

**School of Pharmacy**

**Pharmacist prescribing in Australia**

**Kreshnik Hoti**

**This thesis is presented for the Degree of  
Doctor of Philosophy  
of  
Curtin University**

**October 2010**

## **Declaration**

**To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma or diploma in any university.**

**Signature:**

**Date:**

## **Abstract**

**Background:** A continuous development of pharmacists' skills and expertise in evidence based practice and patient care is enabling pharmacists to assume further patient centred responsibilities such as prescribing. Expanded pharmacist prescribing is emerging internationally, as a new professional practice area. Pharmacists in Australia are currently restricted to prescribing from an over-the-counter list of medications. The number of medicines in this list is gradually expanding. In the UK pharmacists can act as supplementary or independent prescribers dependent on their training whereas in Canada pharmacists have also recently assumed additional prescribing roles.

**Aims:** This research project aimed to evaluate Australian pharmacists' and pharmacy clients' views on expanded pharmacist prescribing with an emphasis on preferred prescribing models and therapeutic areas appropriate for an expanded prescribing role. This research project also aimed to explore improved medication supply models, including expanded pharmacist prescribing, which could be developed to address deficiencies in the current systems in residential aged care facilities (RACFs).

**Methods:** To assess pharmacists' views on expanded prescribing a self-administered postal questionnaire was distributed nationally to a random sample of pharmacists. Pharmacists were selected from State registration lists using an electronic randomizer, except in one State where a random selection of community pharmacies was used. A total of 2592 questionnaires were distributed nationally. Computer Assisted Telephone Interviewing (CATI) was used to obtain pharmacy clients' views. Structured interviews were administered to 400 consenting pharmacy clients by a telemarketing company. In order to analyse the data SPSS® vs16 was used. Focus groups were conducted separately with doctors (two groups), pharmacists (two groups) and nurses/carers (two groups) to obtain qualitative data for exploration of potential ways to improve medication supply in RACFs and the potential role of expanded pharmacist prescribing.

Data analysis for this part of the project used NVivo® vs8. Agency theory was used post-hoc on the results to explore the relationship between the three main stakeholders affected by expanded pharmacist prescribing.

**Results:** Of the 2592 distributed questionnaires 1049 were returned yielding a response rate of 40.4%. The 400 pharmacy clients were recruited from a pool of 1153 eligible respondents hence a response rate of 34.7%. Most pharmacist respondents (83.9%) strongly supported an expanded prescribing role for pharmacists despite perceived barriers. Most pharmacy clients (71%) trusted pharmacists to provide an expanded prescribing role. Both pharmacists and pharmacy clients acknowledged that further training was needed for pharmacists to assume additional prescribing roles. Pharmacist respondents indicated strongest support for a supplementary model of prescribing and this was also reflected by pharmacy clients' views that showed support for an expanded role for pharmacists where doctors retained their role in disease diagnosis. Views of both pharmacists and pharmacy clients indicated that supplementary and independent prescribing models were positive predictors of expanding pharmacists' prescribing role with the former being a stronger predictor in both groups (pharmacists:  $\beta=0.52$ ,  $p<0.0001$  vs.  $\beta=0.18$ ,  $p<0.0001$ ; pharmacy clients:  $\beta=0.160$ ,  $p=0.003$  vs.  $\beta=0.099$ ,  $p=0.027$ ). Improved medication access was the strongest predictor of pharmacy clients' perception of trust in expanding pharmacist prescribing ( $\beta=0.368$ ,  $p=0.0001$ ).

Application of the Agency Theory highlighted a greater complexity in introducing an expanded role for pharmacists as a supplementary model where it indicated a potential disruption of an existing agency relationship between doctors and patients through an introduction of a decision making authority of a second agent (i.e. pharmacist).

Doctors, pharmacists and nurses/carers indicated strongest support for using a centralized medication chart in order to improve medication supply in RACFs. There was limited support for expanded pharmacist prescribing in RACFs with its application having a potential role in supplementing the medication chart model in the area of short-term and 'when required' medications.

**Conclusions:** Pharmacists and pharmacy clients showed support for expanding pharmacists' prescribing role. This role appeared to have only a limited potential and support for improving current medication supply arrangements in RACFs. The Agency Theory conceptualizes the introduction of pharmacist prescribers, as potentially disrupting the patient-doctor relationship and its introduction is best managed by facilitating this already established relationship. This study provides important data for the profession and government in the future development of expanded prescribing roles for pharmacists.

## Table of Contents

<b>Chapter I- Introduction</b> .....	16
<b>1.1 Introduction</b> .....	17
<b>1.2 Background</b> .....	18
1.2.1 Brief international perspective.....	19
1.2.2 Brief Australian perspective .....	20
<b>1.3 Significance</b> .....	22
<b>1.4 References</b> .....	23
<b>Chapter II- Literature review</b> .....	27
<b>2.1 The impact of enhanced pharmaceutical care</b> .....	28
2.1.1 Studies describing pharmacists' impact on doctors' prescribing.....	28
2.1.2 Collaboration between pharmacists and doctors .....	30
<b>2.2 An international perspective on pharmacist prescribing</b> .....	32
2.2.1 Pharmacist prescribing in the UK.....	32
2.2.1.1 Supplementary prescribing.....	33
2.2.1.2 Independent prescribing.....	35
2.2.1.3 Formulary prescribing.....	36
2.2.1.4 Patient group directions (PGD).....	37
2.2.1.5 Patient referral.....	38
2.2.2 United States of America (USA) .....	39
2.2.2.1 Collaborative prescribing model.....	40
2.2.2.2 Independent prescribing in the US.....	41
2.2.2.3 Protocol prescribing .....	41
2.2.2.4 Repeat prescribing.....	42
2.2.3 Canada .....	43
2.2.4 Continental Europe .....	46
2.3.5 Other parts of the world .....	46
<b>2.3 Pharmacist Prescribing in Australia</b> .....	47
2.3.1 Prescribing in Australia by other healthcare professionals.....	49
2.3.2 Australian studies exploring pharmacist prescribing.....	53
<b>2.4 Benefits and facilitators of pharmacist prescribing</b> .....	56

2.4.1	Studies evaluating pharmacists prescribing prescription only medicines ..	57
2.4.2	The UK experience with expanded pharmacist prescribing .....	59
<b>2.5</b>	<b>Barriers to pharmacist prescribing .....</b>	<b>61</b>
<b>2.6</b>	<b>Training of pharmacist prescribers.....</b>	<b>64</b>
<b>2.7</b>	<b>Economical implications of pharmacist prescribing.....</b>	<b>67</b>
<b>2.8</b>	<b>Pharmacy clients' perspectives on pharmacist prescribing.....</b>	<b>69</b>
<b>2.9</b>	<b>Medicine supply to residential aged care facilities (RACF).....</b>	<b>73</b>
2.9.1	General description of residential aged care.....	73
2.9.2	Health workforce in RACFs .....	73
2.9.3	Medicine management in RACF .....	75
2.9.4	Current difficulties in medicine supply and management .....	78
<b>2.10</b>	<b>The Agency Theory .....</b>	<b>82</b>
<b>2.11</b>	<b>Data collection methods.....</b>	<b>85</b>
2.11.1	Questionnaires .....	85
2.11.2	Interviews.....	86
2.11.3	Focus groups.....	87
<b>2.12</b>	<b>Hypotheses .....</b>	<b>89</b>
<b>2.13</b>	<b>References .....</b>	<b>90</b>
<b>Chapter III - Australian pharmacists' views on pharmacist prescribing.....</b>		<b>116</b>
<b>3.1</b>	<b>Introduction .....</b>	<b>117</b>
<b>3.2</b>	<b>Objectives.....</b>	<b>117</b>
<b>3.3</b>	<b>Methods.....</b>	<b>118</b>
3.3.1	Data collection .....	118
3.3.1.1	Focus groups and pilot questionnaire.....	118
3.3.1.2	Final questionnaire .....	118
3.3.1.3	Questionnaire distribution.....	119
3.3.2	Data analysis.....	120
3.3.2.1	Chi-Square testing.....	120
3.3.2.2	One-Way ANOVA .....	120
3.3.2.3	Factor analysis.....	121
3.3.2.4	Regression Analysis.....	124

<b>3.4</b>	<b>Results</b> .....	125
3.4.1	Response rate and demographic characteristics.....	125
3.4.2	Frequency distributions.....	126
3.4.2.1	Prescribing and the future of the pharmacy profession.....	126
3.4.2.2	Pharmacists' opinion based upon their perceptions of their clients.....	127
3.4.2.3	Potential advantages of expanding pharmacist prescribing .....	128
3.4.2.4	Pharmacist prescribing barriers.....	129
3.4.2.5	Pharmacist prescribing models .....	131
3.4.2.6	Therapeutic areas for expanded pharmacist prescribing.....	134
3.4.2.7	Training requirements for pharmacist prescribing.....	137
3.4.2.8	Infrastructure implications for pharmacist prescribing.....	140
3.4.2.9	Pharmacists' role in the management of minor ailments.....	141
3.4.3	Chi-Square testing.....	142
3.4.4	One-Way ANOVA .....	143
3.4.4.1	Prescribing models.....	144
3.4.4.2	Advantages for pharmacist prescribing.....	146
3.4.4.3	Pharmacist prescribing barriers.....	151
3.4.4.5	Training requirements for expanded pharmacist prescribing.....	158
3.4.5	Factor Analysis .....	163
3.4.5.1	Summary of variables created with Factor Analysis models.....	168
3.4.6	Regression Analysis.....	169
<b>3.5</b>	<b>Discussion</b> .....	172
<b>3.6</b>	<b>References</b> .....	176
<b>Chapter IV- Pharmacy clients' perspectives on pharmacist prescribing</b> .....		179
<b>4.1</b>	<b>Introduction</b> .....	180
<b>4.2</b>	<b>Aims</b> .....	181
<b>4.3</b>	<b>Methods</b> .....	181
4.3.1	Data collection .....	181
4.3.1.1	Interview questionnaire development .....	181
4.3.1.2	Final interview questionnaire.....	182
4.3.1.3	Participants eligibility .....	183



4.3.1.4	Sample distribution .....	183
4.3.2	Data analysis .....	184
<b>4.4</b>	<b>Results</b> .....	<b>185</b>
4.4.1	Response rate and demographic characteristics.....	185
4.4.2	Pharmacy clients responses (frequency distributions).....	188
4.4.2.1	Pharmacy clients' current satisfaction with pharmacists professional services provided by pharmacists .....	188
4.4.2.2	Pharmacy clients' general attitudes on pharmacist expanded prescribing... 189	
4.4.2.3	Prescribing model and preferred therapeutic areas of pharmacist prescribing .....	191
4.4.3	Statistical Analysis.....	193
4.4.3.1	Chi-Square testing.....	193
4.4.4	One-way ANOVA .....	199
4.4.4.1	Satisfaction with current professional services offered by pharmacists ..	199
4.4.4.2	Respondents' perception of trust on pharmacist expanded prescribing...201	
4.4.4.3	The extent of expanded prescribing .....	201
4.4.4.4	Pharmacists diagnosing and prescribing medicines for conditions diagnosed .....	203
4.4.4.5	Access to medicines .....	206
4.4.5	Reliability and Factor Analysis.....	208
4.4.6	Regression analysis.....	209
4.4.7	Agency Theory implications.....	211
<b>4.5</b>	<b>Discussion</b> .....	<b>213</b>
<b>4.6</b>	<b>References</b> .....	<b>218</b>
<b>Chapter V- Medication supply systems in RACFs</b> .....		<b>221</b>
<b>5.1</b>	<b>Introduction</b> .....	<b>222</b>
<b>5.2</b>	<b>Aims</b> .....	<b>222</b>
<b>5.3</b>	<b>Methods</b> .....	<b>223</b>
5.3.1	Study participants .....	223
5.3.2	Focus group location.....	224
5.3.3	Recruiting focus group participants .....	224

5.3.4	Focus group design and protocol .....	225
5.3.5	Data analysis .....	226
<b>5.4</b>	<b>Results</b> .....	<b>227</b>
5.4.1	Difficulties with current medication supply systems.....	230
5.4.2	Prescription and dispensing related difficulties.....	243
5.4.3	Potential improved models of medication supply to RACFs .....	250
5.4.3.1	Medical Director .....	250
5.4.4.2	Medication chart .....	251
5.4.4.3	Repeat extension .....	255
5.4.4.4	Non-medical prescribing.....	257
5.4.4.5	Training for expanded non-medical prescribing.....	260
5.4.4.6	Other proposed solutions to improving medication supply and management in RACFs .....	261
5.4.4.7	“The best model” .....	263
5.4.4	A summary of medication supply models and their relationship with difficulties identified .....	264
<b>5.5</b>	<b>Discussion</b> .....	<b>271</b>
<b>5.6</b>	<b>References</b> .....	<b>279</b>
	<b>Chapter VI- General discussion</b> .....	<b>282</b>
<b>6.1</b>	<b>General discussion</b> .....	<b>283</b>
6.1.1	Pharmacists’ attitudes on expanded prescribing.....	284
6.1.2	Community pharmacy clients’ attitudes on expanded prescribing.....	287
6.1.3	Potential improved models of medication supply to RACFs .....	289
6.1.4	Agency Theory .....	292
<b>6.2</b>	<b>Study limitations</b> .....	<b>293</b>
<b>6.3</b>	<b>References</b> .....	<b>295</b>
	<b>Chapter VII- Conclusions and Recommendations</b> .....	<b>299</b>
<b>7.1</b>	<b>Conclusions</b> .....	<b>300</b>
<b>7.2</b>	<b>Recommendations</b> .....	<b>302</b>

Appendix 1	Ethics committee approval for data collection in WA.....	305
Appendix 2	Ethics committee approval for data collection in Australia.....	306
Appendix 3	Questionnaire for pharmacist prescribing in Western Australia.....	307
Appendix 4	Questionnaire for pharmacist prescribing in Australia.....	313
Appendix 5	Invitation and information letter for pharmacist surveying.....	319
Appendix 6	Reminder letter for pharmacist surveying.....	320
Appendix 7	Ethics committee approval for CATI interviews and focus groups....	321
Appendix 8	Questionnaire for customers' view on pharmacist prescribing in Australia.....	322
Appendix 9	Invitation to participate in a focus group meeting form.....	327
Appendix 10	Focus group questions.....	328
Appendix 11	Focus group participation consent form.....	331

## **Acknowledgements**

I thank my supervisors Prof Bruce Sunderland and Prof Jeffery Hughes for their advice, patience, encouragement, inspiration and ongoing support they have provided to me throughout these years. It has been a privilege working with them.

I thank Mrs Jennifer Lalor, Dr Richard Parsons and Dr Satvinder Dhaliwal for their statistical support. I thank Dr Amma Buckley for her assistance in data analysis. I thank Mrs Pascal Ng Cheong Tin, Mr David Halvorsen and staff at CDM Telemarketing Company for their assistance in data collection. I thank Dr Tony Pecotich for his advice.

I thank the administrative staff at the School of Pharmacy for their support.

I thank my parents Refik and Ferijall, to whom I dedicate this thesis, for their love, motivation, encouragement and patience over all these hard years of having me so far away from home.

I thank my parents in law Nexhmi, for his motivation in research and Nebahat for her support.

I express my profound gratitude to my best friend (wife) Dafina whose love, sacrifice and patience were crucial for this thesis completion. No words can describe appreciation and gratitude for my precious Lum and Hana.

## **Publications related to the thesis**

### **Research papers:**

Hoti K, Sunderland B, Hughes J, Parsons R. An evaluation of Australian pharmacist's attitudes on expanding their prescribing role. *Pharm World Sci* 2010; 32:610-621

Hoti K, Hughes J, Sunderland B. Pharmacy client's attitudes on expanded pharmacist prescribing and the role of agency theory on involved stakeholders. *Int J Pharm Pract* 2011; 19:5-12

### **Conference papers:**

Hoti K, Sunderland B, Hughes J. Education and training needs for Australian pharmacists preparing for an expanded prescribing role; 69th International Congress of FIP; September 2009; Istanbul (Turkey)

Hoti K, Sunderland B, Hughes J. Infrastructure implications for expanding pharmacist prescribing and the influence of pharmacy size and ownership; 69th International Congress of FIP; September 2009, Istanbul (Turkey)

Hoti K, Hughes J, Sunderland B. Therapeutic areas for an expanded pharmacist prescribing role; The Mark Liveris health science research student seminar; November 2010; Perth (Australia)

### **Editorials:**

Hoti K, Hughes J, Sunderland B. Pharmacist prescribing in Australia. *J Pharm Pract Res* 2010; 40:175-176

## Abbreviations

Agreement Consultative Committee	ACC
Australian Medical Association	AMA
Australian Pharmaceutical Advisory Committee	APAC
British Hypertension Society	BHS
Canadian Medical Association	CMA
Canadian Pharmacists' Association	CPA
Canadian Society of Hospital Pharmacists	CSHP
Clinical Management Plan	CMP
Computer-assisted Telephone Interviews	CATI
Designated Medical Practitioner	DMP
Dose Administration Aid	DAA
Formulary Prescribing	FP
General Practitioner	GP
Healthcare Management Advisors	HMA
Home Medicine Review	HMR
Indian Health Service	IHS
Information Technology	IT
Medicine Advisory Committees	MAC
Medicine Appropriateness Index	MAI
New South Wales	NSW
Non-Steroidal Anti-Inflammatory Drugs	NSAID
Patient Group Directives	PGD
Patient Medicine Profile	PMP
Patient Referral	PR
Personal Care Attendants	PCA
Pharmaceutical Benefits Scheme	PBS
Pharmaceutical Council of Western Australia	PCWA
Pharmaceutical Society of Australia	PSA
Pharmacist Independent Prescriber	PIP

Pharmacist Supplementary Prescriber	PSP
Pharmacy Guild of Australia	PGA
Prescription Analysis and Cost Data	PACT
Registered Nurse	RN
Residential Aged Care Facility	RACF
Residential Medicine Management Reviews	RMMR
Society of Hospital Pharmacists of Australia	SHPA
South Australia	SA
Standard for the Uniform Scheduling of Medicines and Poisons	SUSMP
United Kingdom	UK
United States of America	USA
Western Australia	WA

# **Chapter I**

Introduction



## 1.1 Introduction

The traditional role of the pharmacist is evolving. Prescribing is emerging as a new practice area for pharmacists and it has been an issue of interest in many countries. A strong argument favouring an expanded pharmacist prescribing role is that pharmacists are developing skills and expertise in evidence based practice and patient care therefore enabling them to assume further responsibilities such as prescribing.<sup>1,2</sup> The fact that over the time pharmacists have been able to expand the list of medications they can prescribe over the counter (OTC) does also reflect this. In some countries, including Australia, medications previously only prescribed by medical practitioners can legally be prescribed by pharmacists as well.<sup>1,3,4</sup>

The main objectives of this study were:

- 1 To evaluate the attitudes and perceptions of Australian pharmacists expanding their current prescribing role with emphasis on preferred prescribing models and therapeutic areas;
- 2 To evaluate community pharmacy clients' perceptions of expanded pharmacist prescribing including issues of improved access to medicines and preferred therapeutic areas of expanded prescribing;
- 3 To explore improved medication supply models, including expanded pharmacist prescribing, which could be developed to address deficiencies in the current systems in residential aged care facilities (RACF).

Agency theory was used post-hoc to explain the relationship between the three main stakeholders affected by expanded pharmacist prescribing.<sup>5,6,7</sup> The agency relationship

was initially described from an economics perspective by Jensen and Meckling.<sup>7</sup> Mott et al. provided a conceptual framework for using Agency theory in pharmaceutical care suggesting that selecting medicines to treat medical conditions was in fact a principal-agent relationship.<sup>5</sup> According to this theory one party (i.e. principal) depends on another one (i.e. agency) and also delegates decision-making authority to this agency for duties performed on its behalf.<sup>5,6,7</sup> Taking into account the Agency theory, a triangular agency relationship exists between pharmacists, doctors and patients where pharmacists are dual agents of both patients and doctors.

## 1.2 Background

The American College of Clinical Pharmacy defined prescribing as a group of activities that included selecting, initiating, monitoring, continuing, modifying and administering drug therapy.<sup>8,9</sup> There are two basic forms of prescribing termed independent and dependent.

- Independent prescribing is defined as a process by which the prescriber is solely responsible for prescribing and assumes full responsibility for patient assessment, diagnosis and clinical management.<sup>1,8,9</sup>
- Dependent prescribing is a form of prescribing in which there are agreed limitations on prescribing activities. This form of prescribing can be carried out in various models which include: prescribing by protocol,<sup>1,11-13</sup> patient group directions,<sup>1,11</sup> formulary prescribing,<sup>1,12</sup> patient referral,<sup>1,10,11</sup> repeat prescribing,<sup>1,11,13</sup> collaborative prescribing<sup>1,2,10</sup> and supplementary prescribing.<sup>1,11,14</sup>

### **1.2.1 Brief international perspective**

In the United Kingdom (UK) an existing supplementary pharmacist prescribing model has recently been expanded and now pharmacists, within specific criteria, may prescribe independently. A model course developed by the Royal Pharmaceutical Society of Great Britain (RPSGB) is available through several educational bodies for pharmacists to become accredited as independent prescribers.<sup>1,8,14</sup> Independent prescribing recently established in the UK allows pharmacists to prescribe any medication, within the area of competency, except for controlled drugs.<sup>11,15,16,17</sup> In the United States (US) pharmacists are involved with doctors in collaborative drug therapy management.<sup>1,8</sup>

Van Foppe et al. suggested that the pharmacy profession in the remainder of Europe was not at a stage where pharmacist prescribing could be implemented.<sup>18</sup> It was suggested that pharmacists in Europe lacked authority in the decision-making processes for drug prescribing and that their active participation in healthcare teams was affected by lack of support from physicians.<sup>14,18</sup>

Major developments in pharmacist prescribing have occurred recently in Canada, where many states are initiating expanded pharmacist prescribing. Recently the state of Alberta implemented a three category prescribing model: 'adapting a prescription', emergency prescribing and initiating and managing drug therapy.<sup>19,20</sup>

## **1.2.2 Brief Australian perspective**

Prescribing is not an unfamiliar process for Australian pharmacists. Pharmacists in Australia are able to prescribe medications listed under Schedules 2 (S2) and 3 (S3) of the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). These medicines are available OTC only from pharmacies except in exceptional circumstances such as isolated communities. Australian pharmacists are also able to continue the supply of prescription only medications based on ‘emergency supply’ and ‘repeat prescription’ systems. The repeat system of prescribing allows Australian pharmacists to continue to re-fill doctors’ initial prescriptions for up to twelve months dependent on the medication.

There are signals suggesting that the health system in Australia is not well prepared to face new challenges such as an ageing population with increased co-morbidity, increased prevalence of chronic disease and insufficient health professionals to keep pace with population growth.<sup>21</sup> Insufficient numbers of health professionals is driving task transfer.<sup>22</sup> There are also signs that fewer medical graduates are choosing general practice as a career hence indicating a further exacerbation of the general practitioner shortage.<sup>23</sup> Furthermore, a continued shortage of general practitioners in the near future for Australia has also been suggested, hence indicating that innovative primary care policies are necessary.<sup>24</sup>

Utilization of pharmacists’ professional skills was one of the main aims of expanded pharmacists prescribing in the UK.<sup>11,16,18</sup> Pharmacists have professional skills that other health professionals do not and many of these skills are not utilized.<sup>25</sup> In this regard King<sup>26</sup> argues that clinical pharmacists in Australia have an active role to play in drug and dose selection. Nissen<sup>27</sup> has also emphasised the fact that Australian pharmacists already diagnose and prescribe Pharmacy Medicines and Pharmacist Only Medicines. Patient monitoring (mainly in a hospital setting) and medication reviews (hospital and community) are also performed by Australian pharmacists. These skills are essential if pharmacists in Australia assume further prescribing responsibilities.

The Australian Government Productivity Commission has recommended that Australia should expand the roles of other health professionals to include aspects of current doctor's tasks.<sup>28</sup> The Royal Australasian College of Physicians (RACP) supported task transfer.<sup>22</sup> The Australian Medical Association (AMA) embraced the idea of allocating clinical responsibilities to other medically trained health professionals "wherever it can be done safely and effectively".<sup>29</sup> However, when it comes to expanding pharmacist prescribing specifically, the AMA has in past stated that it is opposed to such a move.<sup>30</sup>

### **1.3 Significance**

This study will analyse data obtained from pharmacists working in all areas of the pharmacy profession in Australia and provide a representative perspective on the issue of pharmacist prescribing. Therefore, results of this project will be valuable in providing detailed knowledge of the grass-roots of professional attitudes when constructing policies and recommendations on the issue of pharmacist prescribing in Australia.

Given the global interest in pharmacist prescribing, the findings will provide valuable information to stakeholders internationally especially for countries which have thus far not introduced an expanded prescribing role for pharmacists.

By exploring the views of patients on pharmacist prescribing and appreciation of the possible support for expanded pharmacist prescribing will be achieved.

Findings of this study will be important in designing new recommendations and policies addressing current issues with medication supply in RACF.

## 1.4 References

- 1 Emmerton L, Marriott J, Bessell T, Nissen L, Dean L. Pharmacists and Prescribing Rights: Review of International Developments. *J Pharm Pharmaceut Sci* 2005; 8:217-25
- 2 Galt, K. The key to pharmacist prescribing: collaboration. *Am J Health Syst Pharm*, 1995;52:1696-99
- 3 Pharasi B, Price M, Goldstein S. Act 101 and the pharmacist--is it appropriate for the pharmacist to prescribe? *S Afr Med J* 1993; 83:822- 23
- 4 Herrier R, Boyce R, Apgar D. Pharmacist managed patient-care services and prescriptive authority in the U.S. Public Health Service. *Hosp Formul* 1990; 25:67-80
- 5 Mott DA, Schommer JC, Doucette WR, Kreling DH. Agency theory, drug formularies, and drug product selection: Implications for public policy. *J Public Policy Mark* 1998; 17: 287-95
- 6 Eisenhardt KM. Agency Theory: An Assessment and Review. *Acad Manage Rev* 1989; 14: 57-74
- 7 Jensen M, Meckling W. Theory of the firm: Managerial behaviour, agency costs and ownership structure. *J Financ Econ* 1976; 3: 305-60
- 8 Kay O, Brien J. Pharmacist prescribing: Review of literature. *J Pharm Pract Res* 2004; 34; 300-304

- 9 Carmichael JM, O'Connell MB, Devine B, Kelly HW, Ereshefsky L, Linn WD, Stimmel GL. Collaborative drug therapy management by pharmacists. *Pharmacotherapy* 1997; 17: 1050-61
- 10 Task force on Pharmacist Prescribing (Pearson, G., Card, D., Chin, T., Gray, M., Hawboldt, J., Jackevicius, C., Slavic, R., and Thompson, A.), An Information Paper on Pharmacist Prescribing within a Health Care Facility. Canadian Society of Hospital Pharmacists, Canada, 2001
- 11 Crown J. Report of the Review of Prescribing Supply and Administration of Medicines. House of Commons, London, UK, 1999
- 12 Savino, T. Legal Authority for a Pharmacist's Order for Prescription Drugs; WebRx Pharmacy; 2002; [online] <http://www.rxpalace.com/laws.htm> (Accessed 6th December 2009).
- 13 Chi J. Pharmacist prescribing is advancing slowly but surely throughout the country. *Drug Topics* 2000; 20:39
- 14 Hobson R, Sewell G. Risks and concerns about supplementary prescribing: survey of primary and secondary care pharmacists. *Pharm World Sci* 2006; 28: 76-90
15. Department of Health; Pharmacist Independent Prescribing; London, UK; March 2007; [online]:  
[http://www.dh.gov.uk/en/Healthcare/Medicinespharmacyandindustry/Prescriptions/TheNon-MedicalPrescribingProgramme/Independentpharmacistprescribing/DH\\_4133943](http://www.dh.gov.uk/en/Healthcare/Medicinespharmacyandindustry/Prescriptions/TheNon-MedicalPrescribingProgramme/Independentpharmacistprescribing/DH_4133943)  
(Accessed 29 April 2009)



16. Department of Health; Improving patients' access to medicines: A guide to implementing nurse and pharmacist independent prescribing within the NHS in England ; April 2006; [online]  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4133743](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4133743) (Accessed 28 April 2009)
17. Tonna AP, Stewart D, West B, McCaig D. Pharmacist prescribing in the UK; a literature review of current practice and research. *J Clin Pharm Ther* 2007; 32: 545-56
18. Van Foppe MJ, Schulz M, Tromp TF. Pharmaceutical care, European developments in concepts, implementation, teaching and research: a review. *Pharm World Sci* 2004; 26: 303-11
19. Pearson G. Evolution in the practice of pharmacy-not a revolution. *Can Med Assoc J* 2007; 24: 176
20. Yuksel N, Eberhard G, Bungard TJ. Prescribing by pharmacists in Alberta. *Am J Health Syst Pharm* 2008; 65:21:2126-32
21. Del Mar CB, Dwyer N. A radical new treatment for the sick health workforce. *Med J Aust* 2006; 185: 32-4
22. Sewell J. Task transfer: The view of the Royal Australasian College of Physicians. *Med J Aust* 2006; 185: 23-4
23. Joyce C, McNeill J. Fewer medical graduates are choosing general practice: a comparison of four cohorts, 1980–1995. *Med J Aust* 2006; 185: 102-4
24. Joyce C, McNeil A, Stoelwinder J. More doctors, but not enough: Australian medical workforce supply 2001–2012. *Med J Aust* 2006; 184: 441-6

- 25 Nissen L. Prescribing rights for pharmacists in Australia-Are we getting closer? Aust Pharm 2008;27:624-39
- 26 King M. (Pharmacist prescribing in the UK) An Australian's perspective. Aust Pharm 2006; 25:21
- 27 Nissen L. Destiny or dream?-prescribing rights for pharmacists in Australia. Aust Pharm 2007; 26:131-5
- 27 Australian Government Productivity Commission. Australia's health workforce. Productivity Commission research report, 22 December 2005. Canberra: Productivity Commission, 2005. [online] :  
<http://www.pc.gov.au/study/healthworkforce/finalreport/healthworkforce.pdf> (Accessed 15th April 2009)
- 28 Yong C. Task substitution: the view of the Australian Medical Association. Med J Aust 2006;185: 27-8
- 29 The Australian Medical Association; Patient safety paramount in medication prescriptions, 2008 Media Releases, [online] <http://www.ama.com.au/node/3358> (Accessed 30 May 2009)

# **Chapter II**

Literature review

## **2.1 The impact of enhanced pharmaceutical care**

There is a trend of positive outcomes when pharmacists expand their scope of pharmaceutical care practice and are involved more actively within collaborative health care teams, therefore utilizing more of their skills. Evidence suggests that enhanced pharmaceutical care results in positive effects for a wide range of outcomes in patients with chronic conditions, elderly patients and patients at higher risk of drug related problems.<sup>1</sup> Examples include clinical and financial outcome as well as disease severity improvements for patients with heart failure, dyslipidaemia, hypertension, diabetes, asthma, atrial fibrillation, patients' medicine knowledge and adherence.<sup>1-10</sup> In studies reporting improvement of the above health outcomes, pharmaceutical care provided by pharmacists has included the following services: medicine and lifestyle counseling, general practitioner (GP) referral, provision of educational material, medicine management, clinical measurements, drug compliance discussion, pharmacists visiting patients after hospital discharge, home medicine reviews, formulation of drug intervention and monitoring.<sup>2-10</sup>

### **2.1.1 Studies describing pharmacists' impact on doctors' prescribing**

Positive outcomes have been reported in the literature when pharmaceutical care is enhanced through pharmacists' interventions on doctors' drug prescribing.

