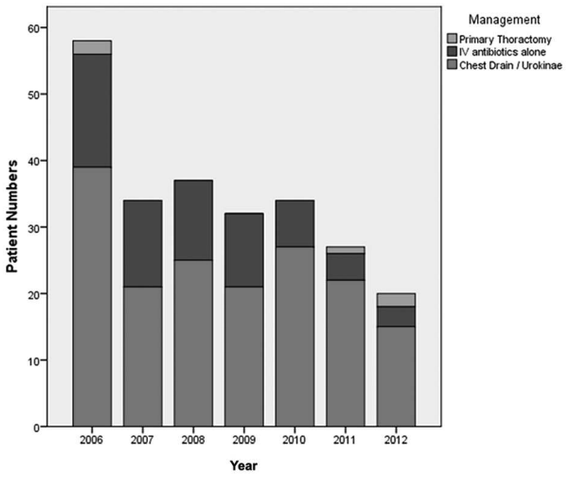
outcome supports timely management of children using an integrated care-pathway led by a multidisciplinary team. The vast majority of children may be safely managed without surgery.




**Abstract S77 Figure 1. Number of inpatient admissions and primary management by year.**

# Managing pleural effusions

## S78 EVALUTION OF AN AMBULATORY PLEURAL SERVICE: COSTS AND BENEFITS

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**Background** Outpatient management of undiagnosed pleural effusions is increasing. Payment for managing these patients is usually based on standard outpatient Healthcare Resource Group (HRG) codes. For 2013/14, a new Best Practice Tariff (BPT) of £1534 has been introduced to further disincentivize emergency inpatient management. We audited our service and examined what effects this tariff may have when applied.

**Methods** Our well-established tertiary pleural service serves a local population of around 540,000. New patients are seen in a weekly pleural clinic or in a daily respiratory admission avoidance (Hot) clinic, which had standard 2012/13 tariffs of £223 and £334 respectively. The service sees approximately 150 new effusion patients per year in clinic and 3 new patients per week in Hot. Around 50 medical thoracoscopies and 60 indwelling pleural catheter insertions are performed each year.

We audited randomly selected patients from our large, prospectively-maintained database. All audited patients were seen as new pleural effusion referrals between 2008 and 2012. Diagnosis was confirmed after a minimum of 12 months' follow-up.

**Results** 146 patients were audited. Median age 76(range 21–93), 71% male. Final diagnoses were mesothelioma (n = 28,19%), lung cancer (n = 10,7%), breast cancer (n = 13,9%), other cancer (n = 31,21%), pleural infection (n = 15,10%), benign pleuritis (n = 11,8%) and other (n = 38,26%). 92% of patients avoided direct admission following their initial clinic appointment.

115 patients (79%) underwent ultrasound-guided pleural aspiration at their initial appointment and 63(43%) patients underwent subsequent pleural biopsy. For patients with malignancy, diagnostic sensitivity on first fluid cytology was 27% (adenocarcinoma n = 15,80%; mesothelioma n = 21,5%), and 93%(25/27) for medical thoracoscopy biopsy. Histological/cytological diagnosis took a median of 20 days (IQR 10–33) from presentation. There were no significant procedural complications noted (bleeding, pneumothorax, empyema). 97%(58/60) of patients surveyed rated the service as either very good or excellent.

**Conclusions** Ambulatory management of undiagnosed effusions is efficacious, avoids hospitalisation in the vast majority and is preferred by patients. The 2013/14 pleural effusion BPT promotes admission avoidance by encouraging appropriate outpatient management. Trust reimbursement for practising in this way should facilitate enough resource to enable new pleural services to be established where required.

