

VOLUME 46 / SUPPLEMENT 59 / SEPTEMBER 2015

# EUROPEAN RESPIRATORY *journal*

OFFICIAL SCIENTIFIC JOURNAL OF THE ERS

**Abstracts** / *25th International Congress*  
Amsterdam, Netherlands 26 –30 September 2015

Online ISSN: 1399-3003



**ERS** EUROPEAN  
RESPIRATORY  
SOCIETY

every breath counts

Copyright for individual abstracts remains with the authors.

This abstract supplement has been produced electronically by the European Respiratory Society. The European Respiratory Society is not responsible for errors or omissions in content. The ideas and opinions expressed in this publication do not necessarily reflect those of Coe-Truman and the European Respiratory Society. Products mentioned in this publication should not be construed as an endorsement of the product or the manufacturer's claims. Readers are encouraged to contact the manufacturer with any questions about the features or limitations of the products mentioned. The European Respiratory Society assumes no responsibility for any injury and/or damage to persons or property arising out of or related to any use of the material contained in these abstracts. The reader is advised to check the appropriate medical literature and the product information currently provided by the manufacturer of each drug to be administered to verify the dosage, the method and duration of administration, or contraindications. It is the responsibility of the treating physician or other health care professional, relying on independent experience and knowledge of the patient, to determine drug dosages and the best treatment for the patient. An effort has been made to check generic and trade names, and to verify drug doses. The ultimate responsibility, however, lies with the prescribing physician. Please convey any errors to [scientific@ersnet.org](mailto:scientific@ersnet.org).

Citations should be made in the following way: **Authors. Title. Eur Respir J 2015; 46: Suppl. 59, abstract number.**



## Table Of Content

<b>219. Respiratory disease management in primary care</b>	<b>2</b>
PA1816: Innovative tools for improving medication adherence in asthma clinic at Srinagarind Hospital	2
PA1818: Asthma management in French general practice: Physician-reported medical care and adherence support	2
<b>408. Management of COPD and other respiratory diseases in primary care</b>	<b>2</b>
PA3851: LATE-BREAKING ABSTRACT: COPD patient preferences for using technology to communicate with physicians	2
PA3861: Hospital resource use for COPD patients varies by both clinical commissioning group and primary care practices across nine CCGs in the United Kingdom	2
<b>412. Novel strategies for the management of asthma, COPD and airway infections</b>	<b>2</b>
PA3927: Prevalence of serious post-training inhaler technique errors made by device-naïve patients using three different dry powder inhalers (DPIs)	2
PA3928: Predictors of good inhaler technique in asthma and COPD	3
PA3929: A 2 year programme to improve inhaler technique for adult patients with asthma and chronic obstructive pulmonary disease in a Welsh university health board	3
PA3930: Is simulation based training in inhaler technique of health care professionals more effective than written information?: A randomised controlled study	4
PA3931: Relationship between the ability to learn dry-powder inhaler use and the cognitive functions in patients with COPD	4
PA3932: A new clinically relevant method of calculating adherence	4
PA3933: Optimal adherence with inhaled corticosteroids is related to better health status	4
<b>418. Treatment and control of respiratory disease</b>	<b>5</b>
PA4050: The adherence to inhaled drugs in COPD patients: Effect on survival	5
PA4051: Use of long acting bronchodilators and inhaled corticosteroids within 30-days of discharge in older adults hospitalized for AECOPD	5
PA4052: Drug treatment in a German real-life COPD cohort (DACCORD)	5
<b>501. Management of asthma and COPD in primary care</b>	<b>5</b>
OA4791: Comparative audit of asthma management in the easy asthma clinic and general out-patient clinic	5
OA4792: Non-adherence to asthma medications: Relation to socio-economic status and asthma education	5
<b>525. Is asthma always an easy disease to diagnose and manage?</b>	<b>6</b>
PA5012: Validation of the 'test of the adherence to inhalers' (TAI) for asthma and COPD patients	6
PA5018: Adherence to the treatment of patients with bronchial asthma	6
PA5019: Inhalation technique education and its impact in asthma and COPD	6
PA5023: Difference between asthma and COPD patients in adherence and non-adherence patterns to inhaler devices	7
PA5025: Comparing pharmacist time use for asthma and COPD patients using various types of inhaler devices	7



## 219. Respiratory disease management in primary care

PA1816

### Innovative tools for improving medication adherence in asthma clinic at Srinagarind Hospital

Chanee Samosorn<sup>1</sup>, Pinyo Rattanaphan<sup>2</sup>, Watchara Boonsawat<sup>1</sup><sup>1</sup>Srinagarind Hospital, Khon Kaen University, Muang, Khon Kaen, Thailand;<sup>2</sup>College of Graduate Study in Management, Khon Kaen University, Muang, Khon Kaen, Thailand

**Introduction:** Medication non-adherence leads to poor asthma control and remains a major problem even in setting with multidisciplinary care team approach towards adherence. Forgetfulness is the most frequently mentioned reason for non-adherence in asthma clinic at Srinagarind Hospital (58.3%). Therefore, we decided to solve this problem. This study **aim** to explore positive experiences of good-adherence patients and apply it to create pharmaceutical care plan for improving patient's adherence. **Methods:** Appreciative Inquiry (AI) was used. Good-adherence asthmatic outpatients were interviewed with positive questions to generate positive experiences in medication adherence behavior. Then, 4D cycle (Discovery, Dream, Design, and Destiny) was followed. **Results:** A total of 68 asthmatic outpatients with good adherence were interviewed: 58.3 ± 12.8 years of age, 71.2% female. Best-practice behaviors include taking medication before tooth brushing or taking a bath 42.4%, putting medication beside toothbrush or keeping it in bathroom cabinet 13.0%, taking medication on a fixed time schedule 10.9%, keeping medication next to bedside 9.8%, putting medication on the dressing table or dining table 9.8%, packing medication in carry-on or travel bag 7.6%, taking medication at mealtimes 4.3% and writing on the board to remind yourself 2.2%. Then we applied these results as a tools for pharmacist intervention in 20 patients with poor-adherence. Improvement in medication adherence was found in 80% of this patient group with a mean adherence rate of 95.4%. **Conclusion:** AI approach by focusing on strengths rather than on problems can be applied to use as a pharmacist's tool to improve patient adherence behavior.

