemorrhage causes prolonged or permanent focal neurological dysfunction, neurological deficits<sup>1</sup> and lesions<sup>2</sup> may sometimes resolve within a few days. To my knowledge no one has reported resolution of the symptoms and signs of intracerebral haemorrhage within 24 hours, although the possibility has been recognised.<sup>3</sup> Intracerebral haemorrhage is therefore not considered to be a cause of transient focal neurological attacks and is not included in the differential diagnosis of transient ischaemic attacks.<sup>4</sup> Clinicians tend to diagnose transient ischaemic attacks on symptoms alone and to start antiplatelet drug treatment pending the results of computed tomography. This is particularly the case in developing countries where computed tomography is scarce. I report two cases of intracerebral haemorrhage in which the focal neurological symptoms and signs resolved within 24 hours.

### Case reports

*Case 1*—A 58 year old woman awoke one night with a numbness and weakness of her left arm and leg. By the morning these had slightly improved. Her doctor diagnosed a transient ischaemic attack. She started aspirin treatment and was advised to see a specialist. By

evening she was admitted to hospital. On examination her symptoms had resolved completely and she did not have weakness or sensory impairment. A computed tomogram showed a small intracerebral haemorrhage in the region of the putamen (figure a).

*Case 2*—A 65 year old man was admitted 2 hours after he had developed a headache, weakness of the left arm and leg, deviation of the mouth, and slurring of speech. He had a history of hypertension and had been drinking alcohol excessively during the 2 weeks before admission. His blood pressure was 190/100 mm Hg—he had recently stopped taking antihypertensive drugs. He had a mild facial weakness and weakness of the left arm and leg. He was unable to use his left hand to button his shirt, and he dragged his leg when walking. He did not have sensory impairment or a hemianopia. A computed tomogram showed a small intracerebral haemorrhage in the region of the putamen (figure b). The next morning he was symptom free and did not have any weakness on testing.

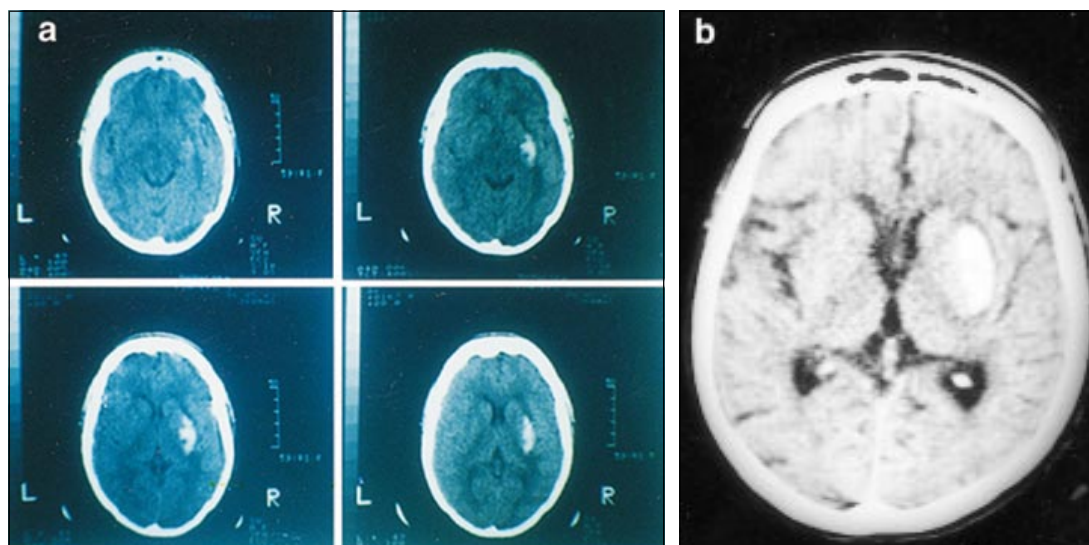
### Comment

The possibility that symptoms and signs of small intracerebral haemorrhages can resolve within 24

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Computed tomograms showing putamen haemorrhage in case 1 (a) and case 2 (b)

hours has been recognised.<sup>3</sup> Although rare, clinicians should be aware that an intracerebral haemorrhage may cause a transient neurological deficit. To start antiplatelet drugs before having the results of computed tomography may be illogical in such cases although I know of no reports of patients with intracerebral haemorrhage becoming worse clinically after receiving aspirin. A computed tomogram should, however, be mandatory before starting anticoagulant treatment in any patient with features of transient ischaemic attack. It is also rational management to arrange computed tomography early in patients who have started antiplatelet treatment as features of an intracerebral haemorrhage may not be apparent on a late scan. Thus if patients with transient focal neurological symptoms are to be treated appropriately

they should have computed tomography soon after the onset of symptoms.

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## Admission for depression among men in Scotland, 1980-95: retrospective study

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It has been reported consistently that women have higher rates of depression than men; however, this difference in prevalence may be changing.<sup>1</sup> An increase in the prevalence of depression among men might help to explain the rising number of men who are committing suicide.<sup>2</sup> The sex ratio for deliberate self harm—a phenomenon that is related to suicide and depression—is also changing, with an increasing number of men deliberately harming themselves.<sup>3</sup> We hypothesised that there would be a decrease in the ratio of the number of women to the number of men admitted to Scottish hospitals for depression between 1980 and 1995. During this time there have been important changes in economic conditions and gender roles in industrialised countries.

### Methods and results

We reviewed discharge data on first admissions to Scottish hospitals for patients aged between 15 and 65 years old; data were obtained from the information and statistics division of the NHS in Scotland. The period from 1980 to 1995 was chosen for study because during this time diagnoses were recorded according to the ICD-9 (international classification of diseases, ninth revision) and important changes had occurred in socioeconomic and employment patterns. We included the following subcategories of depression from the ICD-9 in our analysis of discharge diagnoses: 296.1, 296.3, 298.0, 300.4, and 311.9. We assumed that diagnoses in these categories would be least likely to be confused with other conditions, for example, psychotic