

**Purpose:** To experimentally determine the accuracy of contralateral lung dose calculated by Eclipse for mesothelioma IMRT plans.

**Materials and Methods:** Two planning techniques were used to create 9 mesothelioma IMRT plans in Eclipse, which were then applied to a Rando torso phantom. Group A consisted of 5 plans with 160° of the contralateral side free from entrance beams while the 4 Group B plans had 80°-90° free. MOSFETs were placed at 10 coplanar points within the contralateral lung of the phantom, and doses measured for each field for each plan. These were compared with doses calculated using the pencil beam algorithm (modified Batho) in Eclipse. Two controls (ipsilateral AP/PA and 40x40cm AP/PA) were evaluated.

**Results:** The 40x40cm AP/PA control plan showed good agreement between Eclipse and experimental results with the difference being 1.04% +/- 3.62% (1 stdev), while the ipsilateral only AP/PA plan showed a disagreement of -33.3% +/- 6.9% (Eclipse was cold compared with measurements) suggesting poor scatter modeling. The overall average difference between measured and calculated daily doses of Group A and B plans was -21.1% +/- 15.7% (-6.98cGy +/- 5.2cGy) and -9.8% +/- 29% (-6.58cGy +/- 19.5cGy), respectively. The differences were dependent on whether the points were in or out of individual fields. The average difference for points in field for Group A and B plans were -5.5% +/- 23.4% (-1.169 +/- 4.99cGy) and +3.04% +/- 37.9% (1.57 +/- 19.6cGy), respectively. This increased to -49.2% +/- 10.9% (-5.8 +/- 1.28cGy) and -41% +/- 14.9% (-8.66 +/- 3.12 cGy), respectively, for points outside the field.

**Conclusions:** Eclipse adequately models lung dose in field, but underestimates scatter dose out of field by up to 50%. This should be considered when evaluating contralateral lung DVH's, especially when attempts are made to use IMRT to lower mean lung dose.