PA1818

### Asthma management in French general practice: Physician-reported medical care and adherence support

Alexandra Lelia Dima<sup>1</sup>, Eric Van Ganse<sup>2,3</sup>, Helene Le Cloarec<sup>4</sup>, Marijn De Bruin<sup>1,5</sup><sup>1</sup>Amsterdam School of Communication Research ASCoR, University of Amsterdam, Amsterdam, Netherlands; <sup>2</sup>Pharmaco-Epidemiology Unit, University Claude Bernard Lyon 1, Lyon, France; <sup>3</sup>Respiratory Medicine, Croix-Rouge University Hospital, Lyon, France; <sup>4</sup>Pharmacoepidemiology, Kappa Santé, Paris, France; <sup>5</sup>Aberdeen Health Psychology Group, University of Aberdeen, Aberdeen, United Kingdom

**Background:** Asthma care guidelines recommend physicians to perform a range of medical activities, and to support medication adherence. Little is known on how they routinely perform these activities. Physician self-report is a feasible method that can collect valuable data if the survey is rigorously developed. **Aim:** To examine the psychometric properties of 2 brief asthma care checklists (medical care & adherence support), and describe the content and scope of asthma care in a sample of French general practitioners (GPs). **Methods:** GINA, BTS/SIGN, and NAEPP guidelines, and asthma self-management literature, were used to identify key asthma care activities. Survey items were developed, reviewed, and pre-tested. Data were collected online from 117 GPs within an EC-FP7-funded study (ASTROLAB), and analyzed via descriptive statistics, item response theory and bivariate correlations. **Results:** The 12 medical care activities assessed were performed independently of each other, and half were not routinely delivered by >80% of GPs. Of 25 adherence support items, 12 formed a unidimensional scale from basic (explain drug action) to advanced (advise reminder use) support (mean score 7.2±2.8; range 0-12). Asthma care activities were unrelated to background characteristics, but adherence support scores were associated with GPs' motivation and abilities ( $\rho = .29$  and  $.24$ ,  $p < .01$ ). **Conclusions:** In this sample, medical care provision lacked a homogeneous, guideline-informed structure, while adherence support was more structured. Both varied considerably between GPs. Although GPs performed many key activities, more support to implement guidelines optimally could enhance quality of care and patient outcomes.

## 408. Management of COPD and other respiratory diseases in primary care

PA3851

### LATE-BREAKING ABSTRACT: COPD patient preferences for using technology to communicate with physicians

Laura Khurana<sup>1</sup>, Sarah Tressell Gary<sup>1</sup>, Antonio V. Otero<sup>1</sup>, Chris Hall<sup>1</sup>, Susan M. Dallabrida<sup>1</sup><sup>1</sup>COA Clinical Science and Consulting, ERT, Boston, MA, United States

**Objectives:** The patient-physician axis of communication is critical for effective monitoring and treatment of COPD. Our objective was to characterize the current role of technology in patient/physician communication and identify patient preferences for this interaction. **Methods:** We surveyed 100 subjects in the U.S. with COPD; questions focused on patients' technology use and preferences for communicating with their physician. **Results:** Subjects ranged in age from 34 to 86 years and were 55% female. 39% owned a smartphone and 41% reported using the internet daily or weekly. Most subjects (65%) reported that when they track or monitor their disease, they share their results with their physician. Subjects reported that doing online research about their disease might lead them to ask more questions about medication (46%), treatment options (45%), and new technologies to help manage their disease (34%). Over half of subjects (52%) reported that they always understand information their physicians share with them, but of those who require clarification, 54% call their physician, while others ask family and friends (35%), use internet research (28%), or wait until their next clinical visit (24%). Most subjects preferred a phone call from their physician (91%) if they needed to be contacted between visits, rather than a text message (19%) or email (17%). **Conclusions:** Most subjects with COPD are already sharing their results from tracking and monitoring their disease with their physician, and prefer the telephone for between-visit communication. Programs seeking to improve patient-physician communication with technology can draw from this baseline knowledge to identify potential areas for intervention.

PA3861

### Hospital resource use for COPD patients varies by both clinical commissioning group and primary care practices across nine CCGs in the United Kingdom

Lucy Rigge<sup>1</sup>, Frank Ratcliff<sup>2,4</sup>, Kate Lippitt<sup>1</sup>, Lynn Josephs<sup>3</sup>, Mike Thomas<sup>3</sup>, Tom Wilkinson<sup>1</sup><sup>1</sup>NIHR CLAHRC Wessex, University of Southampton Faculty of Medicine and University Hospitals Southampton NHS Foundation Trust, Southampton, United Kingdom; <sup>2</sup>Healthcare Services Manager, Boehringer Ingelheim Ltd, Bracknell, United Kingdom; <sup>3</sup>NIHR CLAHRC Wessex, University of Southampton, Primary Care and Population Sciences, Faculty of Medicine, Southampton, United Kingdom; <sup>4</sup>Healthcare Service, Academic Health Sciences Network, Wessex, United Kingdom

COPD causes a large disease and cost burden to the UK population. Key to understanding how to improve health within the COPD community and budget most efficiently, is understanding current practice uniformity in resource allocation. We have combined Hospital Episode Statistics (HES) data and Quality and Outcomes Framework (QOF) Registry data to analyse the hospital resource use for COPD patients across the UK region of Wessex (April 2013 to March 2014). HES and QOF data was available for 320 Primary Care Practices and all 9 Clinical Commissioning Groups (CCGs). We compared the average inpatient spend and length of stay for a primary diagnosis of COPD per diagnosed COPD patient from the QOF registry at Practice and CCG level. Prevalence across the CCGs ranged from 1.2% to 2.0%. We found a difference in inpatient admission rates (per spell) varying from 79 to 148 spells per 1000 of the COPD population in individual practices and CCGs. This represents a 1.9 fold difference in admission rates across the CCGs and a 13-fold difference in mean in-patient spend per COPD patient when comparing the 10% of lowest-spend GP practices with the 10% of highest-spend GP practices. Length of stay varied from 5.3 to 7.7 days and did not uniformly correspond to differences in 30 day readmission rates. Assuming a higher number of COPD admissions reflects poorly controlled disease, this data suggests a range of disease control across the CCGs and individual practices, even allowing for static causes of poor COPD prognosis e.g. deprivation. This provides a basis for further analysis of potential factors contributing to the variation seen within the region.

412. Novel strategies for the management of asthma, COPD and airway infections

PA3927

**Prevalence of serious post-training inhaler technique errors made by device-naïve patients using three different dry powder inhalers (DPIs)**  
Henry Chrystyn<sup>1</sup>, Sinthia Bosnic-Anticevich<sup>2</sup>, Nicolas Roche<sup>3</sup>, Mathieu Molimard<sup>4</sup>, John Haughey<sup>5</sup>, Federico Lavorini<sup>6</sup>, Dawn Shan<sup>7</sup>, Erika Sims<sup>7</sup>, Anne Burden<sup>7</sup>, Valerie L. Ashton<sup>7</sup>, John Efthimiou<sup>8</sup>, Marek Ferk<sup>9</sup>, David B. Price<sup>5</sup>

<sup>1</sup>Respiratory Medicine, Inhalation Consultancy Ltd, Yeadon, Leeds, United Kingdom; <sup>2</sup>Pharmacology, School of Medical Sciences, University of Sydney, Sydney, Australia; <sup>3</sup>Cochin Hospital Group, University Paris Descartes, Paris, France; <sup>4</sup>Department of Medical Pharmacology, University of Bordeaux, Bordeaux, France; <sup>5</sup>Centre for Academic Primary Care, University of Aberdeen, Aberdeen, United Kingdom; <sup>6</sup>Medical Director of Pulmonology, Careggi University Hospital, Florence, Italy; <sup>7</sup>Respiratory Medicine, Research in Real Life Ltd, Cambridge, United Kingdom; <sup>8</sup>Respiratory Medicine, Respiratory Specialist, Oxford, United Kingdom; <sup>9</sup>Medical Affairs, Sanofi Generics, Prague, Czech Republic

