Utilising the Pharmacist Clinical Skills to Improve Patient Outcomes

Anna Murphy
Consultant Respiratory Pharmacist
University Hospitals of Leicester NHS Trust

anna.murphy@uhl-tr.nhs.uk
Overview

• Background to the service
• Intervention design
• Evaluation methods
• Main study findings
• Where are we now?
Background: Asthma in the UK

• In the United Kingdom there are 5.4 million people with asthma of which there are:*
  – 1.1 million children and
  – 4.3 million adults.

• Approximately 100,000 admissions per year (England and Wales); 7,105 in Scotland (35% <15years)

• The severity of asthma is often underestimated and 1,143 people died from their asthma in the UK in 2010 (16 of these were children aged 14 and under)*

Local Data - Leicester

- **4,451** emergency admissions for asthma in the East Midlands during 2007-08
We know that ......

• Up to 75% of asthma admissions could be avoided with effective care and self-management¹

• 45% of patients do not have regular asthma reviews¹

• An estimated 50% of medicines for chronic conditions are not taken as prescribed

• In a survey of over 2,300 patients with asthma, only 45% were found to meet the criteria for good asthma control as defined by guidelines²

2  Desfougeres JL et al. Has asthma control improved since AIRE? Results of a survey in 5 European countries. Abstract 1589 presented at ERS congress September 2007
Asthma Review

- Since 1985 nurse led asthma review clinics
- Key components of an asthma review:
  - Assessment of control in order to target care
  - Management to improve control
  - Guiding self-management to facilitate ongoing control
- GP contract QOF
- 45% do not attend review
SIMPLE™ Intervention

• Proactive structured **asthma review** provided by CPs
• **Fully** integrated with GP practice
• The objectives of the service were:
  – To assess the effect of the community pharmacy intervention on the patient’s asthma control (primary outcome – Asthma Control Test (ACT))
  – To assess the impact of the intervention on other clinical outcome measures: health-related quality of life (mini-AQLQ), healthcare utilisation (self-reported GP visits and/or hospitalisation), lung function measurements (PEF), mediation adherence (MARS/prescription pick-up), Inhaled corticosteroids dose and inhaler technique scores
SIMPLE Intervention Framework

- Stop Smoking
- Inhaler Technique
- Monitoring
- Pharmacotherapy
- Lifestyle
- Education

Intervention based on the key components of a structured asthma review

Intensive training on SIMPLE provided to pharmacy teams (GPs and practice nurses also invited to attend)
Stop Smoking

• Single most important change a patient can make
• Encourage & support giving up
• Refer to NHS stop smoking service
Inhaler Technique

• Many people cannot use inhalers (studies up to 90%)
• Provide advice and optimise delivery
• Best choice of inhaler?
Monitoring

- Assess control & severity
- Validated assessment tools
  - RCP 3 Questions
  - ACT
Pharmacotherapy

- Understanding of treatment
- Reason and importance
- Potential side effects
- Medication adherence
Lifestyle

- Healthy, active lifestyle
- Hydration and nutrition
- Advise about alcohol intake
- Annual vaccinations
Education

- Patient belief & understanding
- Quality of Life
- Level of Risk
- Action Plan
- Regular discussion
- Consistent messages
SIMPLE tools

Inhaler Device Technique
REMINDER CARDS

7 steps to success...

7 Steps to Success
Inhaler Device Toolkit
simplesbeguieducation@hotmail.com

CLOCK OF COMPETENCE
Study Design

• Supported by NHS Innovation Fund
• June 2010 – May 2011
• Patient reviewed at baseline, 3 and 6 months
• Local NHS Ethics committee defined study as an Evaluation and not subject to National REC review
• Feasibility study – no control group
  – Pretest – Posttest design
• Targeted MUR plus .... Clinical medication advice to GP, personalised asthma action plan
• Integrated with GP practice service
Patient Eligibility Criteria

Inclusion Criteria

- ≥ 18 years of age
- a current diagnosis of asthma (self-reported)
- able to speak and understand English (or could be supported in translation by the pharmacy team)
- had been using the pharmacy for the dispensing of their medicines for at least 3 months previously.
- able to return for all follow-up visits (two over the 6 months study period)

Exclusion Criteria

- did not speak English well enough to communicate with the pharmacist
- the diagnosis of asthma on discussion with the patient was uncertain
Flow diagram of patient and community pharmacy recruitment and sample attrition

