

Initial diagnosis and management of chronic obstructive pulmonary disease in Australia: views from the coal face

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Abstract:

Background: Early diagnosis and management can mitigate the long-term morbidity and mortality of chronic obstructive pulmonary disease (COPD).

Aim: To gain insights into the initial diagnostic process and early management of COPD by Australian general practitioners (GPs).

Methods: A random sample of Australian GPs was invited to complete a postal survey, which assessed familiarity with and use of contemporary practice guidelines, diagnostic criteria, and management preferences for COPD.

Results: Two hundred and thirty-three GPs completed the survey. While most GPs based a COPD diagnosis on smoking history (94.4%), symptoms (91.0%) and spirometry (88.8%), only 39.9% of respondents recorded a formal diagnosis of COPD after the patient's first symptomatic presentation. Tiotropium was the preferred treatment in 77.3% of GPs for the initial management of COPD, while only 27.5% routinely recommended pulmonary rehabilitation. GPs routinely recorded patients' smoking status and offered smoking cessation advice, but the timing of this advice varied. Less than half of the respondents routinely used COPD management guidelines, or tools and resources provided by the Australian Lung Foundation.

Conclusion: There is scope for major improvement in GPs' familiarity with and use of COPD management guidelines, and readily available tools and resources. Some

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systematic issues were highlighted in the Australian primary care setting, such as a reactive and relatively passive and delayed approach to diagnosis, potentially delayed smoking cessation advice and under-utilisation of pulmonary rehabilitation. There is an urgent need to devise strategies for improving patient outcomes in COPD using resources that are readily available.

Keywords:

Pulmonary Disease, Chronic Obstructive
General Practice
Guideline Adherence
Diagnosis
Disease management

Introduction

Chronic obstructive pulmonary disease (COPD), which is largely a preventable smoking-related condition, is a major cause of disability, hospital admission and premature death in Australia. Approximately 2 million Australians are estimated to have COPD,¹ and the prevalence is likely to escalate as the population ages.

Early diagnosis and appropriate management will slow the progression of COPD.² For a disease where decline is largely preventable, the sight of patients dying slowly of COPD should be a rarity – sadly it is becoming more common.² COPD is the fourth leading cause of death worldwide and by 2020 it is estimated that it will be the third leading cause of death.³ Depending on disease severity, between 40-70% of patients with COPD will die within five years of being diagnosed, indicating how late substantive diagnosis is established.⁴

Under-diagnosis and under-treatment of COPD contribute significantly to the burden of human misery and healthcare costs. Despite widely distributed evidence-based management guidelines,^{5,6} knowledge of and adherence to these guidelines amongst

doctors remains suboptimal.⁷⁻¹² In Australia, more than 40% of patients with COPD do not have a formal diagnosis from their doctors, and less than 50% have ever been prescribed medication for their breathing and are taking the important steps critical to slow disease progression.¹¹ Primary healthcare professionals need to know about the importance of early detection and management of COPD in order to ensure effective strategies are implemented to stop people with early disease progressing.

While previous studies involving patients with COPD in Australia have suggested suboptimal management,^{11,13} there is a lack of research involving practising Australian community-based general practitioners (GPs). The aim of this study was to gain insights into the initial diagnosis and early management practices for COPD amongst Australian primary care GPs, and to highlight any problem areas and management gaps, as determined by comparison with international-standard evidence-based management guidelines.

Methods:

A national postal questionnaire of Australian GPs was conducted. A total random sample of 1,000 GPs was approached; they were selected via the Medical Directory of Australia, an online medical database used to search and locate doctors and health facilities nationwide.¹⁴ The randomisation was undertaken independently by AMPCo Direct (Australasian Medical Publishing Company Ltd, Sydney).

These selected GPs were sent an invitation letter and the survey. Replies were returned via an enclosed postage paid envelope. A follow-up reminder letter was sent to all the doctors three weeks after the initial letter was sent. The survey was 4 pages in length, and contained a total of 32 questions. All items were checkbox questions, except for the final item which allowed any additional comments relating to COPD diagnosis and

management. Completion of the survey was estimated to take approximately 10 minutes. The survey included questions about GP demographics and practice details, familiarity with contemporary practice guidelines, diagnosis of COPD, use of lung function tests, treatment preferences, advice offered and patient follow-up. A prize draw of an iPad mini was used as a recruitment incentive (to maintain anonymity, prize draw details were separated from survey responses immediately upon receipt).