Carter et al. explored how a clinical pharmacist can influence doctors' prescribing.<sup>10</sup> This study aimed at determining whether there were more favourable prescribing patterns in family practice offices which had a clinical pharmacist compared to those which had not. A blinded review panel evaluated the appropriateness of drug and dose selection. Prescriptions generated in offices with clinical pharmacists were rated more favourably both for drug and dose selection.<sup>11</sup>

Favourable effects on doctors' prescribing were also reported when patients' medicine profiles were subjected to pharmacists' feedback to doctors. For this group of patients the end effect was the reduction of polypharmacy by 4% compared to the groups of patients not undergoing the same pharmacist monitoring.<sup>12</sup> Another Dutch study investigating the impact of medicine reviews conducted by pharmacists on quality of prescribing by a healthcare professional team also concluded that pharmacists' medicine reviews results in improved quality of prescribing.<sup>13</sup>

Eide and Schjott reported positive effects achieved on prescribing and administration of hypnotic medicines in residential aged care facilities (RACF) upon pharmacists' intervention.<sup>14</sup> This was achieved after pharmacists provided drug information on use of medicines to staff. The outcome was that benzodiazepine use was reduced and medicine administration timing was also improved. The use of long acting hypnotics (not recommended for use in elderly) was significantly reduced while the use of short-acting hypnotics was increased.<sup>14</sup>

A study described the outcomes of pharmacists providing educational presentations and materials and problem-solving meetings in an acute care state psychiatric facility.<sup>15</sup> The aim was to review prescribing and administration of antibiotics. As a result, better utilization of culture and sensitivity tests, appropriate antibiotic dosage regimens and selection of cost-effective therapy as well as correct administration of antibiotics, were achieved as a result of pharmacists' interventions.<sup>15</sup>

Fletcher et al. indicated improved prescribing of vancomycin and tobramycin as a result of pharmacists' interventions. Pharmacists' role was to promote prescribing of nafcillin instead of vancomycin and of gentamicin instead of tobramycin, when and where appropriate.<sup>16</sup> Similar results were seen in a study which investigated pharmacists' impact on parenteral cephalosporin prescribing.<sup>17</sup>

A positive impact on drug prescribing and patients' utilization of antibiotics as a result of hospital pharmacists providing recommendations to doctors on patients' drug

management has also been reported by Thornton et al. in a multi-centered trial.<sup>18</sup> Literature data also suggested that therapeutic advice provided by pharmacists to general practitioners resulted in improved quality of antibiotic prescribing and a decreased number of prescriptions by general practitioners leading to cost savings.<sup>19</sup>

Reports of improvement in geriatric prescribing in patients receiving pharmacists' interventions have been published. The quality of prescribing in one study was measured by the Medicine Appropriateness Index (MAI).<sup>20</sup> Successful expansion of pharmacists' scope of practice affecting doctors' prescribing was also described in other therapeutic fields such as thyroid disease.<sup>21</sup>

### **2.1.2 Collaboration between pharmacists and doctors**

The key to the success of expanding pharmacists' roles through prescribing is a collaboration of doctors and pharmacists.<sup>22</sup> This should be viewed on the basis of better utilization of pharmacists' skills and easing the burden from overloaded doctors. In this regard, as also suggested by Royal Pharmaceutical Society of Great Britain (RPSGB), one should have in mind that traditional roles of pharmacists in medicine preparation and dispensing are to a large extent being replaced by the use of manufactured medicines in ready to use packs complete with manufacturers' patient information.<sup>23,24</sup> Nevertheless, pharmacists are routinely involved in screening prescriptions for errors such as: dose, strength, quantity, missing or incorrect information, drug-interactions, allergies and even fraud and drug abuse.<sup>23</sup>

Considering the diminishing of traditional roles of pharmacists in preparing and dispensing medicines, it has been suggested that pharmacists are enthusiastic in utilization of their knowledge of medicines.<sup>23,24</sup> The success of pharmacists in hospital settings where they are involved in collaborating with doctors to make prescribing decisions, has prompted a view that this could also be beneficial in primary care.<sup>24,25</sup>

McKinnon and Jorgenson have recently conducted a study with the aim of assessing the effects of collaborative prescribing by pharmacists and doctors.<sup>26</sup> Pharmacists examined drug safety and effectiveness issues related to prescribing and then made collaborative decisions with doctors. This was compared to a control group in which doctors performed the above activities independently. The intervention group had more medication problems identified, medication changes made and new General Practitioner (GP) appointments scheduled. These authors have concluded that there is an improvement in medication management as well as process of care when pharmacists collaborate with doctors on prescribing decisions.<sup>26</sup>

In evaluating prescribing problems and community pharmacists' interventions to identify and resolve prescribing errors, Rupp et al. emphasized the significance of communication and collaboration between doctors and pharmacists in order to ensure a safe and effective provision of pharmaceutical care.<sup>27</sup> These authors also have recommended that the inter-professional system of "checks and balances" be maintained and even expanded.<sup>27</sup>

In the United Kingdom (UK), the 'white paper' reports on primary care have also recommended inter-professional cooperation between pharmacists and doctors in providing health services. An increased mixing of skills was encouraged.<sup>28,29</sup>

Aiming to promote collaboration between pharmacists and doctors, specific projects were developed in the UK.<sup>30</sup> One example was the pairing of community pharmacists with general practitioners in order to review patients' notes and hence identify prescribing errors. Problems were identified in 48% of 6131 medicines reviewed.<sup>31</sup> Other similar programs in the UK between doctors and pharmacists included drug prescribing audits by clinical pharmacists in cooperation with doctors and provision of prescribing recommendations by pharmacists to general practitioners. In all these programs positive outcomes were reported.<sup>30-35</sup>

Closer collaboration of pharmacists and doctors which resulted in a reduction of costs has also been reported in the literature.<sup>25</sup> Bradley suggested that whilst community pharmacists were in a good position to ensure more rational and cost effective prescribing, this was best achieved in a situation where pharmacists and doctors worked closely together.<sup>25</sup> Disadvantages of this close relationship have also been suggested. In this regard, Bradley has put forward the view that in trying to control the cost of prescribing, doctors and pharmacists could end up competing and colliding with each other.<sup>25</sup> Disintegration of patient care has also been raised as a possibility.<sup>25,32</sup>

## **2.2 An international perspective on pharmacist prescribing**

### **2.2.1 Pharmacist prescribing in the UK**

Literature from the UK has suggested that pharmacists have reduced their activities in the sale, supply and manufacturing of medicines and instead are continuously re-defining their professional role in the healthcare system by engaging more in activities such as medicine management, health promotion and diagnostic testing.<sup>36</sup> Expanded prescribing by pharmacists is an example of this re-defined role.

Pharmacists in the UK are able to prescribe using supplementary or independent protocols, dependent on their qualifications.<sup>37</sup> These two models are currently the main models of pharmacist prescribing in the UK. However, pharmacists there can also be involved in other forms of expanded prescribing such as: *Patient Group Directives* (PGD), *Formulary Prescribing* (FP) and *Patient Referral* (PR).<sup>38</sup>



### **2.2.1.1 Supplementary prescribing**

The supplementary prescribing model involves a partnership between an independent prescriber (i.e. doctor) and pharmacist to implement an agreed patient specific management plan. In this model doctors make the diagnosis while pharmacists prescribe according to the agreed clinical management plan.<sup>36,38,39,40</sup>

In the UK, in 1999, a Health Department report titled ‘The Review of Prescribing, Supply and Administration of Medicines’ recommended that prescribing be expanded to other healthcare professionals.<sup>41</sup> This extension of prescribing which resulted in pharmacists being involved in supplementary prescribing occurred in the UK in 2003.<sup>36,41,42</sup> Better utilization of pharmacists’ skills, improvement of patients’ access to medicines as well as easing the burden of GPs were the main objectives for introducing supplementary prescribing for pharmacists.<sup>36,40</sup> In addition to pharmacists, prescribing roles have been expanded to other healthcare professionals such as: nurses, physiotherapists, radiographers and optometrists.<sup>43</sup>

Supplementary prescribers have to undertake additional training in order to become accredited to prescribe and also demonstrate competencies in specific therapeutic areas of prescribing.<sup>42,43</sup> Pharmacist supplementary prescribers (PSP) working in a community pharmacy setting prescribe for chronic conditions. PSPs based in the hospital prescribe in wards and outpatient situations.<sup>44</sup>

The core guidance for supplementary prescribing is the Clinical Management Plan (CMP). The CMP is the framework agreement between an independent prescriber, supplementary prescriber and patient. This framework is designed for every individual patient.<sup>45</sup> Community pharmacists felt that this model offered their patients improved access to medicines and therefore was an advantage for those patients who do not regularly visit their doctors’ surgery.<sup>44,46</sup> During the initial stages of its introduction, it was suggested that this model basically legitimised pharmacists’ current practices as they already performed duties such as recommendations of specific therapy and dosage

adjustments of prescribed medicines.<sup>44,47</sup> It was also argued that pharmacist supplementary prescribing initiated innovative services such as community pharmacists being involved in the management of cardiovascular disease.<sup>44,48</sup>

Prescription Analysis and Cost Data (PACT) indicates that there has been a significant increase in the number of prescriptions written by PSPs (i.e. 2706 in 2004 and 31052 in 2006).<sup>36</sup> In 2006, in the UK, 0.004% of all prescribing in community and primary care setting was done by PSPs.<sup>36</sup> This indicates that supplementary prescribing, although increasing, represented a small proportion of prescribing in the UK. PACT data also indicated that cardiovascular medicines represented the main therapeutic area for which PSPs prescribed.<sup>36</sup> Furthermore it should be noted that George et al. reported that most pharmacists who answered a survey on supplementary prescribing focused more on cardiovascular conditions during their practical learning period.<sup>49</sup> PACT data shows that the cardiovascular therapeutic prescribing area was followed by the central nervous system, respiratory, endocrine and gastrointestinal therapeutic areas for which PSP's prescribed.<sup>36</sup>

The supplementary prescribing model does not specify clinical situations in its definition so that it does not exclude others.<sup>38,41,50</sup> However, this model is not suitable for emergency medical conditions. This prescribing model is essentially a team-focused approach therefore is not limited to a one to one partnership.<sup>38,41,50</sup>

The introduction of an independent prescribing model for pharmacists in the UK occurred alongside the supplementary model. It was considered an important model for new pharmacist prescribers and also suitable for specific situations such as pharmacists working within a healthcare team, where controlled drugs (which cannot be prescribed by pharmacist independent prescribers) are needed and also for chronic stable conditions such as cardiovascular disease and diabetes.<sup>36,43,51</sup> Therefore, the supplementary prescribing model was intended to have a continued role in the UK healthcare system.<sup>43</sup>

A survey conducted in the UK by Hobson and Sewell, indicated that despite concerns with training model for supplementary prescribing, pharmacists had a positive attitude towards supplementary prescribing and that pharmacists wish to assume this role.<sup>39</sup>

### **2.2.1.2 Independent prescribing**

Independent prescribing is a process by which the prescriber is solely responsible and assumes full responsibility for patient assessment, diagnosis and clinical management.  
38,51

Independent prescribing was introduced in the UK and as of May 2006, pharmacists were able to prescribe any medicine within their competency with the exception of controlled drugs.<sup>42,43,45</sup> This restriction on controlled drugs is likely to change once the relevant legislation is amended.<sup>53</sup> Pharmacist Independent Prescribers (PIP) cannot prescribe for themselves.<sup>51</sup> The English Health Department emphasises that PIPs must only prescribe within their level of competency in accordance with guidelines published by the RPSGB.<sup>51</sup> The RPSGB standards on prescribing also state that pharmacists should separate dispensing from prescribing. In exceptional circumstances where a pharmacist is involved both in dispensing and prescribing there should be a checking process of dispensing by a second person with final accuracy check also performed by this second person (i.e. pharmacist).<sup>51</sup>

Lloyd and Hughes have reported that while some pharmacists questioned their training level for such a role they viewed independent prescribing as a natural progression of the supplementary model.<sup>53</sup> In addition, they also reported that doctors generally had negative views about the independent prescribing model.<sup>43,53</sup> A similar finding was reported by Warchal et al. who found that pharmacists considered the independent model to be a “logical step” from the supplementary prescribing model. A majority of respondents planned to become independent prescribers despite the fact that they had

reservations in terms of acceptability of doctors towards pharmacists assuming this role.<sup>54</sup> An important link between supplementary and independent prescribing was identified by George et al. who found that due to increased confidence, pharmacists who commenced with supplementary prescribing were more likely to assume an independent prescribing role.<sup>55</sup>

It should be noted that nurses in the UK are also able to prescribe independently. As of May 2006 an expanded formulary nurse prescriber became an independent prescriber. Nurse independent prescribers are able to prescribe any licensed medicine including some controlled drugs.<sup>42,56</sup>

### **2.2.1.3 Formulary prescribing**

UK non-medical healthcare professionals can also prescribe through a formulary model. This is based upon an agreed list of medicines developed between general practitioners and pharmacists. This delegates prescribing authority to pharmacists for formulary drugs.<sup>38,57,58</sup> The drug formulary includes the list of medicines, symptoms, length of treatment, referral criteria and limitations.<sup>38</sup>

There are cases where local formularies are established between doctors' surgeries and community pharmacies. In some places where a formulary model is applied, some of the medicines in the formulary are already available over the counter.<sup>38,57,58</sup>

It is worth emphasizing that a Scottish study reported positive acceptance of this model by patients. This study indicated that pharmacists prescribed for up to eleven therapeutic areas.<sup>38,59</sup>

#### **2.2.1.4 Patient group directions (PGD)**

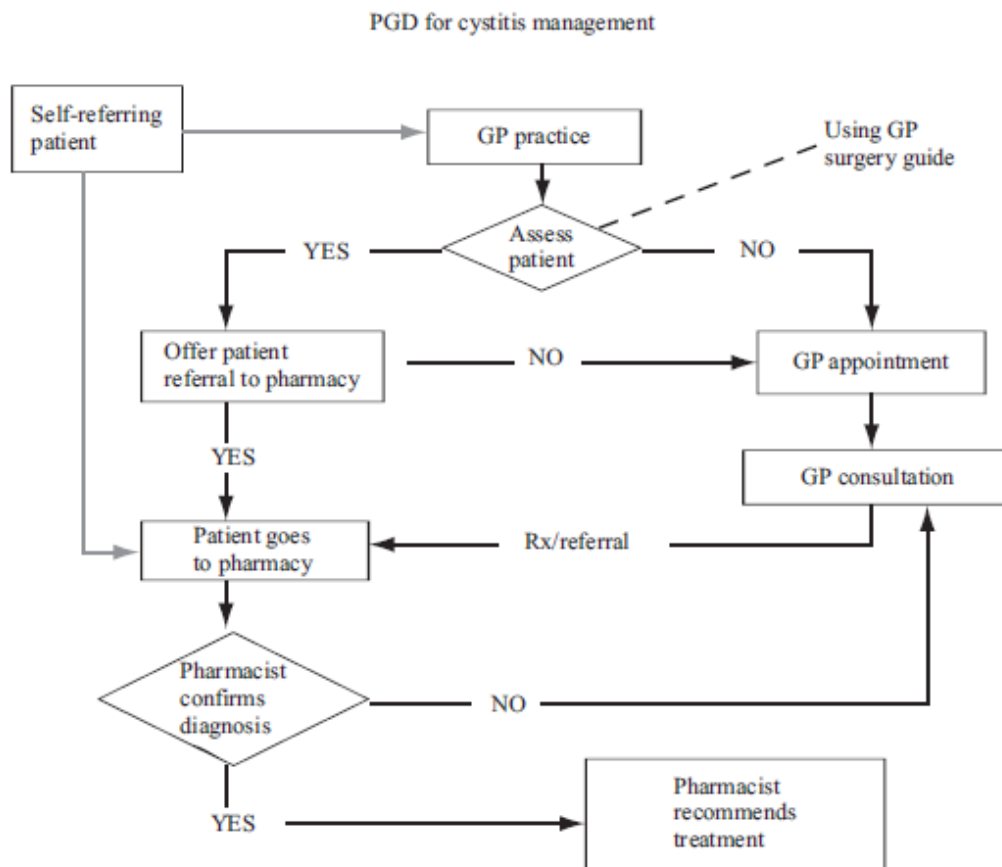
This form of prescribing was introduced during the year 2000. This model is a well-defined protocol, developed locally and involves a written direction signed by a doctor or dentist and by a pharmacist. It only relates to supply and administration of prescription medicines.<sup>38</sup> The main objectives in introducing this model were to improve medicine access, reduce GP workload, increase inter-professional collaboration and also provide another access to therapeutic advice.<sup>42</sup> No official additional training is required for pharmacists to administer or supply medicines according to this model. However, in-house training is provided in most cases.<sup>44</sup>

Emergency contraception, antibiotics, combined oral contraceptives and anti-histamines are listed as medicines included in the PGD model.<sup>38</sup>

The PGD names the medicine or its class, dosage frequency and dosage form(s), route of administration, period of administration, relevant warnings, quantity, situations when a medicine cannot be supplied, referral criteria, follow-up action and records to be kept.

38,60

An example of PGD model for cystitis management is presented in Figure 2.1



**Figure 2.1 Patient group direction for cystitis management. Rothertham Primary Care Trust** <sup>42</sup> (Figure reproduced with permission of the copyright owner).

### 2.2.1.5 Patient referral

Patient referral is another dependent form of prescribing practised in the UK. According to this model, the patient is referred by a physician to the pharmacist for managing an agreed drug therapy or to achieve a certain therapeutic outcome. <sup>38,58,61</sup> There are cases where patients, medical practice staff or a community pharmacist refer patients to a pharmacist as well. <sup>38,41,58</sup>

A study assessed the outcomes from patients being referred to one of eight pharmacies by a medical practice.<sup>38,62</sup> Ailments were identified in medical practice and patients were referred to the pharmacist. Pharmacists then prescribed a medicine from the formulary. Positive outcomes were reported with this model. However, patients did not accept a referral if they felt they needed doctors' examination or antibiotics, if patients were children or had other medical conditions and if the previous treatment was not successful.<sup>38,62</sup>

### **2.2.2 United States of America (USA)**

In the USA, the role of the pharmacist in prescribing was defined in 1971.<sup>57,63</sup> This was viewed in the context of pharmacists' clinical tasks. The prescribing role was described as:

- assisting drug therapy and prescribing at a doctors request;
- refilling prescriptions on patients request;
- dispensing 'standing orders', which means independently prescribing from a pre-arranged plan with the doctor;
- sharing the prescribing role with a doctor based on the pharmacists' competence;
- doctors retaining the right of diagnosing the condition first;
- pharmacist prescribing of over the counter medicines;
- prescribing in an emergency situation when this is in a patients best interest;
- replying to patients enquiries which result in a continuation of drug therapy; and
- in consultation with a doctor, selecting and dispensing a medicine different from the one initially prescribed by the doctor.<sup>57,63</sup>

Several prescribing models are practiced in the USA. These include: collaborative prescribing, independent prescribing, protocol prescribing and repeat prescribing.<sup>38</sup>

### **2.2.2.1 Collaborative prescribing model**

US pharmacists are involved in activities described as collaborative drug therapy management.<sup>64,65,66</sup> This model requires collaboration between doctors and pharmacists, resulting in prescribing authority being given to the pharmacist.<sup>38,58,64,65</sup> Collaborative agreements are negotiated and specifically applied. These agreements must be filed with either the State Pharmacy or Medical Board.<sup>22,38</sup>

According to this model the doctor diagnoses, while the pharmacist selects, initiates, monitors, modifies and continues or discontinues therapy accordingly.<sup>38,65,66</sup> In this model both the doctor and pharmacist are responsible for clinical outcomes.<sup>61</sup>

A collaborative prescribing model has been in place in the US since 1970's.<sup>57,66</sup> Literature data have suggested that pharmacist prescribing in a collaborative model is supported by 38 states in the US as well as the US Public Health Services, armed forces and Veterans Health Administration.<sup>57,66</sup>

Collaborative Drug Therapy Management (CDTM) services offered by pharmacists in the US have expanded over the years and they include a variety of professional services such as: management of pain and chemotherapy related nausea and vomiting, provision of protocol based prescription evaluation and refills, modification and management of hyperlipidaemic and psychiatric therapies, reduction of cardiovascular risk, prescribing, immunization and algorithm based symptom management.<sup>67-73</sup>



Hammond et al. have indicated that pharmacists involved in CDTM have demonstrated improved drug effectiveness, efficacy and safety and went further to recommend that CDTM's should become the core of healthcare service delivery.<sup>66</sup> Additionally, beneficial financial effects of CDTMs were reported by Schumock et al. in a study evaluating 104 studies, half of which qualified as CDTM. In this critical review, authors found that 89% of studies showed positive financial outcomes.<sup>74</sup>

The main difference between supplementary prescribing employed in the UK and CDTM in the US is that in the UK, management plan is customized according to each patient whereas in the US model a standard management plan is produced for each condition.<sup>39</sup>

#### **2.2.2.2 Independent prescribing in the US**

In some US states pharmacists are permitted to initiate or modify drug therapy but only in Florida is independent prescribing practised.<sup>39,75</sup> This independent prescribing however is done from a limited drug formulary with most prescriptions written for topical pediculicides and oral and otic analgesics.<sup>75</sup> Independent prescribing was first introduced in Florida in 1986, but since its introduction the drug formulary has not been updated and most of its drugs are currently available over-the-counter.<sup>57</sup>

#### **2.2.2.3 Protocol prescribing**

As a dependent form of prescribing, protocol prescribing is also practised in the US. This form of prescribing is characterised by a limitation of prescribing activities through a detailed formal agreement describing the activities that pharmacists may perform when prescribing. The protocol, which is a written guideline, includes: disease state, drugs and

drug categories and the procedures and criteria to be followed by the prescribing pharmacist, agreement between the doctor and the pharmacist, agreement time, responsibilities of both doctors and pharmacists and feedback procedures for authorising prescriber and protocol review policies.<sup>38,58,76</sup> The level of prescribing authority given to the pharmacist is competency based.<sup>38,77</sup>

Utilizing the protocol prescribing model, the Indian Health Service (IHS) pharmacists prescribe for patients with disease states such as a limited number of infections (eg. ear infections, urinary tract infections and sexually transmitted diseases), hypertension, heart failure, seizures, and arthritis.<sup>38,77</sup> In 1979, the IHS reported that doctors did not consider as significantly different the quality of care provided to patients by pharmacists.<sup>38,77</sup>

#### **2.2.2.4 Repeat prescribing**

This model allows pharmacists to provide medicine-refills to patients. This model is in place in some US States.<sup>38,78</sup> This prescribing model is generally practised in pharmacies associated with medical centres. The pharmacist through this prescribing model offers three main services: supplies medicines in sufficient quantity to last until a patients' next appointment with a doctor, consults the doctor if there are drug-adherence problems or side effects, and supplies refill prescriptions that would be dispensed at another pharmacy.<sup>38,77,78,79</sup>

### 2.2.3 Canada

In Canada, a survey of its members conducted by the Canadian Society of Hospital Pharmacists (CSHP) in 1996, showed that a number of pharmacists were involved in various degrees in prescribing activities.<sup>57</sup> In August 2001, CSHP approved a statement on pharmacist prescribing advocating pharmacists as capable prescribers. CSHP supported pharmacists' involvement in a collaborative drug prescribing model. The objectives of this model were to improve patients' health and make an efficient delivery of pharmaceutical care. The foundations of this prescribing model, according to the CSHP, would be to recognise "doctors' expertise on disease diagnosis and pharmacists' expertise on pharmacotherapy and disease management".<sup>80</sup>

Major developments in the area of pharmacist prescribing have recently occurred in Canada with different provinces being in various stages of granting expanded prescribing roles to pharmacists. Alberta implemented a three category prescribing model. These models are: a) 'adapting a prescription', where pharmacists can modify the prescription to meet special needs for the patient or expand therapy in cases where patients cannot contact the doctor; b) emergency prescribing, in cases where patients cannot access a doctor and immediate treatment is necessary and c) pharmacists can initiate, modify and extend drug therapy in an interdependent or collaborative fashion.<sup>81,82,83</sup> Controlled drugs and narcotics are not allowed to be prescribed by pharmacists.<sup>82</sup>

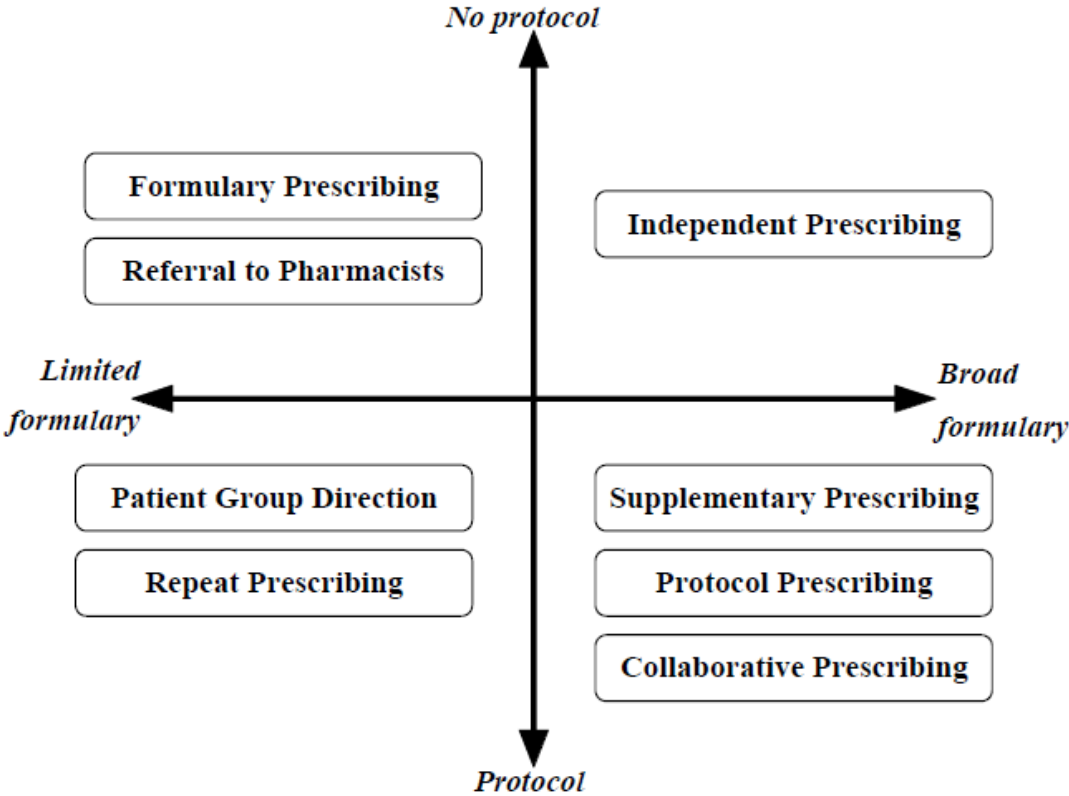
Nova Scotia and Northwest territories allow an extension of prescription medicines by pharmacists by up to 30 days, provided the patient is unable to see a doctor. "Adapting the prescription" and emergency prescribing have also been approved in Nova Scotia. In Quebec, the Pharmacy Act allows pharmacists to initiate or "adjust" medication therapy according to a prescription. In Manitoba pharmacists have a broadened prescribing authority through "continued care" prescriptions. This allows them to independently refill and adapt prescriptions as well as adjust the dose based on certain guidelines.<sup>82,83,84</sup>

In British Columbia, pharmacists who have completed an orientation to British Columbia College of Pharmacy's Medication Management Protocol can adapt and renew prescriptions.<sup>84</sup> They can also substitute a drug within the same therapeutic class. New legislation in New Brunswick has also granted expanded prescribing rights to pharmacists who are now able to alter the dose, formulation or medication regimen and renew a prescription. Emergency and collaborative prescribing is also allowed in New Brunswick. Pharmacists in Prince Edward Island can provide continued care prescriptions for drugs other than narcotics and they must inform patients' doctor as soon as possible.<sup>84</sup> Pharmacists in Newfoundland and Labrador, Ontario and Saskatchewan are in the process of regulatory change to allow expanded prescribing roles for pharmacists. Expanded pharmacist prescribing is not allowed in Nunavut and Yukon.<sup>84</sup>

The expanded pharmacist prescribing role in Canada was met by criticism from Canadian doctors. In August 2007, the Canadian Medical Association (CMA) approved 12 principles on collaborative care models to manage patients.<sup>85</sup> These principles were designed to put the doctors in the core of patient management and enable doctors to always be the leaders of any collaborative patient management model. Canadian doctors also warned that a collaborative care model should not substitute a one care provider only because it may be more cost-effective. The CMA also demanded that the role of pharmacists in prescribing be limited and that pharmacists should not be given an independent prescribing authority.<sup>85</sup>

Croskerry has reported that with Canadian pharmacists expanding their prescribing rights patient safety could be compromised.<sup>86</sup> This author also highlighted the possible commercial influence of the pharmaceutical industry on pharmacists.<sup>73</sup> The Canadian Pharmacists' Association (CPA) has suggested that the Medical profession in Canada still has a long way to go in order to accept enhanced roles for pharmacists. It was also suggested that "Canadian pharmacists already prescribed independently on a regular basis".<sup>86</sup>

Emmerton et al. mapped eight main models of pharmacist prescribing identified internationally.<sup>38</sup> This description is presented in Figure 2.2 and each model previously discussed.



**Figure 2.2 Pharmacist prescribing models identified internationally by Emmerton et al.<sup>38</sup>** (Figure reproduced with permission of the copyright owner).

### **2.2.4 Continental Europe**

Expanded pharmacist prescribing is not practiced in European countries. It is suggested that pharmacists in Europe lack authority in the decision-making process for drug prescribing and that their active participation in healthcare teams is affected by lack of support from physicians.<sup>39,87</sup> In this regard, Van Foppe et al. have indicated that pharmacist prescribing in countries other than the UK was not at a stage where it can be implemented.<sup>39,87</sup>

### **2.3.5 Other parts of the world**

In South Africa there are reports of competition between doctors and pharmacists with their continuous attempts to protect professional domains. As reported by Gilbert, due to socio-economic factors and the country's failure to provide adequate health services, there has been a growing number of dispensing medical practitioners.<sup>88</sup> Therefore, in South Africa, pharmacists seem to be in a position where they struggle to defend their dispensing role rather than assume more responsibilities such as expanded prescribing.

A significant increase in 'gateway pharmacies' (i.e. pharmacies owned by GP's and operated by the same clinic that does prescribing) was seen in Taiwan in 2002, after the introduction of payment incentives for these pharmacies.<sup>89</sup> A dispensing fee increase for pharmacists and an increase in doctors' consultation fee occurred in Taiwan to compensate for revenues lost after a dispensing and prescribing separation policy introduced in 1997.<sup>90</sup> This suggested that until recently Taiwan pharmacists were struggling to protect their dispensing role rather than considering an expanded role in prescribing.

Literature data from Argentina has suggested that to enhance pharmaceutical care, and therefore pharmacists' roles, the main barriers identified by Argentinean pharmacists were lack of time, training and communication skills with patients.<sup>91</sup>

### **2.3 Pharmacist Prescribing in Australia**

Pharmacists in Australia are able to prescribe medicines listed under Schedules 2 and 3 of the SUSMP. Schedule 2 medicines are otherwise called 'Pharmacy Medicines' and Schedule 3 'Pharmacist Only Medicines'.<sup>92</sup>

'*Pharmacy Medicines*' (*S2's*) are intended for therapeutic use in minor ailments and for which symptoms can be readily recognised by the consumer.<sup>93,94</sup> As such, for the purpose of their use there is no need for medical management or differential diagnosis. These medicines are essentially safe to use. Counselling and advice for 'Pharmacy Medicines' is available on 'if necessary basis'. On the other hand, '*Pharmacist Only Medicines*' (*S3's*) are medicines intended for therapeutic use in minor ailments and for symptoms which can be readily recognised by the consumer but these symptoms have to be verified by a pharmacist. '*Pharmacist Only Medicines*' are intended for use in minor ailments and symptoms which do not require initial medical diagnosis. These medicines are essentially safe to use and their provision requires pharmacists' professional counselling, management and monitoring.<sup>93,94</sup>

The Pharmaceutical Society of Australia (PSA) guidelines for the provision of 'Pharmacy Medicines' and 'Pharmacist Only Medicines' state that "all staff members who supply Pharmacy Medicines and Pharmacist Only Medicines receive initial and ongoing training on products, services, and procedures relevant to their supply".<sup>93</sup> Both 'Pharmacy Medicines' and 'Pharmacist Only Medicines' are located in a Pharmacy area

separated from those containing other commercial products. 'Pharmacy Medicines' are located within a 'professional services area' which is an area that contains only health related products.<sup>93</sup> On the other hand, 'Pharmacist Only Medicines' are located in an area not accessible or available for self-selection by customers. These medicines are placed within "pharmacists' sight, hearing and supervision".<sup>93</sup> In Australian pharmacies, consumers often have access to a private consultation area within the pharmacy. This facilitates the provision of 'Pharmacist Only Medicines'. It should be noted that some of the medicines listed as 'Pharmacist Only Medicines' were previously prescription only medicines (e.g. Pantoprazole 20mg tablets, Ketotifen eye drops etc).<sup>92</sup>

The pharmacy profession in Australia has seen an expansion of pharmacists' traditional roles. In addition to regular medicine reviews conducted by clinical pharmacists in hospitals, Home Medicine Reviews (HMR) and Residential Medicine Management Reviews (RMMR) have been introduced during the last decade. These services are conducted by Consultant Pharmacists who are accredited following additional training. These services are reimbursed under the Pharmaceutical Benefits Scheme (PBS)<sup>95</sup>

Australian pharmacists are also able to continue the supply of prescription medicines based on 'emergency supply' and 'repeat prescription' systems. The majority of medicines supplied under the 'repeat prescription system' are subsidised by the PBS.<sup>96</sup> However, it should be noted that the 'repeat prescription' system is also utilised for private prescriptions.

The PBS was established in 1948 and is governed by the National Health Act 1953. It is designed to provide a wide range of medicines at a government subsidized price. The PBS is a rational formulary and covers around 80% of prescriptions dispensed in Australia. It should be noted that in addition to Australian residents, overseas visitors from countries having a reciprocal health care agreement with Australia are also eligible for PBS access.<sup>96,97,98</sup>



The 'repeat prescription' system is a form of dependent prescribing.<sup>38</sup> This model enables a continuation of prescription medicine supply without patients having to see a doctor to obtain a prescription for each refill. Generally, the number of repeats that are authorized by doctors range from one to six. However, as of 1<sup>st</sup> of December 2008, the PBS has expanded the number of repeats allowed from a maximum of six to a maximum of 12 months. This may be regarded as a limited extension of pharmacist prescribing in Australia. It should be noted though that the list of medicines for which the PBS allows up to 12 repeats is limited.<sup>96</sup> The main objective for expanding the number of repeats was to provide greater flexibility to access of repeat prescriptions to patients with chronic conditions. The PBS also lists other reasons for this repeat extension. These include: easing the burden off patients with chronic conditions, simplifying medicine access and reducing the need of seeing a doctor just to refill a prescription without reducing the need for patients' regular review by their doctor.<sup>96</sup>

### **2.3.1 Prescribing in Australia by other healthcare professionals**

Independent prescribing from a limited list of medicines is undertaken by dentists. Dentists commenced prescribing medicines under the PBS on 1<sup>st</sup> of April 1979.<sup>99</sup> There is a wide range of therapeutic classes listed under the PBS from which dentists can prescribe with antibiotics and analgesics being the most abundant classes.<sup>96</sup> There are limits as to the variety of controlled drugs i.e. narcotics and duration of treatment that dentists can prescribe, dependent on the Australian State or Territory. The PBS has also set a limitation on duration of treatment that dentists can prescribe with no repeats allowed under the PBS for dentist prescribing.<sup>96</sup>

Dependent on the Australian State or Territory, podiatrists and optometrists have also been granted prescribing rights for a limited formulary of prescription medicines.<sup>100,101</sup> It is worth mentioning that in addition to medical practitioners only dentists and optometrists have access to prescribing items under the PBS. Optometrists accredited to

prescribe under State or Territory legislation gained access to the PBS items from 1<sup>st</sup> of January 2008.<sup>96</sup> Under the PBS, optometrists can prescribe medicines for optometrical use from the following therapeutic areas: anti-infectives, anti-inflammatory agents, antiglaucoma agents, miotics, decongestants and antiallergics.<sup>96</sup> Optometrists and podiatrists do not have prescribing rights in all Australian States and Territories.

