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## 75. Clinical management of lung diseases: from bronchi to pleura

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### P397

#### Respiratory muscle strength and physical performance in elderly hospitalized patients

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Age-related changes in pulmonary function increase respiratory muscle work. In front of this increased demand, sarcopenia frequently associated with age and multimorbidity, can reduce endurance and strength of respiratory muscles. Furthermore, sarcopenia may per se contribute to reduction of physical performance.

**Aim of the study:** To evaluate the correlation between the respiratory muscle strength and physical performance in elderly.

**Population:** 75 patients (30 men and 40 women) aged over 65 years (mean 78 yrs, SD: 6.6) admitted to the acute care geriatric ward of the Hospital University Campus Bio-Medico. Exclusion criteria: active malignancies, thyroid disease, renal failure (GFR < 30 ml/min), sepsis, severe cognitive impairment and arterial disease of lower limbs. After the resolution of the acute disease, we assessed the function of respiratory muscles by MIP and MEP and pulmonary function by FEV1 and FVC. Physical function was assessed using the 6MWT and dynamometry of the lower limbs. Nutritional assessment was based on the Mini Nutritional Assessment and the BMI. We evaluated the correlation between MIP/MEP and physical function using the Pearson's coefficient of correlation. To evaluate the association between the variables of interest taking into account potential confounders we used multiple linear regression models.

**Results:** The mean age of our sample was  $77.8 \pm 6.6$ , 31 patients had COPD (GOLD I: 36%, GOLD II: 48%, GOLD III: 16%). There was a statistically significant correlation between MIP and dynamometry ( $r^2=0.23$ ,  $p=0.07$ ) and between MIP/MEP and 6MWT (MIP:  $r^2=0.38$ ,  $p=0.001$ ; MEP:  $r^2=0.398$ ,  $p<0.001$ ). The correlation between MIP/MEP and 6MWT was maintained after adjustment for FEV1, FVC, dynamometry and sex.

### P398

#### Plasma homocysteine is associated with low diffusion capacity (DLCO) in COPD patients

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**Introduction:** Chronic obstructive pulmonary disease (COPD) is associated with

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cardiovascular events, however, its underlying pathophysiological mechanism is unknown. Elevated total plasma homocysteine (tHCY) levels is considered to be a cardiovascular risk factor. Several studies show that COPD may be associated with high tHCY.

**Objective:** To identify possible clinical variables associated with high tHCY in COPD patients.

**Methods:** We performed an observational study of 88 consecutive smokers or ex-smokers older than fifty years and with more than 10 pack-years smoking history. We used Mann Whitney test to compare COPD with controls. Step wise logistic regression analysis was used to determine the association between tHCY and different clinical, analytical and physiological variables in COPD patients.

**Results:** Of the subjects evaluated, 62 had COPD (70.5%) and 26 (29.5%) did not, and served as controls. COPD patients had higher tHCY than controls: median ( $\pm$ SD)  $14.2 \pm 6.5$  vs  $11.7 \pm 4.5$   $\mu\text{mol/L}$ ;  $p$  0.025). In COPD patients, using tHCY  $> 14$   $\mu\text{mol/L}$  as an independent variable, logistic regression analysis including age, gender, smoking history, creatinine clearance, FEV<sub>1</sub>, DLCO and daily alcohol intake, only lung diffusion capacity for carbon monoxide (DLCO) was inversely associated [Odds Ratio (95% confidence intervals) 0.947 (0.904 – 0.992);  $p$  0.023].

**Conclusions:** COPD patients had higher tHCY than controls and they were associated with a lower DLCO. Therefore, we conclude that COPD patients with low DLCO may have a higher risk of cardiovascular events; however, further studies are needed to confirm this hypothesis.

### P399

#### Inflammatory mediators associated with bone metabolism in patients awaiting lung transplantation

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**Aim:** to evaluate the association between systemic inflammation, markers for bone turnover and bone mineral density (BMD) in 105 candidates for lung transplantation.

**Methods:** BMD, bone biomarkers, inflammatory mediators were determined in 105 patients with end-stage of chronic respiratory failure and 85 age and sex matched controls.

