

AbstractID: 14593 Title: Principles and clinical application of volumetric modulated arc therapy

Intensity modulated arc therapy (IMAT), first proposed by C. Yu in 1995, is a multiple arc technique in which the aperture defined by the multileaf collimator (MLC) of a conventional accelerator changes dynamically while gantry rotation speed and dose rate remain constant. IMAT was shown to deliver highly conformal dose distributions in times comparable to other conformal techniques; however, widespread adoption of IMAT was limited by the lack of commercial systems. Recently, volumetric modulated arc therapy (VMAT), in which gantry speed and dose rate are modulated in addition to MLC aperture, has been demonstrated and become commercially available. Commercial VMAT delivery systems are available from Elekta AB (Stockholm, Sweden) and Varian Medical Systems, Inc. (Palo Alto, CA). Although the dose distributions produced by VMAT are similar to those produced by fixed gantry intensity modulated radiation therapy (IMRT), VMAT is a distinct delivery technique with unique clinical considerations. We will describe the clinical implementation of VMAT, including commissioning, treatment planning, and patient and machine specific quality assurance. We will also review the elements of starting a VMAT program.

Educational objectives

1. Describe volumetric modulated arc therapy (VMAT).
2. Survey VMAT treatment planning systems and planning techniques.
3. Describe commissioning of a VMAT delivery system.
4. Review patient- and machine-specific VMAT quality assurance.
5. Summarize the key elements of starting a VMAT program.

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