In Australian hospitals, some nurse and midwife practitioners are able to prescribe. Their prescribing is limited to selected specialities such as pain management, primary care, and emergency medicine. This prescribing is either formulary or protocol based (i.e. defined protocols that guide pharmacotherapeutic management). There is also a model for remote area nurse prescribing.<sup>95,102</sup> Nurse practitioners and midwives will gain access to prescribing a limited number of PBS items from 1<sup>st</sup> of November 2010.<sup>96</sup>

It is worth emphasising that the acquisition of prescribing rights by nurse practitioners and optometrists was accompanied by significant efforts made by their professional bodies with each profession making submissions justifying their prescribing rights and highlighting their contribution to collaborative healthcare work, cost effectiveness and patient safety and benefit.<sup>103</sup>

The Australian Government Productivity Commission recommended that Australia should increase the scope for other health professionals undertaking doctor's tasks.<sup>104</sup> This view is not entirely shared by the Australian Medical Association (AMA).<sup>105</sup> According to the AMA, doctors embrace the idea of allocating clinical responsibilities to lesser medically trained health professionals "wherever it can be done safely and effectively".<sup>105</sup> The AMA encourages that this should be done in a context of: team care where skills are synergised, doctors retain their central role, no fragmentation of care occurs and taking into account patient preferences and expectations. The AMA at the same time has warned that a task transfer from doctors to other non-medical health professionals could lead to shortages of other healthcare professionals. Ultimately, the view of the AMA is that any possible reforms must improve what doctors do and not risk standards of care.<sup>105</sup>

The Royal Australasian College of Physicians (RACP) supports task transfer “both across its speciality groups and to other health professionals as long as this transfer is evidence-based, safe, cost-efficient and it facilitates patient care.”<sup>106</sup>

When it comes to transferring the task of prescribing specifically, the AMA has signalled that it is opposed to an extension of prescribing rights for pharmacists. Reacting to a limited pharmacist prescribing extension proposed by the Pharmacy Guild of Australia (PGA), who proposed a list of 20 medicines that pharmacists should be able to prescribe, the AMA’s president has pointed out that “doctors must maintain sole responsibility for prescribing medicines to patients”. The AMA’s president has emphasized patients’ safety, lack of pharmacists’ training and the conflict of interest with pharmacists having both dispensing and prescribing rights as the main reasons for this stance.<sup>107</sup> However, it should be noted that the view of a separation of prescribing and dispensing is also shared by the PSA and the Society of Hospital Pharmacists of Australia (SHPA).<sup>100,108</sup> In addition, the SHPA’s position on prescribing by non-medical professionals is that “only health professionals who have undergone credentialing within their defined practice setting, in pharmacology, pharmacokinetics and applied therapeutics, meeting the standard core competencies for safe and effective prescribing, should be registered to prescribe medicines following diagnosis”.<sup>100</sup>

The Pharmaceutical Council of Western Australia (PCWA), made a submission to a review of WA’s Poisons’ Act endorsing a collaborative drug therapy prescribing model for pharmacists provided that the diagnosis for the patient is established and a treatment plan was developed for individual patients.<sup>109</sup> The PCWA has proposed that part of the doctors tasks can be transferred to another health professional. This prescribing model would require pharmacists to undergo an accreditation process. According to the PCWA this expansion of pharmacist prescribing could be applied to chronic conditions such as diabetes, asthma, hypertension, dyslipidaemia, hypothyroidism, heart failure and anticoagulation therapies. The PCWA also separately advocated the possibility of

pharmacists independently prescribing 'Prescription Only Medicines' in specific circumstances.<sup>109</sup>

When exploring the issue of pharmacist prescribing in Australia, it is worth noting that there is shortage of doctors and nurses which is driving the task transfer in Australia.<sup>106</sup> In addition, literature suggests that fewer medical graduates, are choosing general practice as a career hence indicating further exacerbation of the general practitioner shortage.<sup>110</sup> Joyce et al. predicted a continued shortage of general practitioners in Australia, hence suggesting that innovative primary medical care policies were necessary.<sup>111</sup>

Extension of the current pharmacist prescribing role in Australia has to be weighed against new challenges that the pharmacy profession is facing. These challenges include ownership deregulation, increased access to health products, internet pharmacies, healthcare reforms and nurse practitioners with prescribing authority.<sup>57</sup> Australian studies have reported that Australian GP's are no better at monitoring their patients compared to their UK colleges.<sup>112,113</sup> Clinical Pharmacists in Australia have an active role in drug and dose selection. Patient monitoring and medication reviews are also performed by Australian pharmacists. These skills are certainly valuable if pharmacists in Australia assume further prescribing responsibilities.<sup>113</sup>

An extension of non-medical healthcare professionals' role in prescribing needs to be considered in the context of patient harm caused by the provision of medically prescribed medicines. There is data suggesting that in Australia, nearly 140 000 hospital admissions a year may be linked to drug related adverse effects with half of these being preventable. Also, up to 400 000 visits to general practitioners a year are linked to drug related adverse effects. In 2002 the cost for medicine related hospital admissions was estimated to be \$380 million.<sup>114,115</sup> Miller et al. have suggested that 10.4% patients attending general practices suffered a drug related adverse effect with half of these being moderate to severe. Translating these findings to the total number of patients that visit

GP's in Australia it indicated that almost two million people in Australia have a drug related adverse effect annually.<sup>114,116</sup>

As outlined by Kidd et al. new roles for other Australian health professionals need to take into account six main principles: “support the relationship between patients and their general practitioners, be clearly defined, aligned with competency and with relevant professional registration, be supported by practice systems providing safeguards against medical error, be underpinned by a system ensuring informed patient consent to activities being undertaken by members of the general practice team and be supported by effective medical indemnity insurance and appropriate financing”.<sup>117</sup>

### **2.3.2 Australian studies exploring pharmacist prescribing**

There is one descriptive study to date that has assessed the issue of pharmacist prescribing in Australia. This study addressed the awareness of international developments in pharmacist prescribing and whether respondents would benefit from prescribing activities.<sup>118</sup> However, this study was limited by a low response rate (6.4%). Also, in this study community pharmacists were represented by consultant pharmacists who worked in community pharmacies. It should be noted that a majority of pharmacists in Australia work in community pharmacies and most of them are not consultant pharmacists. Views of Australian hospital pharmacists were assessed by another study.<sup>119</sup> The limitation of this study was that it only included 15 hospital pharmacists. Both the abovementioned studies reported support by pharmacists for expanding their prescribing role.

There are currently two trials in the implementation stage being conducted in Queensland. These trials are exploring the skills, knowledge and competencies of pharmacist prescribers. Both these trials are being conducted in hospital settings.<sup>109</sup>

Aiming to provide Australians with improved and safe access to prescription medicines, utilize pharmacists' and doctors' skills better and reduce healthcare costs, a major Australian research project has proposed four models in which pharmacists would have expanded prescribing roles.<sup>120</sup> These proposed models were:

1) Medicine maintenance

According to this model pharmacists would prescribe based on an individual patient plan designed by doctor. This model in essence is a collaborative approach that would allow patient management in Residential Aged Care Facilities (RACFs).<sup>120</sup> In this model the doctor would initiate the medicine while an accredited pharmacist (i.e. consultant pharmacist) would review, monitor, and renew medicines provided the residents' condition was stable. The main advantage of this model highlighted by researchers was to overcome current difficulties associated with the 'emergency supply' system.

The authors of this project recommended that in this model the supply of medicines for chronic conditions should be prescribed in a way that improves this supply both in terms of time and quantity. The authors also recommended that medicines supplied under the 'emergency supply' system be expanded from three to 30 days or otherwise one 'unbroken' pack.<sup>120</sup>

2) Advanced practitioner

This model is a hospital-focused model in which senior pharmacists could prescribe in a supplementary fashion. This model would allow hospital pharmacists to prescribe medicines in collaboration with doctors and it has the potential to be applied in 'pre-

admission and out-patient clinics, ambulatory care and inpatient clinics. The authors recommended that prior to hospital pharmacists assuming this role, they need to reach a pre-determined level of competence.<sup>120</sup>

### 3) Protocol management

This model would allow pharmacists to prescribe prescription medicines according to a 'defined population-based protocol'. With the protocol management model the authors have proposed similar responsibilities to other rural health workers for pharmacists in rural and remote areas. In this model pharmacists would have an expanded role allowing them to monitor and modify medicines according to evidence-based protocols. The authors suggested that this model could be applied to the management of common disease states.<sup>120</sup>

### 4) Formulary prescribing

This model essentially advanced the current formulary prescribing by pharmacists in Australia by allowing them to claim 'Pharmacist Only Medicines' via the PBS. The authors also proposed that non-PBS items should be covered by private health insurance. In order to implement this model and ensure appropriate use of medicines, the authors recommended introduction of an electronic health record system accessible by doctors, pharmacists and patients.<sup>106</sup> All medicines prescribed by pharmacists would be recorded in this system. The authors also recommended that 'Pharmacist Only Medicines' should be renamed to 'pharmacists' formulary'.<sup>120</sup>

Some concerns were also raised by the participants (prescribing stakeholders) in this project.<sup>120</sup> In the 'medicine maintenance' the extension of the 'emergency supply' system from three to 30 days does seem to provide a postponement rather than a solution to the supply of medicines to RACFs. Stakeholders in this project also had concerns with the possibility of therapy continuing inappropriately until the patient sees the doctor.

The second model includes hospital pharmacists only. Stakeholders have raised concerns about the availability of pharmacists during weekend discharge of patients, particularly in light of hospital pharmacists' shortages. Given that this model emphasizes a patient-specific plan, stakeholders had concerns about the disruption of treatment and potential errors during the weekend with multiple pharmacists being involved.<sup>120</sup>

In terms of the third proposed model i.e. protocol management, stakeholders had concerns with clarification between doctors' and pharmacists' tasks. Main concerns raised by stakeholders with the formulary prescribing model were: potential for increased consumer demand for medicines, adverse health outcomes and the issue of separating prescribing and dispensing.<sup>120</sup>

## **2.4 Benefits and facilitators of pharmacist prescribing**

Literature suggests that the main benefits of expanding prescribing for non-medical health professionals internationally include: improvement of patients' care and access to medicines, better resource utilization both economical and human, making the healthcare system more efficient by reducing waiting times for patients and reducing fragmentation of health care.<sup>38,43</sup>

The main drivers for the expansion of pharmacist prescribing responsibilities in the UK have been to provide better health outcomes for patients with chronic diseases in particular, and assist GPs to utilize their time more effectively by possibly reducing their workload.<sup>121</sup> England's Department of Health lists improving patient care, medicine access, better utilization of pharmacists' professional skills and team work within the healthcare system as the main aims for the introduction of independent nurse and pharmacist prescribing.<sup>51</sup> England's Department of Health also suggests that PIPs may



also fill geographical and skills shortages in services and manage complex medicine regimens and long term medical conditions.<sup>51</sup>

#### **2.4.1 Studies evaluating pharmacists prescribing prescription only medicines**

Positive clinical outcomes were reported in the literature when pharmacists engaged in prescribing prescription only medicines. As early as 1960-1970, in the US there were programs that authorized pharmacists to prescribe prescription medicines directly to patients and without prior authorization from doctors.<sup>57,77</sup> These programs were initiated by the IHS, an agency of the US Public Health Service. In these programs, in addition to prescribing, pharmacists also monitored patients' progress and made pharmacological alterations accordingly. These programs were so successful that eventually pharmacists' roles were expanded even further to include patients' physical examination and differential diagnosis.<sup>77</sup>

A study explored the clinical outcomes in a pain clinic with pharmacists having prescribing authority.<sup>122</sup> In this clinic 90% of patients were treated for chronic non-cancer pain. This study has reported that patients in this clinic were managed effectively by a pharmacist. In addition, cost savings were also achieved.<sup>122</sup>

Improvement of blood pressure control and anticoagulation therapy were reported by studies assessing the clinical outcomes of pharmacist prescribers.<sup>57,64,123,124,125,126</sup> Hawkins et al. reported significantly lower blood pressure results in a study aimed at lowering blood pressure in diabetic patients.<sup>127</sup> In terms of anticoagulation therapies a few studies showed that fewer warfarin related adverse effects occurred in patients managed by pharmacist prescribers.<sup>57,125,126,128,129</sup>

Literature data also suggests improved compliance achieved in cases where pharmacists were involved in prescribing medicines.<sup>57</sup> Additionally, studies have shown better

resource utilization, reduced outpatient visits to clinics and reduced emergency hospital admissions and hospitalization days for patients receiving warfarin therapy with pharmacists engaging in prescribing.<sup>57,124,126,118,130</sup>

Simmel et al. compared prescribing by pharmacists and physicians for psychiatric inpatients. Pharmacist prescribers only dealt with patients who were already diagnosed and treatment was exclusively pharmacologic. Prescribing by both pharmacists and physicians was evaluated by a team of clinical judges independently. The result was that pharmacists' prescribing was as safe and appropriate as physicians' prescribing.<sup>131</sup>

Ellenor and Dishman described a successful expansion of hospital pharmacists' scope of practice in psychiatry.<sup>132</sup> The success of pharmacist prescribers as well as the acceptance of a psychiatry clinic as a role for pharmacists was demonstrated by continuous expansion of this program. By the end of fourth year of this program, pharmacists conducted 46% of all psychiatric medicine visits.<sup>132</sup>

A study conducted in Seattle, US, evaluated pharmacists prescribing hormonal contraceptives in a collaborative drug therapy protocol model.<sup>133</sup> Prescribing was done according to protocol guidelines. This study showed that community pharmacists could efficiently monitor patients for safe use of hormonal contraceptives and select appropriate therapy. Both patients and pharmacists were satisfied with the services. Willingness to pay for this service as well as readiness to visit pharmacist prescribers for receiving other services was also displayed by patients.<sup>133</sup>

Bauer et al. explored the outcomes of expanding pharmacists' scope of practice in the area of venous thromboembolism prophylaxis.<sup>134</sup> Pharmacists developed a program which would assess all new patients admitted to the hospital for risk of venous thromboembolism. Pharmacists accordingly recommended pharmacologic prophylaxis. This pharmacist led program resulted in a significant increase in the use of antithrombotic medicines. Consequently there was a significant decrease in confirmed venous thromboembolism.<sup>134</sup>

Literature data also indicated that a pharmacist directed hypertension clinic resulted in improved patients' blood pressure and prescribing of antiplatelet agents and statins for primary prevention of cardiovascular events.<sup>135</sup> In this program, a total of 242 patients visited this clinic during a period of 10 months. Pharmacists recommended lifestyle and pharmacological alterations with the aim of achieving British Hypertension Society (BHS) target blood pressure levels. This study reported that patients who achieved target blood pressure level increased from 74 (36%) pre-clinic to 174 (85%) post-clinic. During a five months period of time, in this clinic 74 patients (80%) achieved target blood pressure level compared to 27 (40%) with standard GP management.<sup>135</sup>

Till et al. assessed the outcomes of pharmacist managed lipid-lowering therapy in a primary care setting.<sup>136</sup> This study specifically focused on examining the difference in lipid profile improvement for patients receiving lipid lowering medicines prescribed and altered by pharmacists compared to other health care practitioners. In this setting, in addition to prescribing, pharmacists were also responsible for ordering and interpreting laboratory results and monitoring lipid lowering therapy. Clinical pharmacists with an expanded prescribing role in lipid lowering drug therapy achieved a significantly greater reduction in low-density lipoprotein cholesterol (LDL), compared to the group which did not have a clinical pharmacist managing patients' dyslipidemia.<sup>136</sup> This also suggested an improved long-term cardiovascular event profile for these patients.

#### **2.4.2 The UK experience with expanded pharmacist prescribing**

Studies are emerging that have evaluated the experiences of PSPs in the UK. Warchal et al. suggested that professional challenge, a better use of their skills and patient and pharmacy profession benefits were significant reasons for pharmacists commencing

supplementary prescribing training in the UK.<sup>43,54</sup> Pharmacists' professional challenges and patient benefit by supplementary prescribing were also reported by Weiss et al.<sup>137</sup>

A cross-sectional survey conducted by George et al. has identified the benefits perceived by PSP's.<sup>55</sup> These benefits included: improved patient management, job satisfaction and greater confidence and independence for pharmacists. Pharmacists in this study also believed that patients were more satisfied under the pharmacist supplementary prescribing.<sup>55</sup> In addition to job satisfaction and benefits to patients, Lloyd et al. reported that doctors believed that pharmacist supplementary prescribing can reduce their workload and errors.<sup>138</sup> While et al. reported pharmacists' increased knowledge was a benefit to supplementary prescribing.<sup>139</sup>

Benefits for patients have also been identified with Weiss et al. suggesting improved information from and longer consultations with pharmacists, compared to doctors.<sup>137</sup>

There is a lack of research on clinical outcomes of supplementary and independent prescribing practised in the UK. Shulman and Jani conducted a study which measured a clinical outcome with supplementary prescribing arrangements.<sup>140</sup> These authors assessed doctors and pharmacists' adherence to drug dosing guidelines for haemofiltration in an intensive care unit. According to this study, pharmacists were more adherent to haemofiltration drug dosing guidelines.<sup>140</sup>

A good relationship between pharmacists and doctors, which is based on mutual trust, has been reported to be a facilitator in the implementation of supplementary prescribing in the UK.<sup>53</sup>

It is worth adding that the IHS pharmacist protocol prescribing model in the US resulted in increased patients' satisfaction. This model also improved pharmacist-physician relationships and a reduction in doctor referrals and visits was achieved.<sup>38,77,141</sup>

## 2.5 Barriers to pharmacist prescribing

Literature data have indicated that most pharmacists are reluctant to prescribe due to conflict of interest with doctors, drug manufacturers, liability insurance, lack of economic incentives, excessive workload, lack of willingness and time pressure.<sup>57,142,143</sup> It has been reported that UK pharmacists were concerned about time pressures without prescribing.<sup>144</sup> There are also reports stating that fragmentation of care can result in increased costs and inefficiencies within the health care system.<sup>117</sup>

Mrtek highlighted the lack of access to patient's medical records in a community pharmacy as the main barrier to pharmacist prescribing.<sup>145</sup>

Limitations reported with pharmacist protocol prescribing also included additional workload for pharmacist prescribers, complicated financial compensation and pharmacists compromising other professional tasks leading to more errors.<sup>38,78,141,146</sup>

Privacy during consultations as well as the management of pharmacist only medicines were reported to be issues of concern for pharmacists involved in PGD model of prescribing.<sup>38,60,147</sup> There were some barriers reported with the formulary based pharmacist prescribing model as well.<sup>38</sup> Record-keeping and pharmacists' liability were reported to be barriers towards this model.<sup>38,148</sup>

Significant barriers in implementing supplementary prescribing have also been identified.<sup>36,43,137</sup> Barriers identified in the literature include delays in obtaining prescription pads and deficiencies in access to patients' medical records, information technology to print prescriptions, administrative support to run supplementary prescribing clinics, time and financial limitations. Furthermore, Candlish et al. have suggested that a hospital environment was more suitable for supplementary prescribing as there already existed a relationship between doctors and pharmacists and sufficient access to patients' medical records and prescription pads for pharmacists.<sup>149</sup>

Hobson and Sewell have also suggested that there are more barriers to implementing supplementary prescribing in primary care (i.e. health services offered through a local medical practice) in comparison to secondary care (i.e. acute health services including emergency and specialties that cannot be offered in primary care).<sup>39</sup> It was suggested that in hospitals, supplementary prescribing in fact formalized already existing practices.<sup>39,45</sup> Baird has also identified limitations for supplementary prescribing in a community setting. This study reported confusion about the initial patient diagnosis, patient comorbidities resulting in part-prescribing and lack of supplementary prescribing by some pharmacists.<sup>150</sup>

Further evidence from the UK confirms barriers such as lack of funding and Information Technology (IT) support for the implementation of supplementary prescribing. In addition, lack of awareness by other stakeholders has also been reported to be a barrier perceived by PSPs.<sup>49</sup> The same authors have suggested in another study that only half of the pharmacists trained to assume supplementary prescribing were actually practicing.<sup>55</sup> In addition to doctors' and patients' lack of awareness with supplementary prescribing, Weiss et al. reported communication issues, lack of skills in clinical examination to be barriers in the implementation of supplementary pharmacist prescribing.<sup>137</sup>

Difficulties in developing relationships with doctors have also been reported.<sup>36</sup> Child and Cantrill have reported that doctors perceive a lack of pharmacists' clinical and patient knowledge, communication skills and mechanisms for reviewing patients' treatment after doctors initial prescribing, as barriers towards the implementation of supplementary prescribing.<sup>151</sup>

Nurses are more positive to pharmacist prescribing compared to doctors.<sup>43</sup> Child reports that nurses positively perceived pharmacist prescribing if issues such as liability, communication skills and resources are properly addressed.<sup>152</sup> It is worth emphasising that in a study conducted by Lloyd et al. nurses believed pharmacists were the most knowledgeable regarding medicines.<sup>153</sup> However, they did not perceive pharmacists to be the best in prescribing. This same study reported that pharmacist prescribing was not

seen as a threat by nurses but they did consider this role may de-skill doctors.<sup>153</sup> Buckley et al. reported that hospital stakeholders were supportive of pharmacist prescribing despite concerns they had with pharmacists' lack of diagnostic skills and lack of patient knowledge.<sup>154</sup> However, in this study some doctors were more defensive professionally and suggested a reluctance to relinquish their current medical control.<sup>154</sup>

Inter-professional barriers were also reported by Hughes and McCann.<sup>155</sup> These authors highlighted that doctors perceived pharmacists as shopkeepers. In this regard issues such as doctors considering pharmacist prescribing to be a threat to the professional hierarchy and lack of GP's awareness of pharmacist supplementary prescribing were also found to be significant barriers.<sup>155</sup> Lack of doctors' awareness on pharmacist supplementary prescribing was also reported by Lloyd et al.<sup>138</sup>

A qualitative evaluation of pharmacists' and their mentors views on supplementary prescribing conducted by Lloyd and Hughes revealed that although supplementary prescribing was in fact welcomed by both pharmacists and their doctor mentors there were still issues such as a perceived threat of independent prescribing and infringement of boundaries that surfaced.<sup>53</sup> Medical de-skilling was also an issue raised by doctor mentors. However, these doctors believed that supplementary prescribing would ultimately allow them to retain control of the patient. This same study also reported that pharmacists were concerned about the supplementary prescribing limiting their professional autonomy.<sup>53</sup>

Lack of access to patients' medical records and the threat to supplementary prescribing by independent prescribing were also reported to be barriers by Warchal et al.<sup>54</sup> In addition to lack of access to patients medical records, While et al. reported time as a significant barrier for pharmacists to implement supplementary prescribing.<sup>139</sup>

Frequently, the involvement of the CMP in supplementary prescribing has been reported in the literature to be one of the main barriers for its implementation. This is mainly due to its restrictive, inflexible and time consuming nature.<sup>43,44,54,55,137</sup> The CMP is a core

element in supplementary prescribing and represents a framework designed for the management of individual patients. George et al. have suggested that an independent prescribing model has the advantage over the supplementary model as it does not require a CMP.<sup>55</sup>

## **2.6 Training of pharmacist prescribers**

Pharmacists in the UK need to complete an accredited prescribing course at a tertiary institution in order to gain any prescribing rights. This is in addition to the undergraduate training that leads to registration as pharmacists.<sup>157</sup> The RPSGB accredits the training and sets the professional requirements for pharmacist prescribers in the UK. The main difference between pharmacist prescribing training in the UK and elsewhere in the world is that in the UK this training is nationally recognized and accredited as opposed to a local assessment of competencies.<sup>38,156,157</sup>

In the US prescribing authority of pharmacists varies between states and there are no uniform education requirements for pharmacists providing CDTMs. However, pharmacists providing CDTM's usually have an advanced level of training or clinical experience.<sup>67</sup> Additionally, many pharmacy schools in the US are now focusing on providing specific training on CDTM to new graduates. The state of New Mexico, has developed a category of pharmacists providing CDTMs which are trained in physically assessing the patient. These pharmacists complete a 60 hour course which is approved by the pharmacy board and this is also followed by a nine month clinical experience supervision period.<sup>67</sup>



In Canada, pharmacists receive no additional tertiary level training for gaining further prescribing responsibilities.<sup>83</sup> There are also no uniform non-tertiary training requirements throughout Canada for pharmacists assuming expanded prescribing roles. It should be emphasized that prescribing roles vary in different Canadian provinces.<sup>85</sup> In the Province of Alberta pharmacists must be familiar with the new practice standards. In the Province of British Columbia pharmacists are guided by the “Protocol for Medication Management – Adapting a Prescription”, developed by the British Columbia College of Pharmacy. They must also in writing declare that they understand this orientation guide.<sup>83,158</sup>

In the UK, pharmacist prescribing training is taught for an equivalent of 26 days and is part-time based lasting 3-6 months. Distance learning is also offered by some tertiary education institutions.<sup>156</sup> Pharmacists also need to have two years of clinical experience prior to enrolling into a prescribing course. Upon completion of this course pharmacists are also required to undergo a supervised learning experience with a Designated Medical Practitioner.<sup>156</sup>

Under the new training plans, current PSPs will take extra training, including practice-based learning in order to become PIPs. However, it should be emphasized that the independent prescribing model was not started in order to replace the existing supplementary prescribing model but to complement it.

Evidence from the UK suggests that there are concerns that have been identified with the actual training for non-medical prescribing, including pharmacists’ prescribing.<sup>156</sup>

George et al. reported that Scottish community pharmacists considered that their needs for suitable training be emphasised on evidence-based medicine, diagnosis and consultation skills before independent prescribing was undertaken.<sup>159</sup> Buckley et al. suggested that hospital stakeholders considered pharmacists to have sufficient pharmacological knowledge, however they lacked diagnostic skills and patient knowledge.<sup>153</sup> Therefore, suggesting training was to be focused in these areas. Dawoud et al. observed how pharmacists undertaking supplementary prescribing considered were

knowledgeable in areas such as pharmacology and pharmacokinetics, but they needed more training in patient assessment and counseling.<sup>160</sup>

Cooper et al. explored pharmacists' experience with supplementary prescribing after being trained in England.<sup>156</sup> Areas of training such as clinical examination, training in consultation skills and practical experience with doctors were valued the most whereas training in pharmacology was criticized.<sup>157</sup> Pharmacists suggested that training in pharmacology was either a 'waste of time' or 'too basic'. Although supplementary prescribers were not involved in patient diagnosis, some respondents still suggested a need for training in diagnosis. The authors have attributed this to the intentions of most respondents to become independent prescribers. These authors suggested that supplementary prescribing training was an important step for pharmacists wishing to achieve full independent prescribing authority.<sup>156</sup>

In evaluating the experiential learning of pharmacists with DMP's, during supplementary prescribing training, George et al. have identified time, attitudinal and organisational barriers.<sup>161</sup> Alternatively, professional development and teamwork were reported to be major positive aspects of this training. These authors have suggested that the internet could be used to advance communication during the experiential learning of pharmacists with DMP's. The authors have also concluded that a multidisciplinary approach of health professionals, as well as consultation videos, could have a positive affect on pharmacists' training.<sup>161</sup>

## 2.7 Economical implications of pharmacist prescribing

There are limited data directly exploring the economical implications of pharmacist prescribing. However, there is evidence that when pharmacists intervened in otherwise doctors' routine prescribing, this has resulted in significant savings.<sup>16,136,162-168</sup>

Studies have explored the cost-effectiveness of clinical pharmacist interventions in prescribing of antibiotics such as tobramycin and vancomycin. These studies showed a significant cost reduction was achieved for the hospital.<sup>16,162</sup> Pharmacists' intervention in these studies consisted of promotion of the use of other antibiotics.

Another study showed that when a doctors' surgery employed a practice pharmacist, who monitored and ensured rational prescribing, a reduction in prescribing costs was achieved over a three year period.<sup>163</sup>

A study investigated the effect of two pharmacists providing clinical services on prescribing and drug costs for nonsteroidal anti-inflammatory drugs (NSAIDs) and salicylates in a primary-care clinic.<sup>164</sup> Pharmacists recommended prescribers low-cost alternatives and reviewed patients' medicine profiles. These two pharmacists did not reduce the cost of NSAID prescribing while they slightly reduced the cost of salicylate prescribing. The operational costs during the first months exceeded those anticipated and therefore this program was not self-sustainable economically.<sup>164</sup> However, in addition to this study's limitations in terms of representativeness of pharmacists and primary-care clinics, one should take into consideration that availability of NSAIDs in 1987 was significantly lower than today and therefore the chances for pharmacists making recommendations were reduced compared with today. Therefore, the class of medicines that was explored in this study (i.e. NSAIDs) has its own specific limitations, especially when compared to contemporary recommendations on adverse gastrointestinal and cardiovascular side effects of NSAIDs.

Forstrom et al. studied the effect of clinical pharmacists on antihypertensive therapy in a family practice clinic provided by five doctors. Pharmacists reviewed patients' files and placed recommendations to changing drug therapy in patients' medical records.<sup>165</sup> Pharmacists' intervention led to a decrease in the cost of antihypertensive therapy from 33.4 to 27.2 cents per day.

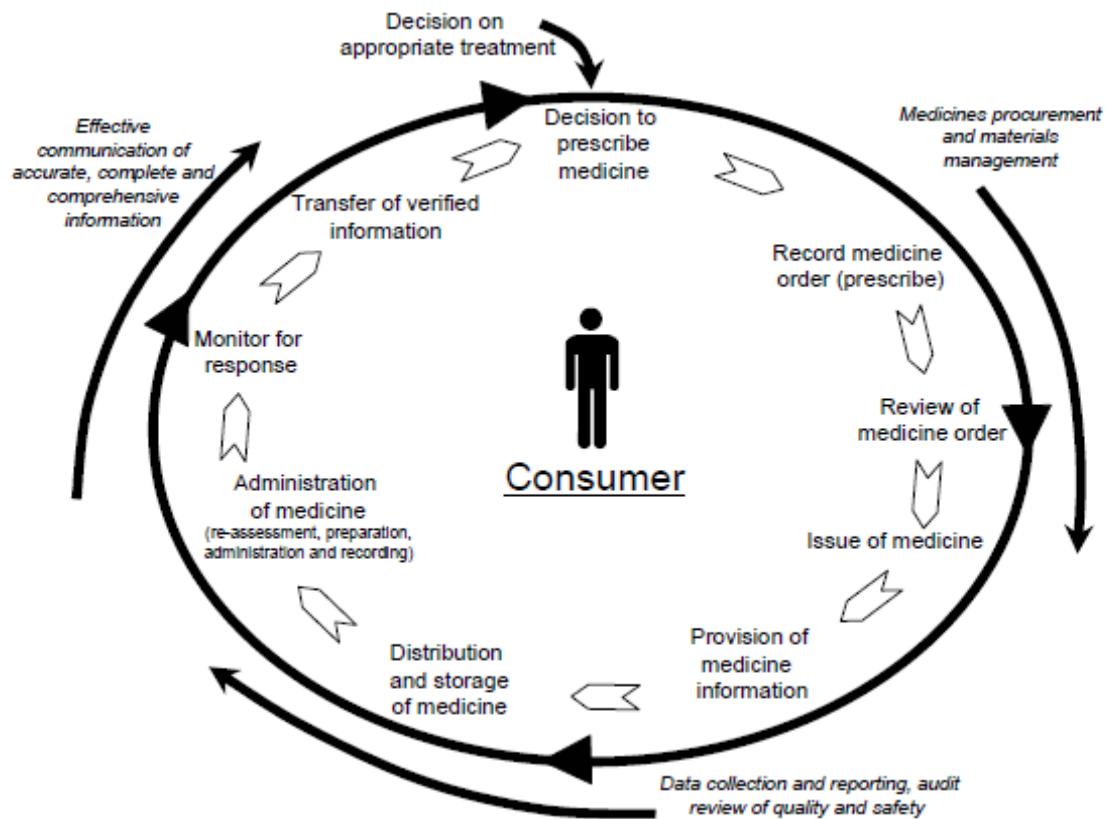
A study which explored the outcomes of a pharmacist with prescribing authority in a pain clinic with patients consisting mainly of chronic non-cancer pain also concluded that additional cost reduction was achieved.<sup>166</sup> Clinical pharmacists' impact on prescribing of parenteral cephalosporins was also reported to result in significant cost savings.<sup>167</sup> Pharmacists interventions consisted of publication of a newsletter that contained specific recommendations for doctors, emphasizing the primary use of cefazolin and personal interaction of pharmacists and doctors promoting the newsletters' recommendations.<sup>167</sup>

Another study showed an improved lipid profile for patients who were managed by a clinical pharmacist with an expanded prescribing role in lipid lowering therapy suggesting lower cost to the healthcare system as a result of dyslipidemia consequences and long term cardiovascular complications.<sup>136</sup>

Rodgers et al. showed that when pharmacists were employed in a UK general practice clinic it resulted in significant savings.<sup>168</sup> Pharmacists did control prescribing costs enough to offset their employment costs. In this general practice pharmacists performed duties such as: generic substitution of branded medicines, clinical audits, repeat prescription and formulary reviews. Pharmacist-run asthma and gastrointestinal clinics in order to review patient medicine were also set up. The group of surgeries who had pharmacists employed was then compared with surgeries that did not have pharmacists.<sup>168</sup> Therefore a major advantage of this study was that it used a control group to compare findings.

## 2.8 Pharmacy clients' perspectives on pharmacist prescribing

Ultimately the process of medicine prescribing is directed towards achieving an optimal treatment and management for patients. Therefore one would argue that this puts patients at the centre of the process. This is well illustrated by Stowasser et al. in Figure 2.3.<sup>108,169</sup>



**Figure 2.3** An illustration of medicine management pathway<sup>169</sup> (Figure reproduced with permission of the copyright owner).

Despite the central role that patients have in the process of medicine provision, literature on their perceptions of pharmacist prescribing is very limited. This is even despite the fact that for example supplementary prescribing involves the use of CMP's which is an

agreement between three parties i.e. doctors, pharmacists and patients.<sup>43,45,49</sup> No study was identified that explored attitudes of pharmacy clients who had not experienced pharmacist prescribing.

One study has evaluated patient's perceptions of a pharmacist-led supplementary prescribing model in a hypertension clinic.<sup>170</sup> Of 110 respondents (87% response rate), 57% reported that the standard of care was better than the previous care and 85% indicated they could make appointments more easily. This study was viewed as an audit to the services provided by this clinic. No statistical analysis was performed and the author specified that it was aimed at finding ways to improve the service provided by the clinic. Also, this study did not indicate whether there was an acceptance of patients for non-medical staff prescribing.<sup>45,170</sup>

Another recent study has explored the experiences of eight doctors, nine PSPs and 18 patients recruited by PSP's. These patients were purposively sampled.<sup>171</sup> Patients expressed a high level of satisfaction with PSP's. Limitations of this study were a) selection of patients by service providers i.e. PSP's and hence the possibility of bias in their responses and b) a low number of patients in the sample.

