

## AbstractID: 12143 Title: Establishing a Stereotactic Body radiation Therapy (SBRT) Clinical Program, Part 2: Clinical and Radiobiological Considerations

Stereotactic Body Radiation Therapy (SBRT) has emerged as an important form of cancer therapy with broad application across a spectrum of tumor types in the primary and metastatic settings. The capability of safely administering a very high dose of therapeutic radiation to discrete extracranial tumor sites has raised new questions about the radiobiology of high dose per fraction treatment. Accumulating clinical experiences are yielding new insights into practical aspects of tumor and normal tissue responses to high dose per fraction treatment.

The current practice of SBRT has evolved to some extent from knowledge gained from principles learned from the practice of cranial stereotactic radiosurgery (SRS). For the integration of SBRT into clinical practice, medical physicists and radiation oncologists are advised to collaborate closely to establish clear guidelines for normal tissue dose constraints and tumor dose prescription practices that are suitable to their own clinical environment. Published literature relevant to this objective will be discussed. A consistent strategy for contouring sensitive organs is encouraged. The technological challenges introduced by the high dose and high precision paradigm of SBRT are presented and the vital relationship between physicist and physician in this context cannot be overemphasized.

The radiobiological issues that have been parsed by this new paradigm of treatment will be explored, including understanding of conventional, hypofractionated and single dose treatments, radiobiological modeling, and the concepts of equivalent doses. Future trends in SBRT will be discussed. Clinical outcomes after SBRT in a variety of setting will be summarized.

### **Learning Objectives:**

1. Review and understand the major issues related to the use SBRT for, including key strategies for uniform contouring and determination of organ tolerances.
2. Review and understand the common clinically observed normal tissue responses to SBRT and the inferences to be drawn regarding the practical radiobiology of high dose per fraction therapy
3. Discuss these new paradigms of fractionation as they relate to conventional regimes, including hypofractionation and single dose treatments and their radiobiological threshold effects.
4. Review potential future application of SBRT