## S79 COMPARING THE QUALITY OF LIFE AND COST-EFFECTIVENESS OF INDWELLING PLEURAL CATHETER VS. TALC PLEURODESIS FOR MALIGNANT PLEURAL EFFUSIONS

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**Abstract S78 Table 1. Estimates of income using old and new tariffs based on yearly patient numbers and audit data**

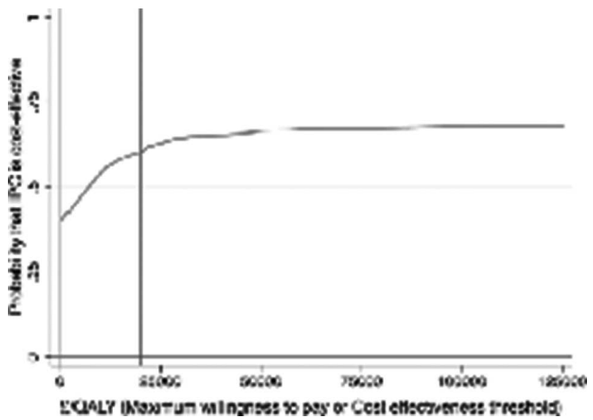
| Type of encounter | Number | 2012 – 2013tariff | 2013 – 2014 BPT tariff | Notes |
|---|---|---|---|---|
| Outpatient/Hot new effusion | 300 | [300*(223+334/2)] = £83,550*0.92 = £76,866 | a. [300*0.70)*1534] = £322,140*0.92 = £296,369<br>b. [(300*0.3)*(189+329/2)] = £23,310*.92 = £21,445 **a+b = £317,814** | Assumed 70% of patients undergo aspiration at first appointment (therefore eligible for BPT), and 8% need admission (therefore not billed as outpatients) |
| Subsequent aspiration | 60 | 60*544 = **£32,640** | 18*544 = **£9792** | Assumed 20% go on to have aspiration later |
| IPC insertion | 60 | 60*544 = **£32,640** | 60*544 = **£32,640** | All IPCs inserted as day case |
| Medical thoracoscopy | 50 | 50*[(544+2153)/2] = £67,425 | 50*[(544+2153)/2] = **£67,425** | Assumed 50% of patients receive talc |
| **12 MONTH TOTAL** | | **£209,571** | **£427,671** | **Extra income£218,100** |

CODES & TARIFFS: Diagnostic thoracoscopy (T11.1, HRG DZ06Z, £544); Thoracoscopy with talc (T10.2, HRG DZ04B, £2153); IPC insertion (T12.4, HRG DZ06Z, £544); Aspiration (T12.3, HRG DZ06Z, £544); Respiratory o/p first attendance (WF01B, £223 in 12/13, £189 in 13/14); HOT clinic (locally agreed £334 in 12/13, £329 in 13/14). BPT aspirations must occur on elective list after initial assessment.

**Background** The TIME2 Trial[1], a randomised clinical trial comparing indwelling pleural catheter (IPC) with talc pleurodesis for malignant pleural effusion, included a prospective economic analysis.
**Methods** 106 patients at 7 UK medical centres were randomly assigned to IPC or talc pleurodesis following chest drain insertion and followed at biweekly, monthly and q3month intervals for one year or until death. Costs associated with the drain insertion, follow up drainage, and adverse events were captured during the trial. Costs for outpatient and inpatient visits, diagnostic imaging, nursing and doctor time were derived from the NHS reference costs and University of Kent's Unit Costs of Health and Social Care 2011. Procedure supply costs were obtained from the manufacturer. The number of quality adjusted life years (QALYs) was determined by adjusting patient survival by the utility weight obtained from the EQ5D questionnaire at each follow up period. Cost effectiveness was calculated over the duration of the trial given that most patients died during the 1 year follow up (14% alive at 1 year). Confidence intervals were calculated using bootstrap analysis.
**Results** Average cost in the IPC group over the trial period was £3087(3504) versus £2892(2706) in the talc pleurodesis group with a mean cost difference of £195(95% CI -1072 to 1463). Average QALY in the IPC group was 0.354(0.29) and 0.328(0.3) in the talc group with a mean QALY difference between groups of 0.026 (95%CI -.08 to. 138). The cost per QALY gained for IPC as compared with talc pleurodesis was £7390 at 1 year. Bootstrap analysis revealed substantial uncertainty around this estimate.
**Conclusions** There is no significant difference in cost or QALYs between IPCs and talc pleurodesis. Although the predictions are subject to substantial uncertainty, the probability that IPCs may be cost effective compared with talc pleurodesis is moderately high (60%) using a threshold of willingness to pay of £20,000/QALY.