Patients' attitudes were explored in another study where participants were again recruited by nine PSP's.<sup>171</sup> A total of 103 patients was surveyed and researchers emphasized the need for larger scale studies exploring patients' attitudes to pharmacist prescribing. Most of these patients consulted PSP's in a general practice. Patients were satisfied with their pharmacist consultation and especially with the information given to them about their medicines. These patients also considered that they trusted the pharmacist and would recommend a pharmacist prescriber to others. However, those patients considered that they would still choose a doctor over a pharmacist if they had that option.<sup>171</sup>

Stewart et al. conducted telephone interviews with nine pharmacist prescribers, eight doctors and 18 patients.<sup>172</sup> This study reported a general support by stakeholders.

Patients in this study did not raise concerns with pharmacist prescribing but they did not know “what to expect on their first visit, leading initially to feelings of apprehension”.<sup>172</sup> This study was also limited by representativeness.

A study which used qualitative, semi-structured interviews with 43 UK stakeholders including doctors, pharmacist and nurse supplementary prescribers, academics, patient group representatives, and policy developers welcomed the introduction of supplementary prescribing but also identified barriers to its implementation.<sup>173</sup>

Weis et al. undertook 10 patient interviews and 15 patient observations. In this study patients considered that PSPs may reduce doctors’ workload. Patients in this study reported that they received more information and increased consulting time with PSP. This study was also limited in terms of representativeness.<sup>137</sup>

Qureshi et al. assessed whether patients were confident of nurse and pharmacist prescribing. However, in this study participants were limited to patients who attended ophthalmology clinics.<sup>174</sup>

Since in the UK nurse prescribing was developed in parallel to pharmacist prescribing, it is worth mentioning that one study has evaluated the views of a small convenience sample of the general public on nurse supplementary prescribing. These patients had not experienced supplementary prescribing.<sup>175</sup> This study concluded that participants had confidence in nurse supplementary prescribing and they raised issues such as prescribing of correct medicine, dose, drug side effects and interactions rather than specific nurse concerns.<sup>175</sup>

A major study conducted in Scotland in 2006 and published in June 2009 has assessed the views and awareness of the general public on non-medical prescribing.<sup>176</sup> Stewart et al. have indicated that the general public was most comfortable with pharmacist prescribing followed by nurses. Respondents agreed that pharmacists should have a prescribing role but were concerned with lack of privacy. Safety of pharmacist

prescribing seemed to be an issue for respondents as only 39.6% agreed that pharmacists would prescribe as safely as doctors.<sup>176</sup> Fewer respondents believed that pharmacists should prescribe the same medicines as doctors and fewer respondents also considered pharmacists equally knowledgeable as doctors in prescribing medicines. In this study more than half of the respondents has not visited a pharmacy to get medicines and/or advice in the past 12 months.<sup>176</sup> Therefore, there may have been a lack of a relationship of the respondents with pharmacists which could have affected the overall results. In addition this study did not separate respondents who had already experienced pharmacist prescribing in the UK.

Hobson et al. conducted a study which explored patients' perspectives on nurse and pharmacist independent prescribers.<sup>177</sup> This study used semi-structured interviews where 18 patients were recruited in four sites: two by doctors and another two by PSP. These authors focused on whether patients had a preference in terms of consulting a nurse or a pharmacist independent prescriber and whether pharmacists were capable of an expanded prescribing role. Contrary to Stewart et al., Hobson et al. reported that patients had a preference for nurses over pharmacists because they were more trustworthy, caring and that their profession had an established relationship with patients. Participants also highlighted privacy issues and available space in community pharmacies adopting independent prescribing. Clinical governance concerns were also raised. However, patients indicated support for pharmacist prescribers.<sup>177</sup> Patients also suggested that the actual popularity of PIPs will take time until PIPs build a relationship with patients. In this study the number of PSP recruited was limited which in turn restricted the sampling frame. The fact that participants previously experienced pharmacist supplementary prescribing but not nurse supplementary prescribing and were selected for participation by prescribers may have had an impact on the findings. Hobson et al. attributed the difference in results with Stewart et al. to the difference in percentage of female versus males between the studies and the different methodologies used.<sup>177</sup>

In Australia, the study conducted by Bessell et al. included a patient perspective. Their perspectives was based on proposed models of pharmacist prescribing. In this study



consumers participated in focus groups and were in favour of improved medication access to prescription medicines.<sup>120</sup>

## **2.9 Medicine supply to residential aged care facilities (RACF)**

### **2.9.1 General description of residential aged care**

An estimated 6% of Australians aged over 65 years and 30% over the age of 85 live in RACFs.<sup>178</sup> In terms of gender there is a significant difference only for residents over the age of 85 where residents are mainly women.<sup>178,179</sup> People with special needs such as those with linguistic and cultural diverse backgrounds, and people with intellectual and physical disabilities also live in RACF. In addition to pharmacy services, RACF residents are also offered other care such as allied health, social services, respite and specialist services. In Australia residential aged care is regulated under The Aged Care Act 1997.<sup>178</sup>

### **2.9.2 Health workforce in RACFs**

There are four main challenges facing the aged care sector.<sup>180</sup> These include: a) building a flexible workforce which provides adequate care to RACF residents, despite the pressure from anticipated reduction in growth of workforce; b) responding to an increased demand for services as the Australian population ages; c) ensuring an upgrade of workforce skills and training in order to comply with improved services and d)

adapting the workforce in order to reflect the changing needs and preferences of consumers.<sup>180</sup>

GP's provide primary medical care to residents of RACFs. This care is focused on preventing and managing chronic conditions and geriatric syndromes. Rehabilitation, palliative and end of life care are also provided by GP's. In managing complex conditions seen in the elderly, GP's are also provided with specialist advice by aged care assessment teams and geriatricians.<sup>178</sup>

There are indications suggesting that GP services to RACFs are inadequate to meet the current needs. A survey based study conducted in 2004 found that 52% of RACFs had difficulties in obtaining services from residents' GPs. This survey also found that 56% of RACFs had difficulties in receiving GPs' input for services such as: prescription writing, reviewing medicine charts and prescriptions.<sup>181,182</sup> Low level of reimbursement, time consuming procedures and the lack of interest by younger GP's, have been reported as barriers to the provision of GP services to RACFs.<sup>183-188</sup>

Pharmacists are closely involved with RACFs and the management of their residents. In addition to dispensing and supplying medicines, pharmacists are actively involved in providing medicine information and advice. Consultant pharmacists also participate in medicine advisory committees (MAC) and perform residential medicine management reviews regularly.<sup>58,178</sup> As a part of multidisciplinary care, other allied health workers are also involved in providing services to residents of RACFs.

Registered nurses (RN) provide a variety of services to RACF residents including general nursing care and assessment and monitoring of residents health needs. RNs also use evidence based tools in care planning which enables them to assess and manage geriatric syndromes.<sup>178,188</sup> Registered nurses supervise carers and have a central role in liaising with GP's. Documentation of residents' care plans, records and accreditation of RACFs is also managed by RNs.<sup>178</sup> Residents' carers (personal care attendants – PCA)

make up the largest workforce in RACF's and while supervised by registered nurses, they maintain daily activities and residents' personal care.<sup>178</sup>

It should be emphasized that The Hogan Review has identified a greater shortage of trained nurses in RACFs and ageing of nurses, compared to other areas.<sup>178,189</sup> This review has also identified difficulties in recruitment and retention in the workforce. Job satisfaction has also been identified to be an issue with the nursing workforce, especially due to low remuneration and high workload. This does not only apply to nurses but to personal carers as well.<sup>189</sup>

### **2.9.3 Medicine management in RACF**

The elderly living in RACFs represent the chronically 'sickest and frailest' group of the Australian population and they also represent the group with the highest disability rate.<sup>179</sup> In terms of medical conditions, it is estimated that 90% of this population has sensory loss, 40-80% suffer from chronic pain and 60% from dementia. Depression, sleep disorders and falls are also quite prevalent in residents living in RACFs.<sup>178</sup>

High prevalence of diseases and co-morbidities implies complex medicine regimens and needs in RACFs. Therefore a multidisciplinary approach is needed in order to ensure optimal medicine management.<sup>178</sup>

To ensure the quality use of medicines the Australian Pharmaceutical Advisory Committee (APAC) has made a number of recommendations.<sup>190</sup> These include:

- 1) The establishment of Medicine Advisory Committees (MAC) by facilities. MAC should include management, general practitioners, nurses, supplying pharmacist or the pharmacist conducting medicine reviews (if different) and residents' advocate(s);
- 2) Use of medicine charts for recording administered medicines;

- 3) Review of residents medicines by health professionals;
- 4) Except in cases where residents self-administer medicines or a DAA is used, medicines should be administered by registered nurses or authorised enrolled nurses;
- 5) No standing orders should be used for administering new medicines for a changed new clinical condition;
- 6) Nurse initiated medicines should be from a list of drugs (including recommended doses) according to protocols developed by the MAC and State/Territory and Commonwealth legislation;
- 7) Self-administration of medicines by residents should be done only after each resident is assessed as capable of carrying this task individually;
- 8) RACFs should have procedures, endorsed by the MAC, for alteration of medicine dosage forms;
- 9) Medicines should be retained in original or dispensed packaging. Dose Administration Aids (DAA) should be used in cases where it overcomes issues with compliance or confusion with medicines. Medicines used on a 'when required' (PRN) basis should not be packed with regular medicines. All medicines packed in a DAA should be included in the residents' medicine formal chart;
- 10) The RACF should have resources available, recommended by the MAC, on medicines information;
- 11) Secure storage of medicines;
- 12) The RACF must have a mechanism for disposal of unwanted, expired and returned medicines;
- 13) The RACF must have policies in place, approved by the MAC, for complementary, alternative and self-selected medicines;
- 14) The emergency supply of medicines should be in accordance with legislation and approved by the MAC.<sup>191</sup>

In Australian RACFs medicine supply is negotiated between the RACF and the community pharmacy. Medicines in RACFs are prescribed by GP's, specialists, locum

and hospital doctors. In addition, dentists and registered nurse practitioners are also able to prescribe medicines.<sup>179</sup> RNs are entitled to use their clinical judgment and assessment to initiate S2 or S3 scheduled medicine.

Currently pharmacists cannot prescribe medicines to RACF residents. The pharmacy supplies the medicines based on the medicine orders which are written by prescribers on an individual residents' medicine chart.

Except for private prescriptions, pharmacists are reimbursed for dispensing and supplying medicines to RACFs through the PBS. Therefore, for each medicine dispensed pharmacists need a prescription from the prescriber to be entitled for reimbursement. After these basic steps in the medicine supply chain, the pharmacy supplies medicines to RACF residents, either in original packs or using DAA. In situations when residents run out of prescriptions (or repeats), pharmacists may supply prescription medicines prior to receiving a new prescription. However, the prescription must be received within seven days.<sup>191</sup>

As per APAC guidelines stated above, RNs and authorized enrolled nurses administer medicines. PCAs also administer medicines in cases where DAAs are used.<sup>178,190</sup> A typical DAA contains doses of medicines packed according to days and weeks of drug supply. DAAs allow for medicines to be packed according to doses schedule of the day.<sup>192</sup> There are two main types of DAAs provided by community pharmacies and these include 'blister packs' and 'compartmentalised boxes'. Medicines in DAAs are packed and labeled by the pharmacist or under a pharmacist's direct supervision. They are directly administered to the resident. In cases where the prescriber alters the medicine chart, the DAA is returned to the pharmacy for repackaging.<sup>178</sup>

#### **2.9.4 Current difficulties in medicine supply and management**

There is a range of barriers to the quality use of medicines in RACFs. These include: polypharmacy, resulting in increased prevalence of drug related adverse effects and interactions; excessive use of sedatives and psychotropic agents; lack of medicine review (required for accreditation); awareness of specific drug requirements in the elderly, and administration of medicines by unqualified staff.<sup>190</sup>

Currently pharmacists need prescriptions supplied by a qualified prescriber for every medicine they dispense during the process of medicine provision to RACFs. Legally, the ‘emergency supply’ system allows pharmacists to supply medicines to RACF residents for a period of three days hence theoretically allowing doctors enough time to visit, review and write the prescription. Residents are charged privately for this service. However, Bessel et al. have suggested that this process is not very feasible because it requires a ‘high level of clerical organisation from the doctor, pharmacist and RACF staff.’<sup>120</sup> There is also a cost burden for pharmacists associated with breaking the packs of medicines when the ‘emergency supply’ system is used.

Pharmacists in some cases continue the supply of medicines without a prescription using the ‘owing prescription’ system.<sup>178,191</sup> This system allows the supply of medicines to residents while pharmacists have to follow-up with doctors to receive prescriptions for medicines supplied. The ‘owing prescription’ system has the advantage of continuing the supply of medicines to patients, hence not interrupting the treatment and it also keeps patients’ costs down i.e. medicines are reimbursed by the PBS once the pharmacist is able to submit the prescription to the PBS. The problem with this system is that it is not always legal, it consumes pharmacists’ time in following up prescriptions from doctors and it presents pharmacists with a financial burden by waiting until the prescription is received from the doctor and hence claiming it after delayed receipt. Furthermore, in some cases doctors may decide to discontinue the therapy hence leaving pharmacists without a prescription.<sup>191</sup>

Working within the boundaries of the Fourth Community Pharmacy Agreement for reviewing existing supply arrangements of PBS medicines to RACFs, Healthcare Management Advisors (HMA) in association with Pharm Consult, responded to a number of existing issues related to medicine supply to RACFs.<sup>191</sup> Their final report on reviewing existing supply of PBS medicines in RACFs and private hospitals was issued in late 2009. This review was provided to the Agreement Consultative Committee (ACC) who reported to the Australian Government. This review considered options of PBS medicine supply to RACFs which included a prescription-less model, PBS authority application of pharmacists for medicines with approved indications and PBS authority application by pharmacists for increased maximum quantity for medicines with approved indications. Issues highlighted in this review relating to medication supply to RACFs pertained to prescription timing, right of choice, transition of residents between RACFs and hospitals, use of DAAs, information technology and infrastructure, right of residents' choice and administrative arrangements.<sup>191</sup>

1) *Prescription timing*: It was suggested that doctors generally initiate or modify medicines whilst visiting residents in RACFs. As highlighted above, when doctors initiate or modify medicines they also need to write and send a prescription to the pharmacy. Often doctors need to obtain an Authority approval for certain PBS listed medicines that require special authority. This means that currently they need to have a PBS prescription pad as well as an Authority prescription pad. In addition, doctors also need to have access to the PBS schedule which advises them about maximum allowed quantities, repeats, indications approved and restrictions. HMA have suggested that this lack of access of doctors may cause delays for doctors writing a PBS prescription. In their discussion paper, HMA have suggested that this may be an unnecessary use of doctors' time and skills. As also stated above in description of the 'owing prescription' system, pharmacies often supply PBS medicines without a prescription, which should then be received from the doctor within seven days. However, the HMA have noted that sometimes doctors do not send their prescriptions within seven days hence pharmacists have to remind doctors about their outstanding prescriptions.<sup>191</sup>

According to the HMA, the abovementioned issues lead to doctors being concerned about the duplication of tasks causing less time to look after residents, pharmacists having delays submitting claims to the PBS which resulted in their cash-flow being affected, additional tasks performed by pharmacists in requesting prescriptions from doctors, additional tasks performed by RACF staff following up these issues and therefore pressure on their time. HMA also suggested that these issues do not promote good collaboration between doctors and pharmacists.<sup>191</sup>

2) *Transition of residents between RACFs and hospitals*: There are issues during this transition as hospitals generally supply only a limited supply of medicines to residents upon discharge. Therefore, generally a prescription is needed to be written by the doctor in order for the pharmacy to be able to continue supplying the medicines. Possible lack of medicine supply was suggested to be a potential for creating life-threatening situations for residents. HMA have highlighted the issue of lack of information on new medicines started in the hospital for residents and the fact that carers in RACFs sometimes do not communicate these changes appropriately due to lack of time and focus on patient care.<sup>191</sup>

3) *DAA's*: The main issues raised by HMA on DAA's are the wastage of medicines that results when changes to residents therapy occur and pre-packed DAA's are discarded, lack of residents input on the decision regarding the generic or non-generic medicines are used and the provision of repeat prescriptions to ensure continuation of DAA's.<sup>191</sup> It should be emphasized that the HMA report found that the use of DAA's was well supported by RACF staff.

Carruthers et al. have indicated that the rate of medicine related incidents in DAA's is as high as 4.3%.<sup>192</sup> These authors emphasized incorrect packaging, use of no longer needed DAA's and operational problems. The main reasons for these incidents have included: missing medicines, incorrect medicines dispensed including the wrong strength, wrong labeling and supply of medicines previously ceased by doctors. Failure to deliver medicines to RACFs and incorrect dosing instructions were also reported by these



authors.<sup>180</sup> It should be emphasized that another study also recognized packaging errors but also identified the benefits in using DAAs. These benefits included reduction of administration errors, time effectiveness, and easier management of medicines.<sup>192,193</sup> Another strong rationale for using DAAs was that supplying medicines from a bulk stock has resulted in a rate of administration errors of as high as 15-20% in comparison to individualized supplies (i.e. DAAs) which reduced this error to 5-8%.<sup>192,194</sup>

4) *Infrastructure and IT*: Lack infrastructure and IT support was suggested to be a barrier towards supporting clinical decisions on medicine use in RACFs resulting in non-optimal care for residents and concerns regarding prescribing. Lack of IT support and infrastructure may also cause a delay in pharmacies receiving both medicine orders and prescriptions.<sup>191</sup>

5) *Residents' right of choice*: In their discussion paper, the HMA have suggested that lack of residents decision on which doctor they see, which pharmacy they use and use of generic medicines affects their right of choice.<sup>191</sup>

The HMA has also raised the issue of storage of medicines being affected when medicines are delivered from the pharmacy to RACFs as the distance of pharmacies to RACF varies.

In their final report, the HMA highlighted a few options to address the current difficulties they identified with medicine supply arrangements in RACFs.<sup>191</sup> These options included: a prescription-less system which would use a medicine chart forming a central document for all stakeholders (this model was supported overwhelmingly by stakeholders in this review), pharmacists having the authority to apply for increased quantities of medicines supplied and/or obtaining PBS authority approval (considered by stakeholders as simply shifting of responsibilities from GPs to pharmacists although the need for modifying PBS authority arrangements was recognised), removing the requirements for obtaining PBS authority for some currently PBS authority required medicines when supplied to RACF residents, pharmacists prescribing in a collaborative

fashion hence allowing a continuation of an established therapy regimen (considered by stakeholders as an issue needing further separate investigation and being beyond its scope), nurse practitioners prescribing in collaborative fashion (some support by stakeholders but given a shortage of nurse practitioners it was proposed to be considered when their numbers increase), provision of a Patient Medicine Profile (PMP) by pharmacies to RACFs, and RACFs entering into a contractual agreement with GP practices similar to agreements they currently have with pharmacies.<sup>191</sup>

## **2.10 The Agency Theory**

The application of the Agency theory was initially described from an economics perspective by Jensen and Meckling.<sup>195,196</sup> Mott et al. provided a conceptual framework for using Agency Theory in pharmaceutical care suggesting that selecting medicines to treat medical conditions was in fact a principal-agent relationship.<sup>195</sup> The Agency Theory was therefore relevant and a useful tool in exploring the issue of pharmacist prescribing since it involves the process of medicine selection. According to the Agency Theory the principal (i.e. patient) delegates the authority to the agent (i.e. doctor, pharmacist) for action on their behalf.<sup>195,196</sup> In this triangular relationship, or dual agency relationship, doctors also delegate some decision making authority to the pharmacist. In terms of prescribing this is particularly noticeable with the supplementary prescribing model which involved an agreement between doctor, pharmacist and patient. The agency relationship between doctors, pharmacist and patients is given in Table 2.1.

**Table 2.1 The agency relationship between doctors, pharmacists and patients**

<b>Principal</b>	<b>Desired action</b>	<b>Agent</b>
Patient	Diagnosis and selection of appropriate medicine, provision of drug information	Doctor
	Dispensing and provision of drug information	Pharmacist
Doctor	Dispensing, provision of drug information	Pharmacist

There are assumptions with the Agency Theory. The first assumption is that both principals and agents are motivated by self-interest. Agents try to perform their actions on agents' behalf with as little effort as possible but on the other hand the higher the effort the better are the chances for favourable outcomes.<sup>195,197</sup> Secondly, the functioning of agents and principals is arranged in an environment of incomplete information. In this regard literature suggests that principals face difficulties with lack of information related to agents' abilities, characteristics as well as the quality and outcomes associated with agents' actions.<sup>195,198,199</sup> Mott et al. suggested that without adequate information agents' actions may not match principals' desires. These authors also suggest that principals can choose to self-select their agents which enable them to demonstrate their abilities to perform activities desired by principals.<sup>195</sup>

The third assumption suggested is that agents and principals differ in the amount of risk they are ready to assume. Hence these authors suggest difficulties arising due to risk preferences with agents pursuing their own interest rather than principals as there may be too much risk involved.<sup>195</sup> Agency Theory also assumes that the outcomes of agents' actions is influenced by external factors such as environment, technology, personal beliefs and the economy beyond the agents' control.<sup>195,198</sup> This makes it difficult for principals to evaluate whether outcomes that are less than desirable result from external factors or agents actions.<sup>195</sup>

Ensuring the right medicine is selected by agents which is harmonious with a principals' goals and desires is a main agency problem for patients. Mott et al. suggested that selection of medicines was associated with conflicts in goals between principals and agents and uncertainty generated by decision making during selecting a medicine.<sup>196</sup> On the other hand, the problem of different goals between principals and agents can be reflected through prescribers being influenced by their self-interest as well as the interests of patients and others (e.g. manufacturers and insurers) when selecting a medicine. According to the literature this can result in differences in type, number and cost of medicines prescribed to the patient.<sup>195,200,201,202,203</sup> The goal conflict can be reduced when principals and agents have a longer relationship. This allows principals to learn more about agents and their actions.<sup>195</sup>

Patients tend to establish control mechanisms to minimize the uncertainty associated with whose interest agents consider when performing actions on principals' behalf. This problem arises between one agent and multiple principals (e.g. patients, manufacturers, insurers). The control mechanism implemented by patients is done through establishing patient-doctor relationships and showing loyalty to the doctor through repeat visiting.<sup>195</sup> The same can apply with patients (i.e. pharmacy clients) establishing a relationship with their pharmacist and demonstrating loyalty by using the same pharmacy. However, the problem of uncertainty may often be inevitable when introduced if decisions are made for conditions which are not diagnosed precisely, uncertainty about signs and symptoms, inadequate knowledge and training and incomplete information about outcomes.<sup>195,204</sup>

## 2.11 Data collection methods

This project has utilized questionnaires, telephone interviews and focus groups to collect the data. The use of different data collection techniques was done to achieve sound data by applying different approaches to studying the issue of pharmacist prescribing in Australia. These data collection techniques are briefly described below.

### 2.11.1 Questionnaires

The use of questionnaires is a data collection technique that provides a relatively cost-effective and time-effective tool of information gathering from a large sample. In constructing questionnaires it should be assumed that respondents are able to provide the relevant information required.<sup>205</sup>

Smith has suggested that issues of validity and reliability need to be carefully considered when using a questionnaire as the research instrument.<sup>205</sup> An important step towards ensuring content validity is to conduct fieldwork which generally implies organising interviews with a small number of potential participants. This should be supported by literature review in order to identify issues which are relevant to the objectives of the study and hence provide content validity.<sup>205</sup>

Reliability is an important factor in producing a successful questionnaire. Reliability indicates the extent to which “questions lead to reproducible responses that are internally consistent”.<sup>205</sup> Unreliability is often inflicted with the actual construction of questions which may be ambiguous or hard for respondents to answer. Validity of questionnaires indicates the “extent to which the questions provide a true measure of what they are designed to measure”.<sup>206</sup> There are four main types of validity: *face validity*- whether the responses produce accurate information, *criterion validity* - if questions correlate with the variable, *construct validity* – if questions present the concept precisely and *content validity* – if data is relevant to study aims.<sup>205</sup>

Questions in a questionnaire used may be either closed or open. For closed questions there is a limitation on the range of responses that can be given. Smith has suggested that closed questions are often preferred in self-administered questionnaires as they are quicker and easier to answer and their use also results in less missing data.<sup>205</sup> Closed questions are also more practical for the researcher in terms of coding and data analysis. On the other hand, in open questions the respondents can express themselves more. These questions are more difficult for the researcher to code and categorize. Smith suggested that open questions are usually left at the end of the questionnaire so that respondents have the opportunity to add issues not covered in the questionnaire hence providing a good check of content validity.<sup>205</sup>

Questionnaires which assess respondents attitudes rely on respondents expressing their opinions based on statements given.<sup>205</sup> Respondents need to have a choice of different strengths that best reflects their opinion on particular statements given. For this purpose, scales such as the Likert are used. Likert scales usually measure attitudes using: strongly agree, agree, neutral, disagree and strongly disagree.<sup>205</sup> This scale was developed in 1932 and still remains one of the most commonly used attitudinal measurement scale.<sup>206</sup>

### **2.11.2 Interviews**

Interviews are employed in both qualitative and quantitative research. They are categorized as structured, semi-structured and unstructured.<sup>205</sup> A structured research interview is run according to structured questions. In comparison to questionnaires interviews have more open questions and they may also include instructions for the interviewer so that responses are clarified. Semi-structured interviews mainly consist of open questions therefore enabling a more detailed exploration of respondents' views. Unstructured interviews only provide a framework for the interview.<sup>205</sup>

In conducting interviews, the interviewer has to ensure that they are not influenced by a personal agenda and preconceptions. Furthermore, an introduction of preconceived ideas

by the interviewer is a source of possible bias when interviews are used.<sup>205</sup> It is suggested that a skilled interviewer exercising a good interviewing technique will have a positive effect on data validity as this would enable adequate reflection of respondents' views.

Interviews can be conducted face to face or by telephone. Telephone interviewing is more convenient for structured interviews.<sup>205</sup> Using the telephone to interview respondents is usually less time-consuming and is a convenient and cost-effective way of collecting the data especially when the population is spread over a large geographical area. Telephone interviewing also yields higher response rates.<sup>207</sup> Some limitations include the possibility of less mobile householders not being able to answer the phone and the possibility of lack of privacy for respondents for which the interviewer may be unaware.<sup>208</sup> Computers are increasingly used to facilitate telephone interviewing. Computer-assisted telephone interviews (CATI) are increasingly being used in health care. This method has been recommended for data collection in primary care research.<sup>207,208</sup>

### **2.11.3 Focus groups**

Focus group data collection is a popular qualitative technique that explores the views of participants through group discussions.<sup>209,210</sup> Focus groups are conducted by an interviewer referred to as the focus group facilitator who encourages participants to engage in the discussion.<sup>205,211</sup> In comparison to one-to-one interviews, focus groups allow for interaction between respondents. Exploration and clarification of views that can be achieved with focus groups is less accessible to one-to-one interviews.<sup>205,211</sup> Kitzinger has suggested that focus groups are a convenient and quick way of collecting the data and useful for exploring participants' experiences and knowledge.<sup>211</sup>

In addition to exploratory work, Smith has suggested that focus groups consisting of experts are sometimes used in consensus building.<sup>205</sup> The main limitation of using focus groups is that they are not an effective tool of data collection when issues are sensitive, in which case one-to-one interviews are preferred.<sup>205,209,211</sup> This is because the presence of other participants can compromise confidentiality.<sup>211</sup> However, Kitzinger considered that it should not be assumed that focus groups cannot explore sensitive issues as group work can lead to discussion of taboo issues through some participants ‘breaking the ice’ for shyer participants.<sup>211</sup>

The majority of studies utilize a few focus groups and some also combine this method of data collection with others. The literature also suggests that homogenous groups (e.g. same profession participants) are preferred to better capitalize on common experiences. Segmentation of focus group participants also facilitates a comparative data analysis.<sup>211,212</sup> However, lack of diversity in focus group participants may be a limitation in exploration of different perspectives when homogenous focus groups are used.<sup>211</sup>



## 2.12 Hypotheses

This project aimed to test the following hypotheses:

H1: There is no significant difference between pharmacists' support for expanded prescribing based their professional practice area.

H2: There is no significant difference between pharmacists' preference for supplementary or independent prescribing models.

H3: There is no significant difference in pharmacy clients' support for supplementary or independent prescribing models.

H4: There is no significant difference in pharmacy clients' perception of trust in pharmacists assuming an expanded prescribing role dependent on doctors continuing to diagnose the condition.

H5: There is no significant difference in pharmacy clients' perception of trust in pharmacists assuming an expanded prescribing role dependent on this role's potential to improve access to prescription medicines.

## 2.13 References

- 1 Benrimoj, S.I., Frommer, M., Rychetnik, L., Holt, P., Heinke, M., Madronio, C., George, M., Reitano, R. Community Pharmacy Research Support Centre Report Series, Report 1: The Value of Professional Pharmacist Services in the Community Setting: A systematic Review of the Literature (Oct 2002-March 2005) 2005, Australian Government Department of Health and Ageing.
- 2 Hughes J, Keen N, Dillon M, Maricic T. Hypertension: improving patient compliance and clinical outcomes through community pharmacist managed care. 2003. [online]: <http://www.guild.org.au/>. (Accessed 10/11/2010)
- 3 Clifford RM, Davis WA, Batty KT, Davis TM. Effect of a pharmaceutical care program on vascular risk factors in type 2 diabetes: The Fremantle Diabetes Study. *Diabetes Care* 2005; 28:771-6
- 4 Jackson SL, Peterson GM, Vial JH, Jupe DM. Improving the outcomes of anticoagulation: An evaluation of home follow-up of warfarin initiation. *J Intern Med* 2004; 256:137-4
- 5 Tsuyuki RT, Johnson JA, Teo KK, Simpson SH, Ackman ML, Biggs RS, Cave A, Chang WC, Dzavik V, Farris KB, Galvin D, Semchuk W, Taylor JG. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Arch Intern Med* 2002; 162:1149-55
- 6 Simpson SH, Johnson JA, Biggs RS, Tsuyuki RT. Greater effect of enhanced pharmacist care on cholesterol management in patients with diabetes mellitus: a planned subgroup analysis of the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Pharmacotherapy* 2004; 24: 389-94

- 7 McLean W, Gillis J, Waller R. The BC Community Pharmacy Asthma Study: A study of clinical, economic and holistic outcomes influenced by an asthma care protocol provided by specially trained community pharmacists in British Columbia. *Can Respir J* 2003;10:195-202
- 8 Nissen LM, SE Tett. Community pharmacists improving health outcomes in rural and remote Queensland. *Aust Pharm* 2002; 21: 874-6, 878-80
- 9 Sookaneknun P, Richards RM, Sanguansermisri J, Teerasut C. Pharmacist involvement in primary care improves hypertensive patient clinical outcomes. *Ann Pharmacother* 2004; 38: 2023-8
- 10 Johnson SG. Improving cost-effectiveness of and outcomes from drug therapy in patients with atrial fibrillation in managed care: role of the pharmacist. *J Manag Care Pharm* 2009.15:S19-25
- 11 Carter BL, Helling DK, Jones ME. Evaluation of family physician prescribing: influence of the clinical pharmacist. *Drug Intell Clin Pharm* 1984; 18:817-21
- 12 Strikwerda P, Bootsma-de Langen AM, Berghuis F, Meyboom-de Jong B.. Drug therapy in a nursing home; favorable effect of feedback by the pharmacist on family physician's prescribing behaviour. *Ned Tijdschr Geneesk* 1994;138:1770-4
- 13 Stuijt CC, Franssen EJ, Egberts AC, Hudson SA. Appropriateness of prescribing among elderly patients in a Dutch residential home: observational study of outcomes after a pharmacist-led medication review. *Drugs Aging* 2008; 25:947-54
- 14 Eide E, Schjott J. Assessing the effects of an intervention by a pharmacist on prescribing and administration of hypnotics in nursing homes. *Pharm World Sci.* 2001; 23:227-31

- 15 Thompson BF, Miller WA, Wells BG, Rawls WN.. Evaluating the impact of education by a clinical pharmacist on antibiotic prescribing and administration in an acute care state psychiatric hospital. *Hosp Pharm* 1986; 21:1056-62
- 16 Fletcher CV. Giese RM. Rodman JH. Pharmacist interventions to improve prescribing of vancomycin and tobramycin. *Am J Hosp Pharm* 1986; 43:2198-201
- 17 Lawlor MC. Lucarotti RL. Clinical pharmacist impact on parenteral cephalosporin prescribing. *Hosp Formul* 1983; 18:402-4, 407-8
- 18 Thornton JP, Goff DA, Segal R, Guy JT Impact of a clinical pharmacist on antibiotic prescribing. A multicenter trial. *J Pharm Technol* 1991; 7:195-200
- 19 Ilett KF, Johnson S, Greenhill G, Mullen L, Brockis J, Golledge CL, Reid DB. Modification of general practitioner prescribing of antibiotics by use of a therapeutics adviser (academic detailer). *Br J Clin Pharmacol* 2000; 49:168-73
- 20 Spinewine A, Swine C, Dhillon S, Lambert P, Nacheha JB, Wilmotte L, Tulkens PM. Effect of a collaborative approach on the quality of prescribing for geriatric inpatients: a randomized, controlled trial. *J Am Geriatr Soc* 2007. 55:658-65
- 21 Dong BJ. Pharmacist involvement in a thyroid clinic. *Am J Hosp Pharm* 1990; 47:356-61
- 22 Galt KA. The key to pharmacist prescribing: collaboration. *Am J Health Syst Pharm.* 1995; 52:1696-9

23 Royal Pharmaceutical Society of Great Britain. Pharmacy in a new age. London: RSPGP, 1996

24 Bradley C, Taylor R, Blenkinsopp A, Primary care—opportunities and threats: developing prescribing in primary care. *BMJ* 1997;14:744

25 Bradley C. Promoting practice services—prescribing in general practice. *Horizons* 1993; 7:115-7

26 McKinnon A, Jorgenson D. Pharmacist and physician collaborative prescribing: for medication renewals within a primary health centre. *Can Fam Physician*. 2009; 55:e86-9

27 Rupp M, DeYong M, Schondelmeyer S. Prescribing problems and pharmacist interventions in community practice. *Med Care* 1992; 30:926-40

28 Secretaries of State for Health, Scotland, and Wales. Primary care: delivering the future. London: Stationery Office, 1996. (Cm 3512.)

29 Secretaries of State for Health, Scotland, and Wales. Choice and opportunity. Primary care: the future. London: Stationery Office, 1996. (Cm 3390.)