**Results:** We identified an osteopenic syndrome in 82/105 patients, 10/85 controls were osteopenia. Procollagen type 1 amino-terminal propeptide (P1NP), markers of bone formation, was higher in lung diseases and osteocalcin was similar between patients and controls. Type 1 collagen C-telopeptide (CTX), a marker of bone resorption, was higher in candidates for lung transplantation and was inversely related to femur neck (FN) BMD and was a direct relationship with P1NP ( $r=0.72$ ,  $p<0.001$ ). TNF- $\alpha$  and its receptors level, interleukin-6, receptor of nuclear factor  $\kappa$ B (RANK) were higher, osteoprotegerin level was low in lung pathology. Osteoprotegerin positively correlated with parameters of bone formation, BMD FN, BMD LS and was negative association with RANK, TNF- $\alpha$  and its receptors. TNF- $\alpha$  and interleukin-4 were positively associated with CTX. Interleukin-2 was directly associated with P1NP ( $r=0.38$ ,  $p<0.05$ ). There was no difference in IL-6 between these patients with and without osteoporosis. Vascular endothelial growth factor was lower in patients with emphysema and correlated with BMD ( $r=0.66$ ,  $p=0.002$ ) only in with end-stage of emphysema.

**Conclusions:** Patients with end-stage lung diseases had a greater prevalence of osteopenic syndrome. Results shows possibly role of systemic inflammatory in the increasing of bone loss at the terminal stage of lung disease.

### P400

#### Administration of lasolvan in the treatment for exogenous allergic alveolitis (EAA)

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**Aim:** To evaluate efficacy of continuous treatment for subacute variant of EAA with inhalation lasolvan.

**Materials and methods:** We studied 27 patients with subacute course of morphologically confirmed EAA. Group 1 (10 patients) received the standard treatment with prednisolone (20 mg/day). Group 2 (17 patients) received prednisolone (15 mg/day) plus inhalation lasolvan. We evaluated clinical symptoms (cumulative index), 6-minute walk test, spirometry, diffusing capacity of the lung (DLCO),

computed tomography (CT) of the lungs using Kazerooni modification, before and after the treatment. The reliability of differences was estimated using the Wilcoxon test.

**Results:** There were no reliable differences between the groups. The analysis of the data within the both groups revealed reliable improvement of clinical symptoms, LVC, distances of the 6-minute walk test, the alveolar component of CT. In group 2 we also observed increased DLCO.

**Conclusion:** Nebulizer administration of lasolvan in the complex treatment for subacute course of EAA allows decreasing corticosteroid doses.

### P401

#### Review of health -related quality of life and patient-reported outcome in patients receiving EPs 7630 treatment for acute bronchitis

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**Background:** Health-related quality of life (HRQL) and patient-reported outcome (PRO) are important outcome parameters for the evaluation of both medical treatment within clinical trials and efficiency in clinical practice. For EPs<sup>®</sup> 7630 (Umckaloabo<sup>®</sup>) treatment, clinically relevant improvements in HRQL/PRO have been reported recently (Matthys, H. *et al.* Wien Med Wochenschr 2010;160:564-70; Matthys, H. *et al.* Eur Respir J 2011;38(Suppl 55):18s-19s).

**Aims:** We systematically reviewed randomised controlled trials (RCTs) in order to assess the impact of EPs 7630 treatment on HRQL and PRO of patients with acute bronchitis (AB).

**Methods:** Trials published 2010 or earlier were included for the review if they were RCTs investigating EPs 7630 vs placebo (PL) in adults or children suffering from AB and assessing HRQL and PRO by means of the EQ-5D questionnaire and the Integrative Medicine Patient Satisfaction Scale (IMPS).

**Results:** 6 trials with a total of 1164 patients (EPs 7630: 586, PL: 578; 53% 1-18 yrs) were identified. After 7 days of treatment, clear and mostly statistically significant advantages were seen for EPs 7630 compared to PL in the 5 EQ-5D dimensions (mobility, usual activities, pain/discomfort and anxiety/depression:  $p<0.01$ ; self-care:  $p=0.02$ ) and in the health status of patients (EQ VAS;  $p<0.01$ ). With EPs 7630, twice as many patients were satisfied or very satisfied with treatment outcome compared to PL (82.1% vs. 40.0%;  $p<0.01$ ).

**Conclusions:** There is encouraging evidence from currently available data derived from placebo-controlled trials that EPs 7630 treatment improves HRQL and PRO in both children ( $>1$  year) and adults with acute bronchitis.

### P402

#### Efficacy of corticosteroids in hospital treated community-acquired pneumonia

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**Aim:** The aim of the study was to evaluate beneficial effect of corticosteroids in short treatment of community acquired pneumonia (CAP).

