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The Pharmacy  
Guild of Australia

# A COLLABORATIVE SCREENING, REFERRAL AND MANAGEMENT PROCESS TO IMPROVE HEALTH OUTCOMES IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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## FINAL REPORT

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## Acronyms

Acronym	Explanation
BMI	Body mass index
COPD	Chronic obstructive pulmonary disease
CPD	Continuing professional development
EAG	Expert advisory group
FEV <sub>1</sub>	Forced expiratory volume in one second
FEV <sub>6</sub>	Forced expiratory volume in six seconds
FVC	Forced vital capacity
GOLD	<b>G</b> lobal Initiative for Chronic <b>O</b> bststructive <b>L</b> ung <b>D</b> isease
GOLD Stage I COPD	Mild COPD, characterised by mild airflow limitation (FEV <sub>1</sub> /FVC < 0.70; FEV <sub>1</sub> ≥ 80% predicted)
GOLD Stage II COPD	Moderate COPD, characterised by worsening airflow limitation (FEV <sub>1</sub> /FVC < 0.70; FEV <sub>1</sub> < 80% predicted)
GOLD Stage III COPD	Severe COPD, characterised by further worsening of airflow limitation (FEV <sub>1</sub> /FVC < 0.70; FEV <sub>1</sub> ≥ 50% predicted)
GOLD Stage IV	Very Severe COPD, characterised by severe airflow limitation (FEV <sub>1</sub> /FVC < 0.70; FEV <sub>1</sub> ≥ 30% predicted)
HRDGP	Hunter Rural Divisions of General Practice
HUDGP	Hunter Urban Divisions of General Practice
ISQ	Initial screening questionnaire
MRC	Medical Research Council
NRT	Nicotine replacement therapy
PGA	Pharmacy Guild of Australia
PSA	Pharmaceutical Society of Australia

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## 1. INTRODUCTION / BACKGROUND

This project aimed to assess the feasibility and impact of pharmacist involvement in the early detection, referral and ongoing management of COPD.

Chronic Obstructive Pulmonary Disease (COPD) is a growing cause of morbidity and mortality worldwide and remains largely unrecognised and under-diagnosed in Australia<sup>1,6</sup>. Diagnosis of COPD is typically missed or delayed until the condition is advanced and significantly affecting quality of life in patients<sup>2</sup>. The overall prevalence estimates for COPD GOLD stage II or greater is 10.8% of the Australian population over 40<sup>1</sup>. Evidence suggests under-diagnosis of COPD in the general population, with only 50% of Australians with symptomatic COPD (Stage II-IV) aware that they even have the disease<sup>3,4</sup>. Early recognition of COPD may have a substantial impact on disease progression and severity, and the potential to positively affect patient outcomes<sup>2,6,5</sup>.

COPD refers to a group of disorders, including chronic bronchitis and emphysema, characterised by a reduction in airflow that is not fully reversible<sup>7</sup>. Due to the insidious nature of symptoms, patients may ignore the early warning signs of COPD and attribute symptoms to smoking, reduced fitness or age. Patients often only seek treatment when airflow limitation is moderate-to-severe. Early detection is important in altering the clinical course of the disease and preventing progressive lung damage as COPD patients benefit from bronchodilation, counselling on smoking cessation and immunisation<sup>2,5,7,8,9</sup>.

The shift from secondary to primary care, combined with reduced availability of medical manpower and increasing workload, has added to the burden on general practitioners. Recent evidence suggests that early detection of COPD in primary care by non-physicians, such as pharmacists, should be considered a feasible alternative.<sup>10,11</sup> Given community pharmacists' accessibility and frequency of contact with patients, they are in an excellent position to screen and refer patients at risk of COPD, as well as play an active role in their ongoing management.

Frameworks exist for the delivery of cognitive pharmaceutical services, and previous research suggests that the community pharmacist can successfully screen individuals, resulting in early referral and intervention for further assessment and management.<sup>12-15</sup> Pharmacists who practice in the community are seen by patients at a higher frequency than other primary care providers<sup>13</sup>. This project utilised the community pharmacists' accessibility, and knowledge of disease and pharmacotherapy, to screen, refer and collaborate in the management of patients with COPD.

### 1.1 Screening and early intervention in COPD

The Piko-6 is a small electronic device that measures the FEV<sub>1</sub>/FEV<sub>6</sub> and provides pharmacists with a practical and reliable screening tool for identifying patients at risk of COPD<sup>11,16,17</sup>. The FEV<sub>1</sub>/FEV<sub>6</sub> has been shown to be a valid alternative to FEV<sub>1</sub>/FVC for investigating airway obstruction<sup>18-21</sup>, and is comparable to FEV<sub>1</sub>/FVC post-bronchodilator<sup>19</sup>. In addition, Swanney et al<sup>22</sup> demonstrate that FEV<sub>6</sub> is an accurate, reliable alternative to FVC for diagnosing airway obstruction and that FEV<sub>6</sub> is more reproducible and less physically demanding for patients. Studies have suggested that early detection of airflow obstruction using spirometry supports smoking cessation education and provides objective data for patient motivation.<sup>23-24</sup>

Recent research has shown that pharmacy can play an important role in the management of chronic diseases.<sup>12</sup> Research in the area of diabetes disease state management involving case detection, self-management support, risk assessment and referral, as well as ensuring continuity of care through patient education, support and monitoring has been shown to be effective in improving glycaemic control, increasing patients' understanding of their diabetes and improving patient adherence<sup>12</sup>. Previous research involving osteoporosis<sup>13</sup> and cardiovascular risk<sup>14</sup> screening and collaborative care programs directed by pharmacists in the community setting have shown that the community pharmacist can successfully screen individuals for early referral and intervention. More recently, a Spanish study has shown that screening of COPD by community pharmacists is feasible<sup>11</sup>. Pharmacists have access to

high-risk middle aged patients who have never been tested for COPD and can detect airflow limitation by spirometry with results that are similar to those previously reported at primary care level<sup>24</sup>.

Flobbe et al<sup>15</sup> identified that providing pharmacists with specific training in the application and interpretation of screening procedures, and implementing quality control measures reduces the number of false referrals or non-referrals, and improves the quality of the service.

The purpose of this pilot study was to evaluate the feasibility and impact pharmacy's role in initial screening and referral of patients at elevated risk of COPD to their general practitioner for full assessment and diagnosis. The project also aimed to assess the feasibility of pharmacist involvement in the ongoing management of COPD patients and to raise COPD awareness in the pharmacy community and general public.

## 2. METHODS

The program was run in four stages as illustrated in the figure below.

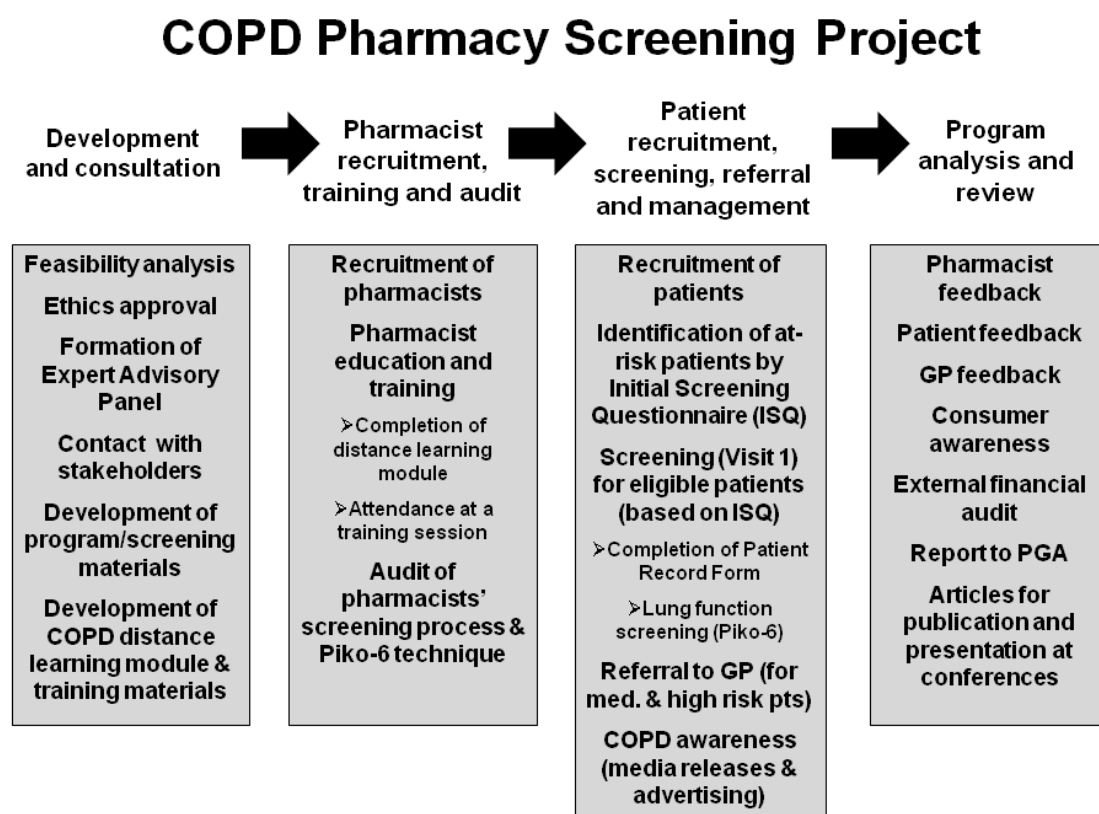


Figure 1 – Four stages of the COPD Pharmacy Screening Project

### 2.1 Ethics approval

This project received ethics approval from the University of Sydney's Human Research Ethics Committee HREC on 25 June 2008.

### 2.2 Development and consultation

An expert advisory panel was established to represent pharmacy, general practice, respiratory medicine, pulmonary rehabilitation, industry, and patients. Materials used in the screening, referral and management process were tailored to the program based on expert feedback and ethics requirements. Materials included checklists, patient screening questionnaires and referral forms, patient information sheets and consent forms, and screening protocols.