- 30 Bradley M. The role of the practice pharmacist—the new member of the team. VFM Update 1996; 2:27-8
- 31 Goldstein R, Hulme H, Willits J. Rationalising repeat prescribing: general practitioners and community pharmacists working together. Pharm J 1996; 257:R7
- 32 McCormick J. Flourishing process—foundering care. Br J Gen Pract 1992; 42:493
- 33 Wood KM, Mucklow JCM, Boath EH. Influencing prescribing in primary care: a collaboration between clinical pharmacology and clinical pharmacy. Int J Pharm Pract 1997; 5:1-5
- 34 Chapman S. Community pharmacists have positive impact. VFM Update 1996;2:8-9
- 35 McGregor S. Pharmaceutical care in the general practice surgery. VFM Update 1996; 2:4-5
- 36 Guillaume L, Cooper R, Avery A, Mitchell S, Ward P, Anderson C, Bissell P, Hutchinson A, James V, Lymn J, McIntosh A, Murphy E, Ratcliffe J. Supplementary prescribing by community and primary care pharmacists: an analysis of PACT data, 2004–2006. J Clin Pharm Ther 2008; 33: 11–6

- 37 Department of Health; Pharmacist Independent Prescribing; London, 2007; [online]:[http://www.dh.gov.uk/en/Healthcare/Medicinespharmacyandindustry/Prescriptions/TheNon-MedicalPrescribingProgramme/Independentpharmacistprescribing/DH\\_4133943](http://www.dh.gov.uk/en/Healthcare/Medicinespharmacyandindustry/Prescriptions/TheNon-MedicalPrescribingProgramme/Independentpharmacistprescribing/DH_4133943) (Accessed 29/4/2009)
- 38 Emmerton L, Marriott J, Bessell T, Nissen L, Dean L. Pharmacists and Prescribing Rights: Review of International Developments. *J Pharm Pharmaceut Sci* 2005. 8:217-25
- 39 Hobson R, Sewell G. Risks and concerns about supplementary prescribing: survey of primary and secondary care pharmacists. *Pharm World Sci* 2006; 28: 76-90.
- 40 Department of Health. Supplementary prescribing by nurses, pharmacists, chiropodists/podiatrists, physiotherapists and radiographers within the NHS in England: a guide for implementation. London: Department of Health, 2005
- 41 Crown J. Report of the Review of Prescribing, Supply and Administration of Medicines, London, House of Commons, 1999
- 42 Reeves D. The 2005 Garrod Lecture: The changing access of patients to antibiotics – for better or worse? *J Antimicrob Chemother* 2007; 59: 333–41
- 43 Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, James V, Lymn J, McIntosh A, Murphy E, Ratcliffe J, Read S, Ward P. Nurse and pharmacist supplementary prescribing in the UK—A thematic review of the literature. *Health Policy* 2008; 85: 277–292
- 44 Baird A. Independent and supplementary prescribing and PGDs. *Nurs Stand.* 2005;19:51-6

- 45 Tonna AP, Stewart D, West B, McCaig D. Pharmacist prescribing in the UK; a literature review of current practice and research. *J Clin Pharm Ther* 2007; 32:545-56
- 46 The Pharmaceutical Journal. Scottish supplementary prescribers get clinic funds (news). *Pharm J* 2005; 275:7358- 73
- 47 Bellingham C. How supplementary prescribing is working for pharmacists in practice. *Prescribing and Medicines Management* 2004. July. 2-3
- 48 The Pharmaceutical Journal. Prescribing reaches community pharmacy (news). *Pharm J* 2004; 272: 7298, 559
- 49 George J, McCaig D, Bond C, Cunningham C, Diack HL, Watson A, Stewart D. Supplementary prescribing: early experiences of pharmacists in the UK. *Ann Pharmacother* 2006; 40:1843–50
- 50 Shaw, N., Pharmacist Prescribing: the UK-NHS Approach. Society of Hospital Pharmacists of Australia (Qld Branch), Toowoomba, Australia, 2004.
- 51 Department of Health. Improving patients' access to medicines: a guide to implementing nurse and pharmacist independent prescribing within the NHS in England. London. Department of Health, 2006
- 52 Royal Pharmaceutical Society of Great Britain, Prescribing of Controlled Drugs by pharmacist and nurse independent prescribers, Law and Ethics Bulletin, London, UK, [online] [www.rpsgb.org.uk/pdfs/LEBprescontrolleddrugs.pdf](http://www.rpsgb.org.uk/pdfs/LEBprescontrolleddrugs.pdf) (Accessed 30/10/2009)
- 53 Lloyd F, Hughes CM. Pharmacists' and mentors' views on the introduction of pharmacist supplementary prescribing: a qualitative evaluation of views and context. *Int J Pharm Pract* 2007;15:31–7



- 54 Warchal S, Brown S, Tomlin M, Portlock J. Attitudes of successful candidates of supplementary prescribing courses to their training and their extended roles. *Pharm J* 2006; 276:348–52
- 55 George J, McCaig D, Bond C, Cunningham IS, Diack HL, Stewart D. Benefits and challenges of prescribing training and implementation: perceptions and early experiences of RPSGB prescribers. *Int J Pharm Pract* 2007;15:23–30
- 56 Department of Health (2006). Independent nurse prescribing. [online] <http://www.dh.gov.uk/PolicyAndGuidance/MedicinesPharmacyAndIndustry/Prescriptions/NonmedicalPrescribing/NursePrescribing/fs/en> (Accessed 11/11/09)
- 57 Kay O, Brien J. Pharmacist Prescribing: Review of Literature; *J Pharm Pract Res* 2004; 34: 300-304
- 58 Task force on Pharmacist Prescribing (Pearson, G., Card, D., Chin, T., Gray, M., Hawboldt, J.,Jackevicius, C., Slavic, R., and Thompson, A.), An Information Paper on Pharmacist Prescribing within a Health Care Facility. Canadian Society of Hospital Pharmacists, Canada, 2001
- 59 Duff, N. The direct supply of medicines pilot in Scotland - a local view. *Pharm J* 2003; 270:26
- 60 Anonymous. The locum report: emergency hormonal contraception. *Locum* 2001; Spring: 8-9
- 61 Pearson G. J. Pharmacist Prescribing. Taking on a new role - and new responsibilities. *Pharm Connects*. 1998; November/December

- 62 Anonymous. Care at the Chemist: a question of access. School of Pharmacy and Pharmaceutical Sciences. University of Manchester. UK, 2001
- 63 Report Z of the task force on pharmacist's clinical roles. J Am Pharm Assoc 1971; NS11:482-5
- 64 Barry CP, Fuller TS. A path to pharmaceutical care (part 2): evolution of collaborative drug therapy management. Hosp Pharm 1998; 33: 490-7
- 65 Zellmer W. Collaborative drug therapy management. Am J Health Syst Pharm 1995; 52:1732
- 66 Hammond RW, Schwartz AH, Campbell MJ, Remington TL, Chuck S, Blair MM, Vassey AM, Rospond RM, Herner SJ, Webb CE. Collaborative drug therapy management by pharmacists—2003. Pharmacother 2003; 23:1210-25
- 67 Koch K. Trends in Collaborative Drug Therapy Management. Drug Benefit Trends 2000; 12:45-54
- 68 Brennan C. Pharmacist prescribing: Harborview Medical Center. Pharm Pract Manage Q. 1995; 15:24-30
- 69 Saltiel E. Pharmacists as primary care providers in a managed care practice. US Pharm 1998;24-35
- 70 Furmaga E. Pharmacist management of a hyperlipidemia clinic. Am J Hosp Pharm 1993; 50:91-95
- 71 Wong E. Management of acute and chronic pain. Hosp Pharm 1998;33:1044-56

- 72 Williams S. Outpatient psychiatric prescriptive authority. *Pharm Pract Manage Q.* 1995.15:31-3
- 73 Ivey M. The pharmacist in the care of ambulatory mental health patients. *Am J Hosp Pharm* 1973; 30:599-602
- 74 Schumock G, Meek P, Ploetz P, Vermeulen L. Pharmacy PCotACoC. Economic evaluations of clinical pharmacy services -- 1988-1995. *Pharmacother* 1996;16:1188-208
- 75 Szeinbach S, Allen J, Barnes J; Barriers to change in regulated channel environments: Pharmacist' Prescribing; *J Retail* 1998; 74: 569-88
- 76 Anderson S. The state of the world's pharmacy: a portrait of the pharmacy profession. *J Interprof Care* 2002; 16:391-404
- 77 Herrier R., Boyce R. Apgar D. Pharmacist managed patient-care services and prescriptive authority in the U.S. Public Health Service. *Hosp Formul* 1990; 25:67-8, 76-8, 80
- 78 Chi J. Pharmacist prescribing is advancing slowly but surely throughout the country. *Drug Topics* 2000; 20:39
- 79 Cram D, Stebbins M, Eom, Ratto N, Sugiyama D. Peer review as a quality assurance mechanism in three pharmacist-run medicationre fill clinics. *Am J Hosp Pharm* 1992; 49:2727-30
- 80 Task Force on Pharmacist Prescribing (Pearson G, Yuksel N, Card D, Chin T, Gray M, Hawboldt J, Jackevicius C, Slavik R, Thompson A); Statement on Pharmacist Prescribing. Canadian Society of Hospital Pharmacists. Canada. 2001

- 81 Pearson G. Evolution in the practice of pharmacy-not a revolution. *Can Med Assoc J* 2007; 24: 176
- 82 Yuksel N, Eberhard G, Bungard TJ. Prescribing by pharmacists in Alberta. *Am J Health Syst Pharm* 2008; 65:2126-32
- 83 Currie B. The future of Canadian pharmacy. *Canadian Pharmacists Journal* 2009; 72: 126-7
- 84 Canadian Pharmacists Association. Summary: Pharmacist Prescribing Authority Status Across Canada. Ottawa. October 2009. [online]  
[http://www.pharmacists.ca/content/about\\_cpha/who\\_we\\_are/policy\\_position/pdf/PharmacistsPrescribingInCanada.pdf](http://www.pharmacists.ca/content/about_cpha/who_we_are/policy_position/pdf/PharmacistsPrescribingInCanada.pdf) (Accessed 07/01/2010)
- 85 Kondro W. Canada's doctors assail pharmacist prescribing. *CMAJ* 2007; 177:558
- 86 Croskerry PG. Prescribing powers for pharmacists. *CMAJ* 2007;176:67
- 87 Van Foppe MJ, Schulz M, Tromp TF. Pharmaceutical care, European developments in concepts, implementation, teaching and research: a review. *Pharm World Sci* 2004; 26: 303-11
- 88 Gilbert L. Dispensing Doctors and Prescribing Pharmacists: A South African Perspective. *Soc Sci Med* 1998; 46:83-95
- 89 Lee YC, Kuang-Hua Huang KH, Huang YT. Adverse pharmaceutical payment incentives and providers' behaviour: the emergence of GP-owned gateway pharmacies in Taiwan. *Health Policy Plan* 2007; 22:427-35

90 David Lima, Jon Emery, Janice Lewis, V Bruce Sunderland. A systematic review of the literature comparing the practices of dispensing and non-dispensing doctors. *Health Policy* 2009; 92:1-9

91 Uema SA, Elena M. Vega EM, Pedro D. Armando OD, Fontana D. Barriers to pharmaceutical care in Argentina; *Pharm World Sci* 2008; 30:211–5

92 Australian Government, Department of Health and Ageing, Therapeutic Goods Administration; Standard for the Uniform Scheduling of Drugs and Poisons, June 2008, Commonwealth of Australia 2009 [online]  
<http://www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/framelodgmentattachments/5CB5C86C278413F0CA2574A6001C715B> (Accessed 12/08/2009)

93 Pharmaceutical Society of Australia, Professional Practice Standards, Standards for the Provision of Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy, Revised, November 2005; 2006, Version 3

94 Consumers' Health Forum of Australia, Information Brochure 2005 [online]  
<http://www.accc.gov.au> (Accessed 12/10/2009).

95 The Australian Pharmaceutical Formulary and Handbook; Section G Standards and Guidelines, 20<sup>th</sup> Edition, 2006, Pharmaceutical Society of Australia, Curtin, 378-384, 392-400

96 Australian Government, Department of Health and Ageing, Schedule of Pharmaceutical Benefits, Commonwealth of Australia 2010; [online] [www.pbs.gov.au](http://www.pbs.gov.au) (Accessed 12/10/10)

97 Australian Government, Department of Health and Ageing, About the PBS; [online] <http://www.pbs.gov.au/html/consumer/pbs/about> (Accessed 12/10/09)

98 Australian Government, Department of Health and Ageing, About the PBS; [online] <http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pbs-general-aboutus.htm-copy2> (Accessed 12/10/09)

99 Parliament of Australia; The Pharmaceutical Benefits Scheme – an Overview; Commonwealth of Australia; [online] <http://www.aph.gov.au/library/intguide/sp/pbs.htm> (Accessed 13/8/09)

100 The Society of Hospital Pharmacists of Australia. Position Statement. National Competencies for the Prescribing of Medicines. Collingwood, Australia. June 2005. [online] [http://www.shpa.org.au/pdf/positionstatement/prescribing\\_jun05.pdf](http://www.shpa.org.au/pdf/positionstatement/prescribing_jun05.pdf). (Accessed 26/5/2010)

101 The Australian Government. Pharmaceutical Benefits Scheme. Preparations which may be prescribed by authorised optometrists for optometrical treatment only. [online]: <http://www.pbs.gov.au/html/healthpro/browseby/optometrist> (Accessed 26/07/2010)

102 The National Nursing and Nursing Education Taskforce. National Nurse Prescribing Glossary (NNPG), Including a taxonomy of contemporary prescribing and initiating practices by nurses and midwives, Australian Health Ministers' Advisory Council, June 2006, 7-11 [online] [http://www.nnnet.gov.au/downloads/n3et\\_national\\_nurse\\_prescribing\\_glossary.pdf](http://www.nnnet.gov.au/downloads/n3et_national_nurse_prescribing_glossary.pdf). (Accessed 26/03/2009)

103 Australian Medical Association Victoria, Submission for access to Schedule 2, 3 & 4 drugs for endorsed podiatrists. January 2009 [online] [http://www.amavic.com.au/page/Media/News/AMA\\_Victoria\\_Submission\\_on\\_Podiatry\\_Prescribing/](http://www.amavic.com.au/page/Media/News/AMA_Victoria_Submission_on_Podiatry_Prescribing/) (Accessed 20/06/2010)

- 104 Australian Government Productivity Commission. Australia's health workforce. Productivity Commission research report, 22 December 2005. Canberra: Productivity Commission, 2005. Available at:  
<http://www.pc.gov.au/study/healthworkforce/finalreport/healthworkforce.pdf> (Accessed 26/03/2009)
- 105 Yong C. Task substitution: the view of the Australian Medical Association; *Med J Aust* 2006; 185: 27-8
- 106 Sewell J. Task transfer: The view of the Royal Australasian College of Physicians. *Med J Aust* 2006; 185: 23-4
- 107 The Australian Medical Association; Patient safety paramount in medication prescriptions, 2008 Media Releases, [online] <http://www.ama.com.au/node/3358> (Accessed 30/05/2009)
- 108 Pharmaceutical Society of Australia. Position Statement. Dispensing by other health professionals; November 2006
- 109 Plunkett W. Don't forget that pharmacists already prescribe. *Aust Pharm* 2008; 27:781
- 110 Joyce C, McNeill J. Fewer medical graduates are choosing general practice: a comparison of four cohorts, 1980–1995. *Med J Aust* 2006; 185: 102-4
- 111 Joyce C, McNeil A, Stoelwinder J. More doctors, but not enough: Australian medical workforce supply 2001–2012. *Med J Aust* 2006; 184: 441-6

- 112 Schoen C, Osborn R, Huynh PT, Doty M, Zapert K, Peugh J, Davis K. Taking the pulse of health care systems: Experience of patients with health problems in six countries. *Health Aff (Millwood)*. 2005. W5-509-25
- 113 King M. (Pharmacist prescribing in the UK) An Australian's perspective. *Aust Pharm* 2006; 25:21
- 114 Roughead EE, Lexchin J. Adverse Drug Events: counting is not enough, action is needed. *Med J Aust* 2006;184:315–6
- 115 Australian Council for Safety and Quality in Healthcare. *Second National Report on Patient Safety – Improving Medication Safety*. Canberra, 2002
- 116 Miller G, Britt H, Valenti L. Adverse drug events in general practice patients in Australia. *Med J Aust* 2006;184:321–4
- 117 Kidd M, Watts I, Mitchell C, Hudson L, Wenck BC, Cole N. Principles for supporting task substitution in Australian general practice. *Med J Aus* 2006; 185: 20-2
- 118 Kay O, Bajorek B, Brien J. Pharmacist Prescribing Activities-an Electronic Survey on the Opinion of Australian Pharmacists. *J Pharm Pract Res* 2005; 36:199-201
- 119 Hanes C, Bajorek B. Pharmacist Prescribing: Views of Australian Hospital Pharmacists; *J Pharm Pract Res* 2005; 35:178-80
- 120 Bessell T, Emmerton L, Marriot J, Nissen L. Improving Australians' access to prescription medicines: proposed practice models; June 2005; Pharmacy Guild of Australia; Canberra [online]  
[http://www.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2003-017\\_fr.pdf](http://www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2003-017_fr.pdf). (Accessed 22/03/2010)



- 121 All Party Pharmacy Group; Pharmacist Prescribing – A report to Health Ministers; House of Commons, London, March 2001
- 122 Dole EJ, Murawski MM, Adolphe AB, Aragon FD, Hochstadt B. Provision of pain management by a pharmacist with prescribing authority. *Am J Health Syst Pharm* 2007; 64: 85-9
- 123 Ellis RF, Stephens MA, Sharp GB. Evaluation of pharmacy-managed warfarin monitoring service to coordinate inpatient and outpatient therapy. *Am J Hosp Pharm* 1992; 49:387-94
- 124 Radley AS, Hall J, Farrow M, Carey PJ. Evaluation of anticoagulant control in a pharmacist operated anticoagulant clinic. *J Clin Pathol* 1995; 48:545-7
- 125 Chiquette E, Amato MG, Bussey HI. Comparison of an anticoagulant clinic with usual medical care-anticoagulant control, patient outcomes and health care costs. *Arch Intern Med* 1998;158:1641-7
- 126 Garabenian Ruffalo SM, Gray DR, Saw Mj, Ruffalo RL. Retrospective evaluation of a pharmacist-managed warfarin anticoagulation clinic. *Am J Hosp Pharm* 1985; 42:304-8
- 127 Hawkins DW, Fiedler FP, Herschel DL, Eschbach RC. Evaluation of a clinical pharmacist in caring for hypertensive and diabetic patients. *Am J Hosp Pharm* 1979; 36:1321-5
- 128 Gray DR, Garabenian Ruffalo SM, Chretien SD. Cost-justification of a clinical pharmacist-managed anticoagulant clinic. *Drug Intell Clin Pharm* 1985; 19:575-80
- 129 Davis S. Evaluation of pharmacist management of streptococcal throat infection in a health maintenance organization. *Am J Hosp Pharm* 1978; 35: 561-6

- 130 Bond CA, Monson R. Sustained improvement in drug documentation, compliance and disease control-a four year analysis of an ambulatory care model. *Arch Intern Med* 1984; 144:1159-62
- 131 Simmel GL, McGhan WF, Wincor MZ, Deandrea DM. Comparison of pharmacist and physician prescribing for psychiatric inpatients. *Am J Hosp Pharm.* 1982; 39:1483-6
- 132 Ellenor GL, Dishman BR. Pharmaceutical care role model in psychiatry--pharmacist prescribing. *Hosp Pharm* 1995;30:371-3
- 133 Gardner JS, Miller L, Downing DF, Le S, Blough D, Shotorbani S. Pharmacist prescribing of hormonal contraceptives: results of the Direct Access study. *J Am Pharm Assoc* 2008; 48:212-21
- 134 Bauer JB, Chun DS, Karpinski TA. Pharmacist-led program to improve venous thromboembolism prophylaxis in a community hospital. *Am J Health Syst Pharm.* 2008; 65:1643-7
- 135 Reid F, Murray P, Storie M. Implementation of a pharmacist-led clinic for hypertensive patients in primary care--a pilot study; *Pharm World Sci* 2005; 27:202-7
- 136 Till LT, Voris JC, Horst JB. Assessment of clinical pharmacist management of lipid-lowering therapy in a primary care setting. *J Manag Care Pharm.* 2003;9:275-6
- 137 Weiss M, Sutton J, Adams C. Exploring innovations in pharmacy practice: a qualitative evaluation of supplementary prescribing by pharmacists. Bath: Department of Pharmacy and Pharmacology, University of Bath, 2006
- 138 Lloyd F, McHenry L, Hughes CM. Views of junior house officers/senior house officers on pharmacist supplementary prescribing. *Int J Pharm Pract* 2005;13:R96

- 139 While AE, Mudaly M, Nathan A. Views of community pharmacists regarding supplementary prescribing. *Int J Pharm Pract* 2004;12:R43
- 140 Shulman R, Jani Y. Comparison of supplementary prescribers' and doctors' compliance with guidelines for drug dosing in haemofiltration on an intensive care unit. *Pharm J* 2005; 274:492-3
- 141 Aldous, J. Hospital pharmacist perspective: prescribing pharmacists. *Information to Pharmacists*, 2003 [online]  
<http://www.computachem.com.au/i2P/emag/Issue17/Article10.shtml>. (Accessed 20/6/2010)
- 142 Eng HJ. The pharmacist as prescriber. *J Clin Pharm Ther* 1987; 2: 237-42
- 143 Segal R, Grines LL. Prescribing authority for pharmacists as viewed by organized pharmacy, organized medicine, and the pharmaceutical industry. *Drug Intell Clin Pharm* 1988; 22: 241-6
- 144 Bellingham C. Space, time and team working: issues for pharmacists who wish to prescribe. *Pharm J* 2002; 268: 562-63
- 145 Mrtek RG, Catizone C. Pharmacy and the professions. In: *Pharmacy practice social and behavioural aspects*. Wetheimer AI, Smith MC eds. 3<sup>rd</sup> edition. Baltimore :Williams and Wilkins; 1989; pp.23-41
- 146 Shaw J. *Pharmacist Prescribing*. Pharmaceutical Society of New Zealand, Wellington, New Zealand, 2002
- 147 Taylor B. The role of the pharmacist in emergency contraception. *J Fam Plann Reprod Health Care* 2003; 29:7

- 148 Savino, T., Legal Authority for a Pharmacist's Order for Prescription Drugs, WebRx Pharmacy Palace, 2002. [online]: <http://www.rxpalace.com/laws.htm> (Accessed 15/10/2009)
- 149 Candlish C, Puri A, Sackville MP. A survey of supplementary prescribing pharmacists from the Sunderland Pharmacy School. *Int J Pharm Pract* 2006;14:B42
- 150 Baird A. Supplementary prescribing: one general practice's experience of implementation. *Nurse Prescribing* 2004; 2:72–5
- 151 Child D, Cantrill JA. Hospital doctors' perceived barriers to pharmacist prescribing. *Int J Pharm Pract* 1999;7:230–7
- 152 Child D. Hospital nurses' perceptions of pharmacist prescribing. *Br J Nurs* 2001; 10:48–54
- 153 Lloyd F, McNally L, Hughes CM. Views of hospital nurses on hospital pharmacist supplementary prescribing. *Int J Pharm Pract* 2005;13:R97
- 154 Buckley P, Grime J, Blenkinsopp A. Inter and intra professional perspectives on non-medical prescribing in an NHS trust. *Pharm J* 2006; 277:394–8
- 155 Hughes CM, McCann S. Perceived interprofessional barriers between community pharmacists and GPs: a qualitative assessment. *Br J Gen Pract* 2003; 53:600–6
- 156 Cooper RJ, Lymn J, Anderson C, Avery A, Bissell P, Guillaume L, Hutchinson A, Murphy E, Ratcliffe J, Ward P.. Learning to prescribe – pharmacists' experiences of supplementary prescribing training in England. *BMC Med Educ* 2008; 8:57

157 Royal Pharmaceutical Society of Great Britain; Pharmacist prescribing; Outline curriculum for training programmes to prepare pharmacist prescribers (August 2006); [online]: <http://www.rpsgb.org/pdfs/indprescoutlcurric.pdf> (Accessed 11/11/2009)

158 College of Pharmacists of British Columbia. Protocol for Medication Management (Adopting a prescription) Professional Practice Policy. Vancouver. [online] [http://www.bcpharmacists.org/library/D-Legislation\\_Standards/D-2\\_Provincial\\_Legislation/PPP58\\_OrientationGuideDeclarationForm.pdf](http://www.bcpharmacists.org/library/D-Legislation_Standards/D-2_Provincial_Legislation/PPP58_OrientationGuideDeclarationForm.pdf) (Accessed 10/01/2010)

159 George J, Pflieger D, McCaig D, Bond C, Stewart D. Independent prescribing by pharmacists: a study of the awareness, views and attitudes of Scottish community pharmacists. *Pharm World Sci* 2006; 26: 45-53

160 Dawoud D, Goody L, Lovejoy A, Greene R. Perceptions and perceived competencies of pharmacists on supplementary prescribing training courses in London and the South East. *Int J Pharm Pract* 2004; 12:R40.

161 George J. Bond CM. McCaig DJ. Cleland J. Cunningham IT. Diack HL. Stewart DC. Experiential learning as part of pharmacist supplementary prescribing training: feedback from trainees and their mentors. *Ann Pharmacother* 2007; 41:1031-8

162 Khanderia, U. The cost-effectiveness of clinical pharmacist intervention on tobramycin prescribing; *Hosp Formul* 1986; 21:1049-50

163 Wells WD. Having a practice pharmacist can reduce prescribing costs. *BMJ* 1998;317:473

- 164 Stergachis A, Fors M, Wagner EH. Effect of clinical pharmacists on drug prescribing in a primary-care clinic; *Am J Hosp Pharm*. 1987; 44:525-9
- 165 Forstrom MJ, Ried LD, Stergachis AS, Corliss DA. Effect of a clinical pharmacist program on the cost of hypertension treatment in an HMO family practice clinic. *Ann Pharmacother* 1990; 24: 304-309
- 166 Dole EJ, Murawski MM, Adolphe AB, Aragon FD, Hochstadt B. Provision of pain management by a pharmacist with prescribing authority. *Am J Hosp Pharm* 2007; 64:85-9
- 167 Lawlor MC, Lucarotti RL. Clinical pharmacist impact on parenteral cephalosporin prescribing. *Hosp Formul* 1983; 18:402-4, 407-8
- 168 Rodgers S, Avery AJ, Meechan D, Briant S, Geraghty M, Doran K, Whynes DK. Controlled trial of pharmacist intervention in general practice: the effect on prescribing costs. *Br J Gen Pract* 1999; 49: 717–20
- 169 Stowasser DA, Allinson YM , O'Leary KM. Understanding the medicines management pathway. *J Pharm Pract Res* 2004; 34: 293-6
- 170 Smalley L. Experience of pharmacist-led supplementary prescribing in Primary care. *Pharm J* 2006; 276: 567–9
- 171 Stewart DC, George J, Bond CM, Cunningham IT, Diack HL, McCaig DJ. Exploring patients' perspectives of pharmacist supplementary prescribing in Scotland; *Pharm World Sci* 2008; 30: 892-6
- 172 Stewart DC, George J, Bond CM, Diack HL, McCaig DJ, Cunningham S. Views of pharmacist prescribers, doctors and patients on pharmacist prescribing implementation. *Int J Pharm Pract*. 2009;17: 89-94

- 173 Cooper R, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, Lymn J, Murphy E, Ratcliffe J, Ward P.. Stakeholders' views of UK nurse and pharmacist supplementary prescribing; *J Health Serv Res Policy* 2008; 13:215-21
- 174 Qureshi K, Kashani S, Robbie S, Malik N. Perceptions of patients to extended prescribing to nurses and pharmacists. *Eye* 2007; 21:1005-6
- 175 Berry D, Courtenay M, Bersellini E. Attitudes towards, and information needs in relation to, supplementary nurse prescribing in the UK: an empirical study. *J Clin Nurs* 2006;15:22-8
- 176 Stewart DC, George J, Diack HL, Bond CM, McCaig DJ, Cunningham IS, Munro K, Pflieger D. Cross sectional survey of the Scottish general public's awareness of, views on, and attitudes toward nonmedical prescribing; *Ann Pharmacother* 2009; 43:1115-21
- 177 Hobson R, Scott J, Sutton J. Pharmacists and nurses as independent prescribers: exploring the patient's perspective. *Fam Pract* 2009; 27:111-20
- 178 The Royal Australian College of General Practitioners, *Medical care of older persons in residential aged care facilities*; 4<sup>th</sup> Edition; South Melbourne: RACGP;2006
- 179 Aged Care Association Australia (ANHECA). *Aged care Australia: the future challenges*. Canberra: ANHECA; 2004
- 180 Australian Government Productivity Commission. *Trends in Aged Care Services: some implications*. Productivity Commission research report, 2008, [online] <http://www.pc.gov.au/research/commissionresearch/aged-care-trends> (Accessed 10/05/2010)

- 181 Australian Government Department of Health and Ageing. Aged Care GP Panels Initiative. 2004 aged care homes survey. Canberra: DoHA, 2005. [online] <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pcd-programs-acgppi-homessurvey> (Accessed 13/03/2010)
- 182 Gadzhanova S, Reed R. Medical services provided by general practitioners in residential aged-care facilities in Australia. *Med J Aust* 2007; 187: 92-4
- 183 Australian Medical Workforce Advisory Committee. The general practice workforce in Australia: supply and requirements to 2013. Sydney: AMWAC, 2005. [online]: [http://www.health.nsw.gov.au/amwac/pdf/gp\\_2005.pdf](http://www.health.nsw.gov.au/amwac/pdf/gp_2005.pdf) (Accessed 9/06/2010)
- 184 Australian Medical Association and Royal Australian College of General Practitioners. GP services to residential aged care facilities. Canberra: AMA, 2006. [http://www.ama.com.au/web.nsf/doc/WEEN-6VT8LA/\\$file/GP\\_Services\\_to\\_Residential\\_Aged\\_Care\\_Facilities.pdf](http://www.ama.com.au/web.nsf/doc/WEEN-6VT8LA/$file/GP_Services_to_Residential_Aged_Care_Facilities.pdf) (Accessed 9/06/2010)
- 185 Siggins Miller Consultants and School of Population Health, University of Queensland. A report to the Brisbane North Division of General Practice (BNDGP). The residential care project. Brisbane: BNDGP; 2002
- 186 Lewis GA, Pegram RW. Residential aged care and general practice: workforce demographic trends, 1984–2000. *Med J Aust* 2002; 177: 84-6
- 187 Australian Government Department of Health and Ageing. Aged Care GP Panels Initiative — statement of rationale for Divisions performance indicators. Canberra: DoHA, 2004. [online]: [http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/health-medicare-health\\_pro-gp-rationale.htm](http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/health-medicare-health_pro-gp-rationale.htm) (Accessed 1/05/2010)



188 Saliba D, Solomon D, Rubenstein L, Young R, Schnelle J, Roth C, Wegner N. Quality indicators for the management of medical conditions in nursing home residents. *J Am Med Dir Assoc* 2004; 5:297–309

189 Aged Care Price Review Taskforce 2004, Review of Pricing Arrangements in Residential Aged Care, Final Report (Prof. W.P. Hogan, Reviewer), Canberra

190 Australian Pharmaceutical Advisory Council. Guidelines for medication management in residential aged care facilities; 3<sup>rd</sup> Edition; Canberra: Commonwealth of Australia; 2002; pp.7-15

191 Healthcare Management Advisors. The Fourth Community Pharmacy Agreement. Review of the Existing Supply Arrangements of PBS Medicines in Residential Aged Care Facilities and Private Hospitals. Final Report. 30 September 2009.

[online] <http://www.health.gov.au/internet/main/publishing.nsf/content/pharmacy-4cpa-reviews> (Accessed 10/09/2010)

192 Carruthers A, Naughton K, Mallarkey G. Accuracy of packaging of dose administration aids in regional aged care facilities in the Hunter area of New South Wales. *Med J Aust* 2008; 188: 280–2

193 Roberts M. Effectiveness and cost effectiveness of dose administration aids (DAAs). Brisbane: Pharmacy Guild of Australia, 2004. {online} [http://beta.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2002-519\\_fr.pdf](http://beta.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2002-519_fr.pdf) (Accessed 10/01/2010).

194 Runciman WB, Roughead EE, Semple SJ, Roberts JA. Adverse drug events and medication errors in Australia. *Int J Qual Health Care* 2003; 15: i49-i59

- 195 Mott DA, Schommer JC, Doucette WR, Kreling DH. Agency theory, drug formularies, and drug product selection: Implications for public policy. *J Public Policy Mark* 1998; 17: 287-95
- 196 Jensen M, Meckling W. Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *J Financ Econ* 1976; 3: 305-60
- 197 Arrow KJ. Uncertainty and Welfare Economics of Medical Care. *Am Econ Rev* 1963; 53(5): 941-73
- 198 Eisenhardt KM. Agency Theory: An assessment and review. *Acad Manage Rev* 1989; 14: 57-74
- 199 Zeckhauser RJ. Principals and agents: An Overview. In: *Principals and agents: The structure of business*; Pratt JW, Zeckhauser RJ, eds; Boston: Harvard Business School Press, 1985, pp.1-35
- 200 Eisenberg JM. Physician Utilization: The State of research by physicians' practice patterns. *Med Care* 1985; 23:461-83
- 201 Schwartz RK, Soumerai SB, Avorn J. Physician motivations for nonscientific drug prescribing. *Soc Sci Med* 1989; 28:577-82
- 202 Hemminki E. Review of Literature on Factors Affecting Drug Prescribing. *Soc Sci Med* 1975; 9:111-5
- 203 Blomqvist A. The Doctor as double agent: Information asymmetry, health insurance and medical care. *J Health Econ* 1991; 10:411-32
- 204 Eddy DM. Variations in Physician Practice: The Role of Uncertainty. *Health Affairs* 1984; 3:74-79

- 205 Smith F. Conducting your pharmacy practice research project. London. Pharmaceutical Press 2005
- 206 Bucher L. Evaluating the affective domain. Consider a Likert scale. *J Nurs Staff Dev.* 1991;7:234-38
- 207 Ketola E, Kockars M. Computer-assisted telephone interview (CATI) in primary care. *Fam Pract.* 1999; 16: 179-83
- 208 Harris D, Grimshaw J, Lemon J, Russell IT, Taylor R. The use of computer assisted telephone interview technique in a general practice research study. *Fam Pract* 1993; 10:454-8
- 209 Webb C, Kevern J. Focus groups as a research method: a critique of some aspects of their use in nursing research. *J Adv Nurs* 2000; 33: 798-805
- 210 Morgan D. Focus groups. *Annu Rev Sociol* 1996; 22:129–52
- 211 Kitzinger J. Qualitative Research: Introducing focus groups. *BMJ* 1995; 311:299-302
- 212 Morgan D. Focus groups. *Annu Rev Sociol* 1996; 22:129–52

# **Chapter III**

Australian pharmacists' views on pharmacist prescribing

### **3.1 Introduction**

To date there is a lack of representative studies evaluating the views of Australian pharmacists on the issue of pharmacist prescribing. As highlighted in the literature review chapter, one study investigated the awareness of international developments in pharmacist prescribing and respondents' benefit from prescribing activities.<sup>1</sup> This study was limited by a very low response rate (6.4%) and a significant under-representation of community pharmacists. Another study assessed the views of 15 hospital pharmacists on pharmacist prescribing.<sup>2</sup> Aimed at improving Australians medication access, Bessell et al. have evaluated four potential prescribing models for Australian pharmacists.<sup>3</sup>

This project evaluated the views of a representative sample of Australian pharmacists on different aspects of pharmacist prescribing.

