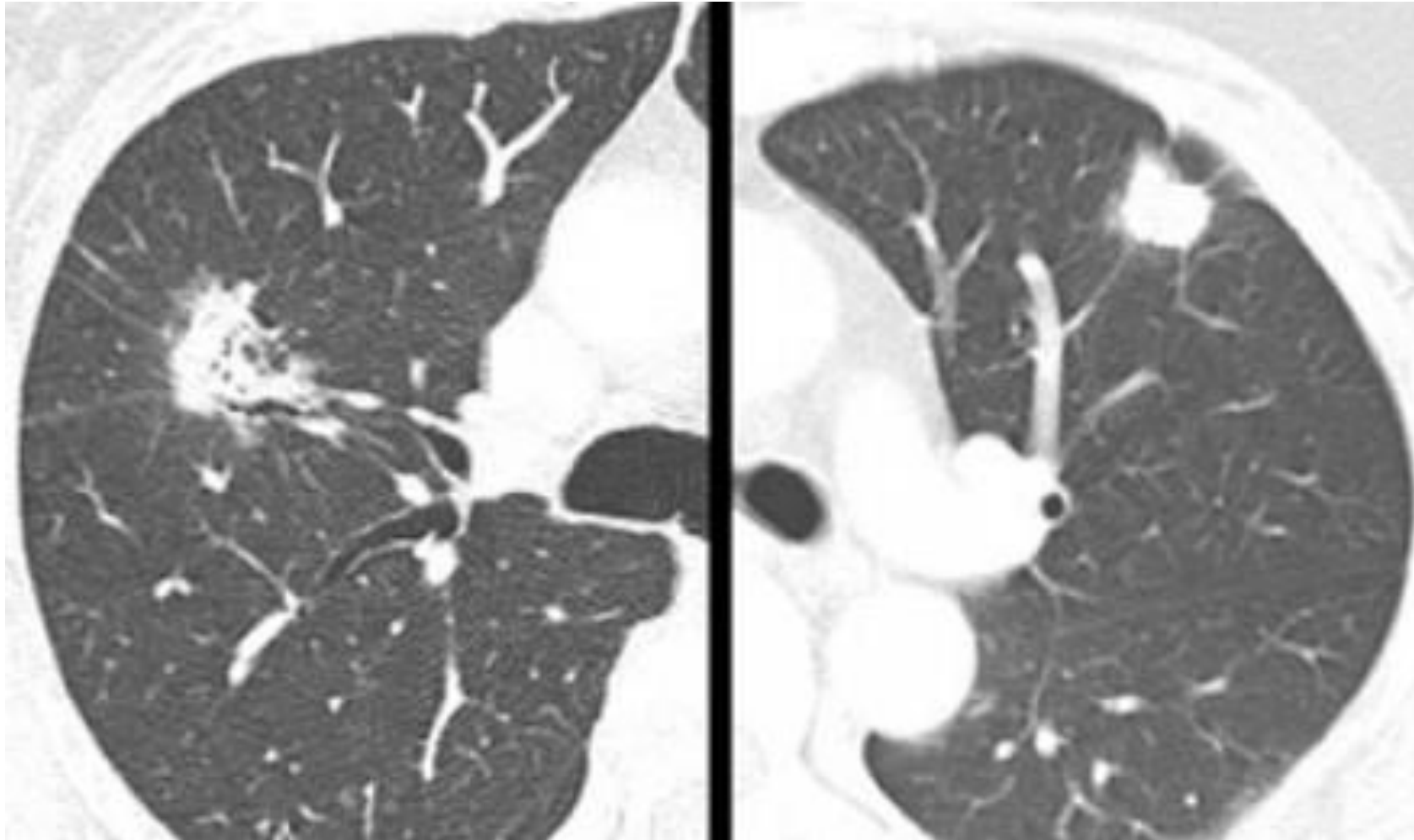


νεώτερες εξελίξεις στη βρογχοσκόπηση Electromagnetic Navigation Bronchoscopy, ENB