**Introduction:** Many patients with asthma and COPD make serious inhaler technique errors, which can impair dose delivery and have an adverse impact on clinical outcomes. **Aim:** To compare the prevalence of serious inhaler technique errors made by patients with asthma and/or COPD after training on DPIs in real life. **Methods:** Single visit, prospective, randomised, crossover study. Patients ≥18 years and naïve to study devices were randomised to training on PulmoJet® and comparator DPIs (Diskus® or Turbohaler®). Patients inhaled through empty devices after reading the patient information leaflet (PIL); if errors (those potentially affecting dose delivery) were observed they repeated the inhalations after video demonstration (PIL+video). Errors were recorded using nurse observed (check list) and technological (spirometry) methods. Conditional logistic regression was used to compare errors for PulmoJet vs comparator DPIs (p<0.05). **Results:** Of 431 patients, 421 eligible and 416 completed technological assessment. Patients were less likely to make errors using PulmoJet vs comparator devices (table).

	Patients who made ≥1 serious inhaler technique error, n (%)		Odds ratio (95% CI) for PulmoJet relative to Diskus (1.00)	p-value
	PulmoJet (n=272)	Diskus (n=272)		
Post-PIL	148 (54)	175 (64)	0.61 (0.42-0.90)	0.012
Post-PIL+ video	56 (21)	87 (32)	0.48 (0.31-0.75)	0.001

	Patients who made ≥1 serious inhaler technique error, n (%)		Odds ratio (95% CI) for PulmoJet relative to Turbohaler (1.00)	p-value
	PulmoJet (n=144)	Turbohaler (n=142)		
Post-PIL	79 (55)	121 (85)	0.16 (0.08-0.34)	<0.001
Post-PIL+ video	38 (26)	93 (66)	0.10 (0.04-0.23)	0.001

**Conclusion:** Device-naïve patients with asthma and/or COPD were significantly less likely to make serious inhaler technique errors with PulmoJet compared with Diskus or Turbohaler after reading the patient information leaflet, both with and without additional video demonstration training.

PA3928

**Predictors of good inhaler technique in asthma and COPD**

Kyra Camilleri<sup>1</sup>, Martin Balzan<sup>1</sup>, Michael Pace Bardon<sup>1</sup>, Emma Schembri<sup>1</sup>, Michael Sullivan<sup>1</sup>, Simon Mifsud<sup>1</sup>, Darlene Muscat<sup>1</sup>, Rachele Asciaq<sup>1</sup>, Stephen Montefort<sup>1</sup>

<sup>1</sup>Medicine, Mater Dei Hospital, Msida, Malta

**Intro:** The use of inhalers or other devices is dependent on proper technique. **Aim:** To evaluate Asthma and COPD patients and determine factors that predict proper inhaler use. **Methods:** 167 patients (Male 45%, Mean age 57.6, std 15.3 years) were recruited both from hospital outpatients and from the community. Patients had to be on regular inhalers. 41.3% were under the care of a respiratory physician, 25.7% GP, 19.8% both, and 13.2% none. A questionnaire was filled by the patient followed by direct observation of inhaler technique. **Results:** Self-rating of inhaler technique 0-10 mean 7.91, sd 2.06, with 80.1% ≥7/10. 67.7% said use of inhaler was easy or very easy. 93.4% said inhalers were effective or very effective. 164 patients used MDIs, of which 119 utilized a spacer. 32(19.2%) used formoterol aerolizer, and 8 (4.8%) used a turbobaler. MDI use was analysed in 12 steps, and 13 with spacer. Mean score was 82.9% (95%CI 80.7-85.1). Paired T test and Mann whitney test comparing with self rating (p=0.45,0.24). Spearman Correlation p=0.021. Predictors for score ≥80%: demo by other health worker OR 4.39(1.62-11.94,p=0.002), Male Gender 4.13(1.75-9.8 p=0.0001), Influenza vaccine ever 3.7(1.17-11.8, p=0.023), Education level 1-4 1.79(1.15-2.77, p=0.006), number of times explained by doctor 0-4 1.43(1.0-2.47, p=0.048), years of use in decades 1.29(0.98-1.67,p=0.058), self-score 1-10 1.28(1.05-1.56, p=0.012), Use of reliever 0-4 0.74(0.56-0.99, p=0.041), Heart disease 0.25(0.09-0.75, p=0.011). **Conclusion:** Patients' self-rating, repeated physician demos, health professional demos, longer duration of use, education level and male gender and lower reliever use predicted good technique in a group with high percentage of good technique.

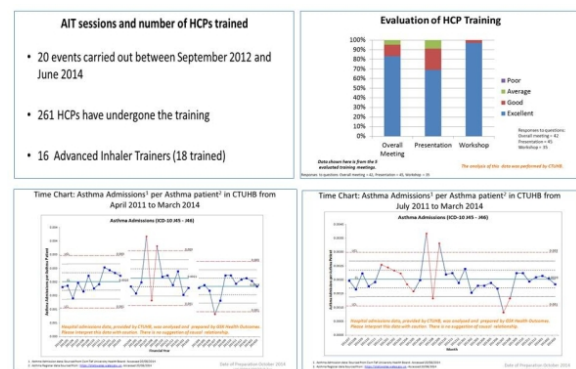
PA3929

**A 2 year programme to improve inhaler technique for adult patients with asthma and chronic obstructive pulmonary disease in a Welsh university health board**

John Amit Benjamin<sup>1</sup>, Rhian Williams<sup>1</sup>, Kathleen Bruce<sup>1</sup>, Owain Jones<sup>1</sup>, Lorna Philips<sup>1</sup>

<sup>1</sup>Respiratory Medicine, Royal Glamorgan Hospital, Cwm Taf University Health Board, Pontyclun, Mid Glamorgan, United Kingdom

**Background-**The Isle of Wight inhaler project<sup>1</sup> demonstrated clinical and cost-effect asthma outcomes with correct inhaler technique. In 2011 our healthboard (popn 290,000), had an asthma prevalence of 6.2% and COPD 2.6% with a £9 million/€12.1 spend on inhaled medications. We implemented a similar project with a primary objective of improving inhaler technique for adults. Secondary Objectives included ensuring a consistent approach to training inhaler technique, ↓admissions for asthma+COPD, closer working between primary, community and secondary care. Methods-Over 2 yrs, 16 advanced inhaler trainers delivered a certified training programme (interactive talk+workshop) to 261 HCPs (primary and secondary care nurses, doctors and pharmacists.) Accompanied by a media campaign. Results- from 2011/12 to 2013/14 there was a relative reduction in admissions for asthma and COPD of 10% and 13%



AIT – advancing inhaler technique  
HCP – Healthcare professional

Figure 1 - Results

**Conclusions-**A comprehensive intervention (1°+ 2° care, pharmacists, Pharma, charities, public relations) is a big undertaking. In our project, Pharma were best placed to support and organise in line with a Joint Working Agreement and Business Case. The importance of correct inhaler



technique is now being publically and professionally acknowledged and addressed at our HB.  
<http://www.nice.org.uk/usingguidance/sharedlearningimplementingnicguidance/examplesofimplementation/eximpresults.jsp?o=461>

