

## **Deep Brain Stimulation (DBS) of patients with Parkinson´s disease.**

### **Scandinavia Movement Disorder Society ScandModis consensus document June 2009**

#### **Background**

Patients with Parkinson´s disease, who no longer can be improved by optimising the oral medical treatment, have shown significant benefits from treatment with DBS. DBS has been shown to improve motor function, reduce tremor, motor fluctuations and dyskinesias, decrease use of medication and increase Quality of Life (see reference 1. and references herein).

#### **Criteria for referral to a specialised Movement Disorder Centre for possible DBS**

Patients with levodopa responsive Parkinson´s disease

Age < 70 years

Preferably with a duration of Parkinson´s disease > 5 years

\*Moderate to severe on-off motor fluctuations

and/or

\*Moderate to severe dyskinesias

and/or

Medical refractory \*moderate to severe tremor

\* Defined as moderate to severe impact on quality of life

#### **Exclusion criteria**

Dementia

Significant medical resistant psychiatric disease (e.g. severe depression)

Significant medical conditions with limited life expectancy

Conditions that prevent surgery or MRI

#### **Patient eligible for DBS**

Patient eligibility for DBS is determined at the Movement Disorder Centre after:

Brain imaging

Neuropsychological assessment of cognitive function and psychiatric symptoms

Levodopa challenge test

## **Expected outcome of DBS treatment**

Expected outcome corresponds to the effect of an optimal levodopa dosage on the motor symptoms

Tremor reduction

Significant reduction of motor fluctuations

Decreased use of medication depending on surgical target, see below

Significant reduction of dyskinesias

Levodopa unresponsive symptoms like

Axial symptoms as postural instability

Freezing of gait

Dysarthria

will not improve

## **Surgery in Parkinson's disease**

Target

The subthalamic nucleus (STN) to treat the cardinal symptoms tremor, rigidity and hypokinesia and reduce motor fluctuations

The internal part of globus pallidus (GPi) is an alternative target to treat cardinal symptoms and especially dyskinesias, however often results in less reduction of medication

The ventral intermediate nucleus of thalamus (VIM) to treat tremor only

The electrodes are implanted bilaterally and connected to a subcutaneous lead and impulse generator (IPG) localised beneath the clavicle

Each electrode has four contacts and stimulation contact and parameters are adjusted by computer telemetry

## **Surgical complications**

Intracranial hemorrhage (appr. ½ -1 %)

Infection

## **Side effects**

Worsening of dysarthria

Sometimes worsening of gait and balance especially patients > 65 years of age

Eyelid apraxia

Dystonia

Psychiatric symptoms (usually transient, treatable and potentially preventable) (6)

Confusion

Depression

Mania

Psychosis

Apathy

Neuropsychological symptoms

Reduced verbal fluency

## **Hardware complications**

### **Patient management and follow-up**

During the first 3-6 months frequent controls in the outpatient clinic to adjust stimulation parameters and medication to obtain maximum effect of stimulation.

Shared control (referral neurologist and DBS centre) of symptoms and disease development and stimulation effect.

Battery replacement every 3-4 years.

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