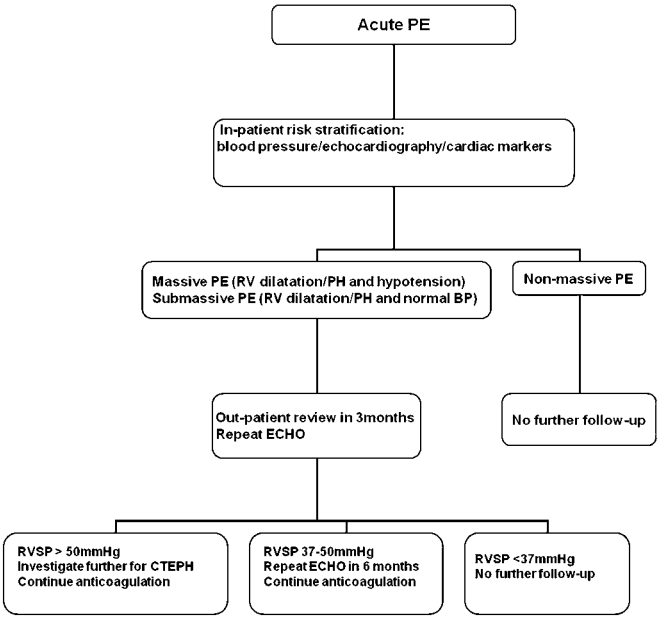

Abstract P7 Figure 1

P8 USE OF D-DIMER: CRP RATIO COMPARED TO D-DIMER ALONE TO PREDICT PE ON VQ SCANNING

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Introduction Pulmonary embolism (PE) is a common presentation in the emergency department and in-patient setting. Measurement of D-dimer in conjunction with clinical risk assessment is used to exclude patients at low risk of PE. Some of the conditions that mimic PE, including infection and inflammation, are also associated with elevated D-dimer concentrations such that the test lacks specificity. Most infectious and inflammatory conditions result in an elevated acute-phase serum response which can be quantified using C-Reactive Protein (CRP) assay. We hypothesised, therefore, that patients with isolated PE would have a higher D-dimer: CRP ratio than patients with infectious or inflammatory mimics of PE and therefore that this ratio would be more discriminatory.
Methods We analysed data from all patients who underwent V/Q scanning to confirm or exclude PE at Royal Free Hampstead NHS Trust, London, UK, during 2010. The CRP and D-dimer results closest, but preceding the V/Q scan were analysed using receiver operator characteristic (ROC) curves to test the hypothesis that the D-dimer: CRP ratio (expressed as ng/ml:mg/l) was a better predictor or PE than D-dimer alone.
Results 179 patients (mean (SD) age 52.8 (19.7) years) had a V/Q scan for suspected PE during the study period. Of these, 85 had a D-dimer assay, a median (IQR) of 1 (0–1) days prior to the imaging. The median D-dimer concentration was 272 (178–675) ng/ml. 137 patients had CRP assay (12 (3–56) mg/l), measured 1 (0–1) days prior to imaging. It was possible to calculate a D-dimer: CRP ratio in 78 patients (44% of the total), of whom 19 (24%) had a V/Q scan reported as high risk for PE. D-dimer, and the D-dimer: CRP ratio, but not CRP were significantly higher between patients who did and did not have high-risk V/Q scans (Mann–Whitney U test analyses: 764 vs 245 ng/ml, p=0.001; 107 vs 31 units, p=0.020 and 20 vs 10 mg/l, p=0.134 respectively). Biomarker data were $\log_{10}$ transformed to permit ROC analysis. Area-under-curve (AUC) values using ROC for D-dimer alone, and D-dimer: CRP ratio were 0.74 and 0.68 respectively, both less than the standard criteria for utility of 0.8.
Conclusions D-dimer: CRP ratio is not superior to D-dimer alone in predicting PE in patients with a clinical suspicion of this diagnosis sufficient to require V/Q scanning.