**PA3930****Is simulation based training in inhaler technique of health care professionals more effective than written information?: A randomised controlled study**

Xavier Valan S. Fernando<sup>1</sup>, Anoop Prakash<sup>1</sup>, Anetha Sabanathan<sup>1</sup>, Graham Fent<sup>1</sup>, Victoria Thorley Dickinson<sup>1</sup>, Frank Edenborough<sup>2</sup>, Jack Kastelik<sup>3</sup>, Alan Rigby<sup>4</sup>, Makani Purva<sup>1</sup>, Jaymin Morjaria<sup>5</sup>

<sup>1</sup>Hull Institute of Learning and Simulation, Hull Royal Infirmary/Hull and East Yorkshire Hospitals NHS Trust, Hull, United Kingdom; <sup>2</sup>Department of Respiratory Medicine/Sheffield Thoracic Institute, Northern General Hospital/Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom; <sup>3</sup>Dept of Resp Medicine, Hull & East Yorkshire NHS Trust, Castle Hill Hospital, Hull, United Kingdom; <sup>4</sup>Department of Statistics, University of Hull, Hull, United Kingdom; <sup>5</sup>Dept of Resp Medicine, Hull & East Yorkshire NHS Trust, Castle Hill Hospital, Cottingham; Dept of Academic Resp Medicine, HYMS, University of Hull, Castle Hill Hospital, Cottingham, Hull, United Kingdom

**Background** Evidence shows lack of competency among health care professionals (HCPS) to demonstrate correct inhaler technique to patients. **Aim** We conducted a multicentre RCT at 2 tertiary hospitals to investigate whether simulation-based training using Aerosol Inhalation Monitor (AIM) and written information is more effective compared to training using written information alone. **Method** 160 HCPS (69 doctors, 80 nurses, 8 physiotherapists, 3 pharmacists) were randomised into 2 groups of simulation and written information (Intensive Intervention Arm (IIA; n=80)) and written information only (Minimal Intervention Arm (MIA; n=80)) arms. Inhaler technique was assessed using the AIM machine and checklist score (maximum score 20; 10 for MDI and 10 DPI) which were conducted immediate-post teaching and 1-week after. **Results** Cumulative combined (MDI+DPI) median scores for the IIA group showed significant improvement at post-teaching compared to MIA at 1-week (p<0.001). However the significant improvement shown in the cumulative DPI group median score at 1-week from post-teaching (p<0.001) was not shown in cumulative MDI group (p=0.38). **Conclusion** Our study showed significant overall improvement in combined inhaler technique scores at 1-week using simulation with the AIM machine compared to written information alone. Surprisingly, the addition of simulation only improved DPI technique scores, but this was not reciprocated in MDI technique scores. These results need confirmation in longer and larger duration studies.

**PA3931****Relationship between the ability to learn dry-powder inhaler use and the cognitive functions in patients with COPD**

Baykal Tulek<sup>1</sup>, Nart Bedin Atalay<sup>2</sup>, Ercan Kurtipek<sup>3</sup>, Gulfem Yildirim<sup>1</sup>, Fikret Kanar<sup>1</sup>, Mecit Suerdem<sup>1</sup>

<sup>1</sup>Chest Diseases, Selcuk University Faculty of Medicine, Konya, Turkey; <sup>2</sup>Psychology, TOBB ETU, Ankara, Turkey; <sup>3</sup>Chest Diseases, Konya Training and Research Hospital, Konya, Turkey

In this study, it is aimed to assess the relationship between the cognitive functions and the ability to learn the DPI medication use in the inhaler-naïve COPD patients. Firstly diagnosed inhaler-naïve 30 patients with COPD were included into the study. Standardized cognitive function tests (Mini Mental State Examination, trail making A and B, clock drawing, forward and backward digit span tests, Brown-Peterson Test, verbal fluency test and Geriatric Depression Scale) were administered before the training. At the end of the training, patients were asked to describe the training steps verbally, and then to practice the use of DPI until they were able to use it correctly three times consecutively. The patients then assessed the ease of use of DPI with a 0 to 10 visual analog scale. Ten days later, an independent observer checked the patients for the correct use of DPI and rated their performance as correct or fault. In the second visit, ten days later, it was observed that 7 patients (24%) were failed to use DPI correctly. Patients who used the inhaler correctly differed from patients who used it incorrectly regarding a number measures. These measures were the total time to complete the training session (p<.01), the total time to complete the practice training (p<.01), the number of practical test errors (p<.05), the ease of use rating (p<.01), the Mini Mental State Examination Z score (p<.01) Trail Making A+B Z Score (p<.01), Brown-Peterson Z Score (p<.05). Our results showed that cognitive functions were closely related with learning and remembering the use of DPI. These results emphasized the importance of assessment of cognitive function in patients with COPD.

**PA3932****A new clinically relevant method of calculating adherence**

Imran Sulaiman<sup>1</sup>, Jansen Seheult<sup>1</sup>, Isabelle Killane<sup>2</sup>, Elaine MacHale<sup>3</sup>, Richard Reilly<sup>2</sup>, Richard Costello<sup>1</sup>

<sup>1</sup>Respiratory Department, Royal College of Surgeons Ireland, Dublin, Ireland; <sup>2</sup>Biengineering Department, Trinity College Dublin, Dublin, Ireland; <sup>3</sup>Respiratory Department, RCSI, Clinical Research Centre, Dublin, Ireland

Currently calculating adherence is based on pill counting which tends to overestimate and can only present adherence as a percentage of total consumption with no information on pattern or potential reasons of non-adherence. We hypothesize a method of calculating adherence, area under the curve (AUC), will be more reflective of drug consumption and correlate better with clinical parameters. In the studies used for this analysis, patients were given an acoustic electronic adherence monitor INCA™ attached to a salmeterol/fluticasone inhaler to measure adherence one month at a time. The AUC was calculated using the trapezoid function We calculated the dose counter rate (Dc) attempted rate (At, patient attempting to take their inhaler) and the actual rate (Ac, accounting for technique errors). This method was developed on 30 patients and validated in more than a 100 patients from different patient cohorts, COPD, Asthma & Community Care. At 1 month there was a significant difference in At and Ac rates (71%, 47% respectively) and Dc (85%) and Ac, p<0.001. Looking at clinical parameters over 3 months 56% of patients with a significant fall in AQLQ had an Ac <80%. With the Dc, 70% of patients with a fall in AQLQ had a Dc > than 80%. Similarly, patients who had > 2 exacerbations in the prior year had a Dc of 85%, and an Ac of 45%. (p<0.001). Looking at asthma control (ACT) at 3 months, the mean Dc of uncontrolled patients (ACT<19) was 88%, and the Ac was 67%. (p<0.001). Finally looking at reliever use, patients who used their reliever every day had a Dc of 94% and an Ac of 75% (p=0.001) We have developed a new method of calculating adherence from data collected by a novel electronic monitor that correlates well with clinical measures.

