416. Update on monitoring airway diseases

P4011

P4012

Assessing the burden of asthma and COPD in Salford UK: Retrospective analysis using a whole population electronic medical record

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There is limited information on predictors of disease progression and their association with managing asthma and COPD in primary care.
This retrospective, real-life, observational cohort study used an electronic medical record (EMR, all residents in Salford) to evaluate patient characteristics and health resource utilisation in Asthma and COPD during 2008/2009. Primary care and hospital data (adult patients with general practitioner [GP] coded diagnosis of asthma and/or COPD; ≥ 2 prescriptions for inhaled bronchodilators during 2008) were analysed.
Of 180,493 adults ≥ 18 years, the prevalence of asthma was 4.4%; of COPD 2.5%. Most commonly prescribed controller medications were: EMR, Asthma: ICS 42%, ICS and LABA 40%; COPD: ICS and LABA 56%, LAMA 36%. Resource utilisation was greatest in patients with a history of exacerbations in 2008:

12 month resource utilisation data per 100 person-years during 2009, subsets predetermined from data during 2008

	Asthma			COPD		
Mean Age (yrs)	47.6			68.0		
Mean FEV_1 (%)	86.0			61.0		
	Total	Subset ≥1 exacerbation	Subset ICS or ICS/LABA	Total	Subset ≥1 exacerbation	Subset ICS/LABA, LABA or LAMA
Short courses oral steroids	34.7	109.1	38.5	160.6	244.1	205.7
Antibiotics	76.3	111.0	77.8	125.3	179.6	141.8
GP visits – all (routine and unscheduled)	1068.9	1325.0	1097.2	1526.0	1702.5	1599.6
Hospitalisations – all cause	25.5	34.9	23.3	53.4	53.7	53.3
Hospitalisations – respiratory cause	2.8	4.7	2.9	13.6	17.2	16.6

Conclusions:
– EMR collected during routine clinical care can quantify the burden of asthma/COPD.
– EMR can identify exacerbations (oral steroids/antibiotics or hospitalisation).
– EMR could evaluate differences in disease outcomes with novel treatments.

P4013

Lipid peroxidation products-diagnostic utility in differentation of pleural effusions

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Introduction: Biochemical analysis of pleural fluid are the first step in differentiation of pleural effusions (PE) into exudates (E) and transudates (T). Therefore, new parameters have been used to improve the accuracy of diagnosis. Free oxygen radicals (FOR) are known to produce damage in many biological tissues. FOR exert their cytotoxic effect by causing lipid peroxidation which is believed to be responsible for the exudation of fluid into the pleural space.
Aims: Based on this idea, the aim of this study was the determination of malondialdehyde (MDA), as the final product of lipid peroxidation in pleural fluid (MDAp) and in serum (MDAs) and pleural fluid to serum MDA ratio (MDAp/s); and to compare our results with other well established criteria.
Methods: We analysed 52 patients with PE who were classified as E(32) and T(20) by Light's criteria. MDA was measured by spectrophotometric method with TBA.
Results: Our results showed significant increase of MDAs level in both groups of patients: E (7.27±1.29 μmol/L) and T (7.75±0.89 μmol/L) in comparison with control group (5.10±0.87 μmol/L) $p<0.001$. MDAp level in E (5.16±1.28 μmol/L) was also significantly increased than in T (2.67±0.61 μmol/L), $p<0.001$. Similarly, MDAp/s ratio was significantly higher in E (0.72±0.17 μmol/L) than in T (0.34±0.05 μmol/L) $p<0.001$. Using a cut-off value (0.4) for MDAp/s ratio (sensitivity 95% and specificity 90%) effectively separated E from T.
Conclusion: Based on these results we can conclude that determination of lipid peroxidation products may be useful in diagnosis-differentiation of pleural effusions into E and T. It is of significance for the correct treatment of patients.