#### 2.2.1 General practice engagement



Immediately upon receiving ethics approval, the two relevant Divisions of General Practice (Hunter Rural Division of General Practice and Hunter Urban Division of General Practice) were contacted, informed of the objectives of the program and invited to participate in the planning and implementation of the program.

One Division (Hunter Urban) declined to participate, citing lack of prior consultation with them on the development of the protocol and lack of resources available to put towards the program. The second Division (Hunter Rural) became an active and supportive participant throughout the program.

Where there was support from the Division (Hunter Rural), information on the program and available clinical resources were included in Division newsletters encouraging GPs to become involved in the program.

This Division support from Hunter Rural augmented more direct communications to all affected GPs, including:

- Letters sent to GP practices geographically close to participating pharmacies (as identified by pharmacists) and through the telephone directory (Appendix 2)
- Participating pharmacists contacted GPs as required to notify them of patients being referred and followed-up
- Media release: 13 November 2008 *Pharmacists to support GPs in identifying those at risk of COPD* (Appendix 3)
- Article in *6minutes* electronic newsletter (Appendix 4)

Materials developed by The Australian Lung Foundation to support GPs in the diagnosis and management of COPD were made available to those participating. These included the COPD-X Checklist and Action Plan, *Feeling Short of Breath? Breathe Easier: Your Guide to COPD, Better Living with COPD: A Patient Guide* (Appendix 5).

## 2.2.2 Other Clinical Engagement

In a site visit late August 2009, members of the project team met with respiratory physicians from the Newcastle Pulmonary Function Laboratory Unit and the Respiratory Laboratories at John Hunter Hospital and coordinators of the Greater Newcastle and Rural pulmonary rehabilitation programs. The purpose of these meetings was to ensure that clinicians were aware of and supportive of the program.

## 2.3 Lung function screening using PIKO-6

The Piko-6 device measures risk for airway disease and is therefore a useful screening device to identify those at risk of COPD who should be referred onto their general practitioner for full assessment, diagnosis and management<sup>16,17,20,22</sup>. The Piko-6 device is not diagnostic and does not replace spirometry that a patient's GP may perform. The Piko-6 measures the FEV<sub>1</sub>/FEV<sub>6</sub> which is an accurate and reliable surrogate for FVC that is more reproducible and less physically demanding on patients<sup>20,22</sup>. Table 1 illustrates the interpretation of the PIKO-6 readings as well as the recommended action for pharmacists as part of the screening protocol established by the Expert Advisory Panel.

**Table 1 – Interpretation of Piko-6 screening results and recommended pharmacist action**

COLOUR ZONE	Lung function FEV <sub>1</sub> /FEV <sub>6</sub>	Risk of COPD	Action
RED	< 0.65	High	Recommend follow up– referral to GP for assessment and diagnosis.
YELLOW	0.65 to 0.75	Medium	Recommend follow-up– referral to GP for assessment and diagnosis.
GREEN	> 0.75	Low	COPD is unlikely – referral to GP based on symptoms recorded in initial screening questionnaire. While COPD is unlikely, the expert panel suggested that the existence of symptoms still warranted a discussion with the GP



## 2.4 Pharmacist recruitment, training and audit

Pharmacists from pharmacies in Newcastle and the Hunter Valley were invited to participate in the pilot program. This area was selected due to the active pharmacy networks in the area, high prevalence of smokers, availability of pulmonary rehabilitation programs as well as the clinical learning opportunities in COPD and spirometry to GPs in the area.

Pharmacists were recruited through:

- Presentation at the Pharmaceutical Society of Australia evening lecture August 2008
- Presentation at the Newcastle & Hunter Valley Pharmacists Association continuing professional development lecture September 2008
- Information booth at the Thoracic Society of Australia and New Zealand conference, March 2009
- Information flyers disseminated to approximately 300 pharmacies in the Newcastle and Hunter Valley through wholesaler drops (Appendix 6) and
- Promotion in professional pharmacy publications and journals
  - Australian Lung Foundation media release “*A call for pharmacists interested in COPD*” (Appendix 7)
  - *Pharmacy Daily*, 14 February 2008 (Appendix 8)
  - *Pharmacy News*, 13 March 2008 (Appendix 9)
  - *Australian Journal of Pharmacy*, May 2008 (Appendix 10)
  - *Australian Journal of Pharmacy*, May 2008 (Appendix 11)

Pharmacists who expressed interest in participating in the program were sent an information sheet and **Expression of Interest form** (Appendix 12). A member of the project team followed up with phone call discussions and face-to-face meetings.

Pharmacists were asked to complete a **Pharmacist Baseline Audit** designed to capture details of each participating pharmacist (Appendix 13).

Prior to commencing screening, each pharmacist completed a distance learning module on COPD (Appendix 1) and attended one of two interactive training sessions (Appendix 14) held in Newcastle and the Hunter Valley.

The **COPD Continuing Professional Education distance learning module** was developed to provide pharmacists with the necessary information to identify and screen at-risk patients, refer them to their general practitioner, and support the ongoing management of patients with a confirmed COPD diagnosis. Pharmacists were eligible for six CPD points upon successful completion of the distance learning module and an additional 10 CPD points for attending the interactive training session. To participate in the program, pharmacists were required to successfully complete the module with a pass mark of 80% or more as well as attend an interactive training program.

The development of training materials for the face-to-face training session was aligned with the COPD distance learning module and learning outcomes required to successfully implement a screening and management service. The content of the distance learning module and the subsequent training was developed by a pharmacist, reviewed by a respiratory physician, medical practitioner as well as by the wider project team. The training program incorporated interactive activities to consolidate the key learnings and allow the pharmacists to practice their screening technique according to the protocols provided and be assessed prior to commencing the project in their pharmacies.

In addition to this, the COPD distance learning module was disseminated to all PSA members to increase COPD awareness in the pharmacy community. At the time of submitting the report, 2,048 pharmacists Australia wide had completed the module with 94% of pharmacists (1,925 pharmacists) achieving a pass mark of >80%. While this has no immediate impact on the project or its findings, it did contribute to overall awareness of COPD within the pharmacy community.

At the beginning of the training session, participating pharmacists were tested for their current knowledge of COPD (Appendix 15). This test was repeated at the completion of the training day. The average mark pre-training was 67.5%. Post-training the average mark increased to 97.5%.

Screening kits and all program materials (Appendix 16) were distributed to pharmacists at the training sessions. Formal assessment was conducted at the training session and the pharmacists' Piko-6 technique and adherence to the **Screening Protocol** (see Appendix 16a) was audited at the completion of the training. A further audit of technique and adherence to the screening protocol was conducted in the middle of the project.

A website microsite was also established on The Australian Lung Foundation website [www.lungfoundation.com.au](http://www.lungfoundation.com.au). This microsite is designed to support community pharmacy (beyond the life of this pilot project) in their role in identifying at-risk patients, screening for COPD using the Piko-6 device, providing information on lung disease for their patients and referring patients suspected of having COPD on to their GPs.

## 2.5 Patient recruitment, screening and referral

### 2.5.1 Patient recruitment

Patients were eligible for screening if they had not already been diagnosed with COPD, emphysema or chronic bronchitis and were aged 35 years or older.

Pharmacists promoted the program through the display of a project poster (Appendix 17) in the pharmacy. Patients were recruited by completing an **Initial Screening Questionnaire** (Appendix 16d) that was available on pharmacy counters. Pharmacists also had the option of approaching patients directly who: 1) requested smoking cessation products; 2) had a history of recurrent respiratory tract infections by having had more than two courses of antibiotics in the last 12 months; and/or 3) had poorly controlled asthma.

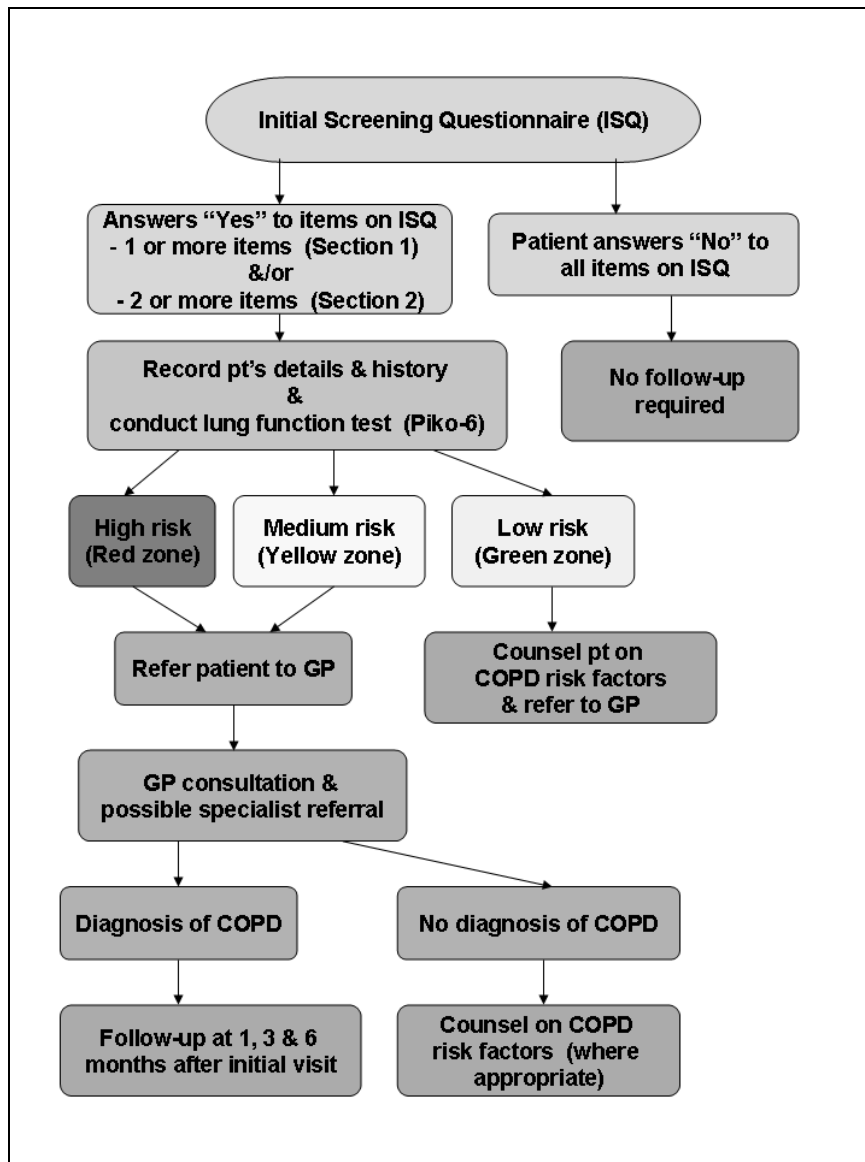
The Australian Lung Foundation supported screening by promoting the program through the media and assisting with screening at "dedicated screening days" in several pharmacies. See Appendix 18 for media releases, articles and advertisements.

