

Purpose: Developed a daily QA procedure for checking; 1) the accuracy of the imager isocenter and 2) the auto couch motion accuracy of the On-Board Imager (OBI) device developed by Varian. This QA procedure will assure that the imager isocenter matches the mechanical isocenter and that the positional difference detected by the imager software can be reliably transferred to couch motion.

Method and materials: The Cube Isocenter Phantom provided by Varian was used for this daily QA procedure. Two sets of bb were used to define 2 separate spatial locations (points.) In each set, one bb is on the anterior side (AP bb) and the other (Lat bb) is on the lateral side of the phantom. The first set defines the isocenter (at the phantom center) and the second set defines a point 1.5 cm anterior, inferior, and lateral from the isocenter. An axial CT scan was acquired with a slice thickness of 2 mm. A plan with an AP MV and a Lat KV fields was created in Eclipse with the corresponding DRRs attached. The QA procedure starts with setting up the phantom center at the mechanical isocenter and taking AP MV and Lat KV images. The locations of the central bbs were first checked to get the accuracy of the imager isocenter. If that accuracy is acceptable, the central bbs in the KV/MV images were then manually moved to overlay to the off-axis bbs in the DRR images. The shifts obtained will be applied to remotely move the couch. All data will be recorded.

Results: This OBI QA procedure is simple and easy to implement. It usually takes 10-15 min to do the QA. The accuracy the procedure can detect is better than 2mm.

Conclusion: The suggested QA procedure is clinically robust and reliable