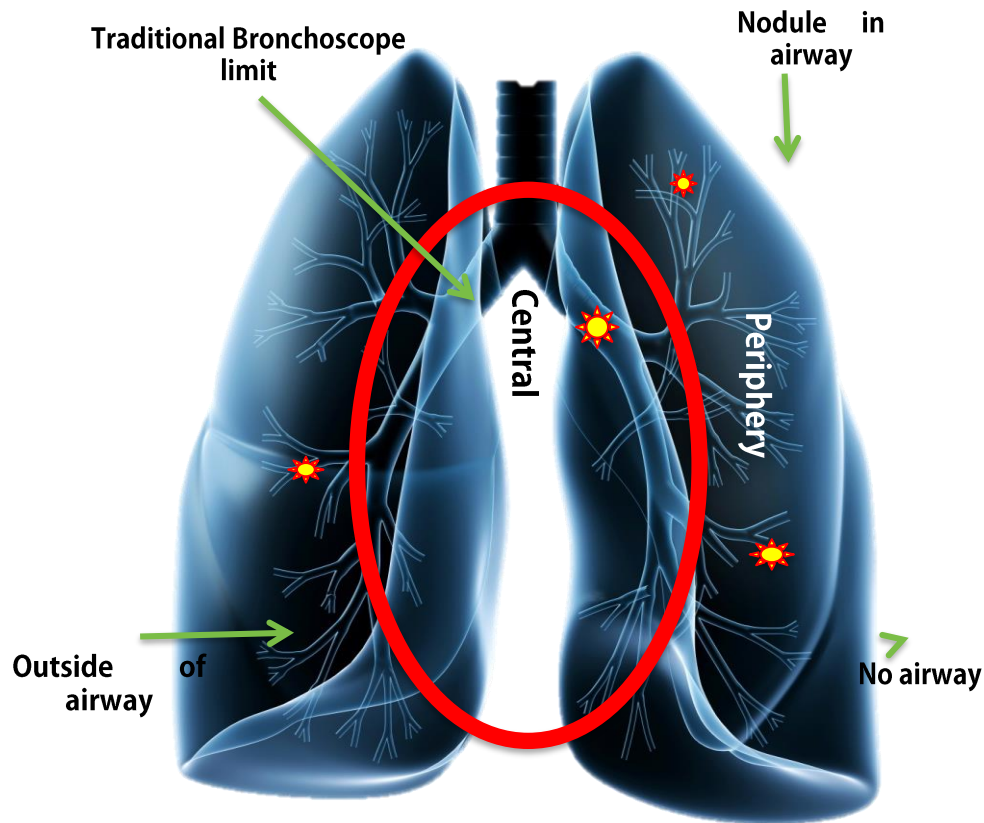


# LungPoint Virtual Navigation Bronchoscopy Electromagnetic Navigation Bronchoscopy Endobronchial Ultrasound Guided Sheath



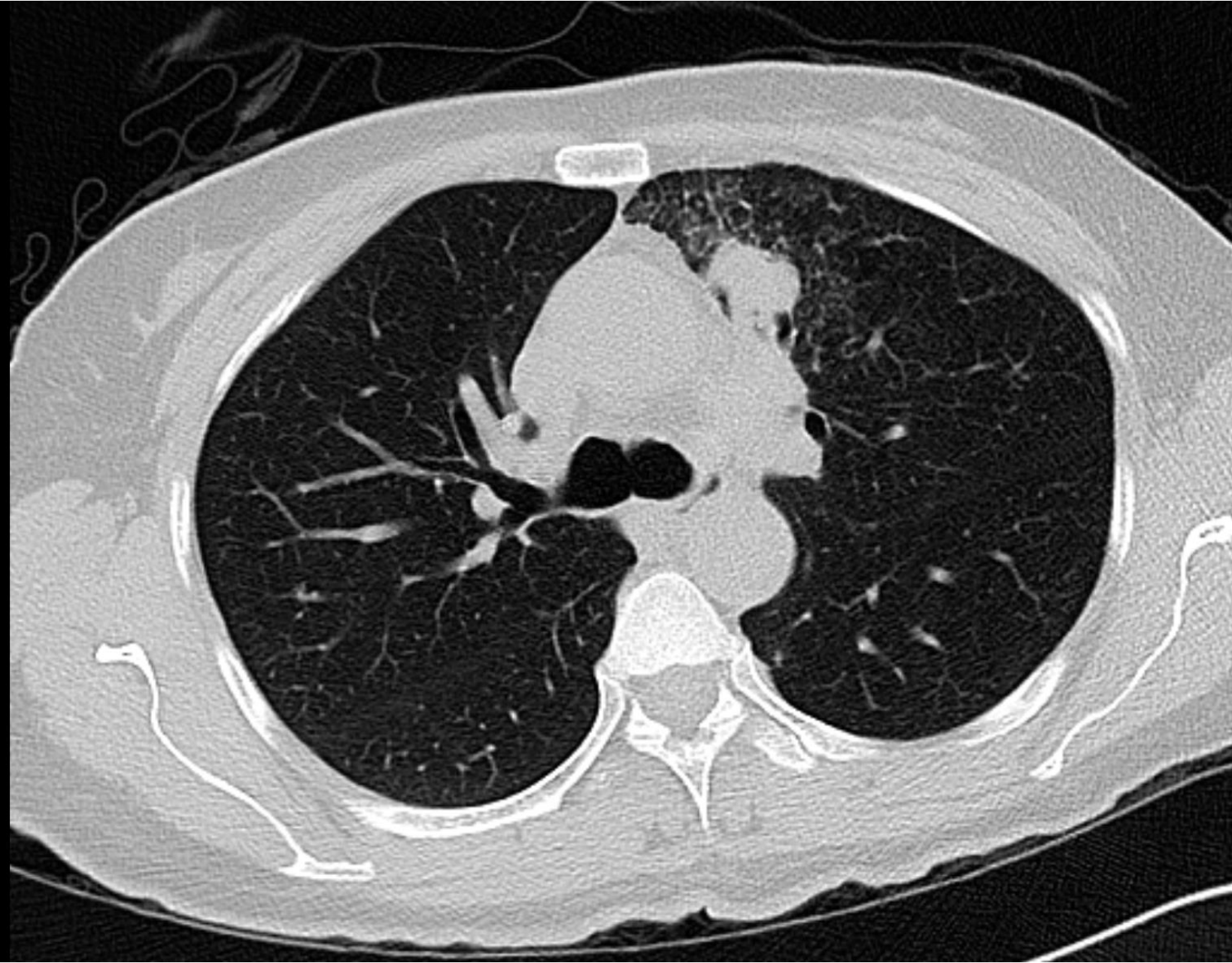
superDimension®

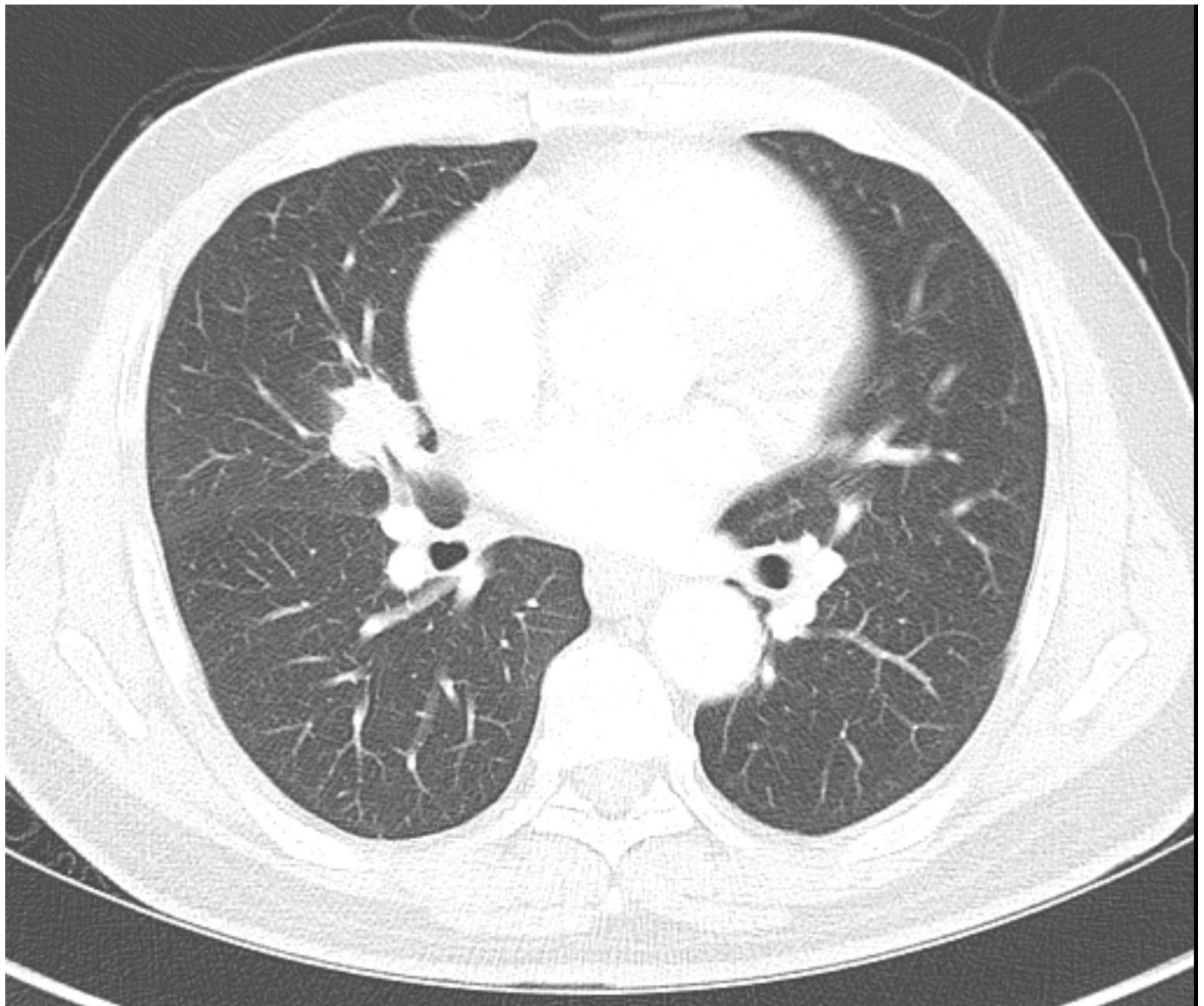
VERAN™  
MEDICAL TECHNOLOGIES

OLYMPUS®

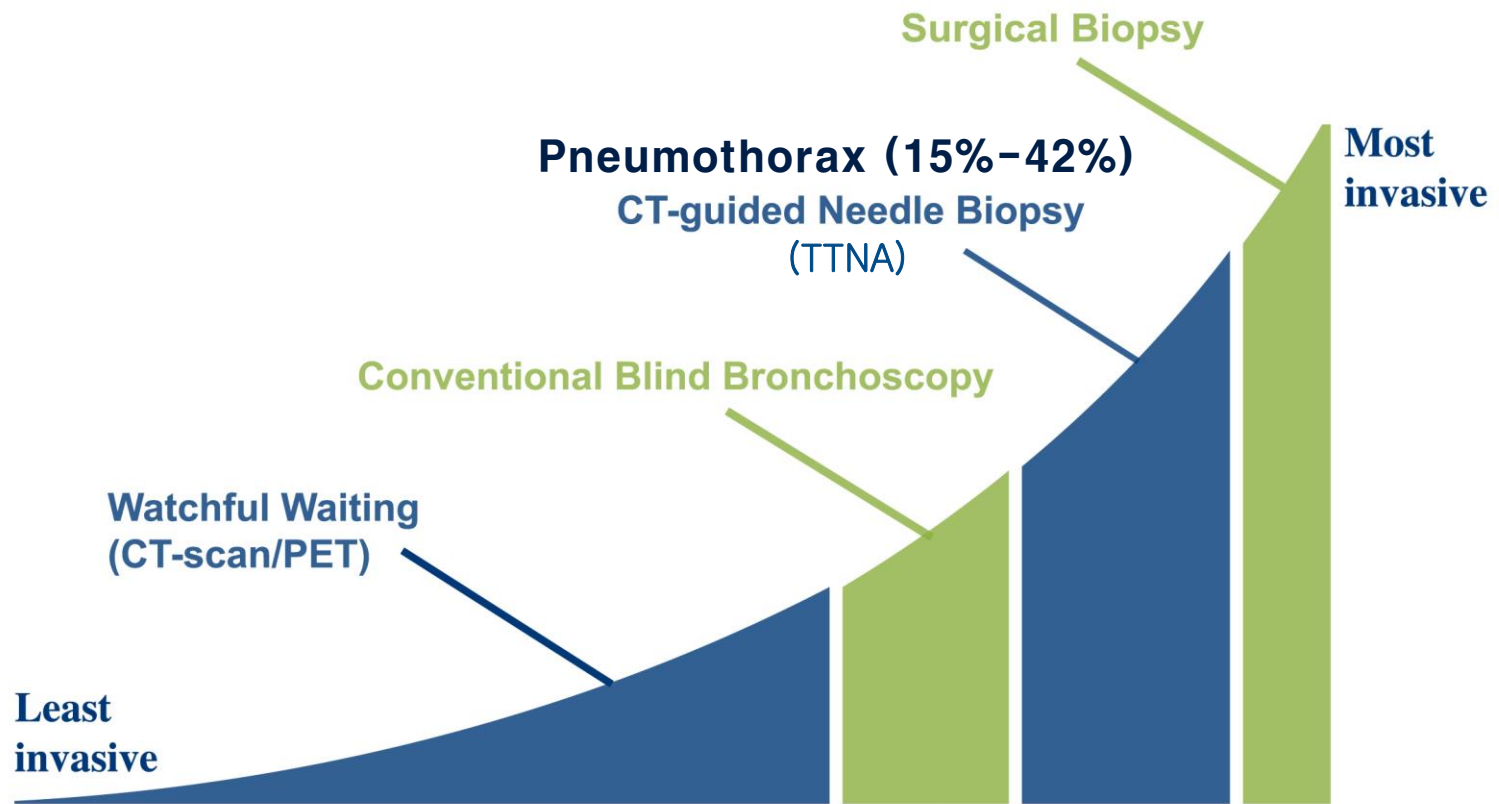
LungPoint®



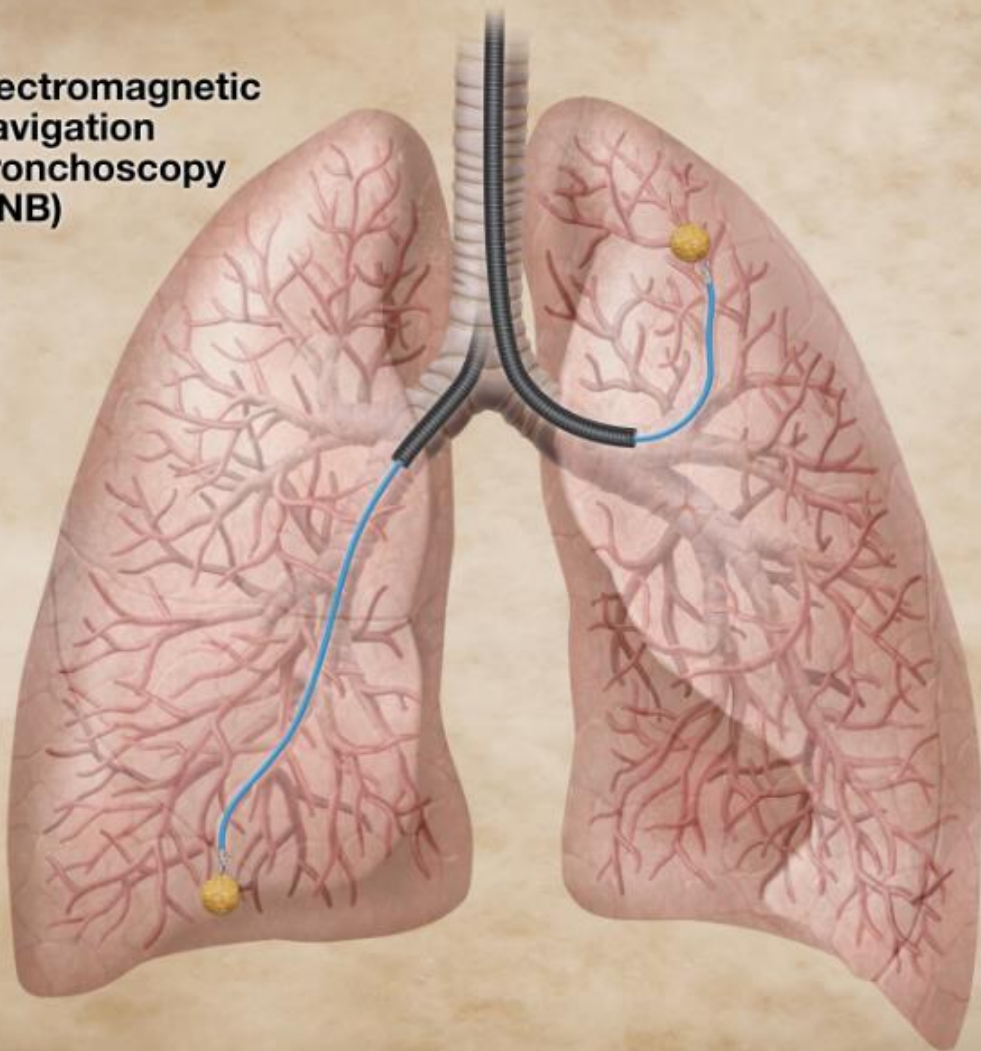




# CURRENT DIAGNOSTIC OPTIONS



**Electromagnetic  
Navigation  
Bronchoscopy  
(ENB)**



# The ENB process

**CT Scan :** →

DICOM CD

**PLANNING:** →

Prepare for the procedure  
learn the patient's anatomy

**PROCEDURE:**

Navigate, biopsy, and  
plan for treatment



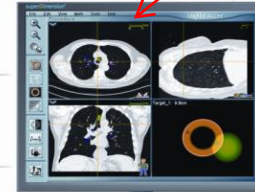
ONE TEAM • ONE GOAL • ONE COVIDIEN



# superDimension<sup>®</sup>

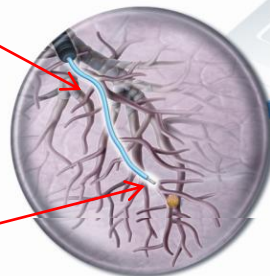
 Logic<sup>™</sup>

Multiple views of pathway provide on-screen steering directions during navigation