**Patients and Methods:** We enrolled a total of 149 hospitalized patients, for a period of an year (January 2011 to December 2011). The diagnosis of CAP was made using standard clinical and radiological criteria. Disease severity was scored using Pneumonia Severity Index. Age, antibiotic treatment and PSI adjustment has been done between the groups. Patients received 50 mg prednisolone for 7 days, along with antibiotics.

The outcomes were clinical cure at day seven, defervescence, length of stay, time to clinical stability,

**Results:** Mean age of patients enrolled in study was  $63 \pm 16.7$  in prednisolone and  $53 \pm 18.6$  in group without prednisolone. Thirty (40%) patients in prednisolone group and 16 (22.2%) in without prednisolone group were in Pneumonia Severity Index class IV-V. Clinical cure at days 7 was 61/75 (82.6%) in the prednisolone group and 44/72 (61.1%) in other group [ $P < 0.008$ ]. Patients on prednisolone had faster defervescence compared with other group, ( $p<0.0032$ ). Length of stay was significantly lower in patients with prednisolone compared with nonprednisolone group,  $9.4 \pm 4.33$  and  $12.3 \pm 6.4$  respectively, ( $p=0.0011$ ). Adverse events were few and not different between the two groups.

**Conclusions:** In this study we show that Prednisolone (at 50 mg) once daily for a short time, (a week), have a beneficial effects in patients hospitalized with mild to severe CAP, improving outcomes without adverse events.

### P403

#### Nurse practitioner insertion of Seldinger chest drains. A pilot study

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**Background:** In 2008 the National Patient Safety Agency encouraged UK hospitals to develop local policies that reduced the risks associated with chest drain insertion. A key theme that emerged from the 2008 Rapid Response Report was

Table 1

Parameter	Prednisolone		Prednisolone + Lasolvan	
	Before treatment M $\pm$ m	After treatment M $\pm$ m	Before treatment M $\pm$ m	After treatment M $\pm$ m
Cumulative index	2.46 $\pm$ 0.24	1.42 $\pm$ 0.15*	2.86 $\pm$ 0.23	1.37 $\pm$ 0.23*
6 MWT	456.54 $\pm$ 14.55	504.25 $\pm$ 19.10*	470.00 $\pm$ 13.55	525.00 $\pm$ 15.76*
LVC	87.21 $\pm$ 5.48	92.00 $\pm$ 4.43*	91.45 $\pm$ 2.87	98.72 $\pm$ 2.97*
FEV1	84.20 $\pm$ 6.01	89.42 $\pm$ 4.31	84.08 $\pm$ 3.51	90.03 $\pm$ 3.92
DLCO	65.83 $\pm$ 4.95	65.83 $\pm$ 5.43	63.93 $\pm$ 3.41	68.76 $\pm$ 3.18*
Chest CT (A)	3.15 $\pm$ 0.27	2.00 $\pm$ 0.37*	3.05 $\pm$ 0.16	1.68 $\pm$ 0.28*
Chest CT (I)	0.38 $\pm$ 0.21	0.33 $\pm$ 0.19	0.71 $\pm$ 0.16	0.53 $\pm$ 0.14

\* $p<0.05$ .

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that the inexperience of junior doctors and inadequate supervision increased the risk of complications associated with the procedure.

**Aims:** We proposed that a ward based nurse practitioner, trained in thoracic ultrasound and chest drain insertion could: 1. Safely perform this procedure in the absence of a competently trained doctor. 2. Optimise training opportunities for junior doctors to undertake this procedure under appropriate supervision.

**Method:** Following a tailored education programme including ultrasound interpretation and chest drain insertion we reviewed 10 chest drain insertions performed by the nurse practitioner. Various aspects relating to chest drain insertion including consent practice, use of thoracic ultrasound and incidence of any adverse events were audited. Data was collected over a four month period (June to September 2011).

**Results:** All 10 chest drain insertions performed by the nurse practitioner were correctly sited, written consent was obtained in 100% of procedures undertaken, thoracic ultrasound was used to guide drain placement in 100% of cases and there were no adverse incidents or complications related to chest drain insertion.

**Conclusion:** Training of specialist nurses in the procedure of chest drain insertion for elective patients with uncomplicated pleural effusion is an acceptable model within the district hospital setting and has the additional benefit of providing appropriate support and supervision for junior doctors undertaking this procedure.