De-identified surveys were collected from June to October 2014. All variables were collated and entered into a statistical software package, SPSS version 21 (IBM, Armonk, New York, US). Respondents were classified as adherent or non-adherent to management guidelines according to their responses to four management areas: (i) using smoking history and spirometry to diagnose COPD, (ii) preferring bronchodilators (not inhaled corticosteroids) for initial treatment of COPD, (iii) routinely recommending pulmonary rehabilitation to patients with COPD and (iv) routinely offering smoking cessation advice to patients with smoking-related COPD.^{5,6} Those classified as adherent had to be following the recommendations in all four areas.

Comparisons between adherent and non-adherent respondents were tested using the Chi Square test for dichotomous variables (with Yates' Correction for Continuity) and the Mann-Whitney test for continuous variables, with P values of < 0.05 deemed statistically significant. A logistic regression analysis was performed to assess the validity of guideline adherence by looking at the impact of potentially related factors, with $P < 0.1$ used as a threshold for entry into the model. Variables that were used to classify respondents as adherent or non-adherent were excluded from the model.

Variables that were closely related to adherence (e.g. views about spirometry and timing

of smoking cessation advice) were also excluded from the model. The study was approved by the Tasmanian Social Sciences Human Research Ethics Committee.

Results:

Of the 1,000 surveys distributed, 233 (23.3%) were completed and returned. The respondents were practicing in New South Wales (36.1%), Victoria (21.9%), Queensland (15.0%), Western Australia (10.3%), South Australia (8.2%), Tasmania (5.2%), Australian Capital Territory (0.4%) and the Northern Territory (0.9%). Most GPs practiced in an urban location (82.0%), and had a practice nurse present in the practice at which they worked (91.4%) (Table 1).

The respondents used a variety of tools to diagnose COPD, with the majority basing a diagnosis on smoking history (94.4%), symptoms (91.0%), spirometry (88.8%) and physical examination (79.0%). Most respondents either had direct access to a spirometer (78.1%) or referred patients elsewhere for spirometry (20.2%), and 98.3% believed that spirometry testing is helpful in guiding a diagnosis. However, only 39.9% of respondents indicated that they record a formal diagnosis of COPD after the patient's first presentation to them, with many GPs delaying the diagnosis until after a trial of pharmacotherapy (40.8%), after a respiratory specialist has made a diagnosis (20.2%) or after a diagnosis was made at hospital discharge (4.7%).

While the majority (87.6%) of GPs indicated that they routinely communicate the diagnosis to patients, 31.8% used terms other than 'chronic obstructive pulmonary disease' or 'COPD' in this communication. The majority (88.8%) of respondents indicated that they routinely schedule follow-up visits with newly diagnosed patients (Table 2).

The majority (93.1%) of respondents believed that spirometry testing is helpful in guiding the management of COPD. Tiotropium was the preferred drug treatment in initial management by 77.3% of GPs, followed by short-acting beta-2 agonists (39.5%), inhaled corticosteroids (33.9%) and long-acting beta-2 agonists (29.6%). However, only 27.5% indicated that they routinely recommend the non-pharmacological management option of pulmonary rehabilitation. Most GPs indicated that they routinely record patients' smoking status (98.7%) and offer smoking cessation advice, but the timing of this advice varied, with 78.1% offering advice on a patient's first presentation with respiratory symptoms, 11.2% waiting until a diagnosis of COPD has been made, 6.9% waiting until a follow-up visit and 3% waiting until the patient expresses an interest in quitting. (Table 3).

Less than half (48.9%) of the respondents indicated that their management of COPD is informed by guidelines. The Australian COPD-X guidelines were the most popular resource used (30.0%), followed by the Therapeutic Guidelines (6.9%). Three-quarters (75.1%) of respondents indicated that they are aware of clinical tools and resources provided by the Australian Lung Foundation, but only 48.9% indicated that they routinely used these aids, and only 7.3% indicated that they were personally familiar with them (Table 4). Use of the chronic disease management GP services items available for reimbursement on the Medicare Benefits Schedule varied amongst respondents, with 41.2% indicating that they routinely use the General Practice Management Plan item and 36.5% routinely using the Team Care Arrangement Plan item.

