

# Low dose CT for chest exams with Incisive CT

## Introduction

Low dose chest CT (LDCT) plays a valuable role in the detection of lung cancer. The Philips Incisive CT provides the tools needed to make LDCT chests a routine procedure. Exam cards (EC) with dose modulation and low kV settings ensure the achievement of routine low dose scans. Interactive advanced visualization, such as lung nodule assessment, aid the operator in providing the clinical results the radiologist needs to make an accurate and timely diagnosis.

### Background

Low dose chest CT is a common noninvasive procedure on a CT machine that takes seconds to perform. It is commonly used to evaluate lung nodules or other parenchymal and pleural diseases in the lung. Lung images have a high contrast-to-noise ratio due to the presence of air, and therefore lend themselves to low dose imaging. Lung cancer screening (LCS) is one of the latest applications used for low dose lung imaging. Following the results of NLST<sup>1</sup> and NELSON<sup>2</sup> trials, LCS using CT is recommended in asymptomatic patients with a heavy smoking history (e.g., 30 pack years). LDCT is recommended for patients between the ages of 50 to 80 years of age. Low dose chest imaging is also used for detecting pleural nodules and changes and the evaluation of lung parenchyma for diseases like pneumonia.

### Incisive CT

Philips Incisive CT can help meet an organization's most pressing challenges, helping organizations find the most economical system while still providing the best care for their patient population. Factoring in that this may be the one and only scanner at this location, the technologist wants to provide consistency from user to user and take the guess work out of setting up the scans. Incisive CT offers intellect at every step, from acquisition through results, and across all fronts: financial, clinical and operational.

## Case 1 – Clinical history

Middle-aged male patient with a past history of smoking was referred for a screening CT chest. The patient was not exhibiting any chest pain, shortness of breath or cough. A nodule was seen in the left lower lung on the CT scan and was evaluated using lung nodule assessment. A 12-month follow up scan was recommended.

kVp	100 kVp	CTDI <sub>vol</sub>	3.0 mGy
mAs	37 mAs	DLP	89.1 mGy*cm
Scan time	3.8 sec	Effective dose	1.2 mSv
Scan length	29.7 cm	Reconstruction filter	B
Rotation time	0.5 sec	Slice collimation	1 mm x 0.5 mm
Pitch	1.2	iDose <sup>4</sup>	Level 5

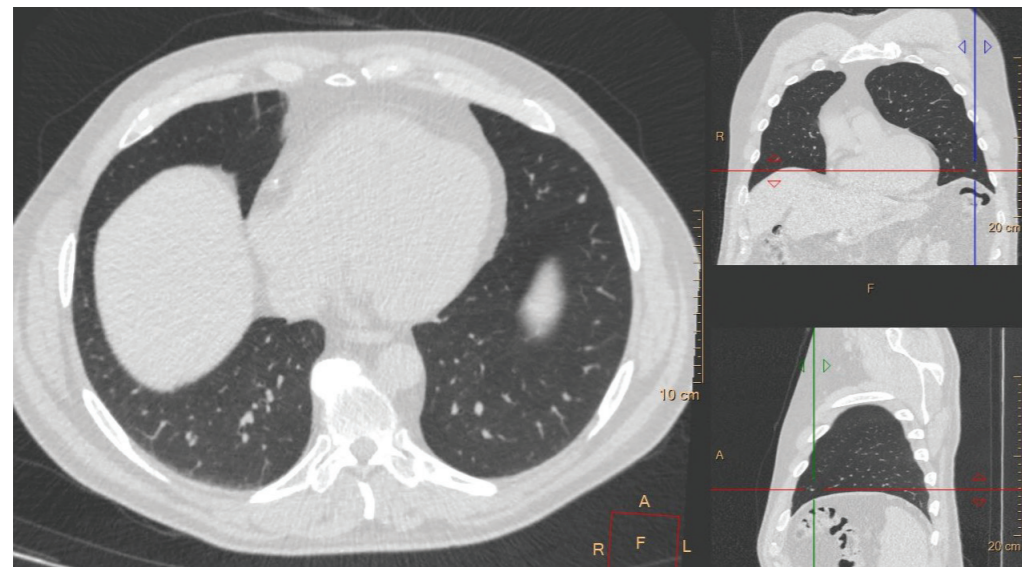


Figure 1- Axial view demonstrating small nodule.