15 pharmacies recruited

2 pharmacies withdrew

125 patients received intervention at baseline (N=125)

46 patients lost to follow-up (Group A)
79 patients received intervention at 3 months

29 patients lost to follow-up (Group B)
50 (40%) patients received intervention at 6 months (Group C)
125 were included in intention-to-treat analysis for primary outcome measure
Study Outcomes

• **Primary Outcome**
  – Change in ACT measure over time

• **Secondary Outcomes**
  – Healthcare utilisation (GP and hospital visits)
  – Quality of Life (mini-AQLQ)
  – Medication adherence (MARS, prescription refill)
  – Inhaled corticosteroid (ICS) dose
<table>
<thead>
<tr>
<th>Q1</th>
<th>During the <strong>past 4 weeks</strong>, how often did your asthma prevent you from getting as much done at work, school or home?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All of the time</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Most of the time</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Some of the time</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A little of the time</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>None of the time</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>During the <strong>past 4 weeks</strong>, how often have you had shortness of breath?</td>
<td>Score:</td>
</tr>
<tr>
<td>1</td>
<td>More than once a day</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Once a day</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3-6 times a week</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1-2 times a week</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>During the <strong>past 4 weeks</strong>, how often did your asthma symptoms (wheezing, coughing, chest tightness, shortness of breath) wake you up at night or earlier than usual in the morning?</td>
<td>Score:</td>
</tr>
<tr>
<td>1</td>
<td>4 or more times a week</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2-3 nights a week</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Once a week</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Once or twice</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>During the <strong>past 4 weeks</strong>, how often have you used your reliever inhaler (usually blue)?</td>
<td>Score:</td>
</tr>
<tr>
<td>1</td>
<td>3 or more times a day</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1-2 times a day</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2-3 times a week</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Once a week or less</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>How would you rate your <strong>asthma control</strong> during the <strong>past 4 weeks</strong>?</td>
<td>Score:</td>
</tr>
<tr>
<td>1</td>
<td>Not controlled</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Poorly controlled</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Somewhat controlled</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Well controlled</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Completely controlled</td>
<td></td>
</tr>
</tbody>
</table>
Baseline Data
## Baseline Characteristics (\(n=125\))

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Study sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean ± SD (range))</td>
<td>57.5 ± 17.0 (21-88)</td>
</tr>
<tr>
<td>Gender (n) (%)</td>
<td>Male: Female 55 (44) : 70 (56)</td>
</tr>
<tr>
<td>Ethnicity (n) (%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>44 (35.2)</td>
</tr>
<tr>
<td>South Asian</td>
<td>79 (63.2)</td>
</tr>
<tr>
<td>Patient supported in translation Yes (n) (%)</td>
<td>46 (36.8)</td>
</tr>
<tr>
<td>Smoking status (n) (%)(^a)</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>16 (13.2)</td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>10 (8.3)</td>
</tr>
<tr>
<td>Never smoked</td>
<td>95 (78.5)</td>
</tr>
<tr>
<td>Asthma review by GP (n) (%)(^a)</td>
<td></td>
</tr>
<tr>
<td>&lt;12 months</td>
<td>71 (58.7)</td>
</tr>
<tr>
<td>12 months – 2 years</td>
<td>23 (19.0)</td>
</tr>
<tr>
<td>&gt;2 years ago</td>
<td>10 (8.3)</td>
</tr>
<tr>
<td>Never had one</td>
<td>17 (14.0)</td>
</tr>
<tr>
<td>Inhaler technique last checked by HCP (n) (%)</td>
<td></td>
</tr>
<tr>
<td>&lt;12 months</td>
<td>56 (44.8)</td>
</tr>
<tr>
<td>1-2 years</td>
<td>12 (9.6)</td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>15 (12)</td>
</tr>
<tr>
<td>never</td>
<td>42 (33.6)</td>
</tr>
<tr>
<td>Asthma action plan: yes (n) (%)</td>
<td>19 (15.2%)</td>
</tr>
</tbody>
</table>
### Baseline Characteristics