P4014

Challenge already established: Identification of risk factors for early need for ventilatory support in Duchenne muscular dystrophy

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Introduction: Duchenne muscular dystrophy (DMD) is a genetic, progressive and disabling disease. Functionally, it puts a restrictive respiratory disorder. Faced with signs and symptoms of chronic respiratory failure should be started as ventilatory support (VS), usually in the second half of adolescence, which was initially due to nocturnal hypoventilation. *Ventilar* Program (VP) assist DMD patients VS-users and VS-non users in John Paul II Child Hospital/Hospitalar Foundation of Minas Gerais State (JPIICH/FHEMIG).
Objective: To identify among patients with DMD assisted by the VP/JPIICH/FHEMIG, possible risk factors for the need early VS.
Patients and methods: Cohort study between 2002-2010. Clinical score 20 points (1 point for each sign of hypoventilation). Risk factors associated with VS were evaluated in multivariate analysis by proportional hazards model of Cox. Multivariate model of Cox: all variables $p<0,20$ in univarate anaysis. Final level of significance $p<0.05$. Group A: 16 (25.8) VS-users; group B: 46 (74.2) VS-non-users. Group C: loss of ambulation before 10 years and group B after 10 years.
Results: Statitically significant difference in univariate analysis for risk factors: body mass index: p=0.15, difficulty swallowing (p=0.05), moderate to severe scoliosis (p=0.01), age at loss of ambulation ($p<0.001$) and clinical score 0-17 and >17 points ($p<0.001$). Cox final model: clinical score: relative risk 1.89 (p= 0.001) and loss of ambulation before 10 years: relative risk 2.04 (p=0.01).
Conclusion: Age at loss of ambulation and clinical score were independent risk factors for the installation of VS before 20 years of age of DMD patients.

P4015

ISAAC Malta: Changes in geographical distribution of wheezing children in Malta between 1994 and 2002

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Introduction: Malta is one of the centres which participated in the Phase 1 and 3 of The International Study of Asthma and Allergies in Childhood (ISAAC).
Aim: To investigate changes in the geographical distribution of wheezing in the Maltese Islands.
Methods: ISAAC Malta Phase 1 was carried out in 1994 with 3506 participants from 24 schools for the 5 to 8 year old age group and 4184 participants from 25 schools for the 13 to 15 year old age group.
ISAAC Malta Phase 3 in 2001 studied 3800 from 44 schools and 4139 children from 18 schools in the 5 to 8 and 13 to 15 year old age groups respectively.
Results: In the younger age group there was an increase from 8.8% to 14.8% ($p<0.0001$) in the total prevalence of current wheezing between 1994 and 2001. Most geographical regions of the Maltese islands reported an increase in wheezing with the Central East (10.2% vs 23% $p<0.0001$), Grand Harbour (8.5% vs 21.2% $p<0.005$), East (8.6% vs 22.5% $p<0.00001$) and Central North (6.5% vs 16.3% $p<0.0004$) regions having the largest increases.
The prevalence of current wheezing in the older age group remained stable (16% to 14.6% p=0.08). A decline in current wheezing (p=0.5) was observed in Central West (16.31% vs 11.2), West (17.5% vs 12.6%) and South (14.8% vs 11.2%) while three regions reported an increase in wheezing.
Conclusions: A strong genetic component together with environmental factors must influence the geographical distribution of wheezing in the Maltese Islands.

P4016

The relationship between sleep respiratory disorder and daytime PaO2 in OSAS and in overlap syndrome

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OSAS and COPD are often associated with daytime hypoxiemia. Overlap Syndrome (OS) increases the risk of daytime hypoxiemia. The aimof this study was to investigate the mechanisms which could justify the low oxygen's levelin these patients and the effect of CPAP therapy.