In total, 106 (45.5%) respondents could be classified as adherent to all four practice guideline areas of diagnosis, pharmacological management, pulmonary rehabilitation

and smoking cessation advice. Comparisons between GPs classed as adherent and non-adherent to management guidelines are shown in Table 5. GPs who were adherent to management guidelines were more likely to report the presence of a regular nurse at their practice who routinely saw patients with COPD ($P = 0.049$), use the term ‘chronic obstructive pulmonary disease’ or ‘COPD’ when describing the diagnosis to patients ($P = 0.081$), use the General Practice Management Plan item ($P = 0.002$) and the Team Care Arrangement Plan item ($P < 0.001$), and be familiar with ($P = 0.004$) and routinely use ($P = 0.011$) the Australian Lung Foundation’s tools and resources for GPs. The logistic regression model to predict the level of guideline adherence contained 7 variables and was statistically significant overall ($\chi^2 = 22.1$, $df = 7$, $P = 0.002$); however, no independent variables made an independent uniquely significant contribution to the model.

Discussion:

Recent studies have demonstrated that the most rapid decline in lung function in COPD may occur in early to moderate disease,^{15,16} suggesting that diagnosing and treating patients early in their disease trajectory may offer the best chance at mitigating the substantial long-term morbidity and mortality associated with COPD. However, COPD is still underdiagnosed and undertreated in most countries, especially in its early stages.^{11,17-19} The present study indicates that COPD is often not diagnosed and managed in Australian primary care per the most recent recommendations and guidelines, and readily available resources are widely underutilised. Diagnosis of COPD is uniformly reactive, with no obvious attempt to case-find COPD among asymptomatic smokers.

While most GPs indicated that they base a diagnosis on smoking history, symptoms and spirometry, which is in accordance with guidelines, many GPs indicated that they often delay the diagnosis until after a trial of pharmacotherapy, after a respiratory specialist has made a diagnosis or after a hospital discharge diagnosis. This passive approach to diagnosis is consistent with other findings demonstrating that among patients meeting guideline criteria for COPD, many do not have a formal diagnosis from their GP, and are not receiving any treatment.^{11,19}

Interestingly, a previous qualitative study of GPs found that delayed diagnosis of COPD by GPs may be intentional, rationalised by a misperception of patients' unwillingness to be given a diagnosis and GPs' nihilistic attitudes to prognosis.²⁰ However, it is now known that pharmacologic therapy initiated early in the course of COPD (in addition to smoking cessation) may alter the rate of disease progression.²¹⁻²³ Establishing and acting on an early diagnosis of COPD is therefore a critical step in reducing the extensive morbidity and mortality of this disease. Achieving the goal of early diagnosis in COPD is clearly a significant challenge. While a number of studies have demonstrated the effectiveness of case-finding programs in general practice to diagnose COPD early,²⁴⁻²⁸ a number of barriers reduce the implementation of such programs, including increased workload, and the need for assistance and financial compensation.^{29,30}

Prescribing preferences in the initial management of COPD were generally in accordance with guidelines, with most GPs indicating that they prescribed bronchodilators. However, ICS seemed to be over-prescribed, with one-third of GPs indicating that they were prescribed in addition to bronchodilators as initial therapy in early disease. While ICS have been shown to improve quality of life and lung function when added to bronchodilator therapy,³¹ they have been shown to increase the risk of

pneumonia in patients with COPD,^{32,33} and national management guidelines recommend that ICS be reserved for reduction in exacerbation rates in patients experiencing these frequently.⁵ Other studies around the world have also demonstrated ICS overuse in COPD, demonstrating suboptimal compliance with national and international guidelines.^{10,34-36}

Disappointingly, less than 30% of respondents indicated that they routinely recommend pulmonary rehabilitation to patients with COPD. While the reasons for this were not fully explored in this study, previous research suggests that low awareness of the health benefits of pulmonary rehabilitation and lack of availability of programs (or lack of knowledge about them) locally may be barriers to referral.^{12,37} Further strategies to enhance GPs' access to, awareness and familiarity with pulmonary rehabilitation, to improve referral rates are warranted.

GPs routinely recorded patients' smoking status and offer smoking cessation advice, but the timing of this advice varied, with more than 20% of respondents indicating that they delayed smoking cessation advice, even once the patient had presented with respiratory symptoms, variably waiting until a diagnosis of COPD has been made, at some ill-defined follow-up appointment, or only when the patient expresses an interest in quitting, whenever socially appropriate or after an infective exacerbation. This delay may be due to patient-based or GP-based barriers to providing opportunistic smoking cessation advice, such as the patient's lack of motivation to quit, or time constraints, both of which have been described in previous research.^{38,39} While it is encouraging that almost 100% of respondents routinely offer smoking cessation advice to their patients, there is some room for improvement in when this advice is first offered, especially

considering that early smoking cessation in COPD has been shown to have a greater impact on lung function decline.⁴⁰

