25/45 had a prior CT report indicating malignant pathology, whereas 20/45 had a CT reporting no evidence of pleural malignancy (sensitivity of CT for a diagnosis of malignant pleural disease=55.6%, 95% CI 41.0% to 70.1%). Of the 42 cases with a thoracoscopic biopsy demonstrating benign pathology, 9 had CTs reporting malignant pathology (specificity for CT=78.6%, 95% CI 66.1% to 90.9%).

Conclusion CT appears to be less sensitive (56%) than previously reported, with a specificity (79%) similar to the previous literature. This difference may reflect changing patterns of disease or changes in the use of invasive biopsy techniques. The data suggests that the use of CT alone in determining which patients should have invasive pleural biopsies should be re-evaluated, and further studies to define the diagnostic pathway are now required.

S20 MEDICAL THORACOSCOPY IS SAFE AND EFFECTIVE IN PATIENTS WITH SMALL OR NO PLEURAL EFFUSIONS

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Introduction Current BTS guidelines recommend the utilisation of medical thoracoscopy (MT) for cytology negative, exudative pleural effusions. A large pleural cavity is required between the lung and chest wall for safe MT. The presence of little or no pleural fluid, despite there being pleural disease present, makes the procedure technically challenging with a higher potential for complications, bleeding and failure of the procedure.

Objective We compare the safety and efficiency of MT performed in patients with small or absent pleural effusions, with patients with moderate or large effusions.

Methods A retrospective review of case notes, radiology and pathology reports of patients who underwent MT between January 2010 and March 2012 was conducted. All procedures were performed or assisted by a level II thoracoscopist with the aid of live ultrasound scanning (USS). Pleural effusion size was estimated using chest x-ray and bedside USS. A small effusion was defined as blunting of the costophrenic angle only on chest x-ray and less than 100ml fluid estimation on USS. Patients were divided into two groups based on effusion size (absent or small effusion and moderate or large effusion). Data was collected and analysed for minor and major complications and diagnostic yield.

Results 43 MT were performed during the period. 88% of patients were male (n=38). The mean patient age was 70.1 years (SD 8.69). 41.9% patients had absent/small effusions (n=18). There were no major complications documented in either group. The minor complication rate was 8% in the moderate/large effusions group (n=2) and 11% in the absent/small effusions group (n=2). The minor complications noted were trapped lung, surgical emphysema, wound infection and haematoma. The diagnostic yield was 96% in the moderate/large effusions group (n=24) and 94% in the absent/small effusions group (n=17).

Conclusions Despite its technical challenges, MT can be performed safely and effectively with minimal minor complications and high diagnostic yield in patients with small pleural effusions and even when no fluid is present when performed by thoracoscopists with appropriate experience level.

S21 IS THERE A CORRELATION BETWEEN LUNG FUNCTION VALUES AND CARDIOPULMONARY EXERCISE OUTCOME?

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Introduction Cardiopulmonary Exercise testing (CPET) has become an important tool for perioperative assessment as it may identify patients at risk of postoperative cardiopulmonary complications. Older (1) recommended that an Anaerobic Threshold (AT)<11 or >11ml/min/kg can be used to stratify post-operative treatment in colorectal patients (ITU, HDU or ward). The BTS guidelines (2) recommend that a Peak VO2 (PVO2)<15 or >15ml/min/kg can be used as a risk assessment in thoracic surgical patients. However, CPET can be difficulty to carry out. This study was undertaken to determine whether selected lung function values correlated with CPET outcome, so that they could be used as an alternative to AT and PVO2.

Method 500 pre-operative colorectal (388) and oesophageal (112) patients attending the Lung Function Department were analysed. Spirometry and Gas Transfer were performed to assess lung function. CPET was performed on a cycle ergometer to calculate PVO2 and AT.

Results The area under the curve (AUC) of a Receiver Operating Curve (ROC) analysis was carried out on the 500 patients. This compared percent predicted FEV1, FVC, TLco and Kco values to PVO2 and AT.

Abstract S21 Table 1

AUC	FEV1 (% Predicted)	FVC (% Predicted)	TLco (% Predicted)	Kco (% Predicted)	PVO2	AT
PVO2	0.560	0.557	0.721	0.625	1.00	0.894
AT	0.547	0.568	0.643	0.555	0.877	1.000

Discussion Our findings indicated that analysis of lung function variables cannot reliably predict PVO2 or AT outcome. However, of the variables recorded, TLco was the best marker for predicting a PVO2>15ml/min/kg (0.721). When the cut-off for TLco was set at 80% predicted it had a sensitivity and 1-specificity of 62% and 24% respectively.

Interestingly, there was a significant correlation between AT and PVO2 (0.894), suggesting that AT can be used as a predictor of PVO2. If the cut-off for AT was set at 11ml/min/kg; the sensitivity was 91.7% and the 1-specificity 37.7%. However if the cut-off was adjusted to 12ml/min/kg; the sensitivity was 77.3% and the 1-specificity was 13.7%.

Conclusion These results suggest that in pre-operative assessment of patients undergoing thoracic surgery, an AT>12ml/min/kg could be used as an alternative measure if the patient was unable to achieve a PVO2>15ml/min/kg.