### 2.5.2 Patient Screening

All patients completed an **Initial Screening Questionnaire (ISQ)** (Appendix 16d) to determine their eligibility for screening. The screening questionnaire used was based on criteria of the Global Initiative for Chronic Obstructive Lung Disease. The ISQ consisted of two sections. The first section contained three items related to risk factor exposure (including exposure to pollutants and tobacco smoke). The second section contained six items related to key symptoms of COPD. The questionnaire also contained five demographic items including age; gender; cultural background; occupation; and current employment status. Two items also identified if patients had been diagnosed with asthma and/or any serious, terminal or debilitating illness. As shown in Figure 2 below, patients were identified as being at risk of potentially having COPD if they received a score of one or more in Section 1 and/or 2 or more in Section 2. These patients were then encouraged to have lung function screening by the pharmacist using the Piko-6 device.

Figure 2 illustrates the screening protocol used by pharmacists in the pilot.

## Figure 2 – Screening, referral and management process



During the initial screening visit (Visit 1), the pharmacist recorded information in the **Patient Record Form** (Appendix 16e) including the:

- Patient name, address and contact details
- DOB/Gender/sex/Height and weight (for BMI)
- Details of their regular GP
- Level of exposure to risk factors (including past and current smoking behaviour, quitting history, and environmental exposure to other pollutants)
- Patient medical history and medication history (including the status of influenza and pneumococcal vaccination)
- Results of the lung function screening (including FEV<sub>1</sub>/FEV<sub>6</sub> and Piko-6 colour zones and dyspnoea score)\*
- Action taken by the pharmacist (including counselling and any GP referral)
- Length of consultation

\*Three readings were taken with the highest FEV<sub>1</sub> value reported in the GP Referral Form

### 2.5.3 Patient referral

Patients were referred to their GP if 1) their Piko-6 result was in the medium (yellow) or high risk (red) zone; or 2) Their Piko-6 result was in the low risk (green) zone AND they had reported at least one respiratory symptom. This change to the original protocol was adopted based on feedback from the

project's Expert Advisory Group. Pharmacists were required to complete the **GP Referral Form** (see Appendix 16f) for those patients who were referred to their GP. This form provided the GP with details of the initial screening, a brief patient history, reasons for referral, and actions taken by the pharmacist.

The GP was asked to complete and return to the pharmacist a brief **GP Report** (see Appendix 16e), to inform the pharmacists whether a diagnosis had been made, and whether the diagnosis was COPD, another respiratory condition or other condition. The GP was also asked to indicate the diagnostic tests that had been conducted, main outcomes of the GP consultation and key recommendations for the pharmacist to follow-up with the patient. Patients were given the choice of taking the GP Referral Form and Patient Record Form to the GP themselves or to give permission for the pharmacist to fax the forms directly to the GP on their behalf.

Pharmacists also had the option to provide information to the screened patients on COPD and lung disease (Appendix 5) where appropriate.

## 2.6 Patient management and follow-up

Pharmacists invited all patients referred to the GP to come into the Pharmacy for two further follow-up visits. Pharmacists conducted follow-up testing to plot progress and monitor changes. Pharmacists conducted the first follow-up visit (Visit 2) at approximately one to two months after the initial screening visit (Visit 1). This follow-up was done by contacting the patient by phone and inviting the patient into the pharmacy or opportunistically when the patient was next in the pharmacy.

The pharmacist noted whether the patient had seen the GP since the initial screening, and recorded any outcomes of that appointment with the GP (including testing performed and medications prescribed) in the **Patient Record Form** (Appendix 16e). Lung function screening was conducted again at both follow up visits and results were recorded as per the first visit (initial screening). If the patient had taken a reliever within the last four hours, they were asked to return later for lung function testing. The pharmacist recorded any action taken (counselling given) at the follow-up visit and time taken for the visit. A second follow-up visit was conducted approximately three to four months after the initial screening, following the same process.

Pharmacists were remunerated in two stages during the study period. They were paid upon completion of initial screening (\$20 per patient screened) and after completion of all follow-up visits (\$20 per follow up visit, to a maximum payment of \$60 per patient screened).

## 2.7 Program analysis and review

Participating pharmacists, general practitioners and patients were given the opportunity to provide feedback on the COPD screening, referral and management process. To assess the impact of the project and the feasibility of rolling out the program on a wider scale in the future, feedback was obtained from participating pharmacists, patients and general practitioners, including the CEO of the Hunter Rural Division of General Practice.

### 2.7.1 Pharmacist feedback

The 14 pharmacists and one pharmacy nurse who conducted screening were sent a **Pharmacist Feedback Questionnaire** (see Appendix 20) that consisted of 11 structured feedback items asking them to rate on 5-point Likert scales their satisfaction with the program's effectiveness, ease of implementation and sustainability, and whether they felt that participating in the program had a positive impact on patients and their relationship with GPs.

The questionnaires also sought pharmacists' feedback to improve the service; their thoughts on whether the program was cost-effective; and the likelihood of their ongoing participation if this type of program were to be rolled out in future.

Pharmacists returned completed questionnaires to the project manager by post or fax. A telephone follow-up was conducted to encourage participation.

Participating pharmacists were also given the opportunity to provide more detailed feedback on the program at a face-to-face focus group held at the end of the screening period. The **Pharmacist Focus Group** was conducted by an experienced, independent facilitator according to a semi-structured interview protocol. Responses were transcribed verbatim (Appendix 21) and thematically analysed.

## 2.7.2 Patient feedback

Patients who were screened at participating pharmacies in Newcastle and the Hunter Valley were invited to participate (up to 25) in individual structured **COPD Consumer Awareness and Feedback Interviews for Screened Patients** (see Appendix 22). Patients were recruited by participating pharmacists. All 12 participating pharmacies were invited to recruit patients. Only three pharmacies found the time to recruit from amongst their screened patients. Patients provided verbal consent to be contacted for the interview and were asked to rate their satisfaction with the program, the level of care they received and provide suggestions for improvement to the program. Demographic items relating to age, gender, cultural background, occupation and employment status were also gathered.

## 2.7.3 General Practitioner feedback

GPs who returned completed patient reports to referring pharmacists were contacted and asked to participate in a short **GP Feedback Interview** (see Appendix 23). The interview protocol consisted of three demographic items (age, gender and cultural background) and 10 structured and semi-structured items regarding their satisfaction with the program, the perceived value of the program to GPs and patients, effectiveness of the collaboration, program sustainability and suggestions for improvement. The interviews were conducted over the telephone or GPs were given the option to be faxed the questions for their completion.

The CEO from the Hunter Rural Division of General Practice participated in a semi-structured interview to provide feedback about the program's value to general practice, benefits and barriers, and sustainability. The interview was conducted over the telephone by a member of the project team.

All interviews were digitally recorded and transcribed verbatim for thematic analysis. All interviewed participants were asked to provide verbal consent to record the interview and advised that they had the opportunity to withdraw consent at any time without penalty. Interviews (excluding the HRDGP interview) were de-identified and coded. Thematic analysis was conducted by members of the research team.

## 2.7.4 COPD awareness

A **COPD Consumer Awareness survey** was conducted to measure consumer awareness of COPD. The survey was conducted with a convenience sample of 71 consumers at four participating pharmacies – representing two regional (Hunter Valley) and two metro (Newcastle). The survey items replicated questions about COPD awareness that were asked in a 2005 Newspoll survey conducted with a sample of 1408 adults in Australia aged 45 years and over as a baseline for comparison (see Appendix 24). Two members of the research team conducted the survey. Consumers provided verbal consent, prior to providing verbal answers. Screened patients were also asked the 2005 Newspoll questions for COPD post-awareness and a similarly worded item for pre-awareness, to allow for comparison, as part of the **COPD Consumer Awareness and Feedback Interview for Screened Patients** (see Appendix 22).

Pharmacists also completed pre- and post- awareness items in the **Pharmacist Feedback Questionnaire** (see Appendix 20) and their knowledge of COPD and its treatment was assessed prior to and after completing the training.

## 2.8 Data analysis

An independent statistician was hired to analyse quantitative data. Statistical analysis was conducted using SPSS (V.17.0). T-tests and ANOVAs for continuous data and chi square analyses for categorical data. Qualitative data was analysed using thematic analysis.

# 3. RESULTS / FINDINGS

## 3.1 Pharmacist recruitment, training and audit

A total of 18 pharmacists and one pharmacy nurse completed the training at one of two training sessions. One pharmacist dropped out and two pharmacists did not conduct any screening. This provided a total sample of 15 (14 pharmacists and one pharmacy nurse) conducting screening from 12 different pharmacies. Five of the pharmacies were located in the Newcastle metropolitan area and seven in regional locations in the Hunter Valley.

Of the participating pharmacists, 60% were male, 60% were the pharmacy proprietor and 60% were currently employed full-time in the pharmacy. (See Table A1 in Appendix 25, Pharmacists' characteristics.)

The majority of pharmacies involved in the program were independent pharmacies (75%). Half of the pharmacies were located in retail community strips, the other half in shopping centres. The majority of the pharmacies did not have a designated private/semi-private area for conducting patient interviews. Table A2 in Appendix 25 lists details of the pharmacies involved in the project.

All participating pharmacists had their Piko-6 technique and adherence to the screening protocol audited by a member of the project team at the end of the training session and again within their pharmacy during the course of the screening program. No significant problems were identified for any of the participating pharmacists.