P9 DETERMINING THE APPROPRIATE D-DIMER CUT-OFF TO EXCLUDE PULMONARY EMBOLI IN AN AMBULATORY CARE SETTING USING DIFFERENT THRESHOLDS BASED ON PRE-TEST PROBABILITY

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Introduction Currently the same threshold value is used to identify a positive D-dimer result for all patients presenting to our ambulatory clinic with suspected pulmonary emboli (PE). It has been suggested that adjusting the threshold value according to the pre-test probability would exclude PE in more patients than using the same cut-off point regardless of clinical probability.
Methods Data from 362 consecutive patients presenting to the ambulatory PE clinic was collected. A pre-test probability of PE was recorded for all patients and those with a high pre-test probability had radiological investigations. Patients with a low or intermediate pre-test probability had a latex agglutination D-dimer test. If this result was =0.5 μg/ml they had further investigations, otherwise they were discharged. The diagnosis of PE was made if a VQ scan showed ventilation/perfusion mismatch or CTPA report demonstrated PE. Receiver operating characteristic curve analysis was performed separately for patients with low and intermediate probability and the optimum cut-off value to exclude PE determined. Sensitivity, specificity, negative predictive value and positive predictive value for different cut-off points were determined.
Results 362 patients were included in the analysis, 207 (57%) had low, 129 (36%) intermediate and 26 (7%) high pre-test probability. Prevalence of PE was 2% in the low probability group, 14% in the intermediate probability group and 42% in the high probability group. No patients with a D-dimer of <0.5 μg/ml who were discharged without further tests have re-presented with similar symptoms. In the low pre-test probability group, a cut-off point of 1.07 improved the specificity from 64% to 89% while maintaining a sensitivity of 100% and negative predictive value of 100%. Analysis in patients in the intermediate risk group suggested that a cut-off of 0.5 μg/ml was appropriate. By adjusting the D-dimer threshold to >1.0 μg/ml in the low probability group, a further 53 patients could have been discharged home without need for radiological investigation.
Conclusion The diagnostic accuracy of D-dimer testing may be improved in patients with a low pre-test probability by adjusting the cut-off threshold.

P10 RISKS OF LOW MOLECULAR WEIGHT HEPARIN IN SUSPECTED PULMONARY EMBOLISM

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Background National Patients Safety Agency (NPSA) issued a statement in July 2010 highlighting the risks associated with the prescription of low molecular weight Heparins (LMWHs). Evidence of harm has been reported due to dosing errors caused by failure to weigh patients and calculate creatinine clearance.
Aim We hypothesised that harm associated with prescription of LMWHs is underreported on the national reporting and learning system (NRLS). We performed a retrospective study to evaluate the frequency of harm associated with LMWHs in patients admitted with a suspicion of pulmonary embolism (PE).

Results 70 patients investigated for suspected PE in an acute teaching hospital during September 2010 were reviewed. Mean age 58 years (median 61), 60% female. The majority of patients presented with breathlessness (64%) and pleuritic chest pain (54%). There was no documentation of clinical probability in 69% of notes, however 73% of imaging requests had clinical probability scores recorded. Eight patients (26%) did not have any risk factors for venous thrombo-embolism. Four patients had CT pulmonary angiogram following an inconclusive perfusion scan. The majority of the patients (70%) were weighed prior to prescribing LMWH. Five (7%) patients had their weight estimated and 14 (20%) had no documentation of weight. Creatinine clearance was <30 ml/min in three patients, one patient had their LMWH adjusted accordingly. More than half of patients (53%) received incorrect dose of LMWH. No LMWH related complication was recorded in any patient.

Conclusion This small cross sectional study has limitations. Larger studies are needed to evaluate the frequency of harm associated with incorrect prescription of LMWH.

P11 ASSESSMENT OF MALIGNANCY IN PATIENTS WITH IDIOPATHIC PULMONARY EMBOLUS: AN AUDIT

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Background There are 65 000 cases of pulmonary embolus (PE) in hospital per year in England and Wales. There is a significant association between idiopathic venous thrombosis and cancer and an increase in risk of diagnosis of cancer within a year of idiopathic venous thrombosis. The British Thoracic Society (BTS) guidelines suggests that all patients who do not have a major risk factor for PE should receive "a combination of careful clinical assessment, routine blood tests and chest radiography" and only when these indicate possibility of malignancy, should further imaging or invasive investigations for malignancy be considered. Our aim was to evaluate these guidelines in a large teaching hospital in England.

Method A retrospective patient-chart review of all patients admitted with pulmonary embolus over 12 months was performed. A patient was excluded if they had a clear major risk factor for developing PE for example, recent pelvic surgery, known malignancy etc. If a patient had no clear risk factor, the documentation during the admission was reviewed to see whether clinicians were complying with BTS guidelines and assessing for malignancy appropriately. A pro-forma was designed to check this, with 1 point being given for every aspect of history/investigation performed in regards to assessing for cancer for example, 1 point awarded if the patient was asked about recent change in bowel habit; 1 point if the patient's serum calcium was checked. An overall score was given for each clinical assessment for malignancy for each patient (out of 14 for men; out of 15 for women).

