

*Guidelines to be followed by centres, services and units in order to be designated as Reference Centres, Services and Units of the National Health System, as agreed by the Interterritorial Board*

#### **40. MOVEMENT DISORDERS SURGERY**

Surgery on certain brain structures is a powerful therapeutic tool for patients with Parkinson's disease and other neurological diseases that concur with movement disorders. This surgery is used after pharmacological treatment of the disease has failed or produced unwanted effects and it cannot bring back to the patient a minimum functional autonomy and quality of life.

The condition which more frequently produces movement disorders is Parkinson's disease. This disease consists of a progressive degeneration of the substantia nigra and other pigmented nuclei of the brainstem. The classic symptoms of Parkinson's disease are shaking, stiffness, akinesia/bradykinesia (slowness of movement) and difficulty to walk, leading to a progressive and growing disability of the patient. Medical treatment is based on levodopa. 5-10 year after using it, patients start showing complications such as motor fluctuations (periods of effectiveness alternating with periods of non effectiveness) and dyskinesias (during periods of effectiveness sudden and strong movements of the muscle groups appear, producing involuntary jerky movements of the body) that may cause so much incapacity as the symptoms of the disease. Due to these limitations, surgery is emerging again as a treatment of choice for Parkinson's disease with incapacitating motor complications. If the patient is correctly selected for surgery (well established international criteria), the benefit provided, according to research comparing with the best medical treatment, is very favourable. The most beneficial effects of the surgery occur in the stiffness, akinesia/bradykinesia and shaking, and, therefore, in the quality of life, resulting on an improvement of approximately 70%.

Essential tremor is other of the pathologies which may benefit from this type of surgery. Surgery on the thalamus (ventral intermediate nucleus) produces a reduction of the shaking of approximately 80%. There are also other types of shaking that may, in specific cases, benefit from this treatment. Other movement disorder is the dystonia, consisting in tonic, painful, involuntary contractions of the slow type of the muscles from one or more parts of the body, due to a dysfunction of the nervous system. The generalized idiopathic dystonia may significantly improve with surgery, and other types of dystonia (segmental, focal and delayed) are starting to be treated surgically with success. The average improvement is 60%. In this type of surgery, with the characteristic variability of the technique used, the mortality is below 1% and the morbidity around 20%.

The purpose of the National Reference Units for Movement Disorders Surgery is treating pathologies susceptible to this type of surgery (Parkinson's disease, shaking due to different causes, and dystonias) after failure of pharmacological treatment.

### ***A. Rationale for the proposal***

► Epidemiological data on the condition (incidence and prevalence).	Parkinson's Disease: Incidence: 0.3/1,000 population/year. Prevalence: 120-165/100,000 population>64years old/year. The rest of pathologies related to movement disorders have a very low incidence.
► Data on the use of movement disorders surgery.	Approximately 200 surgical procedures per year in the whole National Health System.

### ***B. Guidelines to be followed by Centres, Services and Units in order to be designated as Reference Centres, Services and Units performing movement disorders surgery:***

<p>► Experience of the Reference Centres, Services and Units:</p> <p>- Activity:</p> <ul style="list-style-type: none"> <li>• Number (minimum and optimal) of movement disorders surgeries that should be performed in a year to ensure an adequate care.</li> </ul> <p>- Other data: research on the subject, postgraduate teaching, continuing training, publications, etc.</p>	<p>20-25 deep brain stimulation and/or ablation lesions surgical procedures in a year.</p> <p>- Accredited postgraduate teaching: Unit participation in the internship and residency programme in the areas of neurology, neurosurgery and neurophysiology of the Centre.</p> <p>- Participation in research projects and publications in the field<sup>a</sup>.</p> <p>- Continuing training programme standardized and authorized by the centre's board of</p>
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	<p>directors in the areas of neurology, neurosurgery and neurophysiology.</p> <ul style="list-style-type: none"> <li>- Clinical multidisciplinary sessions, at least once a month, in order to make decisions and coordinate treatments.</li> </ul>
<p>► Specific resources of the Reference Centres, Services and Units:</p> <ul style="list-style-type: none"> <li>- Human resources required for adequate performing of movement disorders surgery. <ul style="list-style-type: none"> <li>- Basic education of the team members <sup>b</sup>.</li> </ul> </li> <li>- Specific equipment required for adequate performing of movement disorders surgery.</li> </ul> <p>► Resources from other units and services besides those belonging to the Reference</p>	<ul style="list-style-type: none"> <li>- Multidisciplinary care: neurosurgeons, clinical neurophysiologist, neurologist.</li> <li>- Nursing and surgical staff.</li> <li>- Neurosurgeon with experience in functional neurosurgery techniques with more than 100 deep brain stimulation and radiofrequency lesions procedures.</li> <li>- Neurophysiologist with experience of more than 100 procedures in functional neurosurgery including deep brain recording techniques, evoked potentials and neurostimulation.</li> <li>- Neurologist with experience in movement disorders, who has assessed more than 100 surgical cases.</li> <li>- Nursing staff with more than 2 years experience in functional neurosurgery.</li> <li>- Stereotaxis system, MRI and CT scan compatible.</li> <li>- Radiological operating theatre isolated from magnetic fields.</li> <li>- Mobile radiology equipment.</li> <li>- Craniectomy standard surgical equipment.</li> <li>- Equipment for radiofrequency lesions with lesion electrodes.</li> <li>- Equipment for recording of brain bioelectric activity and electromyography.</li> <li>- Equipment for deep brain stimulation and visual and somatosensorial evoked potentials.</li> <li>- Anaesthesia services/unit with experience in patients with disorder movements, with at least one anaesthetist with more than 2 years experience in functional neurosurgery.</li> </ul>

