Survival of cervical cancer patients with positive para-aortic lymph nodes (PALN) is poor. Results of RTOG-7920 suggested 45Gy PALN radiation improves survival. Dose-escalation by using conventional-planning techniques, hyperfractionation, and chemotherapy (RTOG-9210), resulted in unacceptable bowel toxicity. This study evaluated the potential for dose-escalation to areas of positive PALN by IMRT while sparing surrounding critical structures. Positron-emission-tomography (PET) images were fused to planning CT scan images to delineate areas of gross tumor volume (GTV). The para-aortic bed from T12 to L4 was contoured as the clinical tumor volume (CTV). In the proposed method, the pelvic field was treated with classical delivery methods. The PALN and pelvic regions were abutted at the isocenter, paced at the L4/L5 interspace. This allowed the whole pelvis to be treated using classical methods while the PALN region was treated with IMRT. The planning goal was to deliver 59.4Gy to GTV and 50.4Gy to CTV, representing a dose escalation to the compared to traditional 45Gy to PALN. Critical structure dose limits were set to the acceptable tolerance rather than the absolute maximum. A 4mm planning target margin was used for GTV and CTV. Seven equally spaced 18MV photon fields were used. Evaluation of the IMRT plan revealed that there was adequate and uniform coverage of both the GTV and CTV while the critical structure doses were below dose levels of conventional planning and within tolerance limits. This work was supported in part by NCI R01-CA84409 and R01-CA85797 and a corporate grant by Computerized Medical Systems.