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Primary Care Respiratory **UPDATE**




www.pcrs-uk.org/pcru

HIGHLIGHTS …

PRIMARY CARE RESPIRATORY SOCIETY UK
PCRS UK

Eklira® Genuair® ▼
aclidinium bromide inhalation powder

AstraZeneca

Around-the-clock COPD symptom control[1,2] with morning and evening administration.[3]

Significant and sustained bronchodilation from the first dose *vs* placebo.[1,2]

Prescribing information
(Please consult the Summary of Product Characteristics (SmPC) before prescribing.)

Eklira® Genuair® ▼
322 micrograms inhalation powder aclidinium

Presentation: Each delivered dose (the dose leaving the mouthpiece) contains 375 µg aclidinium bromide (equivalent to 322 µg of aclidinium). Each metered dose contains 12.6 mg lactose monohydrate. **Indication:** Eklira Genuair is indicated as a maintenance bronchodilator treatment to relieve symptoms in adult patients with chronic obstructive pulmonary disease (COPD). **Dosage and Administration:** The recommended dose is one inhalation of 322 µg aclidinium twice daily. *Consult SmPC and package leaflet for method of administration.* **Contraindications, Warnings, Precautions:** *Contraindications:* Hypersensitivity to aclidinium bromide, atropine or its derivatives, including ipratropium, oxitropium or tiotropium, or to the excipient lactose monohydrate. *Precautions:* Should not be used to treat asthma or for relief of acute episodes of bronchospasm, i.e. rescue therapy. Paradoxical bronchospasm has been observed with other inhalation therapies. If this occurs, stop medicine and consider other treatment. Re-evaluation of the treatment regimen should be conducted if there is a change in COPD intensity. Use with caution in patients with a myocardial infarction during the previous 6 months, unstable angina, newly diagnosed arrhythmia within the previous 3 months, or hospitalisation within the previous 12 months for heart failure functional classes III and IV as per the "New York Heart Association". Consistent with its anticholinergic activity, dry mouth has been observed and may in the long term be associated with dental caries. Also, use with caution in patients with symptomatic prostatic hyperplasia or bladder-neck obstruction or with narrow-angle glaucoma. Patients with rare hereditary problems of galactose intolerance, Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicine. *Interactions:* Co-administration with other anticholinergic- containing medicinal products has not been studied and is not recommended. Although no formal *in vivo* drug interaction studies have been performed with Eklira Genuair, it has been used concomitantly with other COPD medicinal products including sympathomimetric bronchodilators, methylxanthines, and oral and inhaled steroids without clinical evidence of drug interactions. *Fertility, Pregnancy and Lactation:* It is considered unlikely that Eklira Genuair administered at the recommended dose will affect fertility in humans. Aclidinium bromide should only be used during pregnancy if the expected benefits outweigh the potential risks. It is unknown whether aclidinium bromide and/or its metabolites are excreted in human milk. The benefit for the breast-feeding child and long-term benefit of therapy for the mother should be considered when making a decision whether to discontinue therapy. *Ability to drive and use machines:* The effects on the ability to drive and use machines are negligible. The occurrence of headache or blurred vision may influence the ability to drive or use machinery. **Adverse Reactions:** *Common:* sinusitis, nasopharyngitis, headache, cough, diarrhoea. *Uncommon:* Blurred vision, tachycardia, dysphonia, dry mouth, rash, pruritus, urinary retention. *Rare:* Hypersensitivity. *Not known:* Angioedema. **Legal Category:** POM **Marketing Authorisation Number(s):** EU/1/12/778/002 - *Carton containing 1 inhaler with 60 unit doses.* **NHS Cost:** £28.60 (excluding VAT)

Marketing Authorisation Holder:
AstraZeneca AB
SE-151 85 Södertälje
Sweden

Further information is available from:
AstraZeneca UK Ltd.
600 Capability Green
Luton
LU1 3LU, UK
Tel: 0800 783 0033 / 01582 836836
Fax: +44 (0)1582 838 003
Email: Medical.informationuk@astrazeneca.com

Date of Revision: 03/2015
RSP 15 0020

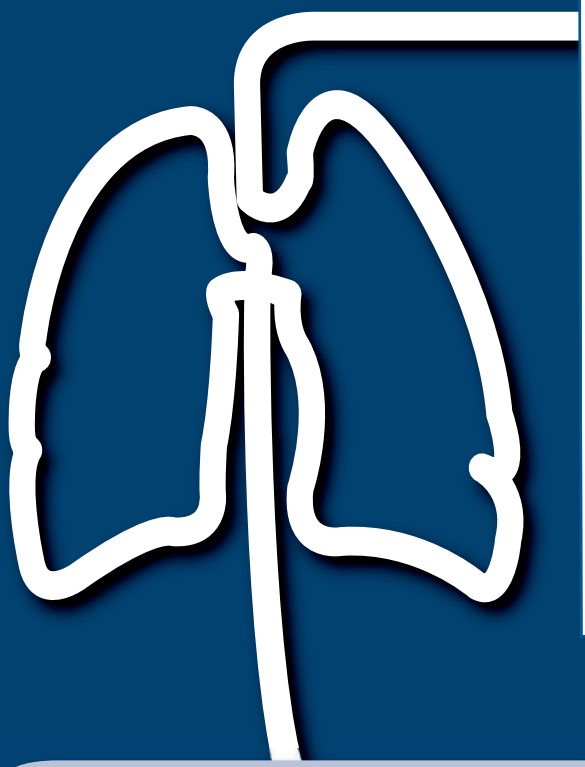
Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to AstraZeneca on 0800 783 0033.

References: 1. Jones PW, Singh D, Bateman ED, *et al.* Efficacy and safety of twice-daily aclidinium bromide in COPD patients: the ATTAIN study. Eur Respir J. 2012; 40(4):830-6. 2. Kerwin EM, D'Urzo AD, Gelb AF, *et al.* Efficacy and safety of a 12-week treatment with twice-daily aclidinium bromide in COPD patients (ACCORD COPD I). COPD. 2012;9(2):90-101. 3. Eklira Genuair Summary of Product Characteristics. Barcelona, Spain: Almirall, S.A.

GU/ACL/1114/0056 Date of preparation: April 2015. Date of expiration: January 2016.

PCRS-UK seeks new lay trustee

Do you know anyone who works in the not for profit sector and has a personal interest in respiratory conditions?



The Primary Care Respiratory Society UK (PCRS-UK) is looking to recruit a lay trustee, with senior not for profit sector (ideally charity) experience. The ideal candidate will have experience (ideally direct involvement) with strategic collaboration/partnerships – with strong negotiating and entrepreneurial skills. S/he needs to be a strategic thinker with strong commercial and financial acumen – ideally with knowledge of statutory/grant funding sources (healthcare sector)

The trustees meet 3 times per year in London with occasional teleconferences as required plus regular email correspondence. The board currently consists of two lay and three medical trustees.

If you know someone who might be suitable please ask them to see the www.pcrs-uk.org for more information about the Society. More information about the role can be found at https://www.pcrs-uk.org/news/lay-trustee-recruitment

Anyone interested in the role should contact the Chief Executive, Anne Smith (anne.smith@pcrs-uk.org) or Patrick White, Chair of the Trustees, via info@pcrs-uk.org Those wishing to apply should submit a CV and supporting statement explaining why they are interested in the role and why they are suitable to info@pcrs-uk.org **by 31 December 2015.**

PRIMARY CARE RESPIRATORY SOCIETY UK
PCRS
UK

NEW STRENGTH. SAME PRICE.

Enabling appropriate prescribing at no extra cost.

Fostair 100/6 and 200/6:
2 devices, 2 strengths, 1 price £29.32.

FOSTAIR NEXTHALER 100/6 dry powder inhaler
FOSTAIR NEXTHALER 200/6 dry powder inhaler
(Beclometasone dipropionate/formoterol fumarate dihydrate)

Fostair NEXThaler prescribing information
Please refer to Summary of Product Characteristics (SPC) before prescribing **Presentation:** Each Fostair NEXThaler 100/6 dry powder inhaler (DPI) metered dose contains 100 micrograms (mcg) of beclometasone dipropionate (BDP) anhydrous and 6mcg of formoterol fumarate dihydrate. Each Fostair NEXThaler 200/6 DPI metered dose contains 200 mcg of BDP and 6mcg of formoterol fumarate dihydrate. **Indication:** Regular treatment of asthma in patients who are not adequately controlled on inhaled corticosteroids (ICS) and 'as needed' short-acting $beta_2$-agonist, or patients who are already adequately controlled on both ICS and long-acting $beta_2$-agonists (LABAs), where the use of an ICS/LABA combination is appropriate. Fostair NEXThaler is not indicated for the treatment of acute asthma attacks. **Dosage and administration:** For inhalation in adult patients (≥18 years). Fostair NEXThaler 100/6: 1 or 2 inhalations twice daily. Fostair NEXThaler 200/6: 2 inhalations twice daily. The maximum daily dose is 4 inhalations. Fostair NEXThaler has an extrafine particle size distribution; therefore, dose adjustment is required when patients are transferred from a formulation with a non-extrafine particle size distribution. When switching patients from previous treatments, it should be considered that the recommended total daily dose of BDP for Fostair NEXThaler is lower than that for non-extrafine BDP containing products and should be adjusted to the needs of the individual patient. However, patients who are transferred to Fostair NEXThaler from Fostair pressurised inhalation solution do not need dose adjustment. **Contraindications:** Hypersensitivity to the active substances or to any of the excipients (lactose monohydrate and magnesium stearate). **Warnings and precautions:** Use with caution in patients with cardiac arrhythmias, aortic stenosis, hypertrophic obstructive cardiomyopathy, ischemic heart disease, severe heart failure, severe arterial hypertension, aneurysm, thyrotoxicosis, diabetes mellitus, phaeochromocytoma and untreated hypokalaemia. Caution should also be used when treating patients with known or suspected prolongation of the QTc interval (QTc > 0.44 seconds). Formoterol itself may induce QTc prolongation. Potentially serious hypokalaemia may result from $beta_2$-agonist therapy and may also be potentiated by concomitant treatments (e.g. xanthine derivatives, steroids and diuretics) and increase the risk of arrhythmias. Formoterol may cause a rise in blood glucose levels. Fostair NEXThaler should not be administered for at least 12 hours before the start of anaesthesia, if halogenated anaesthetics are planned. When treatment with Fostair NEXThaler is discontinued the dose should be tapered, treatment should not be stopped abruptly. Treatment should not be initiated during exacerbations or acutely deteriorating asthma. Treatment should be discontinued immediately if the patient experiences a paradoxical bronchospasm. Use with caution in patients with pulmonary tuberculosis or fungal/viral airway infections. *Systemic effects:* Systemic effects of ICS may occur, particularly at high doses for long periods, but are less likely than with oral steroids. These include Cushing's syndrome, Cushingoid features, adrenal suppression, decrease in bone mineral density, cataract and glaucoma and more rarely, a range of psychological or behavioural effects including psychomotor hyperactivity, sleep disorders, anxiety, depression and aggression. Prolonged treatment with high doses of inhaled corticosteroids may result in adrenal suppression and acute adrenal crisis. Lactose contains small amounts of milk proteins, which may cause allergic reactions. **Interactions:** Beta-blockers should be avoided in asthmatic patients. Concomitant administration of other beta-adrenergic drugs may have potentially additive effects. Concomitant treatment with quinidine, disopyramide, procainamide, phenothiazines, certain antihistamines (e.g. terfenadine), monoamine oxidase inhibitors and tricyclic antidepressants can prolong the QTc interval and increase the risk of ventricular arrhythmias. L-dopa, L-thyroxine, oxytocin and alcohol can impair cardiac tolerance towards $beta_2$-sympathomimetics. Hypertensive reactions may occur following co-administration with monoamine oxidase inhibitors including agents with similar properties (e.g. furazolidone, procarbazine). Concomitant treatment with xanthine derivatives, steroids or diuretics may potentiate a possible hypokalaemic effect of $beta_2$-agonists. Hypokalaemia may increase the likelihood of arrhythmias in patients receiving digitalis glycosides. **Fertility, pregnancy and lactation:** Fostair NEXThaler should only be used during pregnancy or lactation if the expected benefits outweigh the potential risks. **Effects on driving and operating machinery:** Fostair NEXThaler has no or negligible influence on the ability to drive and use machines. **Side effects:** *Common:* tremor. *Uncommon:* nasopharyngitis, oral candidiasis, hypertriglyceridaemia, headache, tachycardia, sinus bradycardia, angina pectoris, myocardial ischaemia, throat irritation, exacerbation of asthma, dyspnoea, oropharyngeal pain, dysphonia, cough, nausea, fatigue, irritability, prolongation of QTc interval, cortisol free urine decreased, blood cortisol decreased, blood potassium increased, blood glucose increased, electrocardiogram poor r-wave progression. *Unknown frequency:* psychomotor hyperactivity, sleep disorders, anxiety, depression, aggression, behavioural changes (Refer to SPC for full list of side effects). **Legal category:** POM **Pack and price:** £29.32 1x120 actuations **Marketing authorisation number:** PL 08829/0173, PL 08829/0174. **Marketing authorisation holder:** Chiesi Limited, 333 Styal Road, Manchester, M22 5LG **Date of preparation:** Oct 2015

Adverse events should be reported.
Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Chiesi Limited on 0161 488 5555.

CHFTB20150915. Oct 15.

FOSTAIR® 200/6

Beclometasone + formoterol
FOR ADULT ASTHMA

Chiesi

FOSTAIR pMDI 100/6 (pressurised metered dose inhaler)
FOSTAIR pMDI 200/6 (pressurised metered dose inhaler)
(Beclometasone dipropionate/formoterol fumarate dihydrate)

Fostair pMDI prescribing information
Please refer to the full Summary of Product Characteristics (SPC) before prescribing
Presentation: Each Fostair pressurised metered dose inhaler (pMDI) 100/6 dose contains 100 micrograms (mcg) of beclometasone dipropionate (BDP) anhydrous and 6mcg of formoterol fumarate dihydrate. Each Fostair pMDI 200/6 dose contains 200 mcg of BDP and 6mcg of formoterol fumarate dihydrate. **Indications:** *Asthma:* Regular treatment of asthma in patients who are not adequately controlled on inhaled corticosteroids (ICS) and 'as needed' short acting $beta_2$-agonist, or patients who are adequately controlled on both ICS and long-acting $beta_2$-agonists (LABA), where the use of an ICS/LABA combination is appropriate. ***COPD*** **(Fostair 100/6 only): Symptomatic treatment of patients with severe COPD (FEV_1 <50% predicted normal) and a history of repeated exacerbations, who have significant symptoms despite regular therapy with long-acting bronchodilators. Dosage and administration:** For inhalation in adult patients (≥18 years). BDP in Fostair is characterised by an extrafine particle size distribution which results in a more potent effect than formulations of BDP with a non-extrafine particle size distribution (100mcg of BDP extrafine in Fostair are equivalent to 250mcg of BDP in a non-extrafine formulation). *Asthma:* Fostair 100/6 may be used as a maintenance therapy (with a separate rapid-acting bronchodilator as needed) or as a maintenance and reliever therapy (taken as a regular maintenance treatment and as needed in response to asthma symptoms). Fostair 200/6 should be used as maintenance therapy only. *Maintenance therapy:* Fostair 100/6: 1–2 inhalations twice daily. Fostair 200/6: 2 inhalations twice daily. The maximum daily dose is 4 inhalations. Patients should receive the lowest dose that effectively controls their symptoms. ***Maintenance and reliever therapy*** **(Fostair 100/6 only): 1 inhalation twice daily plus 1 additional inhalation as needed in response to symptoms. If symptoms persist after a few minutes, an additional inhalation is recommended. The maximum daily dose is 8 inhalations.** ***COPD*** **(Fostair 100/6 only): 2 inhalations twice daily.** Can be used with the AeroChamber Plus® spacer device. **Contraindications:** Hypersensitivity to the active substances or to any of the excipients (Norflurane (HFA-134a), ethanol anhydrous, hydrochloric acid). **Warnings and precautions:** Use with caution in patients with cardiac arrhythmias, aortic stenosis, hypertrophic obstructive cardiomyopathy, ischaemic heart disease, severe heart failure, congestive heart failure, occlusive vascular diseases, arterial hypertension, severe arterial hypertension, aneurysm, thyrotoxicosis, diabetes mellitus, phaeochromocytoma and untreated hypokalaemia. Caution should also be used when treating patients with known or suspected prolongation of the QTc interval (QTc > 0.44 seconds). Formoterol itself may induce QTc prolongation. Potentially serious hypokalaemia may result from $beta_2$-agonist therapy and may also be potentiated by concomitant treatments (e.g xanthine derivatives, steroids and diuretics) and increase the risk of arrhythmias. Formoterol may cause a rise in blood glucose levels. As Fostair contains a corticosteroid, it should be administered with caution in patients with pulmonary tuberculosis or fungal/viral airway infections. Fostair should not be administered for at least 12 hours before the start of anaesthesia, if halogenated anaesthetics are planned. Fostair treatment should not be stopped abruptly. Treatment should not be initiated during exacerbations or acutely deteriorating asthma. Fostair treatment should be discontinued immediately if the patient experiences a paradoxical bronchospasm. *Systemic effects:* Systemic effects of ICS may occur, particularly at high doses for long periods, but are less likely than with oral steroids. These include Cushing's syndrome, Cushingoid features, adrenal suppression, decrease in bone mineral density, cataract and glaucoma and more rarely, a range of psychological or behavioural effects including psychomotor hyperactivity, sleep disorders, anxiety, depression and aggression. Prolonged treatment with high doses of inhaled corticosteroids may result in adrenal suppression and acute adrenal crisis. **Interactions:** Beta-blockers should be avoided in asthmatic patients. Concomitant use of other beta-adrenergic drugs can have potentially additive effects, therefore caution is required when theophylline or other beta-adrenergic drugs are prescribed concomitantly with formoterol. Concomitant treatment with quinidine, disopyramide, procainamide, phenothiazines, antihistamines, monoamine oxidase inhibitors and tricyclic antidepressants can prolong the QTc interval and increase the risk of ventricular arrhythmias. L-dopa, L-thyroxine, oxytocin and alcohol can impair cardiac tolerance towards $beta_2$-sympathomimetics. Hypertensive reactions may occur following co-administration with monoamine oxidase inhibitors. Concomitant treatment with xanthine derivatives, steroids or diuretics may potentiate a possible hypokalaemic effect of $beta_2$-agonists. Hypokalaemia may increase the likelihood of arrhythmias in patients receiving digitalis glycosides. **Fertility, pregnancy and lactation:** Fostair should only be used during pregnancy or lactation if the expected benefits outweigh the potential risks. **Effects on driving and operating machinery:** Fostair is unlikely to have any effect on the ability to drive or operate machinery. **Side effects:** *Common:* pharyngitis, oral candidiasis, headache, dysphonia. *Uncommon:* influenza, oral fungal infection, oropharyngeal candidiasis, oesophageal candidiasis, vulvovaginal candidiasis, gastroenteritis, sinusitis, rhinitis, pneumonia, granulocytopenia, allergic dermatitis, hypokalaemia, hyperglycaemia, restlessness, tremor, dizziness, otosalpingitis, palpitations, blood pressure increased, prolongation of QTc interval, electrocardiogram change, tachycardia, tachyarrhythmia, atrial fibrillation, hyperaemia, flushing, cough, productive cough, throat irritation, asthmatic crisis, pharyngeal erythema, diarrhoea, dry mouth, dyspepsia, dysphagia, burning sensation of the lips, nausea, dysgeusia, pruritus, rash, hyperhidrosis, urticaria, muscle spasms, myalgia, C-reactive protein increased, platelet count increased, free fatty acids increased, blood insulin increased, blood ketone body increased, blood cortisol decrease. *Rare:* ventricular extrasystoles, angina pectoris, paradoxical bronchospasm, angioedema, nephritis, blood pressure decreased. *Very rare:* thrombocytopenia, hypersensitivity reactions, including erythema, lips, face, eyes and pharyngeal oedema, adrenal suppression, glaucoma, cataract, dyspnoea, exacerbation of asthma, peripheral oedema, bone density decreased. *Unknown frequency:* psychomotor hyperactivity, sleep disorders, anxiety, depression, aggression, behavioural changes (Refer to SPC for full list of side effects). **Legal category:** POM **Packs and prices:** £29.32 1x120 actuations. **Marketing authorisation number:** PL 08829/0156, PL 08829/0175. **Marketing authorisation holder:** Chiesi Limited, 333 Styal Road, Manchester, M22 5LG **Date of preparation:** Oct 2015
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Adverse events should be reported.
Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Chiesi Limited on 0161 488 5555.

Primary Care Respiratory **UPDATE**

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www.pcrs-uk.org/pcru

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From time to time PCRS-UK publishes supplements to the regular journal, which are subject to review by the editorial board.

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See http://www.pcrs-uk.org/sites/pcrs-uk.org/files/files/PI_funding.pdf for PCRS-UK statement on pharmaceutical funding.

CONTENTS

Primary Care Respiratory **UPDATE**




AirFluSal® Forspiro®

salmeterol/
fluticasone propionate

A NEW VIEW...

...OF AN ESTABLISHED COMBINATION*[1,2]

An intuitive, award-winning inhaler with clear feedback for patients[3-5]

20% savings vs Seretide® Accuhaler®[6]

*Licensed for use in adults aged 18 years and older only.

Device not actual size

FOR THE TREATMENT OF COPD†

†AirFluSal Forspiro is indicated for the symptomatic treatment of adults with Chronic Obstructive Pulmonary Disease (COPD), with a FEV1 <60% predicted normal (prebronchodilator) and a history of repeated exacerbations and who have significant symptoms despite regular bronchodilator therapy. AirFluSal Forspiro is intended for use by adults 18 years of age and older only.

Prescribing Information: AirFluSal® Forspiro®

(Please refer to the full Summary of Product Characteristics before prescribing)

AirFluSal® Forspiro® (salmeterol xinafoate and fluticasone propionate) Indications: AirFluSal Forspiro is indicated in the symptomatic treatment of patients with COPD with a FEV1 <60% predicted normal (pre-bronchodilator) and a history of repeated exacerbations who have significant symptoms despite regular bronchodilator therapy. For use by adult patients aged 18 years and older only. **Dosage and administration:** Inhalation only. One inhalation b.d. of AirFluSal Forspiro 50/500 (salmeterol 50 mcg/fluticasone propionate 500 mcg) **Contraindications:** Hypersensitivity to the active ingredients or to any of the excipients. **Precautions:** Pulmonary tuberculosis, fungal, viral or other infections of the airway, severe cardiovascular disorders, heart rhythm abnormalities, diabetes mellitus, hypokalaemia and thyrotoxicosis. Increased reporting of pneumonia and bronchitis in patients with COPD receiving AirFluSal compared with placebo. If a patient with severe COPD has experienced pneumonia, treatment with AirFluSal should be re-evaluated. Paradoxical bronchospasm post-dose. *Acute symptoms:* Not for acute symptoms. Use short-acting inhaled bronchodilator. *Systemic effects:* Systemic effects of inhaled corticosteroids may occur, particularly at high doses for prolonged periods, but much less likely than with oral corticosteroids. May include Cushing's syndrome, cushingoid features, adrenal suppression, adrenal crisis, growth retardation in children and adolescents, decrease in bone mineral density, cataract, glaucoma and, more rarely, a range of psychological or behavioural effects including psychomotor hyperactivity, sleep disorders, anxiety, depression or aggression. Tremor, palpitations and headache, have been reported with β2 agonist treatment. Treatment should not be abruptly stopped due to risk of exacerbation. Patients should not be initiated on AirFluSal during an exacerbation. Data from a large clinical trial suggested patients of black African or Afro-Caribbean ancestry were at increased risk of serious respiratory-related events or deaths when using salmeterol. All patients should continue treatment but seek medical advice if symptoms remain uncontrolled or worsen when initiated on AirFluSal or using AirFluSal. Cessation of therapy may also be associated with decompensation and should be supervised by a physician. *Transfer from oral steroids:* Special care needed. Consider appropriate steroid therapy in stressful situations. **Drug interactions:** Avoid beta-blockers. Avoid concomitant administration of ketoconazole or other potent (e.g. itraconazole, telithromycin, ritonavir) and moderate (erythromycin) CYP3A4 inhibitors unless benefits outweigh potential risk. β2 adrenergic blockers may weaken or antagonise the effect of salmeterol. Potentially serious hypokalaemia may result from β2 agonist therapy. This effect may be potentiated by concomitant treatment with xanthine derivatives, steroids and diuretics. **Pregnancy and lactation:** Experience limited. Balance risks against benefits. **Side effects:** *Very Common:* headache, nasopharyngitis. *Common:* candidiasis of the mouth and throat, hoarseness/dysphonia, throat irritation, pneumonia, bronchitis, hypokalaemia, sinusitis, contusions, traumatic fractures, arthralgia, myalgia, muscle cramps. *Uncommon:* respiratory symptoms (dyspnoea), anxiety, tremor, palpitations, tachycardia, angina pectoris, atrial fibrillation, cutaneous hypersensitivity reactions, hyperglycaemia, sleep disorders, cataract. *Rare:* angioedema, respiratory symptoms (bronchospasm), anaphylactic reactions including anaphylactic shock, Cushings syndrome, cushingoid features, adrenal suppression, growth retardation in children and adolescents, decreased bone mineral density, oesophageal candidiasis, behavioural changes including psychomotor hyperactivity and irritability, glaucoma, cardiac arrhythmias and paradoxical bronchospasm. *Not known:* depression or aggression. *Paradoxical bronchospasm:* substitute alternative therapy. **Legal category:** POM. **Presentation and Basic NHS cost:** AirFluSal Forspiro 50/500 60 inhalations. £32.74. **Product Licence (PL) no:** PL 04416/1431 **PL holder:** Sandoz Ltd, Frimley Business Park, Frimley, Camberley, Surrey. GU16 7SR. **Last date of revision:** October 2015.