## 3.2 Patient recruitment, screening, referral and follow-up

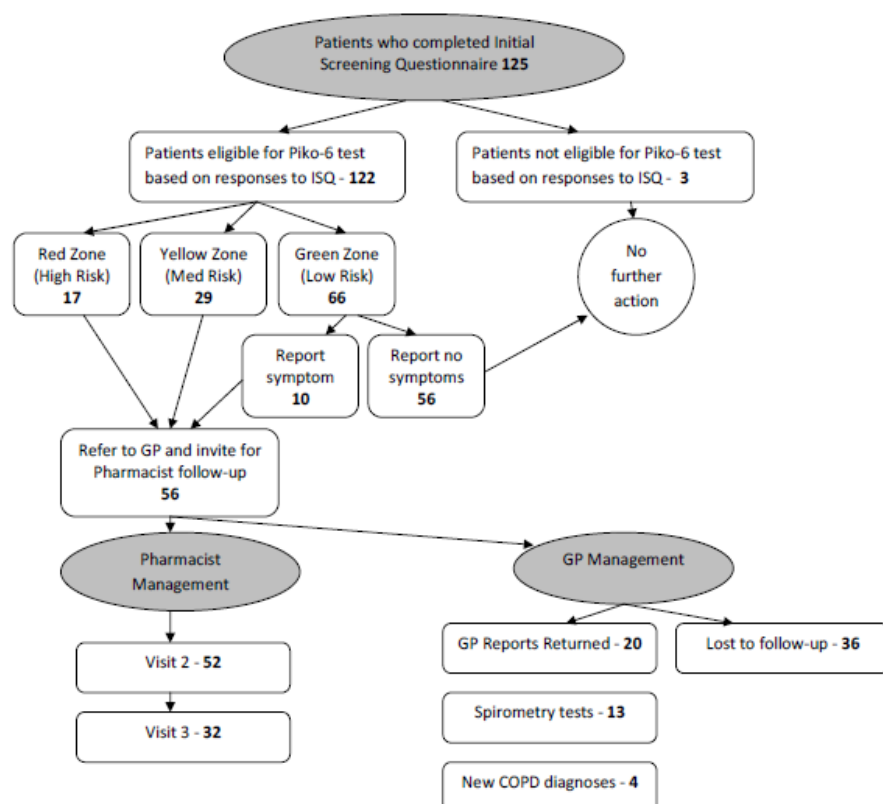


Figure 3 - Screening results and patient follow-up

### 3.2.1 Patient recruitment

As seen above in Figure 3, 125 patients completed the initial screening questionnaire (ISQ). 122 (97.6%) of these patients were eligible for lung function screening using the Piko-6 device. Piko-6 results were recorded and captured for 112 patients in the Patient Record Form. Of these 112 patients, 56 (50%) were referred on to their GP for further action. Those referred included 46 patients whose Piko-6 score was in the red or yellow zone, plus 10 whose Piko-6 score was in the green, but who had reported one respiratory symptom (as per advice from the Expert Advisory Panel).



These 56 patients who were referred to their GP were also invited to have follow-up visits with the Pharmacist. 52 of these patients (92.8%) had their first follow-up with the pharmacist (Visit 2) and 32 patients (57.1%) came for a second follow-up with the pharmacist (Visit 3).

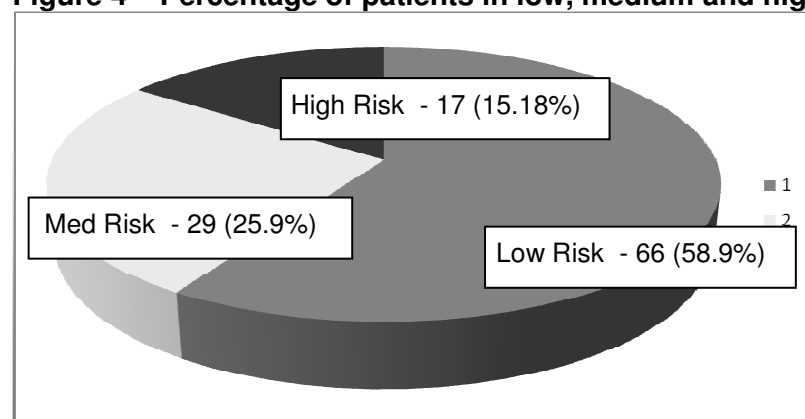
### 3.2.2 Patient screening

Screening results were recorded in the Patient Record Form for 112 patients. Recorded results included lung function screening scores (using the Piko-6), and a patient history, including data on patient demographics, smoking history, other chronic conditions and medications.

Of the 112 screened patients, 66 (58.9%) of patients were low-risk (green zone of the Piko-6), 29 (25.9%) were medium-risk (yellow zone of the Piko-6) and 17 (15.2%) high-risk (red zone). Therefore 46 (41%) were shown to be of either medium or high risk.

The overall mean FEV<sub>1</sub>/FEV<sub>6</sub> score was 0.76 (s.d.=0.12) which was on the border of the low-risk and medium-risk category. This was fairly consistent over time with the mean being 0.77 (s.d.=0.12) at Visit 2 and 0.74 (s.d.=0.15) at Visit 3. Figure 2 shows the percentage of patients in the red (high risk), yellow (medium risk) and green (low risk) zone of the Piko-6 at Visit 1. Table 2 illustrates the lung-function screening scores during the project.

**Figure 4 – Percentage of patients in low, medium and high risk zones at Visit 1**



**Table 2 – Lung function screening scores / Piko results at V1, V2, V3**

Lung function / Piko results (FEV <sub>1</sub> /FEV <sub>6</sub> )	Low risk N(%)	Medium risk N(%)	High risk N(%)
Visit 1 (Initial Screening) (N=112)	66 (58.9)	29 (25.9)	17 (15.18)
Visit 2 (N=52)	29 (55.78)	8 (15.34)	7 (13.46)
Visit 3 (N=32)	22 (68.75)	2 (6.25)	6 (18.75)

Missing data for visit 2 and 3: 52 patients returned for visit 2 but only 44 had their PIKO scores recorded; 32 patients returned for visit 3 but only 30 had their PIKO scores recorded.

Table 3 illustrates the age and BMI of recruited patients in relation to the COPD risk category. The average age of recruited patients was 64.42 years and average BMI was 29.23. The COPD risk category identified during the screening increased with age.

**Table 3 – Patient age and BMI**

Patient characteristics	Low risk Mean (s.d.)	Medium risk Mean (s.d.)	High risk Mean (s.d.)	Group mean Mean (s.d.)
Age (years)	61.9 (12.5)	67.2 (9.5)	70.33 (12.1)	64.42 (12.3)
BMI	28.73 (4.7)	26.65 (3.8)	36.30 (31.36)	29.23 (11.81)



Table 4 illustrates the patient gender by baseline Piko result. 56.3% of patients were female.

**Table 4 –Patient gender by baseline Piko result**

Patient characteristics (N=112)	Low risk N=66	Medium risk N=29	High risk N=17	Total (N=112)
Gender				
- Male	24(21.43)	15 (13.39)	8 (7.14)	47(42)
- Female	40 (35.7)	14 (12.5)	9 (8.04)	63(56.3)
-Missing	2 (1.79)			2 (1.8)

The majority of patients reported being retired (53%) however 17% stated they were still self-employed or employed on a full-time or part-time basis. Further patient characteristics, including employment status and cultural background are illustrated in Table A3 in Appendix 25.

72% of patients screened reported a smoking history (21.43% were current smokers; 50.89% ex-smokers). Of these patients with a smoking history, 93.5% had attempted to quit in the past. Only 2.68% of the current smokers were currently using NRT.

**Table 5: Smoking characteristics by baseline Piko result**

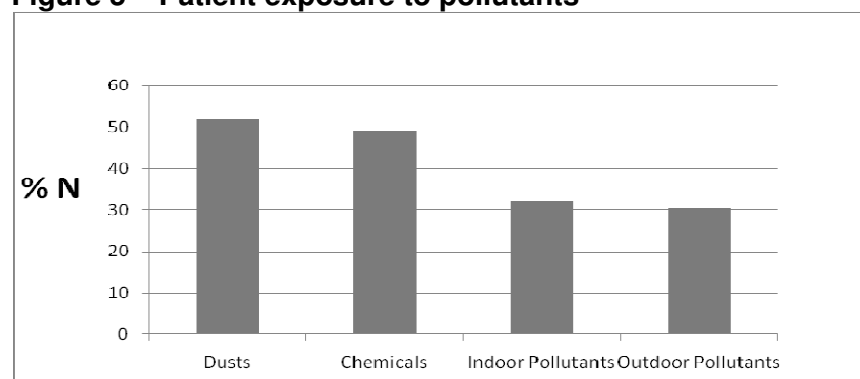
Characteristics	Low risk N=66	Medium risk N=29	High risk N=17	TOTAL N=112*
Smoking Status				
- current smoker	14(12.5)	6 (5.36)*	4 (3.57)	24(21.43)
- ex-smoker	37 (33)	13 (11.61)	7 (6.25)	57(50.89)
- never smoker	15 (13.39)	9 (8.04)	6 (5.36)	30(26.79)
Quitting attempts made				
- No	2 (1.79)	1(0.89)	1 (0.89)	4 (3.57)
- Yes	35 (31.25)	14 (12.5)	9 (8.04)	58 (51.79)
NRT used currently				
- Yes	2 (1.79)	1 (0.89)	-	3 (2.68)
- No	37 (33)	17 (15.18)	12 (10.71)	66 (58.93)

\*Details of the smoking history for one report was not completed.

The mean number of pack years for the overall group was 32.95 pack years. (31.7).

Of the screened patients, 41 (36.61%) indicated they did not have a current influenza vaccination and two (1.79%) “didn’t know” whether they had had a recent vaccination; 43 (38.39%) indicated they had not had a current pneumococcal vaccination and 13 (11.61%) “didn’t know” whether they had. The majority of the screened patients indicated that they had had some exposure to environmental pollutants, including exposure to dust (51.8%), chemicals (49.1), indoor pollutants (32.1%) and outdoor pollutants (30.4%) (Figure 5).