563 consecutive OSAS patients were enrolled. According to pulmonary function test they were divided in 2 groups. Group 1: 473 OSAS/COPD +/-; Group 2: 90 patients OSAS/COPD +/+. All patients underwent blood gases, nocturnal polisomnography, postbronchodilator spirometry. A multivariate analysis was performed to evaluate which were the factors that determining the diurnal PaO2
The groups were matched for BMI, for age and AHI.
OS group showed lower level of daytime PaO2 compared with OSAS patients (71.6±9.7 vs 79.3±11 mmHg, p<0,001), the alveolar-to-arterial oxygen partial pressure difference (AaDO2) was higher in OS than in OSAS (28.3±9.9 vs 22,7±10,7, p<0.01), also the TST90 was higher in OS (34,8%±35,5 vs 24% ± 26). In OS group diurnal PaO2 correlated with age (coef=-0,41) with AHI (-0,18) and with FEV1 (0,21), while in OSAS group the correlation was found with age (coef=-0,27), FEV1 (-0,07) and mostly with BMI (0,46), but not with AHI.
In both groups, patients with good compliance (>4H/night) of CPAP improve daytime PaO2 (p<0.001) whereas, in patients with poor compliance PaO2 was reduced (p<0.001).
Our data suggest that daytime hypoxemia in OSAS patients is largely determinated by the increased of body weight. In the overlap patients daytime hypoxiemia has a more complex origin. However CPAP therapy has been shown to improve daytime PaO2 values both in OSAS than in OS patients with good compliance

P4017

Oxygen prescription and oxygen therapy on the wards according to British Thoracic Society guidelines: Experience of an acute trust in the UK

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Background: Oxygen is one of the most commonly used drugs in a hospital setting. The British Thoracic Society (BTS) published guidelines in Oct 2008 to guide oxygen use in hospital settingS aimed at standardising practise in the prescription and delivery of oxygen therapy. An audit was carried out in 2010 in East Kent Hospitals University Trust (EKHUT) To assess current practise of prescription and monitoring of oxygen therapy and ompliance with standards set out in the BTS Guideline
Methodology: All adult patients admitted to a medical or surgical ward and using oxygen or prescribed oxygen at the time of the audit were included. Data collection was carried out using the BTS audit tool on 6th Feb 2010. The patient's drug chart, monitoring chart and medical notes were used to gather information about oxygen prescription and use. In total 740 patients were audited.
Results: 11% of patients in EKHUT were using oxygen at the time of the audit. This is comparable with national figures of 17.5%.Only 30% had formal prescription and the mode (continuous or PRN) of oxygen delivery was clearly documented and but 12% did not have any documentation about the mode. Rest of them had instruction about oxygen therapy in the medical notes but not on the chart. Majority of patients were within the target saturation range at their most recent observation round indicating that adherence to prescription target ranges was overall good.
Conclusion: This audit has highlighted the need to raise awareness in all medical and nursing staff of BTS recommendations and educate health professionals to deliver oxygen in a more standardised and safe manner.

P4018

Computed tomography of the chest as a way to diagnose and monitor treatment of patients with sarcoidosis in Omsk, Russian Federation

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Purpose: To evaluate lung injuries with computed tomography (CT) for diagnosis and therapeutic follow-up of patients with sarcoidosis (S).
Methods: 247 consecutive patients with biopsy-proven S were retrospectively included respectively. All patients underwent corticosteroid (CS) treatment. All patients were re-examined by CT to assess response to CS treatment at 3 and 6 months.
Results: Mediastinal lymphadenopathy (ML) was detected in 93.75%. The small focal dissemination (SFD) detected in 67,5% and frosted glass areas (FGA) - 30%. A single large-scale patchy shadows (SLPS) - 8,75%, the consolidation of lung tissue (CLT) - 6,25%, bronchiectasis - 3,75%, pleural effusion - 1,25%. The ML in stage I S was detected in 100%. Bilateral intrathoracic lymph nodes (LN) lesions sometimes asymmetrical observed in 29.7%. Bronchopulmonary LN injury in 86,7%. Stage II S manifested as 100% of symmetrical ML, SFD - 89%, the presence of FGA - 37,3% (p = 0,001). Rarely detected SLPS - 11,8%, the CLT - 8,7%, pleural effusion was observed in isolated cases. After 3 and 6 months of CS treatment the decrease ML was detected in 35%. The SFD disappeared in 13.7% after 3 months of treatment and in 44% after 6 months of therapy. FGA remained at 100% within 3 months of therapy, but after 6 months of treatment with CS disappeared or decreased in size in 7.3%.
Conclusion: The most frequent CT manifestations of S were ML, a syndrome of small focal dissemination syndrome and frosted glass. The effectiveness of glucocorticoid therapy in patients with S is confirmed by CT of the thorax, which shows the disappearance or reduction of CT manifestations in respiratory organs.

