a second sample sent for LS analysis. The cause of the original effusion was agreed by two independent consultants after a minimum 12 month follow-up period.

Results 395 patients with undiagnosed effusions were seen, of which 124(31%) were found to be lymphocytic on initial examination. 35(28.2%) patients were excluded due to confirmed (non-haematological) malignancy (11 initial cytology, 24 biopsy). A further 46(37.1%) patients were excluded with confirmed benign diagnoses including inflammatory pleuritis, heart failure and pleural infection. 39/43 (90.7%) patients therefore had samples sent for LS analysis.

7/43 (16.3%) patients' effusions were diagnosed at 12 months as primarily due to lymphoma, with 5 having a previous diagnosis of such. Their characteristics are described in the table below.

LS analysis was diagnostic in 4 and negative in 35 cases. There were no false positive results. Therefore, based on these data, for determining whether there is haematological malignancy in lymphocytic pleural fluid, LS analysis has a sensitivity of 57.1%, a specificity of 100%, and a positive and negative predictive value of 100% and 91.4% respectively.

Conclusions LS analysis appears useful in a selected subgroup of patients presenting with undiagnosed effusions. It should only be considered in those patients with a lymphocytic effusion which shows negative initial cytology and/or no firm diagnosis established on pleural biopsy, or those with a past medical history of a lymphoma. A negative LS result does not exclude the possibility of a haematological cause for the effusion.

Abstract P209 Table 1. Investigations and characteristics of patients with confirmed lymphoma who underwent pleural fluid lymphocyte subsets analysis.

Patient	Disease	Comorbidities	History of lymphoma	LS positive	Tissue obtained	Tissue diagnostic?
1	DLBCL	Nil	No	No	Marrow	Yes
2	DLBCL	AF	Yes	Yes	Marrow	No
3	DLBCL	CCF, AF	Yes	No	Node	Yes
4	Low grade NHL	Nil	Yes	Yes	Too frail	
5	Low grade NHL	Nil	Yes	No	Too frail	
6	CLL	Nil	Yes	Yes	No	
7	CLL	T2DM, AF	No	Yes	Thoracoscopy	Yes

DLBCL=Diffuse large B-cell Lymphoma, NHL=Non-Hodgkin's Lymphoma, CLL=Chronic Lymphocytic Leukaemia

P210 DEFINING THE MINIMAL IMPORTANT DIFFERENCE FOR THE VISUAL ANALOGUE SCALE FOR DYSPNOEA IN PATIENTS WITH MALIGNANT PLEURAL EFFUSIONS

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Background Malignant pleural effusions (MPEs) cause disabling dyspnoea in over 1 million people worldwide per year. Currently recruiting and recently reported randomised controlled trials (RCTs) use the visual analogue scale for dyspnoea (VASD) to assess mean daily breathlessness in patients with MPEs (ISRCTN12852177, ISRCTN4784593, ISRCTN73255764) in order to provide evidence for the optimal method of symptom palliation. The VASD consists of a 100 mm line which subjects mark at a point representing their dyspnoea intensity. Determination of the minimal important difference (MID) for the VASD in patients with MPEs is essential to interpret the results of these trials.

Methods Patients with a confirmed or suspected MPE undergoing a pleural procedure recorded their baseline VASD prior to the procedure and, 24 hours later, their post-procedure VASD and assessed their dyspnoea on a 7 point Likert scale. Age, gender, diagnosis, procedure performed and volume of fluid drained were also recorded.

Results A total of 114/123 (93%) questionnaires were returned. Mean age of respondents was 70 years and 56% were female. Commonest malignancies were breast (41%), mesothelioma (26%) and non-small cell lung cancer (18%). Procedures included: therapeutic aspiration (35%), medical thoracoscopy (27%), chest drain insertion (11%), diagnostic tap (11%) and indwelling pleural catheter insertion (8.8%). The mean decrease in VASD in patients reporting a 'small but just worthwhile decrease' in their dyspnoea (i.e. equivalent to the MID) was 19mm (95% CI 14–24 mm). The volume of fluid required to drain to produce a change in VASD of 19mm was 760ml. Mean decrease in VASD for the different procedures were: chest drain 41mm; IPC insertion and drainage 41mm; therapeutic aspiration 31mm; diagnostic aspiration 19mm; and LAT 24mm.

Conclusion The MID for the VASD in patients with a MPE undergoing a pleural procedure is 19mm (95% CI 14–24mm). This value should be used when interpreting the results of RCTs in patients with MPEs using the VASD as an outcome measure and to calculate the sample size for future RCTs.

