Managing breathlessness and co-morbidity in COPD

M D L Morgan
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• Diagnosis and management of COPD
• Co-morbidity and COPD
• Integrated care and commissioning of COPD as a long term condition
Question 1

Worldwide, what percentage of COPD is caused by cigarette smoking?

1. 99%
2. 95%
3. 85%
4. 70%
Question 2

What percentage of cigarette smokers develop COPD?

1. 85%
2. 65%
3. 40%
4. 15%
Question 3

What percentage of patients with COPD have at least one co-morbid condition?

1. 90%
2. 80%
3. 65%
4. 50%
Question 4

What is the strongest predictor of mortality in COPD?

1. FEV1
2. 6MWD
3. Physical activity level
4. Body mass index
Chronic Obstructive Pulmonary Diseases (COPDs)

- A chronic, slowly progressive disorder characterised by airflow obstruction (reduced FEV1 and FEV1/FVC ratio), which does not change markedly over several months.
- Symptoms include dyspnoea and cough
- Most of the lung function is fixed, although some reversibility can be produced by bronchodilator (or other) therapy.
- Component disorders: - emphysema, chronic bronchitis, asthma
- Causes: - cigarette smoking, coal mining, biomass smoke exposure, anti protease deficiency
Smoking does not always cause COPD!
COPD: chronic, slowly progressive disorders characterised by airflow obstruction (reduced FEV1 and FEV1/FVC ratio), which does not change markedly over several months.
Pattern of decline in chronic lung disease

Lung function

Dyspnoea
Functional performance
Exacerbations

$t$
Followed 17,304 patients for 17 years after first hospital admission

50% died within 3.6 years
75% died within 7.7 years
Delayed or inaccurate diagnosis

- Estimated nearly 3.7 million sufferers
- Only 900,000 diagnosed
- 85% patients with COPD have had missed diagnostic opportunities up to 20 years prior to diagnosis
- Approximately 10-30% of COPD patients admitted to hospital have new diagnosis
COPD: Same FEV1, different pathologies
COPD stratification

• Eosinophilic airway inflammation
  – Response to corticosteroids

• Emphysema
  – Lung volume reduction

• Frequent exacerbations
  – Macrolide antibiotics
The components of care for COPD (NICE)

End of life care
Oxygen therapy
Exacerbation management
Rehabilitation
 Supported self management
Drug therapy
Accurate diagnosis
Smoking cessation

Co-morbid conditions
Cardiac
Metabolic
Nutritional
Osteoporosis
Anxiety/depression
Bronchiectasis
Lung cancer
Asthma (ACOS)
The components of care for COPD

- End of life Care
- Oxygen therapy
- Exacerbation management
- Rehabilitation
- Accurate diagnosis
- Smoking cessation
- Supported Self Management
- Drug therapy

Co-morbid conditions

- Cardiac
- Metabolic
- Nutritional
- Osteoporosis
- Anxiety/depression
- Bronchiectasis
- Lung cancer
- Asthma (ACOS)
Inhalers Today – Know your medicines!

- Long-acting Muscarinic Antagonist (LAMA)
- Inhaled Corticosteroids (ICS)
- Long-acting Beta-2 agonists (LABA)
# Medicines Management of Stable COPD

## TASK 1
Confirm diagnosis of COPD; clinical syndrome with confirmatory obstructive spirometry (post-bronchodilator FEV₁/FVC<0.7). Exclude diagnosis of asthma (variable chest tightness, wheeze, cough and breathlessness; night-time waking; significant diurnal variation of symptoms and peak expiratory flow; symptoms related to work; normalisation of spirometry after inhaled β₂-agonist or a course of inhaled/oral corticosteroids). Check for other co-existing conditions e.g., cardiac failure, bronchiectasis, anaemia; manage appropriately.

## TASK 2
Stop Smoking: All patients still smoking, regardless of age, should be encouraged to stop, and offered help to do so, at every opportunity (refer to local stop smoking programme).

## TASK 3
Record MRC dyspnoea score. Offer Pulmonary Rehabilitation to patients with MRC score >2. All patients should be offered lifestyle e.g., exercise and nutrition advice.

## TASK 4
Offer vaccinations: flu vaccination (annual) / pneumococcal vaccination

## TASK 5
Consider medication: Drug treatment should be guided by breathlessness and exercise limitation, exacerbation frequency, symptoms, disability and physiological complications that the patient experiences. At different times in the natural history of their disease different features may predominate and their management should change to reflect this.

