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Title: Probability of malignancy based on automatic segmentation and software measurements of nodules in the Danish lung cancer screening trial (DLCST)

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Body: Introduction and aim With the widespread use of chest CT in clinical and screening settings pulmonary nodules are detected more frequently than ever, and the risk of malignancy needs to be determined. Materials and methods In DLCST, 4,104 current and former smokers, with a history of at least 20 pack years and age between 50-70 years, were randomized to either five annual multi-slice low-dose CT screenings or no screening. All participants had an annual visit to the screening clinic where lung function tests and questionnaires concerning health, lifestyle, smoking habits and psychosocial consequences of screening were performed. All scans were double-read by two experienced chest radiologists and the location and size were registered. Nodules between diameters of 5-15 mm were considered indeterminate, and rescanned after three months. Participants with nodules larger than 15 mm were referred to diagnostic workup, as were those with growing nodules. Lung cancer was diagnosed by pathological evaluation. Using volumetric software nodules were segmented automatically and for the solid and sub-solid components mass and volume were calculated as well as the largest axial diameter. All automated nodule-segmentations were visually reviewed for correctness and adjusted if needed. Results and conclusion We are currently analyzing the data by logistic regression with malignancy as outcome and nodule measurements and risk factors such as age, sex, smoking status and history and COPD-status as explanatory variables. The results will be presented at the ERS 2012 in Vienna.