

## AbstractID: 5575 Title: Stereotactic Body Frame Apparatus

**Purpose:** To improve immobilization and setup accuracy of patients undergoing extracranial radiosurgery (SBRT therapy). Make possible SBRT treatments of oversized patients.

**Method and Materials:** Advantages of frame based extracranial therapy are: (i) Reduction of the imprecision of positioning, (ii) Reduction of the geometrical treatment error in case frameless delivery tools malfunction. (iii) Efficient and reliable method of abdomen pressure for decreasing tissue motion effects. (iv) Comfort positioning that diminishes body movements caused by fatigue or pain manifest for an extended period of treatment. To utilize advantages of frame based approach to extracranial radiotherapy, and to also address some of the shortcomings of the existing immobilization devices, the new stereotactic body frame (SBF) has been constructed. The frame has been designed to be light, strong and rigid. The frame allows minimizing the disturbance of the penetrating radiation and facilitates its easy handling by therapists/physicists/physicians. The frame displays necessary rigidity to minimize errors associated with potential deformation. For these reasons the frame, as well as all accessories, have been all built from carbon fiber. The system is additionally equipped with the multimodal marker sources allowing synchronizing images of frame and patient body from a variety of imaging platforms. In summary, the new SBF frame allows dealing effectively with: (i) patient size limitations, (ii) abdominal pressure adjustments and pressure monitoring, (iii) stability and positioning accuracy of the measuring arc, (iv) fixation mechanism connecting frame to the couch (to utilize automatic couch motion capability), (v) facilitating extended distance SAD treatments.

**Results:** The device satisfying considerations discussed above have been constructed. The device's parameters and accessories have been evaluated and its clinical applications defined and verified.

**Conclusion:** The new carbon fiber immobilization frame for SBRT treatments is ready for clinical evaluation.

**Conflict of Interest:** Research supported by a grant from Varian Medical Systems