P211 DOMICILIARY CARE OF PATIENTS WITH PRIMARY AND SECONDARY PNEUMOTHORACES: OUR EXPERIENCE IN AYRSHIRE, PATIENT SATISFACTION AND HEALTH ECONOMIC ANALYSIS

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Background Domiciliary care (DC) of Spontaneous Pneumothoraces (SP) with an ambulatory Heimlich Valve (HV) attached to the Intercostal Chest Drain (ICD) has potential for care-closer-to-home, avoiding hospitalisation and saving healthcare resources. Wider acceptance of this practice requires demonstration of tangible benefits in terms of patient safety, patient satisfaction and cost savings.

Method In the last year (since July 2012), we established a consultant-led DC service for SP at the University Hospital Ayr, Ayrshire. All primary (PSP) or secondary (SSP) SP admitted through The Emergency Department (ED) were assessed within 48 hours for potential DC with informed consent, based on presence of Persistent Air Leak and predetermined criteria ensuring patient safety (Table:1). All DC patients had 72 hourly consultant ward reviews (CWR) with chest Xray or sooner should patients identify HV non-movement with coughing. ICD was removed when SP resolved. SP patients on DC were readmitted if concerns were identified. Patient satisfaction was assessed formally (Table 6).

Health economics: Costs were calculated from an NHS perspective by examining resource use associated with DC for SP. This figure was then compared against the potential cost-avoidance in terms of respiratory medicine bed days saved. Costs were taken from published ISD reference costs when available and local

finance teams, staff costs include the full cost to the organisation including superannuation (13%) and national insurance contributions.

Results 8(33.3%) of 24 SP were discharged from ED. 16(PSP : SPS = 7 : 9) were admitted; 10 (62.5%) accepted to have DC. Please see the results tabulated.

Conclusions Carefully organised DC for SP is safe, cost effective and meets with high patient approval and satisfaction.

TABLE 1: Ayrshire Criteria for Domiciliary Care (DC) of Spontaneous Pneumothorax with HV

Patient has Persistent Air Leak
Patient understands Pneumothorax and treatment principles
Patient is independent for all ADLs
Patient has family at home
Patient understands Heimlich Valve (HV) action
Patient and family want Domiciliary Care with HV
Patient willing to come for 72 hourly CWR
Patient has telephone at home
Patient agrees to only sponge bath during DC
Patient able to give informed consent
Nursing staff express no concerns

TABLE 2: Healthcare cost avoidance by DC of SP

AYRSHIRE INDEX Duration of DC of SP with HV as % of total duration of SP (days)	Bed days saved by DC for 10 SP with a mean Ayrshire Index of 62%	Cost avoidance @£448/day
Mean for 10 patients = 62% (Range 8%-94%)	59	£26,432

TABLE 3: Cost of Resource Use in Delivering DC for SP

Cost of Ambulatory Bag With HV (Bags changed once a week)	Cost of CWR @ £162 per visit One visit every 72 hours per SP on DC	Cost of Xray @ £52 per CXR	Additional Costs Consultant time @£28.30 per patient plus One off Nurse Training cost: £262.91)	Total resource cost To provide DC for 10 SP's with HV
£182	£3,888	£1,352	£545.86	£5,967.86

Table 4: Potential resultant Cost Savings by providing Domiciliary Care (DC) for eligible patients with Spontaneous Pneumothoraces (SP) using an ambulatory Heimlich Valve (HV).

Cost avoidance by DC for SP (Table 2) minus
Cost of resource use in delivering service (Table 3)

= £20,464.14

For 10 patients with a mean Aryshire Index of 62%

Table 5: Complications encountered with our cohort of patients with DC for SP with HV

1) One patient became anxious with DC .:Readmitted
2) One patient had minor self limited surgical emphysema - continued with DC. Uneventful resolution
3) One patient disconnected the ICD himself and reconnected it as he thought the HV was blocked. This Patient was removed from DC as his compliance with medical instructions was deem inadequate. He completed the rest of his treatment as an in-patient. He did not suffer any complications.

