NICE guidance

Deep brain stimulation for Parkinson's disease

Interventional procedures guidance
Published: 26 November 2003

www.nice.org.uk/guidance/ipg19

This guidance should be read in conjunction with CG35.

1 Guidance

1.1 Current evidence on the safety and efficacy of deep brain stimulation for Parkinson's disease appears adequate to support the use of the procedure, provided that normal arrangements are in place for consent, audit and clinical governance.

1.2 The clinical and cost effectiveness of deep brain stimulation for Parkinson's disease is being evaluated by the PD Surg trial, which is expected to complete randomisation in 2005/6. The results of this trial are likely to provide evidence on the most appropriate use of the procedure and clinicians are encouraged to consider randomising patients in the trial.

1.3 It is recommended that patient selection should be made with the

involvement of a multidisciplinary team, and that patients should be offered the procedure only when their disease has become refractory to best medical treatment.

2 The procedure

2.1 Indications

2.1.1 Parkinson's disease is a chronic disease of the brain characterised by gradually worsening tremor, muscle rigidity and difficulties with starting and stopping movements. The condition is usually treated with drugs. Surgery may be considered in people who have responded poorly to drugs, who have severe side effects from medication or who have severe fluctuations in response to drugs (on–off syndrome).

2.1.2 Parkinson's disease is common, affecting about 0.5% of people aged 65 to 74 years and 1–2% of people aged 75 years and older. Experts believe that 1–10% of people with Parkinson's disease might be suitable for brain surgery.

2.1.3 Surgery for Parkinson's disease is carried out on structures within the brain that are responsible for the modification of movements, such as the thalamus, the globus pallidus and the subthalamic nucleus. Each of these structures consists of two parts: one on the left hand side of the brain and one on the right. Surgery may be carried out on one or both sides.

2.1.4 Surgical treatment aims to correct the imbalance created by diminished function of the substantia nigra, the underlying abnormality in Parkinson's disease. Surgery alters, through either destruction or electrical stimulation, the function of brain nuclei – such as the thalamus, globus pallidus or subthalamus – that interact functionally with the substantia nigra. Deep brain stimulation is one form of surgery for Parkinson's disease.

2.2 Outline of the procedure

2.2.1 This procedure involves inserting very fine needles into the brain through small holes made in the skull to determine the exact position of the nucleus to be stimulated, which may be different in each patient. This part of the procedure is usually carried out under local anaesthetic. Once the nucleus is identified, a permanent electrode is placed into it. Under general anaesthetic, this electrode is then connected to a pulse generator, which is implanted subcutaneously on the anterior chest wall.

2.3 Efficacy

2.3.1 The evidence suggested that deep brain stimulation results in improved motor skills, function and movement in patients with Parkinson's disease. For more details refer to 'Sources of evidence'.

2.3.2 The Specialist Advisors considered the procedure to be established practice within specialised units. They did not question short-term efficacy, but commented that long-term efficacy was unknown. One Specialist Advisor commented that careful selection of patients was crucial to maximise the chances of success of the procedure.

2.4 Safety

2.4.1 The complications associated with deep brain stimulation include risk of stroke, confusion, speech disorders and visual problems. In the two largest studies, involving 102 and 111 patients, the incidence of stroke was approximately 3%. For more details refer to 'Sources of evidence'.

2.4.2 The Specialist Advisors noted that all procedures involving deep brain stimulation carried similar risks. They considered the procedure to be safe if performed by a multidisciplinary team in a neuroscience unit. The team should include a neurologist and a neurosurgeon, and the unit should have facilities for psychological assessment and, ideally, neurophysiology.

2.5 Other comments

2.5.1 The Interventional Procedures Advisory Committee noted that current evidence relates to relatively young patients.

Andrew Dillon
Chief Executive
November 2003

3 Further information

Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document.

'Interventional procedure overview of deep brain stimulation in Parkinson's disease', April 2003.

Information for patients

NICE has produced information on this procedure for patients and carers ('Understanding NICE guidance'). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

4 Other NICE recommendations on deep brain stimulation

Further recommendations have been made as part of the clinical guideline on Parkinson's disease published in June 2006.

Clinical and cost-effectiveness evidence was reviewed in the development of this guideline which has led to this more specific recommendation. The IP guidance on deep brain stimulation for Parkinson's disease remains current, and should be read in conjunction with the clinical guideline.

5 About this guidance

NICE interventional procedure guidance makes recommendations on the safety and efficacy of the procedure. It does not cover whether or not the NHS should fund a procedure. Funding decisions are taken by local NHS bodies after considering the clinical effectiveness of the procedure and whether it represents value for money for the NHS. It is for healthcare professionals and people using the NHS in England, Wales, Scotland and Northern Ireland, and is endorsed by Healthcare Improvement Scotland for implementation by NHSScotland.

This guidance was developed using the NICE interventional procedure guidance process.

We have produced a summary of this guidance for patients and carers. Information about the evidence it is based on is also available.

Changes since publication

31 January 2012: minor maintenance.

Your responsibility

This guidance represents the views of NICE and was arrived at after careful consideration of the available evidence. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of healthcare professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way which would be inconsistent with compliance with those duties.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.