

AbstractID: 2814 Title: The Radiological Physics Center's Anthropomorphic Quality Assurance Phantom Family: New Developments

Purpose: To develop quality assurance (QA) phantoms that simulate specific treatment sites for the purpose of credentialing institutions for participation in NCI-sponsored advanced technology clinical trials.

Materials and Methods: The Radiological Physics Center (RPC) has developed an extensive credentialing program for institutions wishing to participate in clinical trials that use advanced technologies such as IMRT. This program includes questionnaires and irradiation of an anthropomorphic QA phantom specifically designed for the trial. These QA phantoms typically are water-filled plastic shells with imageable targets, avoidance structures, and heterogeneities that contain TLD and radiochromic film dosimeters. Three new trials are presently under development; 1) extracranial stereotactic radiotherapy for liver metastases, 2) IMRT for endometrial or cervical cancer and 3) advanced RT for mesothelioma. New phantoms or target/dosimetry inserts have been designed to meet the credentialing needs for the three trials listed above.

Results: A new liver phantom has been designed and constructed. The liver phantom contains two targets within the liver and three organs at risk (OAR); the stomach, kidney and spine. This phantom will be placed on a 2D reciprocating table to include target motion in the AP and SI directions. A new target/dosimetry insert has been designed for the RPC's existing thorax phantom that will include an OAR for the liver and dosimeters in the lung and in the chest wall. Finally, another target/dosimetry insert has been designed for the pelvic phantom that will include a vagina, cervix, bladder and rectum.

Conclusion: The RPC has been and will continue to be proactive and responsive to the needs of the study groups as new treatment modalities are used for new clinical trials.

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