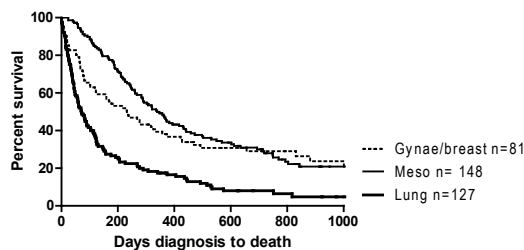


Figure: Survival of patients with malignant pleural effusion by cell type



Abstract S16 Figure 1

S17 PLEURAL IRRIGATION TRIAL (PIT): STANDARD CARE VERSUS PLEURAL IRRIGATION, A RANDOMISED CONTROLLED TRIAL IN PATIENTS WITH PLEURAL INFECTION

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Background Pleural infection remains common with an increasing incidence. It is associated with a high morbidity and mortality. Despite chest tube drainage and antibiotic therapy up to 30% of patients will die or require surgery. Case reports suggest that irrigation of the pleural space with saline may be beneficial but this has never been tested in the form of a randomised controlled trial.

Method Randomised controlled pilot study comparing saline irrigation (250ml normal saline intra-pleurally over one hour, 3 times a day for 3 days) plus best standard care, with best standard care alone, in patients with pleural infection (microbiology positive or pH<7.2 or purulent pleural fluid and clinical infection) requiring chest tube drainage, who had a residual pleural collection on baseline CT thorax. Primary outcome was percentage change in CT pleural volume from day 0 to day 3. Secondary outcomes included referral for surgery, hospital stay and adverse events.

Results 47 patients approached, 38 randomised, 3 excluded (drain fell out/no residual fluid on CT/removal of consent). Saline irrigation results in significant reduction in CT pleural collection volume compared to standard care – Irrigation group 29.15% reduction (95% CI 16.2–62) vs Standard care 13.9% (95% CI –4.1–26.3) $p < 0.04$. There was also a significant reduction in the need for thoracic surgery in the irrigation group 9/17 vs 2/18 $p = 0.01$ (OR 9.0, 95% CI 1.56–51.9). No differences were seen in length of hospital stay or fall in inflammatory markers (CPR, WCC and procalcitonin). The safety profile of saline irrigation was good with no serious complications and adverse events did not differ between groups.

Conclusion Saline irrigation improves fluid drainage in pleural infection (as measured by volumetric CT), leading to reduction in referral for surgery. No change in hospital stay was noted. This study now needs to be repeated as a large multicentre RCT powered to look at mortality and length of hospital stay.

Investigation of lung cancer

S18 BRONCHOALVEOLAR LAVAGE, TRACHEAL WASH AND INDUCED SPUTUM SURFACTANT PHOSPHOLIPID KINETICS FROM HEALTHY VOLUNTEERS

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Introduction and Aims: Pulmonary surfactant is a complex mixture of lipoproteins synthesised and secreted by alveolar type II

cells. The assessment of surfactant synthetic function and metabolism may provide essential information in disease states characterised by surfactant dysfunction. Airway surfactant is thought to be of alveolar origin. However, surfactant kinetics from airway secretions may vary from alveolar surfactant. Stable isotope labelling of surfactant precursors enables dynamic mapping of surfactant PC molecular species. This study aimed to compare three surfactant recovery methods [bronchoalveolar lavage (BAL), tracheal wash (TW) and induced sputum (IS)] to assess surfactant PC kinetics in healthy adults. Surfactant phosphatidylcholine (PC) is synthesised *de novo* from choline via CDP-choline pathway. By labelling choline with deuterium, a naturally occurring isotope of hydrogen, it is possible to assess surfactant PC synthesis and metabolism in humans.

Methods Healthy human volunteers had an infusion of methyl- D_9 -choline-chloride [3.6mg/kg] for 3 hours. BAL and TW specimens were taken at 24 and 48 hours and induced sputum samples were taken at 0, 8, 24, 48 and 96 hours after choline infusion. The lipid fraction was extracted with chloroform and methanol. The samples were analysed by triple quadrupole electro spray ionisation mass spectrometer (ESI/MS). The results are expressed in mean (+/-standard error of mean).

Results Ten healthy volunteers were recruited. The endogenous PC composition from BAL and TW were similar. The newly synthesised PC fraction mirrored the endogenous composition at 48 hours for both BAL and TW IS PC composition and D_9 labelled PC fraction was variable. The total PC D_9 -incorporation at 48 hours was higher than 24 hours for BAL ($0.55 \pm 0.04\%$), TW ($0.56 \pm 0.04\%$) and IS (0.58 ± 0.06). PC16:0/16:0 D_9 -incorporation had significant correlation for BAL and TW ($r^2 = 0.8201$, $P < 0.05$).

Conclusions Isotope labelling of choline using ESI/MS analytical method, it is possible to assess surfactant PC metabolism. The tracheal aspirate is an alternative technique to assess surfactant metabolism in patients otherwise unable to tolerate invasive bronchoscopy. This methodology may be utilised to assess surfactant synthetic function in patients with acute lung injury.

S19 ROLE OF CT IN ASSESSING PLEURAL MALIGNANCY PRIOR TO THORACOSCOPY

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Introduction The definitive diagnosis of pleural malignancy depends upon histological proof obtained via pleural biopsy. CT is reported to have a high sensitivity and specificity for the diagnosis of malignant pleural disease, and is part of the routine diagnostic work up of these patients. However, studies assessing the sensitivity of CT for pleural malignancy were carried out in relatively small cohorts of patients, and there remains a need for further data. The aim of this study was to assess the sensitivity and specificity of CT in detecting pleural malignancy (both primary and metastatic) prior to definitive histology obtained via thoracoscopy in a large cohort of patients with suspected malignant pleural disease.

Methods Retrospective review of thoracoscopy procedures carried out between 2010 and 2012 at the Churchill Hospital, Oxford, comparing histological results from thoracoscopy with the CT reported diagnosis before the procedure.

Results A total of 136 procedures were assessed. Thoracoscopic pleural biopsies were successfully obtained for histological analysis in 121 (89%) cases. Of these, 87 (72%) had CT chest scans prior to the procedure for which reports were available, and were included in this analysis. A total of 45/87 (52%) cases had a diagnosis of malignant pleural disease on the basis of the thoracoscopic biopsies. In those with a final histological diagnosis of malignancy,

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 thoroscopic 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 difficult 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.

Reference

- Older(1999). Cardiopulmonary exercise testing as a screening test for perioperative management of major surgery in the elderly. *Chest*; 116; 355–62.
- BTS Guidelines on the selection of patients with lung cancer for surgery (2001). *Thorax* 56:89–108.

S22 THE EFFECT OF NEEDLE GAUGE ON CHARACTERISATION OF HISTOLOGY SAMPLES AT ENDOBROCHIAL 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