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard Adverse events should also be reported to Sandoz Ltd, 01276 698020 or uk.drugsafety@sandoz.com

1. AirFluSal® Forspiro® SmPC. **2.** Seretide® Accuhaler® SmPC. **3.** Virchow JC *et al.* Identifying the features of an easy-to-use and intuitive dry powder inhaler for asthma and chronic obstructive pulmonary disease therapy: results from a 28-day device handling study, and an airflow resistance study. *Expert Opin Drug Deliv* 2014;**11**(12):1849–57. **4.** Red Dot Design Award. http://red-dot.de/pd/online-exhibition/work/?lang= en&code=2011-14-3170&y=2011&c=167&a=0. Last accessed September 2015. **5.** Alufoil Trophy 2015: The winners. http://www.alufoil.org/alufoil-trophy-2015.html Last accessed September 2015. **6.** MIMS UK September 2015.

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Date of preparation: November 2015

UK/MKT/AFS/15-0057

Editor's Round-up

Hilary Pinnock, *Editor*

Our chairman has been reflecting on a quarter of a century of PCRS-UK and how a burning issue (under-diagnosis and under-treatment of asthma) united the founding members of the General Practitioners in Asthma Group in a campaign to improve the primary care management of asthma. Their vision and the tenacity with which they pursued it not only initiated major changes in care and brought clinical benefit, but in so doing raised the status of primary care as a force in respiratory care.

Today's world brings different challenges, and today's PCRS-UK has identified five campaigns that represent our vision for the future and deserve all our support. Read about the campaigns in the Chairman's perspective on page 8.

One of the campaigns, the promotion of better education and training of health care professionals to enable them to provide better care, will resonate with nurse members of the PCRS-UK who are preparing for revalidation. A PCRS-UK survey reveals their difficulty in accessing training: if this is a concern for you, the article on page 35 will give you some useful hints about how to approach your practice to negotiate time for professional development.

Breathlessness is featured in this edition of *PCRU* with some practical 'top tips' on diagnosing and managing the breathless patient from Noel Baxter and Debbie Roots. How patients describe breathlessness may be important. One of the research summaries highlights a paper by Chang *et al*. in *Chest* that describes how people with asthma tend to describe their breathlessness as a 'tight chest' whereas the breathlessness of interstitial lung disease may be described as 'shallow'. Despite increasingly sophisticated investigations, taking a careful history is still an important component of care.

The editor's choice of the papers from the *npj Primary Care Respiratory Medicine* is a fascinating study by Sohanpal *et al*. which helps us understand why people with COPD don't always take up the offer of pulmonary rehabilitation – and how we can help encourage them. Amongst the abstracts from other respiratory journals don't miss the report from Been *et al*. in the *European Respiratory Journal*, which demonstrates the impressive reduction in hospital admissions for respiratory tract infections in children since the introduction of national smoke-free legislation in England. Some things change for the better.

Some things never change. Respiratory tract infections have always been the commonest reason for people consulting in general practice. In the vast majority of cases, the cause has always been viral and antibiotics have never worked – but we have always had to remain alert because just occasionally that patient with a cough and fever has pneumonia. Refresh your memory on the current guidelines on respiratory tract infections on page 18.

Of course, we all benefit from recharging our batteries and the PCRS-UK Conference in October provided plenty of inspiration – and fun! If you were there you will enjoy remembering and reading about the highlights on page 11. Don't forget to add next year's conference to your 2016 diary – surely the most enjoyable way of keeping up to date with the changes in primary care respiratory medicine!

Chair's perspective: A new direction for PCRS-UK

Stephen Gaduzo, *PCRS-UK Executive Chair*

From tiny beginnings as a small asthma special interest group, PCRS-UK has grown into a highly respected, influential organisation which promotes high standards of respiratory care.

Starting out as the GPs in Asthma Group (GPIAG), our organisation was founded by six GPs in 1987 who were concerned about under-treatment and under-diagnosis of asthma in primary care.

This first campaign to improve care led to innovation in the primary care management of both asthma and COPD as well as changes across the primary/secondary care interface.

PCRS-UK is now a registered charity and, in addition to supporting our members, we have become a high profile national advisory body on policy and strategy for respiratory disease.

We have come a long way and can be proud of the way respiratory care has improved over the last quarter of a century. Many primary care health professionals are now highly specialised in respiratory care, nurses work in extended roles, there is much greater choice of medication to treat asthma and COPD, patients are encouraged to self-manage and are given more information and support. Much of the current respiratory research is now undertaken by primary care clinicians in a more real world setting and is increasingly used to underpin evidence-based national guidelines. Many of these innovations have been brought about by PCRS-UK and its members.

While celebrating this success we must also recognise that there is still a long way to go to achieve our vision of optimal respiratory care for all.

The world is changing

The gaps in asthma care were highlighted last year by the National Review of Asthma Deaths (NRAD).[1] This report revealed that the number of deaths (approximately 1,200 per year) from asthma in the UK have not reduced significantly for many years, even though it is widely accepted that there are preventable factors in 90% of deaths.

International comparisons show that the UK compares poorly for asthma deaths to other high income countries.[2]

Around 3 million people in the UK have COPD but it is estimated that 2 million are currently undiagnosed.[3] The disease kills 30,000 people a year in the UK and[3] we are among the top 20 countries for COPD mortality worldwide. In Europe, only Denmark and Hungary have higher death rates for COPD.[4]

Meanwhile the clinical environment has changed. The combination of an ageing population with increasingly complex health needs, rising demand, workforce shortages and a squeeze on resources is piling the pressure on primary care.

Policy is also changing the way we work. NHS England's Five Year Forward View argues that we need to adopt a more engaged relationship with patients and carers to promote wellbeing and prevent ill-health. It also sets out radical new care delivery options with clinicians from both primary and secondary care working together in more integrated ways.[5]

'Our values haven't changed but our world has', says NHS England. That is also the case for PCRS-UK. A strategic review of our mission earlier this year identified that while we need to continue to promote high value patient-centred care, we need to support our members in new ways to remain effective. So we have drawn up plans for a new direction for PCRS-UK.

New direction for PCRS-UK

As a member-led organisation we will continue to educate, influence and set standards so that nationally agreed policy and guidelines becomes embedded in routine clinical practice.

We will do this by concentrating more on campaigning, improving the way we communicate and by working with new partners who can support us to deliver our goals and our education activities. We will also be looking into how we can work more directly with Clinical Commissioning Groups.

Campaigns

To boost our impact we will concentrate on key campaigns which will galvanise members and bring about change and greater awareness of the need to improve respiratory care.

We have identified five campaigns for 2016:

- Diagnosis as the basic building block of care
- Better education and training of healthcare professionals to enable them to provide better care
- Structure of care: making the most of available time and resources
- Getting research into practice: ensuring guidelines and evidence based practice is routinely implemented in clinical practice
- Establishing tobacco dependency as a long term condition that starts in childhood

Communication

Technology and the way people communicate are developing at a fast pace so we will update the PCRS-UK website so that it is more accessible across multiple devices/browsers and easier for users to search and find material. In future we will be providing busy clinicians with real time access to clinical updates, essential education and respiratory news in easily accessible formats through e-alerts, the website, social media and our quarterly publication, *Primary Care Respiratory Update* (*PCRU*).

Partnership

In a move to reach out to support a wider group of primary care health professionals to deliver high value respiratory care we are delighted to announce a new partnership with Cogora, the publishers of *Pulse*, *Pulse Online* and *Nursing in Practice* who will work with us to develop a PCRS-UK Academy. This will give respiratory clinicians access to new online CPD modules and a series of educational 'roadshow' meetings to be held throughout the UK.

Conclusion

The pioneers who set up GPIAG worked to put respiratory care on the agenda and to put primary care on the map in respiratory medicine. Our role now is to continue influencing high level agendas to address respiratory disease and to ensure the improvements in care for which we campaign so hard become embedded in routine practice across the country.

We will support you, our members, to lead the way in innovating and providing a high standard of respiratory care at a local level. As a community of like-minded professionals, we recognise that the role of our members is key and we want to help you to connect with each other to share professional interests and best practice. We want to make it easier for you to embed good practice in your day-to-day work. Our core programmes: the annual conference, respiratory leaders programme, local affiliated groups, *PCRU* and the website will remain the cornerstone of the support we provide.

As a result of our strategic review we realised that we are in a prime and unique position at a crossroads in the NHS - linking vertically with tertiary and secondary care and horizontally with integrated community and primary care services and patient self-care.

This means PCRS-UK has a pivotal role to play in influencing, educating and communicating, not just with our members but also the wider respiratory community, policymakers and the experts who set national standards.

But what I am really interested in is ensuring that the changes we are proposing will make it easier for busy clinicians to improve the services they deliver. We hope that by raising awareness of the need for change and providing fast access to the information and education that you need to drive change, that excellent care will become the norm – for everyone providing respiratory care in primary care.

Our aim in setting a new direction is to support you to provide the best respiratory care for your patients because that is what PCRS-UK was set up to do over a quarter of a century ago.

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Inspiring, thought provoking and challenging: the PCRS-UK 2015 national conference

Fran Robinson reports on our national conference

Francesca Robinson, *PCRS-UK Communications Consultant*

The 2015 PCRS-UK national primary care conference delivered inspiration, food for thought, insight into new developments on its theme of *Expanding our horizons: delivering high value patient centred care*. Not only that we had a lot of fun on the way!

Topics ranged from the current debate about the asthma and COPD overlap syndrome, a look into the future with the latest drugs which target specific asthma phenotypes ; learning from the past from the National Review of Asthma Deaths and practical hands on sessions on topics such as conducting an effective respiratory review.

"You must keep coming to meetings like this to question what you think you know," said Dr Vinty McGovern, a Belfast GP, who gave a presentation on diagnosing and managing "little wheezers".

The opening plenary kicked off with an in depth look at the mind/body interface. Professor Iona Health, immediate Past President of the RCGP, talked inspirationally about the impact of mental health on wellbeing. The audience were left in no doubt that healthcare professionals must pay attention to a patient's lifetime experience when treating a disease episode.

People with COPD often smoked because of stress in their lives and were likely to feel guilt and shame which could deter them from seeking help. Healthcare practitioners had to find better ways of helping them to stop smoking without demoralising and shaming them. "Our job is to bridge that gap between physical wellbeing and mental health," she said.

Thys van der Molen, Professor of Primary Care Respiratory Medicine at the University Medical Centre Groningen, The Netherlands, explained how respiratory health has an influence on mental wellbeing. It was important to treat patients with COPD who were depressed because people's health deteriorated when they were depressed.

He emphasised that good treatment of COPD had a beneficial effect on depression. The literature showed that successful pulmonary rehabilitation and smoking cessation treatment improved patients' depression scores. It was a misconception not to encourage patients to stop smoking if they felt depressed because the evidence showed they would feel better if they stopped.

> *"I was very interested in the presentation on the asthma/COPD overlap. I'm going to go back and have another look at our register, the diagnosis of COPD and the pathways we have in place. This conference has made me look at my practice and ask myself could we do this better, is there another way?"*
>
> **Karen, Nurse Practitioner, Northfleet**

Expanding the horizons of clinical practice

Expert speakers in the *Expanding the horizons of clinical practice* stream provided a series of thought provoking clinical updates.

Professor Mike Thomas, Chair of Primary Care Research, University of Southampton, talked about

the relevance of phenotyping for primary care clinicians. He explained that there is a growing body of evidence that targeting treatment at people with specific phenotypes of asthma is more effective than giving everybody the same treatment.

> *"I'm involved in COPD commissioning and the presentations on phenotyping and COPD risk factors for admission to hospital were both food for thought. This conference provides up-to-date facts and something to take back and think about"*
>
> **Martyn, GP, Hertfordshire**

Some expensive biologic treatments were being developed for severe asthma but the same principles were also being applied to mild to moderate asthma and could be introduced in primary care. Tests such as FeNO and blood eosinophil count could be used in a new way to identify the patients who would benefit. "Some people say it's too difficult for primary care but primary care is good at encompassing change. With support, equipment and training we can provide personalised care in asthma," he said.

A session on interstitial lung disease also provided an insight into promising new treatments for this crippling lung disease. Mark Jones, Wellcome Trust Clinical Research Training Fellow, University of Southampton, said two new drugs, pirfenidone, approved for use in the UK and nintedanib, currently being reviewed by NICE, were landmark new therapies which could halve the rate of decline in lung function in patients with idiopathic pulmonary fibrosis (IPF). "We are moving in to a new era of drug therapy for IPF. This is important because 5,000 people a year are diagnosed with IPF. These people would benefit from early treatment with these new drugs," he said.

In a session called *Expanding our horizons in COPD* Dr Rupert Jones, Senior Clinical Research Fellow at Peninsula Medical School, Plymouth, gave an update on the national COPD audit.

Sally Harris, practice nurse, Ravenswood Medical Practice, Suffolk, demonstrated through case studies how small changes can improve care and have a huge impact on the patient.

These changes could include:

- Setting up a recall system and doing a monthly search to identify patients with COPD who are being prescribed a lot of steroids and antibiotics. This will prevent any potential exacerbations from slipping through the net.
- Making sure you understand the process for referring to the local admissions avoidance service.
- Taking the opportunity to educate the patient and provide a self management plan to help them understand how to prevent exacerbations.

"Expanding our horizons in COPD means looking beyond what you do or you don't do, or what you don't know, and looking at opportunities to identify small changes. There are opportunities out there to do things differently," she said.

Transforming services for quality and value

The Transforming services for quality and value stream addressed key service and delivery issues, focusing on how clinicians and commissioners can bring about change in practice.

Dr Duncan Powrie, General Medicine and Respiratory Medicine Consultant at Southend Hospital, talked about a one-year pilot study to set up a COPD psychology service in 2013 which identified and addressed the psychological needs of patients with COPD. The pilot achieved some statistically robust clinical, financial and patient satisfaction outcomes.

Dr Iain Small, a GP in Aberdeen gave a presentation on the integration of respiratory services with social care in Aberdeen. He explained that everyone with an interest in respiratory care works in a Managed Clinical Network. Integration meant following patients who had been in hospital with COPD, looking at and changing what happens when they are in hospital, what is prepared as they leave, whether they are picked up by primary care and how soon they are back in hospital.

Dr Rupert Jones talked about identifying high risk patients and admissions avoidance. His take home message was that it is essential to get the basics right: reviewing the patient's diagnosis, the severity of their condition, doing a proper assessment then looking at their management. "I work in a difficult asthma service and so many of those people who have recurrent admissions to hospital are not getting good basic care. It's not advanced science we're talking about, it's about developing a proper action plan giving them support and giving them the time to talk so that they have somebody who they can trust," he said.

> *"The presentation on childhood wheezing was very interesting – I've heard a lot of the components of this before but I will go away and have a rethink about the way we treat children with respiratory disease"*
>
> **Linda, Nurse Practitioner, Bedford**

Back to Basics: practical workshops

For the first time this year there were a series of practical workshops run in conjunction with Education for Health. Topics included making a good diagnosis in COPD, conducting an effective COPD review, effective self management, inhaler technique and spirometry.

Chris Loveridge, Education Lead for spirometry at Education for Health, who ran a session on interpreting spirometry, said: "We had an interactive session with a real-life case study. People were asking lots of general clinical questions and it was very hands on."

Jackie a nurse practitioner from Doncaster, who attended the session said: "This was a very useful session for nurses who may have been doing spirometry for years and who needed a refresher. It was a very relaxed and comfortable environment in which nurses were able to share their concerns about whether they were interpreting spirometry correctly."

Research stream

This year's research stream was a huge success attracting 60 abstracts. Paul Stephenson, GP and joint editor of *npj Primary Care Respiratory Medicine*, said: "The enthusiasm in the research stream has been fantastic. It has been a privilege to listen to the abstracts being presented and speaking to those who have had posters accepted and displayed. The other great thing has been the number of young researchers we've had coming in including medical students and PhD students. This is superb because we need to be drawing in these young people to help drive the research agenda of PCRS-UK."

Patrick White, Clinical Senior Lecturer and Consultant at King's College and Chair of the PCRS-UK Trustees, received the award for the Best Scientific Abstract, which reported a cross sectional study using primary care data to look at ethnic differences in the prevalence of COPD in London. It concluded that the differences in prevalence were due to black smokers smoking fewer cigarettes than white people. The differences in the number of cigarettes smoked per day may be due to cultural, social and reporting factors or may reflect differences in the genetic factors that determine the delivery of nicotine and sensitivity to its addictive potential.

Nameet Surana, a medical student at Imperial College London, received an award for the Best Practice Abstract. His abstract reported a retrospective audit of lung function tests and found that using spirometry alone to diagnose COPD may miss patients with abnormal gas transfer possibly due to non-obstructive emphysema. It concluded that the data made a strong case for routine full lung function testing rather than spirometry alone in patients with suspected COPD.

Patient centred care

There was a strong patient-centred care theme running through the conference thanks to the support of charity partners Asthma UK and the British Lung Foundation. Delegates were shown an Asthma UK film called "Olivia's story" about the sudden death of a young girl from asthma with the message that every year asthma kills enough children to fill a classroom.

Steve Jones, a patient with IPF talked movingly about his journey living with IPF for the last eight years. "Unless you listen to the patients' stories and unless you put yourselves in their shoes, you can't hope to provide the treatment, care and support they need," he said.

Matt Smith a person with asthma and a lawyer, on the panel of the Grand Round, an interactive case based session, gave an insight into some difficulties with communication he has encountered with his care.

He described how he never gets much information about what is happening with his asthma when he visits his surgery and recently discovered he had been overdosing on Salbutamol. When he asked why that had happened he felt no explanation was forthcoming and that the nurse was covering up.

"I just urge you all to be honest about things, we all make mistakes, even lawyers. You will find that patients are receptive to people saying sorry and saying: having looked at this again we think you ought to do something differently - here is the explanation why.

"In the initial conversation with your patient work out what they want or need to know and structure your communication with them appropriately. Just be really clear and also be prepared to "fess up" when things haven't been done brilliantly," he said.

Along with the important and weighty matters of the day there was also some fun to be had as the audience in a Mastermind session discovered. There was much hilarity as four brave experts: Kevin Gruffydd Jones, GP Principal and Joint Policy Lead PCRS-UK, Professor Mike Thomas, Peter Davies, Consultant Respiratory Physician and GP Dr Dermot Ryan, put themselves up for a grilling on bronchiectasis, dysfunctional breathing, TB and allergy as well as some general health questions from question master Dr John Haughney, GP and Senior Research Fellow at the University of Aberdeen.

Tweeters also had a field day discussing the topics they found interesting as the conference progressed. Many said how much they had enjoyed the conference as it drew to a close and that they would be talking all the learning and new ideas they had heard about back to their practices to share with their colleagues.

One tweeter summed up the mood of the conference: "Had a fantastic few days @PCRSUK. 1st time for me this year would highly recommend to everyone. Certainly feeling inspired!"

All the conference tweets can be read at: https://storify.com/PCRSUK/pcrs-uk-2015-conference-expanding-our-horizons-del

All the meeting abstracts can be read online at http://www.nature.com/public/article-assets/npg/npjpcrm/abstracts/npjpcrm201560.pdf

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Contact **info@pcrs-uk** to find out about discounts available to CCGs/ health boards, community teams or other groups wishing to buy 10+ memberships

Correct at date of preparation: September 2015

The Primary Care Respiratory Society UK is grateful to its corporate supporters including AstraZeneca UK Ltd, Boehringer Ingelheim Ltd, Chiesi Ltd, GlaxoSmithKline, Napp Pharmaceuticals, Novartis UK, Pfizer Ltd and TEVA UK Limited for their financial support which supports the core activities of the Charity and allows PCRS-UK to make its services either freely available or at greatly reduced rates to its members.

See http://www.pcrs-uk.org/sites/pcrs-uk.org/files/files/PI_funding.pdf for PCRS-UK statement on pharmaceutical funding.

Inspiring best practice in respiratory care

Policy Round-Up

Bronwen Thompson, *PCRS-UK Policy Advisor*

A summary of the latest developments in the UK health services, including any major new reports, guidelines and other documents relevant to primary care respiratory medicine

Guidance to tackle respiratory conditions in the winter season

In the last 12 months NICE has published two new pieces of guidance which are relevant for the winter season. Guidelines on pneumonia in adults (CG191) and bronchiolitis (NG9) both highlight the challenge of identifying when urgent action is needed – a challenge usually faced in primary care. Both conditions are responsible for high numbers of hospital stays – which may be avoided if appropriate action is taken early. Since microbial resistance is causing increasing concern globally, deciding when to use antibiotics becomes especially important. In adults with respiratory symptoms who clinically do not have a diagnosis of pneumonia, it is recommended that a point of care C reactive protein test is used to help with the decision about whether to prescribe antibiotics. The bronchiolitis guideline makes recommendations about how to differentiate bronchiolitis from other respiratory conditions such as pneumonia, viral wheeze or fever in very young children – and when to refer, and admit them. Both guidelines stress the importance of giving information to adults with pneumonia or the parents of young children with bronchiolitis, about likely length of recovery times and 'red flags' for medical attention respectively. Quality standards are in preparation for both conditions.

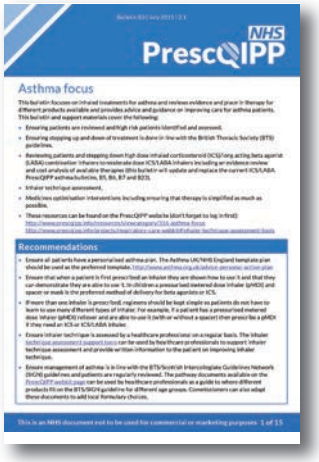
Lung disease in the UK – big picture statistics

The burden of respiratory disease – a new resource

Need data to incorporate into a business case or introduction for a clinical paper? The British Lung Foundation has produced an extensive dataset to illustrate the burden of disease for both adults and children in the UK – and to make regional comparisons within the UK , and with other countries. Clearly laid out in the style of an infographic, this online resource covers: regional variation in the risk of dying from a lung disease; the burden of respiratory disease on the NHS – bed-days, admissions, costs; the numbers living with and dying from lung disease.