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Peripheral Pulmonary Lesions, PPLs



PPLs

The most appropriate biopsy technique for PPLs can be a challenging clinical risk-benefit decision

- tumour size
- location
- patient co-morbidities
- emphysematous changes around the PPL
- respiratory function
- pre-test probability of malignancy

National Lung Screening Trial (NLST)

This landmark study of CT vs CXR screening for lung cancer demonstrated a 20% reduction in lung cancer mortality in the CT screening arm

39.1% of the 53.454 participants had at least one non-calcified nodule ≥ 4 mm in diameter

72.1% of these patients underwent further diagnostic evaluation

The majority of these nodules are not malignant (approximately 1% in the high-risk NLST population)

The challenge is, therefore, to find safer and more accurate ways to diagnose PPL and avoid unnecessary surgical procedures

the New England Journal of Medicine August 4, 2011. NLST was conducted by the American College of Radiology Imaging Network and the Lung Screening Study group

PPLs - general management strategies

- ☐ watchful waiting with serial imaging to detect interval change, including the use of PET scans
- ☐ minimally invasive diagnostic procedures (bronchoscopy and transthoracic needle aspiration)
- ☐ surgical excision for diagnosis and definitive management.

TransBronchial Lung Biopsy (TBLBx) of PPLs

- Sampling with standard bronchoscopy + fluoroscopic guidance
- an overall sensitivity for malignancy between **14-63%**
highly dependent on:
 - *lesion size (2 cm=63%)*
 - *biopsy method (forceps biopsy=57%, brush=54%, wash=43%)*
 - *number of biopsies taken*
- Sampling with standard bronchoscopy + CT guided
- diagnostic yields of between **65-73%**
 - but concerns about radiation exposure and inefficient use of CT scan time [in one study, an average of 4.1 scans per patients were performed with a mean effective radiation dose of 0.55 mSv] has prevented widespread adoption of this technique

Electromagnetic navigation bronchoscopy (ENB)



Electromagnetic navigation bronchoscopy is an exciting new bronchoscopic technique that promises accurate navigation to peripheral pulmonary target lesions, using technology similar to a car global positioning system (GPS) unit



ENB is a complicated procedure requiring pre procedure preparation and skills which will be unfamiliar to experienced bronchoscopists

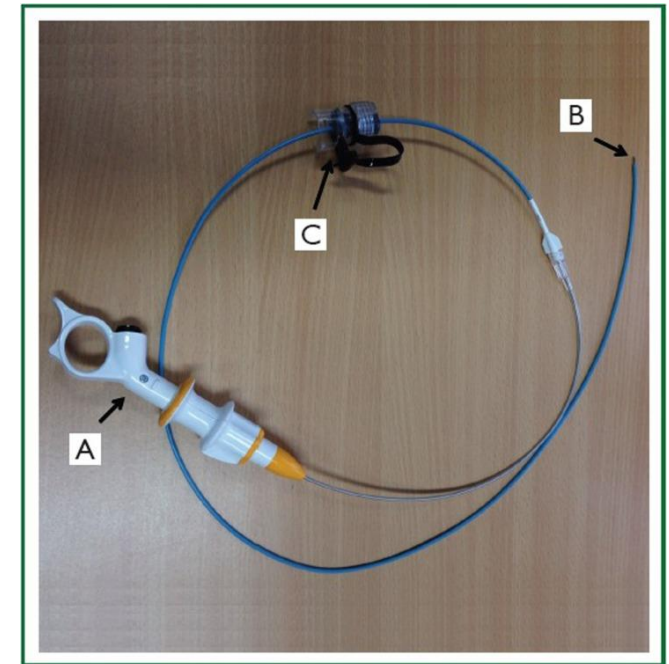
Although more complex than standard bronchoscopy, procedural proficiency in ENB is achievable by an experienced bronchoscopy team



E-description of technology

The system consists of :