**Figure 5 – Patient exposure to pollutants**



As shown in Table 6, 63% of patients who completed the Initial Screening Questionnaire (ISQ) indicated that they were bothered by a persistent cough, phlegm, wheezing or mucous; the majority of these (34.82%) were in the low risk category.

49% of patients indicated that they avoid activities to prevent or limit breathlessness and 47% indicated that they get short of breath more easily than other people their age. 53% have attributed their breathlessness to lack of fitness and/or aging.

21.43% of patients reported a family history of chronic bronchitis or emphysema. 27% of patients reported a history of repeated episodes of bronchitis or respiratory infections.

Of the 17 patients in the high risk category at initial screening, 8 (50.1%) reported having 3 or more symptoms.

**Table 6 – ISQ items highlighting patient symptoms (N=112)**

Symptom	Low risk	Medium risk	High risk	Overall group N=112
Are you bothered by a persistent cough, phlegm, wheezing or mucous?				
No	16 (14.2)	11 (9.82)	4 (3.57)	31 (27.68)
Yes	39(34.82)	12 (10.71)	12 (10.71)	63 (56.25)
Do you avoid any activities to prevent or limit breathlessness?				
No	30 (26.79)	16 (14.29)	9 (8.04)	55 (49.11)
Yes	23 (20.54)	7 (6.25)	7 (6.25)	37(33.04)
Do you get short of breath more easily than others your age?				
No	27 (24.11)	11 (9.82)	9 (8.04)	47 (41.96)
Yes	23 (20.54)	11 (9.82)	7 (6.25)	41 (36.61)
Do you have a family history of chronic bronchitis or emphysema?				
No	38 (33.93)	15 (13.39)	14 (12.5)	67 (59.82)
Yes	14 (12.5)	8 (7.14)	2 (1.8)	24 (21.43)
Do you ever link breathlessness to aging or poor fitness?				
No	21 (18.75)	11 (9.82)	7 (6.25)	39 (34.82)
Yes	32 (28.57)	12 (10.71)	9 (8.04)	53 (47.32)
Have you had a history of repeated episodes of bronchitis or respiratory infections?				
No	40 (35.71)	11 (9.82)	10 (8.93)	61 (54.46)
Yes	13 (11.61)	11 (9.82)	6 (5.36)	30 (26.79)

Screened patients were asked to consider their personal level of breathlessness in relation to the MRC Dyspnoea Scale (Table A4, Appendix 25).

The mean score of those patients on the MRC Dyspnoea Scale was 0.94 (1.1) with 21.2% of patients scoring  $\geq 2$ . The Medical Research Council (MRC) dyspnoea scale has been in use for many years for grading the effect of breathlessness on daily activities and measures perceived respiratory disability. Any score of 1 or more on the MRC Dyspnoea Scale is considered to indicate that breathlessness is starting to have an impact on a patient's ability to carry out activities of daily living. For those identified as being low risk using the Piko-6, the mean MRC score was 1.0 (1.05), 0.72 (0.9) for medium risk, and 1.12 (1.3) for those identified as being high risk.

Screened patients were asked to report on their medical history and this was captured in relation to patient baseline Piko-6 result (see Table A5, Appendix 25).

68% of patients reported having a heart condition; 36% a disorder associated with the central nervous system, such as depression or insomnia; and 25% reported having asthma.

The majority of people were on at least one medication for another chronic illness, with 70% reporting medication use for heart and 26% for a disorder associated with the central nervous system, such as depression or insomnia (see Table A6, Appendix 25).

### 3.2.3 Patient referral and pharmacist follow-up

At each visit with the patient, the pharmacist recorded the action taken in the Patient Record Form. Pharmacists initiated early interventions at Visit 1 (Initial visit) based on Piko-6 results as follows:

- Smoking cessation advice was given to 20 patients (18%), including five patients referred to the Quitline and two supplied with NRT.
- Advice was given on medication use (19 patients); device use (five patients); influenza vaccination (31 patients); and pneumococcal vaccination (23 patients).
- 56 patients (50%) were referred on to their GP for full assessment, diagnosis and management

Pharmacists also invited those 56 patients referred to their GP into the pharmacy for two follow-up visits. 52 patients (92.8%) returned for the first follow-up visit (Visit 2) and 32 patients (57.1%) returned for the second follow-up visit (Visit 3).

Table 7 illustrates the action taken by the pharmacist at each of the patient visits. 50% of patients were referred to their GP for full assessment, diagnosis and management as a result of the initial screening.

**Table 7 – Action taken by the pharmacists at each visit**

Action taken by pharmacist	Visit 1 N=112 N (%)	Visit 2 N= 52 N(%)	Visit 3 N = 32 N (%)
Smoking cessation counselling			
- Smoking cessation advice	20 (17.86.0)	3 (5.76)	3 (9.38)
- Referred to Quitline	5 ( 4.46)	-	-
- Provided NRT	2 (1.79)	-	-
- Referred to prescriber for prescription / treatment	9 (8.04)	1 (1.92)	1 (3.13)
Advice on medication use	19 (16.96)	8 (15.38)	2 (6.25)
Advice on device use	5 (4.46)	6 (11.54)	2 (6.25)
Influenza vaccine recommended	31 (27.68)	12 (23.08)	3 (9.38)
Pneumococcal vaccine recommended	23 (20.54)	10 (19.23)	3 (9.38)
Advice on maintaining fitness	35 (31.25)	18 (34.62)	5 (15.63)
Information provision	10 (8.93)	3 (5.77)	-
Referral to doctor	56 (50)	15 (28.85)	5 (15.63)

The pharmacist recorded the time taken to conduct each of the three visits. The amount of time taken by the pharmacist decreased after the initial screening done at Visit 1. The mean length of time taken for Visit 1, at which initial screening was conducted, was 29.51 minutes (s.d. = 14.2). The mean length of time taken for Visit 2 was 16.4 minutes (s.d. = 10.29). The mean length of time taken for Visit 3 was 17.9 minutes (s.d. = 7.8).

### 3.2.4 General practitioner action

GP Action was measured in two ways. Firstly, this information was collected from the GP through the completed GP Report. The second method for collecting information on GP action was reported by the patients themselves to the pharmacist during Visit 2 and Visit 3.

The patient-reported data on the action of their GPs is important and is captured below in Table 11. However, given the aim of this project was to test the feasibility of a collaborative relationship between the pharmacist and the GP, the more important set of data is captured in the GP completed Reports that were sent back to the pharmacist (Tables 8, 9 and 10).

For the 56 patients referred to their GP, 20 (35.7%) GP Reports were completed and returned from 18 GPs (one GP returned three reports) from 15 practices in the Newcastle and Hunter Valley region. 55% of these came from Newcastle metropolitan and 45% from the Hunter region. Six pharmacies (50%) received at least one completed GP Report from the GP.

According to these 20 reports, 13 spirometry tests were performed, 10 patients (50%) were given a diagnosis, with four (20%) given a COPD diagnosis, 4 (20%) given a respiratory diagnosis other than COPD and two (10%) a non-respiratory diagnosis. The nature of other respiratory or non-respiratory conditions was not recordable. The yield of diagnosed COPD cases was 8.7% based on total referrals (56).

36 (64.0%) GP Reports were not returned and therefore any action taken by the GP is not known. Therefore, data has only been included for the 20 returned.

Table 8 provides a summary of the GP testings and diagnoses.

**Table 8 – GP Reports, testing and diagnoses**

<b>GP Reports (N=20)</b>	<b>N</b>	<b>%</b>
GP practice area		
- Newcastle (Metropolitan)	11	55.0
- Hunter (Regional)	9	45.0
Total	20	100.0
Diagnosis made		
- No	10	50.0
- Yes	10	50.0
Total	20	100.0
Diagnosis		
- COPD (new case)	4	20.0
- Other Respiratory	4	20.0
- Other (not respiratory)	2	10.0
- None reported	10	50.0
Total	10	100.0
Spirometry		
- No	7	35.0
- Yes	13	65.0
Total	20	100.0

The clinical outcomes of the GP visit were also recorded in the returned GP Report Forms.

Of the 20 patients for whom a GP Report was returned, 4 (20%) received pharmacological treatment and 5 (25.0%) received support for smoking cessation.

The main outcomes of the GP visit are listed in Table 9.

**Table 9 - Main outcomes of GP visit**

<b>Main outcomes of GP visit (N=20)</b>	<b>N</b>	<b>%</b>
- Pharmacological treatment	4	20.0
- Referral to pulmonary rehabilitation /support group	0	0.0
- COPD Action Plan	0	0.0
- Smoking cessation	5	25.0
- Other	5	25.0
- None	6	30.0

Total	20	100.0
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The nature of the recommendations provided by GPs was dependent on the patient diagnosis and outcomes of the GP visit. Nearly two-thirds (13, 65.0%) of the participating GPs made counselling recommendations to the pharmacist as part of the ongoing management process. Recommendations included five (25%) smoking cessation counselling; seven (30%) for counselling on medication; four (20%) for counselling on correct use of devices and five (30%) on vaccination for influenza and/or pneumonia. Table 10 highlights these key recommendations. The details of “other” outcomes were not recordable.

**Table 10 – GP counselling recommendations for referring pharmacist**

Counselling recommendation by GP (N=20)	N	%
Smoking		
- No	15	75.0
- Yes	5	25.0
Medication		
- No	13	65.0
- Yes	7	35.0
Device		
- No	16	80.0
- Yes	4	20.0
Vaccination (influenza and pneumonia)		
- No	15	75.0
- Yes	5	25.0
Other		
- No	18	90.0
- Yes	2	10.0

The 56 patients referred to their GP were invited for two follow-up visits with their pharmacist. At these follow-up visits, they were asked to report on the outcomes of any visits with their GP following their referral post Piko-6 screening. These are recorded in Table 11.

According to patients who participated in follow-up visits with the pharmacist (52 patients attended Visit 2 and 32 patients attended Visit 3), the following actions were reported:

- 62 visits to GP – 40 reported at Visit 2 and 22 reported at Visit 3
- 18 spirometry tests – 14 reported at Visit 2 and 4 at Visit 3
- 22 new prescriptions – 14 at Visit 2 and 8 at Visit 3

(Note: The researchers expect that there has been some double counting as patients may have reported the same action taken at both Visit 2 and Visit 3).