When comparing the UK with 99 other countries, the UK is in the top 20 countries for both lung cancer and COPD deaths and admissions. They also highlight that more than half of the deaths from lung disease in Europe, and at least a quarter of all hospital admissions for respiratory conditions, are due to diseases caused by smoking.

Tools to optimise prescribing in respiratory conditions



PrescQIPP exists to help NHS organisations to improve medicines-related care to patients, through the provision of robust, accessible and evidence-based resources. It includes guidance on reducing the cost of prescribing, audit tools including search protocols tailored to different GP computer systems, template letters to invite patients for review and Drugs to Review for Optimised Prescribing (DROP). They have featured respiratory conditions in their work to date – a document focused on asthma in July 2015, and one on COPD to follow. PrescQIPP collates evidence based good practice from a variety of sources and makes recommendations about getting best value from medicines. There is a wealth of useful tools here to help get the best value from expenditure on medicines. www.prescquipp.info

What future for QOF?

Having asthma and COPD indicators in QOF since 2004 has been a boost to get all practices across the country focusing on getting some basics right for people with these conditions. PCRS-UK has influenced the development of the indicators through taking part in all consultations on amending QOF. However, the future for QOF is looking increasingly uncertain. Somerset GPs were given permission to opt out of QOF in 2014. The Health Secretary for Scotland announced in October that QOF would be dismantled from 2016 and a new con-

tract would be put in place by 2017 in Scotland. David Cameron announced at the Conservative party conference that GPs would be offered a voluntary contract to provide 7-days-a week services for patients. It will be interesting to see what the new contracts look like and what will replace QOF to drive improved services for patients.

In brief

COPD audit update – the final decision has been made not to proceed with data collection from primary care in England due to technical issues related to data extraction processes and the additional information governance requirements of the HSCIC General Practice Extraction Service (GPES). However, the audit is proceeding in primary care in Wales, with data collection in November, practices receiving individual reports from January 2016, followed by reports to Healthboards and publication of the all Wales report in May.

Delayed publications - PCRS-UK continues to press for the publication of the document from NHS England on accreditation for spirometry, for which we have been waiting for 18 months, and we are in regular touch with NICE about exploring the implementation issues holding back the asthma diagnosis and monitoring guideline which was due for publication in July.

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Reference: 1. Hubbard GP *et al*. *Clin Nutr* 2012:31;293–312.

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Getting the Basics Right

Managing dilemmas in respiratory tract infections and antibiotics prescribing

Fran Robinson talks to Dr Kevin Gruffydd-Jones, PCRS-UK policy advisor and author of the PCRS-UK opinion sheet on cough

Respiratory tract infections (RTIs) are the commonest acute problem dealt with in primary care. Most will be self limiting and in this case the risk of complications is likely to be small.

However the dilemma for the clinician is being able to spot whether an apparently minor RTI may be something more complicated. Careful decisions also have to be made about when to prescribe antibiotics.

What is a self-limiting infection?

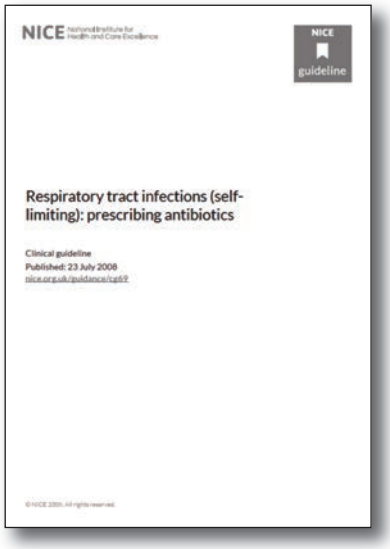
Self-limiting RTIs will resolve on their own without treatment and will have no long term effect on a person's health.

NICE says the duration of uncomplicated RTIs are:

- Acute otitis media: 4 days
- Acute sore throat/acute pharyngitis/acute tonsillitis: 1 week
- Common cold: 10 days
- Acute rhinosinusitis: $2^1/_2$ weeks
- Acute cough/acute bronchitis: 3 weeks

The clinical assessment should include a history (presenting symptoms, use of over-the- counter or self medication, previous medical history, relevant risk factors, relevant comorbidities) and examination to identify relevant clinical signs (temperature, respiratory rate and capillary refill time in children under 5).

It is important to understand why the patient is presenting at this point in their illness and what their ideas, concerns and expectations are.



The NICE 2008 *Respiratory tract infections (self limiting): prescribing antibiotics* guideline says while most patients can be reassured that they are not at risk of major complications, the difficulty for prescribers lies in identifying the small number of patients who will suffer severe and/or prolonged illness or, more rarely, go on to develop complications. The Guideline Development Group struggled to find much good evidence to inform this issue and says this is an area where further research is needed.

How to deal with patients expecting an antibiotic

Dr Gruffydd Jones, GP Principal and Joint Policy Lead PCRS-UK, says many patients will come in expecting antibiotics. The clinician should evaluate whether immediate antibiotics are needed (see box) and if not address their concerns and expectations, explain why an antibiotic will

When should antibiotics be prescribed?

No antibiotics or delayed antibiotic prescriptions should be given when patients have:

- Acute otitis media
- Acute sore throat/acute pharyngitis/acute tonsillitis
- Common cold
- Acute rhinosinusitis
- Acute cough/acute bronchitis.

Unless patients are systemically unwell and/or have:

- Bilateral acute otitis media (in children younger than 2 years)
- Acute otitis media (in children with otorrhoea)
- Acute sore throat/acute pharyngitis/acute tonsillitis when three or more Centor criteria are present:
  - Fever(>38degC)
  - Tender cervical lymphadenopathy
  - Tonsillar exudate
  - Absence of cough
- Signs of community acquired pneumonia (CAP) (see below) - in which case they should be considered for an immediate antibiotic prescribing strategy

Or:

- Patients have signs of developing complications
- If the patient is at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- If the patient is older than 65 years with acute cough and two or more of the following criteria, or older than 80 years with acute cough and one or more of the following criteria:
  - hospitalisation in previous year
  - type 1 or type 2 diabetes
  - history of congestive heart failure
  - current use of oral glucocorticoids

not cure their symptoms and educate them that their condition will be self limiting.

If the patient is still worried, issuing them with a delayed antibiotic prescription can be an effective strategy.

A paper published in the *BMJ* in March 2014 by Paul Little, Professor of Primary Care Research, University of Southampton, and chair of the NICE *Respiratory tract infections (self limiting): prescribing antibiotics* guideline, found that patients judged not to need immediate antibiotics but given a delayed antibiotic prescription resulted in fewer than 40% of patients using antibiotics.[1] Importantly, when these patients were interviewed again they said they would be less likely to come back to the doctor in future because they understood that antibiotics were unlikely to resolve a self limiting infection. Patients given a delayed antibiotic had the same symptom outcomes as those given an immediate prescription.

When the no antibiotic prescribing strategy is adopted, patients should be offered:

- Reassurance that antibiotics are not needed immediately because they are unlikely to make significant difference to symptoms and may have side effects
- A clinical review if their condition worsens or becomes prolonged

When the delayed antibiotic prescribing strategy is adopted, patients should be offered:

- Reassurance that antibiotics are not needed immediately because they are unlikely to make significant difference to symptoms and may have side effects
- Advice about using the delayed prescription if symptoms are not starting to settle in accordance with the expected course of the illness or if a significant worsening of symptoms occurs
- Advice about re-consulting if there is a significant worsening of symptoms despite using the delayed prescription.

Community Acquired Pneumonia (CAP)

The typical symptoms of CAP are acute onset cough, fever, breathlessness and pleuritic chest pain, The BTS Guidelines on Community Acquired Pneumonia 2009 state that a diagnosis of CAP should be considered in the presence of typical symptoms and a patient who is systemically unwell (e.g. temperature > 38 deg C), presence of new focal signs in the chest and no other obvious explanation for these signs.

Recent NICE guidelines on pneumonia say that in primary care a chest X-ray is not essential to make a diagnosis of CAP. They recommend that a point of care C-reactive protein (CRP) blood test should be used to help decide whether patients presenting with mild pneumonia need antibiotics. However Dr Gruffydd Jones says this is an extra refinement which isn't currently available for most clinicians in UK general practice. The test is carried out routinely in a number of other countries but there is a cost issue about buying the equipment for GP surgeries in the UK. For many GP's CRP testing has to be carried out in a local laboratory.

NICE advises:

- do not routinely offer antibiotics if the C-reactive protein concentration is less than 20 mg/litre
- consider a delayed antibiotic prescription if the C-reactive protein concentration is between 20 and 100 mg/litre
- do offer antibiotic therapy if C-reactive protein concentration is greater than 100 mg/litre

NICE also advises GPs to use the CRB65 risk score when making a judgement about whether patients should be referred to hospital. The CRB65 score assigns points based on the criteria of **C**onfusion, raised **R**espiratory rate (>30/min in adults) low **B**lood pressure (<90/60) and older age (≥65).

NICE says GPs can consider home-based care for patients with a score of zero, but should consider hospital assessment for other patients, particularly those with a score of two or higher.

Dr Gruffydd Jones says that clinical judgement is still important especially in the systemically unwell patient.

Treatment of CAP

The vast majority of patients with CAP have a mild form of the disease and can be managed effectively in the community by GPs.

NICE says if an antibiotic is needed patients should be given a five day course of a single antibiotic (e.g. amoxicillin 500mg tds or Clarithromycin 500mg tds) and asked to come back if their symptoms do not improve within three days. Patients should be told their fever will subside within a week but it may take up to six months for them to get completely back to normal.

Management of acute cough in children and adults

Acute cough is a common presentation and whether it's a child or an adult it is usually associated with a viral upper RTI. In the absence of any significant co-morbidity acute cough is likely to be self-limiting clearing up within three weeks. However, 10 to 15% of patients return within one month.

Dr Gruffydd-Jones says the most important differential diagnosis of acute cough in adults is: have they got pneumonia and are they going to require antibiotics?

He recommends a safety net approach - ask patients to report back if their cough is not better in three weeks because this may be the first indication of a chronic condition. In a child it could be the first presentation of asthma or bronchiectasis and it important to remember an inhaled foreign body. In particular, a child who has a persistent wet cough for more than 4 weeks may have persistent bacterial bronchitis, a condition which might need a 2-4 week course of broad spectrum antibiotics.

In an adult it may be the first presentation of COPD, bronchiectasis or lung cancer. Indications which require further investigation in adults include suspicion of inhaled foreign body or haemoptysis, prominent systemic illness, suspicion of lung cancer (Red Flag).

Bronchiolitis

Bronchiolitis is the most common disease of the lower respiratory tract during the first year of life.

Symptoms include:

- a rasping and persistent dry cough
- rapid or noisy breathing
- brief pauses in breathing
- feeding less and having fewer wet nappies
- vomiting after feeding
- being irritable

In primary care the condition may be confused with the common cold though the presence of lower respiratory tract signs (wheeze and/or crackles on auscultation) in an infant would be consistent with bronchiolitis.

The symptoms are usually mild and may only last a few days and can be managed at home without needing treatment. In some cases the disease can cause severe illness and infants will need to be treated in hospital.

Bronchiolitis is a viral infection so antibiotics are not indicated. NICE says corticosteroids are not recommended.

Reference

1. Delayed antibiotic prescribing strategies for respiratory tract infections in primary care: pragmatic, factorial, randomised controlled trial. *BMJ* 2014;**348**:g1606 http://www.bmj.com/content/348/bmj.g1606

The advice in this article has been collated from the following guidelines:

- Respiratory tract infections (self-limiting): prescribing antibiotics. NICE guidelines CG69, July 2008 https://www.nice.org.uk/guidance/cg69
- Pneumonia in adults: diagnosis and management. NICE guideline CG191 December 2014. https://www.nice.org.uk/guidance/cg191
- BTS guidelines of the management of community-acquired pneumonia in adults 2009. https://www.brit-thoracic.org.uk/guidelines-and-quality-standards/community-acquired-pneumonia-in-adults-guideline
- PCRS-UK Opinion sheet on community acquired pneumonia in adults. September 2013 https://www.pcrs-uk.org/system/files/Resources/Opinion-sheets/os33_pneumonia.pdf
- BTS guidelines for the management of community acquired pneumonia in adults: update 2009. http://thorax.bmj.com/content/64/Suppl_3/iii1.full
- BTS guidelines on cough management 2006. https://www.brit-thoracic.org.uk/guidelines-and-quality-standards/cough-in-adults-recommendations
- Bronchiolitis in children: diagnosis and management. NICE guideline. June 2015 https://www.nice.org.uk/guidance/ng9
- Antimicrobial stewardship: system and processes for effective antimicrobial medicine. NICE 2015. http://www.nice.org.uk/guidance/ng15

Learning Objectives

After reading this article you will understand:

- How to deal with a self-limiting RTI
- When antibiotics should be prescribed for an RTI
- How to deal with patients who demand an antibiotic when they don't need one

Ideas for further study and reflection:

- Conduct a search of patients who were given antibiotics for an RTI and ask yourself whether those antibiotics were prescribed appropriately.
- Read the NICE guideline *Antimicrobial stewardship: system and processes for effective antimicrobial medicine use* to find out more about how to use antibiotics effectively
- Are you confident you could spot when a respiratory infection is CAP? Read up the BTS and NICE guidance and download the PCRS-UK opinion sheet on CAP.

Primary Care Respiratory Society UK - Opinion No.33

PCRS UK Opinion

Community-Acquired Pneumonia in Adults in Primary Care

Introduction

Community-acquired pneumonia (CAP) is one of the commoner conditions presenting to primary care, with an estimated annual incidence in the UK of between 2 and 5 per 1000 population.[1] A practice comprising 10,000 patients could expect to see around 23 cases per year. The incidence is higher at extremes of age, especially <5 years and >60 years, and there is an association with male sex and socioeconomic deprivation. In the UK, 22-42% of adults with CAP are admitted to hospital. The reported mortality of adults with CAP managed in the community in the UK is less than 1%, compared to mortality rates of around 15% in hospitalised patients.[2]

Prevention of pneumonia

Smoking is an independent risk factor for the development of CAP and there is a dose-response relationship between number of cigarettes smoked and invasive pneumococcal disease.[3] In the UK, adults at risk from pneumonia (including all adults aged >65 years) are eligible for pneumococcal polysaccharide vaccination. Infant pneumococcal vaccination programmes also provide protection to adults via 'herd protection'. In the US, substantial reductions in the absolute numbers of adults admitted to hospital have been observed following a decade of infant pneumococcal conjugate vaccination.[4]

Diagnosing pneumonia

A chest x-ray (CXR) is the definitive test for the diagnosis of pneumonia. However, access to chest radiography is limited in primary care, and therefore most diagnoses are based on clinical criteria. The typical clinical features of CAP - cough, fever, breathlessness, pleuritic chest pain, and lung crackles on examination, are shared by other respiratory conditions such as:

- Non-pneumonic lower respiratory tract infections (LRTI);
- Exacerbations of chronic lung disease, such as chronic obstructive pulmonary disease (COPD);
- Respiratory viral infections, such as influenza

When confronted by a patient with symptoms of a LRTI, there are some helpful pointers in the clinical diagnosis of CAP:

- Duration of symptoms of <24 hours increases the probability of CXR-confirmed CAP.[5]
- 39% of patients treated for LRTI with new focal signs on chest examination will have CXR-confirmed CAP.[6]
- A combination of the following clinical features discriminated patients with CAP from a group of 2,820 patients presenting to primary care with LRTI:[7]
  - breathlessness
  - fever (>37.8°C);
  - crackles and diminished breath sounds on auscultation
  - absence of runny nose;
  - tachycardia >100/min
- Measurement of C-reactive protein with a level of >30mg/l improved discrimination over standard symptom- and sign-based models.[8]

Pleuritic chest pain may be a prominent symptom. It is commoner in younger patients and is not necessarily indicative of a pulmonary embolism. In elderly patients, the classic symptoms and signs of CAP are less likely. Conversely, non-specific features such as confusion and an absence of fever are recognised.

In practice, CAP diagnosed clinically by GPs accounts for 5–12% of all cases of adult LRTI treated with antibiotics. Patients with non-pneumonic LRTI should be treated according to NICE Guidelines which describe 3 antibiotic strategies – no prescribing, delayed prescribing and immediate prescribing [http://guidance.nice.org.uk/CG69]. A no antibiotic or a delayed antibiotic prescribing strategy should be agreed for patients with the common cold or acute bronchitis. If a patient with acute cough is >65 years old and has ≥2 of the following criteria, or >80 years old and has ≥1 of the following criteria, then an immediate antibiotic prescribing strategy is recommended according to NICE guidelines:

- hospitalisation in previous year
- type 1 or type 2 diabetes
- history of congestive heart failure.
- current use of oral glucocorticoids.

Severity assessment & when to refer to hospital

The first and single most important decision in the overall management of CAP is whether to manage the patient in the community or refer to hospital. This decision is best informed firstly by an accurate assessment of the severity of illness at presentation. The vast majority of patients with CAP have low severity disease and are managed effectively in the community by GPs. Strategies to increase the proportion of patients managed in the community have been shown to be both safe and acceptable.[9] Other than pneumonia severity, the commonest reasons for hospital referral/admission are:

- Presence of unstable co-morbid illness (for example, decompensated heart failure);
- Social care needs (for example, living alone);
- Patient wishes.

The clinical judgement of the GP in disease severity assessment is crucial. The British Thoracic Society CAP Guidelines recommend that patients with CAP diagnosed in the community can be classified according to clinical judgement and the CRB65 score (Box 1) into 3 severity groupings based on risk of mortality. Management may be stratified according to severity (Box 2).

Pulse oximeters are becoming increasingly available in primary care, but their precise utility in the management of CAP has still to be decided. Hypoxaemia is associated with poorer outcomes in hospitalised patients with CAP.[2] A low oxygen saturation of <90%, especially in young patients without chronic lung disease, supports a decision to refer to hospital. However, the lack of hypoxaemia does not imply a low risk of adverse outcomes. Therefore, use of pulse oximetry should not replace clinical judgement and the CRB65 score.[10]

GPs should administer antibiotics in the community to patients who have life-threatening pneumonia providing this action does not delay transfer to hospital. Intravenous penicillin G 1.2g or oral amoxicillin 1g are the preferred agents. Concern over the potential effect on subsequent microbiological investigations is not a reason to withhold treatment in these circumstances.

GPs should also consider administering antibiotics in the community for patients with suspected high severity CAP where there are likely to be delays of over six hours in the patient being admitted and treated in hospital. Inappropriate antibiotic use is a major concern both in community and hospital settings. Therefore, the clinical likelihood of CAP needs to be taken into account when consid-

Box 1: CRB65 severity assessment tool.

Score one point for each feature present:

Confusion – new or worse than normal

Respiratory rate ≥ 30/minute

Blood pressure, systolic < 90 mmHg or diastolic ≤ 60 mmHg

Age ≥ **65** years

The views expressed in this publication are not necessarily those of the Primary Care Respiratory Society UK.

Top Tips: Breathlessness


Noel Baxter and **Debbie Roots**

Persistent and disabling breathlessness is a common condition that is a strong prognostic indicator for hospitalisation and premature death. It is easily missed. People describe feeling embarrassed about it and they gradually withdraw from activities where attention may be drawn to it and become increasingly deconditioned. Many consider it a sign of aging rather than something that can be treated. These episodes can be punctuated by acute worsening of a chronic problem or can represent a new problem.

1. 10% of the adult population have chronic breathlessness but less than half have this problem recorded – Make the MRC breathlessness score part of your annual health check so that it is detected earlier. It is sensitive for non COPD causes too[1]

2. 80-90% of people with COPD have another long term condition that could also be making them breathless – Do an annual breathlessness review at the same time as the annual COPD or Heart Failure review so that you are regularly ruling out other causes[2]

3. Use a breathlessness assessment algorithm (e.g. http://www.impressresp.com/index.php?option=com_docman&task=doc_download&gid=101&Itemid=82) designed by peers and experts. It will help you reach a more complete and accurate diagnosis and allow you to feel more confident in dealing with the problems identified. Two-thirds of causes will be cardio-respiratory[1]

4. Assume that people who are breathless experience anxiety and fear regardless of cause. The question is how much and how to intervene. Measure using an anxiety and depression score and refer or treat accordingly

5. Have and use a pulse oximeter to aid assessment of acute breathlessness. It is cheap and easy to use. A new finding of oxygen saturation of <92% requires emergency assessment.

6. Hyperventilation and other breathing pattern abnormalities can co-exist with other causes of breathlessness as well as be a problem in their own right. If your patient with asthma isn't responding to treatment, consider a review using the SIMPLES algorithm and whether a respiratory physiotherapist can help.[3,4]

7. Chronic breathlessness may be due to factors such as low fitness and being overweight or obese. If you have excluded other causes using a robust agreed local algorithm (e.g. http://www.impressresp.com/index.php?option=com_docman&task=doc_download&gid=101&Itemid=82) then consider offering physiotherapy, psychology, physical activity and dietary interventions according to priority and patient choice. This may achieve better outcomes than a referral to a secondary care cardiorespiratory specialist.

8. Oxygen is not a treatment for breathlessness. Cooling airflow to the face – a fan - is an effective therapy for breathlessness. If pulse oximetry in the non-acute situation is regularly less than 92% or there is a drop of more than 4% on exercise refer to a home oxygen assessment and review (HOSAR) team for advice.

9. Daily disabling breathlessness with minimal activity needs treating as much as each individual cause – Do you have a breathlessness support service locally? If not then ask your palliative care team for advice or ask your commissioners whether they are considering it.[5]

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Pulse oximeters to self-monitor oxygen saturation levels as part of a personalised asthma action plan for people with asthma

Robin Carr reports on a systematic review of trials

Asthma is a difficult disease to diagnose especially during the acute attack. The National Review of Asthma Deaths (NRAD) reported that a substantial number of people with asthma die needlessly and many without seeking medical help. We were alarmed to discover in a patient participation group that some people were using pulse oximeters to decide when to seek medical help during an asthma attack; and that pulse oximeters are now widely available on the internet. The advice which accompanies them may be of doubtful accuracy:

"*A healthy person will normally have a reading of at least 95% saturation, though many will manage be quite content [sic] if the oximeter reveals 90%.*"

(*http://www.pulseoximetersplus.com/categories/Pulse-Oximeter-News/Pulse-Oximeter-and-Asthma/*)

Review of the use of pulse oximeters by patients with asthma

We undertook a Cochrane Systematic Review of randomised controlled trials (RCTs) of patients using a pulse oximeter with a personalised asthma action plan (PAAP) to inform their decision about when to seek medical attention during an asthma attack.[1] The PAAP is key to the self-management of deteriorating asthma, which can be very variable and unpredictable. For example, people with 'mild asthma' can have life threatening attacks.

Our searches identified no relevant RCTs, but showed that pulse-oximeters are widely used by clinicians alongside other clinical findings with good effect.

Risks and potential benefits

There are potential errors when using the pulse oximeter that we have detailed in the review, of which the clinician needs to be aware.

It is important to assess the rate of progress of an asthma attack. Symptoms and signs that are deteriorating rapidly will require observations to be made and interventions to be delivered very promptly. The oxygen dissociation curve is not linear and oxygen delivery falls dramatically below SpO2 92%. Therefore, our fear is that the use of pulse oximetry by the patient at home may result in them waiting until they are hypoxic before deciding to seek help; by which stage they are quite late into the asthma attack and the time available to make contact and physically travel to seek help will have significantly diminished. This introduces an avoidable risk.

In addition, our searches showed that some people with asthma lose their sense of dyspnoea as they become more hypoxic, further increasing the risk, if they are unable to relay on experiencing symptoms. Waiting for their oxygen saturation to fall before seeking help may cause serious delay.

