

# Masterclasses

**M11.1****Advance in Neurosurgical Treatment Using LINAC Machine****09:00****Room 221****Linear Accelerator-based Stereotactic Radiosurgery – Evolution and Revolution**

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The Hospital Authority introduced Stereotactic Radiosurgery for the treatment of intracranial pathologies in the mid 1990s. Stereotactic radiosurgery is a highly complicated treatment modality requiring cooperation and collaboration from radiation oncologist, medical physicist, neurosurgeon and radiographer. The term “stereotactic” means accurate localisation of the structures of the brain in three dimensions. For radiosurgery, it is defined as the utilisation of a highly conformal externally generated ionizing radiation to inactivate or eradicate lesions or targets inside or around the brain without the need for a surgical incision.

In early days, we relied on the use of stereotactic skull frame to provide an accurate array of brain structures. We obtained diagnostic images like CT or cerebral angiogram after placement of stereotactic skull frame and localiser onto patient's skull. The skull frame will be in place for hours until we have finished all the procedures, which include lesion localisation, treatment planning, dose prescription, quality assurance and the radiosurgery treatment. With the advancement of technologies and computer science, we continue to produce treatment plans with improved lesion coverage, better conformity and enhanced preservation of normal brain structure and its function. However, the development of Image Guided Radiation Therapy (IGRT) has revolutionised the work flow and patient care pathway of stereotactic radiosurgery. This technology allows us to obtain frequent imaging during a course of radiation therapy for the purpose of improving accuracy and precision of dose delivery. With IGRT, patients can be handled in a frameless manner, making stereotactic radiosurgery a completely non-invasive ambulatory procedure.

This presentation will give a brief description of the journey we have gone through and touch on future development of stereotactic radiosurgery.