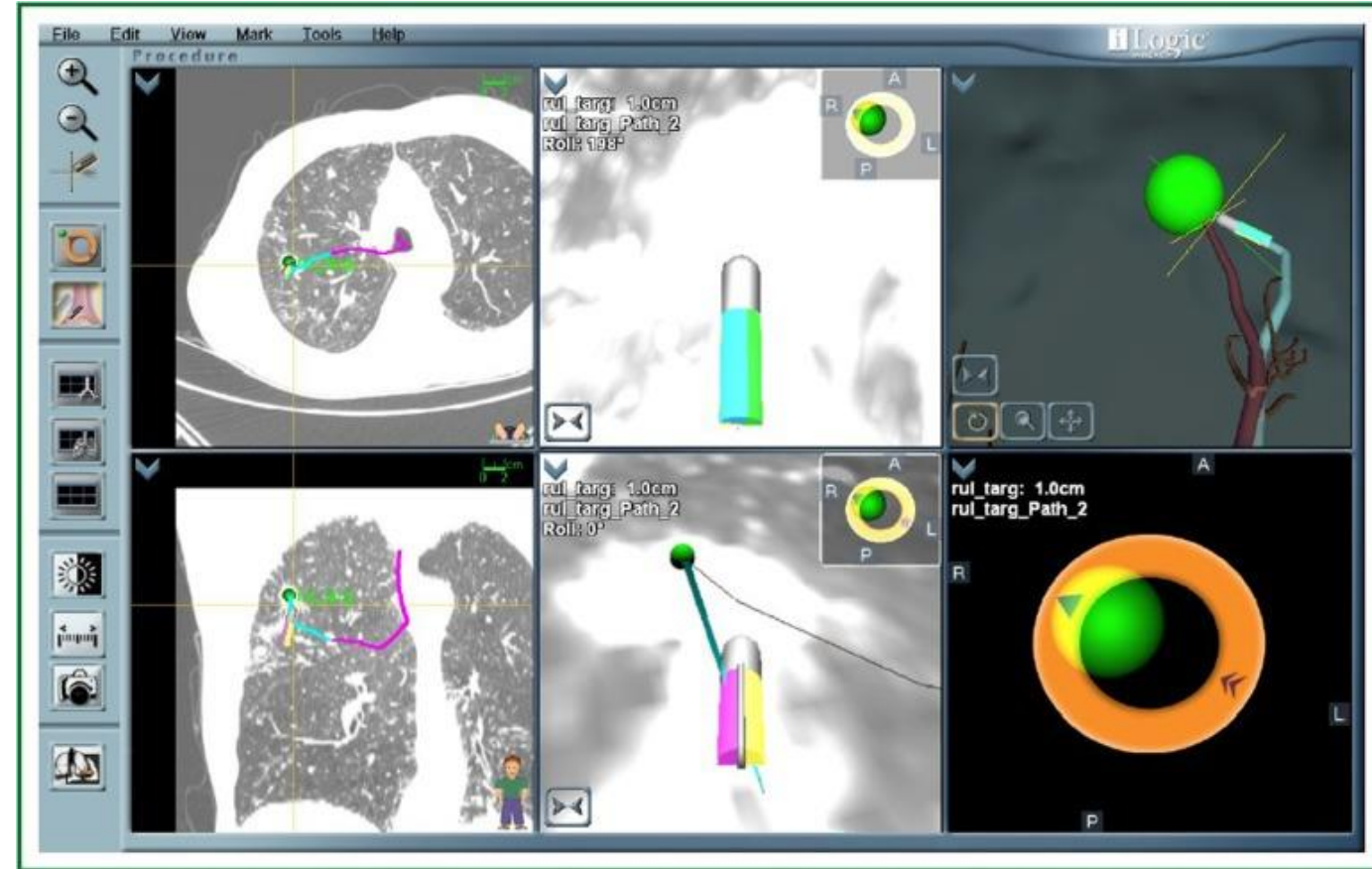
- ❑ iLogic virtual bronchoscopy planning software
- ❑ A "location board" which emits low frequency electromagnetic waves
- ❑ An extended working channel (EWC) that is similar in function to a guide sheath (C)
- ❑ An eight way steerable catheter to enable selective cannulation of bronchi (A)
- ❑ A "locatable guide" containing sensors that allow precise tracking of both position and orientation throughout the electromagnetic field (B)



The bronchoscope is wedged into the subsegment leading to the target lesion and the EWC and LG are then slowly advanced with the aim of keeping the selected waypoint in the centre of the circle presented on the tip view.