More research needed?

We think there is room for debate about whether this is an important clinical question to answer or whether we should discourage this practice based on our theoretical concerns. If there were to be a RCT, our recommendation would be that an intervention using pulse oximetry to monitor deterioration of symptoms in an asthma attack must be part of a PAAP.

Reference

1. Welsh EJ, Carr R. Pulse oximeters to self-monitor oxygen saturation levels as part of a personalised asthma action plan for people with asthma. *Cochrane Database of Systematic Reviews* 2015, Issue 9. Art. No.: CD011584. DOI: 10.1002/14651858.CD011584.pub2.

Journal Round-Up

npj Primary Care Respiratory Medicine Key Summaries

A selection of short summaries of original research articles published in *npj Primary Care Respiratory Medicine*. The articles featured have been selected by the Primary Care Respiratory Update editorial board as being the most relevant and useful to primary care respiratory clinical practice in the UK. You can download freely any articles of interest from the website http://www.nature.com/npjpcrm/

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**** EDITOR'S CHOICE ****

Understanding patient participation behaviour in studies of COPD support programmes such as pulmonary rehabilitation and self-management: a qualitative synthesis with application of theory
Ratna Sohanpal, Liz Steed, Thomas Mars & Stephanie J C Taylor.
Article number: 15054 (2015) doi:10.1038/npjpcrm.2015.54 Published online 17 September 2015

Chronic obstructive pulmonary disease: Participation in support programs
Participation in chronic lung disease support programs is affected by patients' attitudes and social influences. Educational support programs can help patients with chronic obstructive pulmonary disease (COPD) manage their symptoms more effectively. However, these programs often report significant problems with patient attendance and retention. Ratna Sohanpal and co-workers at Queen Mary University of London, UK, combined qualitative techniques and health behaviour theory to analyze data from 10 studies (published 1984-2015) into patient attitudes towards COPD support. Their method provides insights into the factors influencing attendance, non-attendance, and drop-out levels. Concerns related to ability to attend sessions, patient perceptions of the severity of their illness, together with perceived negativity from friends and professionals regarding the programs, all impacted on attendance. Motivating patients by discussing their illness in depth could encourage longer term participation in support programs

Muslim communities learning about second-hand smoke: a pilot cluster randomised controlled trial and cost effectiveness analysis
Sarwat Shah, Hannah Ainsworth, Caroline Fairhurst, Helen Tilbrook, Aziz Sheikh, Amanda Amos, Steve Parrott, David Torgerson, Heather Thompson, Rebecca King, Ghazala Mir & Kamran Siddiqi.
Article number: 15052 (2015) doi:10.1038/npjpcrm.2015.52
Published online 27 August 2015

Smoking: Health promotion by community leaders feasible
Public health initiatives on smoking can be well received by minority ethnic groups if community leaders help deliver them. Sarwat Shah from the University of York in the UK and colleagues noted that smoking rates were higher in Bangladeshi and Pakistani-origin households than in the general population. This made non-smokers living in the same households vulnerable to second-hand smoke. Their pilot study assessed the feasibility and effectiveness of an education initiative delivered by Muslim faith leaders that aimed to reduce second-hand smoke in the home. The researchers found no differences in recent smoke exposure between households who took part in the initiative and those who did not. However, an encouragingly high number of families recruited to the study demonstrated the feasibility of conducting health promotions in Islamic religious settings.

Effectiveness of case finding strategies for COPD in primary care: a systematic review and meta-analysis
Shamil MM Haroon, Rachel E Jordan, Joanne O'Beirne-Elliman & Peymane Adab.
Article number: 15056 (2015) doi:10.1038/npjpcrm.2015.56
Published online 27 August 2015

Chronic obstructive pulmonary disease: Finding undiagnosed cases
Cases of undiagnosed lung disease may be best detected by targeting people at high risk rather than widespread screening. Dr Shamil Haroon and colleagues from the University of Birmingham, UK, noted that a high proportion of people with chronic obstructive

pulmonary disease (COPD) in primary care are initially undiagnosed. In a systematic review of case finding strategies the research team found a large variety of small studies but very few relevant comparative trials, and therefore the best way of identifying these people remains unknown. However, observational studies suggest that offering spirometry to people aged 40 years or more with a history of smoking and reporting respiratory symptoms is likely to lead to finding more cases. Their results are in line with recent UK guidelines that recommend against widespread screening for COPD.

Obesity, low levels of physical activity and smoking present opportunities for primary care asthma interventions: an analysis of baseline data from The Asthma Tools Study
Barbara P Yawn, Matthew A Rank, Susan L Bertram & Peter C Wollan.
Article number: 15058 (2015) doi:10.1038/npjpcrm.2015.58
Published online 01 October 2015

Asthma: Improvements through lifestyle interventions
Encouraging patients to stop smoking, lose weight and improve levels of physical activity could help improve overall asthma outcomes. Asthma can be exacerbated by modifiable lifestyle factors, and early intervention from family doctors could make a significant difference to the condition for many patients. To uncover potential factors associated with asthma severity, Barbara Yawn at the University of Minnesota and co-workers analyzed survey answers and healthcare records from 901 patients, ages 5 to adult, from 21 medical centers across the United States of America. Obesity was associated with poorer asthma outcome in all age groups, and smoking was linked with exacerbations and inadequate asthma control. Those who undertook little or no physical activity also struggled to control their asthma. Regular support to make relevant lifestyle changes may improve asthma outcomes in these patient groups.

Ten-year longitudinal study of factors influencing nocturnal asthma symptoms among Asian patients in primary care
Ngiap Chuan Tan, Nivedita V Nadkarni, Weng Kit Lye, Usha Sankari & van Hai Nguyen.
Article number: 15064 (2015) doi:10.1038/npjpcrm.2015.64
Published online 29 October 2015

Asthma: Predictors of nocturnal symptoms
Researchers in Singapore have determined which traits are most associated with nocturnal asthma symptoms. In a 10-year longitudinal study, Ngiap Chuan Tan and colleagues at SingHealth Polyclinics studied the records of 939 asthma patients in primary care to see what factors predicted and mitigated the risk of nocturnal symptoms. They found that the risks of nocturnal symptoms were greatest for those with nasal allergies, and for patients who lacked an asthma action plan, or whose plan was out of date. Patients with nocturnal symptoms were also more likely to have been switched from inhaled corticosteroid (ICS) medication to a combination of ICS and long-acting β2- agonist drugs by their physicians. The researchers hope the findings can help improve the treatment of patients with chronic asthma in Singapore's polyclinics.

Best of the rest

These reviews were prepared by Dr Basil Penney and published by Doctors.net.uk Journal Watch. They have been selected and edited for inclusion into *Primary Care Respiratory Update* by editor Dr Hilary Pinnock.

The Doctors.net.uk Journal Watch service covers other specialities as well as respiratory medicine. Doctors.net.uk is the largest network of GMC-registered doctors in the UK. To find out more about membership visit http://www.doctors.net.uk

Abbreviations used in these reviews are:

Measures and investigations

6MWT	Six-minute walk test
6MWD	Distance in metres walked in six minutes
BODE Index	Body-mass index, airflow Obstruction, Dyspnea, and Exercise
CT	Computerised tomography
CXR	Chest X-ray
ECG	Electrocardiograph
FEV1	Forced expiratory volume in 1 second
FVC	Forced vital capacity
HAD	Hospital Anxiety and Depression scale
IgE	Immunoglobulin E
MCT	Methacholine challenge test
MRC	Medical Research Council
QoL	Quality of Life
SpO_2	Oxygen saturation

Respiratory conditions

ACOS	Asthma–COPD overlap syndrome
AECOPD	Acute exacerbation of chronic obstructive pulmonary disease
ARI	Acute respiratory infections
CAP	Community-acquired pneumonia
COPD	Chronic obstructive pulmonary disease
ILD	Interstitial lung disease
OSA	Obstructive sleep apnoea
RTI	Respiratory tract infection

Respiratory treatments

CPAP	Continuous positive airway pressure
ICS	Inhaled corticosteroids
LABA	Long acting beta-agonist
LAMA	Long acting muscarinic agent
PR	Pulmonary rehabilitation

Statistical terms

HR	Hazard Ratio
IQR	Interquartile range
n	number(s)
RR	Relative risk
SD	Standard deviation
95% CI	95% Confidence Interval

**** EDITOR'S CHOICE ****

Smoke-free legislation and childhood hospitalisations for respiratory tract infections

Jasper V. Been, Christopher Millett, John Tayu Lee, Constant P. van Schayck, Aziz Sheikh.
Eur Respir J 2015; 46: 697–706. http://dx.doi.org/10.1183/09031936.00014615

Second-hand smoke exposure is a major risk factor for RTIs. Although evidence suggests important early-life health benefits of smoke-free public environments, the impact on childhood RTIs is unclear. This paper investigated the association between England's smoke-free legislation and childhood RTI hospitalisations.

The Hospital Episode Statistics database was used to obtain nationwide data on hospital admissions for acute RTIs among children (<15 years of age) from 2001 to 2012. Hospitalisation counts were disaggregated by month, age group, sex and small-area level, and linked to urbanisation, region, deprivation index and corresponding population estimates. Negative binomial regression analyses were adjusted for confounders, seasonal variation, temporal autocorrelation, population-size changes and underlying incidence trends. Models allowed for sudden and gradual changes following the smoke-free legislation.

1,651,675 hospital admissions were analysed. Introduction of smoke-free legislation was followed by an immediate reduction in RTI admissions (–3.5%, 95% CI –4.7to –2.3%), this mainly being attributable to a decrease in lower RTI admissions (–13.8%, 95% CI –15.6 to –12.0%). Admissions for upper RTI also fell but gradually in a sustained reduction in yearly rate. (–1.9% (95% CI –2.3 to –1.5%) per year, p<0.001)

The introduction of national smoke-free legislation in England was associated with ~11 000 fewer hospital admissions per year for RTIs in children.

Associations between gastro-oesophageal reflux, its management and exacerbations of chronic obstructive pulmonary disease

Victoria S. Benson, Hana Müllerová, Jørgen Vestbo, Jadwiga A. Wedzicha, Anant Patel, John R. Hurst, for the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) Investigators
http://dx.doi.org/10.1016/j.rmed.2015.06.009

A small but significant body of literature suggests that gastro-oesophageal reflux disease (GORD) is a common co-morbidity in COPD. Two studies with prospectively collected information suggest an association between GORD and exacerbations of COPD.

To further elucidate the relationship between GORD, acid suppression medications and exacerbations of COPD, this group analysed data from the large Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) cohort with the following aims: (1) to determine what factors are associated with the presence of GORD in COPD patients and whether these factors differ by sex, and (2) to evaluate the relationship between self-reported history of GORD, its modification by acid suppression medications and future exacerbations of COPD.

Logistic regression was used to determine factors associated with GORD; Cox proportional hazards models were used to calculate adjusted HRs and 95% CIs for GORD and risk of exacerbation and death.

Among 2,135 COPD patients from the ECLIPSE cohort, 547 (26%) patients self-reported GORD, with female preponderance; 237 (11%) were taking proton pump inhibitors/H2 receptor antagonists (PPI/H2RA). Risk factors for GORD did not differ by sex. When compared to patients who did not report GORD or use of PPI/H2RA, patients with GORD and taking PPI/ H2RA had a significantly increased risk of exacerbation (HR =1.58, 95%CI =1.35-1.86); risk was also increased for patients reporting GORD only or PPI/H2RA use only (HR =1.21 [1.04-1.40] and 1.33 [1.08-1.65], respectively). Similar findings were observed for risk of hospitalised exacerbation. GORD was not associated with mortality.

GORD in COPD patients is highly prevalent, and risk factors did not differ by sex. Use of PPI/ H2RA and self-reported GORD were associated with increased risk of moderate-to-severe and hospitalised exacerbations.

Asthma, COPD and overlap syndrome: a longitudinal study in young European adults

Roberto de Marco, Alessandro Marcon, Andrea Rossi, Josep M. Antó, Isa Cerveri, Thorarinn Gislason, Joachim Heinrich, Christer Janson, Deborah Jarvis, Nino Kuenzli, Bénédicte Leynaert, Nicole Probst-Hensch, Cecilie Svanes, Matthias Wjst, Peter Burney
Eur Respir J 2015; 46: 671–679
http://dx.doi.org/10.1183/09031936.00008615

Patients with ACOS have a more rapid disease progression, more respiratory symptoms, exacerbations, comorbidities and healthcare utilisation, compared to subjects with either disease alone. It is still an open question whether ACOS is the result of asthma that has progressed to fixed airflow obstruction, or the expression of COPD in patients with airway hyperresponsiveness or a specific disease entity. Few epidemiological studies have investigated the joint epidemiological distribution of asthma and COPD in the general population, as well as the long-term outcomes of ACOS.

This European prospective study compared risk factors and clinical characteristics, 9-year lung function change and hospitalisation risk across subjects with ACOS, asthma or COPD alone, or none of these diseases.

Participants in the European Community Respiratory Health Survey in 1991–1993 (aged 20–44 years) and 1999–2001 were included. Chronic airflow obstruction was defined as pre-bronchodilator FEV1/FVC < lower limit of normal on both occasions. Based on their

history of respiratory symptoms, spirometry and risk factors, subjects were classified as having asthma alone (n=941), COPD alone (n=166), ACOS (n=218) and none of these (n=5,659).

Subjects with ACOS shared risk factors and clinical characteristics with subjects with asthma alone, but they had an earlier age of asthma onset. FEV1 change in the ACOS group (–25.9 mL·year–1) was similar to that in the asthma group (–25.3 mL·year–1), and lower (p<0.001) than in the COPD group (–37.3 mL·year–1). ACOS was associated with the highest hospitalisation rate.

Among young adults aged 20–44 years, ACOS seems to represent a form of severe asthma, characterised by more frequent hospitalisations, and to be the result of early-onset asthma that has progressed to fixed airflow obstruction.

Characteristics of COPD in never-smokers and ever-smokers in the general population: results from the CanCOLD study

Thorax

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The occurrence of COPD in never-smokers is not widely appreciated, despite the fact that the burden of COPD in never-smokers is high, accounting for about 30% of all COPD in the community. There is limited information on the risk factors associated with spirometrically confirmed COPD in never smokers in the general population.

This group analysed data from 5,176 adults aged ≥ 40 years, who participated in the population-based, prospective, multisite Canadian Cohort of Obstructive Lung Disease study. Never-smokers were defined as those with a lifetime exposure of <1/20 pack year. Logistic regressions were constructed to evaluate associations for 'mild' and 'moderate-severe' COPD defined by FEV1/FVC <5th centile (lower limits of normal).

The prevalence of COPD (FEV1/FVC<lower limits of normal) in never-smokers was 6.4%, constituting 27% of all COPD subjects. The common independent predictors of COPD in never-smokers and ever-smokers were older age, self reported asthma and lower education. In never-smokers a history of hospitalisation in childhood for respiratory illness was discriminative, while exposure to passive smoke and biomass fuel for heating were discriminative for women.

COPD in never-smokers and ever-smokers was characterised by increased respiratory symptoms, 'respiratory exacerbation' events and increased residual volume/total lung capacity, but only smokers had reduced transfer factor and emphysema on chest CT scans.

The study confirmed the substantial burden of COPD among never-smokers, defined the common and gender-specific risk factors for COPD in never-smokers and provided early insight into potential phenotypical differences in COPD between lifelong never-smokers and ever-smokers.

Impact of Age and Sex on Response to Asthma Therapy

ATS Journals

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Sex and older age have been implicated as having an effect on asthma pathophysiology, symptoms, and response to therapy, but these associations are poorly understood.

This group from the United States of America analysed patient data acquired from a series of randomised clinical trials conducted by the Asthma Clinical Research Network over a 10 year period, in which strategies for using a range of standard clinical therapies in mild to moderate asthma were studied. They investigated the impact of age and sex on response to specific treatments in this group of subjects.

1,200 subjects were identified (median age 30.4 years; 43.3% male) . People over 30 years of age were nearly twice as likely to experience treatment failure compared with younger patients (17.3% vs. 10.3%; odds ratio 1.82). Treatment failures increased by 2% for each year of age over 30 years, or by 13% per 5-year increment. Those with treatment failures had lower lung function, used more bronchodilator therapies, and had somewhat higher serum IgE levels and sputum and blood eosinophilia than those not experiencing treatment failures. Predictors of treatment failure in older subjects were lower lung function, longer duration of asthma, and earlier onset of asthma.

A major limitation is that the age range of subjects was limited (50th percentile, 30 year; 10% of subjects were older than 50 years). There was no significant difference in treatment failures between sexes.

These data suggest that age may also be an important phenotype to consider when predicting response to therapy even among subjects with mild to moderate asthma. Future trials are required to determine if older patients may benefit from a different treatment approach than younger patients.

Long-term adherence to inhaled corticosteroids in children with asthma: Observational study

respiratoryMEDICINE

Ted Klok, Adrian A. Kaptein, Eric J. Duiverman, Paul L. Brand
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Adherence to daily medication is of critical importance in treating childhood asthma. Non-adherence is strongly dependent on potentially modifiable factors such as parental illness perceptions and medication beliefs.

This observational study from the Netherlands assessed long-term adherence and its determinants in children with asthma enrolled in a comprehensive asthma care programme employing shared decision making with parents.

135 children with asthma, aged 2-12 years, attending a hospital-based out-patient clinic had their adherence to inhaled corticos-

teroids measured by electronic devices over a 12 month period. Parental illness perceptions and medication beliefs, and asthma control were assessed by validated questionnaires.

Median (IQR) adherence was 84% (70-92%). 55 children (41%) did not achieve the pre-defined level of good adherence (80%) and this was associated with poorer asthma control. Parental perceived medication necessity was high. Parents' replies to the five key questions on the core issues of the programme showed high concordance of their illness perceptions and medication beliefs with the medical model of asthma and its treatment. Differences in these perceptions between adherent and non-adherent families were small and non-significant.

Poor adherence may persist in children despite a high level of concordance between the medical team and parents on illness perceptions and medication beliefs, even in the absence of socioeconomic barriers to good adherence. Achieving good adherence in all children is a complex task, requiring interventions not covered in current guidelines of managing asthma in children.

Prognostic value of variables derived from the six-minute walk test in patients with COPD: Results from the ECLIPSE study

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The six-minute walk test (6MWT) is a reliable, widely used test to assess functional exercise performance in patients with COPD. The primary measure is the distance (metres) walked in six minutes (6 MWD). A 6 MWD <350 m predicts an increased risk of hospitalisation and mortality rates in COPD. Other 6 MWT derived variables, such as mean walk-speed (6MW Speed), 6-min walk-work (6 MWW), exercise-induced oxygen desaturation (EID), and unintended stops may also be useful for the prediction of mortality and hospitalisation in patients with COPD.

This paper examines data from the ECLIPSE study - a 3-year non-interventional longitudinal prospective study - to evaluate the prognostic value of 6 MWT-derived variables in 2,010 COPD patients and compare it with the BODE index. Cox's proportional-hazard regressions were performed to estimate 3-year mortality and hospitalisation.

During the follow-up, 193 subjects died and 622 were hospitalised. With respect to mortality the following 6 MWT variables significantly increased the risk of mortality: 6 MWD <334m [HR=2.30], 6MWSpeed ≤0.9m/sec [HR=2.15], 6 MWW ≤20000 m kg [HR=2.17], EID 8 ≤ 8% [HR=1.75], unintended stops [HR=1.99]. Hospitalisation was predicted by 6 MWW ≤ 27000 m kg [HR=1.23], EID ≤ 88% [HR=1.25], BODE index ≥3 points [HR=1.40].

The 6 MWT-derived variables have an additional predictive value of mortality in patients with COPD. The 6 MWW, EID and the BODE index refine the prognosis of hospitalisation. These findings need to be reproduced by others and reliability needs to be studied.

Respiratory viruses associated with community acquired pneumonia in children: matched case–control study

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CAP is the leading cause of death in children worldwide and viruses cause a substantial proportion of childhood CAP. A better understanding of the role of virus infections in this condition is needed to improve clinical management and preventive measures.

This matched case–control study from Stockholm, aimed to assess the association between specific respiratory viruses and childhood CAP.

Cases (n=121) were children aged ≤5 years with radiological CAP. Healthy controls (n=240) were consecutively enrolled at child health units during routine visits and matched to cases on age and calendar time.

Nasopharyngeal aspirates were obtained and analysed by real-time PCR (Polymerase Chain Reaction) for 15 viruses. Multivariate conditional logistic regression was used to account for co-infections with other viruses and baseline characteristics.

Viruses were detected in 81% of the cases (n=98) and 56% of the controls (n=134). Influenza virus, metapneumovirus and respiratory syncytial virus were detected in 60% of cases and were significantly associated with CAP with ORs >10. There was no association with parainfluenza virus, human enterovirus or rhinovirus. Coronavirus and bocavirus were negatively associated with CAP.

A limitation of the study is the lack of concomitant bacterial data, as bacterial–viral interactions and co-infection may be common in childhood pneumonia and associated with more severe disease.

This study indicates viral CAP is an underestimated disease and points out metapneumovirus as a new important target for the prevention of childhood CAP

Ten-Year Mortality after Community-acquired Pneumonia: A Prospective Cohort

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CAP is a common illness that is associated with considerable morbidity and mortality. The potential long-term consequences of pneumonia remain an area of evaluation.

This prospective cohort study from Canada compared long-term mortality among adult patients enrolled during an emergency department visit or hospitalisation for pneumonia in 2000–2002 (n=6,078) and an age- and sex-matched comparison group (n=29,402) selected from patients without pneumonia. Investigators also monitored subsequent medical encounters.

During a median follow-up of 9.8 years, long-term all-cause mortality was significantly higher among patients who had experienced

pneumonia compared with controls, with an adjusted HR of 1.65 (95% CI, 1.57–1.73). Deaths involving the respiratory system were more common among patients who had experienced pneumonia. (24% vs.9%).

Patients with CAP who were < 25 years old had the lowest absolute rate difference for mortality (4 per 1,000/year; adjusted HR, 2.40), and patients > 80 years old had the highest absolute rate difference (92 per 1,000/year; adjusted HR, 1.42). Absolute rates of all-cause hospitalisation, emergency department visits, and CAP-related visits were all significantly higher in patients with CAP compared with control subjects (P, 0.001 for all comparisons).

These results indicate that an episode of CAP confers a high risk of long-term adverse events compared with the general population who have not experienced CAP, and this is irrespective of age.

Recognition of patients with pneumonia as a group at high risk for long-term mortality seems warranted. Studies are needed to clarify to what extent pneumonia is an independent cause of long-term mortality or whether pneumonia serves as a marker of another underlying process. Addressing known modifiable causes of pneumonia and long-term mortality, such as smoking, would maximise the public health effect on the short- and long-term consequences of pneumonia.

Lifestyle factors and experience of respiratory alarm symptoms in the general population

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Recognition of alarm symptoms is a vital part of lung cancer diagnosis, delay in presenting with symptoms has been associated with poor survival rates. Respiratory alarm symptoms and factors affecting the experience of these in the general population are thus important to understanding and improving lung cancer diagnosis and outcomes.

This Danish study aimed to estimate the prevalence of respiratory alarm symptoms in the general population, and to identify possible associations between lifestyle factors and experiencing respiratory alarm symptoms.

A cohort of 100,000 adults >20 years age was randomly selected to complete a web-based survey. Items regarding experience of prolonged coughing, shortness of breath, coughing up blood and prolonged hoarseness and self-reported lifestyle factors (smoking status, alcohol intake and body mass index) were included in the analysis. 49,706 completed the questionnaire. 16 % reported at least one respiratory alarm symptom. Prolonged coughing (8.4%) and shortness of breath (8%) were most prevalent, while coughing up blood was least prevalent (0.1%). More men than women reported symptoms ($p<0.001$). Odds of reporting symptoms increased with age. Former and current smoking was associated with reporting at least one symptom.