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### All breathless patients

**Salbutamol MDI 100 mcg 2 puffs PRN (reliever) -** for exacerbations consider using up to 10 puffs (1mg) salbutamol MDI via a spacer device PRN

### Persistent Breathlessness and Exercise Limitation

**Initial treatment**
- Long-acting antimuscarinic (LAMA)
- Tiotropium Handihaler 18 micrograms one dose OD or Aclidinium Genuair 322 micrograms one dose BD (if unable to use Handihaler and/or eGFR<50ml/min)

**Long-acting β₂ agonist (LABA)**
- Formoterol Easihaler (or MDI) 12 micrograms one dose BD

**Review after 1 month.**
Discontinue if no improvement in symptoms. Step up treatment if persistent breathlessness to combination LABA / LAMA inhaler (stop single LABA or LAMA)

- DuaKlir (aclidinium/formoterol) Genuair 340/12 one dose BD
- Spioltol (tiotropium/olodaterol) Respimat 2.5/2.5 two puffs OD

### Frequent Exacerbations

Consider long-acting β₂ agonist / inhaled steroid (ICS/LABA combination) only if:
- >2 exacerbations in last 12 months and either
  - (i) FEV₁<50%; and/or
  - (ii) blood eosinophil count >0.3 x 10⁹/l (irrespective of FEV₁)

- Fostair MDI 100/6 two puffs BD plus spacer or DuoResp Spiromax DPI 320/9 one dose BD or Symbicort Turbohaler DPI 400/12 one dose BD

- Use ICS/LABA with caution in any person with a history of chest X-ray confirmed pneumonia. Consider stopping ICS/LABA if confirmed pneumonia whilst on treatment

- Prescribe ICS/LABA by brand name

- Evaluate clinical response (exacerbation and lung function) after 12 months

- If exacerbations continue consider referral to specialist

### Chronic Productive Cough

Consider referral for chest clearance techniques. Consider a trial of:
- Carbocisteine capsules 750 mg TDS for 4 weeks then reduce to 750 mg BD if improvement in sputum production and reduction in viscosity.

**Stop if no improvement**
C/I in patients with active peptic ulceration

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**Symptoms (persistent >48 hours) of an exacerbation include either/or:**

- Change in sputum colour
- Increased quantity of sputum
- Increased breathlessness

Treat with either oral steroids and/or antibiotics (see LMSG antimicrobial guideline). If not effective re-assess with FBC and sputum culture before prescribing more antibiotics. Consider a chest X-ray and re-confirm diagnosis

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Date prepared: Nov 2015
Review date: Nov 2017
Miscellaneous aids to breathlessness
Physical Activity Is the Strongest Predictor of All-Cause Mortality in Patients With COPD
A Prospective Cohort Study

Benjamin Wachholz, MD, Anne Kirven, MD, Olaf Holz, PhD, Kai-Christian Müller, PhD; Thomas Meyer, PhD; Bernd Walt, MD; and Tobias Magnusson, MD

Chest. 2011;140(2) 331-342.
Expected values for steps/day in special populations
Tudor-Locke, Washington T L, Hart TL
Preventative Medicine 2009, 49. 3-11

- Normal: 7000-13000
- Limited activity: 2500-5000
- Sedentary: <2500

- Heart & Vascular
- COPD
- Type2 Diabetes
- Type1 Diabetes
- Dialysis
- Neuromuscular diseases
- Arthritis
- Fibromyalgia

Now 65 RCTs, n = 3822 subjects

Improvement in all aspects of health status (CRQ, SGRQ)
Improvement in exercise capacity (6MWT, ISWT, E SWT, CPET)

No further trials recommended

Exercise training is the most important component
Possible bias in favour of hospital programmes
For every 100 patients that completed either the 6MWT or the ISWT, both on initial assessment and discharge, the following responses were recorded:

- 69 improved after PR by more than the MCID*
- 20 improved after PR but by less than the MCID
- 17 had no change or a reduction

For every 100 patients that had a health status test (either COPD Assessment Test (CAT)); St George’s Respiratory Questionnaire (SGRQ); or Chronic Respiratory Questionnaire (CRQ)) both upon initial assessment and discharge, the following differences were recorded:

- 61 improved after PR by more than the MCID**
- 13 improved after PR but by less than the MCID
- 26 had no change or a worse score

Out of every 100 patients that had either the 6MWT, ISWT, or a health status test, 78 achieved an MCID in at least one measure, 12 achieved improvement of less than the MCID, and 10 had no improvement in any measure.