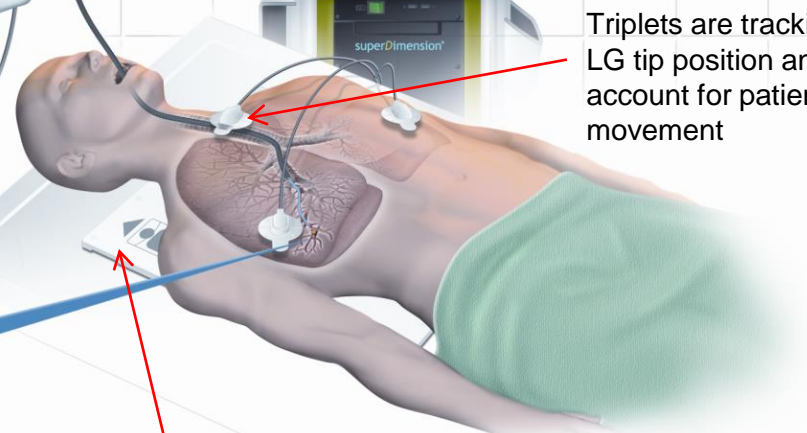
Patient Sensor Triplets are tracking LG tip position and account for patient movement

Extended Working Channel (EWC) locks in place at the lesion providing access for biopsy tools and other catheters

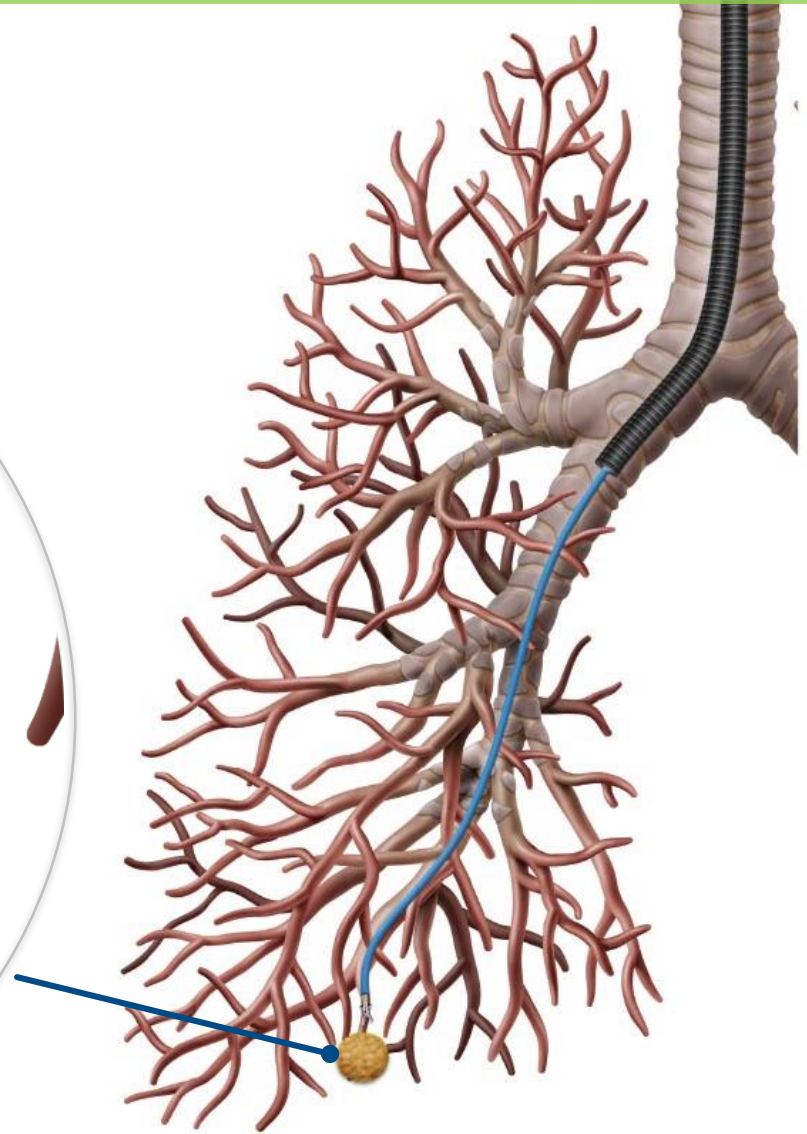
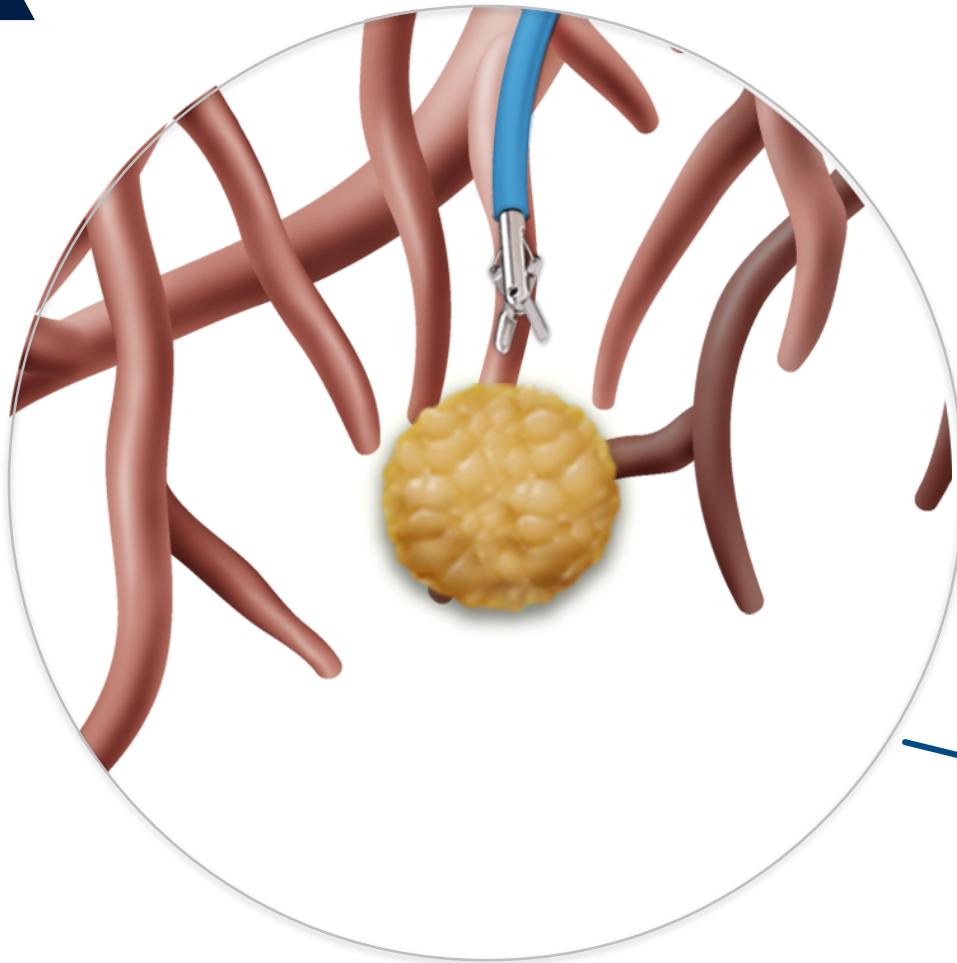


Locatable Guide (LG) has 360° steerability for navigation

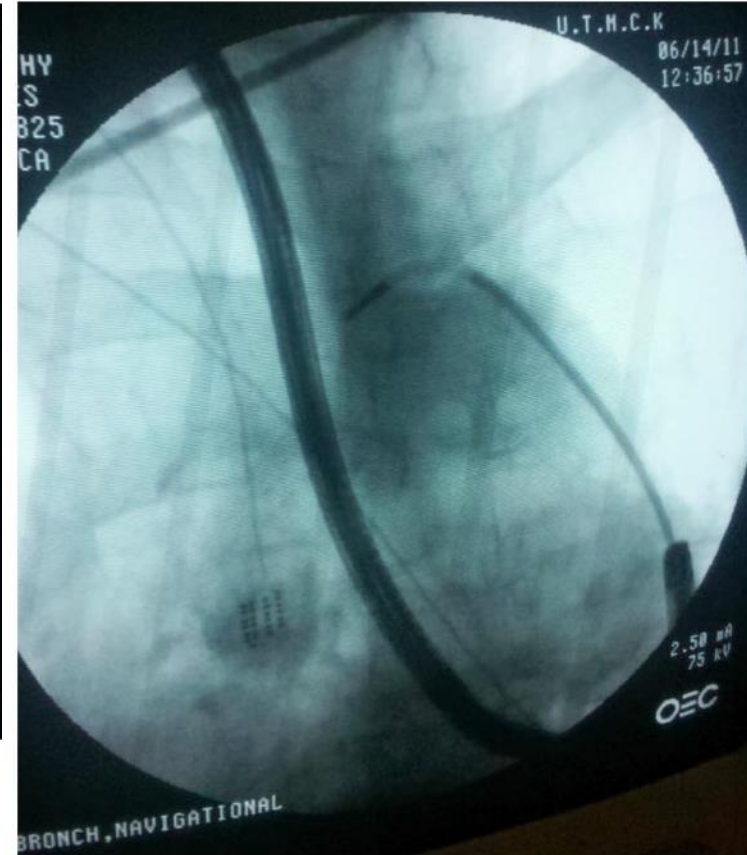
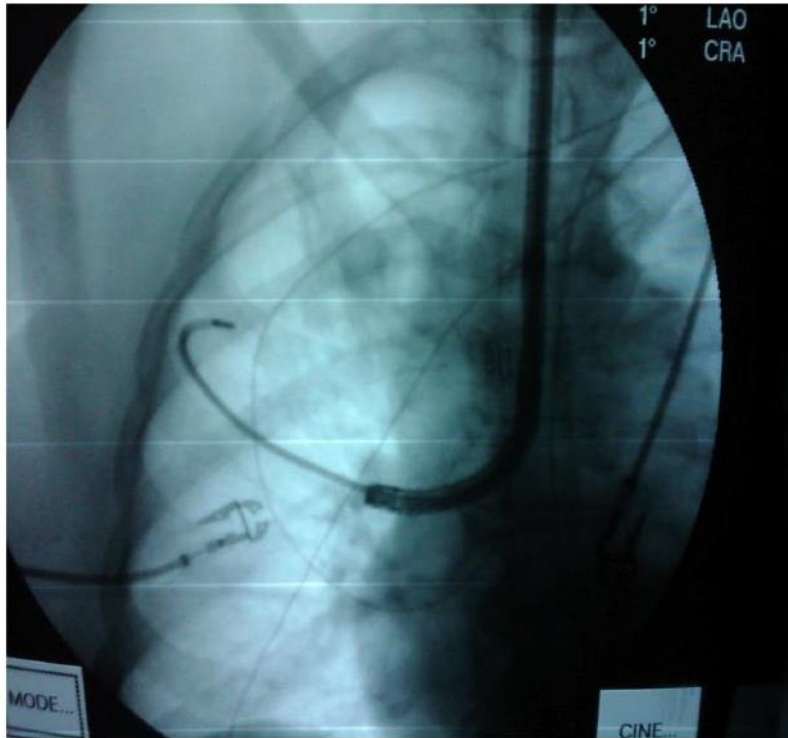
Location Board detects the electromagnetic signals



