

It remains a technical challenge of bilateral lung cancer to limit the dose to acceptable tolerances in the liver, heart, both lungs, and spinal cord, when the planning target volume exists at the level of the heart. In order to avoid these dose limitations, we developed a standard methodology for many patients with the use of the Theraplan Plus 3D planning system. Tumors and organ volumes were reconstructed in 3D following a CT planning scan. In 3D planning, the gross tumor volume (GTV) was outlined by the physician on the CT slices. The planning target volume (PTV) was determined by adding an automatic 2-cm margin around the different tumor volumes. By arranging 4-field photon beams with beam directions that are well aligned with the mediastinal structures and with appropriate wedges, multiportal cerrobend blocks, and beam weights, a larger amount of normal tissues can be spared. The 3D plans were compared with the traditional 2D plans in each patient using dose-volume histograms (DVH's). The doses to normal tissue volumes were considerably reduced with the 3D plans, so that the mean dose to the tumor volume can be increased by more than 40%. The dose that could be delivered at the lowest target volume, without exceeding tolerances of those critical organs was 70 Gy with 3D planning.