**Table 11 – Outcomes of visits to GP as reported by patients to pharmacists**

Outcome of GP visit	Visit 2 (N=52)		Visit 3 (N=32)	
	N	%	N	%
Seen GP since last visit				
- No	9	17.3	10	31.25
- Yes	40	76.9	22	68.75
Total	49	94.2	32	100
GP conducted lung function testing				
- No	29	55.8	24	75
- Yes	14	26.9	4	12.5
Total	43	82.7	28	87.5
Prescribed new medications				
- No	33	63.5	24	75

- Yes	14	26.9	8	25
Total	47	90.4	32	100

## 3.3 Program analysis and review

### 3.3.1. Pharmacist Feedback Questionnaire

Seven pharmacist feedback questionnaires were returned from 12 participating pharmacists. Pharmacists showed a high level of satisfaction with the program in their returned questionnaires, giving the program an average overall satisfaction score of 4.17 (1 = very dissatisfied; 5 = very satisfied). Pharmacists felt the program was effective for patients (1.83, 1 = very effective); and effective for the pharmacy (2.0, 1 = very effective). They were not convinced that the program was effective in enhancing their relationship with local GPs (3).

**Table 12 – Feedback from Pharmacist Questionnaire**

	Mean (SD)
Satisfaction with COPD screening program (1 = very dissatisfied)	4.17 (0.41)
Satisfaction with the program staff (1 = very dissatisfied)	4.50 (0.6)
Easy to administer the screening program (1 = very easy)	2.67 (0.82)
Useful/Effective for participating patients (1=very effective)	1.83 (0.41)
Useful/Effective for Pharmacy (1=very effective)	2
Useful/Effective for GP (1=very effective)	3.17 (0.75)
Effect on relationships with participating patients (1 = very positively)	1.67(0.52)
Effect on relationships with non-participating patients (1 = very positively)	2.83 (0.41)
Effect on relationship with GP (1 = very positively)	3 (0.58)
Impact on business because of offering the program (1 = very positively)	2.43 (0.54)
How effective was your collaboration with GP? (1 = very effective)	3.14 (0.69)
How long did the program take to administer (minutes)?:	
Initial screening visits	31.43(17)
Follow-ups visits	14.67(7.7)
Paperwork	27.83(17.6)
Minimum perceived amount pharmacist would need to be remunerated to consider the program cost-effective	\$38.33(12.6)

### 3.3.2 Pharmacist Feedback Focus Group

A pharmacist focus group was held to evaluate the pharmacists' experiences with the program and measure the potential of the program for future implementation in community pharmacy. A total of eight pharmacists attended (four from the Newcastle metropolitan area and four from the Hunter area), representing eight of the 12 participating pharmacies. The proceedings were taped and transcribed (see Appendix 21 for transcript).

Overall, pharmacists expressed a high level of satisfaction with the program in relation to their personal development, relationship with patients and potential business value. The expressed mixed satisfaction with the program in relation to the impact it had on their relationships with GPs.

They also identified some barriers and made suggestions for any future roll-out.

The barriers identified to running the screening program included:



- the lack of response/support from some general practitioners in participating in the program and completing the GP Reports
- time delay between training and initiating program
- the time taken for initial consultations when first implementing the service
- other responsibilities in the pharmacy that could interrupt consultations (namely dispensing prescriptions)
- paperwork required and amount of data needed to record
- initial lack of confidence in using the Piko-6

## *Time constraints*

For many pharmacists, the initial consultations were time-consuming at the start of the project, but as time passed they became more efficient in screening patients, recording information and counselling customers. Many pharmacists recognised the importance of recording the information required to deliver the service, but felt it could be more streamlined, in particular by reducing duplication of recorded information on pharmacy and patient records.

Other responsibilities within the pharmacy meant that their time was limited for each consultation. The follow-up visits were less time-consuming as the majority of customers booked appointments and were aware of what to expect. Some pharmacists noted that initial consultations where customers received a “green” reading also required some level of time and explanation but was valuable for the customer in allaying fears or identifying other issues.

*“It doesn’t really take that long.....I think the only time ....was really recruiting and getting people that were interested in doing it.....”*

*“Some were green....we sent them off because they had a cough....so a few cases we picked up .....People who the medication was causing a cough...and that was valuable...”*

## *Resourcing at the pharmacy*

It was identified that some of the aspects of the program could be supported by other staff in the pharmacy (including pharmacy support staff, intern pharmacists and/or nurses). The majority of pharmacists felt that it was the responsibility of the pharmacist to perform the screening and provide information/advice during the initial and follow-up consultations. They also felt that customers would expect the pharmacist to fill this role. Some pharmacists however, felt that support staff could assist with the initial screening questionnaire and follow-up appointments of patients. If other staff were to support aspects of the program then adequate training would also need to be provided.

The period between the face-to-face training and implementing the service was also critical. Those pharmacists who attended the face-to-face training session and delayed implementing the service found it difficult to start screening because they had lost confidence in their ability to use the Piko-6. Those who implemented the service immediately after the training were more successful in recruiting patients and providing the service. Follow-up support provided by members of the research team in the pharmacy shortly after the face-to-face training sessions was instrumental in getting some pharmacies up and running.

*“However many days or weeks go by before you actually do it in store..... time has passed....I was all at sea....it’s like I hadn’t ever done it.....but with you in attendance [program staff] on the first day it only took a patient or two and that was it”*

*“I was pretty happy personally [with the training].....I was quite comfortable with my patients....and made sure they were doing the technique properly”.*

## *Relationship with GPs*

The influence of the program on relationships with GPs was varied. Many pharmacists who had good working relationships with GPs were disappointed with the level of collaboration from GPs, whilst others who had no working relationship with some of the local GPs in the past formed new working



relationships. The level of collaboration appeared to be linked to GPs' existing levels of interest and knowledge around COPD.

*"I got a response from people I didn't know and I didn't contact, and I got zero response from doctors that I've known for 20 years and I did contact"*

*"The doctor was very supportive..."*

Pharmacists identified that involving the GP from the start and providing training in COPD would help engage GPs in the program. Many also suggested that providing GPs with some type of incentive would strengthen their involvement and collaboration. Many pharmacists sent the information with the patient instead of sending it to the GP directly; some contacted the GP over the phone.

The facilitators identified in running the screening program included:

- the training in COPD and PIKO screening provided
- the promotional materials (including promotion in the local press)
- support from members of the research team and organising dedicated screening days
- established relationships with customers
- accessibility of program to customers

### *Patient recruitment*

Some pharmacists were inundated with requests for screening as a result of the marketing and promotion. Other pharmacists were initially passive in their approach to identifying patients by leaving the initial screening questionnaire on the counter for patients to see and complete and recognised that they had to be more proactive if they were to identify and screen at risk patients.

Most of the patients were regular customers of the pharmacies involved in the program; however promotion in the local press appealed to non-regular customers who were happy to travel to the pharmacy to receive the service.

*"....its good for the general public because we are so accessible".*

*"The phone just ran hot, we did 25 people in a few sittings basically"*

### *Value for patients*

Pharmacists felt the program was valuable for patients with benefits including:

- increasing awareness of COPD for those at risk
- identifying patients with COPD (as a result of the initial screening)
- identifying patients with other respiratory conditions
- motivating people to quit smoking
- encouraging patients to see their GP for their symptoms so that they could start effective treatment
- providing advice on smoking cessation, vaccination, device technique and aiding compliance

Patients appreciated the time taken by the pharmacist to explain their result and provide them with the appropriate information and next steps.

*"A lot of people really don't have a clue what it [COPD] is, so a bit of awareness is a good thing".*

*"One of my patients actually did take it up with the doctor and the doctor put him on medication".*

*"It was good to encourage people that wouldn't normally go and see the doctor about something like that to go and get followed up appropriately".*

*"Sometimes they're things that patients have not thought was important enough to mention to the doctor, the fact that they were a little bit more breathless. The ones that just put it down to getting older....being able to talk to their doctor as to why they were a little bit more breathless"*

In addition to this, identifying patients at risk and referring them to the GP provided the doctor with an opportunity to manage and treat patients as well as get an update on their condition.

*“....Patients...were brought to their attention so they think, gee I didn’t realise that, I better do something about it...”*

## *Value for pharmacy*

The positive impacts of the program on the business included:

- increasing the offering of pharmacy services
- increasing professional satisfaction and motivation
- increased awareness and knowledge on COPD
- increasing customer base and goodwill

*“I had only two that were regular customers and the others had seen the promotion in the paper and had come from a long way away.”*

*“It’s good for us as professionals and it’s good for the general public because we are so accessible”.*

*“It’s more professionally rewarding.....I’m sick of checking scripts”*

*“In 25 years I’ve heard a lot of projects or whatever saying this will add to goodwill. Seriously this one did. This is probably the only one in 25 years that I’ve seen actually added to the goodwill”.*

## *Future roll-out*

Pharmacists felt that the program could be sustained in community pharmacies in the future and identified the screening component of the program as something that was within their capabilities given the right training.

Although the initial consultation was time consuming, many pharmacists thought that the screening, referral and on-going management process was simple and effective, and could be implemented successfully if data collection was streamlined.

*“....I thought it was really worthwhile, a good screening project”*

*“If you ask me, the industry is going to have to come to terms with it and try and give value for money and this is one way it can do that....develop professional services....it’s what we’ve got to do in the future...”*

*“I found as a tool, I was surprised at how quickly you could do a reading and show people a result that you could then explain to them”*

## *Remuneration*

In terms of remuneration, some pharmacists intended to continue the program without remuneration. The majority of pharmacists felt that given the time and level of expertise required to counsel patients some form of remuneration should be provided, particularly for those patients who blew “yellow” or “red” and needed a more in-depth consultation and follow-up.

