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**Impact of tube current, kernel and pitch in different ultra-low dose
CT protocols on the detectability of lung nodules with solid and
subsolid texture – an anthropomorphic Phantom study**

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The imminent introduction of CT screening for lung cancer raises many questions about its practical implementation.

In this phantom study, the detectability of lung nodules was tested with a 3rd generation dual-source CT scanner system under various CT protocols, considering tube current, kernel and pitch. For this purpose, artificial lung nodules were scattered in a phantom thorax and scanned under different combinations of tube current (30/60/90/120 mAs), kernel (medium-soft and sharp lung kernel) and pitch (non-high pitch 1.2 and ultra-high pitch 3.2). The images were analysed by an experienced reader and an inexperienced reader.

It was found that a high tube current of 120 mAs achieved significantly better detectability for subsolid nodes with a density of -800 HU and lower false negatives. For the other nodules, no specific tube current proved to be favourable. There was no significant difference between the kernels. The non-high pitch protocol proved to be superior for the experienced radiologist.

In conclusion, this study results underline the meaningfulness of the ALARA principle: namely, that for comprehensive screening, the intention to apply the least amount of radiation dose to screening participants should be well-balanced with reliable nodule detection.