Carol Armour, Lorraine Smith, Bandana Saini, Sinthia Bosnic-Anticevich, Ines Krass, Chehani Alles, Kate Lemay, Yun Song, Helen Reddel, Debbie Burton, Julie Cooke, Kay Stewart, Jaya Soma, Lynne Emmerton, Victoria Jarvis.

University of Sydney, Woolcock Institute for Respiratory Research, Charles Sturt University, Monash University, University of Queensland

Funded by the Department of Health and Ageing under the 4th Community Pharmacy Agreement
Cycle of monitoring, review and feedback

- Needs assessment
- Possible interventions
- Goal Setting
- Monitoring and feedback
- Behaviour change

Patient
PHARMACY ASTHMA MANAGEMENT SERVICE (PAMS)

Evidence from RCT *

Cost Effective #

Implementation trial (Broad Scale)

Sustainability

3 versus 4 visits over 6 months

Barriers and Facilitators

Business Model

3 states and 1 territory

*Armour et al Thorax 2007 62: 496
Group 1
50 Pharmacists*
500 patients

4 Visits per patient in 6 months (1,2,4 and 6 m)
120 patients followed up for sustainability at 6 and 12 months

Group 2
50 Pharmacists*
500 patients

3 Visits per patient in 6 months (1,2 and 6 months)
120 patients followed up for sustainability at 6 and 12 months

State, urban and rural representation (PHARIA 1-6)*
Risk assessment

Asthma

Am I at risk?

- In the last 4 WEEKS, I have used my reliever medication/s more than 3 times a week (Ventolin, Asmol, EPAQ, Airomir)
- In the last 4 WEEKS, I have woken up on a night or morning with cough/chest tightness
- In the last 4 WEEKS, I have had to take time off work/study because of my asthma
- In the last 4 WEEKS, I have had symptoms of asthma (cough, breathlessness, wheeze, etc), once or more than once a week
- In the last 6 MONTHS, I have not seen a doctor for my asthma
- None of the above apply to me
<table>
<thead>
<tr>
<th>Medication type</th>
<th>N = 570 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination and Reliever</td>
<td>358 (65)</td>
</tr>
<tr>
<td>Preventer and Reliever</td>
<td>55 (10%)</td>
</tr>
<tr>
<td>Reliever only</td>
<td>109 (19%)</td>
</tr>
<tr>
<td>Combination only</td>
<td>38 (4)</td>
</tr>
<tr>
<td>Preventer, symptom controller, reliever</td>
<td>10(2)</td>
</tr>
</tbody>
</table>
PAMS Baseline Population

Medication Dispensing: Overall

![Bar graph showing the proportion of patients based on the number of times dispensing occurs, with categories ranging from 0 to 7 or more. The graph compares Combination and Preventer medications.](image-url)
RESULTS - Process

- 106 pharmacists trained
- 93 pharmacists recruited patients
- 570 patients recruited
- 398 patients completed (70%)
- These patients had 24,000 interventions delivered - 42/per patient
- They set 1,800 goals over 6 months
- 6/12 months later data – ? improvements sustained
RESULTS – clinical outcomes

Asthma control - Baseline vs Final

![Graph showing asthma control outcomes at baseline and final visits for 3 and 4 visit points. The graph compares the proportion of patients categorized as Poor, Fair, and Good across different time points.]
Inhaler technique - Baseline vs Final