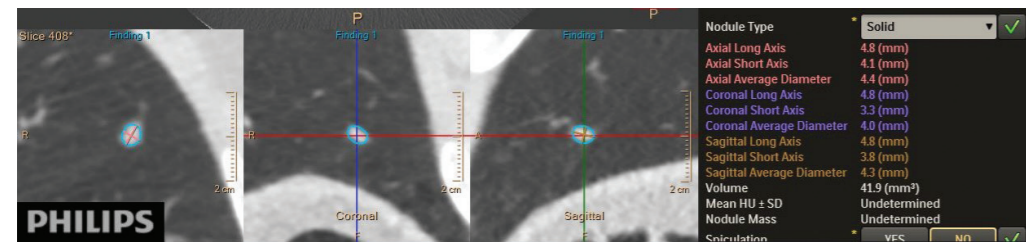


Figure 2- Lung nodule assessment showing measurements and location of small nodule in the left lower lobe.

## Case 2 – Clinical history

Middle-aged male patient with a long history of tobacco use was referred for lung screening exam. The low dose chest CT exam demonstrated a solid pulmonary nodule measuring > 4 cm in the right lower lung. The patient was recommended for a biopsy.

kVp	120 kVp	CTDI <sub>vol</sub>	3.0 mGy
mAs	37 mAs	DLP	102.0 mGy*cm
Scan time	3.6 sec	Effective dose	1.4 mSv
Scan length	29.7 cm	Reconstruction filter	B
Rotation time	0.5 sec	Slice collimation	0.9 mm x 0.45 mm
Pitch	1.2	iDose <sup>4</sup>	Level 5

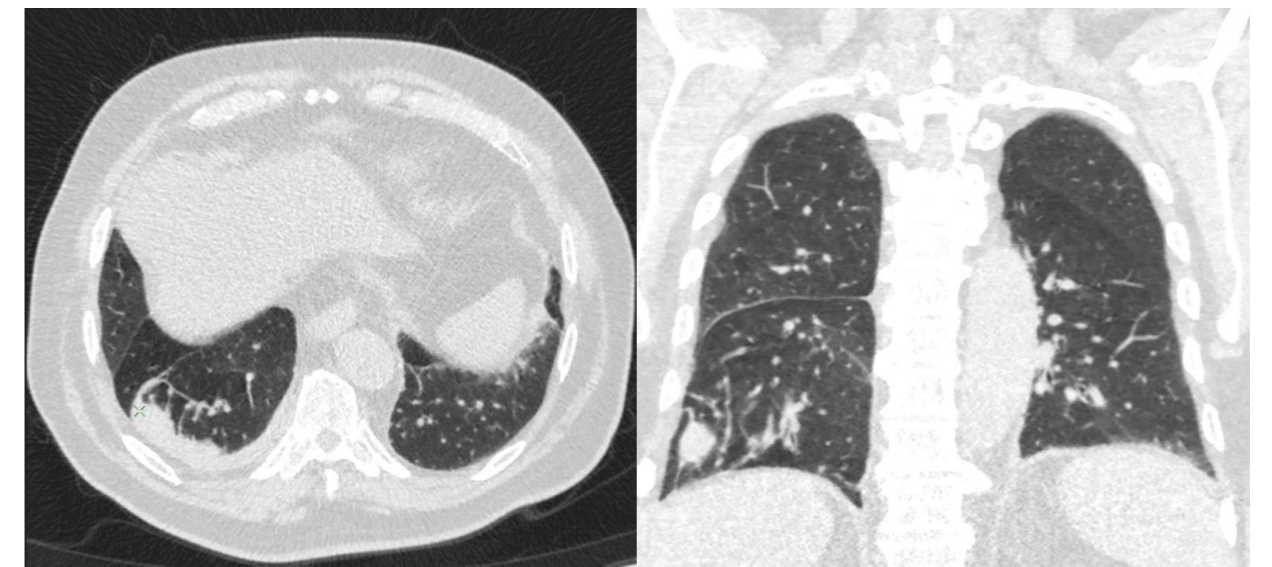


Figure 3A

Figure 3B

Lung screening CT of the chest shows a solid pulmonary nodule in right lower lobe. Axial and coronal views also demonstrate diffused densities in the right lower lung.

## Conclusion

Multiple countries throughout the world have developed programs to study the benefits of LDCT for lung screening. The Philips portfolio of CT scanners, including the Incisive CT, provides the ability to achieve low doses while also providing multiple tools on the scanner console to aid in that process. With its tube for life guarantee, the Incisive CT offers economic benefits for the administration as well as operational benefits with OnPlan for the operator. These tools make it possible to provide routine low dose lung screening for the organization's entire patient population.

## References

1. The National Lung Screening Trial Research Team, Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening; Engl J Med 2011; 365:395-409.
2. Koning H de et. al., Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial; N Engl J Med 2020; 382:503-513.

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Results from case studies are not predictive of results in other cases. Results in other cases may vary.