If the waypoint is not centred, arrows will appear on the circle edge, indicated the direction in which the LG handle needs to be turned before further advancing the EWC/LG.

The size of the sphere is proportional to the distance between the planned waypoint and the LG tip.



superDimension procedure screen showing 6 viewports

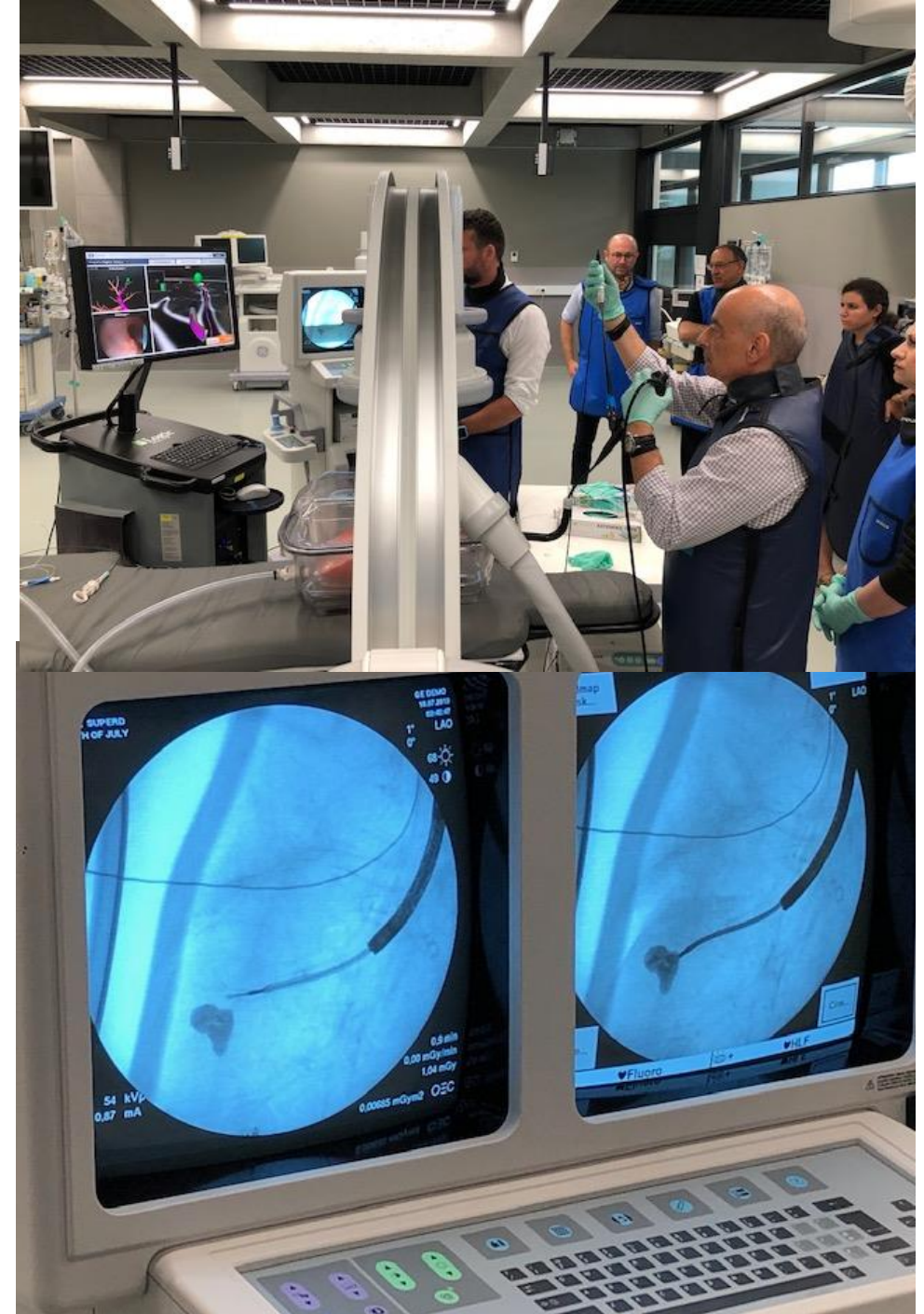
The green sphere is the target lesion and the yellow ring represents the catheter handle.