P4019

Ventilation heterogeneity is associated with asthma control in adults

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Background: The clinical relevance of increased ventilation heterogeneity, a marker of small airways disease, in asthma is unclear. Ventilation heterogeneity is an independent determinant of airway hyperresponsiveness, improves with bronchodilators and inhaled corticosteroids (ICS), and worsens during exacerbations but its relationship to asthma control is unknown.
Objective: To determine the association between ventilation heterogeneity and current asthma control before and after ICS treatment.
Methods: Asthmatic subjects had the 5-item symptom-only asthma control questionnaire (ACQ_5) and lung function measured at baseline and after 3 months of high dose ICS treatment. Ventilation heterogeneity was measured as S_{cond} and S_{acin} by multiple breath nitrogen washout. S_{cond} and S_{acin} represent ventilation heterogeneities in small airways where gas transport occurs mainly by convection or diffusion, respectively. Spearman correlations and paired t-tests were performed.
Results: At baseline (n=110, 64 female), ACQ_5 correlated with S_{cond} (r_s = 0.30, p=0.002) and S_{acin} (r_s = 0.21, p=0.03). After treatment (n=55), the mean (SD) ACQ_5 improved (1.31 (0.71) to 0.70 (0.77), p<0.0001), S_{cond} improved (0.068 (0.035) to 0.053 (0.033) L^{-1}, p<0.0001) but S_{acin} did not significantly change (0.147 (0.07) to 0.142 (0.06) L^{-1}, p=0.28). The change in ACQ_5 correlated with changes in S_{cond} (r_s = 0.34, p=0.02) and S_{acin} (r_s = 0.33, p=0.01).
Conclusions: Current asthma control is associated with markers of small airways disease. Improvements in ventilation heterogeneity with anti-inflammatory therapy are associated with improvements in symptoms. Sensitive measures of small airway function may be useful in monitoring therapy in asthma.

P4020

The burden of airway hyperresponsiveness on the control of asthma

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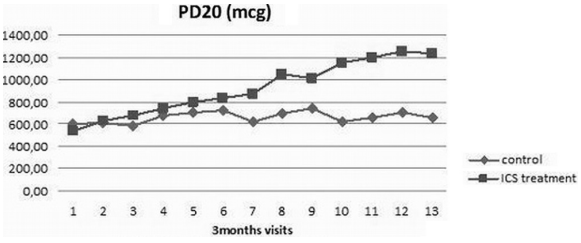
Background: Airway HyperResponsiveness (AHR) in asthma is correlated with decrease of functional parameters and exacerbations.Different phenotypic expression in asthma requires valid biomarkers to monitor the disease.
Aim: To assess the effect of the level of AHR on the preservation of asthmatic control.
Methods: 98 asthmatic pts with ACT (Asthma Control Test) >20, nonsmokers were enrolled in a 3yrs controlled randomized trial. Group A (49) (ICS) receiving a continuous treatment with inhaled beclomethasone MDI100mcg twice/die+salbutamol as needed, and Group B (49) (control) treated with inhaled salbutamol as needed. Step up therapy was performed as recommended by guidelines. Measures of PD20 (methacoline), ACT, exacerbations, use of drug, and visits are scheduled every 3 months. Primary endpoints were AHR, ACTscore, exacerbations, therapy as needed.
Results: Significant difference of mean PD20 (mcg) was reported between the 2 groups.



Although groupB showed values higher than groupA,no significant difference were reported for ACT (A20.1,B19.7), exacerbations/3mths (A3.9,B4.2), medical visits/3mths (A4.4,B4.7), puffs as needed/3mths (A16.8,B19.6), days high dosage ICS/3mths (A47.4,B48.8), days oral CS/3mths (A0.35,B0.39).
Conclusion: In controlled asthma long term treatment with low dosage ICS determine a significant reduction ofAHR. It may lead to a greater control of the disease and a less impairment of spirometric parameters over the years, even if the clinical impact is less significant.