No episodes of infections
No episodes of bleeding.
No episodes of tension Pneumothoraces
No deaths

Table 6: Patient Satisfaction with Domiciliary Care (DC) for eligible patients with Spontaneous Pneumothoraces (SP) using an ambulatory Heimlich Valve (HV)

Assessed continuously during CWR and formally with a Patient Satisfaction Questionnaire. Some relevant responses are given below
Overall Patient Satisfaction with Service: High
Did patients feel supported throughout DC : Completely Agree (100%)
Were patients given sufficient information prior to consent - Ditto-
Were patients worried when DC for SP was suggested? Somewhat: 15% Not at all : 30% A little : 55%
What helped patients make up mind to have DC for SP?
a) Wanted to be at home for my treatment b) Confidence in the medical team

Abstract 211 Figure 1

P212 SHOULD INTERCOSTAL TUBE DRAINAGE BE THE FIRST INTERVENTION IN THE MANAGEMENT OF PRIMARY SPONTANEOUS PNEUMOTHORAX WITH COMPLETE LUNG COLLAPSE?

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Introduction and Objectives Primary Spontaneous Pneumothorax (PSP) is a common presentation with significant variation in severity and treatment strategies globally. There is no differentiation between 'large' PSP with complete lung collapse and 'large pneumothorax' in the current treatment algorithms. Previous studies comparing needle aspiration (NA) and intercostal tube (ICT) drainage for all PSP requiring intervention have shown no significant difference in immediate success rate, early failure rate and length of stay. We aimed to compare NA with ICT as the first intervention in those with complete lung collapse.

Methods Retrospective, observational study of 212 consecutive pneumothorax episodes between January 2012 and December 2012. Those with secondary spontaneous pneumothorax (SSP), history of trauma and iatrogenic pneumothorax were excluded. Pneumothorax with no visible aerated ipsilateral lung on plain chest radiograph was defined as 'complete lung collapse'. Patient records and plain chest radiographs on PACS were reviewed and data was analysed. Values of $p < 0.05$ were considered statistically significant.

Results Of the 212 episodes, 51 (33%) were PSP. Median age was 29 years (IQR 22–38); male 33(75%), female 18(25%). 5 (1%) were observed; 28(55%) had NA and 18(36%) had ICT as 1st intervention. NA was successful in 13(46%) which is comparable to previous studies. 33(65%) required hospitalisation and median length of stay (LOS) for all PSP was 4 days. 18(35%) required definitive surgical intervention.

Conclusion Our results show significantly better lung re-inflation rates with ICT as the first intervention in the management of PSP with complete lung collapse and there was no added benefit in performing NA. We propose a further sub-group of PSP with complete lung collapse in which NA should not be attempted, however well-designed prospective studies are required to validate this.

Abstract P212 Table 1 - PSP with complete lung collapse

	Needle aspiration as 1st intervention (n=6)	ICT drainage as 1st intervention (n=10)	P value
Age, years, median(IQR)	30 (25-32)	32.5 (29-38)	>0.99
Smoking history	1 (17%)	3 (30%)	>0.99
Never smoked, n(%)	2 (33%)	1 (10%)	0.51
Ex-smokers, n(%)	3 (50%)	6 (60%)	>0.99
Current smokers, n(%)			
Symptoms	5 (83%)	8 (80%)	>0.99
Chest pain, n (%)	4 (67%)	10 (100%)	0.125
Dyspnoea, n (%)			
Length of stay, days, median(IQR)	5.5 (4-10)	9 (4-13)	-
Successful lung re-expansion, n(%)	0	6 (60%)	0.03
Requiring surgical intervention, n(%)	2 (33%)	4 (40%)	>0.99

Categorical variables shown as n(%), comparisons made with Fisher's exact test; Continuous variables shown as median (25th– 75thpercentile), comparisons made with Wilcoxon signed rank test.

P213 NEVER EVENTS & THE CHECKLIST MANIFESTO FOR INTERCOSTAL CHEST DRAINS

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Background In the complex medical environment, clinicians commonly face varying challenges especially when undertaking invasive procedure with the risk of potential to harm patients. Checklists have a role in not only helping overcome human fallibility, but also ensuring that key steps are adhered to in order to ensure patient safety.

Intercostal chest drains are amongst the most invasive procedure undertaken in Internal Medicine, often out of hours and in emergent clinical situations, and possibly in less than ideal environments and with limited or no supervision. All of these factors have been highlighted in the 2008 UK National Patient Safety Agency (NPSA) report highlighting 780 events of harm including 12 deaths from intercostal chest drain insertions1. The NPSA Never Events2 list includes wrong site surgery, and in the respiratory discipline this encompasses the inserting of a chest drain on the wrong side. Never Events are preventable because: there is guidance that explains what the care or treatment should be; there is guidance to explain how risks and harm can be prevented; and there has been adequate notice and support to put systems in place to prevent them from happening.

Methodology A systematic review of available literature around chest drain insertion, proformas and checklists was conducted.