# Procedure: at the target

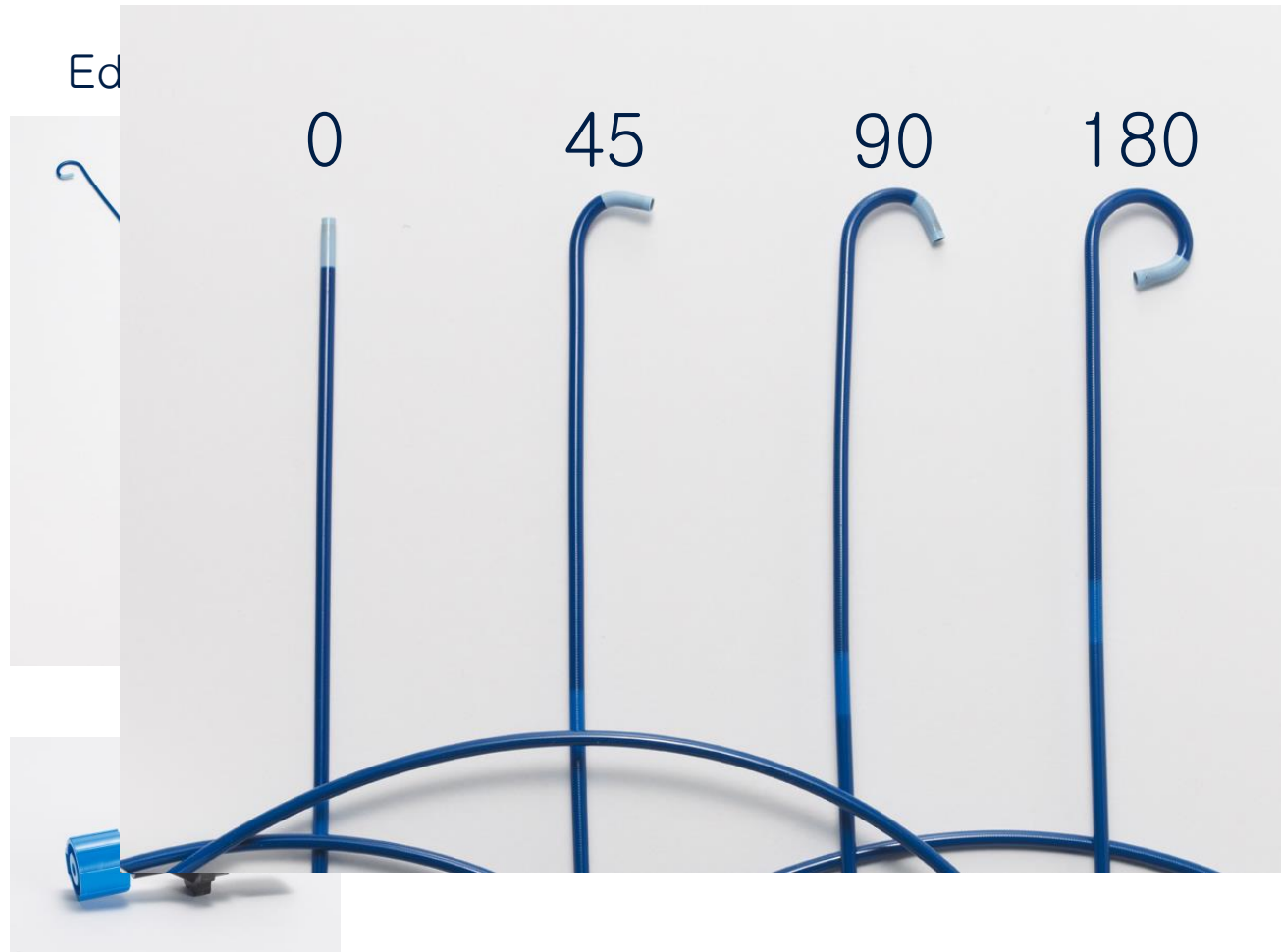


# Confirmation by fluoroscopy or radial EBUS

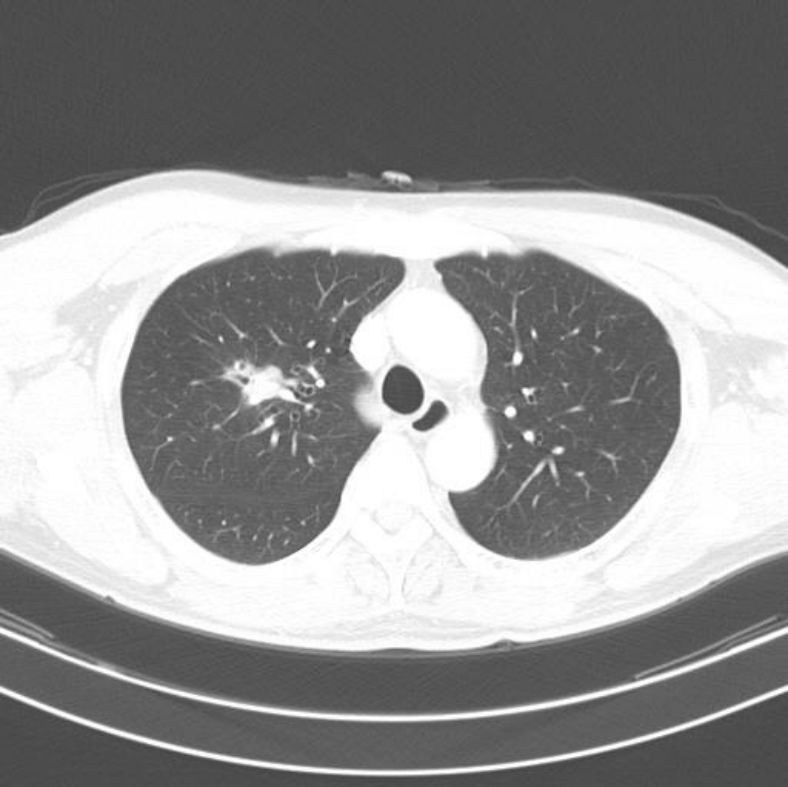


# SUPERDIMENSION CATHETER TECHNOLOGY

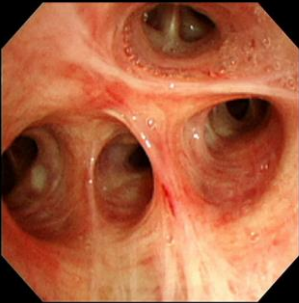
Edge EWC Catheter Family



# Male 64 years old



H  
Y H  
Sex : Age :  
D.O.Birth :  
05/19/2017  
11:48:51

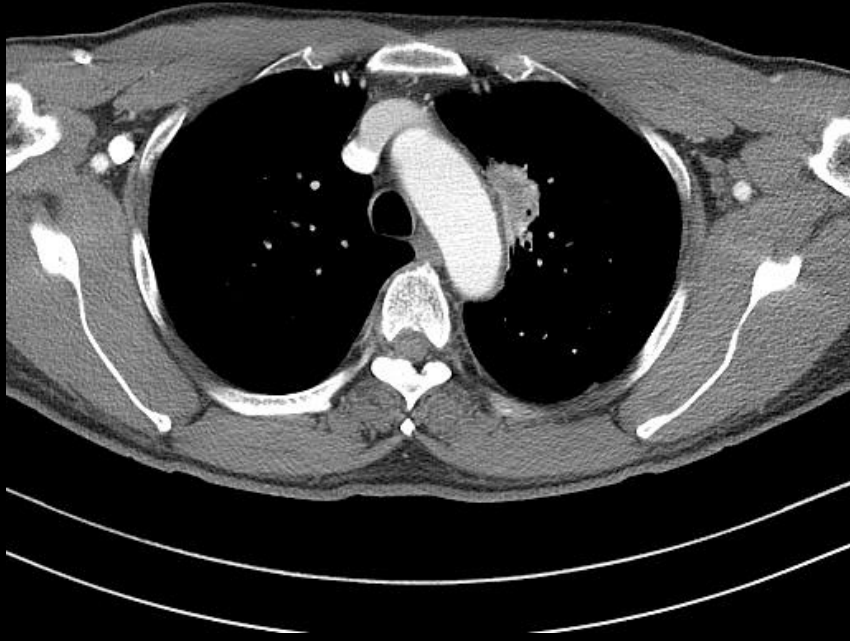


Ct: N Ec: A1  
Cs: 3

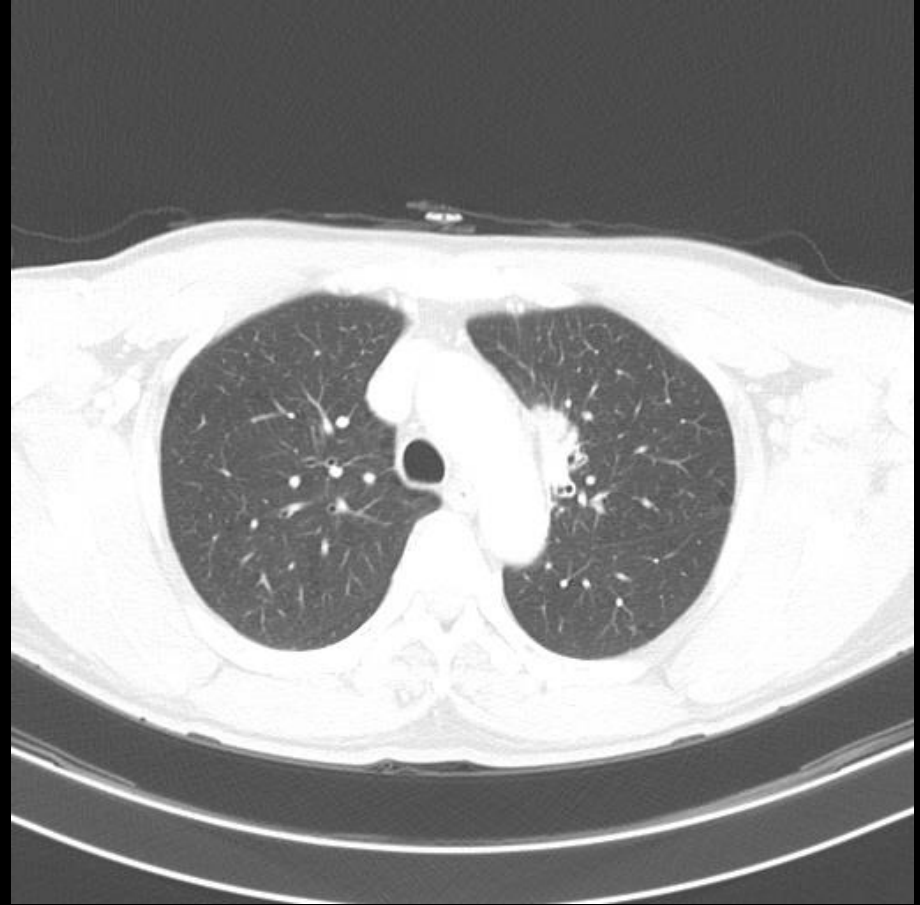
Physician :  
Comment :

Adenocarcinoma

Male 58 years old



Adenocarcinoma



# Radiosurgical Markers

- *Safe procedure*
- *Can be placed at time of biopsy and/or diagnosis*
- *Minimizes complications from trans-thoracic approach*
  - *(50% vs <2% inReach)*

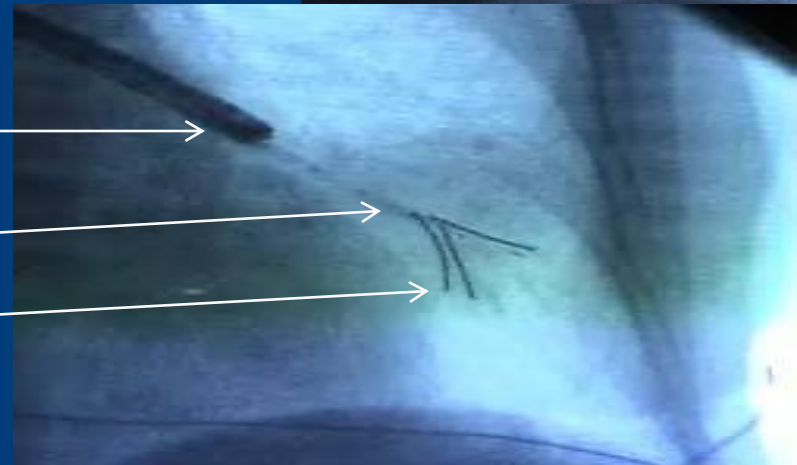
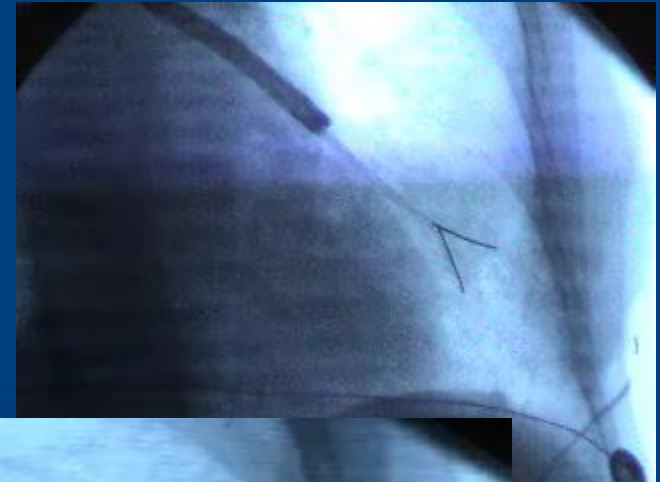
*Scope*



*Extended Working Channel*



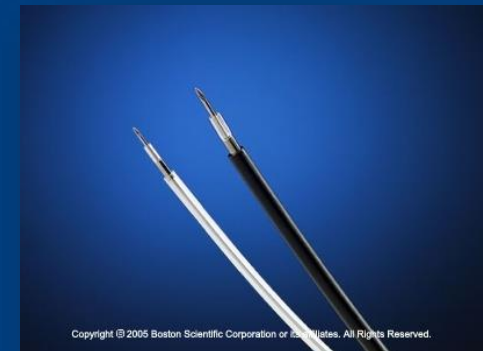
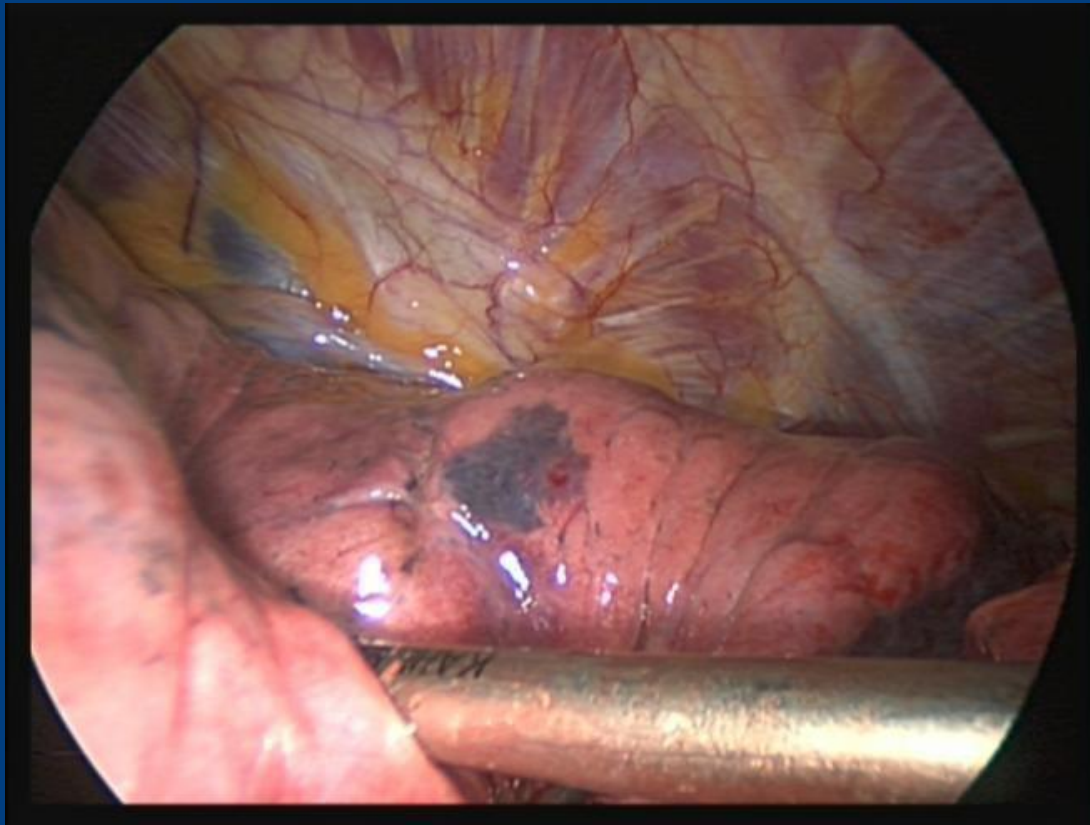
*Fiducials*



[ ONE TEAM • ONE GOAL • ONE COVIDIEN ]



# Placement of pleural dye for follow up surgery



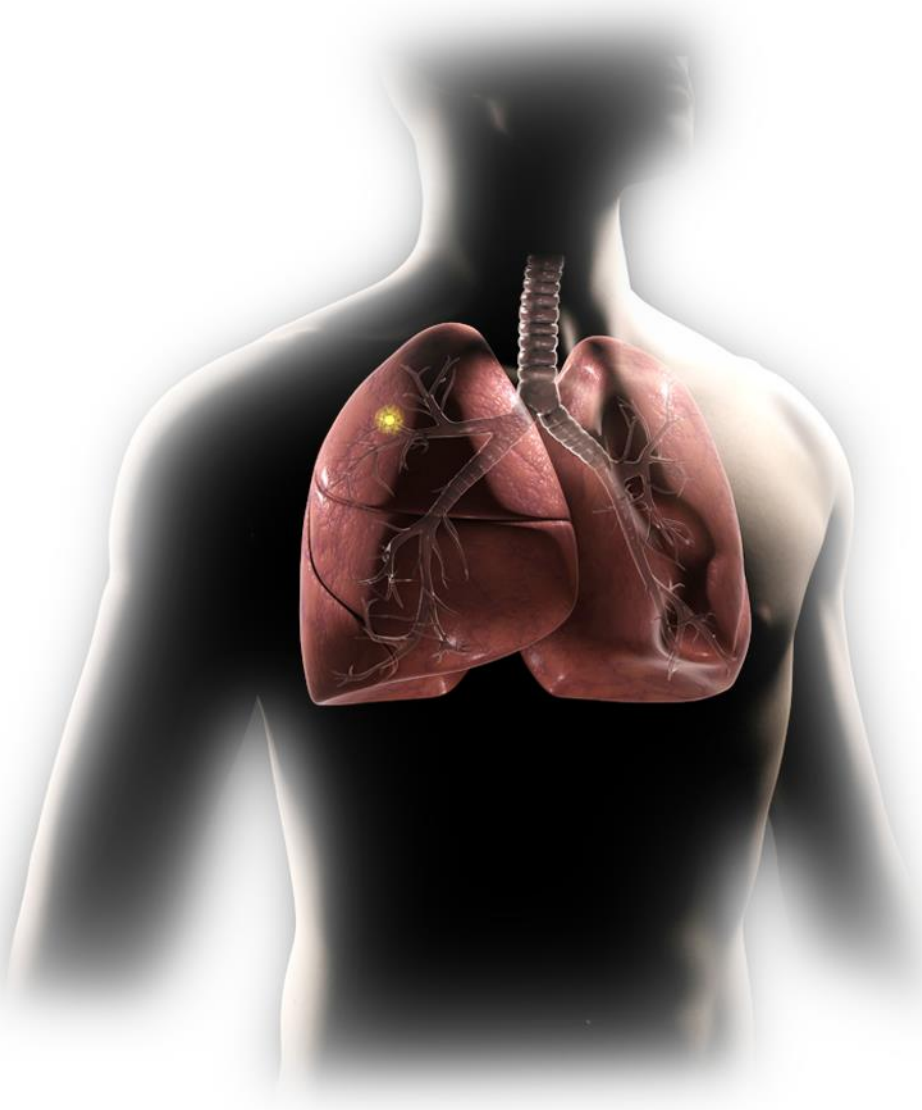
ONE TEAM • ONE GOAL • ONE COVIDIEN





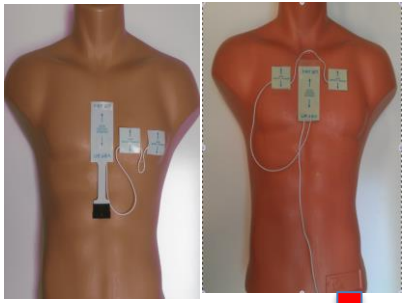
**3.4.2.1. In patients with peripheral lung lesions difficult to reach with conventional bronchoscopy, electromagnetic navigation guidance is recommended if the equipment and the expertise are available (Grade 1C).<sup>1</sup>**

**Remarks:** The procedure can be performed with or without fluoroscopic guidance and it has been found complementary to radial probe ultrasound.