**PA3933****Optimal adherence with inhaled corticosteroids is related to better health status**

Kirsten Koehorst-ter Huurne<sup>1</sup>, Sharina Kort<sup>1</sup>, Kris Movig<sup>2</sup>, Paul VanderValk<sup>1</sup>, Job Van der Palen<sup>1,3</sup>, Marjolein Brusse-Keizer<sup>1</sup>

<sup>1</sup>Pulmonary Medicine, Medisch Spectrum Twente, Enschede, Netherlands; <sup>2</sup>Clinical Pharmacy, Medisch Spectrum Twente, Enschede, Netherlands; <sup>3</sup>Research Methodology, Measurement, and Data Analysis, University of Twente, Enschede, Netherlands

**Objective:** To study the relationship between therapy adherence with inhaled corticosteroids and health status measured with the Clinical COPD Questionnaire (CCQ). **Methods:** Therapy adherence and health status (CCQ) of 583 patients was recorded from pharmacy records over 3 years. It was expressed as percentage and deemed good at 75–125%, suboptimal at 50–75%, and poor at <50% or >125%. **Results:** Optimal adherence showed highest quality of life (lower scores) on questions 1 (short of breath at rest), 3 (concerned getting a cold, breathing getting worse), 8 (limited in moderate physical activities) 9 (limited in daily activity) There were no differences in domain and total scores (data not shown) between the adherence groups.

Table 1: CCQ-score per therapy adherence category

CCQ Median (IQR)	Optimal N=336	Suboptimal N=111	Underuse N=53	Overuse N=83	P
1	1.0 (0.0-2.0)	1.5 (0.0-2.0)	1.0 (0.0-3.0)	1.0 (0.0-3.0)	0.01 (1)
2	4.0 (2.0-6.0)	5.0 (3.0-6.0)	4.0 (2.0-6.0)	5.0 (3.0-6.0)	0.34
3	0.0 (0.0-1.0)	0.0 (0.0-1.0)	0.0 (0.0-1.0)	0.0 (0.0-2.0)	0.01 (2)
4	0.0 (0.0-2.0)	0.0 (0.0-2.0)	0.0 (0.0-2.0)	0.0 (0.0-2.0)	0.39
5	2.0 (1.0-3.0)	2.0 (1.0-3.0)	2.0 (1.0-3.0)	2.0 (2.0-3.0)	0.48
6	2.0 (1.0-3.0)	2.0 (1.0-3.0)	2.0 (0.0-3.5)	2.0 (1.0-3.0)	0.60
7	4.0 (2.0-5.0)	4.0 (2.0-6.0)	4.0 (3.0-6.0)	4.0 (3.0-6.0)	0.26
8	2.5 (1.0-4.0)	3.0 (2.0-5.0)	3.0 (1.0-5.0)	3.0 (2.0-4.0)	0.08
9	1.0 (0.0-3.0)	2.0 (0.0-4.0)	2.0 (0.0-3.0)	1.0 (0.0-3.0)	0.04 (1)
10	0.0 (0.0-2.0)	1.0 (0.0-3.0)	1.0 (0.0-2.0)	1.0 (0.0-3.0)	0.17



Conclusion: Optimal adherence always scored highest on quality of life, although not significant on every question/domain.

IQR: inter quartile range. After Bonferroni Holm correction there was a significant difference between (1) optimal and suboptimal; (2) optimal and overuse

#### 418. Treatment and control of respiratory disease

##### PA4050

**The adherence to inhaled drugs in COPD patients: Effect on survival**  
Valeria Belleudi<sup>1</sup>, Nera Agabiti<sup>1</sup>, Mirko Di Martino<sup>1</sup>, Silvia Cascini<sup>1</sup>, Ursula Kirchmayer<sup>1</sup>, Riccardo Pistelli<sup>2</sup>, Giulio Formoso<sup>3</sup>, Danilo Fusco<sup>1</sup>, Marina Davoli<sup>1</sup>

<sup>1</sup>Department of Epidemiology, Lazio Regional Health Service, Rome, Italy;

<sup>2</sup>Department of Respiratory Physiology, Catholic University, Rome, Italy; <sup>3</sup>Emilia-Romagna Regional Health and Social Care Agency, Emilia-Romagna Regional Health Service, Bologna, Italy

**Background:** Few studies have examined how the continued use of inhaled medications, long-acting bronchodilators (LB) and inhaled corticosteroids (ICS), affect survival in COPD patients. **Aim:** We assessed the effect of adherence to LB/ICS therapy post-hospitalization for COPD on long-term mortality using a time-dependent approach. **Methods:** From the information systems of 3 Italian regions a cohort of new users with a hospitalization for COPD in 2006-2009 and at least one prescription of respiratory drugs within 90 days after discharge was enrolled and followed for 5 years. During the follow-up, for each subject the daily use of LB and ICS was determined. Five levels of drug exposure time-varying were identified: adherent to LB/ICS, non adherent to LB/ICS, adherent to monotherapy LB, non adherent to monotherapy LB and inappropriate treatment. Survival curves (Cox model) associated to the different treatments adjusted for baseline and time-dependent characteristics were evaluated. **Results:** 12,124 individuals were enrolled, mean age 73.8 years, 46% women. Follow up average time was 2.4 years, 3,415 subjects died in 5 years (mortality rate=11.9\*100p.y.). Adherent to combination LB/ICS had the highest probability of survive. In comparison to non adherent to LB/ICS, people adherent to monotherapy LB were more likely to survive (HR=0.89; CI95% 0.79-0.99). The lowest curve was found for the inappropriate treatment. Results were stronger in the subgroup with previous COPD exacerbations. **Conclusions:** Adherence to therapy is essential for the effectiveness of treatment: early treatment after discharge for COPD and keep the patient in appropriate treatment is just as effective and important the combined use of LB/ICS.

##### PA4051

**Use of long acting bronchodilators and inhaled corticosteroids within 30-days of discharge in older adults hospitalized for AECOPD**

Gulshan Sharma, Wei Zhang, Yong-Fang Kuo

<sup>1</sup>Division of Pulmonary Critical Care and Sleep Medicine, Uni of Texas Medical Branch, Galveston, TX, United States; <sup>2</sup>Division of Pulmonary Critical Care and Sleep Medicine, Uni of Texas Medical Branch, Galveston, TX, United States;

<sup>3</sup>Internal Medicine, Uni of Texas Medical Branch, Galveston, TX, United States

**Background:** Long acting bronchodilators (LABD) and inhaled corticosteroids (ICS) are recommended at discharge for patients hospitalized with acute exacerbation of COPD (AECOPD). We hypothesized that use of these medications after hospitalization in older adults is low. **Methods:** We analyzed data from 5% Medicare beneficiaries who were hospitalized with primary discharge diagnosis of AECOPD (ICD-9 code 491.21) or primary discharge diagnosis for respiratory failure (ICD-9 code 518.xx and 799.1) with secondary diagnosis for AECOPD in 2011. We examined the prescription filled within first 30-days of discharge for long acting bronchodilators (LABA or LAMA) or ICS. Only the first hospitalization was analyzed and 30-day readmission rates were determined in those with and without a prescription for LABD and/or ICS. T-test and chi-square are used as appropriate. A p-value <0.05 was considered statistical significant. **Results:** In 2011, 4,055 patients were discharged after hospitalization for AECOPD. Of these, 1,899(46.8%) filled a prescription for a LABD and/or ICS within 30 days. LABA +ICS was most commonly prescribed (58.0%); followed by LAMA alone (49.0%). Factors associated with use of LABD/ICS were younger age and discharge from a for-profit hospital. Patients who filled a prescription for any LABD/ICS had a lower 30 day readmission rate compared to those who did not fill a prescription for these medications (18.2% versus 21.9%, p<0.04). **Conclusion:** LABD and ICS are underutilized in patients after hospitalization with AECOPD. Efforts to reduce early readmission should incorporate care bundle to prescribe these medications at discharge.

