

Abstract Submitted
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Biological Modeling Based Outcome Analysis (BMOA) in 3D Conformal Radiation Therapy (3DCRT) Treatments for Lung and Breast Cancers ANIL PYAKURYAL, Northwestern Memorial Hospital / University of Illinois at Chicago, Chicago, IL, CHIU-HAO CHEN, University of Illinois at Chicago, SUDARSHAN DHUNGANA, Oakland University, Rochester, MI — 3DCRT treatments are the most commonly used techniques in the treatment of lung and breast cancers. The purpose of this study was to perform the BMOA of the 3DCRT plans designed for the treatment of breast and lung cancers utilizing HART program (*Med. Phys.* 36, p.2547(2009)). The BMOA parameters include normal tissue complication probability (NTCP), tumor control probability (TCP), and the complication-free tumor control probability (P+). The 3DCRT plans were designed for (i) the palliative treatment of 8 left lung cancer patients (CPs) at early stage (m=8), (ii) the curative treatment of 8 left lung CPs at stages II and III (k=8), and (iii) the curative treatment of 8 left breast CPs (n=8). The NTCPs were noticeably small (<2%) for heart, lungs and cord in both types of treatments except for the esophagus in lung CPs (k=8). Assessments of the TCPs and P+s also indicated good improvements in local tumor control in all plans. Homogeneous target coverage and improved dose conformality were the major advantages of such techniques in the treatment of breast cancer. These achievements support the efficacy of the 3DCRT techniques for the efficient treatment of various types of cancer.

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