#### P404

##### Outcomes of bronchial artery embolisation in the management of clinically significant hemoptysis

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**Objectives:** Bronchial artery embolisation (BAE) has been established as an effective technique in the emergency treatment of massive hemoptysis. Aim of the study has been to evaluate immediate and long-term outcomes of BAE and to identify factors influencing outcomes.

**Methods:** A retrospective analysis was carried out of the medical records and angiograms of 120 patients who underwent BAE between January 2005 and December 2009. 79 patients were men and the mean age was 54.5 years.

**Results:** The patients were divided 3 groups including recurrent hemoptysis (<100ml/day: n=29), (100-400ml/day: n=67), massive hemoptysis group (>400ml/day: n=24). The common underlying diseases of hemoptysis were pulmonary tuberculosis and related disorders (51%), bronchiectasis (21%) and aspergilloma (13%). Immediate success rate to control bleeding within 24 hours was 89% (106 cases), long-term success in 62.5% (75cases) and recurrence rate was 26% (31cases). Five patients died from massive hemoptysis. Among initial radiographic findings, pleural lesions (P<0.05) and aspergilloma (P<0.05) were significantly associated with hemoptysis recurrence. A good clinical outcome was achieved in those with active tuberculosis (16%). Among initial angiographic findings, systemic-pulmonary shunt was statistically significant with rebleeding (P<0.05). The complications were mild including fever, chest pain, nausea, vomiting, back pain (21%).

**Conclusions:** Bronchial artery embolisation (BAE) is an effective and safe procedure achieving immediate control of clinically significant hemoptysis. But high recurrence rates are associated with aspergilloma and pleural lesions, systemic-pulmonary shunt in angiography.

#### P405

##### A prospective study of factors predicting postoperative pulmonary complications (PPC) in patients undergoing non-cardiothoracic surgery under general anaesthesia (GA)

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**Introduction:** PPC after non-cardiothoracic surgery are common and can adversely effect morbidity, mortality and length of hospital stay. Knowledge as regards factors predicting PPC in our local setting is imperfect.

##### Abstract P406 – Table 1

Parameter	Group 1 (bosentan 125 mg)			Group 2 (bosentan 250 mg)			Normal control
	Baseline	wk3	wk12	Baseline	wk3	wk12	
IL-1β (pg/ml)	1.8 (1.5-2.8)	0.6 (0.3-0.9)*	0.8 (0.7-1.1)	1.5 (0.5-1.9)	0.5 (0.1-1.2)*	0.7 (0.4-1.1)	1.5 (1.1-2.2)
IL-8 (pg/ml)	10.6 (5.1-16.2)	16.2 (6.8-18.7)	8.1 (7.6-11.0)*	24.3 (11.0-28.8)*	20.2 (13.7-17.5)	15.8 (8.2-25.4)*	8.2 (6.7-12.0) <sup>†</sup>
TNFα (pg/ml)	19.4±6.5	19.6±3.9	20.1±2.9	22.3±4.2	21.7±5.4	23.7±3.4	9.34±3.51 <sup>†</sup>

<sup>†</sup>p<0.05 IPAH pts vs control, \*p<0.05 vs baseline, #p<0.05 group 1 vs group 2.

##### Abstract P407 – Table 1

Parameter	Group 1 (bosentan 125 mg)			Group 2 (bosentan 250 mg)		
	Baseline	Wk3	Wk12	Baseline	Wk3	Wk12
CD 19+	10.3±2.8	9.5±3.1**	10.9±3.1#	7.8±4.4	6.4±1.6*	7.7±2.5*
CD3+HLA-DR+	5.5 (2.2-7.5)	4.0 (2.5-9.0)	2.4 (1.8-4.3)#	7.3 (5.2-9.6)	6.2 (5.6-9.2)	5.9 (4.6-8.8)*
CD3+HLA-DR+	11.2±2.4	10.8±2.5	11.9±2.7**	9.0±4.2	8.6±4.8	8.6±1.9*
CD3+CD95+	37.2±12.7#	29.9±18.9#	33.5±16.5	47.5±9.3	46.4±13.6	32.9±18.6

\*p<0.05 vs baseline, #p<0.05 group 1 vs group 2.

**Aims & Objectives:** To study factors predicting PPC in our setting.

**Methods:** Prospective study of consecutive 404 patients undergoing non-cardiothoracic surgery under GA with tracheal intubation from Jan 2009 to Dec 2010. Chi-square was used for univariate analysis and forward stepwise logistic regression for multivariate analysis.