Less than half of the respondents indicated that their management of COPD is informed by guidelines. This is comparable to other studies outside of Australia.^{8,12} Increased awareness and implementation of guidelines and resources may improve screening of patients at risk and allow for earlier diagnosis of COPD. However, increased awareness and dissemination of guidelines alone may not necessarily translate into greater incorporation of such guidelines into practice. This was evidenced by three-quarters of respondents being aware of the Australian Lung Foundation's tools and resources for GPs, but less than half indicating that they routinely use them in practice. The lack of personal familiarity with resources is of special concern. The Australian Lung Foundation has developed a range of clinical resources designed to support general practice in the diagnosis and management of COPD; however, our results suggest a need for better ways of getting GPs familiar with and using their COPD management tools.

There are some potential limitations to this study. The analysable response rate was only 23% and so the data may not have provided a true representation of GPs' practices. However, the response rate was typical of other surveys of doctors' treatment practices,⁴¹⁻⁴³ and was considered acceptable for this form of research, especially given the relatively long questionnaire (32 questions).⁴⁴ Nevertheless, it should be borne in mind that the results may underestimate any evidence-to-practice gaps in Australia, as it is reasonable to assume that GPs may have been less likely to respond if they were uninterested in COPD, or unsure of or did not adhere to, current COPD management guidelines.

Notwithstanding these limitations, the results of this study provide valuable information regarding Australian prescribing and management practices in COPD. While previous studies involving patients with COPD in Australia have suggested suboptimal management,^{11,13} to our knowledge this is the first study to gain insight into these clinical issues from practising Australian GPs.

Conclusion:

There is considerable scope for major overall improvement in GPs' use of and familiarity with COPD management guidelines, and the readily available tools and resources. The findings of this study highlight the need to devise strategies for improving clinical standards and so patient outcomes in COPD, and importantly by better use of resources already readily available. Compilation and dissemination of guidelines and focused education on some areas in need of improvement (such as delayed diagnosis, delayed smoking cessation advice and underutilisation of pulmonary rehabilitation) are important strategies for improving patient outcomes in COPD.

Research in how to do all this more effectively should be a core part of any strategy, and should be recognised as a challenge for both the medical profession itself, and allied agencies such as the Australian Lung Foundation which produce the material that is so relatively under- or misused.

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Table 1. Characteristics of responding general practitioners

Survey item	Responses[†] (n = 233)
Gender	
Male	135 (57.9%)
Female	98 (42.1%)
Age	53 (26-87)
Years registered	29 (2-64)
Location of practice [‡]	
Urban	191 (82.0%)
Rural	40 (17.2%)
Hours per week seeing patients	38 (6-80)
Patients seen per week (all)	120 (10-300)
Patients seen per week (COPD)	7 (1-55)
Presence of practice nurse(s) in practice	213 (91.4%)
Number of full-time equivalent practice nurses	1 (0.3-6)
Practice nurses who routinely see patients with COPD	112 (48.1%)
Practice nurses specifically trained in COPD	47 (20.2%)

[†]Values represent number (percent) of respondents or median (range).

[‡]According to Section of State (Australian Bureau of Statistics).⁴⁵

Table 2. Diagnosis of COPD

Survey item	Responses[†] (n = 233)
Tools routinely used to diagnosis COPD	
Smoking history	220 (94.4%)
Spirometry	207 (88.8%)
Chest x-ray	154 (66.1%)
COPD assessment test	23 (9.9%)
Physical examination	184 (79.0%)
Symptoms	212 (91.0%)
Bronchodilator response	98 (42.1%)
Spirometry – access	
Access to a spirometer	182 (78.1%)
No access to a spirometer, but refer elsewhere	47 (20.2%)
Spirometry – helpful in confirming diagnosis	229 (98.3%)
Recording a formal diagnosis on first presentation [‡]	93 (39.9%)
Routinely communicate diagnosis to patient	204 (87.6%)
Term(s) used to describe diagnosis to patient	
Chronic obstructive pulmonary disease / COPD	159 (68.2%)
Other [§]	74 (31.8%)
Routinely schedules a follow-up visit with newly diagnosed COPD patient	207 (88.8%)

[†]Values represent number (percent) of respondents.

‡Other times when a formal diagnosis was recorded: after a trial of pharmacotherapy – 95 (40.8%), after a respiratory specialist has diagnosed COPD – 47 (20.2%), after a hospital discharge – 11 (4.7%).