# EM Thoracic Navigation Technology from Veran

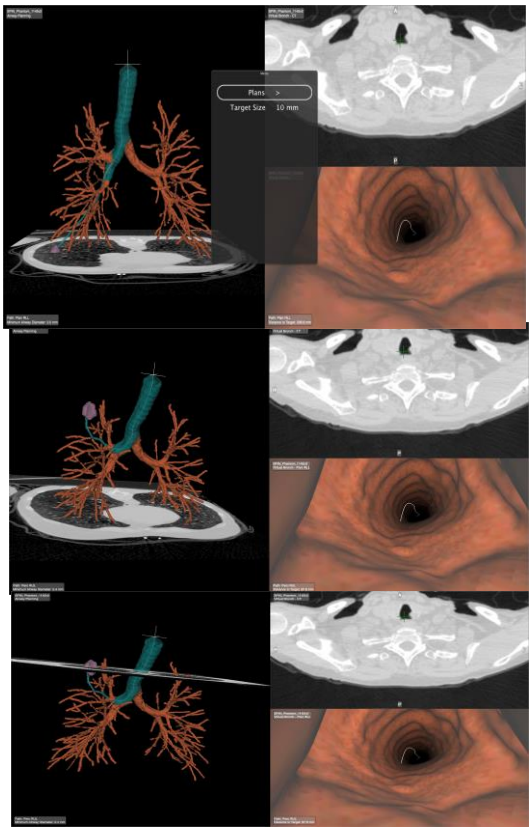
# SPiN Procedure Flow



Vpad placement



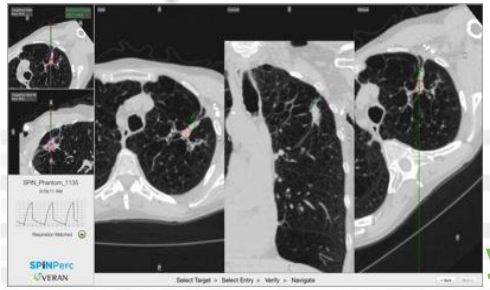
Gated or non-gated CT



Airway/pathway planning



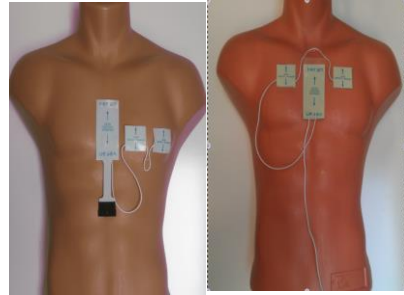
EMB Navigation



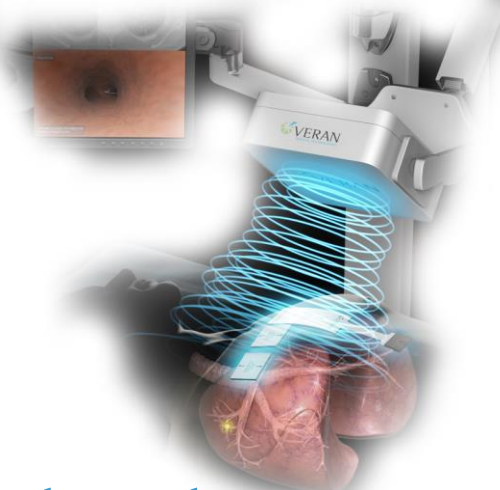
SPiN Perc Navigation



# Comprehensive Navigation Solution



vPads



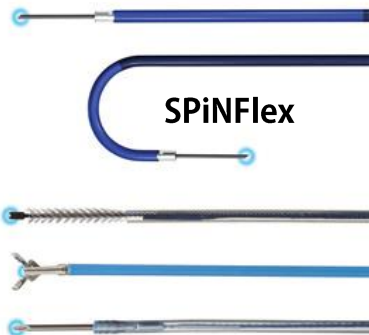
## Always-On Tip Tracked Instruments

Endobronchial

Percutaneous

Navigation System

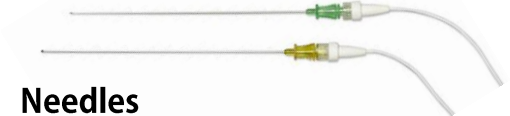
VERAN



SPiNFlex

Tip Tracked Instruments

Conventional Instruments



Needles

vTrack 2.0

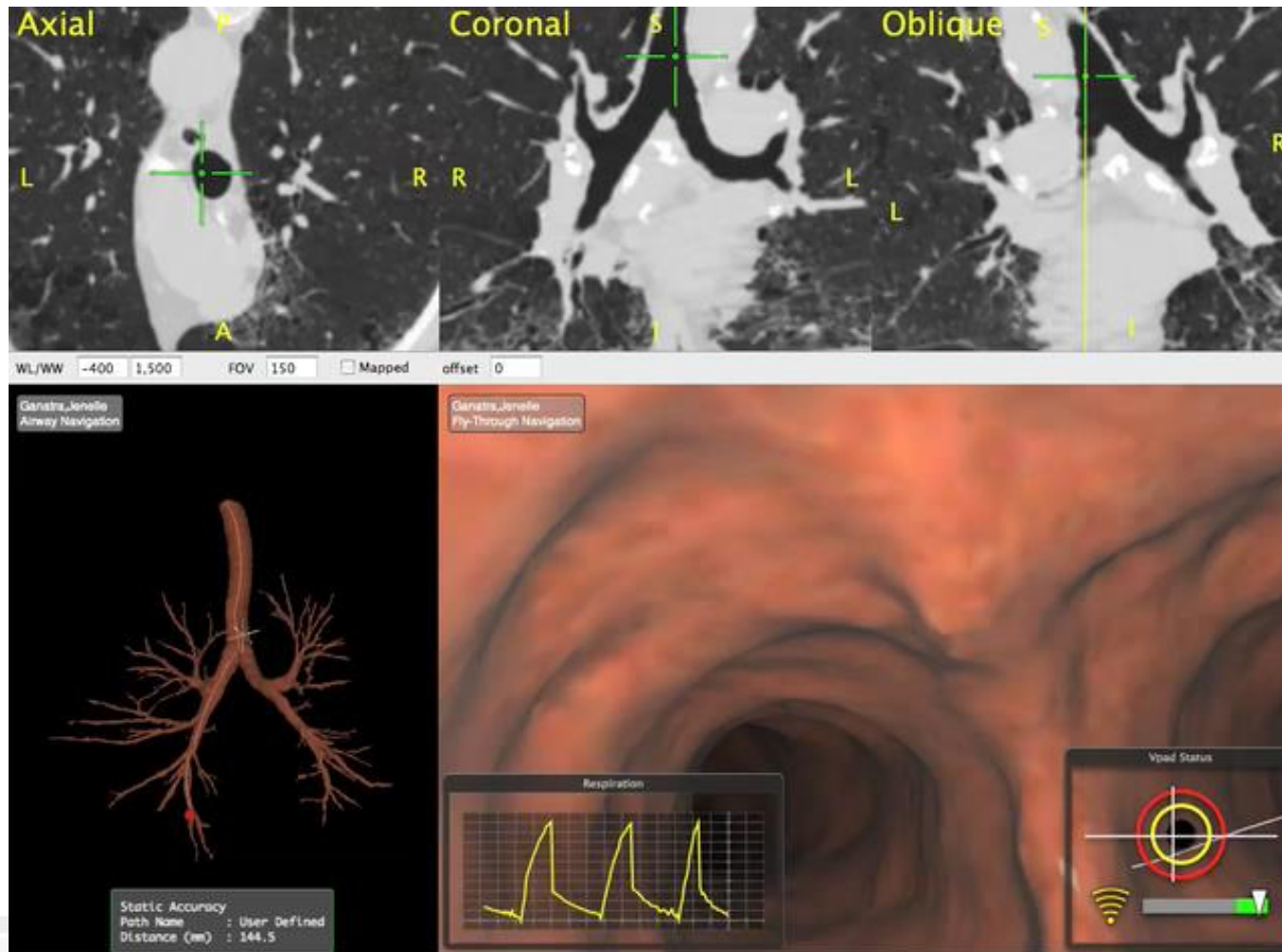


SPiNView

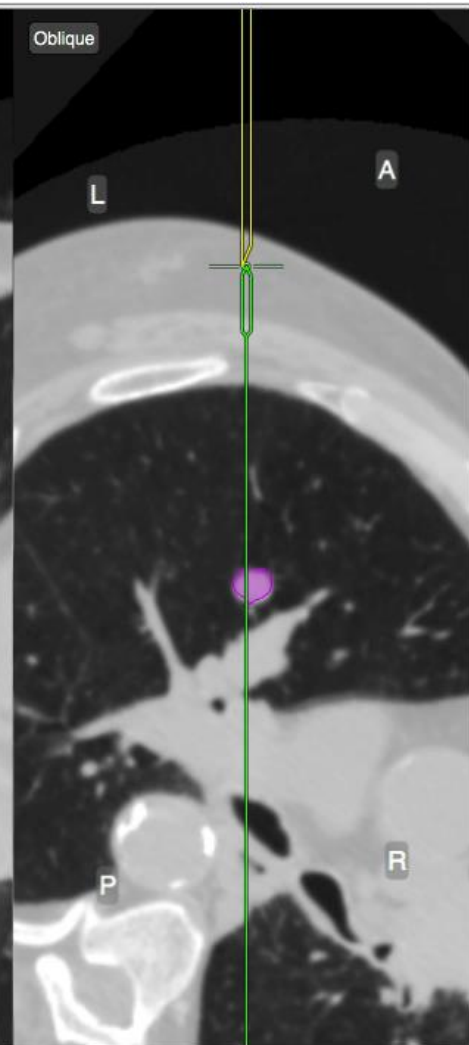
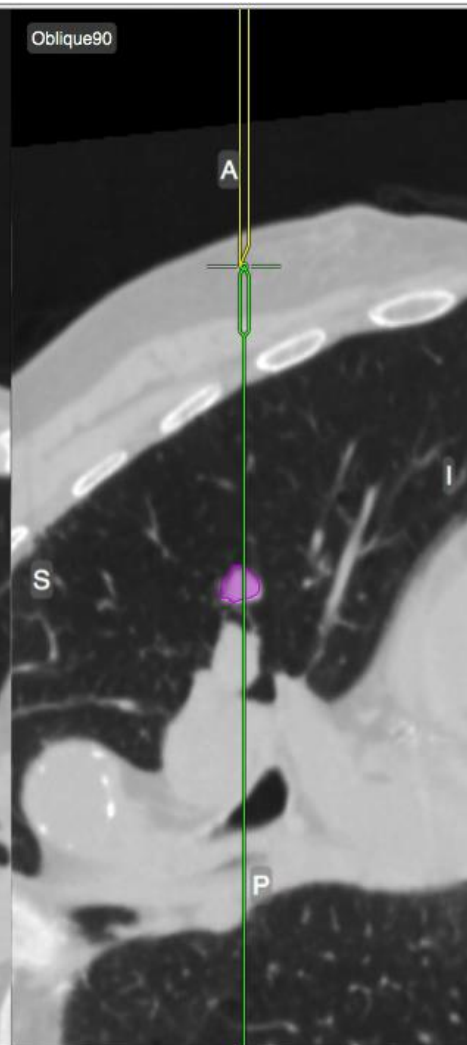
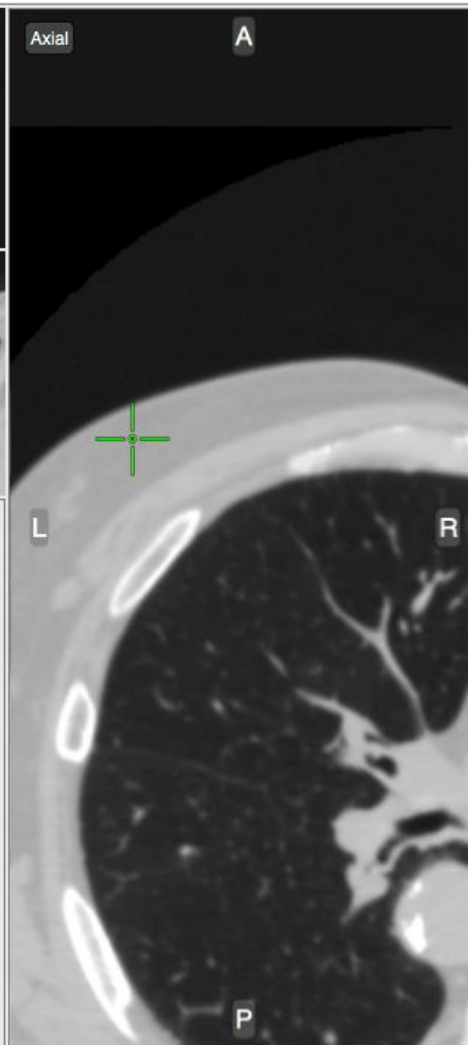
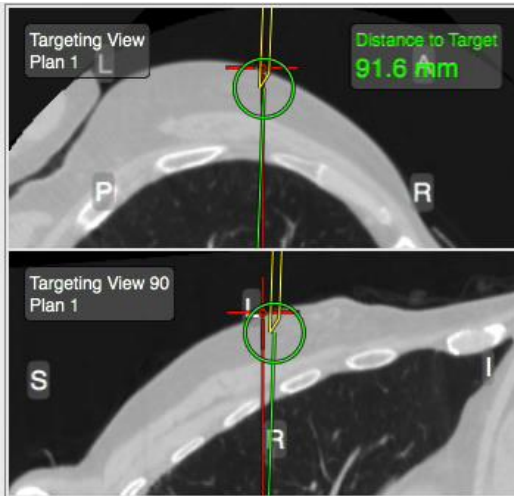


Navigating Across Oncology

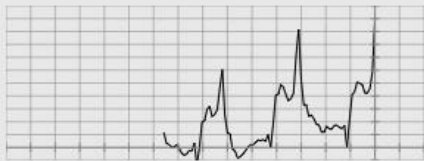
# Electromagnetic Navigation




# Electromagnetic Navigation



10:41:59 PM



Respiration Out of Sync. 

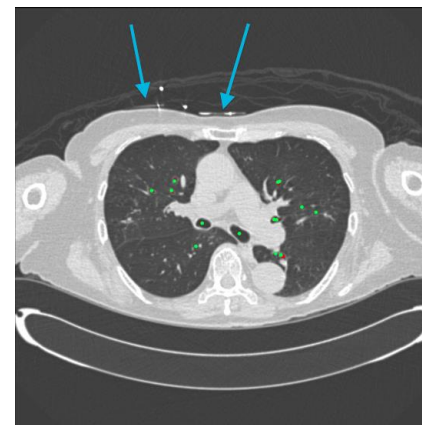
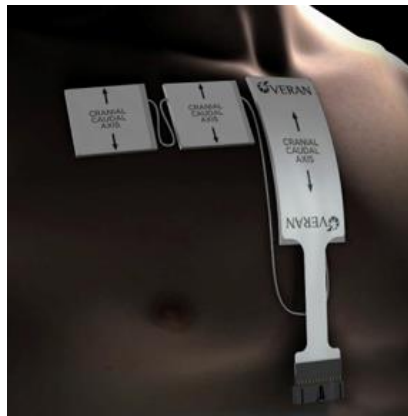


Select Target > Select Entry > Verify > Navigate

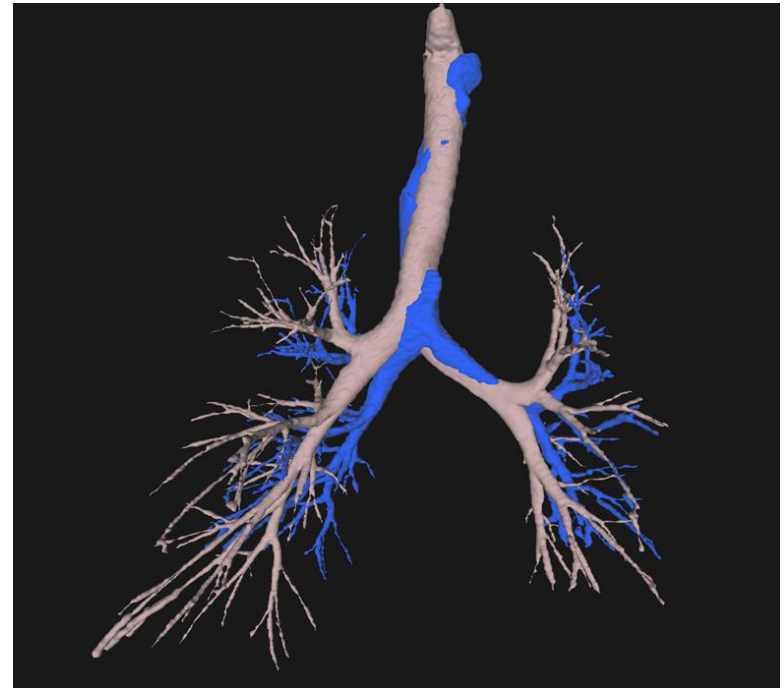
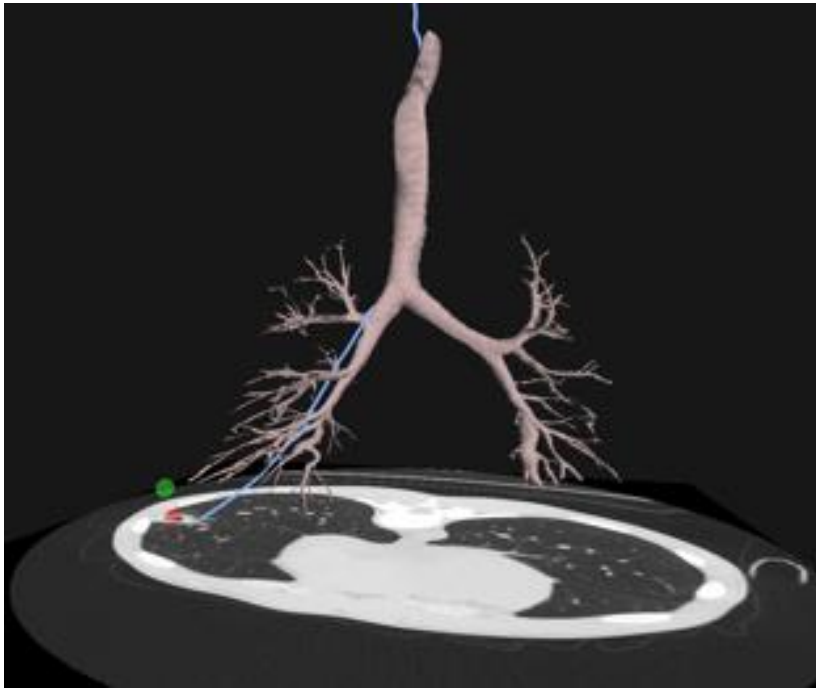
< Back Next >

## Automatic Registration

- The sensors in the vPads not only track patient movement but they allow us to align the CT images to the patients actual anatomy by a process called automatic registration.
- The sensors act as reference points that can be seen within the CT. The software looks at where those same sensors are on the patients skin and aligns the CT with the patient.

