

**Purpose:** To examine whether the Dose Mass Histogram (DMH) concept can be better associated with the expected lung complications than the widely used Dose Volume Histogram (DVH) concept. **Materials and Methods:** A group of lung cancer patients was used to clinically quantify the difference between DVHs and DMHs. Treatment planning was carried out in the Pinnacle<sup>3</sup> treatment planning system. The prescribed dose of 50Gy was delivered over a period of 5 weeks at a daily dose of 2Gy. The plans were created using 5 IMRT beams of 6MV photon energy. The DMHs were computed so that the volume of each CT voxel is weighted by its local density. The influence of the deviation between DVHs and DMHs on the clinical endpoint of radiation pneumonitis was estimated. **Results:** For the group of patients, according to the DVH, the right lung receives 18.9Gy, whereas according to the DMH it receives 24.9Gy (6.0Gy difference). Interpreting these figures in terms of lung response, DVH gives 10.1% probability for lung complications compared to 26.4% given by DMH for the Relative Seriality model. The respective total control probabilities,  $P_B$  are 93.3% and 87.0%, whereas the corresponding total complication probabilities,  $P_1$  are 10.1% and 17.5%. **Conclusions:** The results indicate that the use of IMRT in lung cancer radiotherapy can encompass the often large PTV required while minimizing the volume of the organs at risk receiving high dose. The use of the proper descriptor of the 3D dose distribution is important factor because it is related to the clinical outcome of the applied therapy. The effectiveness of the dose distribution seems to be closer related to the lung complications when using the DMH rather than the DVH concept. Furthermore, the expected lung complications appear to be overestimated when using the DVH concept.