



# Substance abuse and other comorbidities

## Management in Australian general practice

### INTRODUCTION

Comorbidity of substance abuse with chronic conditions may have a synergistic impact on patients' health. Recognition of this may improve patient care.

### METHODS

Associations between substance abuse and three common morbidities from de-identified data from a sample of the electronic records of approximately 360 general practitioners were analysed using one proprietary software. Where 'reason for visit' or 'problem managed' was associated with substance use, multiple logistic regression models tested associations.

### RESULTS

Significant comorbid associations were found for previous smoking with cardiovascular morbidity and respiratory problems. Current smoking and alcohol abuse were nearly three times as common among patients with chronic obstructive pulmonary disease. Prescription drug abuse and illicit drug use demonstrated significant associations with chronic back pain. Current smoking was less common among patients with hypertension and lipid disorder.

### DISCUSSION

The well known causes of substance abuse and common chronic conditions may be more than compensated by their prevention among those with cardiovascular disease. However, other substance abuse comorbidity occurs and may be preventable.

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**Comorbidity has a significant impact on patient health.<sup>1</sup> More than one problem is managed in nearly one third of Australian general practice consultations.<sup>2</sup> There is an almost sevenfold increase in health costs for patients with five index health comorbidities in hospital in Australia.<sup>3</sup> Mental health is a common comorbid condition.<sup>4</sup> This association might be causal, eg, cardiovascular disease among those with depression.<sup>5-7</sup> Similar associations have been found in general practice.<sup>8</sup> However, in reviewing major comorbidity cluster profiles in general practice, similar associations between substance abuse and mental health were not found. This might be attributable to suboptimal recognition or recording of substance abuse in general practice.<sup>9,10</sup> There is Australian government interest in addressing this area through a national comorbidity taskforce.<sup>11</sup>**

### Methods

This study is part of a retrospective data analysis of general practice electronic medical records from the General Practice Research Network (GPRN). The GPRN records are drawn from a network of consenting general practitioners

randomly sampled from a list of the 14 500 Australian GP users of the proprietary patient medical records Medical Director.<sup>12</sup> The GPs provide encrypted de-identified patient data via email to a secure server at Health Communication Network, where all data provided is compiled and updated weekly.

The data includes a 'reason for the encounter' field (sometimes 'reason for prescription'). This is a mandatory field to record disease, symptom or complaint, social problem, or ill defined condition, either by selecting from a medical vocabulary pick list (mapped to the International Classification of Primary Care, version 2<sup>13</sup> [ICPC2]) or inserting free text.

Substance abuse was identified by ICPC2 classification of tobacco abuse (P17) (and also current or past smoking status recorded in tick boxes); alcohol abuse (P15, P16); medication abuse (P18); and illicit drug abuse (P19). Substance abuse associations were identified by univariate analysis with psychological health issues (chapter P); depression (P03, P76); anxiety (P01, P02, P74); sleep disturbance (P06); schizophrenia (P72); cardiovascular (chapter K); ischaemic heart disease (K74, K76); blood

pressure (K85, K86, K87); lipid disorder (T93); respiratory (chapter R); chronic obstructive pulmonary disease (COPD) (R95); chronic bronchitis (R78, R91); and back pain (L02, L03). Reasons for encounter associated with substance abuse were subject to multiple logistic regression,<sup>14</sup> controlling for age and gender (which can confound reasons for encounter<sup>15</sup>). Patient age was grouped into the following ranges (in years): 18–24; 25–44; 45–64; and 65 and over.

The project was approved by the University of Adelaide Human Ethics Committee. The University of Sydney Ethics Committee required a letter of notification about the project.

## Results

Data from 360 GPs from 156 practices who provided data during 2003 for 1 345 352

encounters from approximately 376 055 different patients. The age and gender demographics of the GP group was consistent with all GPs in Australia in 2003 (data not shown, provided by the Department of Health and Aged Care).

A series of univariate analyses for substance abuse specific rates revealed differences between the cohorts and the total population (Table 1). The multivariate model showed significant positive associations between both bronchitis and COPD and status as current smoker, previous smoker, and tobacco abuse. In addition, alcohol abuse status was associated with COPD (Table 2). There were similar significant associations between chronic back pain and medication abuse and illicit drug use.

However, the significant associations between cardiovascular conditions and smoking

were different. For some (hypertension, ischaemic heart disease, and lipid disorder) the association was negative for current smoker status and alcohol abuse (Table 2).

## Discussion

The study's methods had limitations. Simple multivariate modeling was unable to adjust for the potential confounding influence of some effects because not every possible interaction effect was investigated. However, this means that any association found in the study was probably under reported.