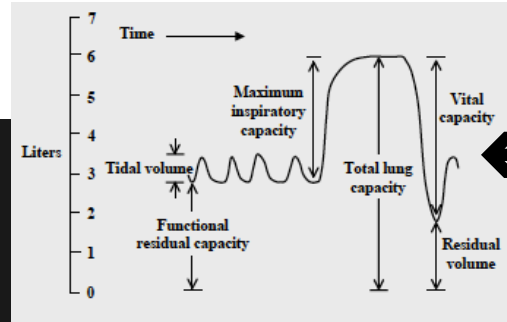
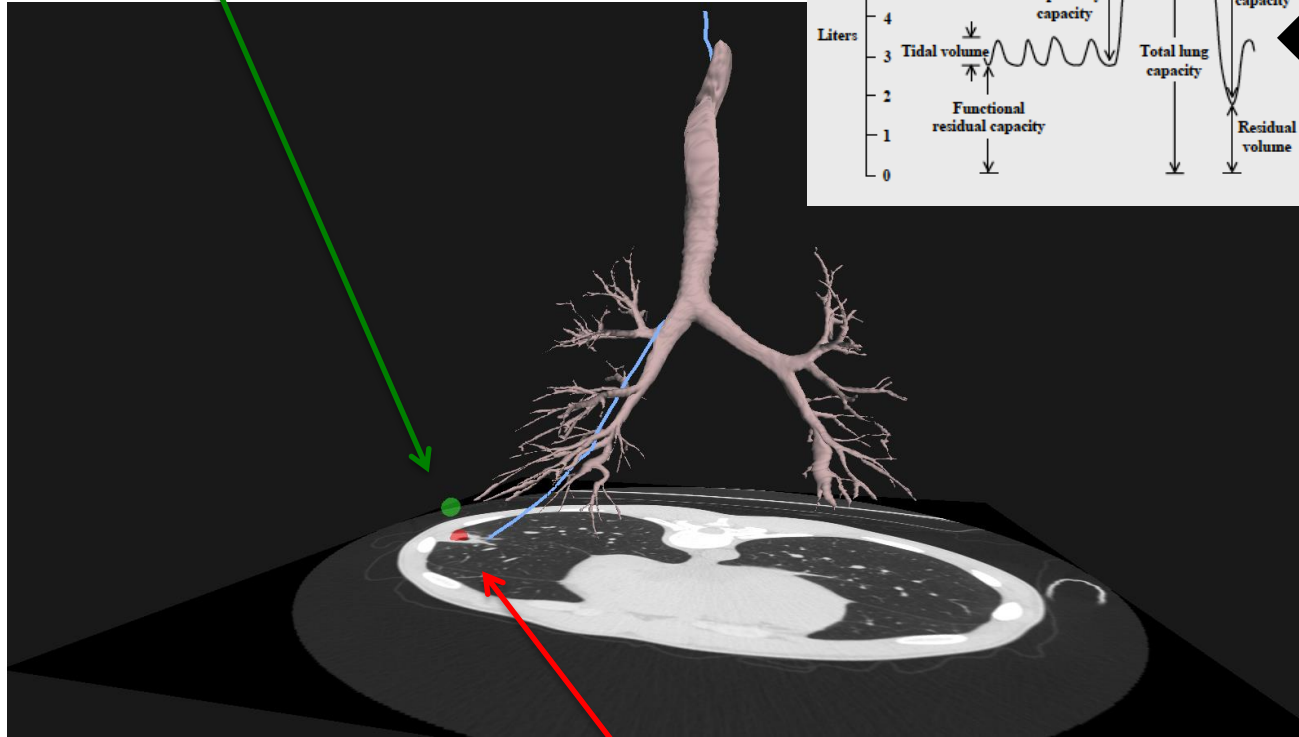


# The RIGHT Map – How much does it move?

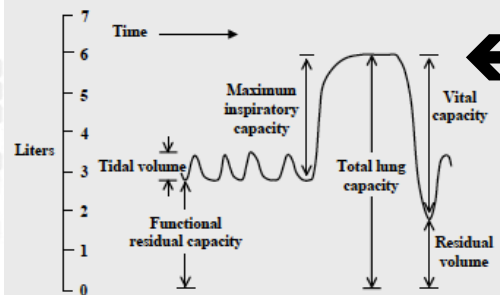


# Patient Procedure INS/EXP State

Veran Target in Green: Different Location by over 29mm – real patient



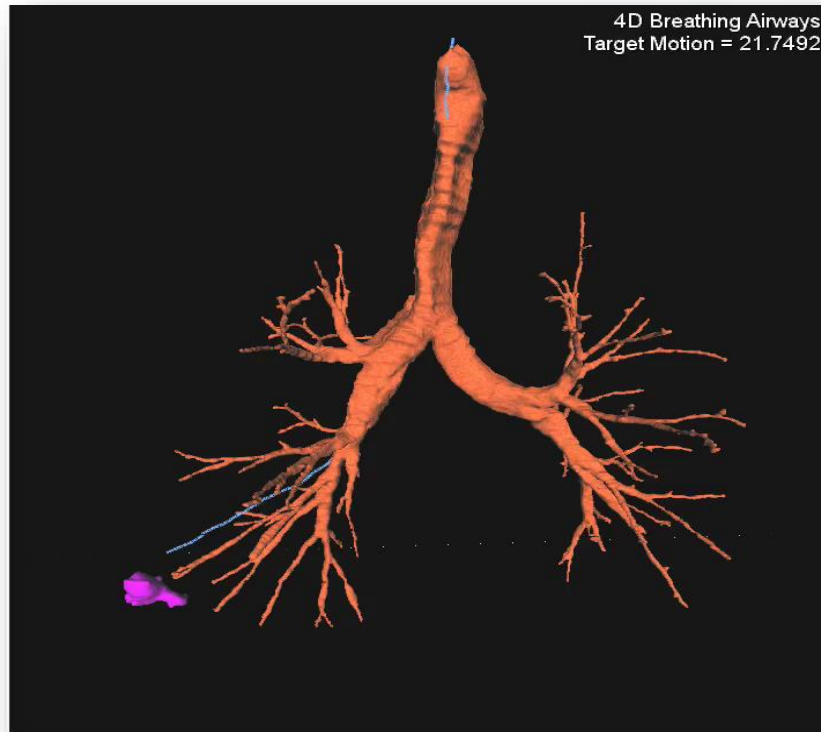
Patient Tidal Breathing - EXP



Patient Tidal Breathing - INP

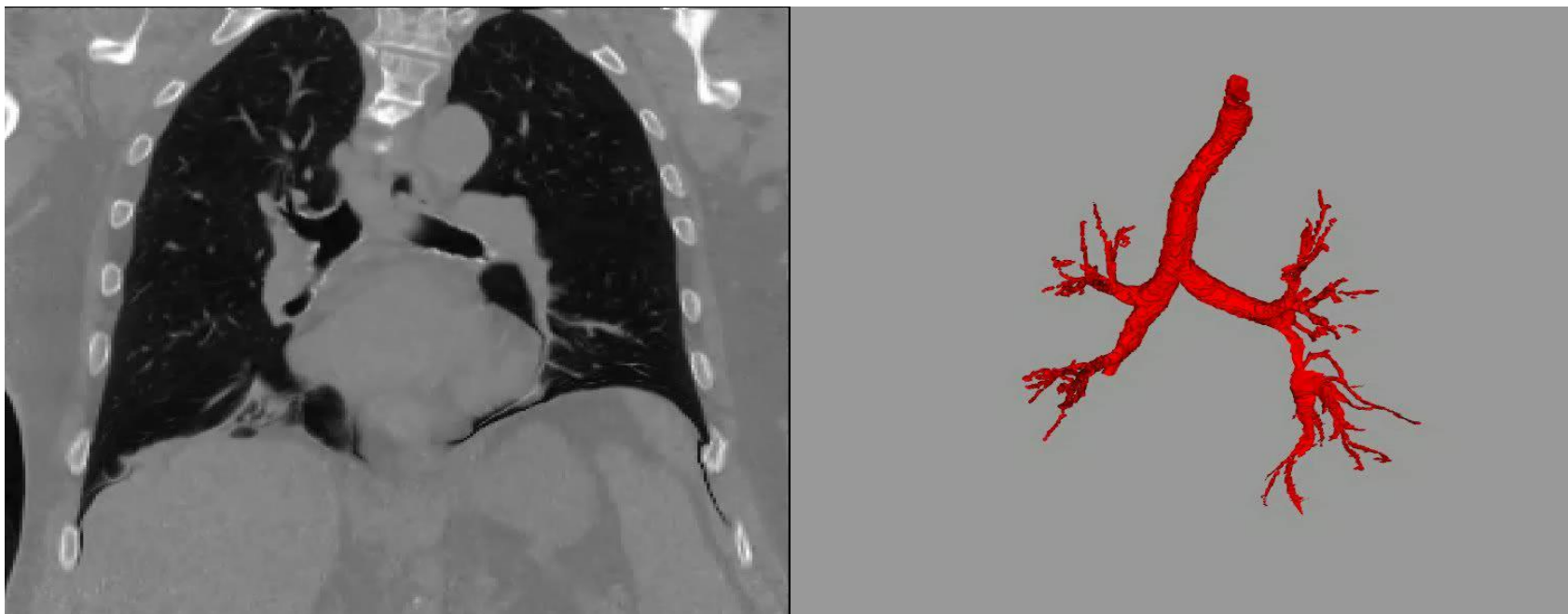
navigating Across Oncology

# TLC/Tidal Volume Movement



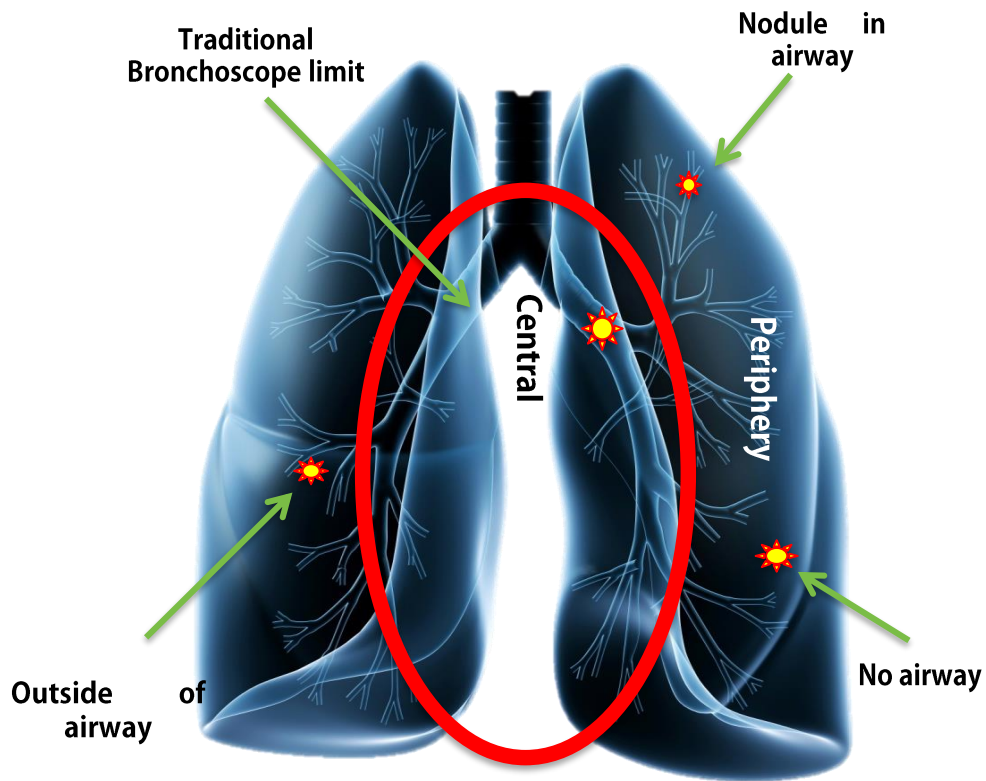
# Why is respiratory tracking important?

Monitor lung movement



30-40% of lower lobe lesions move greater than 4 cm's  
30-40% of upper lobe lesions move greater than 2 cm's





superDimension®

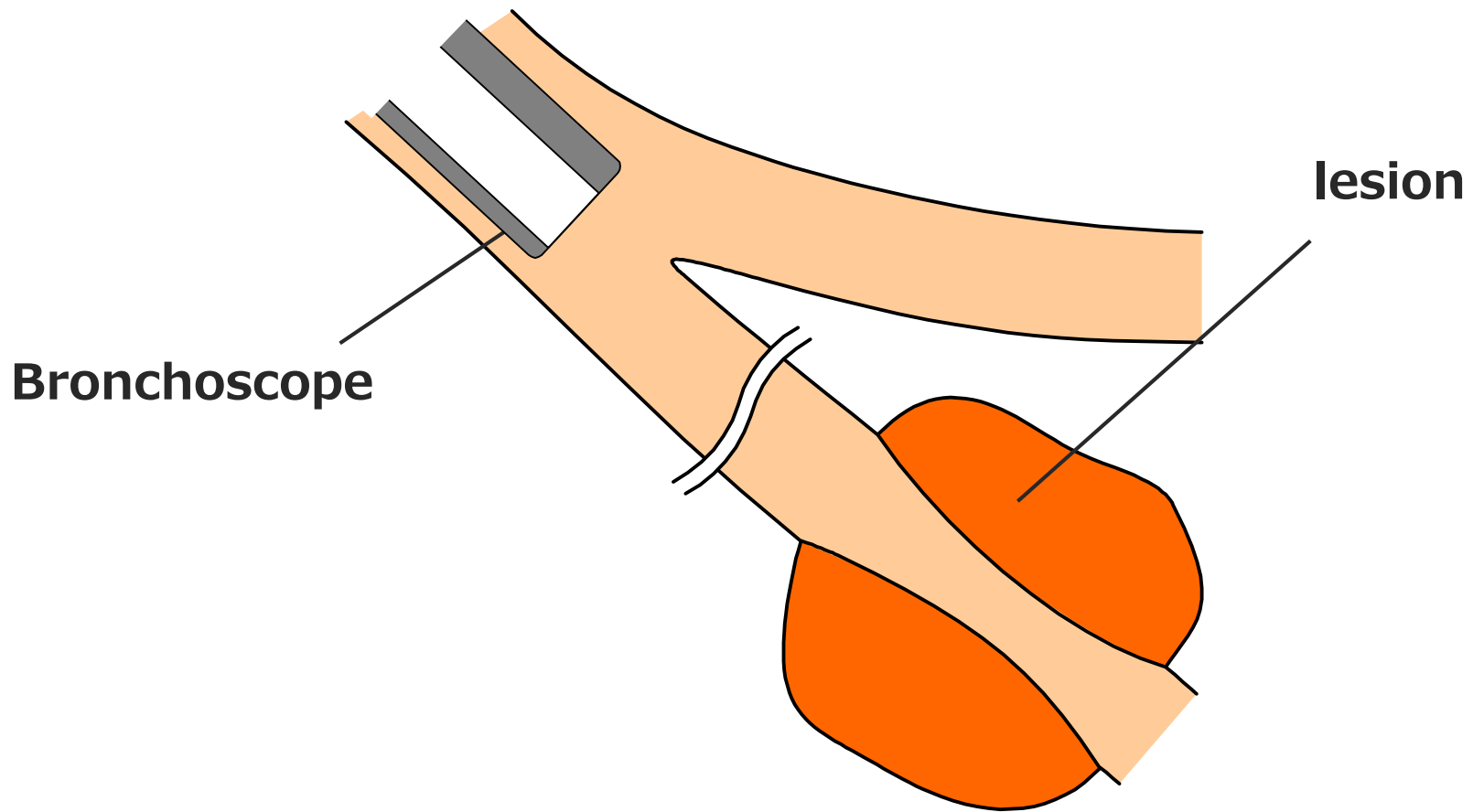
VERAN™  
MEDICAL TECHNOLOGIES



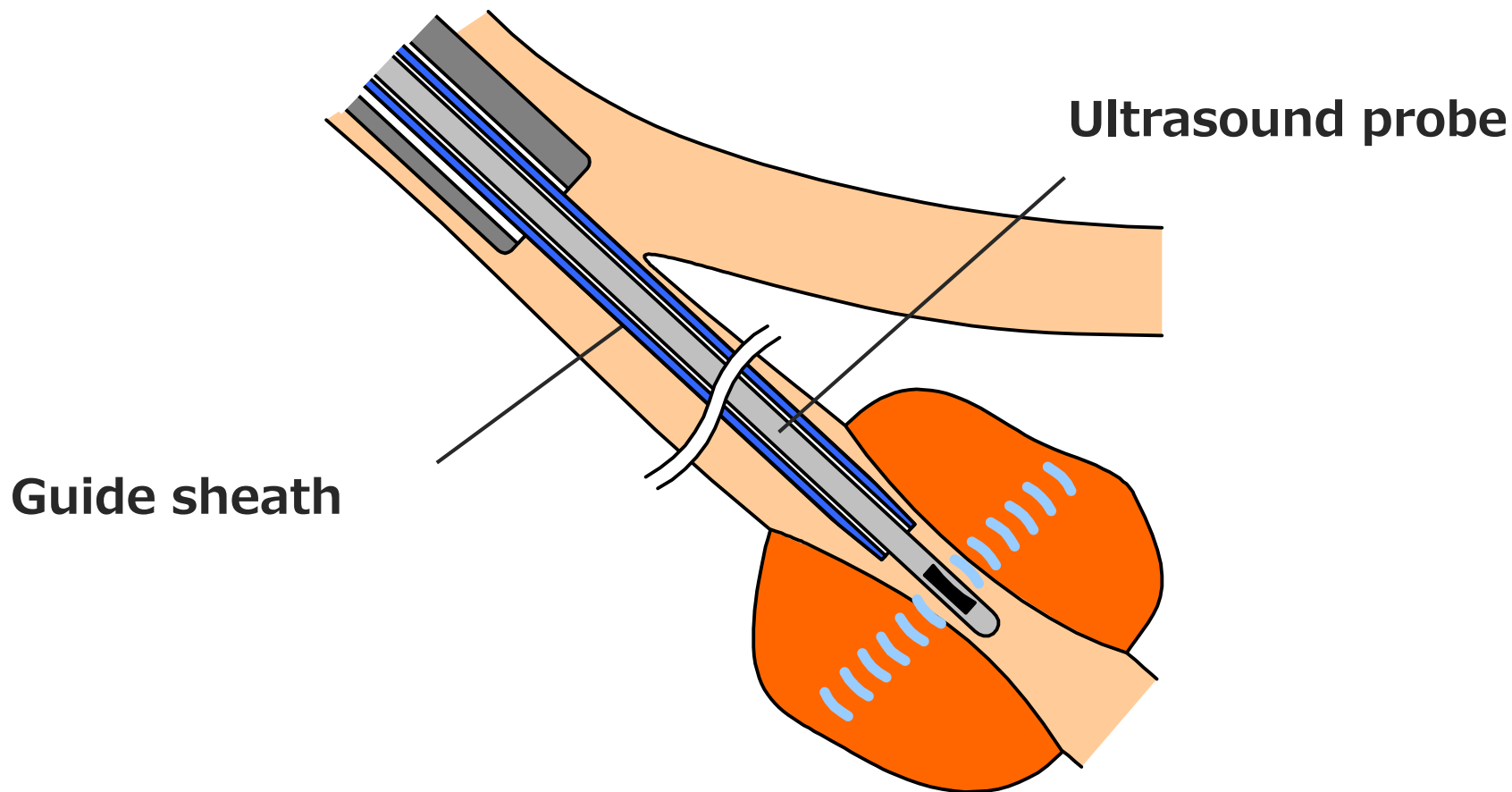
## Introduction: EBUS Guide Sheath (EBUS-GS)



