Purpose: To determine the magnitude of error in the manual delineation of normal anatomical structures.

Methods and Materials: The heart, esophagus, and spinal cord were manually contoured on six CT image data sets of the thorax by six dosimetrists. Each data set was contoured by one dosimetrist five times, as well as by all five other dosimetrists. The magnitude of the discrepancies in delineating the contours was assessed.

Results: Generally, the inter-dosimetrist discrepancies were more than the intra-dosimetrist discrepancies. Inter-dosimetrist contouring discrepancies were: esophagus average 0.4 cm, maximum 2.4 cm, heart average 0.7 cm, maximum 5.3 cm, and spinal cord average 0.2 cm, maximum 0.9 cm. Intra-dosimetrist contouring discrepancies were: esophagus average 0.4 cm, maximum 2.4 cm, heart average 0.4 cm, maximum 2.6, and spinal cord average 0.1 cm, maximum 0.7 cm.

Conclusions: Significant discrepancies may occur when various dosimetrists manually contour normal anatomic structures.

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