**Results:** The mean age was 36±18 years with 54% males. 22% were smokers, and mean BMI was 23±4.5 kg/m<sup>2</sup> with 35% overweight & obese. 4% of subjects had chronic lung conditions while 23% had non-pulmonary chronic conditions. 70% of the surgeries were done electively and the mean duration of GA was 78±44 min. The overall PPC rate was 8%; atelectasis (48%) followed by bronchospasm (25%) and pneumonia (16%) being the commonest complications. The mean duration of hospital stay was significantly longer in patients with PPC (11±9 days, p<0.001) and 29% of them required mechanical ventilation. Logistic regression analysis identified chronic chest condition, emergency surgery and prolonged duration of GA as significant predictors of PPC while age, gender, BMI, smoking history and non-pulmonary pre-morbidities were not of any significance.

**Conclusion:** PPC after non-cardiothoracic surgery are common and lead to increased morbidity and prolonged hospital stay in our setting. We identified pre-existing chest disease, prolonged anaesthesia and emergency surgery as significant predictors of PPC.

#### P406

##### Changing serum cytokines levels in patients with idiopathic pulmonary arterial hypertension treated with bosentan

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**Aim:** To investigate the influence of Bosentan on serum cytokines levels in pts with idiopathic pulmonary arterial hypertension (IPAH).

**Methods:** In the single-center comparative study we included 35 pts aged 35.2±9.6ys with IPAH confirmed by RHC (WHO Functional Class (FC) II-IV) without systemic inflammation signs. On top of stable therapy for at least 3 months Bosentan therapy was started 62.5 mg twice daily for 4 wks. At wk4 the patients were randomized 1:1 by the envelope method to have bosentan 125 or 250 mg/day. At baseline, at wk3 and wk12 visits the pts underwent the clinical and lab assessment (FC, 6-minute walking test (6-MWT), Echo, RHC, routine lab+ measurement of high sensitivity C-reactive protein (hsCRP) and serum pro-inflammatory serum cytokines (interleukin (IL) 1β, 8, TNFα).

**Results:** At baseline 2 groups did not differ in age, disease duration, functional, and hemodynamic parameters, hsCRP levels were normal in both groups.

**Conclusion:** The influence of Bosentan 125 and 250 mg/day on some cytokines levels to wk12 showed its anti-inflammatory effect in IPAH pts.

#### P407

##### Bosentan influence on cellular immunity parameters in patients with idiopathic arterial pulmonary hypertension

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**Aim:** To assess the influence of endothelin receptor antagonist Bosentan on cellular immunity parameters in pts with idiopathic pulmonary arterial hypertension (IPAH).

**Methods:** In the single-center comparative study we included 35 pts aged 35.2±9.6ys with IPAH confirmed by RHC (WHO Functional Class (FC) II-IV) without systemic inflammation signs. On top of stable therapy for at least 3 months Bosentan therapy was started 62.5 mg twice daily for 4 wks. At wk4 the patients were randomized 1:1 by the envelope method to have bosentan 125 or 250 mg/day. At baseline, at wk3 and wk12 visits the pts underwent the clinical and lab assessment (FC, 6-minute walking test (6-MWT), Echo, RHC, routine lab+CD-markers assessed by (fluorimetry (Beckman Coulter FC 500)).

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**Results:** All cellular immunity parameters of IPAH pts remained within normal limits.

**Conclusion:** 12wk therapy with Bosentan changed CD-markers levels. The daily dose of 125mg resulted in the increase of B-lymphocytes levels and slight decrease of activated T lymphocytes. In patients treated with Bosentan 250 mg we found decreased numbers of activated B - and T-lymphocytes.

#### P408

##### High-dose inhalation corticosteroids in conjunction with plasmapheresis in the treatment of patients with acute variant of exogenous allergic alveolitis (EAA)

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**Aim:** To evaluate efficacy of high-dose inhalation corticosteroids in conjunction with plasmapheresis in the treatment for acute variant of EAA.

**Materials and methods:** We studied 16 patients with acute course of morphologically verified EAA. The main group (8 patients) received high-dose fluticasone (2500 µg) and plasmapheresis. The control group (8 patients) received the standard dose of prednisolone (0.25 mg/kg). The both groups received the treatment during one month. We performed cytology and morphology studies of lung biopsies from all the patients. We evaluated clinical symptoms (cumulative index), 6-minute walk test, spirometry, diffusing capacity of the lung, computed tomography (CT) of the lungs by Kazerooni, before and after the treatment.