Approach to lesion

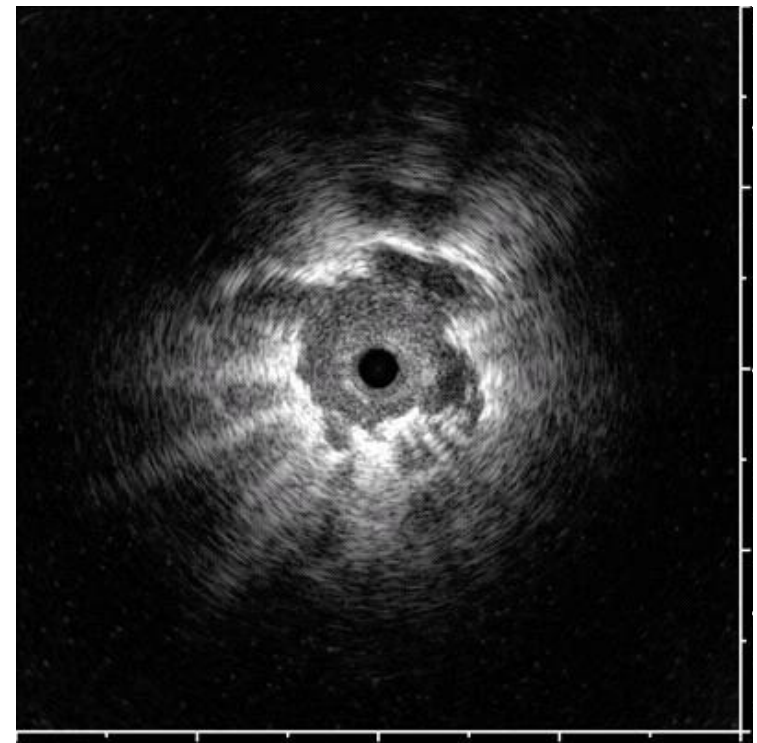
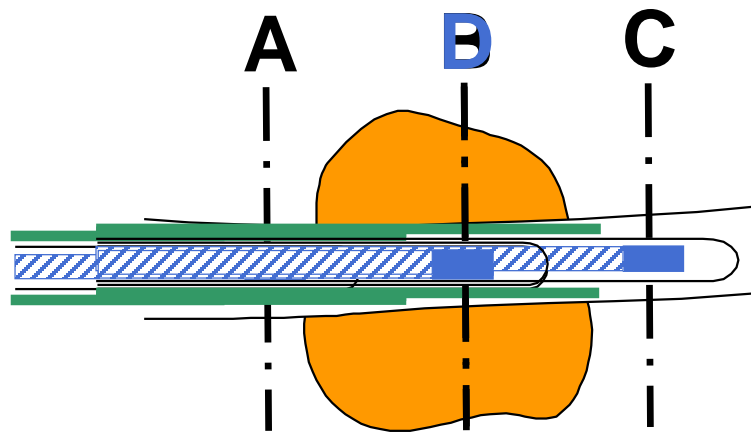


Insert the guide sheath through biopsy channel and insert ultrasound probe inside guide sheath.

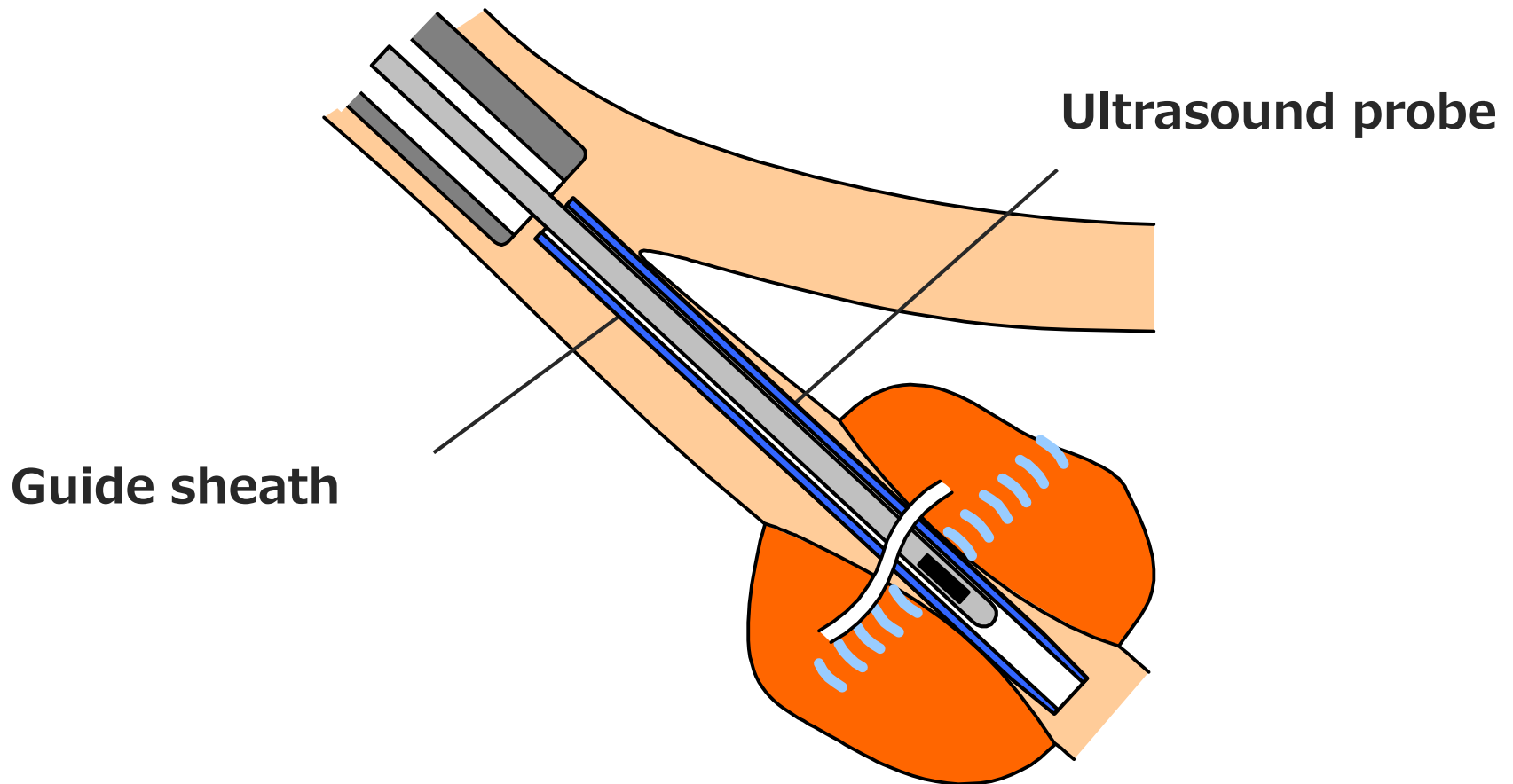


Move ultrasound probe and identify the lesion.

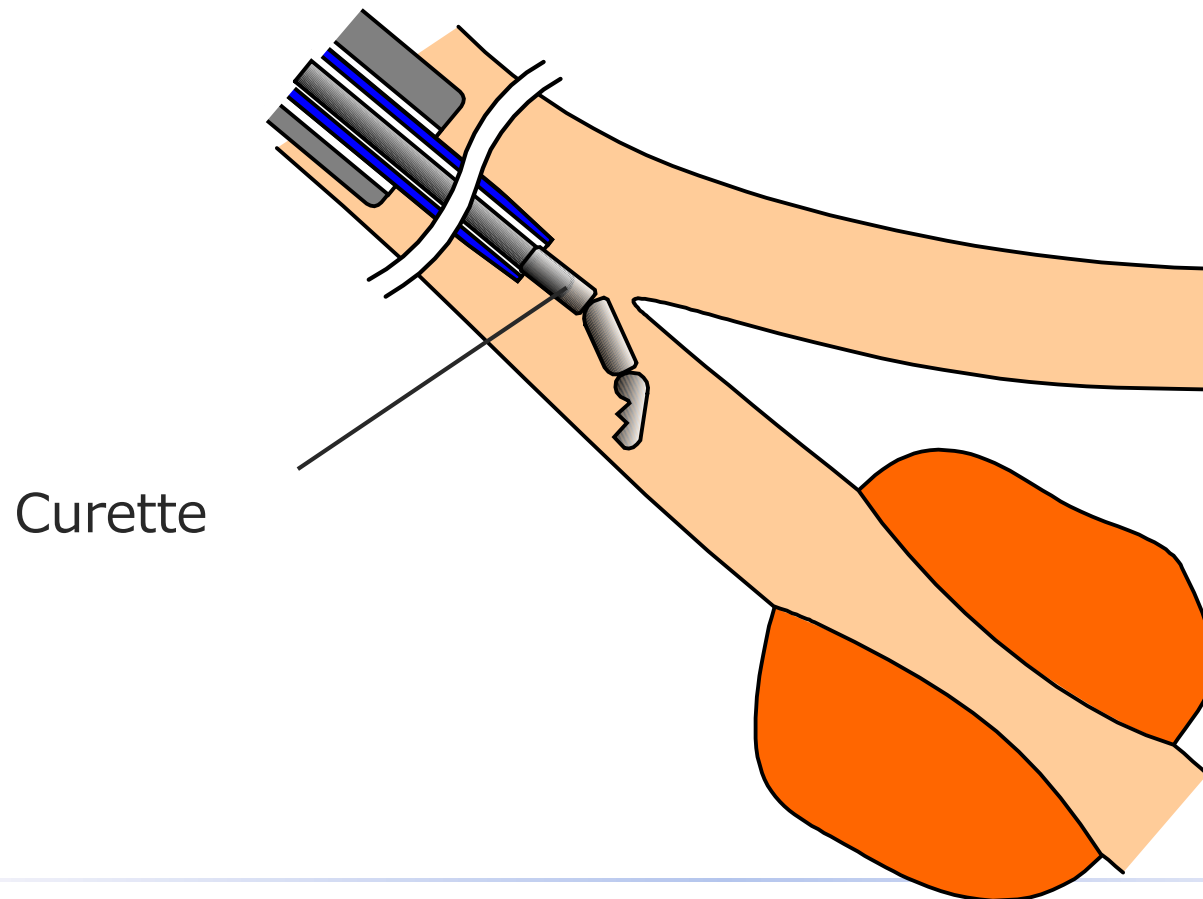
## US image



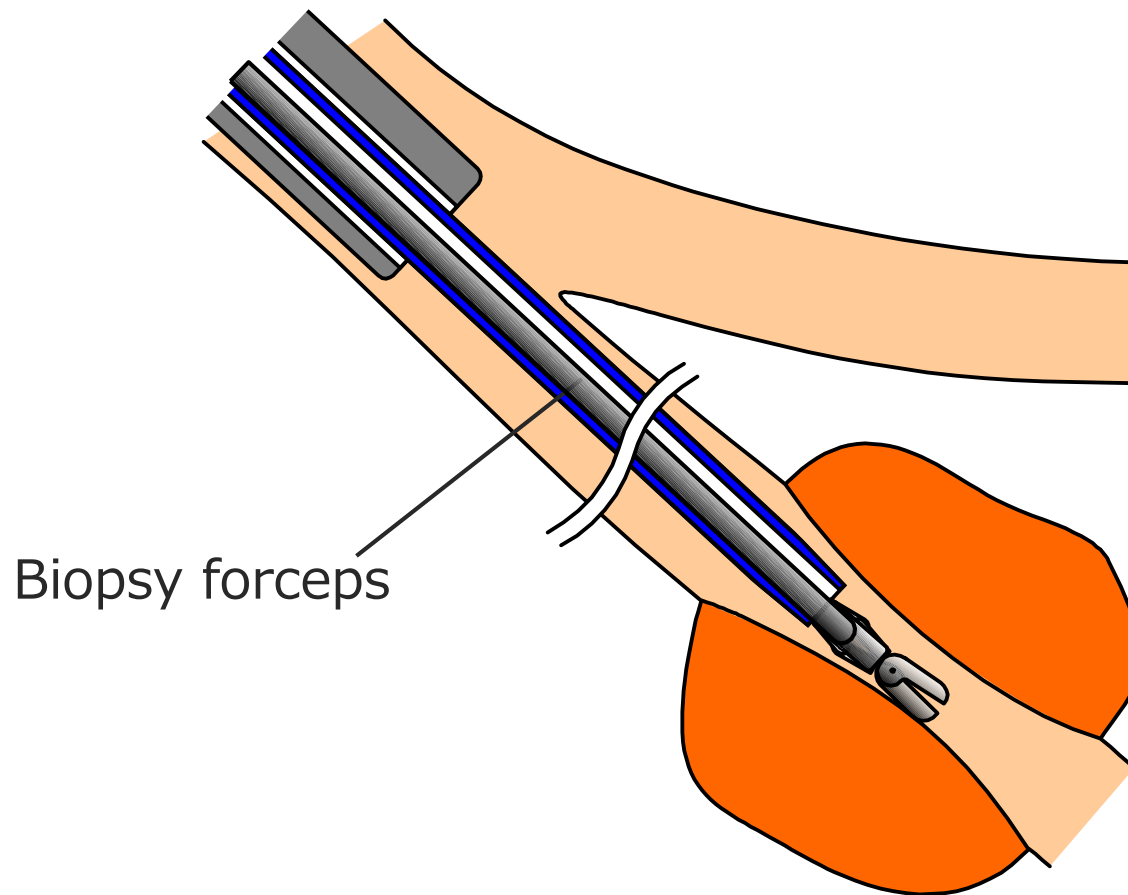
Remove the ultrasound probe remaining guide sheath on the lesion.



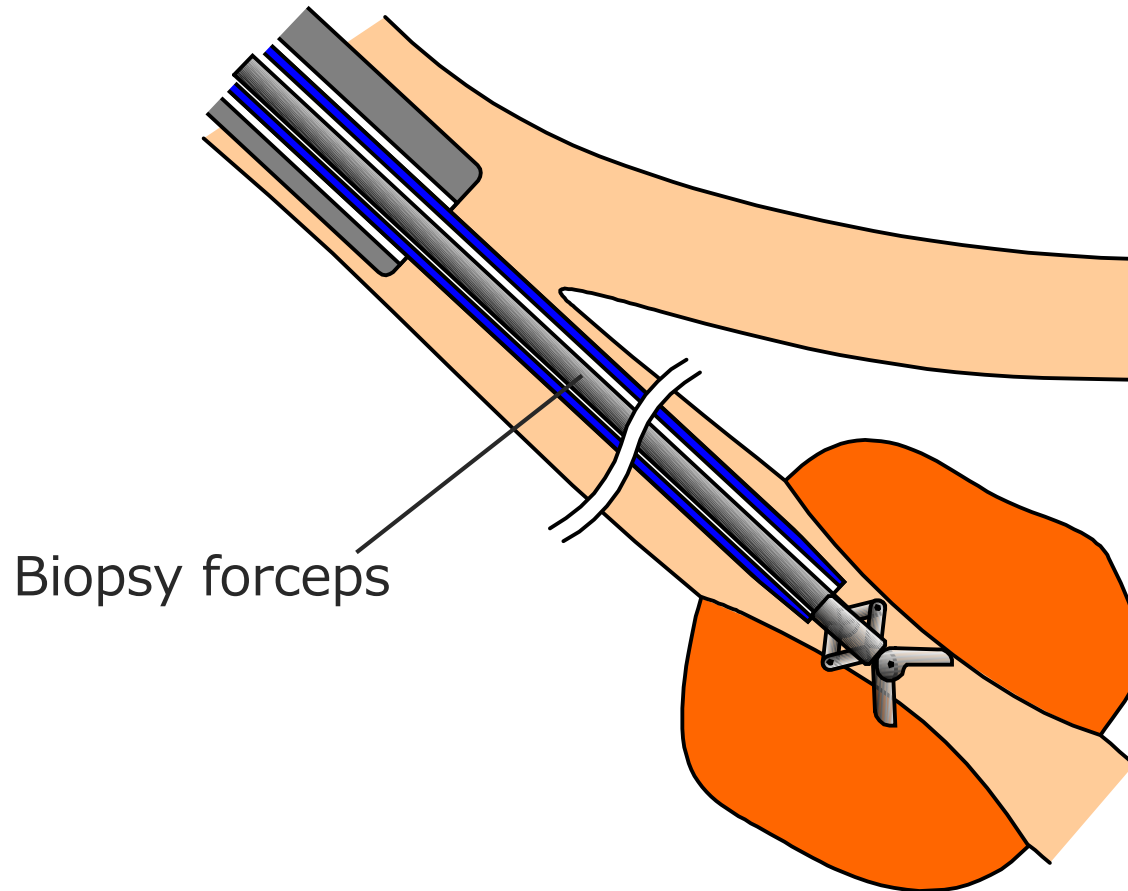
Curette helps the insertion of guide sheath.