*“I think you need to be paid for it because of the time involved with it”*

*“I think it was a great initiative and I’m just disappointed I couldn’t devote more to it so that’s why I’m continuing to do it in the shop anyway”.*

### **3.3.3 Patient Feedback**

Pharmacists from three of the 12 participating pharmacies helped to identify 14 patients to contact for feedback about the program. Eleven agreed to participate, one refused, and two were not able to be

contacted. The mean age of respondents was 70.55 years (s.d = 10.54). Four (36.4%) were male and seven (63.6%) were female. Seven (63.6%) of the patients were current smokers and four (36.4%) had never smoked.

One of the patients in the sample was diagnosed with COPD during the program. Only one respondent (9.1%) reported that they had heard of COPD prior to participating in the program. Eight (72.2%) indicated that they had not heard of COPD and two (18.2%) were unsure. In comparison, eight (72.7%) patients had heard of COPD after participating in the screening program and only three (27.3) had not heard of COPD.

As seen in Table 13, the interviewed patients expressed high overall satisfaction with the program (mean = 4.64, s.d. = 0.50) (5 = very satisfied). Patients' mean satisfaction with health professionals involved in the program was also very high, including the screening pharmacist (mean = 4.64, s.d.=0.5), general practitioner (mean = 4.7, s.d. = 0.48), and the program staff (mean = 4.45, s.d. = 0.69) (5 = very satisfied).

**Table 13 – Patient satisfaction with the program**

	Mean Where 1 = “very dissatisfied” and 5 = “very satisfied”.	Standard deviation
The overall program	4.64	0.50
The pharmacist	4.64	0.50
The general practitioner	4.7	0.48
The program staff	4.45	0.69

All 11 patients (100%) indicated that they would recommend this program to their family and friends. Nine (81.8%) said they would be willing to pay for the program, as long as it was “not too costly”. Of the remaining two patients, one said they were not able to pay as they were a pensioner and the other patient was unsure.

Four of the 11 patients (36.4%) spoke to the GP about their lung health.

When asked about the benefits of participating in the screening program, three patients nominated more interaction with their GP and/or pharmacist; three mentioned information about their medication; two stated management of an existing condition; one said resources about their condition; one said assistance with smoking cessation; and five stated peace of mind associated with being cleared of COPD by their doctor.

### 3.3.4. GP Feedback

#### *Structured GP Feedback Survey*

The 17 GPs who returned GP Reports to the referring pharmacist were contacted about completing a feedback survey. One GP no longer worked at the same practice and was not contacted. Three responses were received. The mean age of respondents was 49.67 years. Two respondents were female and one was male. Two respondents were European and one was Caucasian.

Mean satisfaction with the overall program was 3.0 (where 1 = very dissatisfied and 5 = very satisfied). The mean response to “The program was relatively easy to administer/participate in” was 3.67 (where 1 = strongly disagree and 5 = strongly agree).

Of the three respondents, one GP thought that the program was of value for identifying patients at risk of having COPD and two GPs were “unsure”. The GPs were “unsure” of the value of the program for supporting patients or for providing patients with information about their medical conditions. The GPs did not feel that it affected their relationships with patients. The GPs were “unsure” whether they would recommend the program to their patients.

Two indicated that they would recommend the program to their colleagues and one was “unsure”. The three GPs were “unsure” whether the collaboration with the referring pharmacist was effective. One GP felt that the program would not be sustainable due to time poverty of GPs and two GPs were unsure whether the program would be sustainable.

### **3.3.5 Feedback from CEO, Hunter Rural Division of General Practice**

#### *Program value and benefits*

The CEO of the Division felt that the program was valuable to GPs and their patients and indicated that she would like to see the program continue on a wider scale in the future. She considered the program to have potential to foster better communication between GPs and pharmacists. She felt this to be particularly important in rural communities where there are few GPs and more GPs working part-time. Pharmacists, on the other hand, are available “every day of the week”.

*“GPs can’t do it all... when there’s targeted, supported assistance, like in this case with great resources and a documented process that everyone knew and could follow, I think the GPs relaxed and were happy to get information and to share it and have it shared back to them.”*

The GP Referral Report provided a quick summary of clinical information that the pharmacist collated and the program addressed one of the main issues of COPD management, i.e. tracking patient outcomes through lung function.

The resources were seen to be “of a high caliber” with “great content for both the pharmacists and the GPs involved in the process.”

#### *Program barriers*

Although barriers were seen to be addressed well during the program, some potential barriers were identified for future program implementation.

She noted that relationships between GPs and pharmacists vary from community to community, with some being “positive” and some being “shaky”. Previous and existing relationships between GPs and pharmacists in communities can be a barrier or a facilitator. The program was seen to be a tool to help overcome communication barriers “and bring the GP and the pharmacist together to help improve the health outcomes of the chronic disease patient.”

Another potential issue was “GP control issues around patient screening and outcomes”, where some GPs may see pharmacists as “taking away some of their potential income” from spirometry. However, GPs often don’t have time to do the screening themselves. As the project was new, inherent issues of change management and paperwork were also identified.

#### *GP engagement and collaboration*

The systems put in place and resources provided were perceived to enable effective collaboration by addressing potential barriers. Suggestions for improved collaboration included engaging GPs early by incorporating education about the program into a GP education day through the Division and involving practice nurses “to help with the change process and the communication” and inviting them to the training sessions.

The information was well received - “You gave it to them, as much information as concisely as you could in one go....” However, as there is no “one-size-fits-all” approach and it was suggested that GPs be given “a number of options” about how to receive program information and resources, e.g. electronically.

It was felt that it was important that GPs get feedback about the results of the program, as this often doesn’t happen.

## Future program roll-out

The program was perceived to be “a great initiative” and it was believed “that there could be more screening like this “on a larger scale, “spread out” over a “longer period of time.”

A role for the program was envisaged within the context of current health care reform, possibly along the lines of Home Medicines Reviews, where the Pharmacist has a significant role in collaboration with GPs.

*“I think that this is an ideal time for this sort of research to come out because the impact on the broader community and the way the health is structured could be quite great.”*

## 3.3.6 Consumer Awareness Survey

Fifty customers aged 45 and older responded to the Consumer Awareness Survey that was conducted in four pharmacies. The pharmacies represented one banner and one independent pharmacy each in metropolitan Newcastle and in regional Hunter Valley. The maximum age of participants was 89 years, with a mean age of 62.4 years (s.d. = 11.9). Twenty-six participants (52.0%) were male and 24 (48.0%) were female. A majority of participants (43, 87.8%) were Caucasian (see Table A14 in Appendix 25).

Almost half (24, 48.0%) of the participants had never smoked regularly, 15 (30.0%) were current smokers, one (2.0%) was an occasional smoker and 10 (20.0%) were ex-smokers.

Ten respondents (20.0%) in the pharmacy consumer sample had heard of “Chronic Obstructive Pulmonary Disease” or “COPD” and 40 (80.0%) had not heard of it. This is in comparison to 31.0% of Australians aged 45 and older that were aware of COPD in the 2005 Newspoll.

In the 2005 Newspoll, 22% of Australians aged 45 and over had two or more symptoms of COPD and 45% of those people had seen a doctor about symptoms. Fourteen (28.0%) respondents from the pharmacy sample had experienced two or more of the three potential symptoms of COPD (regular cough, productive cough, breathlessness) and 11 (78.6%) had seen a doctor. Of the 14 people in the pharmacy sample that reported at least two potential symptoms of COPD, five (35.7%) had heard of COPD, which is similar to the baseline figure of 35.0% in the Newspoll sample.

**Table 14 – Proportion of patients who have seen doctor about potential symptoms of COPD experienced.**

Symptom	N	%
Coughing several times on most days		
- Seen doctor	13	26.0
- Not seen doctor	37	74.0
Total	50	100.0
Bringing up phlegm or mucus on most days		
- Seen doctor	8	16.0
- Not seen doctor	42	84.0
Total	50	100.0
Getting out of breath more easily than other people your age		
- Seen doctor	12	24.0
- Not seen doctor	38	76.0
Total	50	100.0

## 4.0 DISCUSSION

### 4.1 Limitations of study

#### 4.1.1 GP engagement

Despite efforts by the project team and the Hunter Rural Division of General Practice, affected general practitioners were not fully engaged in the program. This was clearly reflected in the low return of GP Reports (20 of 56 patients referred, or 36%). The low rate of return does not necessarily reflect the lack of GP action (as captured in the patient reports of GP action), but perhaps lack of time to report back.



The GPs who chose to participate in the program and return a report did not seem to reflect the support or lack thereof from their Division (11 reports came from Hunter Urban Division membership and nine reports came from Hunter Rural Division membership).

Feedback from participating pharmacists indicated that having an established relationship with a GP did not necessarily translate into participation in the program. Rather, pharmacists indicated that interest in respiratory illness seemed to be a predictor of participation.

The CEO of the Hunter Rural Division of General Practice suggested that lack of GP remuneration and lack of confidence in COPD knowledge were two potential barriers to participation.

Any future screening program should consider earlier engagement with the wider general practice team, including the practice nurse, to ensure the GP is supported to participate. Remuneration and targeted GP-specific training in relation to diagnosis and management of COPD would also improve engagement.

## 4.1.2 Missing data

The participating pharmacists found the data collection requirements onerous and some experienced difficulty in collecting complete datasets for each patient. While screening and taking ongoing Piko-6 readings was well completed, there is some missing data in relation to patient history and record of and impact of respiratory symptoms. Feedback from the pharmacists indicates that it was often a challenge to complete all the required paperwork while trying to manage other duties of a busy pharmacy practice.

## 4.1.3 Threshold for referral

Initially, the screening protocol required that pharmacists should refer on all those whose Piko-6 results were in the Red (High risk) and Yellow (Medium risk) zones. Based on feedback from the Expert Advisory Panel, the project team also required pharmacists to refer on those whose result was in the Green (Low risk) zone AND who reported at least one respiratory symptom.

While it is acknowledged that it is important to advise those with respiratory symptoms to discuss their lung health with their GP, for the purposes of identifying an effective screening and referral program for COPD, this change to the protocol probably lowered the threshold inappropriately.

## 4.2 Feasibility of conducting lung function screening in community pharmacy

Despite limitations, this project has demonstrated that it is feasible to deliver a COPD screening, patient referral and follow-up service in community pharmacy when appropriate training and support is in place for pharmacists and required paperwork is streamlined. (See below for recommendations to enhance GP engagement).

