

## AbstractID: 1623 Title: A Linac-SURLAS-Patient Interface Transport to Minimize Accelerator Usage Time During Simultaneous Thermoradiotherapy

The Scanning Ultrasound Reflector - Linear Arrays System (SURLAS) is a superficial external ultrasound hyperthermia system with 3D power deposition control developed for simultaneous thermoradiotherapy when coupled to a radiotherapy accelerator (Linac). In current clinical practice using a commercial hyperthermia device and a Linac, a simultaneous thermoradiotherapy treatment lasts more than 90 minutes. The goal is to reduce this time to 30 minutes by developing specialized technology to transport the patient and SURLAS in-and-out the Linac room. To this end, we designed a Linac-SURLAS-Patient Interface Transport that meets the following objectives: 1) effectively couples the hyperthermia target to the SURLAS, 2) transports the patient and SURLAS in-and-out the room, 3) easily interfaces with the Linac couch for delivery of a preplanned external beam fraction, and 4) precludes interruption of hyperthermia.

The design phase was completed and fabrication is underway. The transport consists of a weight-supporting C-frame on wheels with a detachable patient table with a radio-translucent section that fits on the Linac couch. A positioning arm for the SURLAS is attached to the patient table but not to the C-frame. The table indexes onto the couch for accurate patient positioning. The C-frame can be retracted, if necessary, leaving the table with the patient and SURLAS secured on the couch. The dimensions and features of the transport system were selected to allow unobstructed rotation of the Linac gantry. The final blueprint and results from preclinical tests will be presented. The transport may have other uses in radiotherapy. (Support: NCI-R01 Grant)