##### Results:

Parameter	Main group (n=8)		Comparison group (n=8)	
	Before treatment	After treatment	Before treatment	After treatment
Cumulative index (scores)	2.4±0.3	1.0±0.3*	2.6±0.3	0.6±0.2*
6-minute walk test (m)	446.3±20.6	510.0±24.5*	433.7±19.3	514.2±9.2*
FEV 1 (% of the due values)	98.5±8.4	109.9±8.4*	96.9±6.8	106.5±7.2
DLCO (% of the due values)	102.3±7.6	108.1±7.5	96.5±6.8	108.9±9.4
LVC (% of the due values)	80.9±2.6	83.7±2.5*	76.2±3.5	80.0±3.2
CT alveolar component (scores)	3.1±0.4	1.8±0.4*	2.9±0.3	1.5±0.3*
CT interstitial component (scores)	0.3±0.2	0.3±0.2	0.4±0.2	0.3±0.2

\*p<0.05.

To analyze the data we used the non-parametric methods of the Statistica programme, and the Wilcoxon criterion.

**Conclusion:** High-dose inhalation corticosteroids in conjunction with plasmapheresis may be used to treat patients with acute variant of EAA as alternative to the standard corticosteroid therapy.

#### P409

##### Pleural drain management – A clinical practice improvement project

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**Introduction:** An audit performed in Year 2010 at Flinders Medical Centre showed significant number of complications with intercostal chest drain insertion and management, with only 28% of patients being complication free.

**Aims and objectives:** Our mission was to reduce the incidence of complications associated with management of pleural drains, in respiratory unit at Flinders Medical Centre, by 80% within 6 months.

**Methods:** We used validated tools, introduced by Deming, Shewart, Juran et al, customized to the health environment to tackle this problem. We assembled a team and undertook diagnostics. This included brainstorm sessions, cause and effect diagram and prioritized problems using a pareto graph. We then designed interventions and evaluated the outcome.

##### Results:

Audit: Pre and Post project

Complications	Audit 1	Audit 2
Drain falling out	2/14 (14%)	0
Tubing disconnected	1/14 (7%)	0
Tube kinked	2/14 (14%)	2/16 (12.5%)
Issues with suction/UWSD	1/14 (7%)	0
Ongoing air leak	2/14 (14%)	0
Subcutaneous emphysema	2/14 (14%)	0
Severe Pain	4/14 (28%)	0
Secondary infection	1/14 (7%)	0
Inadequate anchoring suture	1/14 (7%)	0

We found that the three main issues impacting on pleural drain management was a lack of protocol, lack of patient information and Nursing education. This was followed by targeted intervention. Already available protocol was reviewed and customized to our local setting. A formal patient information sheet was adapted from British Thoracic Society and American Thoracic Society guidelines. A nursing education session was undertaken and a continuous refresher course was set-up.

Documentation sticker was prepared. Subsequently a re-audit was performed, which showed a reduction of complications from 72% to 12.5%.

#### P410

##### Risk factors in elderly patients with acute respiratory failure

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**Introduction:** Acute respiratory failure is a condition that may cause morbidity in not only patients with systemic disorders but also healthy people.

**Aim:** To determine risk factors in elderly patients with acute respiratory failure (ARF).

**Method:** Cases over 65 years old with (ARF) that applied to the Department of Chest Diseases of our hospital between years 2011 and 2012 were included in the study prospectively.

**Findings:** 47 cases (M:F=25:22, median age:74.7±10 years) were included in the study. Computed thorax tomography was conducted in 38 cases. Multiple pulmonary pathology was established in 18 cases (41.9%) while 4 cases (9.3%) only had lung bullouses, 3 cases (7%) only had honeycomb appearance, and 1 case (2.3%) only had pneumonia. It was established that 25 cases (53.2%) had type 1 respiratory failure (RF), 22 cases (46.8%) had type 2 RF. Intensive Care (IC) monitoring was necessary for 18 cases. Average term of stay in IC was 10.7±8 days. Need of intubation developed in 13 patients (27.7%). Oseltamivir was administered in 23 cases with suspicion of influenza. Only 3 out of 23 cases administered Oseltamivir were intubated and 9 out of other 24 cases were intubated (p<0.05). Intubation period was average 6.5 days in cases intubated and treated with Oseltamivir and 7.8 days in untreated ones (p>0.05).