P4021

Audit of the impact of introducing exhaled nitric oxide (FE_{NO}) monitoring to an adult asthma clinic in a district general hospital

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Background: FE_{NO} can assist in diagnosis of asthma and enhanced optimization of inhaled corticosteroid (ICS) therapy.

Methods: Data for the first 67 patients to undergo FE_{NO} testing with NiOX MINO in a secondary care adult asthma clinic were collected. ICS doses are expressed as mean±SD daily beclomethasone or equivalent.
Results: FE_{NO} was performed in 17 patients undergoing diagnostic workup for asthma. The need for histamine challenge testing was prevented in 10 patients with normal spirometry and FE_{NO}; six patients were subsequently discharged who would otherwise have required followed up. Of the 50 patients with asthma receiving ICS, FE_{NO} was high (>45ppb) in 15, intermediate (25-45ppb) in 8 and normal (<25ppb) in 27. FE_{NO} altered decision-making in 22 (44%) patients by permitting a reduction (n=3) or maintenance (n=12) in ICS in patients who would otherwise have had their dose increased, and a reduction in 7 patients who would have had their ICS dose maintained. There was more appropriate matching of ICS dose changes to FE_{NO}, with a reduction in ICS dose in patients with normal FE_{NO} (1603±874µg to 1381±926µg; p=0.017), no change in the intermediate FE_{NO} group (1738±639µg to 1800±513µg; p=0.35), and an increased dose in the high FE_{NO} group (2140±767µg to 2733±683µg; p=0.007).
Conclusions: In almost half of patients tested, FE_{NO} prevented the need for a) bronchial challenge testing in patients undergoing diagnostic workup for asthma and b) permitted reduction in overall steroid burden in patients receiving ICS compared to a conventional approach. Patients will be followed to see what impact FE_{NO} has on overall asthma control and steroid dose burden.

P4022
Functional, clinical evolution and cellular inflammatory pattern in induced sputum in patients with difficult-to-control asthma
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Background: Patients with difficult-to- control asthma (DCA), show several phenotypes. Our aim is to identify phenotypic modifications over time in this patients.
Materials and methods: Prospective study in subjects with DCA. Clinical status was evaluated by Asthma Control Test (ACT), exacerbations/6 months (E6M) and relief therapy use (RTU). Daily corticosteroids dose (inhaled -ICs- or oral -OCs-), lung function (FEV1), inflammatory and infectious bronchial status (FeNO, differential cell count and culture in induced sputum) for 6 months.
Results: 26 patients with DCA were enrolled. Outcomes at initial time (T0): ACT 15 (mean), FEV1 69% pred, ICs 1237 mcg and OCs 4.1 mg. RTU 1,2 times/day, E6M 4.3 and FENO 48 ppb. Six months after (T6) 12 patients improved ACT in three or more points. The patients improve ACT had a paucigranulocytic pattern. Patients with similar or poor ACT had an eosinophilic pattern in sputum. At T0 microbial pathogens (MP) were isolated in 2 of 3 patients with controlled asthma and after 6 months the bacterial cultures were negatives but the inflamatory pattern in sputum changed to paucigranulocytic form. In 2 patients with uncontrolled asthma were observed MP and their pattern changed to mixed form at T6.
Conclusions: 50%patients with DCA who improved their ACT on 6 months, show a paucigranulocytic pattern in sputum. Patients who didn't improve showed aggressive patterns (eosinophilic, neutrophilic and mixed). There are individualized changes to beningn or aggressive patterns in sputum without improvement or worsening expected in ACT. Some patients had microbial colonization associated with aggressive patterns in sputum.

