

Individual Patient Shaped Phantoms for Treatment Verification

Due to the complexity of treatment techniques such as IMRT, verification measurements should underpin the dose calculations done by the treatment planning system. Although planning systems like Corvus (Nomos) allow a recalculation in a phantom for verification purposes ideally the patient plan and an individual shaped phantom should be used.

The dkfz scotch cast mask system used for fixation purposes has been filled with materials like bee wax, Agarose (like gelatin) and superflab and used as a phantom. While superflab is perfect tissue equivalent it couldn't be used for its expense and the high temperatures needed to be melt. Bee wax was found to be less tissue eq. for the used beams qualities and drilling a hole to set a detector correctly is difficult. The material of choice is Agarose that mixed with hot water gives a stable and easy to handle mass. A detector can be set easily with a simple guiding device while for tissue equivalence a correction factor is needed. (0.985 /15 MV and 0.97 / 6 MV).

IMRT patients (head and neck cases) retrospectively have been verified using this new phantom concept. Absolut dose measurements were performed delivering the original patient plan showing dependable results (0.18 -8.3% mean 2,5% to calculations). While easy to use, verification time can still be improved by a multi-detector dosimeter.