ENB - Sampling

Once the LG tip is aligned with and in close proximity to the target lesion the EWC is locked onto the bronchoscope, the LG is removed

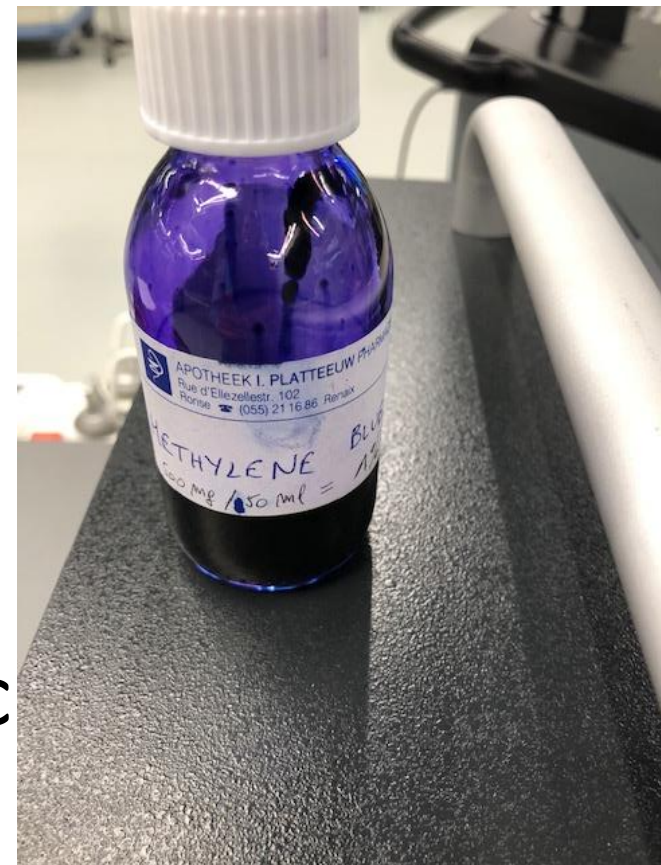
Biopsy tools are then inserted through the EWC in a fashion similar to the way a guide sheath is used during EBUS RP

Fluoroscopy or radial probe EBUS can be used to confirm EWC position in real time.



Potential uses for ENB

- biopsy of peripheral lung lesions
- pleural dye marking of nodules for surgical wedge resection
- placement of fiducial markers for stereotactic radiotherapy
- therapeutic insertion of brachytherapy catheters into malignant tissue
- lung lesions ablation