### **3.2 Objectives**

The main objectives of this part of the project were to assess pharmacists' views on expanded pharmacist prescribing with a focus on:

- 1 Current level of support for introducing an expanded prescribing role for pharmacists
- 2 Pharmacist prescribing models and preferred therapeutic areas of prescribing
- 3 Training needs for assuming an expanded role in prescribing and
- 4 Infrastructure implications for expanding pharmacy services through pharmacist prescribing

### **3.3 Methods**

All data collection instruments and the methodologies used in this project were approved by the Human Research Ethics Committee of Curtin University of Technology (See Appendix 1 and 2).

#### **3.3.1 Data collection**

##### **3.3.1.1 Focus groups and pilot questionnaire**

Data were collected using a self-administered questionnaire. The design of the questionnaire was initially constructed based on a review of the relevant literature and findings from a focus group meeting. The questionnaire was then piloted on 114 pharmacists in Western Australia. The distribution of this pilot questionnaire was done in 2006, electronically or via the Pharmaceutical Council of Western Australia's (PCWA) newsletter (see Appendix 3).

##### **3.3.1.2 Final questionnaire**

The pre-piloting resulted in minor changes to the final questionnaire (see Appendix 4). The final questionnaire had nine sections related to: 1) expansion of pharmacy professional services and pharmacist prescribing, 2) pharmacists perspectives on views of their clients, 3) advantages of expanding the pharmacist's prescribing role 4) prescribing models preferred 5) barriers to expanded pharmacist prescribing 6) therapeutic areas in which pharmacists supported expanded prescribing 7) training requirements to prescribe 8) infrastructural implications 9) expansion of the current role in the management of minor ailments. The questionnaire also had a section which gathered basic demographic data. Dependent upon the question, pharmacists were either asked to respond Yes/No or to complete a five point Likert scale to assess their level of agreement with a particular statement.

### **3.3.1.3 Questionnaire distribution**

The self-administered questionnaire was posted nationally to a random sample of pharmacists directly. In the State of New South Wales (NSW) the distribution of the questionnaire was done through a random sample of community pharmacies. The sample was drawn from Registers obtained from State Pharmacy Boards (South Australia, Victoria, Tasmania) and the PCWA. Registers for NSW and Queensland were not made available due to privacy issues. The list of pharmacies in the telephone directory “Yellow Pages” was used to select a random sample of community pharmacies in NSW. In this case the questionnaire was directed to “The Pharmacist”. The sample for Queensland was drawn from the list of pharmacists publicly available online at the Pharmacy Board of Queensland’s website. An electronic randomiser was used to draw a 20% sample for each of the abovementioned States. A 20% sample was chosen as it allows a representative sample to be drawn from a large number of potential respondents. The questionnaires were sent to 2199 pharmacists and in the case of NSW 503 pharmacies. Therefore, a 20 % sample for each state was drawn from a pool of approximately 11000 pharmacists and in the case of NSW all pharmacies listed in the “Yellow Pages” directory in December 2007. The Northern Territory (NT) and the Australian Capital Territory (ACT) were excluded due to limited number of potential respondents and therefore statistical insignificance. The questionnaires were distributed by mail in December 2007 and included “replied paid” envelopes. A follow-up questionnaire was sent in January 2008 with the aim of increasing the response rate. Each potential respondent also received an information sheet which explained the project (see Appendix 5 and Appendix 6).

Pre-analysis data screening was done to eliminate invalid questionnaires and or/responses.

### **3.3.2 Data analysis**

#### **3.3.2.1 Chi-Square testing**

Data were coded and analysed using SPSS v17. Initially frequency distributions were obtained to summarise the responses to the questions. This included frequencies for categorical variables, and means and standard deviations for variables measured on a continuous scale. Chi-square testing was used to evaluate binary variables (i.e. Yes/No responses) regarding whether 1) pharmacists should have an expanded prescribing role and 2) if they would need further training. Chi-Square testing was purposively used to check for differences between samples drawn from different States in relation to the above two key questions. Additionally differences in age, gender, professional practice setting and pharmacy ownership were also analysed.

#### **3.3.2.2 One-Way ANOVA**

Analysis of Variance (ANOVA) was employed to evaluate various aspects of pharmacists' attitudes on pharmacist prescribing. One-way ANOVA was used to compare the means of Likert scale variables where the independent variables had more than two categories. With the large sample size used in this study, the distribution of the mean score for variables based on the Likert scale can safely be assumed to be Normal (Central Limit Theorem).

One-Way ANOVA was specifically used to evaluate differences between pharmacists working in different pharmacy professional areas and pharmacists from different Australian states in relation to their preferences for:

- a) models of prescribing
- b) therapeutic areas of prescribing,
- c) training requirements and
- d) infrastructure implications.



The influence of years of pharmacist's registration on prescribing models was also evaluated using One-way ANOVA. Years of pharmacist registration were categorised into groups: a) 0-5 years, 6-10 years, 11-20 years and >20 years. The differences between pharmacy owners and non-owners in regards to different aspects of pharmacist prescribing which measured respondents' attitudes on a 5-point Likert scale were also evaluated using One-Way Anova. Tukey's post-hoc comparison was used to locate the significance identified with One-Way ANOVA.

### **3.3.2.3 Factor analysis**

Factor analysis was employed throughout the data analysis process in order to reduce the number of variables and hence facilitate the interpretation of results. The method of extraction throughout the Factor Analysis of data was Principal Component Analysis. The following describes the sections of the questionnaire in which Factor Analysis was used:

*Section 1 (see Appendix 4):* Support for statements related to prescribing and the future of the pharmacy profession were grouped and subjected to factor analysis. These statements were:

- i) I would like the Pharmacy profession to expand its scope of professional services*
- ii) I would like the Pharmacy profession to expand its scope of services, by expanding the prescribing role*
- iii) I see myself in future as having more expanded prescribing responsibilities*
- iv) I am happy with the current pharmacist's prescribing role limited to S3's*

*Section 3 (see Appendix 4):* Support for statements related to potential advantages of an expanded prescribing role were grouped and subjected to factor analysis. These statements were:

- i) I believe customers would have better access to their medications if pharmacists were prescribers*
- ii) Expanded pharmacist prescribing would ease the burden from overloaded GP's and hence improve the functioning of our health system*
- iii) Expanded prescribing responsibilities is a direction that the Pharmacy profession should be headed in order to secure a more important role in health care*
- iv) Pharmacists are highly regarded by the community and therefore they should assume more prescribing responsibilities*
- v) Pharmacists have the necessary drug knowledge to assume more prescribing responsibilities*
- vi) Pharmacists have the necessary patient assessment skills to assume more prescribing responsibilities*
- vii) Pharmacist prescribing enables better use of pharmacist's professional skills*
- viii) Expanded prescribing will contribute to increased Pharmacy profits*

*Section 5 (see Appendix 4):* Support for statements related to barriers for expanding the prescribing role were grouped and subjected to factor analysis. These statements were:

- i) Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)*
- ii) Inadequate training in patient assessment and patient monitoring*
- iii) Potential for a reduction in the quality of patient care*
- iv) Potential for increased patient costs*
- v) Potential for increased hospital admissions*
- vi) Potential for increased government costs*
- vii) Conflict of interest with pharmacists acting both as prescribers and dispensers*

- viii) *Pharmacists' lack of time*
- ix) *Increased confusion amongst the public as to the role of GP's and pharmacists*
- x) *Potential decrease in quality of current services offered by pharmacists*
- xi) *Pharmacists having commercial interest in prescribing*
- xii) *Inadequate facilities within pharmacies to allow pharmacist prescribing*
- xiii) *Increased likelihood of litigation*

*Section 2 (see Appendix 4):* Support related to pharmacists' perspectives based on their clients' views on pharmacist prescribing were grouped and subjected to factor analysis.

These statements were:

- i) *Customers would accept pharmacists with an expanded prescribing role*
- ii) *Customers would trust pharmacists as prescribers*
- iii) *Customers would have safer access to their medications if pharmacists were prescribers*
- iv) *Customers find accessing their GP's too difficult and may prefer pharmacists having an expanded prescribing role*
- v) *Customers appreciate pharmacists' professional advice and may prefer pharmacists as prescribers*

Internal consistency of the statements within each section was performed using Cronbach's coefficient alpha. This was done to confirm that the statements within each section were measuring different facets of the same theme.

All statements which were subjected to Factor analysis measured respondents' agreement on a five-point Likert scale, where 1 was strongly disagree and 5 was strongly agree. Additionally, where appropriate to achieve a clearer interpretation, variables were subjected to Principal Component Analysis and Varimax rotation. Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity were used to confirm the suitability for factoring.

#### **3.3.2.4 Regression Analysis**

Variables extracted during the factor analysis were analysed further with multiple regression. Regression analysis was employed to a) identify positive and negative predictors of expanding pharmaceutical services through prescribing and b) to assess how pharmacy ownership predicts the expansion of pharmacy services through prescribing. Section 1 summary score from Factor analysis was used as a dependent variable during the regression analysis.

## 3.4 Results

### 3.4.1 Response rate and demographic characteristics

A total of 1049 of the 2592 questionnaires distributed were returned and useable, yielding a response rate of 40.4%. Table 3.1 summarises the demographic characteristics of the respondents. The majority of the respondents practiced in a community pharmacy setting and were employee community pharmacists working in larger pharmacies (annual turnover  $\geq$  AUD2M).

**Table 3.1 Demographic characteristics of respondents (n=1049\*)**

Variable	Category	n (%)
Gender	Male	536 (51.6)
	Female	503 (48.4)
Mean age (SD)		42.8 years (SD=13.5)
Mean years of registration as pharmacist (SD)		20.5 years (SD=14.2)
Practice setting	Community	873 (84.1)
	Hospital	119 (11.5)
	Medication reviews (i.e. consultant pharmacists)	14 (1.3)
	Other	32 (3.1)
Pharmacy ownership	Owners	359 (41.1% of community pharmacists)
	Non-owners	675 (65.3% of all pharmacists)
Australian places of practice	Victoria	422 (40.9)
	New South Wales	199 (19.3)
	Queensland	88 (8.5)
	Western Australia	156 (15.1)
	South Australia	121 (11.7)
	Tasmania	43 (4.2)

\*For each category there were some missing responses

### 3.4.2 Frequency distributions

#### 3.4.2.1 Prescribing and the future of the pharmacy profession

The majority of respondents agreed about the pharmacy profession expanding professional services with most of them supporting this be done through an expanded prescribing role. Respondents expressed disagreement with the current prescribing role limited to Pharmacist Only Medicines (i.e. S3's). Table 3.2 shows the level of agreement expressed by respondents in regards to prescribing and the future of the pharmacy profession (Section 1 of Appendix 4).

**Table 3.2 Pharmacists' attitudes on prescribing and the future of pharmacy profession**

Statement	Level of agreement n(%)*				
	SD**	D	N	A	SA
I would like the Pharmacy profession to expand its scope of professional services	23(2.2)	14(1.3)	82(7.9)	323(31.0)	599(57.5)
I would like the Pharmacy profession to expand its scope of services, by expanding the prescribing role	43(4.1)	83(8.0)	160(15.4)	362(34.9)	390(37.6)
I see myself in future as having more expanded prescribing responsibilities	50(4.8)	107(10.3)	220(21.2)	358(34.6)	301(29.1)
I am happy with the current pharmacist's prescribing role limited to S3's	148(14.2)	369(35.5)	261(25.1)	183(17.6)	78(7.5)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

To the YES/NO question “Do you think pharmacists should have expanded prescribing rights?” 83.9% answered “YES”. Additionally, 87.3% of respondents wished to take on an expanded prescribing role (i.e. responses to questions 5a and 5b in Appendix 4).

### 3.4.2.2 Pharmacists’ opinion based upon their perceptions of their clients

Respondents expressed high levels of expectations in regards to how pharmacist prescribing would be accepted by their clients. Respondents’ level of agreement with given statements is shown in Table 3.3.

**Table 3.3 Pharmacists’ opinion based upon their perceptions of their clients**

Statement	Level of agreement n(%)*				
	SD**	D	N	A	SA
Customers would accept pharmacists with an expanded prescribing role	14(1.4)	39(3.8)	116(11.2)	554(53.5)	312(30.1)
Customers would trust pharmacists as prescribers	12(1.2)	35(3.4)	149(14.4)	526(50.8)	314(30.3)
Customers would have safer access to their medications if pharmacists were prescribers	36(3.5)	142(13.7)	408(39.4)	303(29.3)	146(14.1)
Customers find accessing their GP’s too difficult and may prefer Pharmacists having an expanded prescribing role	27(2.6)	32(3.1)	123(11.8)	487(46.9)	369(35.5)
Customers appreciate pharmacist ‘s professional advice and may prefer pharmacists as prescribers	24(2.3)	81(7.8)	285(27.6)	463(44.9)	179(17.3)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

### 3.4.2.3 Potential advantages of expanding pharmacist prescribing

Better utilization of pharmacists' skills followed by easing the burden from overloaded GP's and pharmacists' drug knowledge were the areas for which respondents showed highest level of support in answering statements related to reasons why pharmacists should have expanded prescribing rights. These attitudes are summarised in Table 3.4.

**Table 3.4 Potential advantages of expanding pharmacist prescribing**

Statement	Level of agreement n(%)*				
	SD**	D	N	A	SA
I believe customers would have better access to their medications if pharmacists were prescribers	31 (3.0)	84 (8.1)	223 (21.5)	450 (43.4)	250 (24.1)
Expanded pharmacist prescribing would ease the burden from overloaded GP's and hence improve the functioning of our health system	26 (2.5)	66 (6.3)	140 (13.5)	483 (46.4)	325 (31.3)
Expanded prescribing responsibilities is a direction that the pharmacy profession should be headed in order to secure a more important role in health care	36 (3.5)	86 (8.3)	198 (19.1)	398 (38.3)	320 (30.8)
Pharmacists are highly regarded by the community and therefore should assume more prescribing responsibilities	23 (2.2)	112 (10.8)	257 (24.8)	407 (39.2)	239 (23.0)
Pharmacists have the necessary drug knowledge to assume more prescribing responsibilities	31 (3.0)	71 (6.8)	174 (16.7)	514 (49.4)	250 (24.0)
Pharmacists have the necessary patient assessment skills to assume more prescribing responsibilities	59 (5.7)	206 (19.9)	269 (25.9)	385 (37.1)	118 (11.4)
Pharmacist prescribing enables better use of pharmacist's professional skills	27 (2.6)	65 (6.3)	137 (13.2)	526 (50.7)	282(2 7.2)
Expanded prescribing will contribute to increased pharmacy profits	42 (4.1)	104 (10.1)	446 (43.1)	314 (30.4)	128 (12.4)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree



### 3.4.2.4 Pharmacist prescribing barriers

Respondents were given 13 statements which involved potential barriers of expanded pharmacist prescribing. Inadequate training in disease diagnosis followed by pharmacists' inadequate training in patient assessment and monitoring were the two main barriers perceived by respondents. On the other hand, for potential barriers such as decreased quality of services offered to patients, increased hospital admissions, increased government and patient cost, respondents did not indicate high levels of agreement. Respondents' attitudes on potential barriers to pharmacist prescribing are summarised in Table 3.5.

**Table 3.5 Potential barriers to expanded pharmacist prescribing**

Statement	Level of agreement n(%)*				
	SD**	D	N	A	SA
Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	21 (2.1)	66 (6.5)	90 (8.9)	461 (45.4)	377 (37.1)
Inadequate training in patient assessment and patient monitoring	31 (3.1)	130 (12.8)	142 (14.0)	455 (44.9)	255 (25.2)
Potential for a reduction in the quality of patient care	105 (10.5)	322 (32.1)	246 (24.6)	228 (22.8)	101 (10.1)
Potential for increased patient costs	151 (15.0)	365 (36.1)	309 (30.6)	131 (13.0)	54 (5.3)
Potential for increased hospital admissions	134 (13.3)	362 (36.0)	260 (25.9)	172 (17.1)	77 (7.7)
Potential for increased government costs	175 (17.5)	368 (36.7)	287 (28.6)	125 (12.5)	47 (4.7)
Conflict of interest with pharmacists acting both as prescribers and dispensers	72 (7.2)	195 (19.4)	237 (23.6)	338 (33.6)	163 (16.2)
Pharmacists' lack of time	80 (7.9)	188 (18.6)	207 (20.5)	350 (34.6)	187 (18.5)

**Table 3.5 Potential barriers to expanded pharmacist prescribing (continued)**

Statement	Level of agreement n(%)*				
	SD**	D	N	A	SA
Increased confusion amongst the public as to the role of GP's and pharmacists	73 (7.2)	253 (25.0)	255 (25.2)	318 (31.5)	112 (11.1)
Potential decrease in quality of current services offered by pharmacists	122 (12.1)	389 (38.7)	213 (21.2)	198 (19.7)	83 (8.3)
Pharmacists having commercial interest in prescribing	66 (6.5)	199 (19.7)	236 (23.4)	340 (33.7)	168 (16.7)
Inadequate facilities within pharmacies to allow pharmacist prescribing	52 (5.2)	166 (16.5)	163 (16.2)	434 (43.1)	192 (19.1)
Increased likelihood of litigation	28 (3.2)	110 (12.7)	228 (26.2)	310 (35.7)	193 (22.2)

\*For every statement there were some missing responses

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

### **3.4.2.5 Pharmacist prescribing models**

Respondents were given statements which described five prescribing models. These models were: independent prescribing, supplementary prescribing, expanded repeat prescribing, formulary prescribing and emergency prescribing (see Section 4 statements in Appendix 4). Respondents could respond to all these models and not only the one preferred. Respondents were also asked if expanded prescribing should apply to hospital pharmacists only. Respondents indicated highest support for the supplementary model of prescribing followed by the formulary model. Lower levels of support were shown for emergency and independent models of prescribing. These results are summarised in Table 3.6.

**Table 3.6 Pharmacists attitudes on different models for expanded prescribing**

Statement	Level of Agreement n(%)*				
	SD**	D	N	A	SA
Pharmacists should be able to prescribe independent of medical practitioners, this includes assuming the responsibility of clinical assessment of the patient, establishing diagnosis and clinical management for a range of conditions within professional and clinical competence.	205 (20.0)	316 (30.9)	226 (22.1)	204 (19.9)	72 (7.0)
Pharmacists should be able to prescribe in a <i>supplementary</i> fashion through a partnership with an independent prescriber (a doctor or dentist) implementing an agreed patient-specific management plan. In this model the doctor diagnoses and initiates therapy while the pharmacist continues prescribing as long as patient's condition is within agreed management plan parameters.	25 (2.4)	40 (3.9)	95 (9.3)	525 (51.2)	341 (33.2)
Pharmacists should be able to prescribe from a limited drug formulary which would include current S2's, S3's and additional drugs depending on pharmacists field of specialization	30 (2.9)	56 (5.5)	116 (11.4)	538 (52.7)	281 (27.5)
Pharmacists should be able to prescribe for 30 day emergency supply, rather than current three day limit	67(6.5)	164 (16.0)	189 (18.4)	302 (29.5)	303 (29.6)
I believe any possible future expanded prescribing should be done by Hospital Pharmacists only	347 (34.1)	408 (40.0)	170 (16.7)	50 (4.9)	44 (4.3)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Cross-tabulation analysis revealed that the vast majority of respondents who answered agree/strongly agree to the independent prescribing model also answered agree/strongly agree to the supplementary model of prescribing. This is shown in Table 3.7.

**Table 3.7 Cross-tabulation of pharmacists' attitudes on supplementary vs. independent prescribing model**

		Pharmacists should be able to prescribe in a supplementary fashion n=1022					Total
		SD	D	N	A	SA	
Pharmacists should be able to prescribe independently of medical practitioners	SD*	20	14	25	84	62	205
	D	1	10	29	198	77	315
	N	3	4	23	131	65	226
	A	0	7	10	99	88	204
	SA	1	5	7	11	48	72
Total		25	40	94	523	340	1022

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

The exclusion of respondents who answered agree/strongly agree to both supplementary and independent models resulted in much less support for the independent prescribing model only. This is shown in Table 3.8.

**Table 3.8 Respondents who supported either a supplementary only or an independent prescribing model only**

Statement	Level of agreement n(%)				
	SD**	D	N	A	SA
Pharmacists should be able to prescribe <i>independently</i> of medical practitioners	205 (26.4)	316 (40.7)	226 (29.1)	17 (2.2)	13 (1.7)
Pharmacists should be able to prescribe in a <i>supplementary</i> fashion	25 (3.2)	40 (5.1)	95 (12.2)	415 (53.2)	205 (26.3)

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

#### **3.4.2.6 Therapeutic areas for expanded pharmacist prescribing**

Respondents were given the choice of indicating the level of support for different therapeutic areas of prescribing, based on whether they supported an independent or a supplementary prescribing model (see Section 6A and 6B in Appendix 4). Many respondents who answered Section 6A also answered Section 6B and vice versa. Therefore, in order to gain a clearer interpretation of results, Statement 1 and 2 of Section 4 were cross-tabulated with Section 6A and 6B so that three groups of respondents could be clearly identified: 1) those that agreed to supplementary prescribing model only, 2) those that agreed to independent prescribing model only and 3) those that agreed to both models. Therapeutic areas included in Section 6A and 6B for respondents to choose were the main chronic conditions as well as infections and pain management (see Section 6, Appendix 4).

Respondents favouring the independent prescribing model only showed strongest support for a limited range of infections and pain management. Respondents who preferred only the supplementary prescribing model, showed strongest support for expanded prescribing for asthma and a limited number of infections followed by hypertension, pain management and diabetes. Lower levels of support by all groups were seen for an expanded role in anticoagulation and heart failure. These preferences are summarised in Tables 3.9 and 3.10 respectively.

**Table 3.9 Therapeutic area preferences of respondents who supported either a supplementary or an independent prescribing model**

Therapeutic areas	Supporters of supplementary model only n(%)*			Supporters of independent model only n(%)**		
	A/SA ***	N	D/SD	A/SA	N	D/SD
Antibiotics****	408 (79.1)	33 (6.4)	75 (14.6)	23 (82.1)	2 (7.1)	1 (10.7)
Diabetes	378 (73.4)	61 (11.8)	76 (14.7)	13 (46.4)	8 (28.6)	7 (25.0)
Hypertension	394 (76.5)	46 (8.9)	75 (14.5)	13 (46.5)	3 (10.7)	12 (42.8)
Heart Failure	224 (43.5)	87 (16.9)	204 (39.6)	8 (28.6)	5 (17.9)	15 (53.5)
Asthma	446 (86.6)	31 (6.0)	38 (7.4)	19 (67.9)	3 (10.7)	6 (21.4)
Anticoagulation	286 (55.6)	69 (13.4)	160 (31.0)	13 (46.4)	4 (14.3)	11 (39.3)
Pain management	391 (75.9)	55 (10.7)	69 (13.4)	23 (82.1)	3 (10.7)	2 (7.2)

\* Missing is from the data set for these questions

\*\* Missing is from the data set for these questions

\*\*\* A/SA=Agree/Strongly agree; N=neutral; D/SD=Disagree/Strongly disagree

\*\*\*\* Treatment of a limited number of infections

Respondents who supported both models showed remarkable preference consistency with those that only preferred either supplementary or independent prescribing. This indicated that pharmacists supporting an independent prescribing model showed strongest support for prescribing in a limited number of infections and pain management. Pharmacists who preferred supplementary prescribing showed strongest support for prescribing in asthma. This is shown in Table 3.10.

**Table 3.10 Therapeutic area preferences of respondents who supported both a supplementary and an independent prescribing model**

Therapeutic area	Supplementary model n(%)*			Independent model n(%)*		
	A/SA **	N	D/SD	A/SA	N	D/SD
Antibiotics***	156 (75.4)	13 (6.3)	38 (18.3)	166 (78.3)	14 (6.6)	32 (15.1)
Diabetes	162 (77.9)	15 (7.2)	31 (14.9)	92 (45.1)	22 (10.8)	90 (44.1)
Hypertension	156 (75.0)	20 (9.6)	32 (15.4)	92 (45.1)	25 (12.3)	87 (42.7)
Heart Failure	105 (49.7)	38 (18.0)	68 (32.2)	43 (21.1)	35 (17.2)	126 (61.8)
Asthma	168 (80.8)	8 (3.8)	32 (15.4)	151 (72.0)	23 (11.0)	36 (17.2)
Anticoagulation	124 (59.3)	29 (13.9)	56 (26.8)	60 (29.4)	32 (15.7)	112 (54.9)
Pain management	153 (73.2)	17 (8.1)	39 (18.7)	156 (74.0)	18 (8.5)	37 (17.5)

\* Missing is from the data set for these questions

\*\* A/SA=Agree/Strongly agree; N=neutral; D/SD=Disagree/Strongly disagree

\*\*\* Treatment of a limited number of infections



### 3.4.2.7 Training requirements for pharmacist prescribing

Almost all respondents (97.1%) considered they would need further training if they assume additional prescribing responsibilities.

In terms of therapeutic areas, pathophysiology of conditions was the area for which respondents agreed more that they need further training. These attitudes are summarised in Table 3.11.

**Table 3.11 Training preferences for therapeutic areas**

Training area	Level of agreement n(%)*				
	SD**	D	N	A	SA
Clinical pharmacology	52 (5.4)	123 (12.7)	138 (14.3)	381 (39.4)	274 (28.3)
Pharmacodynamics and pharmacokinetics	71 (7.4)	193 (20.1)	213 (22.2)	299 (31.1)	185 (19.3)
Adverse drug reactions and drug interactions	89 (9.3)	217 (22.6)	181 (18.8)	283 (29.4)	191 (19.9)
Pathophysiology of conditions that you would prescribe for	16 (1.6)	25 (2.6)	45 (4.6)	433 (44.4)	457 (46.8)
Selection of drug regimen	40 (4.1)	79 (8.1)	115 (11.9)	424 (43.7)	312 (32.2)
Physiological changes and drug response in different age groups	38 (3.9)	83 (8.5)	126 (12.9)	435 (44.7)	291 (29.9)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Respondents were given additional statements specifically related to the practice of an expanded prescribing role. Highest levels of support were indicated for training areas

such as principles of diagnosis, principles and methods of patient monitoring, and legal and ethical aspects of prescribing. These results are summarised in Table 3.12.

**Table 3.12 Training preferences for expanded pharmacist prescribing**

Training area	Level of agreement n(%)*				
	SD**	D	N	A	SA
Patient consultation and decision making	81 (8.3)	184 (18.9)	174 (17.8)	325 (33.3)	212 (21.7)
Communication skills	156 (16.1)	324 (33.4)	221 (22.8)	161 (16.6)	109 (11.2)
Principles of diagnosis	19 (1.9)	37 (3.8)	64 (6.5)	442 (44.9)	422 (42.9)
Evidence based practice	37 (3.8)	98 (10.0)	152 (15.5)	424 (43.2)	270 (27.5)
Legal and ethical aspects of prescribing	31 (3.2)	65 (6.6)	101 (10.3)	411 (41.8)	376 (38.2)
Psychology of prescribing	28 (2.9)	80 (8.2)	145 (14.8)	453 (46.3)	273 (27.9)
Principles and methods of patient monitoring (physical examination, laboratory results, patient compliance)	16 (1.6)	37 (3.8)	69 (7.0)	452 (45.9)	411 (41.7)
Public health issues	26 (2.7)	70 (7.2)	202 (20.6)	440 (44.9)	241 (24.6)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Ranked training preferences are also illustrated in Table 3.13

**Table 3.13 Ranked training area preferences for expanded pharmacist prescribing**

Training area	Agreement level n(%)*
	%A/SA **
Pathophysiology of conditions	890(91.2)
Principles of diagnosis	864(87.8)
Patient monitoring	863(87.6)
Legal and ethical aspects of prescribing	787(80)
Selection of drug regimen	736(75.9)
Physiological changes and drug response in different age groups	726(74.6)
Psychology of prescribing	726(74.2)
Evidence based practice	694(70.7)
Public health issues	681(69.5)
Clinical pharmacology	655(67.7)
Patient consultation and decision making	537(55)
Pharmacodynamics and pharmacokinetics	484(50.4)
Adverse drug reactions and drug interactions	474(49.3)
Communication skills	270(27.8)

\*For every statement there were some missing responses

\*\*A/SA=Agreed/Strongly agreed

The majority of respondents (93.2%) agreed/strongly agreed that continuing education is needed in order to keep their prescribing skills up to date. Of the respondents, 88.3% considered that pharmacists needed to specialise in specific clinical areas in accordance with their prescribing rights. Most respondents (84.5%) also considered that pharmacist prescribers need a specialist registration as prescribers with the registering body. Just over half of respondents (58.9%) agreed/strongly agreed that training of pharmacist prescribers should also include a period of supervision by a medical practitioner.

### 3.4.2.8 Infrastructure implications for pharmacist prescribing

Respondents were given statements which pertained to the potential impact of pharmacist prescribing on pharmacy infrastructure. Most respondents considered that in order to support an expanded pharmacist prescribing role, additional IT resources were needed and that prescribing in the pharmacy should be separated from dispensing. Pharmacists did not consider that current staff arrangements and access to patient information were adequate to support this role. Respondents' attitudes exploring infrastructural implications of pharmacist prescribing are summarised in Table 3.14.

**Table 3.14 Implications of pharmacist prescribing on pharmacy infrastructure**

Statements related to infrastructure implications	Level of agreement n(%)*				
	SD**	D	N	A	SA
I believe additional IT resources in the pharmacy would be needed to support pharmacist prescribing	22 (2.1)	75 (7.3)	130 (12.7)	455 (44.3)	344 (33.5)
I believe I have access to sufficient patient information in order to make prescribing decisions for them	141 (13.7)	379 (36.9)	173 (16.8)	213 (20.7)	121 (11.8)
I believe prescribing and dispensing should be carried out in separate areas in the Pharmacy	27 (2.6)	86 (8.4)	127 (12.3)	406 (39.5)	383 (37.2)
I believe a separate quiet consulting area for pharmacist prescribing should be created in the Pharmacy	16 (1.6)	22 (2.1)	60 (5.8)	415 (40.4)	513 (50.0)
I believe current staff arrangements in the pharmacy can support expanded pharmacist prescribing	204 (19.8)	345 (33.6)	190 (18.5)	201 (19.6)	88 (8.6)
I believe independent prescribing by a pharmacist should NOT occur in a community pharmacy (excluding S3's)	266 (26.0)	336 (32.9)	194 (19.0)	117 (11.4)	109 (10.7)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

### 3.4.2.9 Pharmacists' role in the management of minor ailments

As mentioned in Chapter I and II, currently pharmacists in Australia manage clients' minor ailments through prescribing 'Pharmacy Medicines'/'Pharmacist Only Medicines' i.e. S2/S3s. A potential extension of pharmacists' current roles in the management of minor ailments was also explored in this study. Just over half of respondents considered that a more defined consultation system should be set up for the provision of S3s. Most respondents considered that expanding the role of pharmacists in the management of minor ailments would require remuneration and that medicines prescribed under this role should be claimable from the Medicare. These attitudes are summarised in Table 3.15.

**Table 3.15 Expanding pharmacists' role for managing minor ailments**

Statements related to management of minor ailments	Level of agreement n(%)*				
	SD**	D	N	A	SA
I believe a more defined consultation system should be set up for provision of Pharmacist Only Medicines (i.e. S3's)	49 (4.8)	201 (19.6)	243 (23.7)	402 (39.1)	132 (12.9)
I believe such a defined consultation system would require a separate consultation room and possibility for customers to make appointments with the pharmacist in regards to minor ailments	49 (4.8)	233 (22.6)	231 (22.4)	380 (36.9)	136 (13.2)
I believe that any extension of current role in the management of minor ailments would require remuneration	15 (1.5)	62 (6.0)	133 (13.0)	468 (45.6)	348 (33.9)
I believe medicines prescribed from an expanded role and consultations should be claimable from Medicare	25 (2.4)	49 (4.8)	119 (11.6)	473 (46.1)	359 (35.0)
I believe current staff arrangements in the pharmacy can support an expanded pharmacists' role in the management of minor ailments	118 (11.6)	288 (28.2)	198 (19.4)	307 (30.1)	110 (10.8)

\*For every statement there were some missing responses

\*\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Most respondents (62.6%) considered 10 minutes would be needed for pharmacists' consultations under a potential new expanded role for managing minor ailments. This is as opposed to 34.3% of respondents who considered that five minutes was needed and 3.2% who considered that only three minutes was needed for such a consultation.

The remuneration of AU\$22.3 was the mean amount that respondents considered pharmacists should be paid (excluding medication cost) for their services in an expanded role for managing minor ailments. The median amount indicated by respondents was AU\$20.

