

Intensity modulated radiation therapy (IMRT) treatments at our clinic are performed using a commercial computer-controlled treatment planning and delivery system (Peacock/Corvus, NOMOS Corp.) and a Clinac 600C/D (Varian Corp.). Target volumes are treated with the accelerator in the arc mode and using sequential 1.68 cm thick slices with the patient moved between each successive slice delivery. Due to the method of delivery, superficial doses from a course of IMRT may be significantly different from doses delivered with conventional radiation therapy. Understanding these differences is becoming increasingly important as more and more patients are being treated with this technique. A water equivalent cylindrical phantom was custom designed to evaluate dose distributions in the buildup region using thermoluminescent dosimetry chips. IMRT treatment plans were calculated for centrally located, off-centered, and superficial targets. To provide a comparison against conventional therapy, the treatment plans were recomputed to deliver the same target doses using conventional techniques. For all three targets, superficial doses from IMRT treatments were higher than doses from conventional radiation therapy treatments. The measured IMRT doses were also higher in all three cases than the doses calculated using the IMRT treatment planning system. Doses measured in the buildup region from a treatment by IMRT of a superficially located target indicated that bolus would be required to provide the prescribed dose at the surface.