Results 202 patients with confirmed PE were admitted over 12 months. 39 patients were included in the study. In summary, compliance with BTS guidelines calling for thorough clinical assessment was poor in a number of parameters—patients were not asked if they were suffering from systemic symptoms of malignancy, or assessed for symptoms and signs of common malignancies associated with PE. Conversely, a number of patients were inappropriately referred for further investigation—particularly imaging—for possible malignancy without a documented history or examination pertaining to a specific malignancy.

Conclusion Compliance with the guidelines from the BTS is poor. Adequate histories and examinations for malignancy are not being performed. This suggests that either the guidelines or the clinical practice needs re-evaluation.

Interferon-gamma assays in TB diagnosis

P12 ROLE OF INTERFERON GAMMA RELEASE ASSAY (QUANTIFERON—TB GOLD IN TUBE) IN BLOOD IN THE DIAGNOSTIC WORK UP OF ACTIVE TUBERCULOSIS IN A HIGH TB PREVALENCE REGION

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Objective To study the role of Interferon gamma release assay (IGRA) (QuantiFERON—TB Gold In Tube) in blood in the diagnostic work up of active tuberculosis (TB) in a high TB prevalence region.

Design Prospective, comparative group study.

Setting Subjects presenting to the services of the Pulmonary Medicine Department of a large tertiary care teaching hospital in northern India.

Methods We prospectively enrolled, 30 cases of smear or histopathology proven newly diagnosed tuberculosis (18 pulmonary (PTB) and 12 extra-pulmonary (EPTB)) patients controls along with 30 healthy controls. All cases and controls underwent Tubercular Skin Test (TST) using 0.1 mL (1 tuberculin units) of purified protein derivative RT23 and IGRA using QuantiFERON-TB-Gold In Tube assay (QFT) in blood. For TST an induration ≥10 mm was taken as positive. QFT testing was performed and interpreted as per manufacturer's (Cellestis) instructions.

Results We studied 30 patients of active tuberculosis (18 PTB and 12 EPTB) and 30 healthy controls (14 men and 13 women, mean age 35.03±13.23 years). TST positivity had a sensitivity of 83.33% and 66.67% and specificity of 60% for both categories for the diagnosis of active PTB and EPTB respectively. In contrast QFT positivity had a sensitivity of 61.11% and 58.33% and specificity of 50% for the diagnosis of active PTB and EPTB respectively.

Conclusions In this study the QFT-IGRA had a limited overall usefulness in the diagnosis of active pulmonary and extrapulmonary TB. QFT, thus can neither be taken as rule in nor rule out test in a

Abstract P12 Table 1 Head to head comparison of TST & QFT positivity in different categories of tuberculosis patients (vs control)

Parameter	Value obtained for TST (95% CI)	Value obtained for QFT (95% CI)
Pulmonary tuberculosis		
Sensitivity for positive test	83.33% (0.5858 to 0.9642)	61.11% (0.3575 to 0.8270)
Specificity for positive test	60% (0.4060 to 0.7734)	50% (0.3130 to 0.6870)
Efficiency (correct classification rate)	68.75% (0.5375 to 0.8134)	54.17% (0.3917 to 0.6863)
Predictive value of positive test	55.56% (0.3533 to 0.7452)	42.31% (0.2335 to 0.6308)
OR	7.5000 (1.7791 to 31.6170)	1.5714 (0.4793 to 5.1526)
Predictive value of negative test	85.71% (0.6366 to 0.9695)	68.18% (0.4513 to 0.8614)
Extra pulmonary tuberculosis		
Sensitivity for positive test	66.67% (0.3489 to 0.9008)	58.33% (0.2767 to 0.8483)
Specificity for positive test	60% (0.4060 to 0.7734)	50%(0.3130 to 0.6870)
Predictive value of a positive test	40% (0.1912 to 0.6395)	31.82% (0.1386 to 0.5487)
Efficiency (correct classification rate)	61.90% (0.4564 to 0.7643)	52.38% (0.3642 to 0.6800)
OR	3.0000 (0.7361 to 12.2268)	1.4000 (0.3620 to 5.4139)
Predictive value of negative test	81.82% (0.5972 to 0.9481)	75% (0.5090 to 0.9134)
Any tuberculosis		
Sensitivity for positive test	76.67% (0.5772 to 0.9007)	60% (0.4060 to 0.7734)