##### PA4052

**Drug treatment in a German real-life COPD cohort (DACCORD)**

Heinrich Worth<sup>1</sup>, Roland Buhl<sup>2</sup>, Carl-Peter Criée<sup>3</sup>, Peter Kardos<sup>4</sup>, Claus Vogelmeier<sup>5</sup>

<sup>1</sup>Facharztforum Fuerth, Facharztforum Fuerth, Fuerth, Germany; <sup>2</sup>Pulmonary Department, University Hospital Mainz, Mainz, Germany; <sup>3</sup>Department of Sleep and Respiratory Medicine, Evangelical Hospital Goettingen-Weende, Bovenden, Germany; <sup>4</sup>Group Practice and Centre for Allergy, Respiratory and Sleep Medicine, Red Cross Maingau Hospital, Frankfurt, Germany; <sup>5</sup>Department of Respiratory Diseases, University of Marburg, Marburg, Germany

**Background** At present, limited real-life data are available on the proportion of COPD patients treated according to GOLD 2011 recommendations. The aim of the analysis was to find out if COPD patients in Germany were treated according to these recommendations. **Methods** Baseline data from the DACCORD registry, which collected data from a large real life population sample in Germany, were used to categorize patients according to GOLD 2011. 5924 COPD primary and secondary care outpatients with documented COPD from 349 centers were evaluated. Medication at baseline was analyzed based on prescriptions. **Results** The proportion of patients treated according to GOLD 2011 recommendations increased from A to D. Approximately one third of the patients in both category A and B were receiving an ICS-based treatment. This was independent of the symptoms questionnaire used (33% vs 34.8% for CAT and mMRC, respectively). Moreover, 10% and 20.7% of the patients were treated with a triple combination in stage A and stage B, respectively.

#### 501. Management of asthma and COPD in primary care

##### OA4791

**Comparative audit of asthma management in the easy asthma clinic and general out-patient clinic**

Wachara Boonsawat<sup>1</sup>, Prapai Watranagri<sup>2</sup>, Kriddhiya Sriprasert<sup>2</sup>

<sup>1</sup>Medicine, Khon Kaen University, Khon Kaen, Thailand; <sup>2</sup>Bureau of Medical Audit, National Health Security Office, Bangkok, Thailand

**Background:** National asthma audit in Thailand by the National health Security Office (NHSO) in 2007 found that asthma treatment in Thailand is suboptimal. PEFr were measured in only 1.08% of the visits and ICS were prescribed in only 10.92% of the visits. Since 2009 NHSO launched the project to improve asthma management in Thailand by setting up Easy Asthma Clinic in general hospitals. Objective: This study aim to compare the management of asthma in the Easy Asthma Clinic (EAC) to the general out-patient clinic (OPD) using the national asthma audit data. **Methods:** The national asthma audit was performed by the NHSO to evaluate the quality of asthma management. Patients were randomized from patients who attended the EAC or the OPD with the principle diagnosis of asthma (J45) during 1<sup>st</sup> October 2013 – 30<sup>th</sup> September 2014. The OPD cards were then collected for the auditors to examine using the auditing form. **Results:** 2,865 charts were audited, 1,726 from the EAC and 1,139 from the OPD. 992 visits (57.47%) in the EAC group and 227(19.92%) in the OPD group were met the standard of treatment according to the Thai asthma guideline. PEFr were measured in 65.94% EAC group and 25.96% of the OPD group. ICS were prescribed in 78.26% in the EAC group and 46.26 % in the OPD group. Asthma controlled achieved in 34.69% in the EAC group and 9.58% in the OPD group. **Conclusions:** The national asthma audit in 2014 revealed improvement in asthma management compare with the first audit in 2007. The management of asthma in the EAC showed a significant better than the OPD. Promoting the setup of Easy Asthma clinic should be the national asthma policy.

##### OA4792

**Non-adherence to asthma medications: Relation to socio-economic status and asthma education**

Soham Mazumdar<sup>1</sup>, Subhajit Ghosh<sup>2</sup>, Suranjan Mukherjee<sup>3</sup>

<sup>1</sup>Department of Respiratory Medicine and Critical Care, AMRI Hospital, Kolkata, West Bengal, India; <sup>2</sup>Department of Respiratory Medicine, Cipla, Mumbai, Maharashtra, India; <sup>3</sup>Department of Respiratory Medicine, AMRI Hospital, Kolkata, West Bengal, India

**Background:** Poor adherence to asthma medications remains a major problem and improved patient adherence may lead to improved asthma control and quality of life[1]. **Objectives:** To understand the reason for non-compliance and whether it's related to socio-economic status and asthma education



received. **Methods:** Asthma patients visiting the outpatient department completed questionnaires that included demographics, socio-economic condition, inhalers usage, asthma education received and reasons for non-compliance. **Results:** Two hundred and forty two patients (133 males) participated in the study. Twenty-six percent patients were non-compliant with inhalers. Reasons for non-compliance included fear of side effects (38%), inhaler cost (30%), concerns about habit formation (12.7%), as advised by family members (11%) and as advised by physician (22%). Non-compliance was higher with usage of metered dose inhaler without spacer compared to other devices ( $p=0.00$ ). Non-adherence to treatment was significantly higher in low-income and lower education groups ( $p<0.05$ ). Compliance was higher when physician was directly involved in asthma education and inhaler technique demonstration compared to other health professionals/non-medical persons ( $p=0.004$ ). **Conclusions:** Non-adherence to asthma medications was significant in the survey with significant variations related to socio-economic or educational status. Compliance improved when the physician was directly involved in asthma education and inhaler technique demonstration. **References:** 1. Bender BG, Bender SE. Patient-identified barriers to asthma treatment adherence: responses to interviews, focus groups and questionnaires. *Immunol Allergy Clin North Am* 2005;25(1):107-130.

