AbstractID: 7880 Title: Stereotactic Body Radiation Therapy: (2) Technical Issues for Clinical Implementation of an SBRT Program

The technical advantage of stereotactic body radiation therapy (SBRT) is based upon the ability to deliver a hypofractionated course of heterogeneous dose to a well-defined volume with a rapid fall-off of dose outside the treatment volume. The overall goal is to minimize the direct effects of radiation on the surrounding normal tissue while delivering a dose biologically equivalent (or greater) to several weeks of conventionally fractionated radiation therapy to the treatment volume. Over 4000 publications spanning several decades have affirmed the clinical usefulness of SRT, including hundreds of articles on SBRT in the last decade. The intent of SBRT treatment has been to deliver noninvasive tumor-ablative doses to sharply demarcated lesions so that clinical outcomes comparable to surgery could be achieved without surgical complications. The majority of published clinical data describes the treatment of lung, liver and spinal tumors. The radiobiology of short-course, high-dose-per-fraction regimens suggests that utilizing SBRT, with significant local dose escalation even to curative doses, is feasible. The number of fractions and total doses currently in clinical use varies widely in the literature, typically ranging from 60 Gy delivered in 10 fractions to 30 Gy delivered in a single fraction.

Educational Objective:
To present the technical issues for clinical implementation of SBRT as reported in the AAPM Task Group No. 101 on Stereotactic Body Radiation Therapy. Including the following topics:

1. Equipment and space considerations
2. Time and personnel considerations
3. Acceptance and commissioning requirements
4. Localization devices
5. Treatment-planning systems
6. Treatment-delivery and auxiliary systems
7. Image guidance, patient alignment and verification systems
8. Quality assurance procedures