**Result:** Influenza related respiratory failure should be borne in mind in patients that apply with acute respiratory failure and that do not have a pre-existing pulmonary disease. In these patients supplementation of antiviral agents in the treatment particularly in the high risk group in terms of influenza complications may reduce the need of IC, duration of stay in IC and duration of intubation.

#### P411

##### The use of pulmonary embolism severity index (PESI) score in identifying patients suitable for ambulatory treatment or early hospital discharge following diagnosis of pulmonary embolism

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**Introduction:** International treatment guidelines for pulmonary embolism (PE) recommend that patients with low-risk of mortality should be considered for early discharge or ambulatory care. The Pulmonary Embolism Severity Index (PESI) has been validated to assess probability of 30 and 90 day mortality post PE. The aim of this study was to determine whether avoiding hospital admission, or facilitating early discharge, in low-risk patients could be achieved safely using the PESI score.

**Methods:** Since May 2010, St George's Hospital has implemented a PE Assessment pathway. The PESI score was used to risk stratify patients in order to determine suitability for early discharge or ambulatory care. A dedicated PE specialist nurse collected patient data and selected appropriate patients. Low-risk patients with PESI score I-II were given education, and taught self-administration of low molecular weight heparin.

**Results:** Over a twenty-one month period, 119 of 346 patients with confirmed PE on computed tomography pulmonary angiogram (CTPA) were discharged within 24-48 hours of diagnosis. A further 25 patients were able to avoid hospital admission altogether. No readmissions or mortalities were noted in these groups, within up to 90 days of diagnosis.

**Conclusions:** The PESI score can be utilised effectively by a specialist nurse to treat patients with low-risk PE (PESI score class I-II) in the community.

#### P412

##### The rise in carboxyhemoglobin and methemoglobin concentration from repeated five second breath-hold maneuvers

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The measurement of pulmonary diffusing capacity for carbon monoxide (DLCO) raises the carboxyhemoglobin concentration in the blood, [COHb]. The standard 10 s breath-hold technique increases [COHb] by about 0.7% per test, which results in a 1% decrease in DLCO for every 1% rise in [COHb] (Respir Physiol, 1990, 81: 303-12). However, few data exist on the rate of increase in [COHb] or methemoglobin [METHb] from the modified Roughton and Forster one-step technique in which 0.28% CO and 40 to 50 ppm NO is inhaled simultaneously for 5 s. The combination of CO and NO inhaled together allows for determination of pulmonary capillary blood volume in a single breath-hold maneuver. Nine healthy subjects [24 (SD 4) yrs, hemoglobin concentration 13.2 (1.7) g/dL] performed repeated DLCO testing on two separate days. The days were randomized to provide either the standard 10 s breath-hold maneuver (0.30% CO), or the 5 s modified Roughton and Forster technique (0.28% CO, 55 ppm NO). Twenty-two 5 s breath-hold maneuvers, each separated by 4 min rest raised [COHb] to 11.1 (1.4)% and minimally raised the [METHb] to 0.8 (0.2)%. After the 22nd test, DLCO was reduced by 3.6 (2.9) mL/min/mmHg. This equates to a 0.44 (SEE

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0.08)% increase in [COHb] per 5 s breath-hold maneuver and a concomitant 0.35 (SEE 0.31)% decrease in DLCO. Pulmonary diffusing capacity for nitric oxide (DLNO) was not altered after 22 tests. On another day, the 10 s single breath-hold maneuver increased [COHb] by 0.64 (SEE 0.13)% per test, and reduced DLCO by 0.40 (SEE 0.26)% per test. In conclusion, the 5 s modified one-step technique does not appreciably raise [METHb], and DLCO is only significantly reduced after 10 tests.

#### P413

##### Impact of an hand held ultrasound machine (HHUSM) in pulmonologist's clinical hospital practice: Experience of nine months

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**Introduction:** HHUSM utilization is spreading outside radiology department at the point of care to guide some procedures and to assist clinical evaluation.

**Objectives:** The aim of this study was to evaluate the impact of HHUSM utilization in the pulmonologist's hospital practice.

**Methods:** An ultrasound report was written by the P after each examination Thoracic ultrasound evaluation (TUSE); a database was created after nine months. This database was analyzed to deduce the impact of HHUSM in pulmonologist's practice.

