Application of Histogram Analysis in Radiation Therapy (HART) in Intensity Modulation Radiation Therapy (IMRT) Treatments ANIL PYAKURYAL, Northwestern Memorial Hospital / University of Illinois at Chicago, Chicago, IL. — A carcinoma is a malignant cancer that emerges from epithelial cells in structures through out the body.It invades the critical organs, could metastasize or spread to lymph nodes.IMRT is an advanced mode of radiation therapy treatment for cancer. It delivers more conformal doses to malignant tumors sparing the critical organs by modulating the intensity of radiation beam.An automated software, **_HART_** (S. Jang et al.,2008,Med Phys 35,p.2812) was used for efficient analysis of dose volume histograms (DVH) for multiple targets and critical organs in four IMRT treatment plans for each patient. IMRT data for ten head and neck cancer patients were exported as AAPM/RTOG format files from a commercial treatment planning system at Northwestern Memorial Hospital (NMH).HART extracted DVH statistics were used to evaluate plan indices and to analyze dose tolerance of critical structures at prescription dose (PD) for each patient. Mean plan indices (n=10) were found to be in good agreement with published results for Linac based plans. The least irradiated volume at tolerance dose (TD50) was observed for brainstem and the highest volume for larynx in SIB treatment techniques. Thus HART, an open source platform, has extensive clinical implications in IMRT treatments.

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Date submitted: 14 Nov 2008

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