Additionally, differential under reporting of substance abuse by condition may have biased the associations: cardiovascular risk factors are substantially under recorded in general practice.<sup>16</sup> The different ways information is recorded in

**Table 1. Substance abuse specific rates of cardiovascular, respiratory, and back pain comorbidities**

Condition and ICPC2 code	Total GPRN (P17)	Rates per 1000 encounters (95% confidence interval)			
		Tobacco abuse*	Current smoker**	Previous smoker**	Alcohol abuse* (P15, P16)
Chronic bronchitis (R78, R91)	14.3 (12.3–16.3)	18.0 (12.1–23.9)	16.4 (12.0–20.7)	16.1 (12.5–19.7)	9.4 (4.6–14.2)
COPD (R95)	11.1 (9.6–12.5)	34.1 (22.6–45.6)	22.3 (18.0–26.5)	27.6 (22.7–32.6)	29.0 (16.1–41.9)
Blood pressure (K85, K86, K87)	88.4 (83.1–93.7)	64.4 (52.3–76.3)	55.9 (49.2–62.6)	113.8 (103.7–123.9)	67.9 (52.7–83.2)
IHD (K74, K76)	17.1 (14.9–19.3)	24.6 (15.5–33.6)	10.2 (7.7–12.7)	32.0 (26.4–37.5)	14.2 (8.1–20.3)
Lipids (T93)	36.2 (33.9–38.6)	39.3 (30.8–47.9)	26.8 (23.4–30.1)	52.5 (47.0–58.0)	28.6 (22.5–34.7)
Back pain (L02, L03)	27.8 (25.5–30.0)	63.9 (37.9–89.9)	44.7 (38.9–50.5)	29.7 (25.8–33.6)	9.4 (4.6–14.2)

\* ICPC coding category derived from the reason for prescribing/reason for visit data  
\*\* Smoking status is a discrete entity as recorded by the doctor

**Table 2. Odds ratio of associations of substance abuse with cardiovascular, respiratory, and back pain comorbidities in a multivariate logistic regression**

Condition and ICPC2 code	Odds ratio (95% CI) (significant associations in bold)			
	Tobacco abuse*	Current smoker** (P17)	Previous smoker**	Alcohol abuse* (P15, P16)
Chronic bronchitis (R78, R91)	<b>1.94 (1.50–2.51)</b>	<b>1.62 (1.45–1.82)</b>	<b>1.54 (1.39–1.72)</b>	1.03 (0.74–1.44)
COPD (R95)	<b>3.76 (2.91–4.86)</b>	<b>2.75 (2.41–3.14)</b>	<b>2.35 (2.08–2.65)</b>	<b>2.37 (1.77–3.16)</b>
Blood pressure (K85, K86, K87)	0.85 (0.69–1.04)	<b>0.79 (0.74–0.86)</b>	1.04 (0.98–1.10)	1.01 (0.85–1.20)
IHD (K74, K76)	<b>1.64 (1.14–2.37)</b>	0.99 (0.83–1.17)	<b>1.39 (1.25–1.55)</b>	1.19 (0.84–1.68)
Lipids (T93)	<b>1.36 (1.10–1.68)</b>	<b>0.83 (0.76–0.91)</b>	<b>1.16 (1.08–1.24)</b>	0.95 (0.77–1.18)
Back pain (L02, L03)	<b>1.65 (1.33–2.05)</b>	<b>1.71 (1.57–1.87)</b>	<b>1.20 (1.10–1.32)</b>	1.19 (0.94–1.50)

\* ICPC coding category derived from the reason for prescribing/reason for visit data  
\*\* Smoking status is a discrete entity as recorded by the doctor

Medical Director may explain some internal inconsistencies, eg. the distinctions between 'tobacco abuse' and 'current/previous smoker'.

The short sampling frame of 1 year might exaggerate inadequate recording of conditions. The next stage of this project will analyse continuation notes, patient summaries and patient management sections of another database of general practice records so as to give more depth to the data.

Nevertheless, the study found significant comorbid associations between a history of previous smoking and cardiovascular morbidity and respiratory problems. Current or previous smoking and alcohol abuse were all individually associated with chronic respiratory problems. Prescription drug abuse and illicit drug use demonstrated significant associations with

chronic back pain, which will resonate with many GPs' clinical experience.

However, current smoking behaviour was negatively associated with the management of hypertension, ischaemic heart disease and lipid disorder. This may reflect the results of smoking cessation interventions as part of management of these conditions, which are known to work well for these risk factors.<sup>17</sup> In contrast, no negative associations were found with alcohol abuse, which is relatively poorly addressed by intervention strategies in general practice.<sup>18</sup>

Perhaps comorbidities should be treated more aggressively in general practice. This might be facilitated by system changes, eg. with regard to remuneration.<sup>19</sup>

## Implications for general practice

What we already knew:

- Some conditions managed by GPs act synergistically to harm health.
- These conditions include abuse of different substances.

What this study found:

- Substance abuse is positively associated with several chronic conditions, as expected, including:
  - COPD
  - back pain.
- Substance abuse was negatively associated with some chronic conditions, including:
  - lipid abnormalities
  - hypertension.

Conflict of interest: none declared.

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Illicit drug use* (P19)	Medication abuse* (P18)
10.5 (4.0–16.9)	8.9 (1.7–16.1)
5.5 (1.7–9.3)	18.5 (0.0–40.9)
9.8 (3.8–15.7)	50.7 (13.9–87.5)
1.9 (0.0–4.4)	6.2 (0.2–12.1)
11.9 (3.5–20.3)	13.7 (2.5–24.9)
80.9 (43.5–118.3)	107.5 (34.7–180.3)

on model

Illicit drug use* (P19)	Medication abuse* (P18)
1.01 (0.67–1.51)	1.27 (0.65–2.48)
1.21 (0.71–2.05)	1.90 (0.94–3.88)
<b>0.04 (0.25–0.64)</b>	0.60 (0.36–0.98)
0.63 (0.20–1.99)	0.82 (0.30–2.33)
0.71 (0.45–1.11)	0.62 (0.33–1.18)
<b>1.76 (1.38–2.25)</b>	<b>3.11 (2.19–4.24)</b>