### 3.4.3 Chi-Square testing

Chi-square testing was done to identify any differences between pharmacists from different Australian states, pharmacists working in different professional settings (i.e. community, hospital, consultant pharmacy, other), pharmacists' years of registration (divided in four groups: 0-5 years, 6-10 years, 11-20 years and >20 years), gender and pharmacy ownership versus key categorical variables in the questionnaire that measured pharmacists' agreement with YES/NO statements. These statements were:

1) For the YES/NO statement "***Do you think pharmacists should have expanded prescribing rights***", the following were the Chi-square test results:

- a) No significant difference ( $p=0.095$ ) was found between pharmacists' samples from different Australian states.
- b) No significant difference ( $p=0.139$ ) was found based on pharmacists' professional practice settings.
- c) No significant difference ( $p=0.998$ ) was found based on pharmacists' years of registration.
- d) No significant difference ( $p=0.742$ ) occurred between male and female pharmacists.

- e) No significant difference ( $p=0.431$ ) was found between pharmacy owners and non-owners.
- 2) For the YES/NO statement “*If I assume additional prescribing responsibilities, I would need further training*”, the following were Chi-square test results:
- a) No significant difference ( $p=0.293$ ) was found between pharmacists’ from different Australian states.
  - b) A significant difference ( $p=0.001$ ) was found based on pharmacists’ professional practice setting. Compared to other groups, consultant pharmacists responded that they needed less training in order to assume further prescribing responsibilities.
  - c) No significant difference ( $p=0.321$ ) was found between pharmacists with different years of registration.
  - d) No significant different ( $p=0.894$ ) was found between male and female pharmacists
  - e) No significant difference ( $p=0.247$ ) was found between pharmacy owners and non-owners.

#### **3.4.4 One-Way ANOVA**

One-Way ANOVA was used to evaluate differences between pharmacists from different Australian states, professional settings (i.e. community, hospital, consultant pharmacy, other), pharmacists’ years of registration (0-5 years, 6-10 years, 11-20 years and >20 years), gender and pharmacy ownership. Continuous variables measured pharmacists’ agreement on a five-point Likert scale. Significance found with ANOVA was located using Tukey’s post-hoc comparison. Where a result of  $p \leq 0.05$  occurred it was considered significant. The following is a summary of the ANOVA results.

### 3.4.4.1 Prescribing models

#### a) Respondents from Australian states

No significant difference was found in attitudes of pharmacists practising in different states for statements measuring the agreement level for supplementary and formulary prescribing models ( $p=0.172$ ,  $p=0.338$ ). However, a significant difference was found in attitudes regarding the respondents' agreement levels for independent and emergency prescribing models ( $p=0.005$ ,  $p<0.001$ ). Tukey's test identified respondents from SA to favour the independent prescribing model less in comparison to respondents from WA ( $p=0.023$ ) and NSW ( $p=0.011$ ). In terms of the emergency prescribing model, Tukey's test identified significant differences between respondents from SA in comparison to those from WA ( $p<0.001$ ), NSW ( $p=0.001$ ) and VIC ( $p=0.043$ ). Again, SA respondents indicated significantly lower levels of agreement for the emergency prescribing model. Mean values and standard deviations (SD) for these differences are given in Table 3.16.

**Table 3.16 Mean and standard deviation values of respondents from different Australian states regarding prescribing models**

Models	States					
	WA	NSW	VIC	QLD	SA	TAS
<b>I*</b> $\bar{x}$ (SD)	2.81(1.22)	2.82(1.20)	2.58(1.22)	2.49(1.10)	2.36(1.18)	2.53(1.16)
<b>S#</b> $\bar{x}$ (SD)	4.15(0.84)	4.12(0.85)	4.14(0.85)	4.07(1.04)	3.93(0.97)	3.91(0.95)
<b>E#</b> $\bar{x}$ (SD)	3.83(1.16)	3.77(1.21)	3.56(1.27)	3.40(1.30)	3.18(1.17)	3.79(1.18)
<b>F†</b> $\bar{x}$ (SD)	4.04(0.91)	3.94(0.95)	4.00(0.89)	3.83(1.10)	3.87(0.95)	4.09(0.87)

\*I=Independent, #S=Supplementary, #E=Emergency, †F=Formulary



**a) Pharmacists' professional practice setting**

No significant difference was found between pharmacists working in different professional settings in regards to their preferences for independent, supplementary, formulary or emergency prescribing model given in the questionnaire (p=0.115, p=0.087, p=0.922, p=0.159).

**b) Pharmacists' years of registration**

No significant difference was found between pharmacists' years of registration and their agreement levels for independent, supplementary, formulary and emergency prescribing models (p=0.835, p=0.663, p=0.537, p=0.617).

**c) Pharmacy Ownership**

No significant difference was found in attitudes of pharmacy owners and non-owners in regards to their preferences for supplementary and formulary prescribing models (p=0.644, p=0.360). However, a significant difference was found in attitudes regarding the independent and emergency prescribing models. Mean values of responses suggested that pharmacy owners were more supportive of both the independent and emergency prescribing models in comparison to pharmacy non-owners [independent model ( $\bar{x}$  =2.75±1.21 vs.  $\bar{x}$ =2.57±1.20, p=0.024), emergency model ( $\bar{x}$ =3.74 ±1.25 vs.  $\bar{x}$  =3.52±1.22, p=0.006)]

### 3.4.4.2 Advantages for pharmacist prescribing

#### a) Respondents from different Australian states

One-Way ANOVA levels of significance for advantages of pharmacist prescribing versus pharmacists' state of practice are summarised in Table 3.17.

**Table 3.17 One-Way ANOVA results for advantages of pharmacist prescribing vs. pharmacists' state of practice**

<b>Statements measuring agreement level for advantages of pharmacist prescribing</b>	<b>ANOVA significance</b>
S1)* Patients' better access to their medications	0.063
S2) Easing the burden from overloaded GP's and	0.003
S3) A direction which secures a more important role in health care	0.010
S4) Pharmacists are highly regarded by the community and therefore they should assume more prescribing responsibilities	0.006
S5) Pharmacists have the necessary drug knowledge	0.012
S6) Pharmacists have the necessary patient assessment skills	0.009
S7) Better use of pharmacist's professional skills	0.007
S8) Contribution to increased Pharmacy profits	0.073

\*For more details refer to sub-group of statements in Section 3, Appendix 4

Tukey's test located the significant difference in attitudes of respondents from WA and SA, in regards to whether expanded pharmacist prescribing: a) eases the burden off overloaded GP's ( $p < 0.001$ ); b) is a direction by which pharmacy profession secures a more important role in healthcare ( $p = 0.006$ ); c) should occur as pharmacists are highly regarded by the community ( $p = 0.005$ ) and d) enables a better use of pharmacists' skills ( $p = 0.002$ ). WA respondents were more in favour of those statements. Additionally, in

comparison to WA ( $p=0.024$ ) and NSW ( $p=0.008$ ) respondents, SA pharmacists were significantly less in supportive of pharmacists having the necessary drug knowledge to assume more prescribing responsibilities. Furthermore, SA pharmacists in comparison to NSW pharmacists were less convinced of pharmacists having the necessary patient assessment skills to assume more prescribing responsibilities ( $p=0.002$ ). Mean values of statements in which a significant difference was found are summarised in Table 3.18.

**Table 3.18 Mean and standard deviation values of statements where significant differences were found between respondents from different states in relation to advantages of pharmacist prescribing.**

Place of practice	Mean and standard deviation values of statements measuring the agreement levels for advantages of pharmacist prescribing											
	S2*		S3		S4		S5		S6		S7	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
WA	4.21	0.82	4.04	0.96	3.90	0.94	3.92	0.97	3.32	1.01	4.13	0.83
NSW	3.98	1.04	3.87	1.09	3.76	1.02	3.94	0.90	3.50	1.10	3.97	0.98
VIC	3.98	0.94	3.88	1.05	3.72	1.00	3.83	0.95	3.27	1.06	3.94	0.90
QLD	4.00	0.89	3.84	1.08	3.63	1.03	3.94	0.91	3.23	1.07	3.92	1.06
SA	3.73	1.04	3.59	1.03	3.46	1.05	3.56	1.06	3.03	1.16	3.69	1.02
TAS	3.91	0.89	3.60	1.18	3.47	0.93	3.91	0.95	3.19	1.04	3.81	0.91

\*Please refer to Table 3.17 for a description of statements

#### **b) Pharmacists professional practice setting**

One-Way ANOVA significance values for potential advantages of pharmacist prescribing (i.e. Section 3 statements in Appendix 4) versus pharmacists' professional practice setting are summarised in Table 3.19.

**Table 3.19 One-Way ANOVA significance values for reasons for pharmacist prescribing vs. pharmacists professional practice setting**

<b>Statements measuring agreement level for advantages of pharmacist prescribing</b>	<b>ANOVA significance</b>
S1)* Patients' better access to their medications	0.496
S2) Easing the burden from overloaded GP's and	0.314
S3) A direction which secures a more important role in health care	0.001
S4) Pharmacists are highly regarded by the community and therefore they should assume more prescribing responsibilities	0.011
S5) Pharmacists have the necessary drug knowledge	0.025
S6) Pharmacists have the necessary patient assessment skills	0.053
S7) Better use of pharmacist's professional skills	0.002
S8) Contribution to increased Pharmacy profits	0.094

\*For more details please refer to sub-group of statements in Section 3, Appendix 4

Mean values of statements in which a significant difference was found are summarised in Table 3.20.

**Table 3.20 Mean and standard deviation values of statements where a significant difference was found between pharmacists' practice setting and advantages of pharmacist prescribing**

<b>Practice setting</b>	<b>Mean and standard deviation of statements measuring the agreement levels for advantages of pharmacist prescribing</b>							
	S3*		S4		S5		S7	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Community	3.87	1.04	3.73	1.00	3.85	0.96	3.95	0.93
Hospital	3.58	1.17	3.48	1.02	3.71	1.00	3.76	1.02
Consultancy	4.57	0.65	4.29	0.73	4.43	0.65	4.71	0.61
Other	4.09	0.86	3.69	0.96	4.06	0.88	4.03	0.68

\*Please refer to Table 3.19 for a description of statements

The Tukey's test identified hospital pharmacists to be less in favour of expanding prescribing so that pharmacists secure a more important role, in comparison to community ( $p=0.026$ ) and consultant pharmacists ( $p=0.005$ ). Hospital and consultant pharmacists also had differences in attitudes for the statement that prescribing should be introduced because pharmacists are regarded highly by the community ( $p=0.023$ ) and that pharmacists have the necessary drug knowledge ( $p=0.038$ ). Hospital pharmacists were less in favour of these statements. In terms of better use of pharmacists' skills, consultant pharmacists had significant level of differences in attitudes with both community ( $p=0.013$ ) and hospital pharmacists ( $p=0.002$ ). Consultant pharmacists agreed significantly more with this statement.

#### **c) Pharmacists' years of registration**

No significant differences in responses were identified using One-way ANOVA based on pharmacists' years of registration for statements regarding advantages of pharmacist prescribing in section 3 of Appendix 4: Statement 1,  $p=0.74$ ; Statement 2,  $p=0.677$ ; Statement 3,  $p=0.418$ ; Statement 4,  $p=0.692$ ; Statement 5,  $p=0.307$ ; Statement 6,  $p=0.380$ ; Statement 7,  $p=0.906$ ; Statement 8,  $p=0.411$ .

#### **d) Pharmacy ownership**

The results of the One-way ANOVA to assess the influence of pharmacy ownership on pharmacists' perceptions of the advantages of expanded pharmacist prescribing are summarised in Table 3.21.

**Table 3.21 One-Way ANOVA significance values for advantages of pharmacist prescribing vs. pharmacy ownership**

<b>Statements measuring agreement level for advantages of pharmacist prescribing</b>	<b>ANOVA significance</b>
S1)* Patients' better access to their medications	0.014
S2) Easing the burden from overloaded GP's and	0.059
S3) A direction which secures a more important role in health care	0.284
S4) Pharmacists are highly regarded by the community and therefore should assume more prescribing responsibilities	0.041
S5) Pharmacists have the necessary drug knowledge	0.075
S6) Pharmacists have the necessary patient assessment skills	<0.0001
S7) Better use of pharmacist's professional skills	0.050
S8) Contribution to increased Pharmacy profits	0.220

\*For more details refer to sub-group of statements in Section 3, Appendix 4

The interpretation of mean values shows that for statements 1, 4, 6 and 7 significant differences were found. Pharmacy owners compared with non-owners more strongly favoured a) patients' better access to medicines ( $\bar{x}=3.89\pm 1.02$  vs.  $\bar{x}=3.73\pm 0.97$ ), b) pharmacists highly regarded role by community being a reason for expanding their prescribing role ( $\bar{x}=3.79\pm 1.02$  vs.  $\bar{x}=3.66\pm 1.00$ ) c) better use of pharmacist's professional skills ( $\bar{x}=4.02\pm 0.90$  vs.  $\bar{x}=3.90\pm 0.95$ ) and d) pharmacists having the necessary patient assessment skills to assume further prescribing responsibilities ( $\bar{x}=3.50\pm 1.01$  vs.  $\bar{x}=3.18\pm 1.10$ ).

### 3.4.4.3 Pharmacist prescribing barriers

#### a) Pharmacists working in different Australian states

The results of the One-Way ANOVA to assess the influence of the pharmacists' state of practice on perceived barriers to pharmacist prescribing are summarised in Table 3.22.

**Table 3.22 One-Way ANOVA significance levels for pharmacist prescribing barriers vs. pharmacists' state of practice**

<b>Statements measuring agreement level for barriers of pharmacist prescribing</b>	<b>ANOVA significance</b>
S1) Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	0.131
S2) Inadequate training in patient assessment and patient monitoring	0.010
S3) Potential for a reduction in the quality of patient care	0.533
S4) Potential for increased patient costs	0.026
S5) Potential for increased hospital admissions	0.167
S6) Potential for increased government costs	0.044
S7) Conflict of interest with pharmacists acting both as prescribers and dispensers	0.007
S8) Pharmacists' lack of time	0.015
S9) Increased confusion amongst the public as to the role of GP's and pharmacists	0.123
S10) Potential decrease in quality of current services offered by pharmacists	0.002
S11) Pharmacists having commercial interest in prescribing	0.009
S12) Inadequate facilities within pharmacies to allow pharmacist prescribing	0.001
S13) Increased likelihood of litigation	0.778

\*For more details refer to sub-group of statements in Section 5, Appendix 4

The Tukey's test located a significant difference between respondents from SA, NSW and VIC in regards to their agreement levels for the statement pertaining to inadequate training in patient assessment and patient monitoring. Respondents from NSW agreed significantly less than those of SA ( $p=0.017$ ) and VIC ( $p=0.023$ ) with that statement. WA respondents agreed significantly less than SA respondents that a) increased government cost ( $p=0.047$ ), b) conflict of interest between pharmacists acting both as prescribers and dispensers ( $p=0.006$ ), c) pharmacists lack of time ( $p=0.003$ ), d) decrease of quality of current pharmacy services ( $p=0.007$ ) and e) pharmacists commercial interest in prescribing ( $p=0.038$ ) are reasons why pharmacists should not assume expanded prescribing roles. Respondents from SA also agreed significantly more than respondents from WA ( $p=0.013$ ) and NSW ( $p=0.001$ ) that inadequate facilities within pharmacies is a barrier towards an expanded prescribing role.

A summary of mean values for statements where One-Way ANOVA identified a significant difference (and also confirmed with Tukey's post-hoc) is given in Table 3.23.

**Table 3.23 Mean values of statements where significant difference was found between respondents' state of practice and attitudes on pharmacist prescribing barriers**

State	Mean and standard deviation values of statements measuring the agreement levels for barriers to pharmacist prescribing					
	S2*		S6		S7	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
WA	3.74	1.06	2.34	1.00	3.07	1.21
NSW	3.56	1.11	2.38	1.08	3.19	1.15
VIC	3.85	1.03	2.53	1.07	3.37	1.18
QLD	3.62	1.26	2.56	0.97	3.38	1.04
SA	3.96	0.94	2.71	1.15	3.58	1.10
TAS	3.74	0.93	2.55	0.92	3.44	1.20

\*Please refer to Table 3.22 for a description of statements



**Table 3.23 Mean values of statements where significant difference was found between respondents' state of practice and attitudes on pharmacist prescribing barriers (continued)**

State	Mean and standard deviation values of statements measuring the agreement levels for barriers to pharmacist prescribing							
	S8		S10		S11		S12	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
WA	3.09	1.32	2.51	1.17	3.14	1.18	3.40	1.17
NSW	3.34	1.16	2.60	1.10	3.17	1.13	3.32	1.12
VIC	3.39	1.22	2.79	1.18	3.43	1.19	3.59	1.13
QLD	3.36	1.17	2.65	1.08	3.38	1.07	3.58	1.20
SA	3.64	1.11	3.07	1.19	3.56	1.06	3.86	0.98
TAS	3.40	1.17	2.72	1.05	3.28	1.16	3.60	1.00

**b) Pharmacists' professional practice setting**

The results of the One-Way ANOVA to assess the influence of the pharmacists' professional practice setting on perceived barriers to pharmacist prescribing are summarised in Table 3.24.

**Table 3.24 One-Way ANOVA levels of significance for pharmacist prescribing barriers vs. pharmacists' professional practice setting**

<b>Statements measuring agreement level for barriers of pharmacist prescribing</b>	<b>ANOVA significance</b>
S1*) Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	0.142
S2) Inadequate training in patient assessment and patient monitoring	0.025
S3) Potential for a reduction in the quality of patient care	0.440
S4) Potential for increased patient costs	0.294
S5) Potential for increased hospital admissions	0.149
S6) Potential for increased government costs	0.082
S7) Conflict of interest with pharmacists acting both as prescribers and dispensers	0.003
S8) Pharmacists' lack of time	0.007
S9) Increased confusion amongst the public as to the role of GP's and pharmacists	0.035
S10) Potential decrease in quality of current services offered by pharmacists	0.373
S11) Pharmacists having commercial interest in prescribing	<0.001
S12) Inadequate facilities within pharmacies to allow pharmacist prescribing	0.027
S13) Increased likelihood of litigation	0.708

*\*For more details please refer to sub-group of statements in Section 5, Appendix 4*

The Tukey's test located a significant difference between community and hospital pharmacists in regards to a) pharmacists' inadequate training in patient assessment and monitoring ( $p=0.029$ ), b) conflict of interest with pharmacists acting both as prescribers and dispensers ( $p=0.001$ ), c) pharmacists having a commercial interest in prescribing ( $p<0.001$ ) and d) inadequate facilities to allow pharmacist prescribing ( $p=0.031$ ). Community pharmacists agreed less with these statements. Community pharmacists in comparison to pharmacists working in *other* professional settings agreed more that pharmacists' lack of time ( $p=0.017$ ) was a reason why they should not have expanded prescribing rights. A summary of mean values of statements for which One-Way

ANOVA identified a significant difference (and also confirmed with Tukey's test) is given in Table 3.25.

**Table 3.25 Mean and standard deviation values of statements where a significant difference was found between respondents practice setting and attitudes on pharmacist prescribing barriers**

Practice setting	Mean and standard deviation values of statements measuring the agreement level on barriers to pharmacist prescribing					
	S2*		S6		S7	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Community	3.73	1.08	2.48	1.06	3.27	1.17
Hospital	4.03	0.90	2.72	1.08	3.71	1.07
Consultancy	3.86	1.10	2.21	0.97	3.07	1.23
Other	3.53	1.07	2.39	1.12	3.41	1.21

**Table 3.25 Mean and standard deviation values of statements where a significant difference was found between respondents practice setting and attitudes on pharmacist prescribing barriers (continued)**

Practice setting	Mean and standard deviation values of statements measuring the agreement level on barriers to pharmacist prescribing					
	S8*		S11		S12	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Community	3.39	1.20	3.28	1.16	3.51	1.13
Hospital	3.48	1.14	3.78	1.02	3.82	1.02
Consultancy	2.86	1.15	3.43	1.16	3.21	1.48
Other	2.75	1.21	3.25	1.22	3.41	1.04

\*Please refer to Table 3.24 for a description of statements

### c) Pharmacists' years of registration

In terms of differences in attitudes regarding the barriers of expanded pharmacist prescribing versus pharmacists' years of registration, inadequate facilities to expand pharmacist prescribing was the only statement for which One-Way ANOVA indicated a significant difference ( $p=0.035$ ). The Tukey's test found that the group of pharmacists registered for less than 5 years were more strongly in favour of this statement in comparison to pharmacists' registered for more than 20 years ( $p=0.023$ ). Mean values for responses to the statement "inadequate facilities to expanding pharmacist prescribing" are presented in Table 3.26.

**Table 3.26 Mean and standard deviation values of statement for which Tukey's test located a significant difference**

Years of registration	Mean and standard deviation values for the statement "inadequate facilities within pharmacies to support pharmacist prescribing"	
	$\bar{x}$	SD
0-5	3.72	1.08
6-10	3.59	1.12
11-20	3.51	1.11
>20	3.44	1.17

### d) Pharmacy ownership

The results of the One-Way ANOVA to assess the influence of pharmacy ownership on perceived barriers to pharmacist prescribing are summarised in Table 3.27.

**Table 3.27 One-Way ANOVA significance values for pharmacist prescribing barriers vs. pharmacy ownership**

<b>Statements measuring agreement level for barriers of pharmacist prescribing</b>	<b>ANOVA Significance</b>
S1*) Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	0.001
S2) Inadequate training in patient assessment and patient monitoring	0.066
S3) Potential for a reduction in the quality of patient care	0.595
S4) Potential for increased patient costs	0.215
S5) Potential for increased hospital admissions	0.590
S6) Potential for increased government costs	0.049
S7) Conflict of interest with pharmacists acting both as prescribers and dispensers	0.147
S8) Pharmacists' lack of time	0.001
S9) Increased confusion amongst the public as to the role of GP's and pharmacists	0.484
S10) Potential decrease in quality of current services offered by pharmacists	0.049
S11) Pharmacists having commercial interest in prescribing	<0.001
S12) Inadequate facilities within pharmacies to allow pharmacist prescribing	<0.001
S13) Increased likelihood of litigation	0.001

*\*For more details please refer to sub-group of statements in Section 5, Appendix 4*

The interpretation of mean values shows that for statements 1, 6, 8, 10, 11, 12 and 13 significant differences were found with ANOVA. Compared to pharmacy owners, pharmacy non-owners more strongly favoured the following barriers to expanded prescribing rights: a) inadequate training in disease diagnosis ( $\bar{x}=3.96\pm0.965$  vs.  $\bar{x}=4.16\pm0.932$ ), b) potential for increased government cost ( $\bar{x}=2.41\pm1.101$  vs.  $\bar{x}=2.55\pm1.038$ ), c) pharmacists' lack of time ( $\bar{x}=3.20\pm1.168$  vs.  $\bar{x}=3.40\pm1.214$ ), d) potential decrease in quality of current services offered by pharmacists ( $\bar{x}=3.64\pm1.00$  vs.  $\bar{x}=2.79\pm0.99$ ), e) pharmacists having a commercial interest in prescribing ( $\bar{x}$

=3.16±1.00 vs.  $\bar{x}$ =3.44±1.00), inadequate facilities within pharmacies to allow pharmacist prescribing ( $\bar{x}$ =0.26±1.00 vs.  $\bar{x}$ =3.69±1.00) and f) increased likelihood of litigation ( $\bar{x}$ =3.44±1.00 vs.  $\bar{x}$ =3.70±0.86).

#### **3.4.4.5 Training requirements for expanded pharmacist prescribing**

##### **a) Respondents from different Australian states**

One-Way ANOVA performed on these data showed no significant difference ( $p>0.05$ ) between respondents practicing in different Australian states for any of the statements that measured attitudes of respondents on training requirements (see Section 7A,7B and 7C statements in Appendix 4) for an expanded prescribing role for pharmacists.

##### **b) Pharmacists' professional practice setting**

From statements related to training requirements for expanded pharmacist prescribing, One-Way ANOVA identified a significant difference in attitudes of pharmacists working in different professional practice settings for the following three statements:

- 1) Selection of drug regimen ( $p=0.005$ )
- 2) Specializing in clinical areas in accordance with additional prescribing rights assumed eg. Diabetes, Cardiology, Asthma, Anticoagulation, Pain management, Infections ( $p=0.003$ )
- 3) Specialist registration as prescribers with the registering body ( $p=0.004$ )

The Tukey's test identified consultant pharmacists involved in medication reviews needed less training for selection of drug regimens in comparison to community ( $p=0.009$ ) and hospital pharmacists ( $p=0.003$ ). The Tukey's test also identified community pharmacists, in comparison to hospital pharmacists, to be less in favour of a)

pharmacist prescribers to specialise in specific clinical areas in accordance with additional prescribing rights assumed (p=0.008) and b) specialist registration as prescribers with the registering body (p=0.009). A summary of mean and standard deviation values for statements where One-Way ANOVA identified significant difference (and also confirmed with Tukey's test) is given in Table 3.28.

**Table 3.28 Mean and standard deviation values of statements where significant difference was found between respondents' practice setting and training preferences for therapeutic areas**

Practice setting	Mean and standard deviation values of statements measuring the agreement level on preferred therapeutic area training preferences					
	Selection of drug regimen		Specialising in clinical areas		Registering with a registering body	
	$\bar{x}$	SD*	$\bar{x}$	SD	$\bar{x}$	SD
Community	3.93	1.06	4.23	0.85	4.15	0.92
Hospital	4.06	0.98	4.50	0.81	4.44	0.81
Consultant	2.91	1.64	4.64	0.50	4.64	0.67
Other	3.74	0.89	4.45	0.57	4.03	0.87

**c) Pharmacists' years of registration**

The results of One-Way ANOVA on the influence of pharmacists' years of registration on training preferences for therapeutic areas of prescribing are summarised in Table 3.29.

**Table 3.29 One-Way ANOVA levels of significance for training preferences for therapeutic areas vs. pharmacists' years of registration**

<b>Statements measuring agreement levels on training needs for therapeutic areas</b>	<b>ANOVA significance</b>
S1*)Clinical pharmacology	<0.0001
S2)Pharmacodynamics and pharmacokinetics	<0.0001
S3)Adverse drug reactions and drug interactions	<0.0001
S4)Pathophysiology of conditions that you would prescribe for	0.010
S5)Selection of drug regimen	0.037
S6)Physiological changes and drug response in different age groups	0.002
S7)Patient consultation and decision making	0.069
S8)Communication skills	0.753
S9)Principles of diagnosis	0.133
S10)Evidence based practice	0.063
S11)Legal and ethical aspects of prescribing	0.116
S12)Psychology of prescribing	0.018
S13)Principles and methods of patient monitoring (physical examination, laboratory results, patient compliance)	0.070
S14)Public health issues	0.098
S15)A period of supervision by a Medical Practitioner	0.213
S16)Demonstration of relevant Continuing Education that ensures their prescribing skills are kept to date	0.431
S17) Specializing in clinical areas that conform with additional prescribing rights assumed (eg. Diabetes, Cardiology, Asthma, Anticoagulation, Pain management, Infections)	0.113
S18)Specialist registration as prescribers with the registering body	0.192

*\*For more details please refer to sub-group of statements in Section 7, Appendix 4*

The Tukey's test identified pharmacists registered for >20years compared to those registered for 0-5years and 11-20years to need more training in pharmacology (p=0.012 and p=0.001). Compared to respondents registered for 0-5years, 6-10years and 11-20years, respondents registered for >20years also needed more training in



pharmacokinetics and pharmacodynamics ( $p < 0.001$ ,  $p = 0.043$  and  $p = 0.001$ ), adverse drug reactions and drug interactions ( $p = 0.012$ ,  $p = 0.008$  and  $p = 0.002$ ).

Pharmacists registered for 11-20 years felt they needed less training in pathophysiology of conditions, compared to pharmacists registered for 0-5 years and 6-11 years ( $p = 0.045$  and  $p = 0.011$ ).

Pharmacists registered for 11-20 years felt they needed less training in selection of drug regimen compared to pharmacists registered for 6-10 years ( $p = 0.045$ ).

Pharmacists registered for >20 years, in comparison to those registered for 0-5 years, considered they needed more training in physiological changes and drug response in different age groups in comparison ( $p = 0.001$ ). No significant difference between different groups was located using Tukey's test ( $p > 0.05$ ), for training in psychology of prescribing although ANOVA alpha-level was significant ( $p = 0.018$ ).

A summary of mean values for statements where One-Way ANOVA indicated significant differences is given in Table 3.30. This table illustrates with exception of area of selection of drug regimen (S4), pharmacists registered for >20 years showed stronger levels of agreement with all statements.

**Table 3.30 Mean and standard deviation values of statements for which One-Way ANOVA indicated significant difference**

Years of registration	Mean and standard deviation values of statements measuring the agreement level on preferred therapeutic area training preferences					
	S1*		S2		S3	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
0-5	3.58	1.22	3.07	1.17	3.14	1.25
6-10	3.65	1.20	3.26	1.27	3.09	1.32
11-20	3.52	1.24	3.17	1.23	3.09	1.32
>20	3.90	1.05	3.56	1.14	3.48	1.20

**Table 3.30 Mean and standard deviation values of statements for which One-Way ANOVA indicated significant difference (continued)**

Years of registration	Mean and standard deviation values of statements measuring the agreement level on preferred therapeutic area training preferences					
	S4		S5		S6	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
0-5	4.39	0.81	3.98	1.09	3.66	1.15
6-10	4.44	0.81	4.11	0.95	3.91	1.11
11-20	4.17	0.96	3.81	1.13	3.80	1.09
>20	4.33	0.72	3.87	1.05	4.00	0.95

\*please refer to Table 3.29 for description of statements

#### **d) Pharmacy ownership**

One-Way ANOVA identified significant differences between the attitudes of pharmacy owners and non-owners only on the need for a) a period of supervised training by a medical practitioner ( $p=0.001$ ), b) specializing in clinical areas in accordance with additional prescribing rights assumed ( $p<0.001$ ) and c) specialist registration as prescribers with a registering body ( $p=0.001$ ). In comparison to pharmacy owners, pharmacist non-owners agreed significantly more with the above statements. Mean and standard deviation values for these three statements where the difference was significant are presented in Table 3.31.

**Table 3.31 Mean and standard deviation values for statements where a significant difference in attitudes between owners and non-owners on training requirements**

Pharmacy ownership	Mean and standard deviations values of statements					
	training with medical practitioner		specializing in clinical areas		specialist registration	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
<b>Owners</b>	3.44	1.14	4.13	0.91	4.04	1.00
<b>Non-owners</b>	3.68	1.15	4.34	0.79	4.25	0.86

### 3.4.5 Factor Analysis

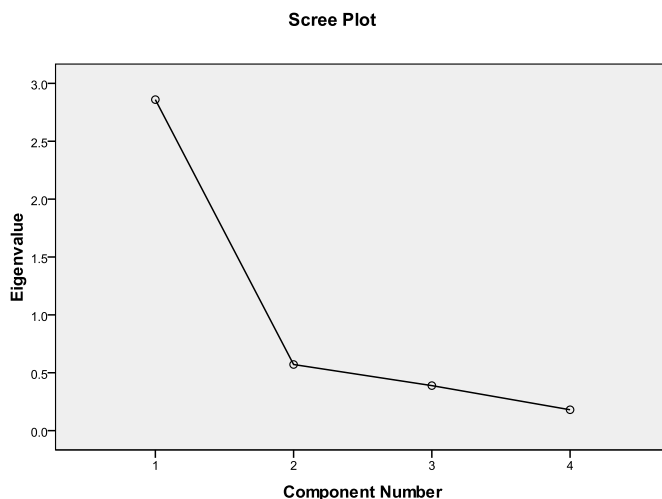
Factor analysis was performed on four sections of the questionnaire in order to reduce the number of variables and hence facilitate further analysis of results. Principal Component Analysis was the extraction method. In each section, sub-group of statements measured attitudes of respondents on one particular theme related to expanded pharmacist prescribing. Results of factor analysis for these four sections of the questionnaire are presented below:

**Section 1:** Factor analysis of questionnaire statements related to prescribing and the future of the pharmacy profession (please refer to sub-group of statements in Section 1 of Appendix 4) was successful in reducing the number of variables. One factor was extracted for this group of statements. Factor loadings for these statements were 0.77, 0.93, 0.88, 0.79. Percentage of variance explained was 71.4%. Kaiser-Meyer-Olkin measure of sampling adequacy (0.783) and Bartlett's test of sphericity (<0.0001)

confirmed the suitability for factoring. This was additionally supported by the screeplot (Figure 1).

Cronbach's alpha was performed for the group of statements related to prescribing and the future of pharmacy profession to confirm their internal consistency. Cronbach's alpha result was 0.86.

The variable extracted was named "*Expanding pharmaceutical services through prescribing*".

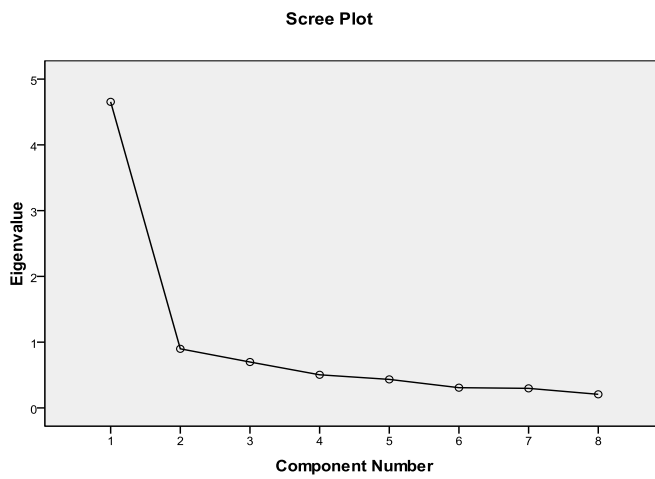


**Figure 3.1 Screeplot illustrating variables extracted from groups of statements related to prescribing and the future of pharmacy profession**

**Section 3:** Factor analysis of questionnaire statements related to potential advantages for pharmacists expanding their prescribing role (please refer to sub-group of statements in Section 3 Appendix 4 for statement details) was successful in reducing the number of variables.

One factor was extracted for this group of statements. Factor loadings for these statements were (0.76, 0.82, 0.85, 0.85, 0.77, 0.69, 0.87, 0.38). Percentage of variance explained was 58.2%. Kaiser-Meyer-Olkin measure of sampling adequacy (0.903) and Bartlett's test of sphericity ( $<0.0001$ ) confirmed the suitability for factoring. This was supported by the screeplot as well (Figure 3.2). Internal consistency of statements was performed and Cronbach's alpha result was 0.89.

