

AbstractID: 14504 Title: VMAT and the Tradeoff Between Treatment Time and Dose Conformality

## **Abstract**

Intensity modulated arc therapy (IMAT) was proposed in 1995 by Yu as an alternative to Tomotherapy. Due to the lack of an efficient planning algorithm, wide clinical adoption of IMAT as a major form of radiation treatment delivery did not happen until a 2007 when multiple new planning methods were developed and commercial interests in IMAT were intensified due to competition. Specifically, a commercial product, RapidArc, based on the Volumetric Modulated Arc Therapy (VMAT) developed by Otto, was developed and marketed by Varian in 2007. VMAT is a single arc form of IMAT that delivers apertures of varying weightings with a single arc rotation. The intense commercial promotion and fast clinical adoption caused much confusion and controversy. There is a lack of a general understanding of how such arc treatments are planned, and what delivery limitations and compromises are made. It is therefore the purpose of this presentation to provide a summary of this technology and some guidelines on its clinical implementation.

A historical review of all the works leading to the wide clinical adoption will be provided. Different planning methods will be described by a companion presentation in the same session. Issues related to clinical implementations, including commissioning and quality assurance will also be described. We will also hope to provide some perspectives on its further development in the context of increased clinical use of image guidance. Because there has been vast experience in IMRT using multiple intensity modulated fields, comparisons between IMAT and IMRT will also be made in the review to illustrate its advantages and limitation in the areas of planning, delivery and quality assurance.

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