

Dosimetric Correlation of Pneumonitis in Pediatric
Sarcoma and Hodgkin's Lymphoma Patients
Receiving Radiation Therapy

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ABSTRACT

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by

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Pediatric sarcoma and Hodgkin's lymphoma patients often receive radiation therapy for local tumor control. Unfortunately, radiation can be deleterious to the healthy tissues adjacent to the target volume, leading to acute effects including radiation pneumonitis. Characterized by a cough, fever, and shortness of breath, radiation pneumonitis or inflammation of the lung develops in 5% to 15% of patients receiving thoracic irradiation. In this study, clinical complication data on radiation pneumonitis and dose-volume data for the lung were reviewed for 40 patients with Hodgkin's lymphoma and 23 patients with thoracic sarcomas; this enabled evaluation of the applicability of dose-volume constraints derived from adult lung cancer patients and determination of dosimetric planning guidelines for pediatric lung. Three of the Hodgkin's lymphoma patients and one of the sarcoma patients developed radiation pneumonitis within six months of radiotherapy. Only one patient from each tumor type required the use of steroids (CTC grade 2) for the management of their radiation pneumonitis. Of the three patients with Hodgkin's lymphoma who developed radiation pneumonitis, two received 8 Gy to their entire right lung. Patients presenting with grade 2 pneumonitis had higher total lung DVHs, a $V_{20} \geq 35\%$, and a mean lung dose above 16 Gy. Findings suggest that irradiated volume and delivered dose may be used in the clinical setting to predict patients at risk for development of pneumonitis. Early intervention in this group of patients may help reduce or eliminate radiation-induced lung side effects.