## 525. Is asthma always an easy disease to diagnose and manage?

### PA5012

#### Validation of the 'test of the adherence to inhalers' (TAI) for asthma and COPD patients

Fernando Gutiérrez-Pereyra<sup>1</sup>, Vicente Plaza<sup>1</sup>, Concepción Fernández-Rodríguez<sup>2</sup>, Carlos Melero<sup>3</sup>, Borja G. Cosío<sup>4</sup>, Luis Manuel Entrenas<sup>5</sup>, Luis Pérez de Llano<sup>6</sup>, Eduard Tarragona<sup>7</sup>, Rosa Palomino<sup>8</sup>, Antolín López-Viña<sup>9</sup>  
<sup>1</sup>Department of Respiratory Medicine, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain; <sup>2</sup>Faculty of Psychology, Universidad de Oviedo, Oviedo, Spain; <sup>3</sup>Pulmonology Department, Instituto de Investigación, Hospital 12 de Octubre, Madrid, Spain; <sup>4</sup>Department of Respiratory Medicine, Hospital Son Espases-IdisPa, Palma de Mallorca, Spain; <sup>5</sup>Pulmonology Department, Hospital Reina Sofía, Córdoba, Spain; <sup>6</sup>Pulmonology Department, Hospital Universitario Lucus Agustí, Lugo, Spain; <sup>7</sup>Medical Department, Chiesi Spain, L' Hospitalet de Llobregat, Spain; <sup>8</sup>Applied Research, GOC Networking, Barcelona, Spain; <sup>9</sup>Pulmonology Department, Hospital Universitario Puerta de Hierro Majadahonda, Madrid, Spain

There are not validated tools that specifically and reliably establish patient's adherence and non-adherence patterns to inhalers. **Objectives** To develop and validate the 'Test of Adherence to Inhalers' (TAI), a questionnaire designed to assess the adherence to inhalers in patients with COPD or asthma. **Methods** A total of 1,009 patients with asthma or COPD were included in a cross-sectional multicentre study. Patients with electronic adherence  $\geq 80\%$  were defined as adherents. Construct validity, internal validity and criterion validity were evaluated. Self-reported adherence was compared with the Morisky-Green questionnaire. **Results** Factor analysis demonstrated two factors, factor 1 was coincident with TAI patient domain (items 1 to 10) and factor 2 with TAI health-care professional domain (items 11 and 12). The Cronbach's alpha was 0.860 and the test-retest reliability 0.883. TAI scores correlated with electronic adherence ( $\rho=0.293$ ,  $p=0.01$ ). According to the best cut-off for 10 items (score 50, area under the ROC curve 0.7), 569 (62.5%) patients were classified as non-adherents. Non-adherence behaviour pattern was: erratic 527 (57.9%), deliberate 375 (41.2%) and unwitting 242 (26.6%). As compared to Morisky-Green test, TAI showed better psychometric properties. **Conclusions** The 12-item TAI is a reliable and homogeneous questionnaire to easily identify non-adherence and barriers related to the use of inhalers in asthma and COPD.

Table 1. Description of the Test of the Adherence to Inhalers (TAI) questionnaire

Patient domain: questions, responses (scores)					Score
1. During the last 7 days, how many times did you forget to take your usual inhalers?					1 to 5
All (1)	More than half (2)	Approximately a half (3)	Less than half (4)	None (5)	
2. Do you forget to take inhalers?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
3. When you feel good about your illness, do you stop taking your inhalers?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
4. When you are on vacation or weekend, do you stop taking your inhalers?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
5. Do you stop taking your inhalers because you believe they interfere with your everyday or working life?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
6. Do you stop taking your inhalers because of fearing of side effects?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
7. Do you stop taking your inhalers because of considering they are useless to treat your condition?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
8. Do you take fewer inhalations than those prescribed by your doctor?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
9. When you are nervous or sad, do you stop taking your inhalers?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
10. Do you stop taking your inhalers because you have difficulties to pay them?					1 to 5
Always (1)	Mostly (2)	Sometimes (3)	Rarely (4)	Never (5)	
Health care professional domain: questions, responses (scores)					
11. Does the patient remember the prescribed regimen (dose and frequency)? (checking the medical record)					1 or 2
No (1)			Yes (2)		
12. The technique of using the evaluated inhaler device by the patient is (checking the inhalation technique)					1 or 2
With critical mistakes (1)			Without critical mistakes (2)		

\*Critical mistakes:

Pressure metered dose inhalers (pMDIs): do not remove the cover, do not hold the inhaler in a vertical position, firing the device before beginning inspiration, inhalation stopped, inhalation too fast, incorrect insertion of MDI into the inhaler camera, several device firing in the same inhalation, no apnoea after inhalation, cough during inhalation.  
 Dry powder inhalers (DPIs): do not uncover the inhaler, do not change the drug properly, place the device down after preparation of the dose (before inhalation), blow into the device before inhalation, inhalation not deeply and forcefully, no apnoea after inhalation.

### PA5018

#### Adherence to the treatment of patients with bronchial asthma

Larisa V. Bogovin<sup>1</sup>, Anastasia S. Shabanova<sup>2</sup>, Victor P. Kolosov<sup>1</sup>, Juliy M. Perelman<sup>2</sup>

<sup>1</sup>Laboratory of Prophylaxis of Nonspecific Pulmonary Diseases, Far Eastern Scientific Center of Physiology and Pathology of Respiration, Blagoveshchensk, Russian Federation; <sup>2</sup>Laboratory of Functional Research of Respiratory System, Far Eastern Scientific Center of Physiology and Pathology of Respiration, Blagoveshchensk, Russian Federation

**Background:** Low adherence to the treatment is one of the main problems which hampers the achievement of asthma control. **Aim:** To study psychological characteristics of asthmatics, affecting adherence to treatment. **Methods:** 141 patients with mild (n=28), moderate (n=86) and severe asthma (n=27) were examined. The mean age was  $44 \pm 1.2$  years old, the mean duration of the disease was  $6 \pm 0.8$  years. The questionnaire of the assessment of adherence to treatment at asthma, Toronto Alexithymia Scale – TAS (G.Taylor, 1984), and self-questionnaire for identification of depression CES-D (M.M.Weissman et al., 1977) were used. **Results:** While self-filling questionnaire of the assessment of adherence to treatment the patients overestimated their compliance (self-assessment of compliance index was 100%). Therefore, we used the data from interviews with patients. The patients were divided into 2 groups according to adherence to treatment. The 1<sup>st</sup> group included 34 patients with high adherence to treatment. The 2<sup>nd</sup> group consisted of 107 patients who violated the regime of treatment and did not follow the prescriptions. The 2<sup>nd</sup> group significantly differed from the 1<sup>st</sup> one by low mean values of "compliance index" ( $58.1 \pm 7.3$  vs.  $78.4 \pm 12.3\%$ ), high indices of TAS ( $66.2 \pm 2.3$ ), low level of education and unemployment (14 vs. 3%). All patients had high safety needs (the mean index was  $87.6 \pm 6.3\%$ ). The degree of adherence to treatment inversely correlated with asthma severity (Spearman's  $R=-0.68$ ), the duration of the disease ( $R=-0.54$ ), the level of depression ( $R=-0.59$ ). **Conclusion:** The severity and duration of asthma, alexithymia, poor education and unemployment have most influence on the degree of adherence to treatment in patients with asthma.

