AbstractID: 2609 Title: IMRT in Gynecologic Malignancies

Intensity modulated radiation therapy (IMRT) is increasingly used for the treatment of gynecologic malignancies. In a survey conducted in 2004, we found that over 35% of the radiation oncology clinics with IMRT were using this modality in gynecologic patients. While treatment planning is an important aspect of gynecologic IMRT, successful implementation requires careful attention to detail throughout the entire planning process. At the University of Chicago, IMRT planning for whole-pelvic gynecologic patients begins with a CT simulation. Patients are treated in the supine position, and customized immobilization devices (alpha cradles) are fabricated which are subsequently indexed to the treatment table. Oral, intravenous and rectal contrast are used to aid in the delineation of the CTV and surrounding normal tissues. The CTV consists of the contrast enhanced vessels (plus a 2 cm margin) to identify common, external and internal nodal regions along with the upper half of the vagina, parametrial tissues, presacral region and uterus (if present). A PTV is added to the CTV based on measured set-up uncertainties and organ motion data. Normal tissues that are contoured include the bladder, rectum, small bowel region and pelvic bone marrow. For treatment planning, 7 (small patients) or 9 (larger patients) equally spaced, co-planar beams are used. Input parameters derived for the PTV and surrounding normal tissues were developed over time, and their evolution will be discussed. Values used for a number of commercially available planning systems will also be presented. Treatment plans are evaluated primarily based on the PTV coverage and normal tissue DVHs. For the PTV, acceptable plans are defined as those which cover >98% of the volume with the prescription dose while <2% of the PTV receives >110% of the prescription dose. Evaluation of small bowel is based on a normal tissue complication probability (NTCP) curve for the incidence of acute gastrointestinal toxicity of IMRT patients treated in our clinic. From this analysis, acceptable plans are those in which <200 cc of the small bowel region receives 45 Gy (prescription dose). Acceptability criteria for the bladder, rectum and pelvic bone marrow will also be discussed. At our institution, quality assurance is performed using an independent monitor unit verification (MUV) program and patient-specific measurements. In gynecologic patients, an acceptable disparity between the treatment planning system and MUV calculation is 0.2% +/- 1.1%. An additional consideration is that the relatively large treatment fields in whole pelvic gynecologic IMRT necessitate splitting individual fields to accommodate the limitations of the MLC carriage motion. The dosimetry of these split fields and measurements of the junction region will be presented.

Educational Objectives:

1. To understand the practical aspects of IMRT planning for gynecologic malignancies
2. To describe the criteria for IMRT plan evaluation in gynecologic patients
3. To understand the IMRT quality assurance issues for this disease site