

# Central Nervous System and Therapeutics

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## Microelectrode recording and deep Brain Stimulation

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**Introduction:** Microelectrode recording (MER) Defined as Neurophysiological Technique that detect and amplifies the activity of Individual Single Neural Units.

Mechanism of Deep Brain Stimulation (DBS):

- HFS suppresses the activity
- of STN, STN neurons discharge spontaneously at a frequency of ~ 20 Hz.
- PD they became hyperactive with an average firing ~ 40Hz. DBS HFS at >100Hz, STN will increase firing during the initial stimulation period after which they will fail to respond secondary to inactivation of Na<sup>+</sup> channels, result in synaptic inhibition.
- This stimulation induced activation of inhibitory presynaptic terminals result reduction of pathologic activity and its transmission, and subsequent improvement in information processing high likely responsible for amelioration of motor symptoms during DBS

The Food and Drug Administration (FDA) approved DBS as a treatment for:

- Essential tremor in 1999
- Parkinson's disease in 2002
- Dystonia in 2003

**Methods:** Patients selection criteria is important.

A number of stimulation techniques may be performed during movement disorder surgery. Used either:

To assess side effect (proximity to structures wish to avoid) To assess the potential clinical effect of chronic stimulation.

**Conclusion:** Deep Brain Stimulation (DBS) is safe procedure.

It is safety Greatly depend on:

The quality of the instruments.

The method of stereotactic planning.

The experience of the surgical and neurophysiology team. Complication of Deep Brain Stimulation (DBS) could be Numbness, tingling, Symptomatic subdural hemorrhages, Infection, Hardware issues.

### Speaker Biography

Amal Mokeem, is at present a consultant Clinical Neurophysiologist in the department of Neurosciences at King Faisal Specialist Hospital/ Riyadh. Assistance professor at Al-Faisal University. Program director of Clinical Neurophysiology fellowship program and technologist training program. She is honored to be the first Saudi Neurophysiologist physician experienced in the field of deep brain stimulation (DBS) and intra-operative micro-electrode recording (MER) in the kingdom of Saudi Arabia.

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