NICE National Institute for Health and Care Excellence

NICE guidance

Deep brain stimulation for Parkinson's disease

HealthTech guidance
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www.nice.org.uk/guidance/htg7

Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

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This guidance replaces IPG19.

This guidance should be read in conjunction with NG71.

1 Recommendations

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 was evaluated by the PD Surg 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% to 2% of people aged 75 years and older. Experts believe that 1% to 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 2 parts: 1 on the left-hand side of the brain and 1 on the right. Surgery may be carried out on 1 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 1 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, see the overview.

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 2 largest studies, involving 102 and 111 patients, the incidence of stroke was approximately 3%. For more details, see the overview.

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 committee noted that current evidence relates to relatively young patients.

3 Further information

Sources of evidence

The evidence considered by the committee is in the overview.

Information for patients

NICE has produced information for the public on this procedure. It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

Update information

Minor changes since publication

January 2026: Interventional procedures guidance 19 has been migrated to HealthTech guidance 7. The recommendations and accompanying content remain unchanged.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.