AbstractID: 13812 Title: Characterization of Mesothelioma and tissues present in contrast-enhanced chest CT scans

Purpose: To characterize the Hounsfield Unit (HU) distributions of mesothelioma and other tissues present in contrast-enhanced chest CT scans, investigate the influence of scanner type, filter and reconstruction kernel on these HU distributions, and assess interpatient variability.   **Method and Materials:** The database consisted of 28 contrast-enhanced chest CT scans from different patients. For each scan, three to six randomly selected regions of interest were manually outlined within each of thirteen tissues, including mesothelioma. For each tissue, the empirical percentiles in HU values were calculated as well as the interpatient variability. The HU distributions for different scanner as well as filter and reconstruction kernel were compared.   **Results:** The HU distributions of blood-containing tissues overlap, and the HU distributions of pleural effusion, mesothelioma, muscle and liver overlap. The HU distribution of fat has the least overlap with other tissues. Fat and muscle have the lowest interpatient variability as well as the narrowest distributions, while fat with artifact has the widest distribution. A low resolution filter and reconstruction kernel has the narrowest distribution and blood-containing tissues have the highest interpatient variability.   **Conclusion:** Characterization of tissues is informative and useful. Due to their overlapping HU distributions and close spatial proximity to one another, separating pleural effusion, mesothelioma, muscle and liver from one another is a difficult task based on gray-level thresholding alone. Metal artifact widens HU distributions while low resolution filter and reconstruction kernel narrow HU distributions. Lastly, the presence of contrast increases interpatient variability.