

**Purpose:** To develop a methodology of therapy portal imaging verification for volumetric modulated arc therapy (VMAT) and RapidArc treatments.

**Method and Materials:** For Varian dynamic IMRT treatments the “DMLC aperture” or CIAO can be imaged by electronic portal imaging device (EPID) or with film. However, during VMAT and RapidArc treatment delivery, MLC leaves constantly move while gantry is rotating continuously. For quality assurance purpose for VMAT and RapidArc treatments we introduce the concept of “Dose Aperture”. In this approach a 3D isodose surface is created with a fixed beam direction, and a portal aperture is drawn around the projection of the isodose surface. For rotational modalities, such as VMAT and RapidArc, a standard orthogonal pair of beam directions can be selected on which the Dose Apertures are projected on the digitally reconstructed radiographs (DRRs). Portal images using these apertures can be obtained to verify the isocenter and location of the treatment with respect to the patient’s bony anatomy.

**Results:** For a VMAT plan the prescription isodose surface was generated using well established planning software tools. For the AP and LAT beams, two Dose Apertures were created, which were then projected on the corresponding DRRs for field matching and correlation. The Dose Apertures could be transferred to setup fields which are then readily available for portal imaging application of VMAT and RapidArc treatments.

**Conclusion:** Although setup fields without the treatment apertures can be used to verify the location of the isocenter, the portal image generated with Dose Aperture is patient specific and can be used when weekly portal imaging is required.