Participating pharmacists were trained to conduct reliable and reproducible Piko-6 lung function screening. Members of the research team conducted audits to ensure quality Piko-6 technique and adherence to the screening protocol by the pharmacists. Each pharmacist conducting screening was audited with no significant issues reported.

Pharmacists reported satisfaction with the program. The pharmacist feedback questionnaires recorded scores indicating a high level of satisfaction with the screening program. Pharmacists further reported that they felt the project was effective for patients and in fostering the relationship between the pharmacist and patient.

Pharmacist feedback through the focus group discussion indicated that early support to bolster pharmacist confidence in using the Piko-6 would have facilitated earlier and more screening. This support could be in the form of additional training in Piko-6 technique and/or in-store support from members of the research team.

*"It's like I hadn't [used the Piko-6 before], but with [research team member] in attendance on the first day, it only took a patient or two and that was it. Every one after that was great, but just that little kick-start ... was a huge help"* Male Pharmacist 1 – Focus Group

Two significant issues for the pharmacists was 1) the time taken to conduct the screening during the initial visit and the associated paperwork required and 2) limited engagement with local general practitioners. A future roll-out should consider streamlining paperwork so that duplication is minimised and documentation becomes more efficient.

## 4.3 Lung function screening in community pharmacy facilitates early pharmacist intervention, particularly in relation to smoking cessation advice.

This project has shown that lung function screening facilitates important early intervention for patients at risk of COPD by providing the opportunity for pharmacist/patient conversation on a range of important disease management actions.

46 (41%) of those who had their lung function screened were shown to be in either the medium or high risk COPD category.

Patient record forms show that at initial screening, the pharmacist was able to initiate smoking cessation counselling in 20 cases, advice on medication use in 19 cases, advice on immunisation in 31 cases (fluvax) and 23 cases (pneumovax).

Patient record forms also show that of the smokers, only 4% were currently using NRT. This was identified in the focus group feedback as a significant health promotion opportunity as well as a business opportunity.

*“What we did find that was beneficial was for those who we were trying to encourage to stop smoking. There was more encouragement once they saw their readings.” (Female pharmacist 2 Focus Group)*

*“I thought it was really worthwhile ... It was good to encourage people that wouldn't normally go and see the doctor about [their lung health] to go and get followed up appropriately.” (Female pharmacist 4 – Focus Group)*

Pharmacists reported feeling satisfied at the positive impact this project had on their relationship with their patients. Of the 56 patients referred on to their GP and subsequently followed-up by the pharmacist, 52 came in for a first follow-up visit with the pharmacist and 32 came in for a second follow-up visit.

*“I think it was a great initiative and I'm just disappointed I couldn't devote more to it so that's why I'm continuing to do it in the shop anyway.” (Male Pharmacist 3 – Focus Group)*

Awareness of COPD continues to be a barrier to screening. Despite program promotion within the pharmacy and in the community media, this program had little or no impact on consumer awareness in the wider community. However, based on the consumer feedback interviews, the program did have a positive impact on awareness of COPD amongst the recruited patients.

## 4.4 Lung function screening at community pharmacy can facilitate clinical diagnosis and GP follow-up in at-risk patients.

Pharmacists reported encouraging customers who would not normally seek advice for their symptoms to see their doctor. While only 20 completed reports were returned by the GP out of 56 referred patients, the GP reports that were returned show that spirometry was conducted in 13 cases. As a result, COPD was diagnosed in four of these cases (representing 7% of all 56 of those referred to GP and 20% of those referred patients for whom a GP Report was sent back). It is important to note that a respiratory illness was diagnosed in 17.4% of the 46 *medium to high risk* patients, and half of those (8.7%) were diagnosed with COPD. Other respiratory illness was diagnosed in a further four cases and another non-respiratory diagnosis made in two cases. Additional tests and diagnoses may well have resulted in relation to the 36 patients referred to GPs but for whom there was no report back from the GP, but this data is unknown to the researchers.

These GP-reported results compare to *patient reports* of action taken by their GP as a result of the screening program. According to the patients who were followed up by the participating pharmacist, there were:

- 62 visits to the GPs – 40 reported at Visit 2 and 22 reported by Visit 3
- 18 Spirometry tests\* – 14 at visit 2 and four at Visit 3
- 22 new prescriptions\* – 14 at Visit 2 and eight at Visit 3



\*It is important to note that these are actions reported by the patients themselves. Patients may have reported the same action taken at both Visit 2 and visit 3.

## 4.5 Participating GPs see a role for the community pharmacist in the collaborative management of COPD in their patient; however more resources need to be directed to facilitate improved collaboration with GPs.

Of the 20 reports completed, the GPs recommended the pharmacist take the following follow-up action with their patients:

- Smoking cessation counselling -- five cases (25%)
- Medication counselling – seven cases (35%)
- Vaccination counselling – five cases (25%)

This collaborative relationship might have been further enhanced had more resources been dedicated to earlier and more intensive communications with GPs, particularly with the practice manager whose role in supporting GP participation could be important.

Pharmacist feedback showed that the project had little impact on their relationship with the GPs and their collaboration with the GP. Pharmacists felt GP support was varied with some GPs being very supportive of the program and others showing little or no interest.

*“I got responses from [GPs] I didn’t know and I didn’t contact, and I got zero response from doctors that I’ve known for 20 years and I did contact.”*

Pharmacist feedback indicated that having the patient bring the Patient Information Form directly to the GPs and ask him/her to complete it was more effective than sending the Form by mail or fax.

Pharmacists felt that demands on GPs’ time and lack of financial incentive may have been a barrier to greater collaboration.

*“I gave the form to the patient to give to the doctor and the doctor just didn’t do much. I think they don’t know what’s going on. They don’t know what its about and so didn’t do much. They’re too busy the doctors.” (Female pharmacist 3 – Focus Group)*

In addition to this, training on COPD provided to GPs and the wider general practice team at the start of the program may have motivated GPs to be more involved.

Feedback from the Hunter Rural Division of General Practice indicated that the program has the potential to foster better collaboration between GPs and pharmacists for the benefit of the patient which would be of particular benefit in more remote areas where there are fewer GPs and more demands on their time.

Earlier communication was also supported with individual practices through targeted training days for practice staff, including practice nurses.

Overall, the Division was optimistic about the program and the role it could play as an important part of disease management in conjunction with Home Medicines Review.

*“Imagine if a GP could have some type of communication arrangement with a pharmacist about a patient who has a chronic disease ... the pharmacist did part of the screening and the HMR all rolled into one.” Alison Croker, CEO, Hunter Rural Division of General Practice.*

## 5.0 CONCLUSIONS & RECOMMENDATIONS

Lung function screening at community pharmacy has been shown to be feasible (with appropriate support) and has been shown to have a positive impact on:

- Identifying patients at risk of COPD and referring them to GPs for diagnosis
- Early intervention for at-risk patients at the pharmacy level

- Pharmacist/patient relationship
- Pharmacist awareness of COPD

The study has further shown that in order to have a greater impact on the collaborative approach to patient management between the pharmacist and the GP, further resources must be dedicated to enhancing and facilitating communication with GPs.

Further work is required to trial proposed modifications to the model aimed at facilitating improved engagement of GPs and improved collaboration between community pharmacy and general practice.

Based on the critical success factors of the project, the following next steps are recommended:

**Recommendation 1:** Deliver a “modified pilot” program in order to prepare for national roll-out of a screening, referral and management program to identify medium and high risk patients of COPD so that they are identified and treated early. The modified pilot should include a program of engagement and training with the wider general practice team.

**Recommendation 2:** Increase GP engagement and participation by providing adequate training and remuneration for participating GPs. Earlier and more intensive communication with GPs (including the practice nurses) at both the Division and individual practice level would also increase participation. This may also include dedicate training days for practice staff where appropriate.

**Recommendation 3:** Amend screening protocol so that only those patients whose Piko-6 results are in the Red (High risk) or Yellow (Medium risk) zones are referred to their GP.

**Recommendation 4:** Streamline the level of documentation required for both pharmacists and GPs to limit the amount of information gathered in the patient record form.

**Recommendation 5:** Review the training program to increase the time allocated to the training component and allow for more time to demonstrate and assess use of the PiKo-6 device and study protocol. Joint training of pharmacists and GPs on both COPD and the program would facilitate collaboration.

**Recommendation 6:** Provide in-store support post-training for pharmacists to increase confidence in screening and facilitate early program implementation.

**Recommendation 7:** Ensure adequate resources are available in the pharmacy to maximise the efficiency of consultations and minimise disruptions. This may include involving other staff in parts of the program (particularly where general data is collected); having an additional pharmacist or intern pharmacist on for screening sessions; having screenings done on dedicated (and advertised days) and/or by appointment. This would involve providing any other staff contributing to the program with adequate training.

**Recommendation 8:** Remunerate pharmacists for delivering the service for initial screening visits as well as a minimum of one follow up visit based on medium and high risk patients.

**Recommendation 9:** Incentive payments (or possibly CPD points) are considered for general practitioners to remunerate them for the increased work required to communicate with the pharmacist. This as well as COPD training may motivate and engage the GP to participate in the program.

**Recommendation 10:** Increase the quality and variety of resources for a COPD Awareness campaign to support the screening program in the pharmacy, GP surgery and mainstream media.

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3. Media release 13 November 2008 *Pharmacists to support GPs in identifying those at risk of COPD*
4. Article *6 minutes* 25 November 2008 – *Pharmacists to screen for COPD*
5. Australian Lung Foundation supporting resources for clinicians
  - a. COPD-X Checklist
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  - c. *Feeling Short of Breath* - DL Flyer
  - d. *Breathe Easier: Your Guide to COPD* - DL brochure
  - e. *Better Living with COPD: A Patient Guide* – patient handbook
6. NHVPA information flyer, *COPD Pharmacy Screening Project*
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10. *Australian Journal of Pharmacy* article May 2008 – *The COPD Burden*
11. *Australian Journal of Pharmacy* article May 2008 – *Breathing life into failing lungs*
12. Pharmacist Expression of Interest Form
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