



BCL5

5th Workshop on Brain, Computation, and Learning



Dr. George C. Vilanilam

*Professor of Neurosurgery,
Sree Chitra Tirunal Institute for Medical Sciences,
R Madhavan Nayar centre for comprehensive epilepsy care,
Trivandrum, Kerala, India*



2 July | 11:00 – 12:30
Faculty Hall

Functional Brain Mapping and its clinical applications

Abstract: Human beings are the most evolved of living forms, with a complex brain that mediates several elaborate and sophisticated functions. Language, memory, sensorimotor, visual, auditory and other critical functions, along with their processing and interpretation, makes *Homo Sapiens* superior to others in the evolutionary chain. 'Eloquent' cortical areas in the brain control these critical functions. These could be impaired by several diseases of the brain, like brain tumors, developmental anomalies, strokes, infections, injuries, vascular malformations, etc., thereby affecting critical brain function and a meaningful human existence.

The function of each area of the brain lobe/hemisphere can be mapped by several techniques. Non-invasive brain mapping techniques include functional MRI, electroencephalogram(EEG), PET scan, transcranial magnetic stimulation(TMS), WADA test(intracarotid amobarbital test), etc. Awake brain surgery and intraoperative brain mapping are considered to be the ideal gold standard in brain mapping techniques. With advances in awake anesthesia care and intra-operative language, sensorimotor, visual, auditory, and electroencephalographic(EEG) mapping, it is possible to identify functional brain areas during complex neurosurgical operations. 'Brain plasticity often causes functional reorganisation and 'new' functional areas to develop in long-standing diseases. Intraoperative functional brain mapping aids in preserving maximal brain function during neurosurgical operations for brain tumors, developmental anomalies, infective lesions, vascular malformations, and pharmacoresistant epilepsies. We discuss the clinical physics of awake brain function mapping, the fascinating team effort, patient experiences, and clinical outcomes with optimum function preservation.