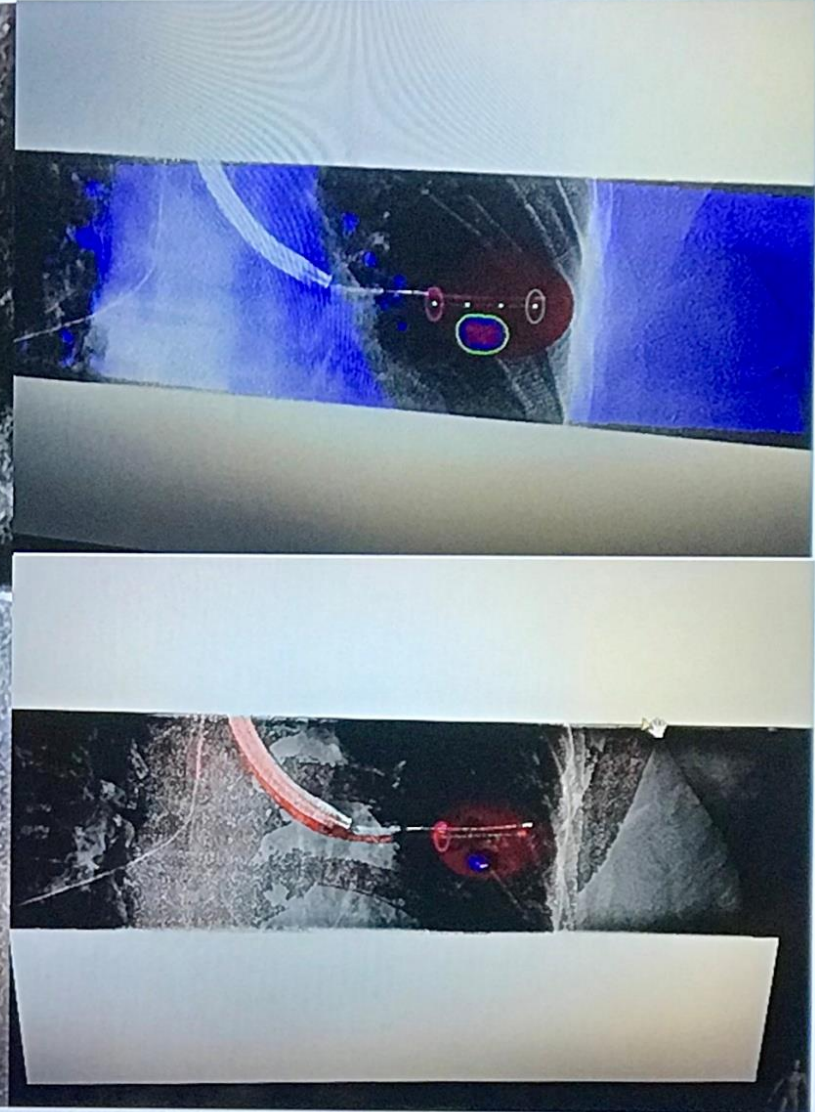
FIM @ ST. BARTS LONDON

BY DR. KELVIN LAU (08.02.18)

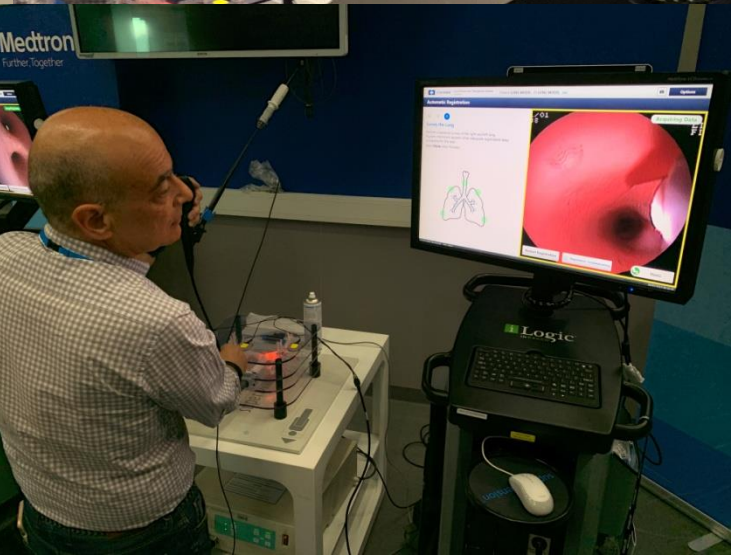
EBN- ABLATION



- Lesion size: 1.2 cm
- Margin: 5mm
- 30 days CT done ✓
- Next one sheduled for 05.04.17
- More in the queue!!







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completed the training program led by Medtronic Trainers
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Matthew Brown

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