P4023
Relationship between circulating Th2 prevalence and asthma control in pregnant asthmatics
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Introduction: Asthma is one of the most common diseases complicating pregnancy and a risk factor for several maternal and fetal complications. It was previously shown that altered systemic inflammation present in pregnant asthmatics may contribute to the outcome of the pregnancy; however less has been known about the relationship between circulating T cell profiles and clinical characteristics of asthma in pregnant patients.
Aim: The aim of this study was to assess the relationship between various T cell profiles and clinical variables in asthma during gestation, including lung function, exhaled nitric oxide, and asthma control.
Methods: The prevalence of Th1, Th2, and Treg lymphocyte subsets was identified by cell surface markers and intracellular FoxP3 staining in 22 pregnant women in the second or third trimester suffering from persistent allergic asthma. FENO, Asthma Control Test (ACT) total score and lung function were also evaluated.
Results: A significant negative relationship was observed between Th2 cell prevalence and ACT total scores (r=-0.48, p=0.03), while no relationship was found between Th2 prevalence and FENO or lung function parameters. However, none of the other T cell subsets were correlated to any of the clinical characteristics (FENO, lung function, or ACT; p>0.05).
Conclusions: The level of asthma control related to blood Th2 cell prevalence suggests a direct relationship between symptoms and cellular mechanisms of asthma in pregnant patients.
The study was supported by OTKA 68808.

P4024
Chronious: A new wearable monitoring system for COPD patients
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CHRONIOUS is a FP7 European Community project which also includes a new wearable platform for home monitoring of people suffering from chronic diseases. The wearable system is composed of a shirt made of washable stretch-material into which are sewn 4 ECG electrodes, two bands for respiratory inductive plethismography (RIP) and a reflectance pulseoximeter. The data coming from the sensors are collected and transmitted via wireless connection by the Data Handler, a microcontroller-based acquisition system. To evaluate accuracy and usability of this device, we studied 9 COPD patients (70.8±6.6 years, FEV1 45.1±9%pred) during 1 hour in the seated and 1hour in the supine positions. Patients were breathing spontaneously and data were collected continuously. At the beginning and at the end of each hour flow at the mouth was also measured by a spirometer (Sibelmed, Barcelona, Spain), heart rate (HR) and oxygen saturation (SpO2) by a finger clip pulseoximeter (NONIN, Plymouth, Minnesota, USA) for 10 minutes, to get reference values for comparison. The first measurement for each subject with the spirometer was used to calibrate the RIP using Sackner algorithm, J.Appl.Physiol 1989; 66(1): 410-420.
The evaluation of accuracy was focused on the following parameters: HR, SpO2 and tidal volume (VT). Linear regression analysis on the data acquired resulted as follows: HR r^2=0.99, m=1.00, q=-0.31, SpO2 r^2=0.92, m=1.29, q=-27.54, VT r^2=0.89, m=1.15, q=-0.072. From the signals of the ECG electrodes it was possible to identify PQRST waves within the 3 derivations.
The new wearable monitoring system provided reliable measurements of HR, SpO2, VT and ECG in both supine and seated posture. RIP calibration was still consistent after 1 hour of use.

P4025
Using routine spirometry to obtain sputum samples in the respiratory clinic
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Background: Analysis of sputum is helpful in diagnosis and management. Not all patients produce sputum on request. However most undergo spirometry during their clinic visit. We had noticed that many patients appear to produce sputum during spirometry which was often swallowed and wondered if this might be an opportunity to obtain a sample.
Method: 303 consecutive patients performing nurse led spirometry in our chest clinic at the North Bristol Lung Centre from 1st November 2010 to 31st January 2011 were studied. Initial 139 patients were not informed prior to spirometry that a sputum specimen was required; subsequent 164 patients were asked to provide a specimen if possible.Nature of the sputum (mucoid/purulent) was recorded by the nurse.
Results: Of the initial 139 patients, 14 (10%) produced sputum spontaneously. 19 (12%)of the subsequent 164 were able to produce sputum on request during spirometry. Many patients in both groups swallowed sputum during spirometry.
Among the 303 patients, 66 (22%) had bronchiectasis, 65 (21%) had asthma and 53 (18%) had chronic obstructive pulmonary disease (COPD). Among those who produced sputum at spirometry, 22 (17 purulent) had bronchiectasis, 5 had COPD and 4 asthma.
22/33 sputum samples collected were sent to the laboratory. Sputum assessment by the clinic nursing staff matched that of the lab in 18 (82%) of the 22 cases.
Conclusion: Performing spirometry provides an opportunity to gain sputum. Forewarning the patient appears to have no effect on giving a sputum specimen. Nurses' categorisation of sputum nature correlates well with microbiology laboratory assessment. Categorisation as mucoid may enable fewer samples to be submitted for microbiology assessment.

