

Dual-chamber pacemakers for the treatment of symptomatic bradycardia

**Understanding NICE guidance –
information for people with symptomatic
bradycardia, their families and carers, and
the public**

February 2005



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Issue date: February 2005

Review date: January 2007

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Copies of this booklet can be ordered from the the Department of Health Publications Order Line; telephone 0870 1555 455 and quote reference number N0803. A version in Welsh and English is also available, reference number N0804. Mae fersiwn yn Gymraeg ac yn Saesneg ar gael hefyd, rhif cyfeirnod N0804. The NICE technology appraisal on which this information is based, 'Dual-chamber pacemakers for symptomatic bradycardia due to sick sinus syndrome and/or atrioventricular block', is available from the NICE website (www.nice.org.uk/TA088guidance). A short version of the guidance (a 'quick reference guide') is available from the website (www.nice.org.uk/TA088quickrefguide) or from the the Department of Health Publications Order Line, reference number N0802.

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Web: www.nice.org.uk

ISBN: 1-84257-869-3

Published by the National Institute for Clinical Excellence
February 2005

Typeset by Icon Design, Eton
Printed by Abba Litho (Sales) Ltd

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What is NICE guidance?

The National Institute for Clinical Excellence (NICE) is part of the NHS. It produces guidance (recommendations) on the use of medicines, medical equipment, diagnostic tests and clinical and surgical procedures within the NHS in England and Wales.

To produce this guidance, NICE looks at how well the medicine, equipment or procedure works and also how well it works in relation to how much it costs. This process is called an appraisal. The appraisal process involves the manufacturer of the medicine or equipment for which guidance is being produced and the organisations that represent the healthcare professionals, patients and carers who will be affected by the guidance.

NICE was asked to look at the available evidence on the use of dual-chamber pacemakers to treat people with bradycardia caused by sick sinus syndrome, atrioventricular block or both. NICE was asked to provide guidance that will help the NHS in England and Wales decide when dual-chamber pacemakers should be used.

What is symptomatic bradycardia?

For the heart to beat, an electrical impulse is needed. These electrical impulses are produced in an area of the heart called the sinus node. When the electrical impulses produced by the sinus node are disturbed, the heart beats at a slower rate than normal (this is called bradycardia). This can cause problems such as faints, falls, dizziness, confusion, palpitations (when the person is aware of the heartbeat), difficulty breathing and chest pain. When bradycardia occurs with these symptoms it is called symptomatic bradycardia.

Common causes of symptomatic bradycardia are sick sinus syndrome and atrioventricular block, or a combination of the two. Sick sinus syndrome happens when the heart's sinus node doesn't produce the electrical impulses the heart needs to beat at the normal rate. Atrioventricular block is when the electrical impulses are partly or completely stopped from travelling between the chambers of the heart. Symptomatic bradycardia caused by either sick sinus syndrome or atrioventricular block can be treated using a pacemaker.

What is a pacemaker?

A pacemaker is a small, battery-powered device that is connected to the surface of the heart by tiny wire leads. The pacemaker detects whether or not the heart has naturally produced an electrical impulse. If an impulse is not produced, or if the rate of heartbeat is too slow, the pacemaker will produce an electrical impulse to start off or control the beat.

Pacemakers are described as either single-chamber or dual-chamber, depending on the way they are connected to the heart. Single-chamber pacemakers are connected to either the upper chamber of the heart (atrium), or the lower chamber of the heart (ventricle). Dual-chamber pacemakers are connected to both chambers of the heart. The choice of which type to use depends on the exact heart problem that the patient has.

What has NICE recommended on dual-chamber pacemakers for symptomatic bradycardia?

During the appraisal, NICE's Appraisal Committee read and heard evidence from:

- high-quality studies of dual-chamber pacemakers
- doctors with specialist knowledge of symptomatic bradycardia and its treatment
- individuals with specialist knowledge of the issues affecting people with symptomatic bradycardia
- organisations representing the views of people who will be affected by the guidance (because they have, or care for someone with, the condition or because they work in the NHS and are involved in providing care for people with the condition).

The evidence is summarised in the full guidance (see page 10 for details). More information about the studies is provided in the Assessment Report for this appraisal (see page 10 for details).

NICE has made the following recommendations about the use of dual-chamber pacemakers to treat symptomatic bradycardia within the NHS in England and Wales.

Dual-chamber pacemakers are recommended to treat symptomatic bradycardia in people with sick sinus syndrome, atrioventricular block, or both. But there are a number of special circumstances where dual-chamber pacemakers should not be used for symptomatic bradycardia.

The first of these circumstances is when the symptomatic bradycardia is caused by sick sinus syndrome, but the flow of electrical impulses between the upper and lower chambers of the patient's heart is normal. When this happens, a single-chamber pacemaker should be used. When the pacemaker is fitted to these patients, it should be attached to the upper chamber of the heart.

The second is when the symptomatic bradycardia is caused by atrioventricular block and the patient has continuous atrial fibrillation (this is a rapid and irregular beating of the upper chamber of the heart). When this happens a single-chamber pacemaker should be used, and it should be attached to the lower chamber of the heart.

Doctors should consider the risks and benefits of using a dual-chamber pacemaker for individual patients. Patients may be frail or have other medical conditions that may make a dual-chamber pacemaker unsuitable for them. For these patients, a single-chamber pacemaker should be used, and should be attached to the lower chamber of the heart.

What should I do next?

If you or someone you care for has symptomatic bradycardia, you should discuss this guidance with your doctor.

Will NICE review its guidance?

Yes. The guidance will be reviewed in January 2007.

Further information

The NICE website (www.nice.org.uk) has further information about NICE and the full guidance on 'Dual-chamber pacemakers for symptomatic bradycardia due to sick sinus syndrome and/or atrioventricular block' that has been issued to the NHS. The Assessment Report, which contains details of the studies that were looked at, is also available from the NICE website. A short version of the guidance (a 'quick reference guide') is available on the website and from the the Department of Health Publications Order Line (phone 0870 1555 455 and quote reference number N0802).



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