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma control, (mean ± SD)</td>
<td>Total ACT score</td>
<td>17.1 ± 5.5</td>
</tr>
<tr>
<td></td>
<td>ACT&lt; 15 % patients</td>
<td>31.2%</td>
</tr>
<tr>
<td></td>
<td>ACT 15-19 % patients</td>
<td>29.6%</td>
</tr>
<tr>
<td></td>
<td>ACT 20-25 % patients</td>
<td>39.2%</td>
</tr>
<tr>
<td>Patient self reported asthma control n (%)a</td>
<td>Yes, well controlled</td>
<td>78 (64.5)</td>
</tr>
<tr>
<td></td>
<td>No, not controlled</td>
<td>15 (12.4)</td>
</tr>
<tr>
<td></td>
<td>Not sure</td>
<td>28 (23.1)</td>
</tr>
<tr>
<td>Peak expiratory flow reading (mean ± SD)b</td>
<td></td>
<td>330 ± 120</td>
</tr>
<tr>
<td>Medication adherence (scale 5-25) (median,iqr)</td>
<td></td>
<td>22 (17-25)</td>
</tr>
<tr>
<td>HR Quality of Life (scale 1-7), (mean ± SD)c</td>
<td></td>
<td>5.6 ± 1.0</td>
</tr>
</tbody>
</table>
Baseline ACT score and QOL scores for patients with high (≥ 80%) and low adherence (<80%) ratios for inhaled corticosteroid for the 6 month period prior to patient recruitment (n=93)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adherence ICS score ≥ 80% (High-adherers) (n=54)</th>
<th>Adherence ICS score &lt; 80% (Low-adherers) (n=39)</th>
<th>p-value</th>
<th>Mean Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT (mean±SD)</td>
<td>19.07±5.05</td>
<td>14.97±5.49</td>
<td>p&lt;0.001&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-4.10 (-6.29 to -1.91)</td>
</tr>
<tr>
<td>QOL (mini-AQLQ)</td>
<td>5.14±1.31</td>
<td>4.24±1.57</td>
<td>p=0.019&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.91 (-1.66 to -0.15)</td>
</tr>
<tr>
<td>PEFR (mean±SD)</td>
<td>324±100</td>
<td>311±127</td>
<td>p=0.607&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-12 (-62 to 36)</td>
</tr>
</tbody>
</table>

<sup>a</sup>students independent t-test
Study Outcomes
**PRIMARY OUTCOME**

Asthma control outcome measures at baseline (0 months), 3 months and 6 months \((n=50)\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>0 months</th>
<th>3 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACT score (mean±SD)</strong></td>
<td>17.36 ± 5.16</td>
<td>19.08 ± 5.25</td>
<td>20.18 ± 4.36</td>
</tr>
<tr>
<td><strong>Self reported</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% good asthma control</td>
<td>60%</td>
<td>76%</td>
<td>74%</td>
</tr>
<tr>
<td><strong>Lung function</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEFR (l/min), (mean±SD)</td>
<td>297 ± 107</td>
<td>293 ± 117</td>
<td>311 ± 106</td>
</tr>
</tbody>
</table>

\(p\) values:
- \(p=0.002\) for ACT score
- \(p=0.055\) for self-reported asthma control
- \(p=0.268\) for lung function
Key Findings – Primary Outcome

- Significant improvements in patients asthma control measured by ACT ($p=0.002$)

- Increase in ACT scores for 36 (72%) patients, decrease for 11 (22%) and no change in 3 (6%)

- Intention-to-treat analysis showed significant increase in ACT ($n=125$; $p=<0.001$)

- 40% of patient’s ACT score increased by a score that would be clinically important (minimal important difference (MID) = 3)
Comparison of the mean difference in total ACT scores across the 6 month study period in relation to the time of the participant’s last asthma review at their GP practice \((n=50)\)
SECONDARY OUTCOMES
Healthcare utilisation comparing 6 months pre-intervention to 6 month study period (n=50)

- 32% reduction in visits to GP for asthma-related issue over the study period (p=0.053)
- 40% reduction in hospital admission data (not significant)

<table>
<thead>
<tr>
<th></th>
<th>0 months* (n = 50)</th>
<th>6 months (n = 50)</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>% with zero visits to GP</td>
<td>17.0%</td>
<td>56.5%</td>
<td>Q=31.69, p=&lt;0.001</td>
</tr>
<tr>
<td>Visits to GP practice (median, iqr)</td>
<td>1.00 (0.5-1.5)</td>
<td>1.00 (0-1)</td>
<td>T=198.00, p=0.053</td>
</tr>
<tr>
<td>% with zero hospital admissions</td>
<td>89.1%</td>
<td>93.4%</td>
<td>Q=4.75, p=0.093</td>
</tr>
<tr>
<td>Hospital admissions (median, iqr)</td>
<td>0.00 (0-3)</td>
<td>0.00 (0-1)</td>
<td>T=16.50, p=0.831</td>
</tr>
</tbody>
</table>
Background: Asthma in the UK

- In the United Kingdom there are 5.4 million people with asthma of which there are:
  - 1.1 million children and
  - 4.3 million adults.

