value (SUV(max)) cut-off >2.5, sensitivity, specificity, accuracy, PPV, and NPV were 76.0%, 80.0%, 76.6%, 95.0%, and 40%, respectively. Combining with visual assessment of uptake (moderate or high), sensitivity, specificity, accuracy, PPV, and NPV were 71.4%, 90.0%, 76.3%, 95.2% and 52.9% respectively. Figure 1 demonstrates receiver-operating curve for SUVmax. Area under the curve is 0.924 (95% CI: 0.82, 1.0; p<0.005), demonstrating outstanding test performance. Ideal SUVmax cut off in this cohort was 1.25; sensitivity, specificity, accuracy, PPV, and NPV 92.0%, 80.0%, 90.0%, 95.8% and 66.6% respectively. PET-CT detected extra-pulmonary findings requiring further investigation in 28.2%.

Conclusion: In this cohort, PET-CT was able to discriminate well between benign and malignant lung nodules detected at lung cancer screening. Further work is ongoing to clarify the clinical utility and cost-effectiveness of PET-CT in lung cancer screening.

Disclosure: No significant relationships.

48 Machine learning can predict lung cancer using primary care data

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Introduction: 17.5% of patients who are urgently referred for suspected lung cancer do not have lung cancer, and so better risk stratification is needed in primary care [1]. We previously identified several features which differentiate patients with and without lung cancer, such as systemic symptom burden [1]. This study expanded our previous work by doubling its sample size and formulating a machine learning algorithm to identify patients at high risk of lung cancer.

Methods: All urgent lung cancer referrals to Watford General Hospital between January 2020-January 2021 were screened. Lung cancer patients (radiological and/or pathological diagnosis) and patients without lung cancer (diagnosis excluded by a multi-disciplinary team) were randomly selected. Patient data was retrospectively collected from hospital and primary care records. "Red flag" symptoms were defined as per the NICE guidelines for lung cancer referral. Several machine learning models were assessed to identify an algorithm that predicts lung cancer.

Results: 200 patients with lung cancer and 200 patients without lung cancer were randomly selected. More lung cancer patients displayed systemic symptoms than patients without lung cancer (Table 1). Fewer lung cancer patients presented solely with respiratory symptoms (28.0% vs 69.0%; P < 0.0001). Lung cancer patients presented with a greater total of red flag symptoms (2.86 vs 1.63; P < 0.0001) and accumulated more smoking pack-years (37.2 vs 18.5; P < 0.0001). Extreme gradient boosting (XGBoost) was the most accurate machine learning model for predicting lung cancer (AUC = 0.84 in the training set; AUC = 0.78 in the validation set).

Conclusions: Machine learning can predict lung cancer cases using clinical data available in primary care. Prospective validation of this algorithm in a primary care setting is needed.

Reference:

[1] Ananth S et al. Factors predicting lung cancer in urgent cancer referrals. Lung Cancer. 2021; 156(S1).

Disclosure: No significant relationships.

49 Pleural manometry: pilot study to assess integration of pleural manometry into clinical practice in the pleural service

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Introduction: Pleural manometry has been shown to provide useful diagnostic information in the diagnosis of non-expandable lung. With large studies planned to ascertain the clinical benefit of its use (pre-EDIT trial), we conducted a pilot study to see if this was a feasible addition to our clinical service. Aim To assess pleural manometry in new, suspected malignant pleural effusions or known malignant effusions requiring further intervention and compare the interpretation with clinical outcomes.

Methods: Patients attending the pleural procedures list who had a known malignant pleural effusion or pleural effusion of unknown cause and required therapeutic drainage were chosen for manometric measurement. The measurement was made according to a standard protocol and documented on a standardised proforma. The information was not recorded on the patients records to avoid it's use in clinical practice. Further treatment for the patient was continued as per the local standard of care.

Results: In the 5-month study period we measured pleural pressures in 20 separate effusions from 19 patients. 13 of these effusions were malignant. Measurements from these patients showed 5 cases of lung entrapment pattern and 8 normal lung patterns on visual inspection of the graph. This correlated well with subsequent calculation and interpretation of pleural elastance. There was good correlation of manometric diagnosis and subsequent clinical outcome in this small cohort.

Discussion: The integration of the pleural manometer into pleural clinic practice was simple. The measurements added a trivial amount of time to the procedure itself which was deemed insignificant by the operating team. Good correlation with clinical outcomes suggests that this would be a valuable tool to make informed decisions with patients regarding definitive management of malignant pleural effusion. We intend to continue our collection of data as a prospective trial with a potential additional site within the trust incorporating its use.

Disclosure: No significant relationships.

50 Evaluation of diagnostic algorithms for initial lung cancer investigation: are bundles safe and efficient?

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Background: The recently introduced lung cancer diagnostic algorithms aim to improve outcomes by streamlining investigation pathways [1]. These allow for individual variation in practice suggesting either an initial PET-CT or a diagnostic test 'bundle'. We aimed to evaluate the impact of each strategy on our patient cohort.

Methods: We reviewed radiology reports, MDT and clinic records for all patients who underwent PET-CT for suspected new lung cancer between 1st October 2020 and 31st March 2021 (n=42) at one teaching hospital in the South-West. Mean age of patients was 66.9 years (IQR 60.0 to 71.0 years) and 61.9% (n=26) had IASLC stage I disease.

Results: A PET-CT first approach was taken in 45.2% (n=19) vs. a testing bundle (n=18, 42.9%), and was preferred for patients with IASLC stage I disease (68.4%) over a bundle (61.1%). A biopsy was performed as an initial investigation in remaining patients (n=5, 11.9%). PET-CT results significantly up-staged 3/42 cases and down-staged disease in 12/42 – for the remaining 27/42 staging remained unchanged. In the bundle cohort, 2 unnecessary invasive tests were performed. Within the PET-CT cohort, 6/19 patients subsequently had a biopsy and 4/19 patients had a resulting delay to a malignant diagnosis. We propose that if our entire cohort were investigated with a bundle of tests, 5/42 (11.9%) would have had unnecessary invasive tests due to subsequent disease down-staging, the majority of whom (n=4) had T1b disease. There was no notable difference between impact on the MDT workload between groups.