Individuals who were underweight or obese were significantly more likely to report at least one symptom. Odds of reporting at least one symptom were increased with increasing alcohol intake for both genders ($P_{trend}<0.001$).

Respiratory alarm symptoms are common in the general population. Future research should investigate healthcare seeking behaviour for respiratory alarm symptoms among individuals with different lifestyles.

A care-bundles approach to improving standard of care in AECOPD admissions: results of a national project

CHEST

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This short report describes the results of an initiative to implement care bundles for acute exacerbations of COPD undertaken in 2003 by the BTS.

The admission bundle elements were:

1. Establishing a correct diagnosis of acute exacerbations of COPD— required CXR and ECG performed within 4 hours of admission, together with a record of spirometry
2. Assessing oxygenation and prescribing oxygen to a target range within 1 hour of admission
3. Recognising and responding to respiratory acidosis
4. Initiating correct treatment—this required administration of steroids, antibiotics (if appropriate) and nebulised therapy within 4 hours of admission
5. Review by a member of the respiratory specialist team within 24 hours of admission.

Documentation of the following discharge bundle elements was also required:

1. Inhaler technique and medication reviewed.
2. Written self-management plan and emergency drug pack.
3. Smoking status and assistance to quit.
4. Suitability for pulmonary rehabilitation (PR) assessed and PR offered.
5. Follow-up (by phone or in person) within 72 hours.

21 hospitals participated. Data were collected for 11,748 patients and patient-level data for 3,272 COPD admissions. Discharge bundles were provided for 1,174 of these patients.

Receipt of the oxygen component was associated with 80% lower in-patient mortality, and receipt of appropriate treatment within 4 hours of admission was associated with 40% lower in-patient mortality. Furthermore, receipt of either the oxygen element and/or timely Non Invasive Ventilation was associated with shorter length of stay.

While the biggest impact of the discharge bundle was likely to be on readmission rates, only about a third of patients had a discharge bundle completed, so it was not surprising that no effect on this outcome was seen. Outcomes, including bundle completion rates, were better when specialist respiratory review occurred.

The results support wider use of care bundles for acute exacerbations of COPD.

Bronchoscopic lung volume reduction with endobronchial valves for patients with heterogeneous emphysema and intact interlobar fissures (the BeLieVeR-HIFi study): a randomised controlled trial

THE LANCET

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Lung volume reduction surgery improves survival in selected patients with emphysema, and has generated interest in bronchoscopic approaches that might achieve the same effect with less morbidity and mortality.

Previous trials with endobronchial valves have yielded modest group benefits because in those patients with collateral ventilation the lobar atelectasis is prevented.

The BeLieVeR-HIFi study was a randomised, parallel group, double-blind sham-bronchoscopy controlled trial of unilateral, endobronchial valve placement (Zephyr valves; PulmonX, Redwood City, CA, USA) which aimed to achieve lobar occlusion in patients with heterogeneous emphysema and intact interlobar fissures.

They enrolled stable outpatients with COPD who had a FEV1 < 50% predicted, significant hyperinflation (Total Lung Capacity >100% and Residual Volume >150%), a restricted exercise capacity (6 min walking distance <450 m), and substantial breathlessness (MRC dyspnoea score ≥3).

50 participants were randomised to receive either valves placed to achieve unilateral lobar occlusion (bronchoscopic lung volume reduction; n=25) or a bronchoscopy with sham valve placement (control; n=25). In the bronchoscopic lung volume reduction group, FEV1 increased by a median 8.77% (IQR 2.27–35.85) versus 2.88% (0–8.51) in the control group (Mann-Whitney p=0.0326). There were two deaths in the bronchoscopic lung volume reduction group and one control patient was unable to attend for follow-up assessment because of a prolonged pneumothorax.

Unilateral lobar occlusion with endobronchial valves in patients with heterogeneous emphysema and intact interlobar fissures produces significant improvements in lung function. There is a risk of significant complications and further trials are needed that compare valve placement with lung volume reduction surgery.

Gender differences in adult-onset asthma: results from the Swiss SAPALDIA cohort study

EUROPEAN RESPIRATORY *journal*

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Asthma follows a gender-related life-course pattern, with higher incidence rates in boys compared with girls, a reversing of the gender ratio in puberty, and a female preponderance in early and middle adulthood. Incidence seems to decrease with increasing age, and women are shown to have a higher incidence of asthma than men, but there is a lack of knowledge particularly in the elderly. Non-allergic asthma, which has a more severe clinical course in adults, appears to have a higher incidence in women than in men.

This Swiss study used the Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults (SAPALDIA), to investigate the incidence of adult asthma in Switzerland and its relation to gender, taking into account age and allergic sensitisation. They assessed incidence of self-reported doctor-diagnosed asthma between 1991/1992 and 2010/2011 in 5,128 subjects without asthma, aged 18–60 years at baseline. The age-related probability of asthma onset was analysed by logistic regression.

Over 20 years, 128 (5.1%) men and 198 (7.5%) women newly reported doctor-diagnosed asthma. The adjusted odds ratio for female sex was 1.99 (95% CI 1.54–2.57) overall, 3.21 (95% CI 2.12–4.85) among non-allergic subjects, and 1.43 (95% CI 1.02–2.02) in allergic subjects. The probability of asthma onset decreased with increasing baseline age in women but not in men. The higher probability of new asthma in allergic compared with non-allergic men was unrelated to age, whereas in women it decreased with age.

Asthma incidence was higher in women than in men but decreased with increasing age. The female predominance was considerably stronger in non-allergic adults compared with those with allergic sensitisation.

Has growth in electronic cigarette use by smokers been responsible for the decline in use of licensed nicotine products? Findings from repeated cross-sectional surveys

Thorax

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The rise in electronic cigarette use by smokers may be responsible for the decreased use of licensed nicotine products and/or increased overall use of non-tobacco nicotine-containing products. This paper reports findings from the Smoking Toolkit Study tracking use of electronic cigarettes and licensed nicotine products to address this issue.

Data were obtained from monthly surveys involving 14,502 cigarette smokers in England between March 2011 and November 2014. Smokers were asked about their use of electronic cigarettes and licensed nicotine products.

Prevalence of electronic cigarette use increased rapidly from 2.2% in quarter 2 of 2011 to 20.8% in quarter 3 of 2013, after which there was no change. Prevalence of licensed nicotine product use in smokers remained stable from quarter 2 of 2011 (17.4%) to quarter 3 of 2013 (17.9%), and thereafter declined steadily to 7.9% . Prevalence of use of any product was stable to quarter 1 of 2012, after which it increased from 18.5% to 33.3% in quarter 3 of 2013, and then decreased to 22.7% .

The shapes of trajectories since 2011 suggest that electronic cigarettes are probably not responsible for the decline in use of licensed

nicotine products. Electronic cigarettes appear to have increased the total market for use of non-tobacco nicotine containing products.

Non-anaemic iron deficiency impairs response to pulmonary rehabilitation in COPD

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In chronic heart failure, non-anaemic iron deficiency has been demonstrated to be a prevalent comorbidity with deleterious impact on health outcomes and aerobic capacity. In contrast, in patients with COPD, iron deficiency has only been studied in the context of anaemia. As pulmonary rehabilitation (PR) is a core component of COPD management, the assessment of non-anaemic iron deficiency impact on exercise training response might be relevant to optimise PR outcomes in COPD patients.

This prospective observational study from Spain was carried out in 70 consecutive non-anaemic COPD patients from outpatient clinics, and aimed to evaluate the relationships between NAID and aerobic capacity in COPD patients before and after a high-intensity, 8-week endurance exercise training programme.

The prevalence of iron deficiency was 48% (n = 34) showing no relationship with the Global Initiative for Obstructive Lung Disease stages (P = 0.209). Patients with iron deficiency showed lower pre-training endurance time (P = 0.033) and incremental cycling exercise to peak oxygen uptake (P = 0.007) than normal iron status patients after adjustment for potential covariates. Significant training-induced physiological changes were seen in the normal iron group, but not in the iron deficiency group. A smaller proportion of the iron deficiency group responded to training (56%) compared to the normal iron group (78%) (P = 0.041).

The results suggest a negative association between non-anaemic iron deficiency and aerobic capacity before and after endurance exercise training in COPD patients. The study suggests the need to assess non-anaemic iron deficiency in COPD patients who are candidates for skeletal muscle training programmes in order to optimize the outcomes of the intervention.

Oxygen saturation targets in infants with bronchiolitis (BIDS): a double-blind, randomised, equivalence trial

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The American Academy of Paediatrics recommends a hypoxaemic target for an oxygen saturation of 90% for children with bronchiolitis, which is consistent with the WHO recommendations for targets in children with lower respiratory tract infections. No evidence exists to support this threshold.

The Bronchiolitis of Infancy Discharge Study (BIDS) was a parallel group, randomised, controlled, equivalence trial of infants aged 6 weeks to 12 months of age with physician-diagnosed bronchiolitis newly admitted into eight UK paediatric units. Infants were randomly allocated to the use of standard oximeters and treated with oxygen if SpO_2 <94%; (n=308) or modified oximeters (displayed a measured value of 90% as 94%, therefore oxygen not given until SpO_2 <90%; n=307). All parents, clinical staff, and outcome assessors were masked to allocation. The primary outcome was time to resolution of cough (pre-specified equivalence limits of plus or minus 2 days) in the intention-to-treat population.

Cough resolved by 15.0 days (median) in both groups and so use of the different oxygen thresholds were equivalent. They recorded 35 serious adverse events in the standard care group and 25 serious adverse events in the modified oximeter group. In the standard care group, eight infants transferred to a high-dependency unit, 23 were readmitted, and one had a prolonged hospital stay. In the modified care group, 12 infants were transferred to a high-dependency unit and 12 were readmitted to hospital. Recorded adverse events did not differ significantly.

Management of infants with bronchiolitis to an oxygen saturation target of 90% or higher is as safe and clinically effective as one of 94% or higher. Future research should assess the benefits and risks of different oxygen saturation targets in acute respiratory infection in older children, particularly in developing nations where resources are scarce.

Tuberculosis associates with both airflow obstruction and low lung function: BOLD results

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A history of tuberculosis has been suggested by several small studies as a strong predictor of chronic airflow obstruction that could explain COPD among nonsmokers. Spirometric restriction is characteristic of restrictive lung diseases and has been reported as a consequence of tuberculosis since the late 1910s.

The aim of this analysis was to assess the association of airflow obstruction and spirometric restriction with a history of tuberculosis in the large, international, population-based, Burden of Obstructive Lung Disease (BOLD) study.

14,050 adults, aged 40 years and above from 19 sites provided acceptable post-bronchodilator spirometry measurements and information on a history of tuberculosis. The associations between a history of tuberculosis and airflow obstruction and spirometric restriction were assessed within each participating centre, and estimates combined using meta-analysis. These estimates were stratified by high- and low/middle-income countries, according to gross national income.

A self-reported history of tuberculosis was associated with airflow obstruction (adjusted odds ratio 2.51, 95% CI 1.83–3.42) and spirometric restriction (adjusted odds ratio 2.13, 95% CI 1.42–3.19).

A history of tuberculosis was associated with both airflow obstruction and spirometric restriction, and should be considered as a

potentially important cause of obstructive disease and low lung function, particularly where tuberculosis is common.

Anticholinergic vs Long-Acting β-Agonist in Combination With Inhaled Corticosteroids in Black Adults With Asthma.
The BELT Randomized Clinical Trial
Michael E. Wechsler, Barbara P. Yawn, Anne L. Fuhlbrigge, Wilson D. Pace, Michael J. Pencina, Gheorghe Doros, Shamsah Kazani, Benjamin A. Raby, Jane Lanzillotti, Suzanne Madison, Elliot Israel, for the BELT Investigators
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The US Food and Drug Administration (FDA) has questioned the safety of long-acting beta-agonist (LABA) therapy in asthma, noting possible increases in serious events, including hospitalisations and death. Data suggest that LABA risks, if they exist, may affect black populations disproportionately. Some studies have suggested that allelic variation at the Arg16Gly locus of the beta2-adrenergic receptor gene may be associated with increased rates of adverse outcomes, especially among black patients.

While long-acting anti-muscarinics (LAMAs) could be substituted for LABAs in asthma, there is a paucity of data on outcomes related to their use instead of LABA as an add-on therapy to inhaled corticosteroids (ICS).

The Blacks and Exacerbations on LABA vs Tiotropium (BELT) study was a parallel-group, randomised pragmatic trial that enrolled black adults with asthma from primary care and specialist practices in the US to examine whether LABA/ICS was superior to tiotropium /ICS and to determine whether allelic variation is associated with treatment response.

Patients receiving, or eligible for, combination ICS/LABA therapy were randomly assigned 1:1 to receive either daily LABA (n=538) or tiotropium (n=532), in addition to their prior dose of ICS. Patients underwent genotyping, and were followed up for 18 months.

The study did not find LABA/ICS to be more effective than tiotropium/ICS in delaying asthma exacerbations (primary outcome). Furthermore, LABA /ICS was not superior to tiotropium/ICS for the secondary outcomes that addressed asthma control. Arg16Gly ADRB2 alleles were not associated with differences in the effects of tiotropium /ICS vs LABA/ICS.

These findings do not support the superiority of LABA/ICS compared with tiotropium/ICS for black patients with asthma.

A Bayesian cost-effectiveness analysis of a telemedicine-based strategy for the management of sleep apnoea: a multicentre randomised controlled trial
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Obstructive sleep apnoea (OSA) causes significant morbidity and mortality and increased use of healthcare resources. Continuous positive airway pressure (CPAP) is the optimal treatment for OSA; however, many patients fail to use CPAP adequately. Optimising adherence is an essential aspect of patient management. Cost effective approaches are needed to improve OSA management and to promote CPAP compliance.

This multi-centre randomised controlled trial from Spain evaluated the efficacy of a telemedicine-based strategy for OSA patients under CPAP treatment. They assessed its impact on treatment compliance, sleepiness, QoL and cost-effectiveness when compared with traditional face-to-face follow-up.

139 consecutive OSA patients requiring CPAP treatment, with sufficient internet skills, were randomised. They were followed up at 1, 3 and 6 months. Patients randomised to the telemedicine group completed a web-based biweekly six-item questionnaire about their status, physical activity, sleep time, CPAP use and treatment side effects. Televisits via videoconference (Skype) were undertaken at 1 and 3 months. Patients randomised to the control group had the same follow-up, but attended the hospital. Additional contacts could be scheduled if clinically necessary in both groups.

Levels of CPAP compliance, and daytime sleepiness, QoL, side effects and degree of satisfaction were similar in both groups. Despite requiring more visits (by Skype), the telemedicine group was more cost-effective: costs were lower and differences in effectiveness were not relevant.

This multicentre randomised controlled trial provides evidence that a telemedicine-based strategy for the follow-up of OSA patients using CPAP is as effective as the face-to-face approach but is less expensive.

A repeated short educational intervention improves asthma control and quality of life
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http://dx.doi.org/10.1183/13993003.00458-2015

Written action plans for adjusting treatment based on the degree of asthma control are effective, and lead to a reduction in the risk of exacerbations and indirect costs, and an improvement in quality of life. Use of limited asthma education (i.e. information only) does not appear to improve health outcomes in adults with asthma.

This cluster randomised controlled multicentre study from Spain, aimed to assess the effectiveness of an asthma educational programme based on a repeated short intervention to improve symptoms and quality of life as well as to prevent future asthma exacerbations in adult patients with asthma.

230 adults with mild-to-moderate persistent uncontrolled asthma were enrolled from participating secondary and primary care centres. The intervention consisted of four short face-to-face sessions over a 12-month period, plus administration of a personalised, writ-

ten action plan and inhaler technique training. There were two comparator groups: one that included usual care without an educational initiative, and another that provided the 'gold standard' extended asthma education programme in two or more educational sessions.

Physicians and/or nurses, all of whom had received specific training to ensure consistent education, provided educational messages. The mean time for implementation of the programme was short (10.7 min for the initial visit and 6.4 min for the subsequent follow-up visits).

There was a significant improvement in the asthma control score in the three groups, although it was more marked in the short intervention and gold standard groups compared with usual practice. The short intervention and gold standard cohorts had fewer exacerbations and greater increases in QOL.

Dedicated Severe Asthma Services Improve Health-care Use and Quality of Life

David Gibeon, MBChB; Liam G. Heaney, MD; Chris E. Brightling, PhD, FCCP; Rob Niven, MD; Adel H. Mansur, PhD; Rekha Chaudhuri, MD; Christine E. Bucknall, MD; Andrew N. Menzies-Gow, PhD, on behalf of the British Thoracic Society Difficult Asthma Network
Chest 2015;148(4):870-876.
http://dx.doi.org/10.1378/chest.14-3056

Patients with severe and difficult-to-treat asthma comprise a small proportion (5%-10%) of all patients with asthma, yet are responsible for a disproportionate degree of asthma morbidity and costs. Some of these patients may have an alternative diagnosis, while others are poorly adherence to therapy. At present, there is no standardised way that patients with severe asthma are assessed, and different asthma centres follow their own evaluation protocols.

This prospective study of 346 patients with severe asthma whose data were submitted to the National Registry for dedicated UK Difficult Asthma Services aimed to determine whether the systematic assessment of severe asthma is associated with improved QoL and healthcare use. Patient demographics, disease characteristics, and healthcare use were compared between initial assessment and a median follow-up of 286 days.

They observed significant reduction in primary care or emergency department visits (66.4% vs 87.8%, P <0.0001) and hospital admissions (38% vs 48%, P =0.0004). There was no change in the number requiring maintenance oral corticosteroids, however, there was a reduction in steroid dose, and fewer subjects required short-burst steroids (77.4% vs 90.8%, P =0.01). Significant improvements were seen in QoL and control.

Systematic assessment within dedicated severe asthma centres is associated with improved QoL, improved asthma control, reduced health-care use, and reduced oral steroid burden.

Do asthma patients with panic disorder really have worse asthma? A comparison of physiological and psychological responses to a methacholine challenge

Maxine Boudreau, Kim L. Lavoie, André Cartier, Barbara Trutshnigg, Alexandre Morizio, Catherine Lemière, Simon L. Bacon
Respiratory Medicine October 2015 Volume 109, Issue 10, Pages 1250–1256 http://dx.doi.org/10.1016/j.rmed.2015.09.002

Panic disorder affects between 6 and 24% of asthmatics, which is 3-10 times more prevalent than the general population. Comorbid panic and asthma tends to be associated with worse outcomes. Some suggest that asthmatics with panic have worse underlying asthma; others argue that worse outcomes are a result of their tendency to over-report symptoms. This Canadian study aimed to measure physiological and psychological responses to a methacholine challenge test (MCT) in asthmatics with and without panic disorder.

39 asthmatics were recruited with (n=19) and without (n=20) panic disorder. They completed symptom questionnaires (Panic Symptom Scale, Borg Scale) before and after a MCT. Heart rate, and blood pressure were also recorded.

There was no difference in methacholine concentration required to induce a 20% drop in FEV1 between the two groups. Panic disorder patients reported worse subjective symptoms, including greater ratings on dyspnoea and anxiety scales, although they exhibited lower levels of physiological arousal (i.e., heart rate, blood pressure). Patients with panic disorder reported more panic symptoms post-MCT.

These results indicate that asthmatics with panic disorder report higher levels of subjective distress, despite exhibiting lower levels of physiological arousal, and in response to a MCT they have exaggerated panic symptoms compared to asthmatics without panic disorder. There was no evidence of greater airway responsiveness among panic disorder patients.

This suggests that worse outcomes among asthmatics with panic disorder are likely not to be due to greater bronchial responsiveness but rather to increased subjective distress in response to asthma symptoms. Interventions designed to educate patients on how to distinguish and manage anxiety in the context of asthma are needed.

Evidence for a genetic contribution to non-smoking-related lung cancer

Shamus R Carr, Wallace Akerley, Mia Hashibe, Lisa A Cannon-Albright
Thorax 2015;70:1033–1039.
http://dx.doi.org/10.1136/thoraxjnl-2014-206584

Studies have shown familial clustering of lung cancer cases, supporting evidence for a genetic contribution to the development of lung cancer. Presence of familial clustering in close relatives is supportive, but not sufficient, to prove a genetic contribution. Evaluation of increased risk beyond first-degree relationships would provide greater weight to a genetic contribution; evaluation of familial clustering and risk in the absence of smoking would eliminate the largest confounding variable.

This group analysed a population-based computerised Utah Population Database linked to the Utah Cancer Registry of lung cancer cases (n=5,544) for evidence of a genetic contribution to lung cancer predisposition in smoking (n=1,747) and non-smoking cases (n=784). Statistical methods were used to test for significant excess relatedness of cases and estimate relative risk (RR) in close and distant relatives of lung cancer cases.

Significant excess relatedness was observed for all lung cancer cases ($p<0.001$) and for the subsets of smoking-related ($p<0.001$) and non-smoking-related ($p<0.001$) cases when all pairwise relationships were considered. Only the non-smoking-related subset of cases showed significant excess relatedness when close relationships were ignored ($p=0.020$).

Significant excess relatedness for close and distant relationships in non-smoking-related lung cancer cases provides strong evidence for a genetic and an environmental contribution. Significant excess relatedness for only close family relationships in all lung cancer cases and in only smoking-related lung cancer cases implies environmental contribution. The highest RR for lung cancer was observed in the relatives of smoking-related lung cancer, suggesting predisposition gene carriers who smoke are at highest risk for lung cancer.

Infant respiratory infections and later respiratory hospitalisation in childhood

Hannah C. Moore, Graham L. Hall, Nicholas de Klerk
Eur Respir J 2015; 46: 1334–1341
http://dx.doi.org/10.1183/13993003.00587-2015

Acute respiratory infections such as bronchiolitis, whooping cough, pneumonia and influenza are a major cause of morbidity in young children. Risk factors for acute respiratory infections include prematurity, low socioeconomic groups, maternal smoking during pregnancy and congenital heart disease and chronic lung disease.

This population-based study aimed to assess the relationship between acute respiratory infections requiring hospitalisation in infancy and subsequent hospitalisation for respiratory causes including asthma. Using the Western Australian Data Linkage System, that brings together data from numerous datasets, the authors linked hospitalisation data to perinatal, birth and death records for 145,580 children from 1997 to 2002. Cox analyses was used to quantify the risk of an acute respiratory infections in infancy for respiratory hospitalisation after the age of 3 years.

7,911 (5.4%) had at least one hospitalisation for an acute respiratory infection in the first year of life. The most common diagnosis was bronchiolitis (62%) followed by pneumonia (10%). Fewer than 3,000 children (2.1%) had a hospitalisation for respiratory causes after the age of 3 years. The most common diagnosis after the age of 3 years was asthma (71%), followed by unspecified acute lower respiratory infection (11%).

An acute respiratory infection in infancy was significantly related to respiratory hospitalisation in childhood (HR 3.0, 95% CI 2.6–3.4) after adjusting for known risk factors. Increased number and length of infant hospitalisations for acute respiratory infection increased subsequent risk.

Interventions that reduce infant acute respiratory infections are likely to have significant public health benefits.

Prospective use of descriptors of dyspnoea to diagnose common respiratory diseases

Andrew S. Chang, Jeffrey Munson, Alex H. Gifford, Donald A. Mahler
Chest 2015;148(4):895-902
http://dx.doi.org/10.1378/chest.15-0308

Many patients find it difficult to describe how their breathing discomfort feels. When asked to select among a list of descriptors, patients with various cardiorespiratory conditions are able to select statements that describe their dyspnoea. However prospective testing has not been performed to examine whether certain descriptors of breathing discomfort can discriminate between respiratory conditions in clinical practice.

This study from the U.S. examined the sensitivity and specificity of descriptors of breathing discomfort prospectively in 136 hospital patients with common respiratory conditions as well as those patients who had refractory dyspnoea.