§Other diagnostic terms: emphysema – 83 (35.6%), chronic bronchitis – 14 (6.0%), chronic obstructive airways disease – 4 (1.7%), asthma / adult-onset asthma/severe asthma – 3 (1.3%), lung damage – 2 (0.9%), smoker's lungs / smoker's damage – 2 (0.9%), chronic airway limitation – 1 (0.4%).

Table 3. Pharmacological and non-pharmacological management of COPD

Survey item	Responses [†] (n = 233)
Spirometry – helpful in guiding management	217 (93.1%)
Preferred initial pharmacological management [‡]	
Tiotropium	180 (77.3%)
Long-acting beta-2 agonists	69 (29.6%)
Ipratropium	31 (13.3%)
Short-acting beta-2 agonists	92 (39.5%)
Inhaled corticosteroids (ICS)	79 (33.9%)
Other [‡]	1 (0.4%)
Routinely recommend pulmonary rehabilitation	64 (27.5%)
Smoking status routinely recorded	230 (98.7%)
Smoking cessation advice routinely offered	232 (99.6%)
Timing of initial smoking cessation advice	
On first presentation with respiratory symptoms	182 (78.1%)
Later [§]	51 (21.9%)

[†]Values represent number (percent) of respondents.

[‡]Other pharmacological management preference: glycopyrronium.

[§]Other times of smoking cessation advice: at time of diagnosis – 26 (11.2%), at time of follow-up – 16 (6.9%), whenever a patient expresses an interest in quitting – 7 (3.0%), whenever socially appropriate – 1 (0.4%), after an infective exacerbation – 1 (0.4%).

Table 4. Use of plans, guidelines, tools and resources

Survey item	Responses[†] (n = 233)
Routinely use General Practice Management Plan (item 721)	96 (41.2%)
Routinely use Team Care Arrangement Plan (item 723)	85 (36.5%)
Use of management guidelines	
Management informed by guidelines	114 (48.9%)
Australian Lung Foundation / COPD-X	70 (30.0%)
Therapeutic Guidelines	16 (6.9%)
Other [‡]	19 (8.2%)
Aware of Australian Lung Foundation's tools and resources	175 (75.1%)
Familiar with Australian Lung Foundation's tools and resources	17 (7.3%)
Routine use of Australian Lung Foundation's tools and resources [§]	114 (48.9%)

[†]Values represent number (percent) of respondents.

[‡]Other management guidelines used: international guidelines – 7 (3.0%), colleagues/specialists/professional meetings – 4 (1.7%), National Asthma Council – 3 (1.3%), National Prescribing Service / continuing professional development activities – 2 (0.9%), pharmaceutical representatives – 1 (0.4%), National Health and Medical Research Council – 1 (0.4%), Symbicort[®] Maintenance and Reliever Therapy – 1 (0.4%).

[§]Australian Lung Foundation's tools and resources used: COPD Action Plan – 76 (32.6%), Stepwise Management of Stable COPD – 38 (16.3%), Primary Care Respiratory Toolkit – 7 (3.0%), COPD Screening in General Practice – 36 (15.5%).

Table 5. Comparisons between GPs classed as adherent and non-adherent to COPD management guidelines

Survey item	Univariate analyses			Logistic regression		
	Adherent [†] (n = 106)	Non- adherent [†] (n = 127)	<i>P</i>	Odds ratio	95% confidence interval	<i>P</i>
Presence of practice nurses who routinely see patients with COPD	61 (57.5%)	51 (40.2%)	0.049	1.5	0.8-2.7	0.20
Use “chronic obstructive pulmonary disease” / “COPD” to describe diagnosis to patients	79 (74.5%)	80 (63.0%)	0.081	1.4	0.7-2.6	0.30
Routinely use General Practice Management Plan (item 721)	56 (52.8%)	40 (31.5%)	0.002	0.9	0.3-2.9	0.86
Routinely use Team Care Arrangement Plan (item 723)	52 (49.1%)	33 (26.0%)	<0.001	2.0	0.6-6.8	0.26
Management of	62 (58.5%)	52 (40.9%)	0.013	1.5	0.8-2.7	0.20

COPD informed by guidelines						
Familiar with Australian Lung Foundation's tools and resources	14 (13.2%)	3 (2.4%)	0.004	3.2	0.8-12.3	0.09
Routine use of Australian Lung Foundation's tools and resources	62 (58.5%)	52 (40.9%)	0.011	0.8	0.4-1.5	0.48

[†]Values represent number (percent) of respondents.