- Approximately 100,000 admissions per year (England and Wales); 7,105 in Scotland (35% <15 years)

- The severity of asthma is often underestimated and 1,143 people died from their asthma in the UK in 2010 (16 of these were children aged 14 and under)*

Secondary outcomes

• Patient QOL improved (measured by mini-AQLQ) ($p=0.03$)

• Patient inhaled technique improved significantly ($p<0.001$)

• Reduction SABA Rx and increase ICS ($p<0.001$). 92% end of 6 months collected at least 80% of their ICS inhalers

• The pharmacist completed and provided a personalised asthma action plan for 80 patients (78%)

• Patient acceptability – 46% self-reported questionnaire
Summary

• Results suggest that community pharmacists with basic training in asthma management can deliver an intervention resulting in improved clinical outcomes

• Patients follow-up over 6-months

• Limitations in the study design

• SIMPLE intervention framework being developed and expanded across East Midlands for all HCPs
The service continues ............
Making Respiratory SIMPLE

- Further expansion of SIMPLE asthma by Community pharmacists and GP practices across Leicestershire and Rutland

- CCG commissioned training programme for all primary care HCPs – 4 modules

- Making COPD service provided by community pharmacists is being evaluation
Patient Resources

LIFESTYLE

- It may be possible to avoid certain asthma triggers, which some people find make their symptoms worse

My known asthma triggers:

- If you have severe asthma needing regular steroid inhalers or tablets, you should have an influenza (flu) jab every autumn
- Exercise more! It is a myth that exercise will trigger asthma. Actually it can help and it will keep your lungs healthy. If you haven’t been exercising, start with five minutes a day and gradually build upon this
- Watch your weight – being overweight can increase breathlessness

I will manage my asthma so that I can:

EDUCATION

Do your symptoms and/or peak flow readings suggest you need to make changes to your medication? The guide below explains what you should do if you are concerned or if you are having an asthma attack.

Good asthma control – my goal!
- I have no symptoms (no wheezing, no chest tightness, no coughing and I am not waking at night due to my asthma). It is still very important for me to take my preventer medicines, as prescribed, so that I keep my asthma under control and prevent attacks and long term damage to my lungs.

My asthma is getting worse
- I am wheezing, my chest is tight, I feel breathless, I am coughing or waking at night due to my asthma and/or my asthma is interfering with my life
- My peak flow has dropped below ______ l/min
- I am using my reliever inhaler ______ times a week or more

What I need to do is...
- Make sure I am taking my preventer medicine correctly or increase my preventer _________ dose to ________ _______ times a day
- If I have steroid tablets at home (e.g. prednisolone), I need to take ______ x5mg prednisolone tablets now and then every morning for ______ days or until I am fully better
- I must call my GP today and let them know I have increased or started steroids and to make an appointment to be seen within 24 hours.

I need to get help NOW – this is an emergency – let someone know
- I find it difficult to breathe, walk or talk, my reliever inhaler is not helping, my chest is very tight and I am coughing a lot
- My peak flow reading has dropped below ______ l/min

What I need to do is...
- Take TWO puffs of my reliever (one puff at a time) every two minutes – up to 10 puffs and I will sit up and try to take slow, steady breaths
- If I don’t feel better I will call 999 straight away and take my reliever again
- If I have prednisolone tablets I will take EIGHT x 5mg tablets altogether now
Patient smart-phone APP

Asthma made simple

Control my asthma
I will control my asthma. It won't control me.
Remind me
Daily
Weekly

This app has been developed in collaboration and support from
Making Respiratory SIMPLIIE
University Hospitals of Leicester NHS Trust
Respiratory

Date of preparation: August 2014
UK/HDM/14/0001a
Web-based Platform
Publications

Improving the care of adults with difficult to manage asthma: a practical guide for primary healthcare professionals

CASE-BASED LEARNING

‘SIMPLES’: a structured primary care approach to adults with difficult asthma

*Dermot Ryan¹, Anna Murphy¹, Bjorn Stallberg³, Noel Baxter⁴, Liam G Heaney⁵

Clinical Focus

The SIMPLE approach to asthma consultations
Thank You

anna.murphy@uhl-tr.nhs.uk