A questionnaire presented 15 statements describing breathing discomfort, and subjects selected the three that most closely applied, and then completed the HAD. Sensitivity, specificity, and predictive values were calculated for the descriptors by diagnosis in four respiratory diseases—asthma, COPD, interstitial lung disease (ILD), and respiratory muscle weakness.

All four groups selected "work/effort" descriptors ("I feel out of breath," "My breathing requires effort," "My breathing requires work," and "I cannot get enough air in") as best reflecting their perception of breathing discomfort. None of the descriptors exhibited high sensitivity and high specificity for any of the four common respiratory conditions.

"My chest feels tight" was a unique descriptor selected among the "best three" by patients with asthma. "My breathing is shallow" was a unique descriptor selected among the "best three" by patients with ILD.

Those with high anxiety scores reported the affective descriptors "frightening" and "awful" more frequently.

This information may be useful in clinical practice when evaluating patients who complain of breathing discomfort.

PCRS-UK News Round-Up

PCRS-UK SURVEY HIGHLIGHTS CHALLENGES NURSES FACE IN ACCESSING EDUCATION

A PCRS-UK survey has revealed that many primary care nurses feel poorly prepared for revalidation and face challenges accessing continued, appropriate education for respiratory care.

Four in ten of the 96 PCRS-UK members who completed the survey (a higher than usual 24% response rate) said they did not feel ready for revalidation, a surprising finding considering that this is a highly motivated group of nurses, who are already members of the Society, says the survey report.

Nearly half (45%) of the respondents were the respiratory lead for their practice, 87% had an asthma diploma, just under 72% had a COPD diploma, 47% had a prescribing qualification and more than half had qualifications in smoking cessation. Fewer than 12% had only the basic nurse registration.

The survey shows that nurses are supplementing the education provided by their employers by absorbing the costs of training themselves or taking time off to attend educational meetings.

Less than half (45%) of nurses had their training fees paid by their employer and many had to make a contribution: almost a quarter (24%) had to pay their own fees and nearly a third (31%) shared the cost with their employer. The majority of nurses (72%) said they were allowed up to five days off a year for study but backfill to cover absence for training, study or personal development was only available to 30% of nurses.

Free text comments show there is considerable uncertainty among nurses regarding whose responsibility it is to pay for training and that for many there is no formal arrangement in place to support their education.

Carol Stonham, PCRS-UK Nurse Lead, a nurse practitioner at Minchinhampton Surgery, Stroud and a Queen's Nurse, says the practice should be the first port of call for nurses seeking funding for training. "*Be very positive when making your case for education. Education is a really good tool and a lot of employers are really quite scared about revalidation. Use your need to revalidate as leverage – tell your employers you must revalidate or you will not be able to stay on the register and won't be able to work. Use your need to revalidate in a positive way and remember – if you don't ask you won't get.*"

In England, the Clinical Commissioning Group (CCG) can also be approached for funding because they have been given money for practice nurse education by Health Education England.

Carol advises that when approaching the CCG, rather than making the case about yourself, link your training needs to the need for improving patient care and/or the CCG's locality plan. Argue that nurses need to be involved in improvement plans and the way to achieve those plans is to support their professional development.

Other sources of funding include charities such as The Queen's Nursing Institute, which has an innovation fund, community trusts and pharmaceutical company sponsorship.

"*For too long practice nurses have asked "please can I go on a training course" and if the answer is no they have just said "okay". "Okay" is not a good answer. Practice nurses are entitled to be trained. We have to revalidate and keep our skills up to date. Now is the time for us to shine, to move forward and not take "no" for an answer,*" she says.

The survey report contains many tips, tools and resources for gaining support from managers and for educational activities that can support your professional development. These include joining PCRS-UK affiliated groups, accessing online resources such as Quick Guides, Opinion Sheets, Checklists, using the new PCRS-UK Guide to Reflective Practice and the recently updated Skill Levels for Delivering High Quality Respiratory Care.

The report is available at https://www.pcrs-uk.org/sites/pcrs-uk.org/files/files/SurveyResultsReportFINAL2.pdf

NEW PCRS-UK ACADEMY TO BE DEVELOPED

The Primary Care Respiratory Society UK is delighted to announce that it has entered into a new partnership with Cogora, the publishers of *Pulse*, *Pulse Online* and *Nursing in Practice* to develop the PCRS-UK Academy. The new Academy is to be launched in mid 2016 and will include a news and Continuing Professional Development website portal and a UK wide series of medical education events. Steve Holmes, PCRS-UK Education Lead says ' The Academy, which will be supported through Pulse, Pulse online and Nursing in Practice provides PCRS-UK with a unique opportunity to reach out to a far wider group of primary care health professionals with independent high quality respiratory education'. The PCRS-UK Academy is funded by Pfizer on behalf of the Pfizer Novartis Alliance.

SAVE THE DATE

PCRS-UK National Primary Care Conference

14th and 15th October 2016, Telford

PCRS-UK MEMBER DISCOUNT ON THE ARTICLE PROCESSING CHARGE FOR *NPJ PRIMARY CARE RESPIRATORY MEDICINE* SUBMISSIONS

npj Primary Care Respiratory Medicine is published in partnership between Primary Care Respiratory Society UK and Nature Publishing Group.It is an open access publication and authors whose papers are accepted for publication are required to pay an article processing charge (APC).

All members of PCRS-UK are entitled to a discounted APC (50% reduction on the full rate) if an article for which they are the corresponding author is accepted for publication within the journal. The discounted rate is also available to anyone who has

PCRS-UK News Round-Up

presented an abstract or poster at a PCRS-UK conference within the previous year.

The discounted PCRS-UK APC for *npj Primary Care Respiratory Medicine* is as follows (plus VAT):

- Original Article (PCRS-UK)* £950
- Other article types (PCRS-UK)* £450

* PCRS-UK preferential pricing is available if the corresponding author meeting is either a current PCRS-UK member and/or an abstract/poster presenter at a PCRS-UK conference within the previous year. Preferential pricing is not available for manuscripts where the APC is funded by the pharmaceutical industry. The rate is available for all new submissions made after 1st October 2015.

For more information about *npj Primary Care Respiratory Medicine* please visit the website http://www.nature.com/npjpcrm/

PCRS-UK WEBSITE: NEW CHANGES AFOOT....

We have been working hard in the background this year to prepare for some new changes to the PCRS-UK website. And it won't be long before you will be able to enjoy the changes. Launching in January 2016 our new updated site will include the following features:-

- Increased dynamic content
- Increased accessibility across multiple device types (e.g. cell phones and tablets) and browsers
- Easier to navigate, search for, and find information and resources and rationalised resources to facilitate this
- *Primary Care Respiratory Update* will be used as a vehicle for providing useful tools and news to users via individual PDF files as well as full issue downloads
- Opportunity for affiliated groups and other local respiratory groups to promote their events via our website

Watch out for the new changes and don't forget to tell us what you think

SMOKING CESSATION UPDATE

The PCRS-UK online smoking cessation resources have been updated with the latest guidance, tools and opinion.
The update contains information about a new NICE quality standard which covers ways of reducing harm from smoking and information for healthcare professionals about offering harm reduction approaches to smoking cessation.

The chapter on e-cigarettes has been completely rewritten to reflect the latest evidence and opinion about this popular, but controversial tool that adult smokers are increasingly using to help them stop smoking. It covers a Public Health England (PHE) expert review which has concluded that e-cigarettes are significantly less harmful to health than tobacco and have the potential to help smokers quit. But experts have challenged the evidence that PHE uses to endorse the safety and efficacy of e-cigarettes. There is link to a new PCRS-UK position statement on e-cigarettes.

The resources also provide information about a new report from ASH called Smoking Still Kills which proposes new targets for a renewed national strategy to accelerate the decline in smoking prevalence over the next decade.

There is also a link to new guidance on the expired carbon monoxide (CO) test, authored by PCRS-UK executive member Dr Noel Baxter, GP in Southeast London and local respiratory champion for NHS Lambeth and Southwark.

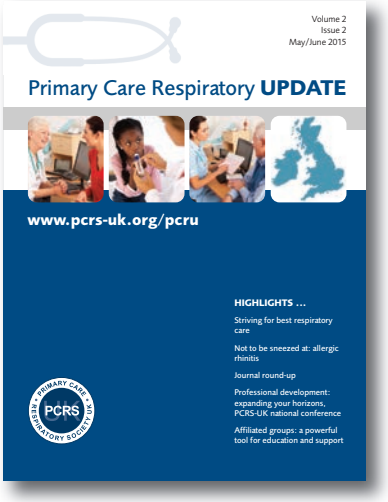
The resources are at https://www.pcrs-uk.org/smoking-cessation

TELL US WHAT YOU THINK...

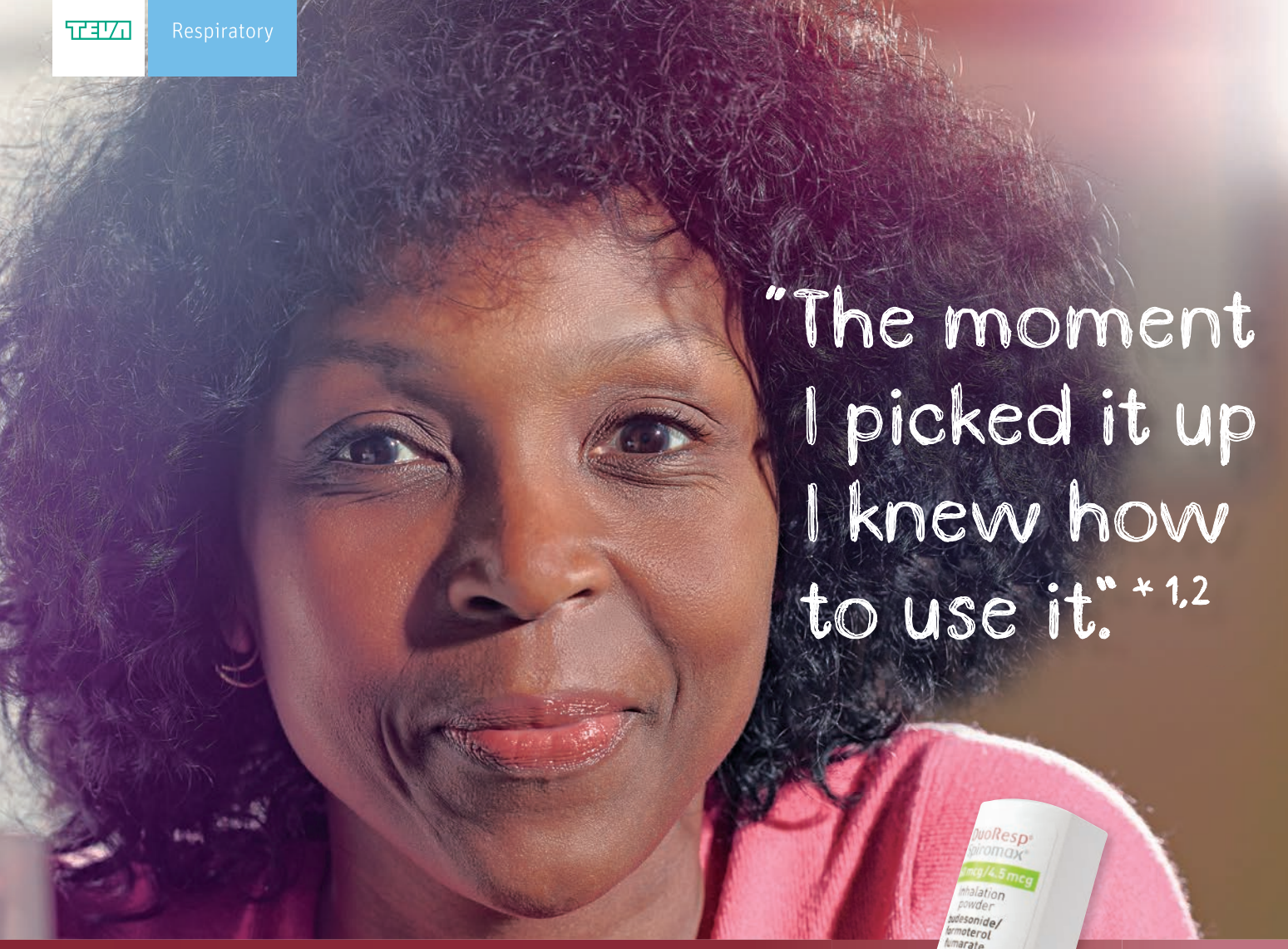
We are keen to hear from you what you think of the *Primary Care Respiratory Update*. Is it useful? Do you like the centre-fold pull out charts that we produce from time to time? Do you like having summaries from other respiratory related journals?

Enter this short (it takes less than five minutes) survey to tell us your views
Visit **https://www.surveymonkey.com/r/PCRU Review** to take part

Make sure you submit your feedback before 31st December 2015



TEVA Respiratory



Intuitive design[1,2]

- Intuitive to use[1,2]
- Ready in one flip of the cover
- For adult asthma and COPD**[3]

DuoResp® Spiromax®
budesonide/formoterol

MEDICAL DESIGN EXCELLENCE AWARDS®
2015 SILVER WINNER
Drug-Delivery Devices and Combination Products

Please refer to the Summary of Product Characteristics (SmPC) for full details of the Prescribing Information. DuoResp® Spiromax® (budesonide/formoterol) 160mcg/4.5mcg inhalation powder and DuoResp® Spiromax® (budesonide/formoterol) 320mcg/9mcg inhalation powder Abbreviated Prescribing Information. **Presentation:** *DuoResp® Spiromax® 160/4.5:* Each delivered dose contains 160mcg of budesonide and 4.5mcg of formoterol fumarate dihydrate. This is equivalent to a metered dose of 200mcg budesonide and 6mcg of formoterol fumarate dihydrate. *DuoResp® Spiromax® 320/9:* Each delivered dose contains 320mcg of budesonide and 9mcg of formoterol fumarate dihydrate. This is equivalent to a metered dose of 400mcg budesonide and 12mcg of formoterol fumarate dihydrate. Inhalation powder. **Indications:** ***Asthma:*** Treatment of asthma, where use of a combination (inhaled corticosteroid and long-acting β_2-adrenoceptor agonist) is appropriate. COPD: Symptomatic treatment of patients with severe COPD (FEV_1 <50% predicted normal) and a history of repeated exacerbations, who have significant symptoms despite regular therapy with long-acting bronchodilators. **Dosage and administration:** For use in adults ≥18 years. Not for use in children <18 years of age. ***Asthma:*** Not intended for the initial management. If an individual patient should require a combination of doses other than those available in the combination inhaler, appropriate doses of β_2-adrenoceptor agonists and/or corticosteroids by individual inhalers should be prescribed. The dose should be titrated to the lowest dose at which effective control of symptoms is maintained. When control of symptoms is achieved titrate to the lowest effective dose, which could include once daily dosing. *DuoResp® Spiromax® 160/4.5:* maintenance therapy – regular maintenance treatment with a separate reliever inhaler: *Adults:* 1-2 inhalations twice daily (maximum of 4 inhalations twice daily). DuoResp® Spiromax® maintenance and reliever therapy – regular maintenance treatment and as needed in response to symptoms: should be considered for patients with: (i) inadequate asthma control and in frequent need of reliever medication (ii) previous asthma exacerbations requiring medical intervention. *Adults:* The recommended maintenance dose is 2 inhalations per day, given either as one inhalation morning and evening or as 2 inhalations in either the morning or evening. For some patients a maintenance dose of 2 inhalations twice daily may be appropriate. Patients should take 1 additional inhalation as needed in response to symptoms. If symptoms persist after a few minutes, an additional inhalation should be taken. Not more than 6 inhalations should be taken on any single occasion. A total daily dose of up to 12 inhalations could be used for a limited period. Patients using more than 8 inhalations daily should be strongly recommended to seek medical advice. *DuoResp® Spiromax® 320/9:* Only to be used as maintenance therapy. *Adults:* 1 inhalation twice daily (maximum of 2 inhalations twice daily). ***COPD:*** *Adults:* 1 inhalation twice daily. *Elderly patients (≥65 years old):* No special requirements. *Patients with renal or hepatic impairment:* No data available. **Contraindications:** Hypersensitivity to the active substance or to any of the excipients. **Precautions and warnings:** If treatment is ineffective, or exceeds the highest recommended dose, medical attention must be sought. Patients with sudden and progressive deterioration in control of asthma or COPD should undergo urgent medical assessment. Patients should have their rescue inhaler available at all times. The reliever inhalations should be taken in response to symptoms and are not intended for regular prophylactic use e.g. before exercise. For such, a separate rapid-acting bronchodilator should be considered. Patients should not be initiated during an exacerbation. Serious asthma-related adverse events and exacerbations may occur. If asthma symptoms remain uncontrolled or worsen, patients should continue treatment and seek medical advice. If paradoxical bronchospasm occurs, treatment should be discontinued immediately. Paradoxical bronchospasm responds to a rapid-acting inhaled bronchodilator and should be treated straightaway. Systemic effects may occur, particularly at high doses prescribed for long periods. Potential effects on bone density should be considered, particularly in patients on high doses for prolonged periods that have co-existing risk factors for osteoporosis. Prolonged treatment with high doses of inhaled corticosteroids may result in clinically significant adrenal suppression. Additional systemic corticosteroid cover should be considered during periods of stress. Treatment should not be stopped abruptly. Transfer from oral steroid therapy to a budesonide/formoterol fumarate fixed-dose combination may result in the appearance of allergic or arthritic symptoms which will require treatment. In rare cases, tiredness, headache, nausea and vomiting can occur due to insufficient glucocorticosteroid effect and temporary increase in the dose of oral glucocorticosteroids may be necessary. To minimise risk of oropharyngeal Candida infection patients should rinse mouth with water. Administer with caution in patients with thyrotoxicosis, phaeochromocytoma, diabetes mellitus, untreated hypokalaemia, or severe cardiovascular disorders. The need for, and dose of inhaled corticosteroids should be re-evaluated in patients with active or quiescent pulmonary tuberculosis, fungal and viral infections in the airways. Additional blood glucose controls should be considered in diabetic patients. Hypokalaemia may occur at high doses. Particular caution is recommended in unstable or acute severe asthma. Serum potassium levels should be monitored in these patients. As with other lactose containing products the small amounts of milk proteins present may cause allergic reactions. **Interactions:** Concomitant treatment with potent CYP3A4 inhibitors should be avoided. If this is not possible the time interval between administration should be as long as possible. Not recommended with β-adrenergic blockers (including eye drops) unless compelling reasons. Concomitant treatment with quinidine, disopyramide, procainamide, phenothiazines, antihistamines (terfenadine), Monoamine Oxidase Inhibitors (MAOIs) and Tricyclic Antidepressants (TCAs) can prolong the QTc-interval and increase the risk of ventricular arrhythmias. L-Dopa, L-thyroxine, oxytocin and alcohol can impair cardiac tolerance. Concomitant treatment with MAOIs, including agents with similar properties, may precipitate hypertensive reactions. Patients receiving anaesthesia with halogenated hydrocarbons have an elevated risk of arrhythmias. Hypokalaemia may increase the disposition towards arrhythmias in patients taking digitalis glycosides. **Pregnancy and lactation:** Use only when benefits outweigh potential risks. Budesonide is excreted in breast milk; at therapeutic doses no effects on infants are anticipated. **Effects on ability to drive and use machines:** No or negligible influence. **Adverse reactions:** Since DuoResp® Spiromax® contains both budesonide and formoterol, the same pattern of adverse reactions as reported for these substances may occur. No increased incidence of adverse reactions has been seen following concurrent administration of the two compounds. *Serious:* Immediate and delayed hypersensitivity reactions, e.g. exanthema, urticaria, pruritus, dermatitis, angioedema and anaphylactic reaction, Cushing's syndrome, adrenal suppression, growth retardation, decrease in bone mineral density, hypokalaemia, hyperglycaemia, aggression, psychomotor hyperactivity, anxiety, sleep disorders, depression, behavioural changes, cataract and glaucoma, tachycardia, cardiac arrhythmias, e.g. atrial fibrillation, supraventricular tachycardia and extrasystoles, angina pectoris, prolongation of QTc-interval, variations in blood pressure, bronchospasm and paradoxical bronchospasm. *Common:* Candida infections in the oropharynx, headache, tremor, palpitations, mild irritation in the throat, coughing and hoarseness. Consult the Summary of Product Characteristics in relation to other side effects. **Overdose:** An overdose of formoterol may lead to: tremor, headache, palpitations. Symptoms reported from isolated cases are tachycardia, hyperglycaemia, hypokalaemia, prolonged QTc-interval, arrhythmia, nausea and vomiting. Supportive and symptomatic treatment may be indicated. **Price per pack:** *DuoResp® Spiromax® 160/4.5* and *DuoResp® Spiromax® 320/9:* £29.97. **Legal Category:** POM. **Marketing Authorisation Numbers:** *DuoResp® Spiromax® 160/4.5:* EU/1/14/920/001. *DuoResp® Spiromax® 320/9:* EU/1/14/920/004. **Marketing Authorisation Holder:** Teva Pharma BV, Computerweg 10, 3542 DR Utrecht, The Netherlands. **Date of Preparation:** May 2014. **Job Code:** UK/MED/14/0019. **References: 1.** Rychlik R, Kreimendahl F. Presented at the 7th IPCRG World Conference, 2014. **2.** Plusa T, Bijoś P. *Int Rev Allergol Clin Immunol Family Med,* 2015; 21(1): 21–24. **3.** DuoResp Spiromax® Summary of Product Characteristics.

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Teva UK Limited on 0207 540 7117 or medinfo@tevauk.com

*Instructions for use should be followed as per the patient information leaflet.
**DuoResp Spiromax® is licensed for use in adults 18 years of age and older only.

Teva UK Limited, Ridings Point, Whistler Drive, Castleford, West Yorkshire, WF10 5HX.

Approval code: UK/DUO/15/0007(1)a **Date of preparation:** August 2015

Delivering Excellence Locally

Featuring initiatives led by PCRS-UK members around the UK, supported by PCRS-UK programmes and tools

Scanning the horizon: How to get ahead of the game

Francesca Robinson reports on the PCRS-UK Affiliated Group Leaders Meeting held on 22 October 2015

Top tips for running effective meetings, preparing for revalidation and making the case for training were squeezed in to a highly practical and packed agenda of the PCRS-UK Affiliated Group Leaders meeting in October

Carol Stonham, Nurse Lead for PCRS-UK, a nurse practitioner at Minchinhampton Surgery Stroud and a Queen's Nurse, said the aim of the meeting was to enthuse group leaders, help them to keep their groups fresh and show them how PCRS-UK could support their groups.

"We currently have around 50 affiliated groups and it is really important that this network continues to grow. Affiliated respiratory groups help prevent nurses and other healthcare professionals with responsibility for respiratory care from feeling isolated in general practice, they provide support and clinical supervision and help practitioners gain confidence in their role," she said.

Tricia Bryant, PCRS-UK Operations Director, said PCRS-UK supported affiliated groups by promoting meetings on the PCRS-UK website and emailing out agendas and was keen to share new ideas and news of successful meetings in *Primary Care Respiratory Update*.

Everyone at the meeting agreed that they would become "buddies" to support and inspire fellow leaders setting up new groups. Carol said buddies were a point of contact for new leaders and were a "friendly face" available on email or at the end of a phone to answer questions.

Dr Steve Holmes, GP and PCRS-UK Education Lead and Allwin Mercer, nurse practitioner and Clinical Lead nurse North West Reading Clinical Commissioning Group, ran an interactive workshop on how leaders can get the most out of their meetings.

