

AbstractID: 14019 Title: The Lung Image Database Consortium (LIDC) and Image Database Resource Initiative (IDRI): A Completed Public Database of CT Scans for Lung Nodule Analysis

PURPOSE: The Lung Image Database Consortium (LIDC) was created by the National Cancer Institute to create a public database of annotated thoracic computed tomography (CT) scans as a reference standard for imaging research. This effort was augmented by the Foundation for the National Institutes of Health through the Image Database Resource Initiative (IDRI). The LIDC/IDRI Database is intended to facilitate computer-aided diagnosis (CAD) research for lung nodule detection, classification, and quantitative assessment.

METHOD/MATERIALS: The LIDC/IDRI Database contains 1018 CT scans collected retrospectively from the clinical archives of seven academic institutions. Each scan was reviewed asynchronously by four thoracic radiologists through a two-phase process. During the first "blinded read" phase, each radiologist independently reviewed the scans and marked lesions they identified according to one of three categories: "nodule \geq 3 mm," "nodule $<$ 3 mm," and "non-nodule \geq 3 mm." The second "unblinded read" phase allowed each radiologist to review the marks of all other radiologists and confirm or modify their own marks. For any lesion that a radiologist marked as a "nodule \geq 3 mm," that radiologist constructed nodule outlines in every CT section in which the nodule appeared and provided subjective ratings of nodule characteristics such as subtlety, spiculation, solidity, and margin. The Database contains all images and radiologist marks for use by investigators.

RESULTS: The Database contains 7371 lesions marked by at least one radiologist as either a "nodule \geq 3 mm" or a "nodule $<$ 3 mm." 2669 lesions were marked by at least one radiologist as a "nodule \geq 3 mm," of which 777 (29.1%) were assigned such a mark by only a single radiologist, and 928 (34.8%) received such marks from all four radiologists.

CONCLUSIONS: The LIDC/IDRI Database is expected to become a powerful resource as a reference standard for the medical imaging research community.