### PA5019

#### Inhalation technique education and its impact in asthma and COPD

Tiago Maricoto<sup>1</sup>, Sofia Madanelo<sup>2</sup>, Luis Rodrigues<sup>3</sup>, Gilberto Teixeira<sup>3</sup>, Carla Valente<sup>3</sup>, Lília Andrade<sup>3</sup>, Alcina Saraiva<sup>3</sup>

<sup>1</sup>UCSP Aveiro I, Aveiro Health Center, Aveiro, Portugal; <sup>2</sup>USF Santa Joana, Aveiro Health Center, Aveiro, Portugal; <sup>3</sup>Pneumology Department, Hospital Centre of the Baixo Vouga, Aveiro, Portugal

**Introduction:** COPD and asthma affect almost 300 million individuals





worldwide. Inhaled therapy is often associated with technical errors reducing efficacy and compliance. **Objective:** To assess the impact of teaching the inhalation technique in clinical and functional control of Asthma and COPD. **Methods:** Inhalation was evaluated in 4 steps: previous expiration, device activation, forced inspiration and end inspiratory pause. Clinical control was measured through Asthma Control Test (ACT), Control of Allergic Rhinitis and Asthma Test (CARAT), modified Medical Research Council and COPD Assessment Test. Pulmonary function tests were performed in all patients. After the first visit patients were educated on correct use of their devices using repeated placebo devices manipulation and visual support material. They were reevaluated 6 to 8 months later. **Results:** 44 participants were included. Overall there was a significant decrease in the number of performed errors (average 0.7) ( $p < 0.05$ ). 46% improved the technique, with significant results in previous expiration and in end expiratory pause (relative improvement of 45.5% and 52% respectively) ( $p < 0.05$ ). In Asthma group, significant improvements in FEV1 (mean 6.4%), FVC (mean 8.6%) and PEF (mean 8.3%) ( $p < 0.05$ ) were found, and the technique was significantly related with clinical improvement in CARAT (OR 14.4;  $p < 0.05$ ), but not in ACT. In COPD there was no significant variation in clinical or functional control. **Conclusions:** Inhalation technique education improves its performance, leading to an improvement in clinical and functional control in Asthma. These findings were not reproduced in the COPD group, which may reflect its physiopathological hallmark of irreversible obstruction.

#### PA5023

##### Difference between asthma and COPD patients in adherence and non-adherence patterns to inhaler devices

Fernando Gutiérrez-Pereyra<sup>1</sup>, Vicente Plaza<sup>1</sup>, Antolín López-Viña<sup>2</sup>, Luis Manuel Entrenas<sup>3</sup>, Concepción Fernández-Rodríguez<sup>4</sup>, Carlos Melero<sup>5</sup>, Eduard Tarragona<sup>7</sup>, Rosa Palomino<sup>8</sup>, Borja G. Cosío<sup>9</sup>

<sup>1</sup>Department of Respiratory Medicine, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain; <sup>2</sup>Pulmonology Department, Hospital Puerta de Hierro Majadahonda, Madrid, Spain; <sup>3</sup>Pulmonology Department, Hospital Reina Sofía, Córdoba, Spain; <sup>4</sup>Faculty of Psychology, Universidad de Oviedo, Oviedo, Spain; <sup>5</sup>Pulmonology Department, Hospital Universitario 12 de Octubre, Madrid, Spain; <sup>6</sup>Pulmonology Department, Hospital Universitario Lucus Agustí, Lugo, Spain; <sup>7</sup>Medical Department, Chiesi Spain, L' Hospitalet de Llobregat, Spain; <sup>8</sup>Applied Research, GOC Networking, Barcelona, Spain; <sup>9</sup>Department of Respiratory Medicine, Hospital Son Espases-IdisPa, Palma de Mallorca, Spain

According to the different sociodemographic characteristics of asthma and COPD patients, the adherence to inhaled drugs could also be different. However, there are no studies prospectively evaluating the inhaler adherence in large samples of asthma and COPD patients in the same trial. **Objective** To determine the differences between asthma and COPD patients in adherence and non-adherence patterns to inhaled therapy with the Test of the Adherence to Inhalers (TAI). **Methods** A total of 910 (500 [55%] asthma and 410 [45%] COPD) patients were included in a cross-sectional observational multicenter study. Participants completed questions about sociodemographics, cultural level, asthma or COPD history, TAI, Morisky-Green test, Asthma Control Test (ACT), COPD Assessment Test (CAT) and recorded spirometry. **Results** Patients of the asthma group were significantly women and younger, had higher educational level, active working status, less smokers and more frequently controlled disease with a better pulmonary function than patients of the COPD group. However, they were less adherents (in 10-items TAI), 140 (28%) front 201 (49%), respectively, and they were more frequently erratic (46.4 vs 34.9%) and deliberated (66.8 vs 47.1%) non-adherents, but unwitting non-adherence pattern was more frequent in COPD group (31.2 vs 22.8%). **Conclusions** Even though asthma patients have a more favourable sociodemographic and clinical characteristics, they are more non-adherents than COPD patients and exhibit a different pattern of non-adherence type. These points should be considered in the specific educational programs of each disease.

#### PA5025

##### Comparing pharmacist time use for asthma and COPD patients using various types of inhaler devices

Sunee Lertsinudom<sup>1</sup>, Kesarin Choopunyaalert<sup>2</sup>, Suratsawadee Jinda jumnon<sup>3</sup>  
<sup>1</sup>Faculty of Pharmaceutical Science, Khon Kaen University, Khon Kaen, Thailand; <sup>2</sup>Pharmacy Department, Khon Kaen Hospital, Khon Kaen, Thailand; <sup>3</sup>Pharmacy Department, Khon Kaen Hospital, Khon Kaen, Thailand

**Introduction:** Incorrect use of inhaler devices is common problem in clinical practice. Providing pharmaceutical care services remains a core activity to improve medication safety and adherence. **Objective:** To determine the duration that the pharmacists used in the pharmaceutical care services for asthma and COPD patients using various types of inhaler devices that were MDI, DPI, and MDI with DPI. The comparison among the time use was

employed. **Method:** We performed a descriptive study during October to December 2013. The data collection was done by using video tape to record the time spend on pharmaceutical care service for asthma and COPD patients every Friday. The patients were classified according to the inhaler devices used. They were MDI group (n=56), DPI group (n=18) and MDI with DPI (n=71). The differences between the three designs were analyzed by the Kruskal-Wallis test. The Mann-Whitney U-test (MWU test) was used for pairwise comparisons. The level of significance was set at  $p < 0.05$ . **Result:** Median minute/patient time allocations on pharmaceutical care services for asthma and COPD were: MDI-7.45± 6.12, DPI-6.49± 4.06, and MDI with DPI-8.58± 3.36. The median time spent on patient group using only DPI was less than the MDI with DPI group that was significantly different ( $p < 0.05$ , MWU test). **Conclusion:** Providing pharmaceutical care services for patients using variety of inhalers takes more time than services for patients using the same inhaler type. However, one of the most important issues for the pharmacist is to ensure adequate and sufficient instruction for correct handling of the device(s) and checking of the patient's inhalation technique at each visit.