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GLOSSARY**Activa[®] Parkinson's Control Therapy**

Activa[®] Therapy*: the umbrella term describing the treatment developed by Medtronic in collaboration with pioneering physicians that uses brain stimulation to suppress the symptoms of movement disorders. The therapy uses an implantable medical device to deliver electrical stimulation to brain structures involved in motor control. Includes Activa Parkinson's Control Therapy and Activa Tremor Control Therapy.

* See enclosed brief statement for indications, contraindications, warnings/precautions/adverse events or visit: www.brainpacemaker.com

- ◆ **Activa[®] Parkinson's Control Therapy**: a treatment developed by Medtronic in collaboration with pioneering physicians for controlling the motor symptoms of advanced Parkinson's disease. The therapy is an adjustable and reversible treatment that uses an implanted medical device to deliver electrical stimulation to either the subthalamic nucleus (STN) or the globus pallidus interna (GPi) to counter the brain signals that cause the motor symptoms of Parkinson's disease. There is no cure for Parkinson's disease, and treatment options currently available in the United States may have disabling and unpredictable side effects.
- ◆ **Activa[®] Tremor Control Therapy**: a treatment developed by Medtronic in collaboration with pioneering physicians for controlling Essential Tremor or Parkinsonian tremor. It is an adjustable and reversible therapy that uses an implanted medical device to deliver electrical stimulation to the thalamus to counter the brain signals that cause tremor.
- ◆ **Activa[®] System**: often called a pacemaker for the brain. The Activa System includes the Medtronic neurostimulator, lead, and extension.
 - Neurostimulator: similar to a cardiac pacemaker, is usually implanted near the patient's collarbone. It contains microelectronic circuitry and a battery that powers the system and generates the electrical current for the stimulation.
 - Lead: a thin, insulated, coiled wire implanted in the patient's brain. The tip of the lead contains four electrodes that may be programmed to stimulate the targeted brain structure.
 - Extension: another thin, insulated, coiled wire that connects the neurostimulator to the lead. It is passed under the skin of the patient's head, neck and shoulder.

Activities of Daily Living (ADL): activities that must be accomplished independently for patients to assume responsibility for their own needs and to participate actively in society (examples include bathing, eating, communicating, using transportation, parenting/spousal roles)

agonist: a class of drugs that increases neurotransmitter activity by stimulating dopamine receptors directly

akinesia: absence of movement

amantadine: a dopaminergic and an antiviral drug that controls rigidity, bradykinesia and tremor

anticholinergic: a class of drugs that relaxes smooth muscle; used primarily to treat tremor in Parkinson's disease.

ballism: violent, flinging movements caused by involuntary contractions of limb muscles

basal ganglia: a network of brain structures that are involved in movement control

benserazide: a decarboxylase inhibitor drug, combined with levodopa, used to treat the symptoms of Parkinson's disease

benztropine: an anticholinergic drug used to treat Parkinson's disease

bradykinesia: slowness of movement

bromocriptine: a dopamine agonist drug used to treat the symptoms of Parkinson's disease

carbidopa: a decarboxylase inhibitor drug, combined with levodopa, used to treat the symptoms of Parkinson's disease

central nervous system (CNS): the portion of the nervous system consisting of the brain and spinal cord. The nervous system coordinates the adjustments and reactions of the body to internal and external conditions and stimuli.

chorea: involuntary, dance-like movement of the extremities and head

COMT inhibitor: a class of drugs that allows more levodopa to cross the blood-brain barrier by blocking enzymes that break down levodopa in the peripheral bloodstream

decarboxylase inhibitor: a class of drugs that allows more levodopa to cross the blood-brain barrier by blocking enzymes that break down levodopa in the peripheral bloodstream; used to treat nausea and vomiting

deep brain stimulation: delivery of electrical impulses to structures deep within the brain

dopamine: a chemical substance (neurotransmitter) manufactured in the brain that transmits messages between neurons (brain cells) involved in the control of movement. Loss of dopamine due to degeneration of cells in the substantia nigra results in the symptoms of Parkinson's disease

dopamine agonist: a class of drugs that binds to dopamine receptors and imitates the action of dopamine

dopaminergic: a class of drugs with dopamine-like action; used to treat all symptoms of Parkinson's disease except postural instability. Also refers to systems within the brain that contain dopamine

dysarthria: slurred speech

dyskinesia: abnormal, involuntary movements that can be caused by dopaminergic drug therapy

dystonia: abnormal, involuntary muscle contractions

entacapone: a COMT inhibitor drug used to treat the symptoms of Parkinson's disease

