

Volumetric modulated arc therapy (VMAT) is an arc-based dose delivery approach that produces highly conformal dose distributions similar to intensity modulated arc therapy (IMAT) and helical tomotherapy. VMAT can be delivered with a conventional linear accelerator equipped with a multileaf collimator (MLC). During VMAT delivery, the dose rate, the gantry speed and the MLC leaf positions can be varied dynamically, potentially capable of treating the target volume in just one arc. Consequently VMAT has the promise to maximize the benefit of intensity modulated radiation therapy (IMRT) by treating the patient with a wide range of beam orientations in the shortest possible time. Due to these possible advantages many clinics around the world are implementing VMAT aggressively. With the increased commercial availability of VMAT, there is a need to educate the radiation oncology and physics community, regarding various aspects of this complex technology. This educational session will review concepts of IMRT, IMAT and VMAT and will elaborate on the clinical implementation, quality assurance (QA) and treatment planning techniques necessary for the successful implementation of VMAT into the clinic.

The specific objectives of the session are to:

1. Describe and elaborate concepts of VMAT, IMRT, IMAT, helical tomotherapy, etc. The similarities and differences between these radiation delivery techniques will also be explained.
2. Discuss the increased need for MLC quality assurance due to the enhanced complexity of VMAT. Specific MLC QA tests essential for VMAT will be presented along with a suggested frequency for carrying out the tests.
3. Describe VMAT commissioning and QA tests and measurements and present results.
4. Present patient specific QA using various radiation measuring devices available in the market.
5. Present VMAT treatment planning concepts, various treatment planning software and case studies from a range of different anatomical sites.