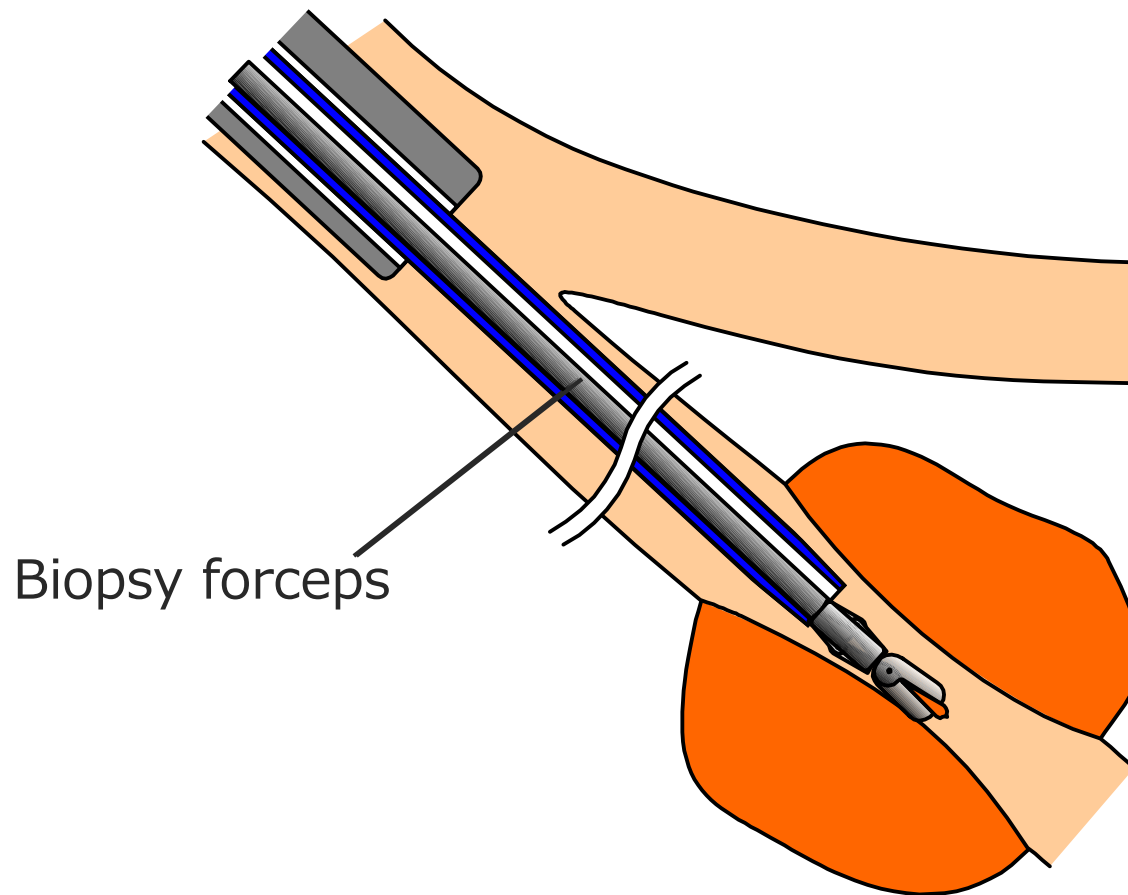
Perform sampling with biopsy forceps or brush.



Perform sampling with biopsy forceps or brush.



Perform sampling with biopsy forceps or brush.



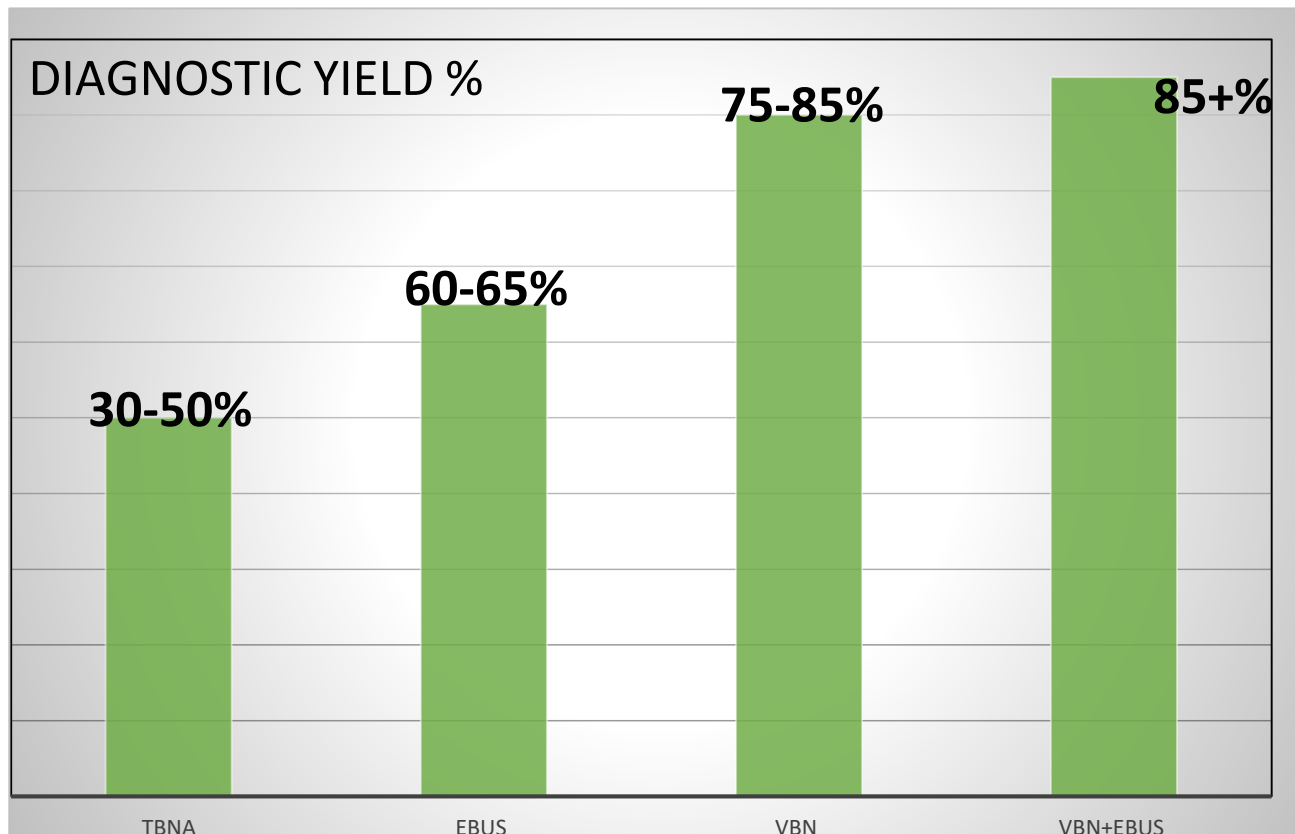


LungPoint  
Virtual Bronchoscopic  
Navigation(VBN) system



LungPoint Planner system

- CT slice thickness : 1.25mm or 그 이하
- CT slice spacing : 0.625mm 이하
- CT slice : 200 images~1200 images

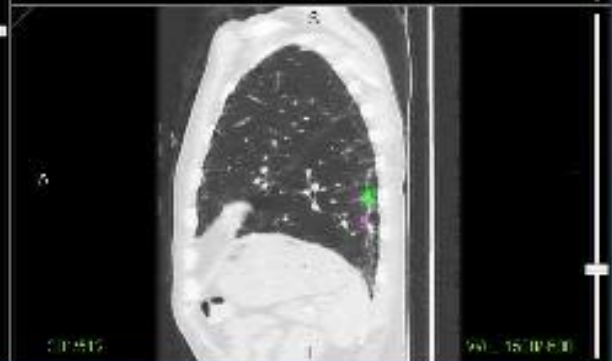
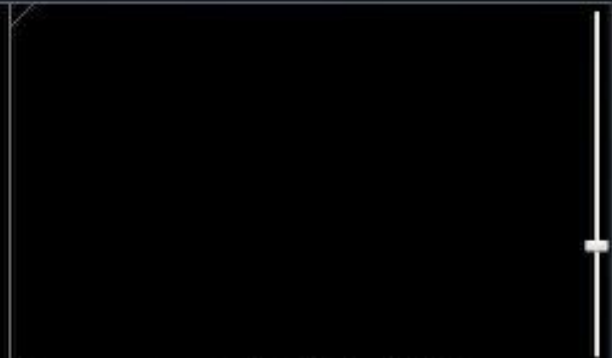


1 ● TARGET : 3 DOUBLE CLICK TO ENTER TARGET NAME

2

3

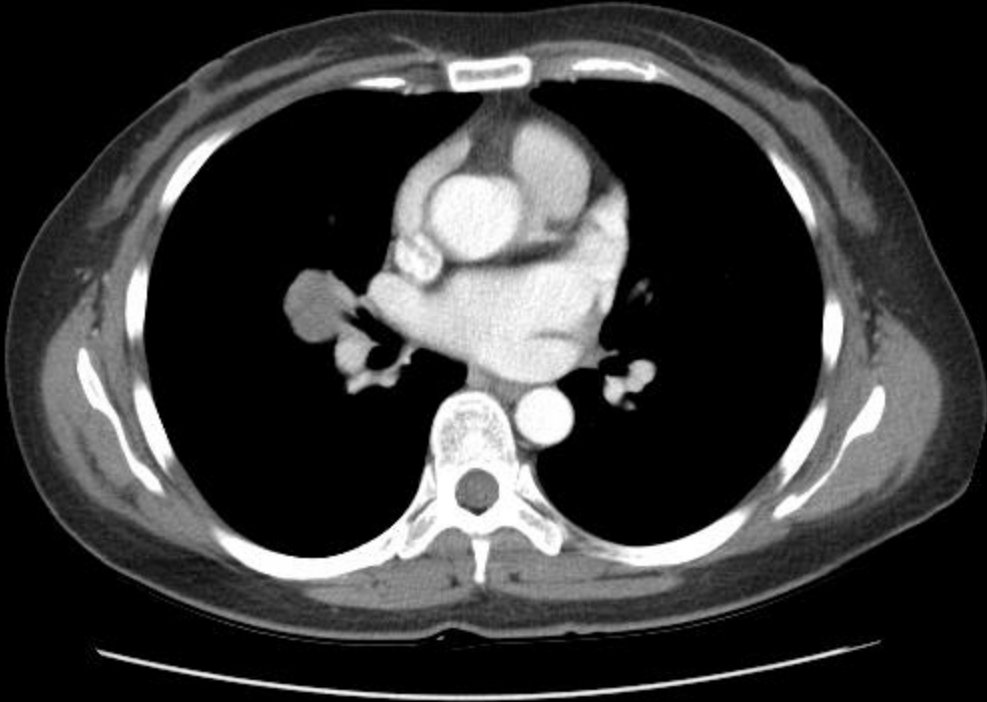
+



FILE IMPORT

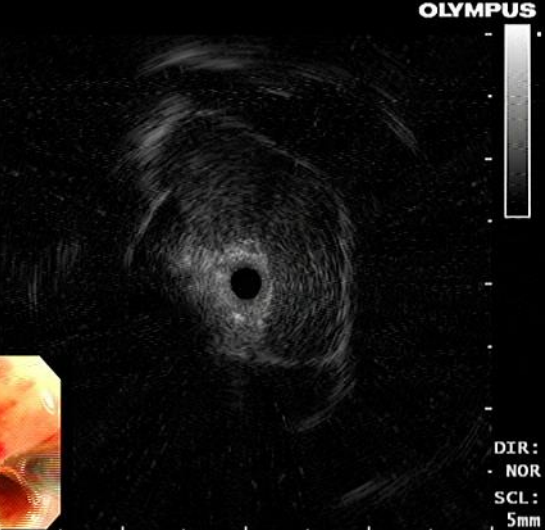
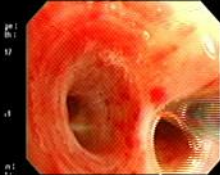
VIRTUAL BRONCH

