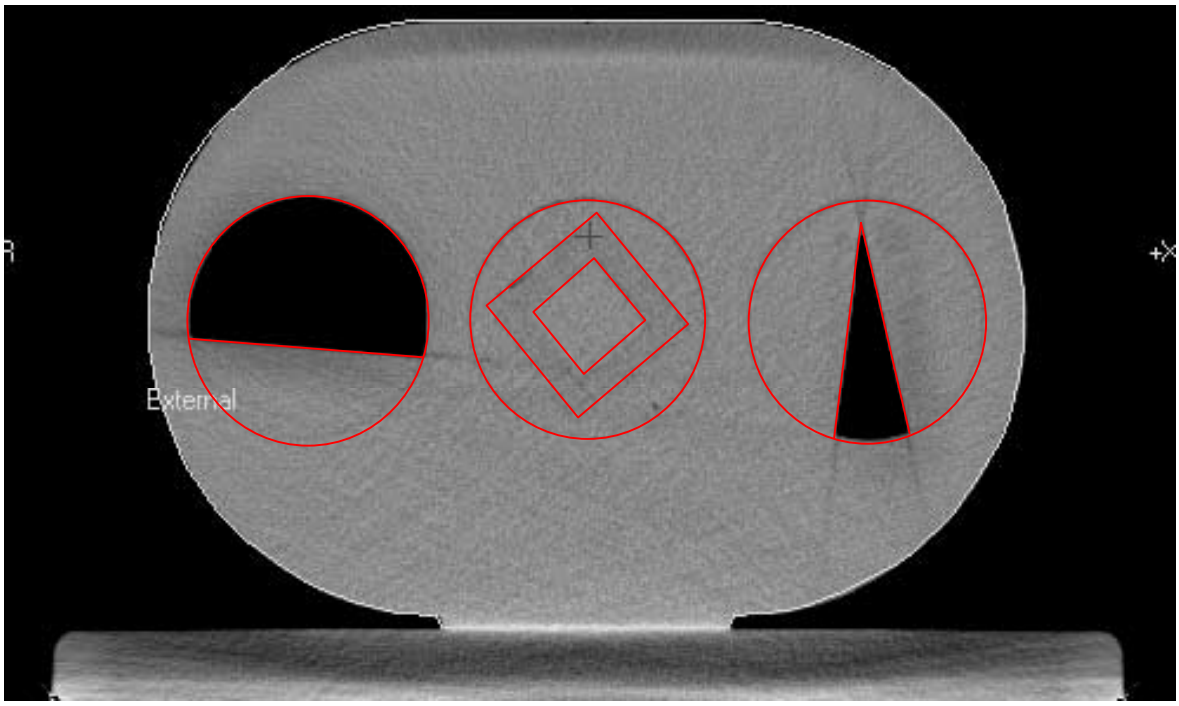
QUASAR Body Phantom

A cost effective tool designed to test the complex 3D geometrical features of CT simulators and radiation therapy planning systems, the QUASAR Body Phantom incorporates a variety of test objects in a solid acrylic housing. The QUASAR Body Phantom and its partner the QUASAR Beam Geometry Phantom were developed[(1)] by Jake Van Dyk at the London Regional Cancer Centre. These phantoms are designed to enable many of the nondosimetric quality assurance tests recommended by TG 53[(2)].

Features and functions that can be tested using the QUASAR Body Phantom include:

- Geometric accuracy of 2D images and 3D image reconstructions
- 2D and 3D measurement tools including volume calculation accuracy
- Automatic, semi-automatic and manual boundary identification tools
- Automargining tools
- Representation and manipulation of contoured patient anatomy
- Dose volume histograms
- Conversion of CT numbers to relative electron densities
- Comparison of display on CT sims, RTPS and other imaging work stations
- Image transfer, storage, retrieval, Dicom tools on all workstations



The QUASAR Quality Assurance System for Advanced Radiotherapy has been designed to support the testing of a wide variety of nondosimetric functions of Radiation Therapy Planning Systems and CT simulators using a single set of test objects.

A valuable part of any quality assurance program, the QUASAR phantoms can improve the efficiency of your quality assurance program. The phantoms should be used for regularly scheduled testing, as well as commissioning new systems and upgrades, and testing repairs.

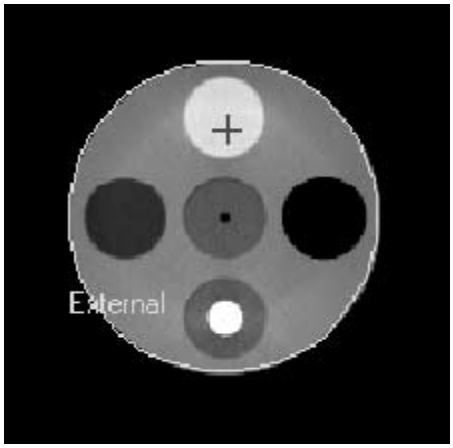
The QUASAR system provides you with the confidence that your radiation treatment planning software and CT simulators are performing to their full potential.

Body Phantom Specifications

- Main body component, acrylic, oval shape, 20 cm high, 30 cm wide, 8 cm long
- 3 openings for Cylindrical Inserts, each opening is 8 cm diameter by 8 cm long
- Electron density extension, 12 cm diameter with 5 openings at 2.5 cm diameter
- Laser alignment marks
- Phantom overall height, 25.4 cm, width 36.6 cm, length 28.4 cm, weight 9.3 kg
- Materials: acrylic, Delrin, polyethylene, epoxy resin (Electron Density rods), rubber
- Container for storage and handling, optional shipping case
- User's Guide with Quality Assurance Worksheets

Cylindrical Inserts

- 27 cc acrylic cube within a 125 cc Delrin cube, within an 8 cm diameter acrylic cylinder, 8 cm long
- 20° air wedge (40 cc) within an 8 cm diameter acrylic cylinder including two Delrin cylinders:
  - 5 mm diameter by 5 cm long (.98 cc)
  - 10 mm diameter by 5 cm long (3.9 cc)
- 60° air wedge in 8 cm diameter acrylic
- Electron Density rods, 2.5 cm diameter by 2.5 cm long; relative electron density (RED)
  - Lung (Inhale) RED = 0.190
  - Polyethylene RED = 0.945
  - Water Equivalent RED = 1.002
  - Trabecular Bone RED = 1.117
  - Dense Bone RED = 1.512



References:

1) A Quality Assurance Phantom for Three-Dimensional Radiation Therapy Treatment Planning, Tim Craig, Denis Brochu, and Jake Van Dyk; Int. J. Radiation Oncology Biol. Phys., Vol. 44, No. 4, pp. 955-966, 1999.
2) AAPM Radiation Therapy Committee Task Group 53: Quality Assurance for Clinical Radiotherapy Treatment Planning, Benedick Fraass, Karen Doppke, Margie Hunt, Gerald Kutcher, George Starkschall, Robin Stern, Jake Van Dyke; Med. Phys. 25 (10), October 1998, pp. 1773-1829.

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