% of patients with 100% correct inhaler technique

Baseline 4-visit (n=205)
Final 4-visit (n=170)
Improvement In Inhaler technique

Accuhaler 3 visit patients n=38

pMDI 3 visit patients n=135

Turbuhaler 3 visit patients n=55
Asthma Action Plan - Baseline vs Final

% of patients with written asthma action plan

Baseline

Final

3-visit (n=216)
4-visit (n=178)
Medication Adherence - Baseline vs Final

Total Adherence Score

Baseline | Final
---|---
3 | 3.25

3-visit (n=193) | 4-visit (n=161)
### Spirometry - Baseline vs Final

<table>
<thead>
<tr>
<th>Spirometry</th>
<th>Group</th>
<th>Baseline Mean ± SD</th>
<th>Final Mean ± SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% predicted FVC</td>
<td>3 visit (n=138)</td>
<td>83.47 ± 16.9</td>
<td>82.59 ± 15.8</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>4 visit (n=136)</td>
<td>80.52 ± 16.5</td>
<td>81.01 ± 17.7</td>
<td>0.44</td>
</tr>
<tr>
<td>% predicted FEV&lt;sub&gt;1&lt;/sub&gt;</td>
<td>3 visit (n=138)</td>
<td>77.15 ± 21.8</td>
<td>78.25 ± 21.1</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>4 visit (n=136)</td>
<td>74.04 ± 21.7</td>
<td>76.32 ± 21.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>% predicted FEV&lt;sub&gt;1&lt;/sub&gt;/FVC</td>
<td>3 visit (n=138)</td>
<td>91.17 ± 13.6</td>
<td>93.44 ± 13.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>4 visit (n=136)</td>
<td>90.24 ± 15.1</td>
<td>92.37 ± 15.8</td>
<td>0.02</td>
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</tbody>
</table>
### Humanistic Outcomes – Baseline vs Final

<table>
<thead>
<tr>
<th>Humanistic Outcomes</th>
<th>Group</th>
<th>Baseline Mean ± SD</th>
<th>Final Mean ± SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived Control of Asthma</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 visit (n=200)</td>
<td>24.38 ± 5.27</td>
<td>21.83 ± 5.17</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>4 visit (n=174)</td>
<td>26.01 ± 5.51</td>
<td>22.45 ± 6.19</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td><strong>Asthma Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 visit (n=186)</td>
<td>7.51 ± 2.39</td>
<td>8.76 ± 2.19</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>4 visit (n=179)</td>
<td>7.80 ± 2.33</td>
<td>8.98 ± 1.99</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td><strong>Impact of Asthma Quality of Life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 visit (n=203)</td>
<td>4.13 ± 1.41</td>
<td>3.39 ± 1.19</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>4 visit (n=186)</td>
<td>4.45 ± 1.49</td>
<td>3.57 ± 1.48</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>
Sustainability - Asthma control 6 and 12 months later

Follow Up (n=74)

- PAMS Final Visit
- 6m post PAMS (12m)
- 12m post PAMS (18m)

- Poor
- Fair
- Good
**Correct inhaler technique (chi squared)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Inhaler</th>
<th>n</th>
<th>Final Visit n (%)</th>
<th>6 months post-PAMS n (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up</td>
<td>MDI</td>
<td>84</td>
<td>49 (58%)</td>
<td>48 (57%)</td>
<td>0.876</td>
</tr>
<tr>
<td></td>
<td>Accuhaler</td>
<td>21</td>
<td>15 (71%)</td>
<td>15 (71%)</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Turbuhaler</td>
<td>37</td>
<td>29 (78%)</td>
<td>27 (73%)</td>
<td>0.588</td>
</tr>
<tr>
<td></td>
<td>MDI + spacer</td>
<td>15</td>
<td>10 (66%)</td>
<td>8 (53%)</td>
<td>0.456</td>
</tr>
</tbody>
</table>
Summary

- 3 visits produce similar clinical outcomes to 4 visits
- Asthma control, inhaler technique, adherence, lung function
- Action plans
- Patient focused outcomes also improved (QOL, perceived control, knowledge, health beliefs)
- Goals (proportion quit smoking)
- GP, Pharmacist and Patient feedback
Outcomes sustained at 6 months (and 12 months)

- Asthma control
- Inhaler technique (inhaler technique not checked)
- Perceived control
- Knowledge
- Adherence
- Quality of Life
Conclusions

- Risk assessment tool identified those with poor control
- Baseline adherence poor as assessed by dispensed histories
- 3 visits over 6 months produces similar clinical and humanistic outcomes to 4 visits
- Visits spaced at baseline, one month later and 6 months
- Improvements sustained at 6 months and (inhaler technique) at 12 months also.
- Patients and practitioners liked the service (liked the spirometry)
- Suggest a 3 visit service followed up by 12 month review would be sufficient to improve and maintain asthma control in most individuals.
Visit 1

- Recruit patient and obtain consent, baseline questionnaires
- Collect Asthma history
- Assess Asthma control
- Perform spirometry
- Assess adherence to medication regimen
- Discuss trigger factors
- Assess technique
- Question on action Plan
- Complete goal setting and set appointment
Visit 2 (1 month)

- Review goals
- Review asthma control
- Conduct Spirometry
- Review triggers and medication
- Action plan?
- Set goals and appointment for next visit
Visit 3 (optional)

- Review goals
- Assess control
- Perform spirometry
- Meds/trigger factors/action plan
- Set goals and next appointment
Final Visit (6 months)

- Review goals
- Complete history
- Complete questionnaires
- Perform Spirometry and complete assessment
- Assess inhaler technique/adherence/action plan