Female 40 years old



ID:  
NAME:  
AGE:  
DOB: SEX:  
02/13/2017  
10:01:14  
20MHz 4cm  
G: 9/19 I:N  
C:4/8

MEDIA  
T/B:IMG ROT



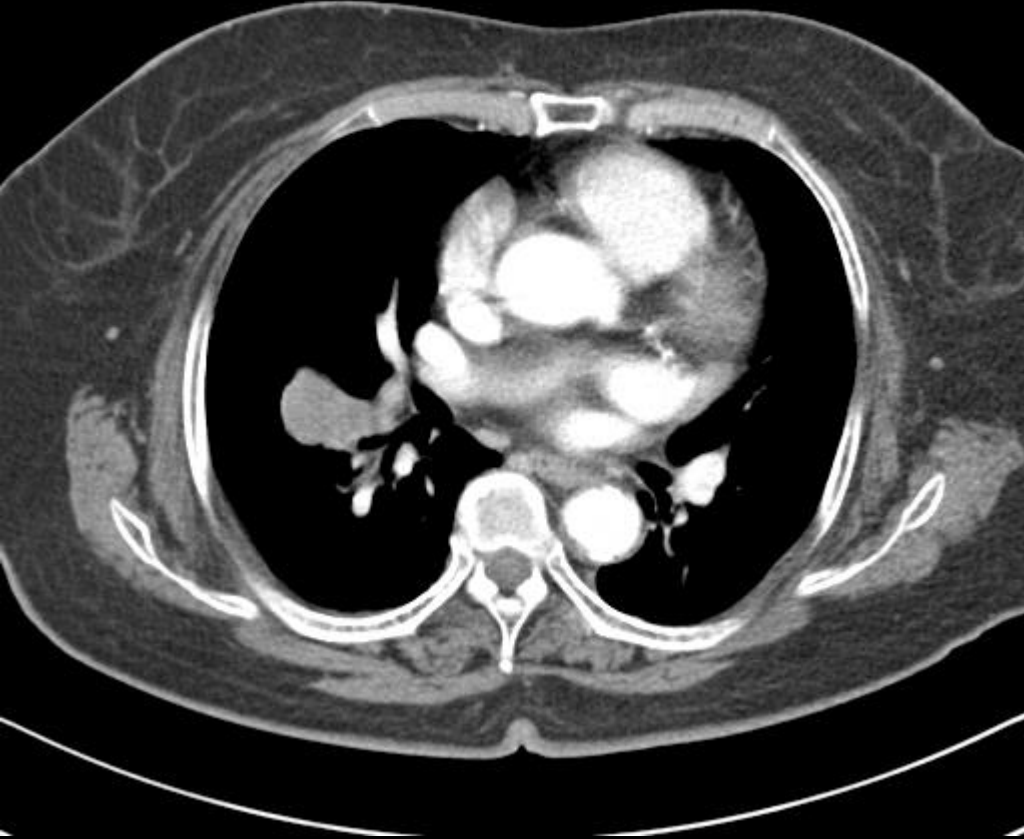
OLYMPUS



DIR:  
NOR  
SCL:  
5mm

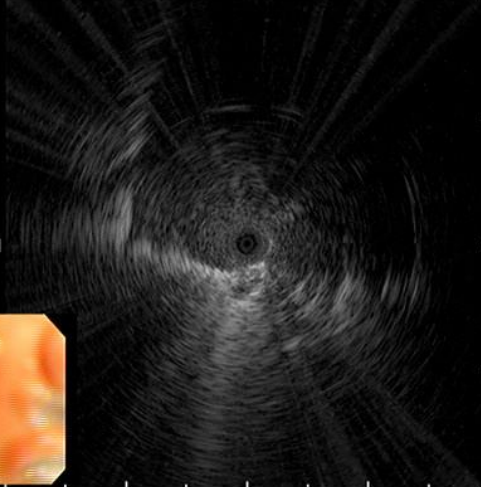
Squamous cell carcinoma

Female 77 years old



ID:  
NAME:  
DOB: 10/07/2016  
13:26:31  
20MHz 4cm  
G: 9/19 I:N  
C:4/8

OLYMPUS

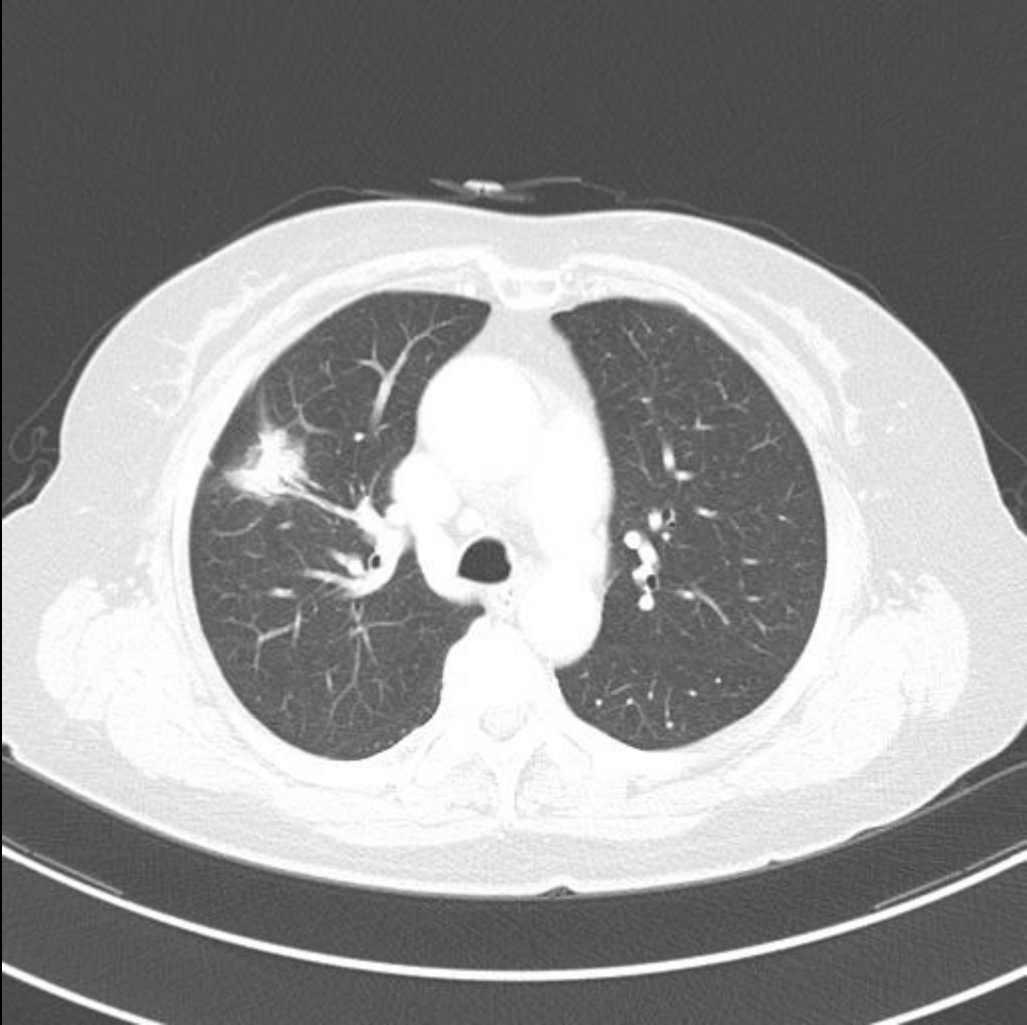


MEDIA  
T/B:IMG ROT

DIR:  
- NOR  
SCL:  
5mm

Adenocarcinoma

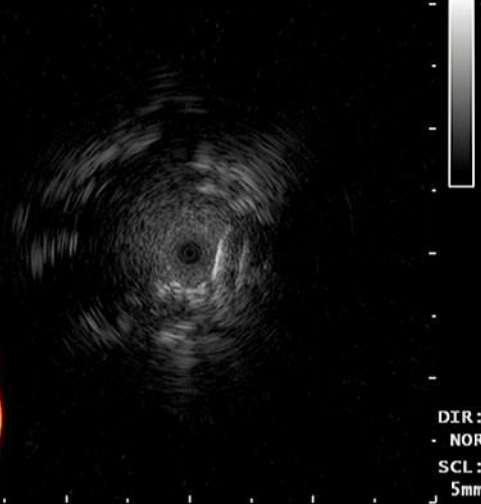
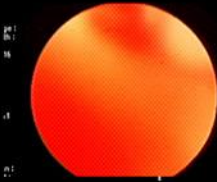
Female 69 years old



ID:  
NAME:  
AGE:  
DOB: SEX:  
09/01/2016  
11:23:56  
20MHz 4cm  
G: 9/19 I:N  
C:4/8

OLYMPUS

MEDIA  
T/B:IMG ROT



DIR:  
- NOR  
SCL:  
5mm

Adenocarcinoma

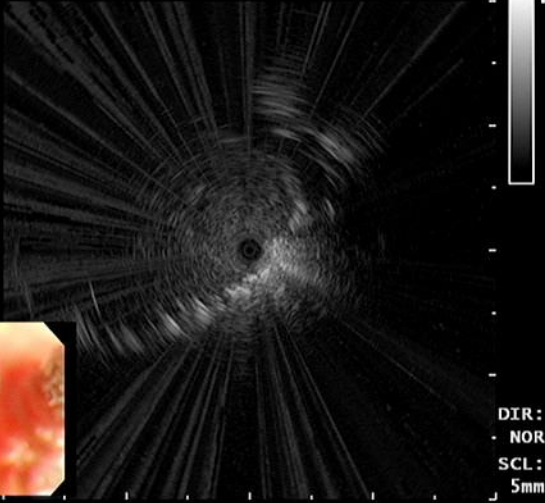
Female 69 years old



ID:  
NAME:  
AGE:  
DOB: SEX:  
08/01/2016  
11:24:24  
20MHz 4cm  
G: 9/19 I:N  
C:4/8

OLYMPUS

MEDIA  
T/B:IMG ROT



DIR:  
NOR  
SCL:  
5mm

Adenocarcinoma

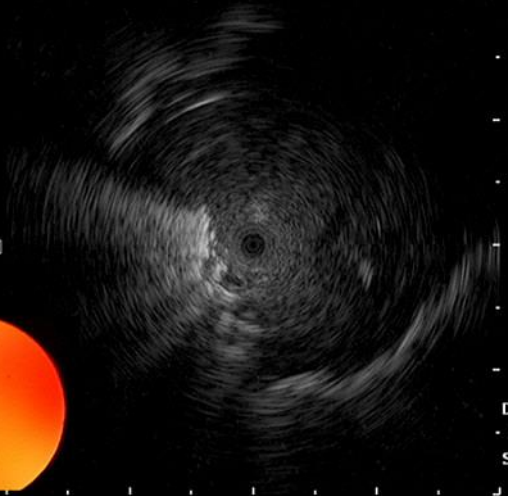
Female 49 years old



ID:  
NAME:  
AGE:  
DOB: 07/11/2016  
SEX:  
09:08:34  
20MHz 4cm  
G: 9/19 I:N  
C:4/8

OLYMPUS

MEDIA  
T/B:IMG ROT

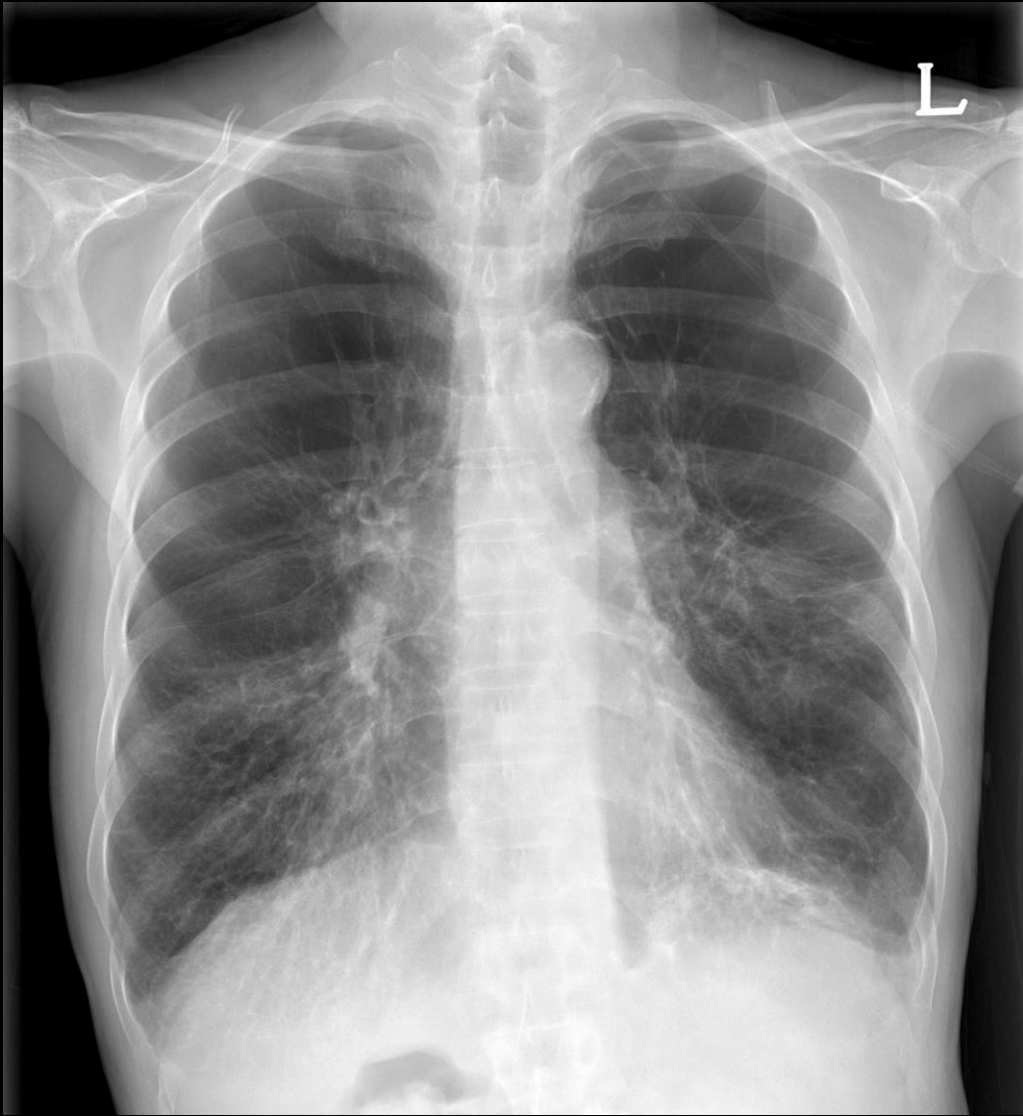


DIR:  
- NOR  
SCL:  
5mm

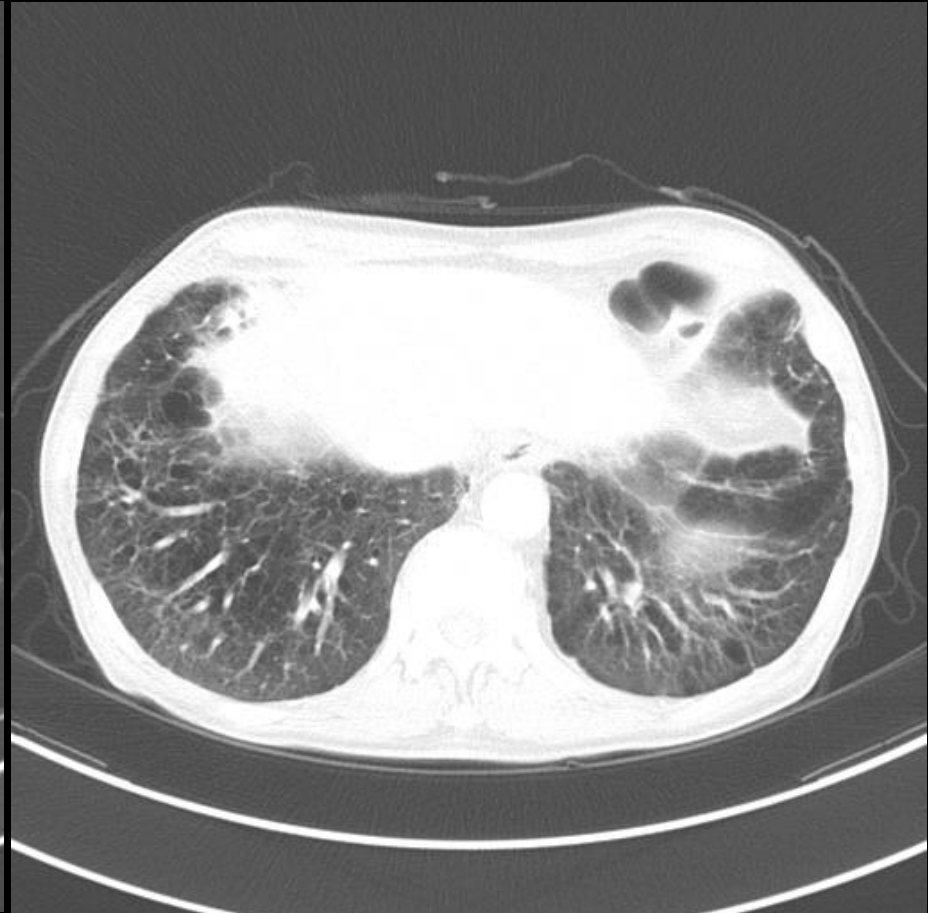
Adenocarcinoma

Male 66 years old

FEV1 1.42L 48% DLCO 14%

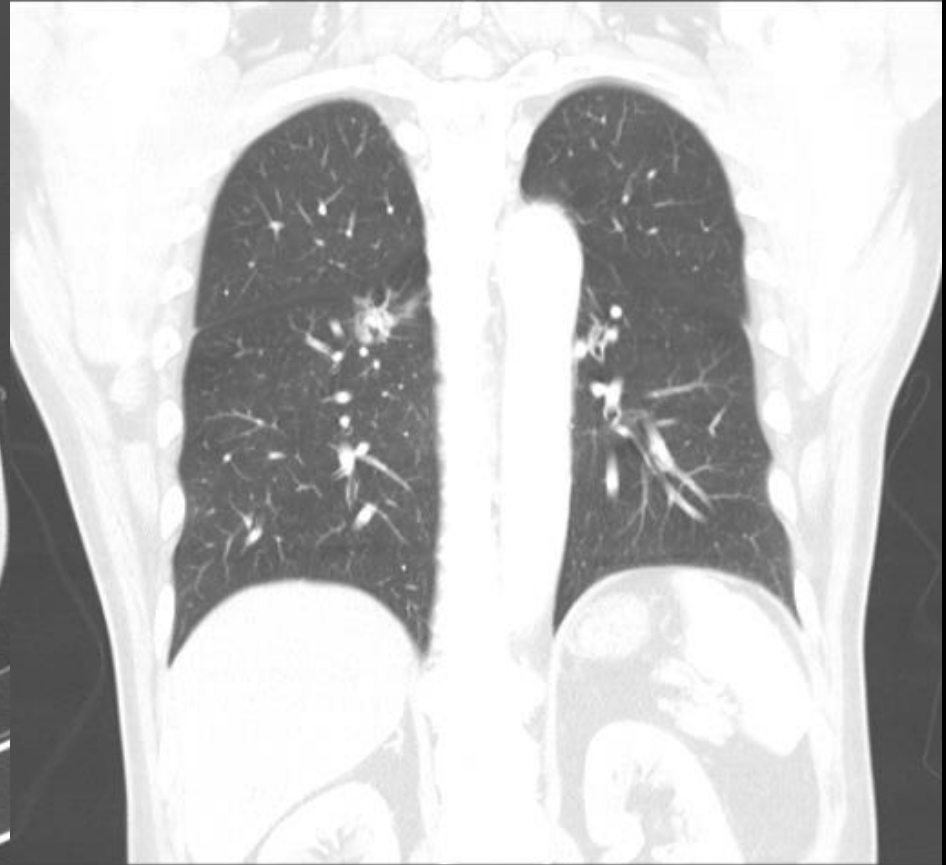


Male 66 years old

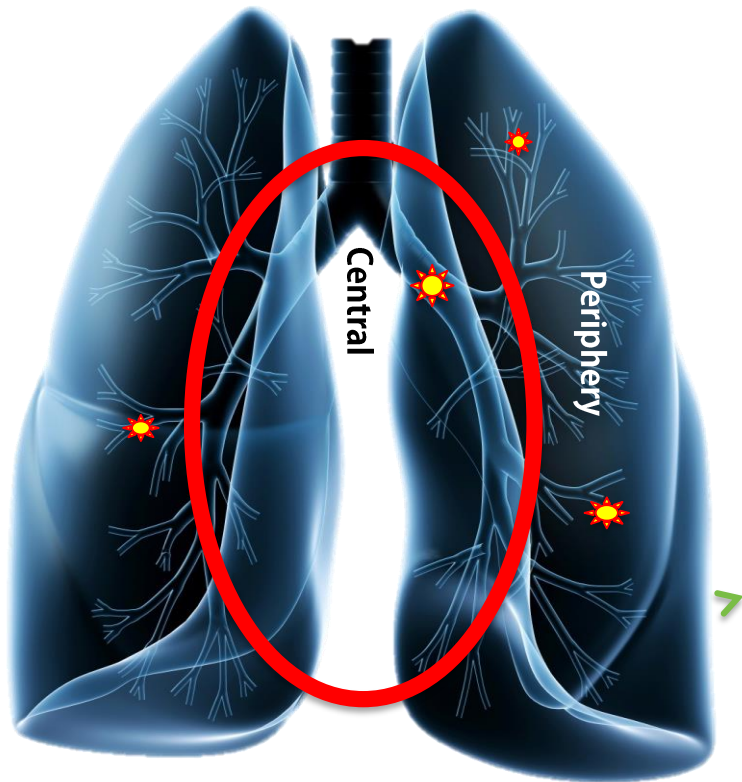


Chronic Granulomatous Inflammation

Male 53 years old



Fail due to acute angle



superDimension®



**OLYMPUS**®

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LungPoint®