Centres, Services and Units required for the adequate performing of movement disorders surgery <sup>b</sup> .	<ul style="list-style-type: none"> <li>- Intensive care services/unit.</li> <li>- Radiodiagnosis services/unit including CT scan and MRI, with at least one radiologist with more than 2 years experience in functional neurosurgery techniques.</li> <li>- Psychiatry services/unit and/or clinical psychology services/unit with experience in patients with movement disorders.</li> <li>- Rehabilitation services/unit with experience in patients with movement disorders.</li> </ul>
► Procedure and clinical results indicators of the Reference Centres, Services and Units <sup>c</sup> :	<b>The indicators will be agreed with the Units that will be designated.</b>
► Existence of an adequate IT system (Type of data that the IT system must include to allow identification of the activity and evaluation of the quality of the services provided)	<ul style="list-style-type: none"> <li>- Filling up the complete MBDS of hospital discharge.</li> <li>- The unit must have a <i>registry of patients</i> who have undergone movement disorders surgery which at least must include: <ul style="list-style-type: none"> <li>- Medical record number.</li> <li>- Date of birth.</li> <li>- Sex.</li> <li>- Patient's habitual region of residence.</li> <li>- Admission date and discharge date.</li> <li>- Type of admission (Emergency, planned, other).</li> <li>- Type of discharge (Home, hospital transfer, voluntary, death, transfer to a healthcare centre, other.)</li> <li>- Service in charge of patient's discharge.</li> <li>- Main diagnosis (ICD-9-CM).</li> <li>- Other diagnosis (ICD-9-CM).</li> <li>- Diagnostic procedures provided to the patient (ICD-9-CM).</li> <li>- Therapeutic procedures provided to the patient (ICD-9-CM): <ul style="list-style-type: none"> <li>♦ Surgical procedures related to movement disorders surgery: <ul style="list-style-type: none"> <li>- Type of procedure and date when it was provided.</li> <li>- Number of hemispheres involved in the surgery.</li> </ul> </li> </ul> </li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>♦ Other therapeutic procedures: Type of procedure and date when it was performed.</li> <li>- Surgical complications (ICD-9-CM).</li> <li>- Patient monitoring: <ul style="list-style-type: none"> <li>♦ % of improvement according to Schwab and England Activities of Daily Living Scale.</li> <li>♦ Reduction in equivalent L-dopa dose in mg.</li> <li>♦ Completion of indicators 6, 12 months after and yearly.</li> <li>♦ Other.</li> </ul> </li> <li>- The unit must have the required data which should be sent to the Spanish National Health Service Reference Centres, Services and Units Appointment Commission Secretariat for yearly reference unit monitoring.</li> </ul>
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<sup>a</sup> *Criteria to be assessed by the Appointment Commission.*

<sup>b</sup> *Experience will be accredited by certification from the hospital manager.*

<sup>c</sup> *Clinical results standards, agreed to by the experts group, will be assessed, initially by the Appointment Commission, while in the qualification process, as more information from the Reference Centres, Services and Units is being obtained. Once qualified by the Appointment Commission, the Quality Agency will authorize its compliance, as for the rest of guidelines.*

## **Bibliography:**

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