P4026
Concordance between the new questionnaires to evaluate asthma control
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Objectives: Regarding asthma, the main objective is to control the disease symptoms. Both Asthma Control Test (ACT) and Asthma Control Questionnaire (ACQ) are one of the most used tools to evaluate asthma control in medical practice. Two studies have been recently published where new cut-off points for ACT (> 21, 19-20 and <18) and ACQ (<0.5, from 0.6 to 0.99 and> 1) are established. This leaded us to evaluate the concordance between both test in our patients.
Methods: We have included 179 asthmatic patients chosen from our medical practice, who performed both questionnaires and were classified in different categories of asthma control, and we analyzed the concordance of the results.
Results: The average age of our patients was 45±11 years and the FEV1 measured was 2.65±0.95 litres (82±22%).

The classification of our patients, according to the questionnaires is shown in Table 1.

Table 1. Astma control evaluation according to specific questionnaires

	Control	Partial Control	No Control
ACT (>20, 18–19, <18)	60 (33.17%)	31 (17.32%)	88 (49.16%)
ACQ (<0.5, 0.6–0.99, >1)	43 (18.53%)	19 (8.2%)	113 (48.7%)

By comparing the results of both questionnaires, we find a very good correlation (correlation coefficient 0.75) and a poor concordance (kappa 0.556), although statistically significant ($p < 0.001$).
Conclusions: As we cannot find a good concordance between both questionnaires is not possible to exchange them or their cut-off points, so it would be convenient to carry out prospective multicentre studies using both questionnaires and GINA/GEMA criteria.

P4027
Data reduction for large scale cough studies using distribution of audio frequency content
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Background: Recent studies have suggested that the objective quantification of coughing from sound recordings provides novel insights into the mechanisms underlying cough and the efficacy of therapies. However, reliable methods for minimisation of sound data are required to improve the feasibility of processing many and large patient data records for large scale studies of cough treatments for both manual and potential automatic cough counting.
Aim: To determine if a developed system can identify periods of inactivity in sound recordings to significantly reduce record length without degrading data (i.e. inadvertent removal of cough sounds), referred to hereafter as destructiveness.
Methods: Inactive periods of audio are identified by measuring the median audio frequency within small segments of recordings and removing those below a selected threshold. 200 randomly selected 15 minute periods known to contain cough, from 20 patients [healthy (5), COPD (5), asthma (5) and chronic cough (5); male (10)] were used, each recorded for 24hrs. To measure destructiveness, both the audio kept and removed by the algorithm were analysed by trained cough counters and compared to counts for the original files. Finally, the efficacy of the algorithm was determined by the reduction in record length achieved across all of the patient data.
Results: The average resultant file size was 6.04% (54.4s) of the original (median 13.9s, iqr 56.4s) and the system erroneously removed 1.6% of coughs at a rate of 0.62 coughs h^{-1}.
Conclusions: The system has shown to be reliable for use in cough monitoring as an excellent means of removing large sections of audio and profoundly improving the efficiency of manual cough counting.

P4028
Oropharyngeal pH evaluation to determine the presence of airway reflux in asthmatic patients
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Introduction: Reflux disease can affect the tracheobronchial tree directly, this has been shown to lead to aspiration. Currently pharyngeal pH measuring detects only liquid reflux.
Aims and objectives: To evaluate the presence of gaseous airway reflux in physician diagnosed asthmatic patients, utilising the "Dx-pH Measurement System" (Restech, Respiratory Technology Corporation, San Diego, California, USA). The Dx-pH probe can detect the pH of aerosolized droplets and liquid.
Methods: Asthmatic patients with symptoms assessed on the Hull Airway Reflux Questionnaire (HARQ) underwent 24-hour airway pH monitoring with the Dx-pH measurement system. The probe was inserted transnasally in to the oropharynx with the distal end sitting lateral to the uvula. A Ryan score (composite pH score for pharyngeal acid exposure) was calculated for both the upright and supine periods.
Results: The study population consisted of 12 asthmatic patients (1 male, 11 female) with a mean age of 50 (range 33 - 72). Ryan score values for the upright period were 2.12 - 612.57 (normal <9.41) and for the supine period were 2.17 - 38.01 (normal <6.80). The mean HARQ score was 32/70. Airway reflux was present, confirmed by an abnormal Ryan score in 75% of the study population in the upright position and 58% in the supine position.
Conclusion: Airway reflux is a frequent condition in asthma patients. It should be recognised as a distinct entity that warrants specialized focus and treatment to improve the symptoms of patients suffering with extraoesophageal reflux and asthma. The Dx-pH probe is a useful diagnostic tool for patients with asthma and symptoms suggestive of airway reflux.