*For the 6MWT, the MCID is a 40m increase and for the ISWT, the MCID is 3.8m.
**For the SGRQ, the MCID was taken as a reduction in 6.5 points in the total score. For the CAT, the MCID was an increase in 6.5 points in the average of the four domain scores, and for the CRQ, the MCID was a reduction in 3 points.

There are an estimated 446,000 patients in England and Wales with COPD and an MRC grade 3 or worse.¹

From the organisational audit report², it was found that during the audit period there were an estimated 68,000 referrals for patients with COPD.

For every 100 patients referred for PR²:

- 69 attend an assessment²
- 10 do not enrol onto PR³
- 59 enrol onto PR³
- 17 do not complete PR³

²Pulmonary Rehabilitation: Time to take action. National Chronic Obstructive Pulmonary Disease (COPD) audit and organisational dimension and evaluation of pulmonary rehabilitation services in England and Wales 2013, Summary. HSCIC; 2015.
³Information to be found within the report.
Exercise capacity vs physical activity

N K Leidy, Chest 1994 106 1645-6
Self management training (not just self management education)

Knowledge -> Skills -> lifelong behaviour change -> Competence

Self efficacy
Definitions

• **Self care**......What patients do all the time

• **Action plans**......Written instructions and medication for self management of exacerbations alone

• **Self management training**......Providing the necessary skills, knowledge and confidence to self-manage whole condition

• **Pulmonary rehabilitation**......A structured opportunity to provide self management training.

• **Integrated Care** ......The commissioning framework for delivery
Integrated care?

No single definition

• Co-ordinated care structures
• Primary/secondary care
• NHS/Social Care
• Triple integration NHS/Social Care/ Local Government
Integrated care = a programme with:

Two components (e.g., smoking cessation, rehabilitation, etc)
Two different professional providers
Duration > 3 months

26 studies (n=2997)

Clinically significant improvements in:
- dyspnoea,
- 6MWD,
- hospital admissions

No effect on mortality.
Effectiveness of telemonitoring integrated into existing clinical services on hospital admission for exacerbation of chronic obstructive pulmonary disease: researcher blind, multicentre, randomised controlled trial

Hilary Pinnock reader, Janet Hanley principal research fellow, Lucy McCloughan programme manager, Allison Todd research nurse, Ashma Krishan statistician, Stephanie Lewis reader in medical statistics, Andrew Stoddart health economist, Marjon van der Pol professor of health economics, William MacNee professor of respiratory and environmental medicine, Aziz Sheikh professor of primary care research and development and director Harkness fellow in healthcare policy and practice, Claudia Pagliari senior lecturer in primary care and health informatics, Brian McKinstry professor of primary care ehealth.
Multiple LTCs

South Somerset Symphony project
Multi morbidity is the new norm
Key points on co-morbidity

COPD often coexists with other diseases (comorbidities) that may have a significant impact on prognosis.

In general, the presence of comorbidities should not alter COPD treatment and comorbidities should be treated as if the patient did not have COPD.

Cardiovascular disease is a major comorbidity in COPD and probably both the most frequent and most important disease coexisting with COPD.

Osteoporosis and depression are also major comorbidities in COPD, are often under-diagnosed, and are associated with poor health status and prognosis.

Lung cancer is frequently seen in patients with COPD and has been found to be the most frequent cause of death in patients with mild COPD.
Does body mass index influence the outcomes of a Waking-based pulmonary rehabilitation programme in COPD?

Neil J Greening¹, Rachael A Evans¹, Johanna EA Williams¹,
Ruth H Green¹, Sally J Singh¹,² and Michael C Steiner¹
44 COPD and 32 CHF completed Pulmonary Rehabilitation

- **COPD**: 239 (111)m - 307 (122)m
- **CHF**: 218 (136)m - 281 (156)m

- **COPD**: 265 (159)s - 613 (389)s
- **CHF**: 206 (84)s - 532 (378)s
Commissioning and contracting for integrated care

British Thoracic Society

POSITION STATEMENT

The role of the Respiratory Specialist in the provision of Integrated Care and Long Term Conditions Management

October 2014

Summary

A. Integrated care requires a move away from responsive fragmented care given to patients by separate individuals in separate organisations to co-ordinated, proactive continuous care which healthcare professionals in different organisations work across boundaries, forming a single team which includes the patient. This will require radical change within the NHS.