Their tips for facilitating meetings included:

- Prepare before the meeting - make sure your speakers know what they are expected to do so there are no surprises
- Set the ground rules early e.g. how you are going to manage questions
- Try to involve everybody in the meeting with everything that is happening
- Concentrate, never relax and get up close to any trouble in the group
- Clarity is important: listen to what people are saying, appreciate the diversity in the group but seek clarity and simplicity

Their tips for chairing meetings included:

- Agree the aims of the meeting with group
- Delegate note keeping
- Encourage everyone to participate (and keep control)
- Listen to contributions (don't dominate)
- Look for positive solutions rather than negative acceptance
- Summarise action points at the end
- Make sure you finish on time

Steve also set out some sensitive ways of dealing with difficult delegates. These included silencing chatterers at the back of the meeting by moving up close and standing directly behind them, attempting to understand a person's "issues" over coffee, and directing attention

away from a dominant attendee by asking to hear the views of other people in the group.

Beverley Bostock Cox, nurse practitioner and Clinical Lead, Education for Health, gave a presentation on preparing for revalidation and how PCRS-UK tools can be used to support group members. "PCRS-UK has lots of really good resources to help you with revalidation," she said. She highlighted the PCRS-UK opinion sheets, practice improvement sheets, the new PCRS-UK skills checklist and the new PCRS-UK Guide to Reflective Practice

Carol Stonham presented the results of a PCRS-UK nurse survey on education and explained how they could be used by nurses to make their case for training either with their practice or Clinical Commissioning Group.

Feedback from the meeting has been very positive with participants highlighting the highly relevant content and the enthusiasm, camaraderie and collaboration of the group as key factors in making the meeting enjoyable, inspiring and supportive.

All the speaker presentations from the meeting can be downloaded at https://www.pcrs-uk.org/leaders-events

Enthusiastic new PCRS-UK affiliated group launches in North Shields


Francesca Robinson talks to **Judith Lawrence**

A new multidisciplinary PCRS-UK affiliated group has launched in North Shields after Dr Caroline Sprake, Clinical Commissioning Group Long Term Conditions Lead, purchased PCRS-UK membership for the respiratory lead in every practice in the locality.

Early topics for discussion are a new local COPD guideline, some recent local inhaled therapy formulary changes and a review of respiratory education and reflection linked to Nursing and Midwifery Council (NMC) revalidation.

At the first meeting Dr Sprake presented some new clinical respiratory data and there was a useful discussion around how the data could be used to improve practice and generate audit opportunities.

The group's chair Judith Lawrence, Nurse Practitioner, Collingwood Health Group, North Shields, says securing the funding for 23 PCRS-UK memberships has been the catalyst for the setting up the group, which will offer a forum for healthy discussion and debate.

"There is a practice nurse forum in the area but they have a broad agenda so it's good that we now have a respiratory group that is multidisciplinary.

"It has been a challenge setting up this group but now we have launched, it is generating a lot of discussion, emails and enthusiasm. The benefit of having a local respiratory group is that it enables you to hear what other people are doing and take inspiration and ideas from their good work back to your own practice.

"The key for our success has been having the resources of PCRS-UK to hand and the opportunity to network with other respiratory healthcare professionals."

PCRS-UK is able to support affiliated groups by sending out emails and advertising meetings on the PCRS-UK website. There are also meetings for group leaders to provide them with help and support in running their groups.

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PCRS-UK leadership programme inspires two practice nurse entrepreneurs to aim high

Francesca Robinson reports on the development of a respiratory social enterprise by two PCRS-UK members inspired by the PCRS-UK respiratory leaders programme

Two practice nurses plan to launch a general practice respiratory care service after gaining essential business skills and confidence from attending the PCRS-UK Respiratory Clinical Leadership Programme.

Melissa Canavan and Sarah Anderson, both from Leeds, have spotted a need for improved care in their area which has a high prevalence of COPD and some of the worst respiratory outcomes in the country.

There is a shortage of practice nurses and Melissa and Sarah say local data show there is a need to improve care in practices which either have no practice nurse or have a nurse with little respiratory expertise. They argue such a service could reduce hospital admissions, reduce the cost of medicines and lower smoking cessation rates. These are the goals they have already achieved in their own practices.

They are aiming to win a contract from Leeds and South East Clinical Commissioning Group (CCG) next year and plan to employ a team of practice nurses to go in to practices with no specialist respiratory nursing to do patient reviews and standardise care.

The nurses have already successfully pitched for funds and business support from two community foundations and set up a social enterprise, found themselves a solicitor and an accountant and opened a bank account. They have begun to liaise with commissioners and are now seeking start-up funds for equipment and marketing costs and to train their new team of nurses.

The pair have already made a difference locally not only by improving respiratory care in their own practices but also by setting up the Leeds Respiratory Network in 2013. The idea for the network was also inspired by the Respiratory Leaders Programme.

As well as holding regular meetings the network sends out weekly emails updating members with latest developments and guidance in respiratory care. There are 80 people on their emailing list and 800 followers on Facebook and Twitter. Their ethos has been to develop a community of respiratory clinicians sharing good practice to improve respiratory care.

Melissa says: "*I first went to a PCRS-UK Respiratory Leaders Workshop in June 2013 and again in July 2014. Last November they asked me to facilitate and then in January to join the management team. Now I am helping to organise the meetings.*

"*The PCRS-UK Respiratory Leaders Workshop has given me new skills such as understanding how to use data, make a case for change, engage stakeholders and why it is important to have a vision, a mission and values. The meetings also provide valuable networking opportunities – every time I go I find out about a new service or something that is really innovative and say to myself – I want that in Leeds.*

"*I have attended my local CCG meetings ever since it was set up and this insight together with the support of the PCRS-UK Respiratory Leaders Workshops has made me realise that there are opportunities out there and that you can influence the system. If it wasn't for PCRS-UK none of this would have happened.*"

PCRS-UK clinical leadership programme

Key skills learned include:

- Learning styles and how people work in a team
- Making a case for change
- Stakeholder mapping, effective influencing
- Practical project management
- Business case development
- Chairing a board or a meeting
- Being effective by using policy

PCRS-UK leadership programme 2016

Noel Baxter looks ahead at plans for the 2016 Respiratory Leaders programme

The PCRS-UK respiratory clinical leadership programme offers a rolling three year course of workshops and in 2016 the clinical focus will be on identifying and working with high-risk people with COPD and asthma.

Those identified as high risk or with severe disease often have complex needs that may require a different way of working that will impact on us as individuals and in our organisations. We will look at where we are now since the original seminal work by Impress on Living and Dying with COPD.[1]

We will explore how to work in an integrated way with social care, hospital and community teams and voluntary organisations. As we go in to 2016 we will see the architecture of the NHS continuing to change and there will be a requirement for respiratory leaders to understand what their population want, whether it be at practice, Clinical Commissioning Group (CCG) or health board level. We will support and guide those who want to build networks and develop the skills to work beyond their practices.

Along with clinical topics we will be teaching delegates the management tools, knowledge and skills to drive improvements for patients with respiratory disease in their area. This will include stakeholder mapping, influencing your commissioners or organisation leads. We will look at the latest data that can help you make a case when you know that it is time to deliver care in a different way.

We will also teach you the professional skills such as how to chair a meeting, working better with people in your work group, understanding your team to enable you to lead better, understanding your own leadership style and how to resolve conflict or work with difficult people.

We run two residential workshops a year (from Friday lunchtime to Saturday afternoon) and the meetings are free for PCRS-UK members. Each year about 50 per cent of attendees return and they support the newcomers. At the beginning of the meeting we find out what everyone's needs are and what they want to get out of the sessions. We check back regularly to make sure we are meeting those requirements.

We try to cater for everyone – both the type of person who wants to develop confidence and understanding of clinical issues as well as the clinician who wants to take away a template for a business case. We aim to work to everyone's strengths and weaknesses.

These meetings are an opportunity to express those things that people find very exciting and positive but also scenarios that might have been very upsetting and difficult. This allows people to work through these workplace issues in a safe environment and to build up the confidence and expertise to go back and do things in a different way.

In 2016 we will be teaching attendees about the exciting new campaigns for improving respiratory health that PCRS-UK is planning to take forward. We will be giving the group specific tools that will enable them to go out and support the campaigns. Our respiratory leaders are always enthusiastic people and we see them as our agents who will be able to help us to promote our campaigns.

Standard items at the events include a policy update from Bronwen Thompson, a session where people practice presenting, and an opportunity to learn critical analysis of research papers.

The workshops, run by experienced clinical leaders, provide a friendly and supportive environment in which to develop and practice a range of skills and an opportunity to network with like-minded colleagues both during and after the meetings.

Clinicians who participate in the workshops regularly over a 2-3 year period will build the breadth and depth of skills and knowledge that they will need to be an effective respiratory leader with the capability and passion to make difference for their patients.

Those people who may not think of themselves as leaders will find this a supportive environment in which to learn new skills which will enable them to be influential both within and beyond the practice. Many of the current leaders in PCRS-UK are "graduates" of the Respiratory Leaders programme.

Reference

1. IMPRESS guide for commissioners on supportive and end of life care for people with COPD. April 2012. http://www.impressresp.com/index.php?option=com_content&view=article&id=47&Itemid=41#sthash.ewxIKXCy.dpuf

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PERSPECTIVE **OPEN**

Four patients with a history of acute exacerbations of COPD: implementing the CHEST/Canadian Thoracic Society guidelines for preventing exacerbations

Ioanna Tsiligianni[1,2], Donna Goodridge[3], Darcy Marciniuk[4], Sally Hull[5] and Jean Bourbeau[6]

The American College of Chest Physicians and Canadian Thoracic Society have jointly produced evidence-based guidelines for the prevention of exacerbations in chronic obstructive pulmonary disease (COPD). This educational article gives four perspectives on how these guidelines apply to the practical management of people with COPD. A current smoker with frequent exacerbations will benefit from support to quit, and from optimisation of his inhaled treatment. For a man with very severe COPD and multiple co-morbidities living in a remote community, tele-health care may enable provision of multidisciplinary care. A woman who is admitted for the third time in a year needs a structured assessment of her care with a view to stepping up pharmacological and non-pharmacological treatment as required. The overlap between asthma and COPD challenges both diagnostic and management strategies for a lady smoker with a history of asthma since childhood. Common threads in all these cases are the importance of advising on smoking cessation, offering (and encouraging people to attend) pulmonary rehabilitation, and the importance of self-management, including an action plan supported by multidisciplinary teams.

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CASE STUDY 1: A 63-YEAR-OLD MAN WITH MODERATE/SEVERE COPD AND A CHEST INFECTION

A 63-year-old self-employed plumber makes a same-day appointment for another 'chest infection'. He caught an upper respiratory tract infection from his grandchildren 10 days ago, and he now has a productive cough with green sputum, and his breathlessness and fatigue has forced him to take time off work.

He has visited his general practitioner with similar symptoms two or three times every year in the last decade. A diagnosis of COPD was confirmed 6 years ago, and he was started on a short-acting β_2-agonist. This helped with his day-to-day symptoms, although recently the symptoms of breathlessness have been interfering with his work and he has to pace himself to get through the day. Recovering from exacerbations takes longer than it used to—it is often 2 weeks before he is able to get back to work—and he feels bad about letting down customers. He cannot afford to retire, but is thinking about reducing his workload.

He last attended a COPD review 6 months ago when his FEV_1 was 52% predicted. He was advised to stop smoking and given a prescription for varenicline, but he relapsed after a few days and did not return for the follow-up appointment. He attends each year for his 'flu vaccination'. His only other medication is an ACE inhibitor for hypertension.

Managing the presenting problem. Is it a COPD exacerbation?

A COPD exacerbation is defined as 'an acute event characterised by a worsening of the patient's respiratory symptoms that is beyond normal day-to-day variation and leads to change in medications'.[1,2] The worsening symptoms are usually increased dyspnoea, increased sputum volume and increased sputum purulence.[1,2] All these symptoms are present in our patient who experiences an exacerbation triggered by a viral upper respiratory tract infection—the most common cause of COPD exacerbations. Apart from the management of the acute exacerbation that could include antibiotics, oral steroids and increased use of short-acting bronchodilators, special attention should be given to his on-going treatment to prevent future exacerbations.[2] Short-term use of systemic corticosteroids and a course of antibiotics can shorten recovery time, improve lung function (forced expiratory volume in one second (FEV_1)) and arterial hypoxaemia and reduce the risk of early relapse, treatment failure and length of hospital stay.[1,2] Short-acting inhaled β_2-agonists with or without short-acting anti-muscarinics are usually the preferred bronchodilators for the treatment of an acute exacerbation.[1]

Reviewing his routine treatment

One of the concerns about this patient is that his COPD is inadequately treated. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) suggests that COPD management be based on a combined assessment of symptoms, GOLD classification of airflow limitation, and exacerbation rate.[1] The modified Medical Research Council (mMRC) dyspnoea score[3] or the COPD Assessment Tool (CAT)[4] could be used to evaluate the symptoms/health status. History suggests that his breathlessness has begun to interfere with his lifestyle, but this has not been formally asssessed since the diagnosis 6 years ago. Therefore, one would like to be certain that these elements are taken into consideration in future

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Patient category C High risk few symptoms GOLD 3–4 Exacerbations ≥2/year or ≥ 1 admission CAT score <10 mMRC 0–1	**Patient category D** High risk many symptoms GOLD 3–4 Exacerbations ≥2/year or ≥1 admission CAT score ≥10 mMRC ≥2
Patient category A Low risk few symptoms GOLD 1–2 Exacerbations ≤1/year CAT score <10 mMRC 0–1	**Patient category B** Low risk many symptoms GOLD 1–2 Exacerbations ≤1/year CAT score ≥10 mMRC ≥2

Figure 1. The four categories of COPD based on assessment of symptoms and future risk of exacerbations (adapted by Gruffydd-Jones,[5] from the Global Strategy for Diagnosis, Management and Prevention of COPD).[1] CAT, COPD Assessment Tool; COPD, chronic obstructive pulmonary disease; mMRC, modified Medical Research Council Dyspnoea Scale.

management by involving other members of the health care team. The fact that he had two to three exacerbations per year puts the patient into GOLD category C–D (see Figure 1) despite the moderate airflow limitation.[1,5] Our patient is only being treated with short-acting bronchodilators; however, this is only appropriate for patients who belong to category A. Treatment options for patients in category C or D should include long-acting muscarinic antagonists (LAMAs) or long-acting β_2-agonists (LABAs), which will not only improve his symptoms but also help prevent future exacerbations.[2] Used in combination with LABA or LAMA, inhaled corticosteroids also contribute to preventing exacerbations.[2]

Prevention of future exacerbations

Exacerbations should be prevented as they have a negative impact on the quality of life; they adversely affect symptoms and lung function, increase economic cost, increase mortality and accelerate lung function decline.[1,2] Figure 2 summarises the recommendations and suggestions of the joint American College of Chest Physicians and Canadian Thoracic Society (CHEST/CTS) Guidelines for the prevention of exacerbations in COPD.[2] The grades of recommendation from the CHEST/CTS guidelines are explained in Table 1.

Pharmacological approach

In patients with moderate-to-severe COPD, the use of LABA or LAMA compared with placebo or short-acting bronchodilators is recommended to prevent acute exacerbations (Grades 1B and 1A, respectively).[2,6,7] LAMAs are associated with a lower rate of exacerbations compared with LABAs (Grade 1C).[2,6] The inhaler technique needs to be checked and a suitable device selected. If our patient does not respond to optimizing inhaled medication and continues to have two to three exacerbations per year, there are additional options that offer pulmonary rehabilitation and other forms of pharmacological therapy, such as a macrolide, theophylline, phosphodieseterase (PDE4) inhibitor or *N*-acetylo-cysteine/carbocysteine,[2] although there is no information about their relative effectiveness and the order in which they should be prescribed. The choice of prescription should be guided by the risk/benefit for a given individual, and drug availability and/or cost within the health care system.

Non-pharmacological approach

A comprehensive patient-centred approach based on the chronic care model could be of great value.[2,8]

This should include the following elements

- Vaccinations: the 23-valent pneumococcal vaccine and annual influenza vaccine are suggested as part of the overall medical management in patients with COPD.[2] Although there is no clear COPD-specific evidence for the pneumococcal vaccine and the evidence is modest for influenza, the CHEST/CTS Guidelines concur with advice of the World Health Organization (WHO)[9] and national advisory bodies,[10–12] and supports their use in COPD patients who are at risk for serious infections.[2]
- Smoking cessation (including counselling and treatment) has low evidence for preventing exacerbations (Grade 2C).[2] However, the benefits from smoking cessation are outstanding as it improves COPD prognosis, slows lung function decline and improves the quality of life and symptoms.[1,2,13,14] Our patient has struggled to quit in the past; assessing current readiness to quit, and encouraging and supporting a future attempt is a priority in his care.
- Pulmonary rehabilitation (based on exercise training, education and behaviour change) in people with moderate-to-very-severe COPD, provided within 4 weeks of an exacerbation, can prevent acute exacerbations (Grade 1C).[2] Pulmonary rehabilitation is also an effective strategy to improve symptoms, the quality of life and exercise tolerance,[15,16] and our patient should be encouraged to attend a course.
- Self-management education with a written action plan and supported by case management providing regular direct access to a health care specialist reduces hospitalisations and prevents severe acute exacerbations (Grade 2C).[2] Some patients with good professional support can have an emergency course of steroids and antibiotics to start at the onset of an exacerbation in accordance with their plan.

Finally, close follow-up is needed for our patient as he was inadequately treated, relapsed from smoking cessation after a few days despite varenicline, and missed his follow-up appointment. A more alert health care team may have been able to identify these issues, avoid his relapse and take a timely approach to introducing additional measures to prevent his recurrent acute exacerbations.

CASE STUDY 2: A 74-YEAR-OLD MAN WITH VERY SEVERE COPD LIVING ALONE IN A REMOTE COMMUNITY

A 74-year-old man has a routine telephone consultation with the respiratory team. He has very severe COPD (his FEV_1 2 years ago was 24% of predicted) and he copes with the help of his daughter who lives in the same remote community. He quit smoking the previous year after an admission to the hospital 50 miles away, which he found very stressful. He and his family managed another four exacerbations at home with courses of steroids and antibiotics, which he commenced in accordance with a self-management plan provided by the respiratory team.

His usual therapy consists of regular long-acting β_2-agonist/inhaled steroid combination and a long-acting anti-muscarinic. He has a number of other health problems, including coronary heart disease and osteoarthritis and, in recent times, his daughter

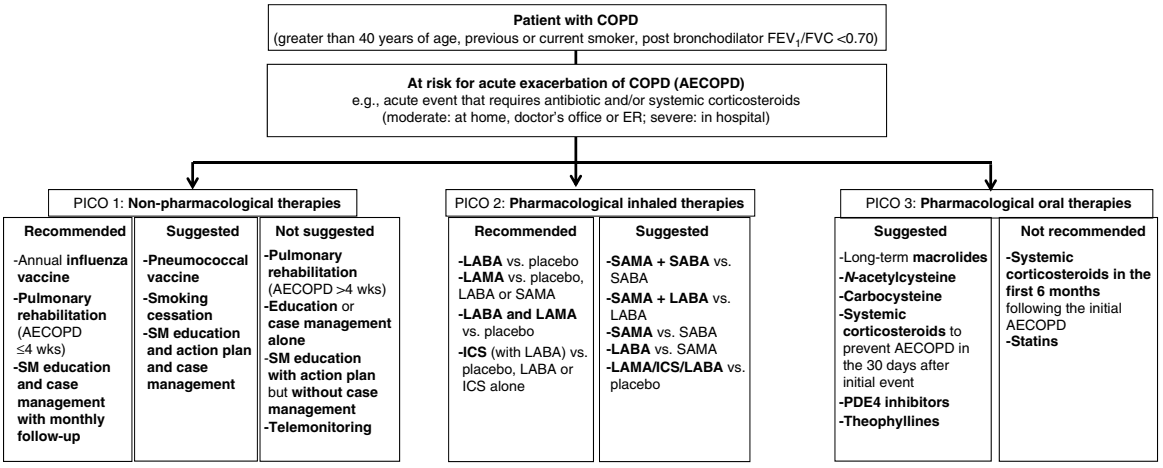

Figure 2. Decision tree for prevention of acute exacerbations of COPD (reproduced with permission from the CHEST/CTS Guidelines for the prevention of exacerbations in COPD).[2] This decision tree for prevention of acute exacerbations of COPD is arranged according to three key clinical questions using the PICO format: non-pharmacologic therapies, inhaled therapies and oral therapies. The wording used is 'Recommended or Not recommended' when the evidence was strong (Level 1) or 'Suggested or Not suggested' when the evidence was weak (Level 2). CHEST/CTS, American College of Chest Physicians and Canadian Thoracic Society; COPD, chronic obstructive pulmonary disease; FEV_1, forced expiratory volume in one second; FVC, forced vital capacity; LABA, long-acting β-agonist; LAMA, long-acting muscarinic antagonist; ICS, inhaled corticosteroids; SAMA, short-acting muscarinic antagonist; SABA, short-acting β-agonist; SM, self-management.

Table 1. Summary of the grading system used in the CHEST/CTS guidelines for preventing exacerbations of COPD

Strength of recommendation	*Strength of evidence*	*Balance of benefits versus risk*	*Implication for clinicians*
1—Strong recommendation	A—High quality B—Moderate quality C—Low quality	Benefits clearly outweigh risks and burdens (or vice versa)	Strong recommendation, applies to most patients in most circumstances May change if higher quality evidence becomes available
2—Weak recommendation	A—High quality B—Moderate quality C—Low quality	Benefits closely balanced with risks and burden	Weak recommendation, best action may differ depending on circumstances Other alternatives may be equally reasonable

Abbreviations: CHEST/CTS, American College of Chest Physicians and Canadian Thoracic Society; COPD, chronic obstructive pulmonary disease.
Adapted from Guyatt *et al.*[49]

has become concerned that he is becoming forgetful. He manages at home by himself, steadfastly refusing social help and adamant that he does not want to move from the home he has lived in for 55 years.

This is a common clinical scenario, and a number of important issues require attention, with a view to optimising the management of this 74-year-old man suffering from COPD. He has very severe obstruction, is experiencing frequent acute flare-ups, is dependent and isolated and has a number of co-morbidities. To work towards preventing future exacerbations in this patient, a comprehensive plan addressing key medical and self-care issues needs to be developed that accounts for his particular context.

Optimising medical management

According to the CHEST/CTS Guidelines for prevention of acute exacerbations of COPD,[2] this patient should receive an annual influenza vaccination and may benefit from a 23-valent pneumococcal vaccine (Grades 1B and 2C, respectively). Influenza infection is associated with greater risk of mortality in COPD, as well as increased risk of hospitalisation and disease progression.[1] A diagnosis of COPD also increases the risk for pneumococcal disease and related complications, with hospitalisation rates for patients with COPD being higher than that in the general population.[10,17] Although existing evidence does not support the use of this vaccine specifically to prevent exacerbations of COPD,[1] administration of the 23-valent pneumococcal vaccine is recommended as a component of overall medical management.[9–12]

Long-term oxygen therapy has been demonstrated to improve survival in people with chronic hypoxaemia;[18] it would be helpful to obtain oxygen saturation levels and consider whether long-term oxygen therapy would be of benefit to this patient.

Even though this patient is on effective medications, further optimisation of pharmacologic therapy should be undertaken, including reviewing administration technique for the different inhaler devices.[19] Maintenance PDE4 inhibitors, such as roflumilast or theophyllines, long-term macrolides (i.e., azithromycin) or oral *N*-acetylcysteine are potential considerations. Each of these therapeutic options has demonstrated efficacy in preventing future acute exacerbations, although they should be used with caution in this frail elderly man.[2] This patient would benefit from a review of co-morbidities, including a chest X-ray, electrocardiogram, memory assessment and blood tests including haemoglobin, glucose, thyroid and renal function assessments.

Pulmonary rehabilitation, supported self-management and tele-health care

Pulmonary rehabilitation for patients who have recently experienced an exacerbation of COPD (initiated <4 weeks following the

exacerbation) has been demonstrated to prevent subsequent exacerbations (Grade 1C).[2] Existing evidence suggests that pulmonary rehabilitation does not reduce future exacerbations when the index exacerbation has occurred more than 4 weeks earlier;[2] however, its usefulness is evident in other important patient-centred outcomes such as improved activity, walking distance and quality of life, as well as by reduced shortness of breath. It would be appropriate to discuss this and enable our patient to enrol in pulmonary rehabilitation.

