

## 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 a Consultant Clinical Neurophysiologist at King Faisal Specialist Hospital and Research Centre, Saudi Arabia. She has been in the Arab Board – Dec 2003 and Saudi Board – Feb 2004. She has done Pediatric Neurology Fellowship at King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia during 2004-2006, at British Columbia's Children's Hospital, Canada during 2006-2007, Clinical Neurophysiology EEG Fellowship at British Columbia's Children's Hospital, Canada during 2007-2008, Clinical Neurophysiology Intraoperative Neurophysiology Monitoring (IOM) Fellowship at Vancouver General Hospital, Canada (2008-2009) and Neurophysiology and Deep Brain Stimulation Fellowship at Lahey Clinic/ Tufts University, USA (2009-2010). She is having 2 Publications and gave more than 10 International Presentations.

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