B. To enable this change team members require additional knowledge and skills concerning the care of patients with Long Term Conditions. It requires specialists, doctors or other professionals in specialist roles to make more in terms of that responsibility to the whole population of patients within their local health care economies.

C. This is not about specialists just working in the community, but leading and working with teams, using well defined components of care to deliver high quality integrated care across populations as well as to individuals.

D. In this model, the components lead to our goal of an educated patient taking more control, working with a trained team of healthcare professionals who act pro-actively to improve wellbeing and to prevent exacerbations and hospital admissions.

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Why respiratory specialists have a key role to play in Integrated care 4
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British Thoracic Society is a membership organisation and a registered charity. We have over 1,900 members in respiratory medicine and allied health professions (October 2014) and can lay claim to being the professional voice of respiratory medicine in the UK. Our objectives are to develop and promote best evidence-based standards of care for patients with respiratory and associated disorders; to disseminate knowledge and learning about these conditions to patients, prevention and treatment and to education.
Are specialists a barrier to progress?

Hospital consultants

General practitioners
Whole community responsibility?

Specialists in acute Trusts

Specialists out of hospital
• Enhancing the skills of GPs and other health care professionals
  Outreach clinics jointly staffed by hospital consultants and other health care professionals
  Consultant-run email and telephone helplines
  Consultant participation in multidisciplinary team (MDT) meetings
  Consultant-run education sessions
  Consultants supporting staff to work in extended roles

• Redesigning the workforce
  Integrated consultant roles that span hospital and community settings
  New roles for nurses and other allied health professionals
  GPs with Special Interests

• Redesigning the work

• Addressing patient needs along their care pathway and taking a population health-based approach (pit crew not cowboy approach)
COPD: Long term care

Primarily CCG responsibility
   Delivered by Primary Care & Acute Trusts

Some specialised commissioning
   (transplantation, LVRS, home ventilation)
Health Outcomes
- Patient defined bundle of care
- Cost of delivering outcomes

Value = Health Outcomes / Cost

- Telehealth for chronic disease £3,000/QALY
- Triple Therapy £7,000-
  £187,000/QALY
- LABA £8,000/QALY
- Tiotropium £7,000/QALY
- Pulmonary Rehabilitation £2,000-8,000/QALY
- Stop Smoking Support with pharmacotherapy £2,000/QALY
- Flu vaccination £1,000/QALY in “at risk” population

* (not specific to COPD)

Population level commissioning

- “Year of Care”
- Stratification for:
  - Risk
  - Need
  - Service provision
- Capitated budgets
- Pilot sites ongoing
Risk assessment

Derivation and Validation of a Composite Index of Severity in Chronic Obstructive Pulmonary Disease
The DOSE Index

Rupert C. Jones, Gavin C. Donaldson, Niels H. Chavannes, Kozui Kida, Maria Dickson-Spillmann, Samantha Harding, Jadwiga A. Wedzicha, David Price, and Michael E. Hyland


TABLE 4. DOSE INDEX SCORING SYSTEM

<table>
<thead>
<tr>
<th>DOSE Index Points</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRC Dyspnea Scale score</td>
<td>0–1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Obstruction FEV₁ % predicted</td>
<td>&gt;50</td>
<td>30–49</td>
<td>&lt;30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking status</td>
<td>Nonsmoker</td>
<td>Smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exacerbations per year</td>
<td>0–1</td>
<td>2–3</td>
<td>&gt;3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Validation population  375

DOSE score ≥ 4 associated with hospital admission, respiratory failure
Long term conditions “House of Care”

LTCs are those conditions that cannot, at present, be cured, but can be controlled by medication or lifestyle modifications.
I have COPD

- I have had my diagnosis confirmed by lung function test performed by a qualified person
- I feel supported to manage my COPD. I am actively involved in my care and have the opportunity to discuss how I wish to be treated
- I have been regularly offered help and support to stop smoking
- I know the importance of keeping active and have been offered the opportunity to improve my activity through exercise and pulmonary rehabilitation if appropriate
- I know how and when to take my medicines, and feel able to use my inhalers and other medicines properly
- I have a written action plan, rescue medication and know when and how to use them
- I see my doctor or nurse routinely at least once a year for review of my lung function, medicines and inhaler technique, flu vaccination, breathlessness, activity, oxygen levels and my action plan