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S22 THE EFFECT OF NEEDLE GAUGE ON CHARACTERISATION OF HISTOLOGY SAMPLES AT ENDOBRONCHIAL ULTRASOUND-GUIDED TRANSBRONCHIAL NEEDLE ASPIRATION (EBUS-TBNA)

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Introduction Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive mediastinal node sampling technique used for lung cancer staging and

diagnosis of malignant and benign lesions. Sampling is done with either 21-gauge (21G) or 22-gauge (22G) needles. There are only two published (non-UK) studies which have evaluated the effect of EBUS-TBNA needle gauge on diagnosis.[1,2] Neither study demonstrated a difference in diagnostic yield but one study suggested better preservation of histological structure with the 21G needle.[1] The aim of this retrospective UK study was to evaluate the diagnostic utility of 21G versus 22G EBUS-TBNA needles. Our hypothesis was that the 21G needle would allow greater histological characterisation of non-small cell lung cancer (NSCLC) and benign mediastinal lesions.

Methods A retrospective analysis was performed from 185 patients referred for EBUS-TBNA between 2011 to 2012. EBUS-TBNA was performed as previously described under conscious sedation.[3] 21G or 22G (Olympus ViziShot, NA-201SX-4021 and NA-201SX-4022) was used at the discretion of the operator. Pathologists were blinded to needle gauge. Contingency table statistical analysis was performed (GraphPad Prism version 5) to compare diagnostic utility of 21G and 22G EBUS-TBNA needles and ability to subcharacterise NSCLC and benign lesions.

Results Performance data (table 1) showed non-inferior diagnostic utility for 21G and 22G needles. Subgroup analysis of benign 21G tissue samples revealed superior characterisation (especially for sarcoidosis) compared to 22G samples (30/37, 81%, versus 17/33, 52%, p=0.008). Similarly, characterisation of NSCLC was superior in 21G samples versus 22G samples (28/33, 85%, versus 25/41, 61%, p=0.02).

Conclusion This UK single centre retrospective study suggests 21G EBUS-TBNA needles are superior in characterising benign lesions (especially sarcoidosis) and NSCLC Making a positive benign diagnosis avoids the need to perform mediastinoscopy; additionally, identification of lung adenocarcinoma allows appropriate epidermal growth factor receptor mutation testing and targeted oncological therapy.

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S23 ROLE OF TRANSOESOPHAGEAL FINE-NEEDLE ASPIRATION USING AN ULTRASOUND BRONCHOSCOPE IN MEDIASTINAL STAGING AND DIAGNOSIS OF LUNG CANCER

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Objective To evaluate the role of transoesophageal fine-needle aspiration using an ultrasound bronchoscope (EUS-B-FNA) as an alternative means of diagnosing and staging lung cancer.

Methods This was a retrospective analysis of 132 cases of EUS-B-FNA between July 2008 and March 2012 in a large tertiary centre for respiratory medicine. EUS-B-FNA was performed with an OLYMPUS linear ultrasonic bronchoscope (BF-UM40) using a 21 Gauge needle. Samples were deposited into Cytolyte for cytological examination.

Results Of the 132 patients, 76 were male and 56 were female. The mean age was 69 years (range 40–86 years). No patients had a tissue diagnosis of malignancy prior to the procedure. 86 patients had a peripheral mass on CT, 43 had a mediastinal mass, and 3 patients had a new pleural effusion on CXR and mediastinal lymphadenopathy on CT scanning. EUS-B was used to sample subcarinal (n=100), L4 (n=46), R8 (n=4), R4 (n=2), R2 (n=2), L8 (n=1), L9 (n=1) and paragastric (n=1) lymph node stations. It was also used to sample RLL (n=4), RUL (n=3), LUL (n=3), LLL (n=1), paraoesophageal (n=2) and anterior mediastinal (n=1) masses. A left adrenal mass was sampled in 1 patient. EUS-B was used as a first line procedure in patients with enlarged lower mediastinal lymph nodes, reduced oxygen saturations (SpO2<90%) or FEV1 (<1.0L), and those with a poor performance status. It was also used as a second line procedure in patients who could not tolerate bronchoscopy or EBUS procedures, and those with normal brocnhoscopy or EBUS procedure. There were no complications and the procedure was well tolerated. Of the 132 cases, a tissue diagnosis was obtained in 100 patients. Samples revealed no malignant cells in 22 patients. Samples were insufficient for diagnosis in only 2 cases. Of the 22 negative samples, 11 patients were referred to Thoracic Surgery, all of these patients also had a negative staging mediastinoscopy and so underwent surgical resection. 6 patients went on to have a CT guided biopsy which provided a tissue diagnosis. 3 patients were not fit for further investigation and so were treated on the basis of a radiological diagnosis of lung cancer.

Conclusion EUS-B-FNA should be considered as a safe and effective investigation in the diagnostic and staging algorithm in lung cancer. It allows sampling of stations L4, 7 and 8, and is effective as a first line procedure in patients with reduced oxygen saturations or FEV1, and a poor performance status.

Clinical studies in COPD

S24 PROFILE OF THE AIRWAY MICROBIOME IN COPD USING MALDI-TOF

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Introduction Bacterial infections are well known to have an association with chronic obstructive pulmonary disease (COPD), with Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis often seen at exacerbation. Many microbiome studies

Abstract S22 Table 1

EBUS-TBNA Needle	Sensitivity (%)	Specificity (%)	Positive Predictive value (%)	Negative Predictive Value (%)	Prevalence (%)	Accuracy (%)
21G n=88 (48%)	90	100	100	88	58	94
22G n=97 (52%)	91	100	100	85	66	94
Combined n=185	90	100	100	86	62	94