Essential Tremor: the most common movement disorder, characterized by rhythmic shaking occurring during voluntary movement (action tremor), such as lifting a cup to one's mouth, or while voluntarily maintaining a position against gravity (postural tremor), such as reaching or extending one's hand or arm

fetal cell transplantation: experimental and controversial surgical procedure involving the implantation of fetal brain cells into the brain of a Parkinson's patient; goal is to enhance or restore dopamine production by spurring growth of new dopamine cells

freezing: temporary inability to move or begin walking

functional neurosurgery: neurosurgery intended to improve function

functional stereotactic neurosurgeon: a neurosurgeon who specializes in treating central nervous system function using a stereotactic head frame along with imaging techniques to map the brain and localize the surgical target

functional stereotactic neurosurgery: central nervous system surgery intended to improve the ability of a person to function, using a stereotactic head frame along with imaging techniques to map the brain and localize the surgical target

globus pallidus (GP): a structure in the basal ganglia of the brain that is involved in motor control; the globus pallidus interna (GPi) and globus pallidus externa (GPe) are segments of the globus pallidus

hemiballism: violent, flinging movements caused by involuntary contractions of limb muscles on one side of the body

hemiparesis: slight or incomplete paralysis affecting one side of the body.

idiopathic: of, related to or being a disease having no known cause

lesion: damage to tissues of the body due to disease or trauma. In the case of functional neurosurgery for movement disorders, a lesion refers to the deliberate destruction of certain cells of the brain to alleviate poor movement control.

levodopa: the drug most commonly used to treat the symptoms of Parkinson's disease; a dopaminergic

lisuride: a dopamine agonist drug used to treat the symptoms of Parkinson's disease

MAO-B inhibitor: a class of drug that blocks an enzyme that breaks down dopamine, allowing it to be at the receptor longer; used to treat all symptoms of Parkinson's disease

motor symptoms: the symptoms of Parkinson's disease affecting movement—bradykinesia, rigidity, and tremor.

neurologist: a physician who specializes in diagnosing and treating diseases of the central nervous system; may further specialize in a certain area, such as movement disorders

neurosurgeon: a physician who specializes in surgery of the nervous system

neurotransmitter: a chemical substance that relays impulses from one neuron to another

“off” time: poor motor function and increase in Parkinsonian symptoms

“on” time: good motor function and relief from Parkinsonian symptoms

“on” time with dyskinesia: good motor function and relief from Parkinsonian symptoms, but marked by abnormal, involuntary movements

on-off effect: abrupt changes in condition due to the effect (“on” time) or loss of effect (“off” time) of antiparkinsonian medication that result in transitions between good and poor motor function

pallidotomy: irreversible surgical destruction of specific cells in the brain's globus pallidus. May improve some of the symptoms of Parkinson's disease and drug-induced side effects, but may also result in serious side effects, especially when the procedure is performed on both sides of the brain. Risks are associated with the proximity to sensitive areas of the brain and include acute or chronic motor deficits, mild paralysis on one side of the body (hemiparesis), facial weakness, slurred speech (dysarthria) and partial loss of visual field

paresis: slight or incomplete paralysis

paresthesia: tingling sensation

Parkinson's disease: a progressive and degenerative movement disorder with primary motor symptoms: rigidity (stiffness of the limbs and joints), bradykinesia/akinesia (slowness of movement/absence of movement), and tremor (involuntary rhythmic shaking of a limb, the head, mouth or tongue; or the entire body), and postural instability (impaired balance and coordination). Results when dopaminergic cells in the substantia nigra degenerate, causing a loss of the chemical dopamine

pergolide: a dopamine agonist drug used to treat the symptoms of Parkinson's disease

postural instability: impaired balance and coordination

pramipexole: a dopamine agonist drug used to treat the symptoms of Parkinson's disease

rigidity: stiffness or inflexibility of the limbs and joints

ropinirole: a dopamine agonist drug used to treat the symptoms of Parkinson's disease

selegiline: a MAO-B inhibitor drug used to treat the symptoms of Parkinson's disease

stereotactic: pertains to precise localization of a specific target point based on three-dimensional coordinates

stereotactic head frame: a device that is affixed to the skull to position the head and allow a neurosurgeon to precisely locate areas of the brain

stereotactic neurosurgeon: a neurosurgeon who uses stereotactic methods to perform various procedures, such as biopsies of brain tumors

stereotactic neurosurgery: surgery employing stereotactic techniques to map the structures of the brain, allowing the surgeon to precisely target a specific area. Surgery in which a long needle is lowered into the brain through a tiny hole in the skull, thus eliminating the need to open the skull and expose the brain to the outside environment. Used for procedures such as lesioning, deep brain stimulation, and biopsies of brain tumors

substantia nigra (“black substance”): a group of cells in the brain that produces dopamine. Degeneration of these cells and loss of dopamine lead to Parkinson's disease

subthalamic nucleus (STN): a structure deep within the brain that is involved in motor control. The left STN controls movement on the right side of the body, and the right STN controls movement on the left side

thalamotomy: irreversible surgical destruction of specific cells of the brain's thalamus. May improve tremor only, does not affect other symptoms of Parkinson's disease

thalamus: a message relay center located deep within the brain and involved in movement

tolcapone: a COMT inhibitor drug used to treat the symptoms of Parkinson's disease

tremor: involuntary, rhythmic shaking of a limb, the head, mouth or tongue; or the entire body

trihexyphenidyl: an anticholinergic generally used to treat Parkinsonian tremor

Unified Parkinson's Disease Rating Scale (UPDRS): a rating scale for assessing functional outcome measures in Parkinson's disease

wearing off: decline in motor function associated with the timing of levodopa ingestion; can be countered by taking the next dose