P4029
Comparison of the asthma control test and % predicted FEV1 in relation to correlation with physicians assessment of asthma control and treatment decisions
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Background: The Asthma Control Test (ACT) is a 5-item questionnaire for the assessment of asthma control. An ACT score of <20 correlates with poorly controlled asthma.
This study compared whether ACT or FEV1 correlated better with physicians assessments of asthma control and treatment decisions made by clinicians.
Method: Serial visits were reviewed to a specialist Asthma Outpatients Clinic. All subjects completed the Asthma Control Test and performed same day spirometry. Clinicians made their own assessment of the patients' asthma control and made appropriate treatment decisions. The clinicians were not blinded to the results of spirometry or ACT.
Results:

	ACT >20	ACT <20	FEV1 >0.8	FEV1 <0.8
n	26	96	57	65
Mean age	48	48	48	47
Mean % FEV1	93.7	73.7	103.4	58.1
Physician Judged Controlled (%)	88.4	24.2	53.6	
Physician Jusged Uncontrolled (%)	11.6	75.8	46.4	75.4
Treatment Increased (%)	3	38.5	21.4	42.4
Treatment Unchanged (%)	81.6	57.3	71.5	54.5
Treatment Decreased (%)	15.4	4.2	7.1	6.1

In the group defined as having controlled asthma (as defined by ACT <20), 88.4% of patients were also classified as controlled by clinicians. However, in the group with% predicted FEV1 < 0.8, only 53.7% of patients were classified as controlled by clinicians.
Conclusion: The results of our study show that an ACT score of <20 had a strong association with the physicians assessment of asthma control and correlated better with treatment decisions than did the severity of asthma as defined by FEV1. The ACT could serve as a useful in the assessment and management of asthma by guiding physicians with regards to asthma control.

P4030
Circulating nucleosomal DNA of blood as an indicator of the pathological process during chronical bronchitis
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The expression of the protein Ras is the basis of the activation of cell cycle by the connection of the signal path of the EGRF with the cascade of MAP. This method of regulation is used in the cells of respiratory epithelium as a response to the impact of air pollutants and caused in the inhibition of apoptosis in pathogenesis of COPD. Low-molecular-weight, nucleosomal DNA fraction (lmwDNA) of the blood plasma is an universal quantitative indicator of apoptosis, which allows to distinguish fundamentally different condition of the organism. The states accompanied by strengthening of apoptosis are marked by increase in lmwDNAs content. The level of lmwDNA can be lower than background level during states, connected with the apoptosis inhibition. The COPD is noticed for the first time by the decline of the level of lmwDNA in the blood plasma unlike in the case of the CnonOB. COPD patients in the remission state the lmwDNA level consisted 7.8 ng/ml plasma (n=31) and was lower ($P<0.2$) than in CnonOB patients - 22.5 ng/ml (n=20). Assumption about the inheritability of this index was made. The mean values of lmwDNA in the group of healthy first-degree relatives of COPD patients compound 22.9 ng/ml (n=19) and it is 1.24 time lower than in group of relatives of CnonOB patients - 28.0 ng/ml (n=22). Our results suggest with the dates of the detection of K-ras mutation in plasma DNA. It is used as a method of determination of malignant disease and risk factor for them. The results indicate that it is possible to use the proposed indicator for integrated differential diagnosis in practical medicine. Further research in this field is promising.