The patient's access to pulmonary rehabilitation in his remote location, however, is likely to be limited. Several reports have noted that only one to two percent of people with COPD are able to access pulmonary rehabilitation programmes within Canada,[20] the United States[21] and the United Kingdom.[22] Alternatives to hospital-based pulmonary rehabilitation programmes, such as home-based programmes or programmes offered via tele-health, may be options for this patient.[23] Home-based pulmonary rehabilitation programmes have been found to improve exercise tolerance, symptom burden and quality of life.[24–27] Outcomes of a pulmonary rehabilitation programme offered via tele-health have also been found to be comparable to those of a hospital-based programme,[28] and may be worth exploring.

Written self-management (action) plans, together with education and case management, are suggested in the CHEST/CTS guidelines as a strategy to reduce hospitalisation and emergency department visits attributable to exacerbations of COPD (Grade 2B).[2] Our patient has an existing action plan, which has enabled him and his family to manage some exacerbations at home. Although the patient has likely had some education on COPD and its management in the past, on-going reinforcement of key principles may be helpful in preventing future exacerbations.

The self-management plan should be reviewed regularly to ensure the advice remains current. The patient's ability to use the self-management plan safely also needs to be assessed, given his daughter's recent observation of forgetfulness and his living alone. Cognitive impairment is being increasingly recognised as a significant co-morbidity of COPD.[29,30] Patients who were awaiting discharge from hospital following an exacerbation of COPD were found to perform significantly worse on a range of cognitive functional measures than a matched group with stable COPD, a finding that persisted 3 months later.[29] Cognitive impairment may contribute independently to the risk for future exacerbations by increasing the likelihood of incorrect inhaler device use and failure to adhere to recommended treatments.[29]

Given that this patient resides in a remote location, access to case management services that assist in preventing future exacerbations may be difficult or impossible to arrange. Although there is currently insufficient evidence that in general the use of telemonitoring contributes to the prevention of exacerbations of COPD,[2] tele-health care for this remotely located patient has potential to allow for case management at a distance, with minimal risk to the patient. Further study is needed to address this potential benefit.

Assessing for and managing frailty

Recognising this patient's co-morbid diagnoses of coronary heart disease and osteoarthritis, careful assessment of functional and self-care abilities would be appropriate. Almost 60% of older adults with COPD meet the criteria for frailty.[31] Frailty is defined as a dynamic state associated with decline of physiologic reserves in multiple systems and inability to respond to stressful insults.[32] Frailty is associated with an increased risk for institutionalisation and mortality.[33,34] Given the complex needs of those who are frail, screening this patient for frailty would constitute patient-centred and cost-effective care. Frailty assessment tools, such as the seven-point Clinical Frailty Index,[35] may provide structure to this assessment.

Admission to a hospital 50 miles away from our patient's home last year for an exacerbation was stressful. Since his hospitalisation, this patient has experienced four additional exacerbations that have been managed at home in his remote community. It would be appropriate to explore the patient's treatment wishes and determine whether the patient has chosen to refuse further hospitalisations. Our patient's risk of dying is significant, with risk factors increasing the risk of short-term mortality following an exacerbation of COPD (GOLD Stage 4, age, male sex, confusion).[36] Mortality rates between 22 and 36% have been documented in the first and second years, respectively, following an exacerbation,[37,38] which also increase with the frequency and severity of hospitalisations.[39]

Our patient has refused social help and does not want to be relocated from his home. Ageing in their own home is a key goal of many older adults.[40,41] Efforts to ensure that adequate resources to support the patient are available (and to support the daughter who is currently providing a lot of his care) will form an important part of the plan of care.

CASE STUDY 3: A 62-YEAR-OLD WOMAN WITH SEVERE COPD ADMITTED WITH AN EXACERBATION

A 62-year-old lady is admitted for the third time this year with an acute exacerbation of her severe COPD. Her FEV_1 was 35% predicted at the recent outpatient visit. She retired from her job as a shop assistant 5 years ago because of her breathlessness and now devotes her time to her grandchildren who 'exhaust her' but give her a lot of pleasure.

She quit smoking 5 years ago. Over the years, her medication has increased, as nothing seemed to relieve her uncomfortable breathlessness, and, in addition to inhaled long-acting β_2-agonist/inhaled steroid combination and a long-acting anti-muscarinic, she is taking theophylline and carbocysteine, although she is not convinced of their beneficial effect. Oral steroid courses help her dyspnoea and she has taken at least six courses this year: she has an action plan and keeps an emergency supply of medication at home.

A secondary care perspective on the management strategy for this woman

Acute exacerbations of COPD have serious negative consequences for health care systems and patients. The risk of future events and complications, such as hospital admission and poor patient outcomes (disability and reduced health status), can be improved through a combination of non-pharmacological and pharmacological therapies.[2]

Evaluation of the patient, risk assessment and adherence to medication

The essential first step in the management of this lady (as for any patient) includes a detailed medical evaluation. Our patient has a well-established diagnosis of COPD with severe airflow obstruction (GOLD grade 3), significant breathlessness that resulted in her retiring from her job, and recurrent exacerbations. She does not have significant co-morbidity, although this requires to be confirmed. Further to the medical evaluation, it is important to assess her actual disease management (medication and proper use) as well as making sure she has adopted a healthy lifestyle (smoking cessation, physical activities and exercise). Does she live in a smoke-free environment? Effect of and evidence for smoking cessation in the prevention of acute exacerbations of COPD is low, but evidence exists for a reduction in cough and phlegm after smoking cessation and less lung function decline upon sustained cessation. With respect to the medication, never assume that it is taken as prescribed. When asking the patient, use open questions such as 'I would like to hear how you take your medication on a

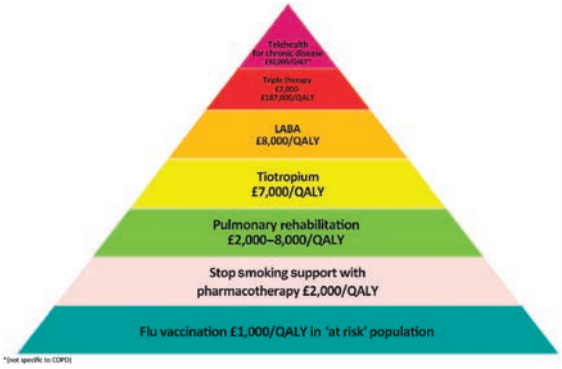

Figure 3. The COPD value pyramid (developed by the London Respiratory Network with The London School of Economics and reproduced with permission from the London Respiratory Team report 2013).[48] This 'value' pyramid reflects what we currently know about the cost per QALY of some of the commonest interventions in COPD. It was devised as a tool for health care organisations to use to promote audit and to ensure adequate commissioning of non-pharmacological interventions. COPD, chronic obstructive pulmonary disease; LABA, long-acting β-agonist; QALY, quality-adjusted life-year.

typical day?' instead of 'Did you take the medication as prescribed'. Open questions tend to elicit more useful and pertinent information, and invite collaboration. Asking the patient to demonstrate her inhalation technique shows you the way she uses her different inhalation devices.

Optimising the pharmacological therapy

The second step is to assess whether the patient is on optimal treatment to prevent exacerbations. In other words, can we do better helping the patient manage her disease and improving her well-being. As in the previous cases, vaccination, in particular, annual administration of the influenza vaccine, should be prescribed for this lady. We should evaluate other alternatives of pharmacological therapy that could improve symptoms, prevent exacerbations and reduce the use of repeated systemic corticosteroids with their important adverse effects (such as osteoporosis, cataracts, diabetes). Prescribing a PDE4 inhibitor (Grade 2A) or a long-term macrolide (Grade 2A) once a day would be a consideration for this lady.[2] As there is no superiority trial comparing these two medications, our preference will be based on potential side effects, as well as cost and access to treatment. For PDE4 inhibitors, there are limited data on supplemental effectiveness in patients with COPD and chronic bronchitis concurrently using inhaled therapies, and they potentially have side effects such as diarrhoea, nausea, headache and weight loss. The side effects tend to diminish over time, but some patients may have to discontinue the therapy. Long-term macrolides have been studied in COPD patients already treated with inhaled therapies and shown to be effective, although clinicians need to consider in their individual patients the potential for harm, such as prolongation of the QT interval, hearing loss and bacterial resistance. Furthermore, the duration (beyond 1 year) and exact dosage of macrolide therapy (for example, once daily versus three times per week) are unknown.

Making non-pharmacological therapy an essential part of the management

The third step, often neglected in the management of COPD patients, is non-pharmacological therapy. For this lady, we suggest self-management education with a written action plan and case management to improve how she deals with exacerbations (Grade 2B).[2] The expectation will not be to reduce exacerbations but to prevent emergency department visits and hospital admissions. However, despite general evidence of efficacy,[42] not all self-management interventions have been shown to be effective or to benefit all COPD patients[43,44] (some have been shown to be potentially harmful[44]). The effectiveness of any complex intervention such as self-management in COPD critically depends on the health care professionals who deliver the intervention, as well on the patient and the health care system. The patient may not have the motivation or desire to change or to commit to an intensive programme. The individual patient's needs, preferences and personal goals should inform the design of any intervention with a behavioural component. For this lady, it is essential to apply integrated disease management and to refer the patient to a pulmonary rehabilitation programme. Pulmonary rehabilitation has high value, including reducing the risk for hospitalisation in COPD patients with recent exacerbations (Grade 1C).[2] The most important benefits our patient can expect from participating in structured supervised exercise within pulmonary rehabilitation are improved health status, exercise tolerance and a reduction in dyspnoea (Grade 1A).[2,15] Pulmonary rehabilitation programmes provide clinicians with an opportunity to deliver education and self-management skills to patients with COPD, and are well established as a means of enhancing standard therapy to control and alleviate symptoms, optimise functional capacity and improve health-related quality of life.

CASE STUDY 4: A 52-YEAR-OLD LADY WITH MODERATE COPD—AND POSSIBLY ASTHMA

A 52-year-old lady attends to discuss her COPD and specifically the problem she is having with exacerbations and time 'off sick'. She is a heavy smoker, and her progressively deteriorating lung function suggests that she has moderate COPD, although she also has a history of childhood asthma, and had allergic rhinitis as a teenager. Recent spirometry showed a typical COPD flow-volume loop, although she had some reversibility (250 ml and 20%) with a post-bronchodilator FEV_1 of 60% predicted.

She has a sedentary office job and, although she is breathless on exertion, this generally does not interfere with her lifestyle. The relatively frequent exacerbations are more troublesome. They are usually triggered by an upper respiratory infection and can take a couple of weeks to recover. She has had three exacerbations this winter, and as a result her employer is not happy with her sickness absence record and has asked her to seek advice from her general practitioner.

She has a short-acting β_2-agonist, although she rarely uses it except during exacerbations. In the past, she has used an inhaled steroid, but stopped that some time ago as she was not convinced it was helping.

It is a welcome opportunity when a patient comes to discuss her COPD with a particular issue to address. With a history of childhood asthma, and serial COPD lung function tests, she has probably been offered many components of good primary care for COPD, but has not yet fully engaged with her management. We know that ~40% of people with COPD continue to smoke, and many are intermittent users of inhaled medications.[45] It is easy to ignore breathlessness when both job and lifestyle are sedentary.

Understanding her diagnosis and setting goals

Her readiness to engage can be supported by a move to structured collaborative care, enabling the patient to have the knowledge, resources and support to make the necessary changes. Much of this can be done by the primary care COPD team, including the pharmacist. Regular recall to maintain engagement is essential.

The combination of childhood asthma, rhinitis and a long history of smoking requires diagnostic review. This might include serial peak flows over 2 weeks to look for variability, and a chest X-ray, if not done recently, to rule out lung cancer as a reason for recent exacerbations. Her spirometry suggests moderate COPD,[1,46] but she also has some reversibility, not enough to place her in the asthma camp but, combined with her past medical history, being enough to explore an asthma COPD overlap syndrome. This is important to consider as it may guide decisions on inhaled medication, and there is evidence that lung function deteriorates faster in this group.[47] It is estimated that up to 20% of patients have overlap diagnoses, although the exact prevalence depends on the definition.[48]

Reducing the frequency of exacerbations

Exacerbations in COPD are debilitating, often trigger hospital admission and hasten a progressive decline in pulmonary function.[2] Written information on interventions that can slow down the course of COPD and reduce the frequency and impact of exacerbations will help to support progressive changes in management.

Smoking cessation

Few people are unaware that cessation of smoking is the key intervention for COPD. Reducing further decline in lung function will slow down the severity of exacerbations. Finding a smoking cessation programme that suits her working life, exploring previous attempts at cessation, offering pharmacotherapy and a non-judgemental approach to further attempts at stopping are crucial.

Immunisations

Many, but not all, exacerbations of COPD are triggered by viral upper respiratory tract infections. Annual flu immunisation is a part of regular COPD care and reduces exacerbations and hospitalisation when flu is circulating (Grade 1B). Pneumococcal immunisation should be offered, although evidence for reducing exacerbations is weak; those with COPD will be at greater risk for pneumococcal infection.[2]

Pulmonary rehabilitation

Pulmonary rehabilitation improves symptoms, quality of life and reduces hospital admission.[49] It is most efficacious in patients who are symptomatic (MRC dyspnoea scale 3 and above) and in terms of reducing exacerbations is most effective when delivered early after an exacerbation (Grade 1C).[2] The major hurdle is encouraging patients to attend, with most programmes showing an attrition rate of 30% before the first appointment, and high rates of non-completion.[45,50] Effective programmes that maintain the gains from aerobic exercise are more cost-effective than some of the inhaled medications in use (see Figure 3).[50]

Medication

Inhaled medication is likely to improve our patient's breathlessness and contribute to a reduction in exacerbation frequency. Currently, she uses only a short-acting β_2-agonist. One wonders if she has a spacer? How much of the medicine is reaching her lungs? Repeated observation and training in inhaler use is essential if patients are to benefit from expensive medications.

With her history of asthma and evidence of some reversibility, the best choice of regular medication may be a combination of inhaled corticosteroid and a LABA. Guidelines suggest the asthma component in asthma COPD overlap syndrome should be the initial treatment target,[48] and a LABA alone should be avoided. Warn about oral thrush, and the increased risk for pneumonia.[46] If she chooses not to use an inhaled steroid, then a trial of a LAMA is indicated. Both drugs reduce exacerbation rates.[2,51]

Finally, ensuring early treatment of exacerbations speeds up recovery.[52] Prescribe rescue medication (a 5–7-day course of oral steroids and antibiotic) to be started when symptomatic, and encourage attendance at a post-exacerbation review.

CONTRIBUTIONS

IT, DG and DM, JB, SH wrote the perspectives on case studies 1, 2, 3 and 4, respectively. The handling editor (Hilary Pinnock) collated and edited the individual sections.

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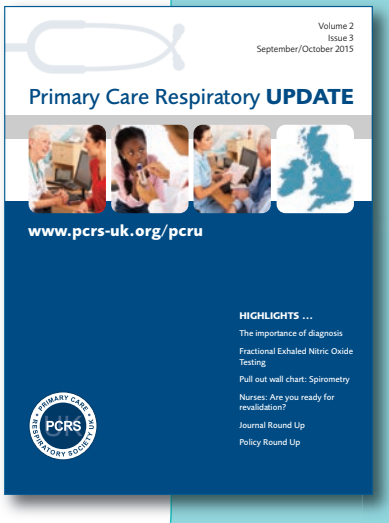

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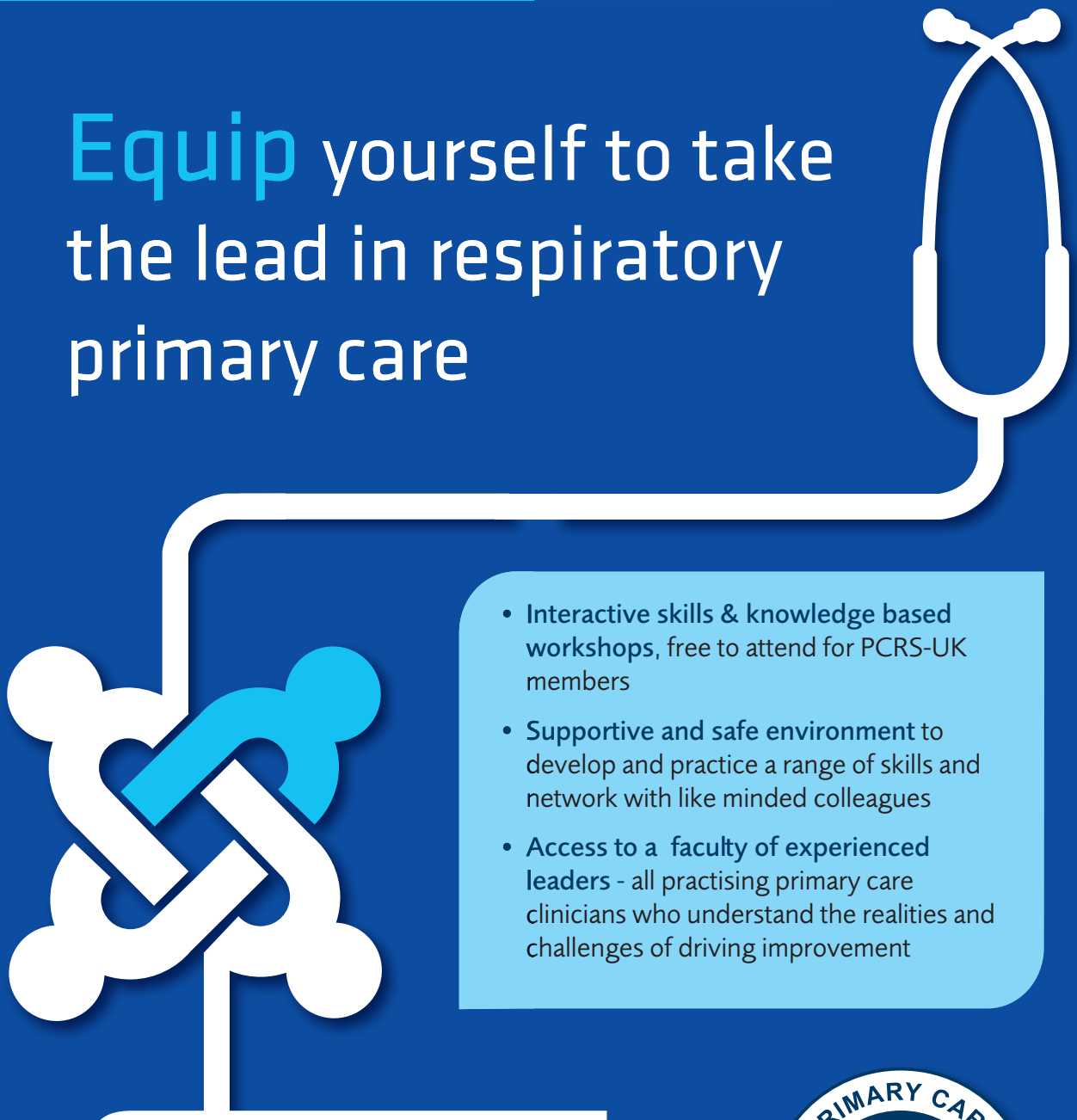

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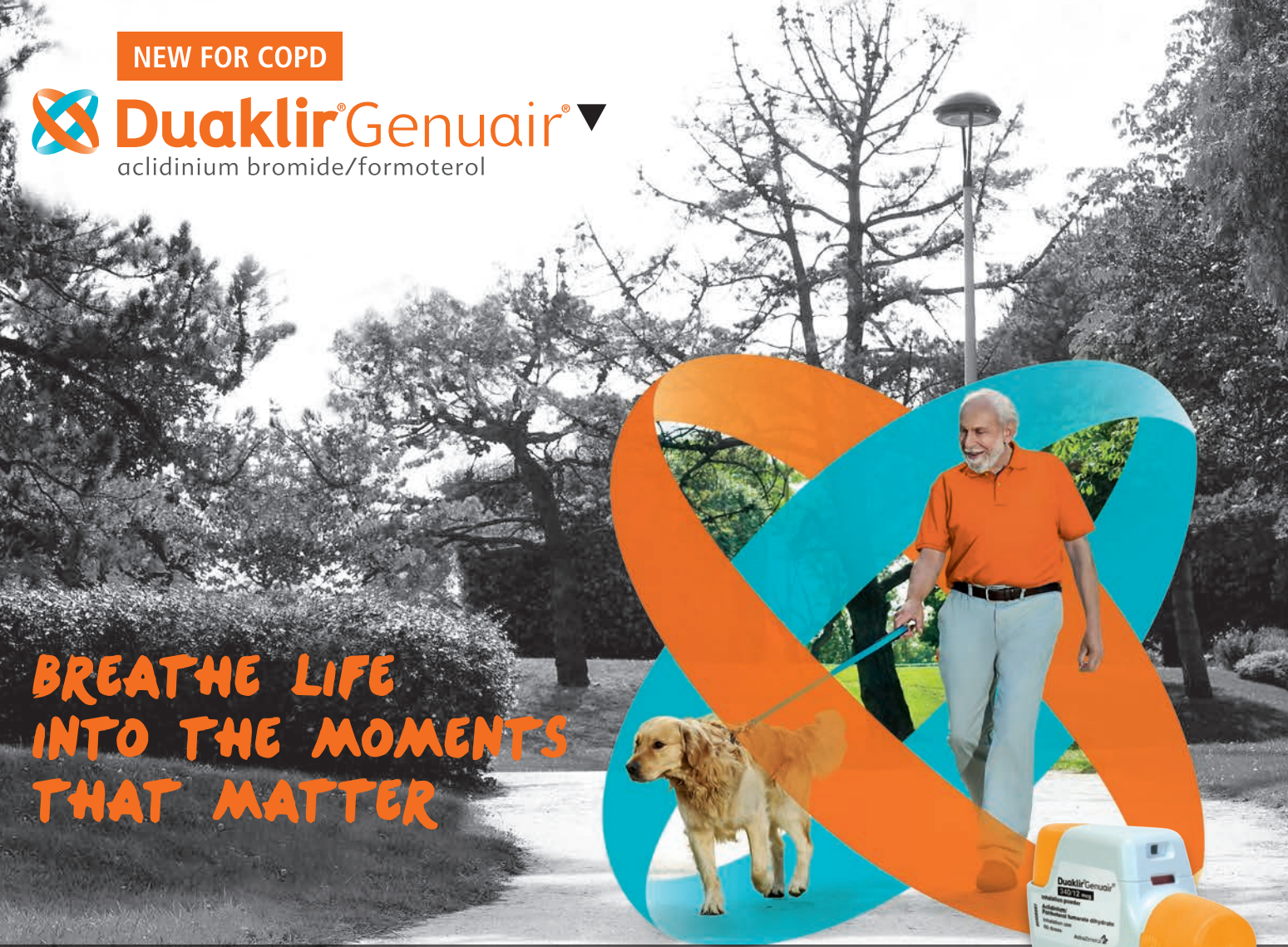

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References: 1. Duaklir® Genuair Summary of Product Characteristics. Södertälje, Sweden: Aztrazeneca AB. Revision date April 2015. **2.** Singh D, Jones P, Bateman E, *et al.* Efficacy and safety of aclidinium bromide/formoterol fumarate fixed-dose combinations compared with individual components and placebo in patients with COPD (ACLIFORM-COPD): a multicentre, randomised study. BMC Pulm Med. 2014;14:178. **3.** Singh D, Chapman KR, Make BJ, *et al.* LAC30-31: Effect of aclidinium bromide/formoterol fumarate fixed-dose combination (FDC) on night-time and early morning symptoms in COPD. Eur Respir J. 2014;44(Suppl 58):A2415.

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