## REFERENCES

1. Davies H, Mishra E, Kahan B, *et al*. Effect of an Indwelling Pleural Catheter vs. Chest Tube and Talc Pleurodesis for Relieving Dyspnea in Patients with Malignant Pleural Effusion. The TIME2 Randomised Controlled Trial. *JAMA*. 2012;307(22): 2383–2389.



**Abstract S79 Figure 1.**

## S80 POST-THORACOSCOPY LUNG RE-EXPANSION: PILOT DATA USING DIGITAL SUCTION DEVICE

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**Introduction** Current practice for diagnostic only thoracoscopy varies from day-case procedures to routine overnight stays. Radiographic evidence of lung re-expansion and underwater seal evidence of lack of on-going air leak are required before patient discharge. Use of a digital suction device which accurately measures air leak may allow earlier identification of lung re-expansion and hence earlier discharge.

Patients pleurodesed at thoracoscopy are admitted for 3–4 days, however the presence of trapped lung preventing re-expansion after thoracoscopy reduces the chance of successful pleurodesis, and measurement of air leak with a digital device may allow prediction of trapped lung.
**Aim** To determine whether initial air leak measurement can predict trapped lung and whether use of digital device can reduce time to chest radiograph post thoracoscopy.
**Methods** Data was prospectively collected (November 2012 to May 2013), on patients undergoing thoracoscopy in a specialist respiratory centre. Post-procedure, the "air leak" was measured using a digital suction device (Thopaz, Medela UK), and time to chest radiograph (CXR) was compared to LAT in the preceding three months.
**Results** 32 patients were investigated. Results were non-normally distributed so non-parametric analysis was undertaken. Median initial flow rate post-thoracoscopy was 108ml/min. Nine (28%) had trapped lung: median air flow rate was significantly lower in this group 45ml/min (IQR 39–118ml/min) vs 118ml/min (IQR 75–179ml/min), using Mann-Whitney U Test ($p = 0.01$). Those with trapped lung had larger effusions drained during procedure: 1739ml vs 1332ml ($p = 0.48$).

Fourteen (44%) patients were successfully managed as day-cases with the digital suction device: mean time to CXR was 2.1 hours (SD 1.1); less than the 8 preceding day-case thoracoscopies (mean 2.9, SD 1.6 hours) ($p = 0.2$).
**Conclusion** This pilot data suggests that digital air flow measurement has the potential to predict which patients are likely to have trapped lung and lack of air leak, and may potentially identify the group of patients in which to use indwelling pleural catheters. Use of the device may also allow earlier identification of full re-expansion, earlier CXR and hence more rapid discharge home.

## S81 A RANDOMISED CONTROLLED STUDY COMPARING THE OUTCOMES OF PLEURAL NURSE PRACTITIONER VERSUS DOCTORS TRAINED TO PERFORM PLEURAL PROCEDURES FOR MANAGEMENT OF PLEURAL EFFUSIONS

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**Background** Following the National Patient Safety Agency alert in the UK thoracic ultrasound (TUS) is strongly recommended for all pleural procedures. This places strains on clinical service delivery. The role of the Nurse Practitioner (NP) in this setting is not established. We undertook a randomised control study to test the hypothesis that a Nurse Practitioner trained to Royal College of Radiologist level 1 TUS and in performing pleural procedures independently is equivalent to doctors trained in undertaking pleural procedures.
**Method** In this prospective ethically approved un-blinded non-inferiority study we assessed pleural procedures as carried out by a Nurse Practitioner (Group A) in comparison with doctors