**Results:** Data are summarized in Table 1: 146 TUSE were analyzed; 108 were used in the clinical setting of lung opacities in the chest X ray and ultrasound assisted thoracentesis. According to the pulmonologist's Knowledge, 38 TUSE were applied in critical care setting.

TABLE 1 INDICATION FOR USING THORACIC ULTRASOUND EVALUATION (TUSE)

CLINICAL SETTING	N°	OBSERVATION	N°
THORACIC OPACITIES	88	PLEURAL EFFUSIONS (PE) (5 BILATERAL) LUNG OPACITIES (LO) LO+PE EMPIEMA NO PE ATELECTASIS	30 25 15 6 8 4
US ASSISTED THORACENTESIS	20	PE TAPPED	20
US INTERSTITIAL LUNG SYNDROME 19 ACUTE DYSPNOEA AND PULMONARY EDEMA REGISTRATION OF B LINES*	19	B LINES PRESENT = ABSENT	16 3
FALLS PROTOCOL (FLEET ADMINISTRATION LIMITED BY LUNG ULTRASOUND)**	9	INTRAVENOUS FLUID ADMINISTRATION TILL DETECTION OF B LINES BY LUNG ULTRASOUND	9
DETECTION OF PNEUMOTHORAX	5	PNEUMOTHORAX ABSENT LUNG GLIDING + A LINES CHEST X-R CONFIRMED PNEUMOTHORAX DETECTED	3 2
COMPRESSIVE ULTRASOUND LOWER LEGS (CUS) FOR PULMONARY EMBOLISM E/O VENOUS THROMBOEMBOLISM	5	REGULAR COMPRESSION UNCOMPRESSIBLE VEIN	3 2

\* Interstitial lung syndrome: B lines or comet tail artifacts in the TUSE suggestive of inspissated interstitial space, this is related to pulmonary congestion.  
\*\* A protocol used in critical care to guide intravenous fluid infusion in an hypovolemic patient. The hypovolemic status is related to an inferior vena cava (IVC) collapsible in inspiration and reduced in diameter. The rehydration was guided till recognition of B lines in TUSE (see above interstitial lung syndrome)

**Conclusion:** HHUSM utilization is really important in several clinical situation. Limitations of technique were the operator's knowledge and the standardisation of the skillfulness outside radiology department. Waiting for gold standard examination HHUSM utilization could help in clinical procedures and decisions when applied at point of care.

#### P414

##### Premature adult lung study (PALS): Spirometry and lung clearance index are impaired in adult survivors of bronchopulmonary dysplasia

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**Introduction:** We have previously reported increased respiratory symptoms in adult survivors of bronchopulmonary dysplasia (BPD) compared with very low birth weight (VLBW) (<1500g) and term controls. Here we report preliminary findings from spirometric and Lung Clearance Index (LCI) measurements.

**Objective:** To investigate whether adult survivors of BPD have greater impairment of lung function and LCI than age and gender matched VLBW and term controls.

**Methods:** Spirometry measurements (MicroLab ML3500 Mk8™) were obtained in 16 BPD [8male; mean (SD) age 24.9 (3.9) y], 9 VLBW [Mean (SD) age 25.8 (3.73) y] and 55 term controls [30 male; mean (SD) age 26.0 (4.0) y]. LCI measurements (Innocor™ device) obtained in BPD and VLBW participants were compared to 17 healthy controls [6M, mean (SD) age 30.5 (7.5) y].

**Results:** For all spirometry end points (FEV<sub>1</sub>, FVC, FEV<sub>1</sub>/FVC and FEF<sub>25-75</sub>), BPD adults had significantly lower values than term controls (p<0.001). Mean FEV<sub>1</sub> and FEV<sub>1</sub>/FVC measurements were lower in BPD adults than VLBW (p<0.05). Mean LCI measurements were higher (more impaired) in BPD [mean (SD) 6.99 (0.78)] versus healthy controls [mean (SD) 6.36 (0.362)] (p=0.006). LCI measurements were also higher in BPD than VLBW but this was not statistically

significant. Three BPD subjects had entirely normal spirometry but abnormal LCI values (value > healthy control mean +2SD).

**Conclusions:** Our preliminary findings suggest persisting lung function impairment in adult survivors of BPD. LCI may be a useful tool in detecting early small airways disease in adult survivors of preterm birth.