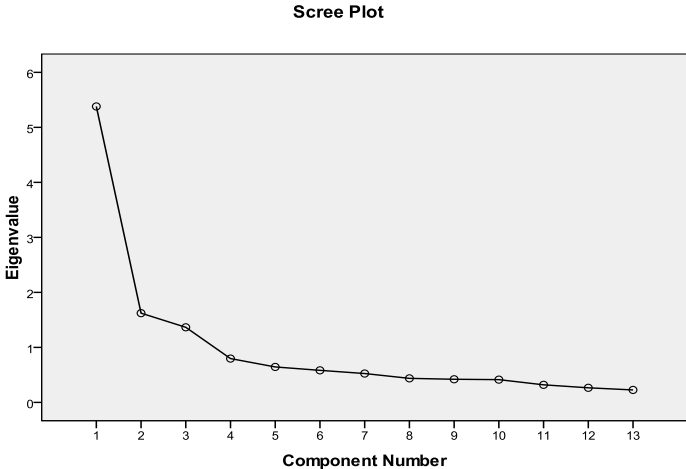
The variable extracted was named “*Pharmacist prescribing drivers*”.



**Figure 3.2** Screeplot illustrating variables extracted from groups of statements related to potential advantages why pharmacists should have expanded prescribing rights

**Section 5:** In factoring the group of questions related to barriers for expanding pharmacists’ prescribing role (please refer to sub-group of statements in Section 5, Appendix 4), three factors emerged with eigenvalues of more than 1.0. Kaiser-Meyer-Olkin measure of sampling adequacy (0.867) and Bartlett’s test of sphericity (<0.0001) confirmed the suitability for factoring. This was supported by the screeplot as well (Figure 3.3). Clearer interpretation was obtained by using Varimax rotation as shown in Table 3.32. Three factors extracted explained 64.3% of the variance. Factors extracted (i.e. variables) were named according to what the groups of statements pertained to: **i) “Other barriers”;** **ii) “Increased cost and deterioration of patient care”** and **iii) “Inadequate training in diagnosis, patient assessment and monitoring”** (see Table 3.32).

Cronbach's alpha internal consistencies were as follows: i) other barriers 0.83; ii) increased cost and deterioration of patient care 0.87 and iii) inadequate training in diagnosis, patient assessment and monitoring 0.83.



**Figure 3.3 Screeplot illustrating variables extracted from groups of statements related to barriers of pharmacist expanded prescribing.**

**Table 3.32 Rotated Component Matrix for statements related to potential barriers of pharmacist expanded prescribing**

Reasons for which pharmacists should not have expanded prescribing rights	Factors extracted <sup>(a)</sup>		
	i	ii	iii
Increased confusion amongst the public as to the roles of GP's and pharmacists	0.752		
Pharmacists' having commercial interest in prescribing	0.727		
Pharmacists' lack of time	0.716		
Potential decrease in quality of current services offered by pharmacists	0.663		
Increased likelihood of litigation	0.662		
Inadequate facilities within pharmacies to allow pharmacist prescribing	0.659		
Conflict of interest with pharmacists acting both as prescribers and dispensers	0.642		
Potential for increased hospital admissions		0.854	
Potential for increased patient costs		0.824	
Potential for increased government costs		0.816	
Potential for a reduction in the quality of patient care		0.731	
Inadequate training in patient diagnosis			0.896
Inadequate training in patient assessment and monitoring			0.864

Extraction Method: Principal Component Analysis.

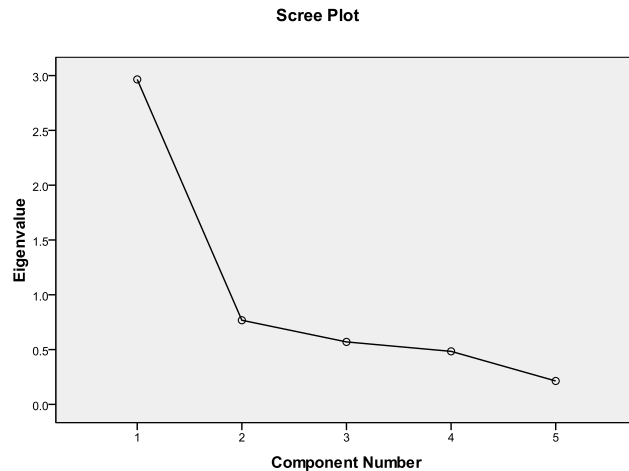
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations

(a)factors: i)other barriers, ii)increased cost and deterioration of patient care and iii) inadequate training in diagnosis and patient assessment

**Section 2:** Factor analysis of questionnaire statements related to pharmacists' perspectives on their clients' views on pharmacist prescribing (please refer to sub-group of statements in Section 2, Appendix 4) was successful in reducing the number of variables. One factor was extracted for this group of statements. Factor loadings for these statements were (0.82, 0.83, 0.71, 0.72, 0.75). Percentage of variance explained was 59.3%. Kaiser-Meyer-Olkin measure of sampling adequacy (0.772) and Bartlett's test of sphericity (<0.0001) confirmed the suitability for factoring. This was supported by the screeplot as well (Figure 3.4)

Internal consistency of statements in Section 2 was checked using Cronbach's alpha and the result was 0.82.

The variable extracted was named “*Pharmacists’ perspectives on their clients’ views of pharmacist prescribing*”.



**Figure 3.4** Screeplot illustrating variables extracted from groups of statements related to Pharmacists’ opinion based upon their perceptions of their clients.

#### **3.4.5.1 Summary of variables created with Factor Analysis models**

Factor analysis reduced the number of questionnaire items and facilitated further interpretation of the data. New variables created as a result of this analysis are summarised below:

- 1) Expanding pharmaceutical services through prescribing;**
- 2) Pharmacist prescribing drivers;**
- 3a) Other barriers;**
- 3b) Increased cost and deterioration of patient care**
- 3c) Inadequate training in diagnosis, patient assessment and monitoring;**
- 4) Pharmacists’ perspectives on their clients’ views of pharmacist prescribing**



### 3.4.6 Regression Analysis

From the variables extracted during the factor analysis two models were developed using linear regression. The two regression analyses performed used the factor summary score obtained from Section 1 (Appendix 4) as the dependent variable (“*Expanding pharmaceutical professional services through prescribing*”). The first regression model examined the association between the independent and supplementary prescribing model, in relation to the dependent variable used. This model explained only 36.7% of variance. Both independent and supplementary prescribing were positive predictors of expanding pharmaceutical services through prescribing ( $p < 0.001$ ). Pharmacists who preferred supplementary prescribing showed a stronger association (based on the regression coefficient  $\beta$ ) compared to pharmacists who preferred independent prescribing ( $\beta = 0.52$ ,  $p < 0.0001$  versus  $\beta = 0.18$ ,  $p < 0.0001$ ).

In the second regression model, the independent variables included the five summary scores found through the factor analyses performed on Sections 2,3 and 5 of Appendix 4. The dependent variable (“*Expanding pharmaceutical professional services through prescribing*”), used the factor summary score obtained from Section 1 (Appendix 4). This model explained 62.2% of variance. This model, shown in Table 3.33, indicated that both pharmacist prescribing drivers (i.e. advantages) and their opinions based upon their clients’ perspectives on pharmacist prescribing were important positive predictors of an expansion of pharmacist services through prescribing ( $\beta = 0.74$ ,  $p < 0.001$  and  $\beta = 0.12$ ,  $p = 0.005$ ). The model also showed patient diagnosis, assessment and monitoring were more negatively associated with expanding services through prescribing as opposed to other barriers or increased cost and deterioration of patient care [ $\beta = -0.098$ ,  $\beta = -0.091$  and  $\beta = -0.075$ ;  $p < 0.001$ ,  $p = 0.003$  and  $p = 0.004$ ) see Table 3.33].

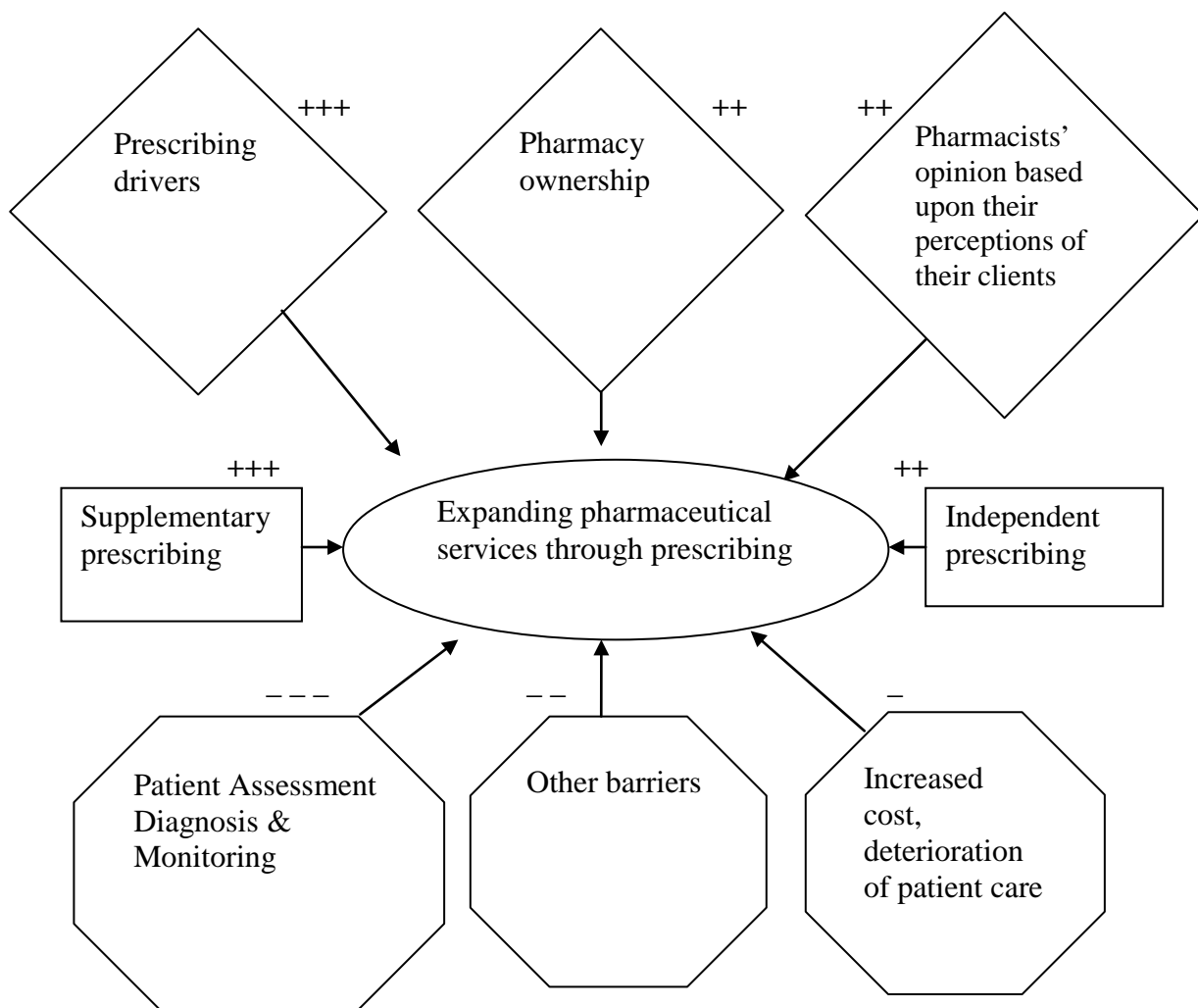
Regression analysis for the effect of pharmacy ownership on expanding pharmaceutical services through prescribing revealed that pharmacy ownership is also a positive predictor for this role ( $\beta = 0.156$ ,  $p = 0.009$ ).

**Table 3.33 Beta values for Model 2: The relationship between the variables of pharmacist prescribing drivers, barriers and pharmacists opinions based upon their experience with clients against expanding pharmaceutical services through prescribing.†**

Constant	Standardized Coefficients*		Probability
	Beta	T	
	1.432	6.820	<.0001
Prescribing drivers	.747	18.847	<.0001
Experience with clients	.127	2.796	0.005
Diagnosis and Assessment	-.098	-4.094	<.0001
Cost & deterioration of patient care	-.075	-2.913	0.004
Other barriers	-.091	-3.002	0.003

†Dependent variable: Expanding pharmaceutical services through prescribing; \*Negative coefficients indicate a significant barrier

Figure 3.5 encapsulates the factors and weightings that had significant positive and negative impact on pharmacists considering moving towards an expanded prescribing role. The weightings are assigned based on the parameters in the regression models showing the extent to which variables predicted the expansion of pharmaceutical services through prescribing.



**Figure 3.5 Graphical illustration of a relationship model between positive and negative predictors of expanding pharmaceutical services through prescribing.**

### 3.5 Discussion

This study has explored perspectives of a large sample of Australian pharmacists on expanded pharmacist prescribing. Respondents were from all areas of pharmacy practice and all Australian states. To our knowledge this is the first major study on the attitudes of Australian pharmacists to expanded pharmacist prescribing. Respondents place of professional practice in this study was reflective of the Australian Bureau of Statistics (ABS) Population Census data 2006 (i.e. Community pharmacists 84.9%, Hospital 11.2% and Industrial 3.8%).<sup>4</sup> This study achieved a response rate of 40.4%, which although adequate for a postal survey, leaves a possibility of some non-respondents not sharing the same views as respondents. However, it should be emphasized that the respondents' highly supportive views for expanded pharmacist prescribing (83.9%) suggested that non-respondents' views would not markedly influence the findings.

Pharmacists who participated in this study were clearly in favour of expanding the scope of pharmaceutical services through expanding their prescribing role. Almost all respondents indicated that further training was needed to assume such a role. This study has indicated that Australian pharmacists strongly preferred a supplementary prescribing model. This support for the supplementary model might suggest this model should be initially introduced. Respondents also indicated a strong level of support for pharmacists prescribing from an expanded list of drugs included in a drug formulary (i.e. an expanded S2 and S3 drug list) according to their area of specialisation. The level of support for independent prescribing in this study was less than reported in a previous Australian study.<sup>1</sup> However, that study was limited by a low response rate (6.4%) and an under-representation of community pharmacists.<sup>16</sup> Given the strongest level of support for a supplementary prescribing model, this study focused more on comparing this prescribing model with the independent one. For example, although both supplementary and independent prescribing were positive predictors of expanding pharmaceutical services through prescribing, pharmacists who were in favour of supplementary prescribing showed a stronger association towards this expansion. Respondents who favoured the independent model showed support for less therapeutic areas of prescribing

compared to supporters of supplementary prescribing. This was probably because supplementary prescribing does not involve the initial diagnosis and prescribing. It is worth emphasising that pharmacists' opinions based upon their perceptions of their clients was shown to be an important predictor of expanding pharmaceutical services through prescribing. To date there is a lack of literature exploring this particular relationship.

This study found no significant differences between pharmacists from different states in regards to key questions such as support for expanded pharmacist prescribing and training requirements. However, there were differences in attitudes in regards to sub-questions such as those related to prescribing models, advantages of and barriers to pharmacist prescribing. These differences could have been due to key opinion leaders in various states as the impact of different educational foci in various pharmacy schools would dissipate with time. There were also differences identified between pharmacists' professional practice area and their attitudes on issues such as training. In this regard consultant pharmacists were less supportive. However, they were more supportive of pharmacist prescribing enabling a better use of their skills. These differences may be due to consultant pharmacists receiving additional training to become accredited to enable them to perform medication reviews.

The positive attitude towards a supplementary prescribing model found in this study is supported by the views of pharmacists reported elsewhere. This was shown in the UK by Hobson and Sewell who suggested pharmacists had a positive attitude towards supplementary prescribing and wished to assume this role, despite concerns.<sup>5</sup> Better use of pharmacists' skills, easing the burden from overloaded GPs and pharmacists' drug knowledge were the main reasons for Australian pharmacists supporting an expanded role in prescribing. In this regard it is worth mentioning that in several 'Crown Reports' in the UK a better utilisation of pharmacists' skills in order to develop a more flexible system of prescribing, administration and supply of medicines was identified as the main driver for expanding pharmacist prescribing.<sup>6,7</sup> Additionally, improvement of patient care, medication access and team work within the healthcare system were considered the

main objectives by England's Department of Health for introducing independent pharmacist prescribing.<sup>8</sup>

As mentioned above, the vast majority of respondents considered pharmacists needed further training for pharmacists to assume additional prescribing roles. Strongest preferences for such training were shown for areas of pathophysiology of conditions, principles of diagnosis and patient monitoring. Training in clinical pharmacology as well as pharmacodynamics and pharmacokinetics was supported more by pharmacists who were registered for longer than 20 years. Dawoud et al. also suggested that training in patient assessment was valued highly by pharmacists undertaking supplementary prescribing training in the UK.<sup>9</sup>

In terms of infrastructural implications of expanded pharmacist prescribing, respondents in this study indicated that additional IT resources are needed for pharmacists to assume this role. Respondents were also supportive of the fact that prescribing and dispensing should be separated in the pharmacy. Respondents did not consider that current staff arrangements in the pharmacy can support an expanded role in prescribing and they also were not supportive of pharmacists having sufficient access to patient information.

Inadequate training in patient diagnosis, assessment and monitoring were the main barriers to expanded pharmacist prescribing identified by respondents of this study. At the same time these potential barriers were also the strongest negative predictors of expanding pharmacists' prescribing role in Australia. These areas were the ones that pharmacists also strongly believed that they needed further training. This illustrates the readiness of Australian pharmacists to go ahead with assuming an expanded prescribing role despite perceived barriers. This should be taken into consideration when expanded pharmacist prescribing is considered in Australia. Additionally, Australian policymakers should also consider early experiences from supplementary prescribing in the UK suggesting inadequate funding to be a major limitation for delivering this service.<sup>10</sup> Restrictive, inflexible and time consuming nature of CMP involvement in supplementary

prescribing was also reported to be a major limitation during the implementation of this role in the UK.<sup>10</sup>

Other studies have revealed a variety of other limitations to expanded pharmacist prescribing. These included potential conflict with doctors, need for greater liability insurance, excessive workload and time pressures.<sup>11,12,13,14</sup> A possibility for fragmentation of care resulting in increased costs and inefficiencies within the health care system has also been reported.<sup>9</sup> Conflict of interest with pharmacists having a commercial interest in prescribing with supply and inadequate access to patient records were also reported to be obstacles towards the adoption of this role.<sup>14,15</sup> Increased health care cost was not considered to be a limitation to pharmacist prescribing by respondents of this study. Additionally, only about half of the respondents agreed that increased litigation and commercial interest in pharmacists both prescribing and dispensing were barriers to expanded pharmacist prescribing. Just over half of respondents agreed that pharmacists lack of time is a barrier towards expanded pharmacist prescribing in Australia.

Support for expanded pharmacist prescribing indicated by respondents in this study should be interpreted having in mind other studies Australian studies which, although limited in representativeness, also confirmed that an expanded role in prescribing was supported by Australian pharmacists.<sup>1,2</sup> Results of this study should be taken into consideration when constructing policies and recommendations towards future pharmacist prescribing in Australia. They are also valuable elsewhere, given the global interest on this issue and the lack of literature exploring pharmacists' views outside of the UK.<sup>7,11,16</sup>

### 3.6 References

- 1 Kay O, Bajorek B, Brien J. Pharmacist Prescribing Activities-an Electronic Survey on the Opinion of Australian Pharmacists. *J Pharm Pract Res* 2005; 36:199-203
- 2 Hanes C, Bajorek B. Pharmacist Prescribing: Views of Australian Hospital Pharmacists. *J Pharm Pract Res* 2005; 35:178-80
- 3 Bessell T, Emmerton L, Marriot J, Nissen L. Improving Australians' access to prescription medicines: proposed practice models; June 2005; Pharmacy Guild of Australia; Canberra;[online] [http://www.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2003-017\\_fr.pdf](http://www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2003-017_fr.pdf). (Accessed 21/04/2010)
- 4 Australian Bureau of Statistics (ABS) 2008; 2006 Census of Population and Housing; Canberra; [online] <http://www.censusdata.abs.gov.au/> (Accessed 12/01/2009)
- 5 Hobson R, Sewell G. Risks and concerns about supplementary prescribing: survey of primary and secondary care pharmacists. *Pharm World Sci* 2006; 28: 76-90
- 6 Crown J. Report of the Review of Prescribing, Supply and Administration of Medicines, London, House of Commons, 1999
- 7 Tonna AP, Stewart D, West D, McCaig D. Pharmacist prescribing in the UK; a literature review of current practice and research. *J Clin Pharm Ther* 2007; 32: 545-6



- 8 Department of Health; Improving patients' access to medicines: A guide to implementing nurse and pharmacist independent prescribing within the NHS in England ; April 2006; [online]  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4133743](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4133743) (Accessed 8/06/2010)
- 9 Dawoud D, Goody L, Lovejoy A, Greene R. Perceptions and perceived competencies of pharmacists on supplementary prescribing training courses in London and the South East. *Int J Pharm Pract* 2004; 12:R40
- 10 George J, McCaig D, Bond CM et al. Supplementary prescribing: early experiences of pharmacists in the UK. *Ann Pharmacother* 2006; 40:1843-50
11. Kay OC; Brien JE. Pharmacist Prescribing: Review of the literature. *J Pharm Pract Res* 2004; 34: 300-4
12. Eng HJ. The pharmacist as prescriber. *J Clin Pharm Ther* 1987; 12: 237-42
13. Segal R; Grines LL. Prescribing authority for pharmacists as viewed by organized pharmacy, organized medicine, and the pharmaceutical industry. *Drug Intel Clin Pharm* 1988; 22: 241-6
14. Bellingham C. Space, time and team working: issues for pharmacists who wish to prescribe. *Pharm J* 2002; 268: 562-4
15. Stimmel GL. Political and legal aspects of pharmacist prescribing; *Am J Hosp Pharm* 1983; 40:1343-4

16 Emmerton L, Marriott J, Bessell T, Nissen L, Dean L. Pharmacists and Prescribing Rights: Review of International Developments. *J Pharm Pharmaceut Sci* 2005. 8:217-25

## **Chapter IV**

Pharmacy clients' perspectives on pharmacist prescribing

## 4.1 Introduction

Patients have a central role in the process of medicine prescribing. However, the literature exploring their attitudes towards pharmacist prescribing is limited with most studies focusing on perspectives of pharmacists and doctors.<sup>1,2,3</sup> No study has thus far investigated the attitudes of pharmacy clients (i.e. patients who regularly receive doctor prescribed prescription medicines from a pharmacy) who have not experienced expanded pharmacist prescribing.<sup>4,5,6,7</sup>

This project investigated the attitudes of pharmacy clients with no experience with expanded pharmacist prescribing. This study describes the relationships between pharmacists, doctors and pharmacy clients in the domain of pharmacist prescribing from an Agency Theory perspective. Mott et al. have provided a conceptual framework for using Agency Theory in pharmaceutical care in suggesting that selecting medications to treat medical conditions invoked a principal-agent relationship.<sup>8</sup> According to the agency relationship, in a pharmaceutical care setting, the principal (patient) delegates the authority to the agent (doctor, pharmacist) for performing actions on his/her behalf.<sup>8,9,10</sup> Since the process of prescribing involves selection of medication(s) for treatment, the Agency Theory provides valuable insight into the relationship between patients (i.e. pharmacy clients in this case), doctors and pharmacists.

## **4.2 Aims**

The main objectives of this study were to:

- Explore pharmacy clients' perceptions on pharmacists assuming an expanded role in prescribing
- Identify therapeutic areas that pharmacy clients would prefer pharmacists to assume expanded prescribing roles
- Identify drivers that contributed to pharmacy clients perception of trust in pharmacists assuming expanded prescribing roles
- Examine the relationships between doctors, pharmacists and pharmacy clients, regarding pharmacist expanded prescribing, using the Agency Theory post-hoc on the results.

## **4.3 Methods**

This study was approved by the Human Research Ethics Committee of Curtin University of Technology (See Appendix 7).

### **4.3.1 Data collection**

#### **4.3.1.1 Interview questionnaire development**

An interviewer-administered questionnaire was used to conduct a structured interview utilizing Computer Assisted Telephone Interviewing (CATI). This method has been recommended in primary care research data collection.<sup>11</sup> It enables instant recording of answers and it is more efficient than face-to-face interviews when respondents are widely spread geographically.<sup>11,12</sup> This advantage of the CATI method was important for

this study given the geographical expanse of Australia. The development of the questionnaire was initially aided by a literature review. Expanded pharmacist prescribing was the focus of this literature review while question design was aided by the previous part of this study assessing the attitudes of Australian pharmacists using the pre-piloted questionnaire. A UK based study on patients' perceptions of nurse and pharmacist prescribing also informed the design of questions.<sup>7</sup>

Structured questions were used since they were suitable to administer by telephone interviewing due to time restrictions.<sup>13</sup> The questionnaire was then checked for face and content validity by a small pharmacist focus group. The questions were also checked for suitability of administration by the telemarketing company that conducted interviews. They were from lay public not related to the pharmacy industry and experienced in this form of surveying.

#### **4.3.1.2 Final interview questionnaire**

The final interview questionnaire had a total of 23 questions (see Appendix 8). The content of this interview-questionnaire can be divided into three main sections: 1) demographic characteristics, b) statements related to the respondent's satisfaction with current services provided by pharmacists and c) statements specifically related to the respondent's attitudes on pharmacist prescribing. Respondents (i.e. pharmacy clients) were asked either to respond Yes/No or on a five point Likert scale in order to express their level of agreement with statements provided by the interviewer. Reliability of subscales in the questionnaire was tested using Cronbach's alpha.

#### **4.3.1.3 Participants eligibility**

Eligible participants needed to be self-administering at least ONE prescription medicine dispensed in a pharmacy regularly and be over the age of 18 years. These were the first two screening questions for eligibility of respondents used at the start of CATI (See Appendix 8). Respondents needed to be able to converse in English. Identification of eligible participants and their structured interviews were conducted by trained staff of an experienced telemarketing company not linked to the pharmacy industry or any of the researchers conducting this study. This was employed in order to minimise potential bias introduced by pharmacists, persons related to the pharmacy industry or researchers of this study, interviewing pharmacy clients.

#### **4.3.1.4 Sample distribution**

A telephone number list was generated via a random number generation function in Microsoft Excel with sequences of likely number combinations where the first two digits corresponded to Australian area codes, were created according to the required Australian State and Territory breakdowns rather than using a publicly available telephone number list. These were then incorporated into a predictive dialler system to eliminate probable invalid number sequences. Distribution targets of connected calls were based on Australian Bureau of Statistics Population data as at end June Quarter 2008, with the following distribution: New South Wales (NSW) 33%, Victoria (VIC) 25%, Queensland (QLD) 20%, Western Australia (WA) 10%, South Australia (SA) 8%, Tasmania (TAS) 2%, Australian Capital Territory (ACT) 2%, Northern Territory (NT) < 1%. The target

was to interview 400 pharmacy clients who were regularly taking at least one prescription medicine from their pharmacy. This target was chosen as it enabled a precision of no greater than  $\pm 5\%$  in prevalence estimation.

### **4.3.2 Data analysis**

Data collected were coded and analysed using SPSS v17. Basic descriptive statistics were used to summarize demographic data and responses (i.e. frequency distributions, means and standard deviations). Chi-square testing and One-Way ANOVA were also employed to analyse the data. In order to reduce the number of items, the scores of four questions related to respondents' satisfaction with their pharmacists roles were combined and subjected to reliability analysis using Cronbach's alpha. Factor analysis was employed to confirm item reduction and obtain a summary score. Principal Component Analysis was the extraction method. Regression analysis was used to explore the impact of factors on pharmacy clients' perception of trust in pharmacists assuming an expanded role in prescribing. "Trust" was used in the context of respondents' confidence in pharmacists' capability to prescribe.

The relationships between the main stakeholders i.e. doctors, pharmacists and pharmacy clients affected by expanded pharmacist prescribing, was evaluated from the perspective of the Agency Theory.<sup>8</sup> The Agency Theory was applied post hoc on results. In particular, this theory was employed to identify how an introduction of expanded pharmacist prescribing could potentially disrupt the current relationship of the stakeholders involved.



## **4.4 Results**

### **4.4.1 Response rate and demographic characteristics**

A telephone list with 5072 entries was generated. The predictive dialler system eliminated 1628 likely invalid number sequences. There were a total of 1980 failed calls (i.e. answering machines, busy line, disconnected, fax machines, no answer, and ring errors). In order to interview 400 consenting pharmacy clients around Australia, a total of 1464 successfully connected calls were made. Of the successfully connected calls, 311 contacted persons did not meet the eligibility criteria. This gives a response rate of 34.7% of eligible pharmacy clients who participated in the survey. Demographic characteristics of respondents are summarised in Table 4.1.

**Table 4.1 Demographic characteristics of respondents (n=400, no missing responses)**

<b>Variable</b>	<b>Category</b>	<b>n(%)</b>
Gender	Male	155 (39%)
	Female	245 (61%)
Age	<30	44 (11%)
	30-50	108 (27%)
	51-65	116 (29%)
	>65	132 (33%)
Education	Primary	25 (6%)
	Secondary	231 (58%)
	University	97 (24%)
	Other	43 (11%)
	Prefer not to disclose	4 (1%)
Employment status	Full Time	142 (36%)
	Part Time	44 (11%)
	Casual	31 (8%)
	Retired	127 (32%)
	Not Employed	53 (13%)
	Prefer not to disclose	3 (1%)
Household income	Less than AU\$ 20,000	38 (10%)
	AU\$20,000 to AU\$50,000	150 (38%)
	AU\$50,001 to AU\$100,000	110 (28%)
	Greater than AU\$ 100,000	28 (7%)
	Prefer not to disclose	74 (19%)
Location	NSW	122 (31%)
	VIC	98 (25%)
	QLD	85 (21%)
	SA	32 (8%)
	WA	42 (11%)
	TAS	11 (3%)
	NT	4 (1%)
	ACT	6 (2%)

Approximately one third of respondents (35%) obtained one prescription per month from a pharmacy, 46% obtained two to five prescriptions per month and 17% of respondents obtained more than five prescriptions per month. Most respondents (81%) had their prescriptions dispensed at the same pharmacy. In addition to having

prescriptions dispensed, most respondents (73%) also purchased over-the-counter medicines from their pharmacy (i.e. ‘Pharmacy Only Medicines’ and ‘Pharmacist Only Medicines’). These data are given in Table 4.2.

**Table 4.2 Characteristics of respondents regarding number of prescription medicines, OTC medicines and use of the same pharmacy**

Q1: How many prescriptions do you approximately obtain from your pharmacy?	n(%)
1 per Month	141(35)
2 to 5 per month	185(46)
> 5 per Month	69(17)
Other	5 (1)
Q2: Do you also purchase OTC medicines (e.g. pain relievers-Panadol <sup>®</sup> , vitamins, herbal products) from your Pharmacy, in addition to obtaining your prescription(s)?	n(%)
Yes	292(73)
No	108(27)
Q3: Do you usually get your prescriptions dispensed at the SAME pharmacy?	n(%)
Yes	325(81)
No	75(19)

## 4.4.2 Pharmacy clients responses (frequency distributions)

### 4.4.2.1 Pharmacy clients' current satisfaction with pharmacists professional services provided by pharmacists

High satisfaction levels were indicated by a vast majority of respondents in regards to pharmacists' drug knowledge and the professional services provided. These data are summarised in Table 4.3.

**Table 4.3 Respondents current satisfaction with their pharmacists' professional roles (n=400)**

Interviewer administered statements	Level of agreement n(%)				
	SD*	D	N	A	SA
I am satisfied with my pharmacists' professional advice I receive for medicines	1 (0)	6 (2)	30 (8)	239 (60)	124 (31)
I am satisfied with my pharmacists' level of drug knowledge	0 (0)	2 (1)	44 (11)	222 (56)	132 (33)
I am satisfied with the level of assistance my pharmacist provides when I purchase medicines from the Pharmacy	0 (0)	4 (1)	27 (7)	263 (66)	106 (27)
I am satisfied with how my pharmacist diagnoses minor ailments such as cold & flu, indigestion, hayfever, headache, conjunctivitis.	0 (0)	9 (2)	95 (24)	254 (64)	41 (10)

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

#### **4.4.2.2 Pharmacy clients' general attitudes on pharmacist expanded prescribing**

Most respondents (71%) agreed/strongly agreed that they would trust pharmacists prescribing medicines that they currently need repeat prescriptions from their doctor. On the other hand, most respondents (77% agreed/strongly agreed) only felt comfortable with pharmacists prescribing medicines if the condition is first diagnosed by their doctor.

Almost half of respondents (47%) agreed/strongly agreed they had difficulties accessing their doctor and therefore would prefer pharmacists writing prescriptions for medicines they currently needed repeat prescriptions from their doctor. However, most respondents (64%) agreed/strongly agreed that they would find it easier to access medicines without delay if prescriptions were also written by pharmacists.

Most respondents (68%) agreed/strongly agreed that pharmacists would need further training if they assumed additional prescribing roles. Almost one half of respondents (46%) were willing to pay a fee for pharmacists prescribing medicines for which they currently need a prescription from doctor. The above responses are summarised in Table 4.4.

**Table 4.4 Respondents attitudes regarding pharmacist prescribing (n=400)**

Interviewer administered statements	Level of agreement n(%)				
	SD*	D	N	A	SA
I would trust my pharmacist to write prescriptions for medicines that I currently need repeat prescriptions from my doctor.	15 (4)	57 (14)	11 (11)	244 (61)	40 (10)
I would only feel comfortable to have my pharmacist write prescriptions for my medicines, if my condition is first diagnosed by my doctor.	4 (1)	41 (10)	47 (12)	260 (65)	48 (12)
I find it difficult to access my doctor, therefore I would prefer my pharmacist writing prescriptions for medicines for which I currently need repeat prescriptions from my doctor.	24 (6)	131 (33)	58 (15)	151 (38)	36 (9)
I would find it easier to access my medicines without delay if prescriptions were also written by my pharmacist.	8 (2)	76 (19)	60 (15)	228 (57)	28 (7)
I think that if pharmacists were to assume the expanded role of writing prescriptions, they would need further training	4 (1)	57 (14)	68 (17)	184 (46)	87 (22)
I would be willing to pay a fee for my pharmacist to write prescriptions for medicines for which I currently need prescriptions from my Doctor.	11 (3)	115 (29)	92 (23)	179 (45)	3 (1)

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Approximately one half of the respondents (51%) preferred that pharmacists who write prescriptions be located in the community pharmacy as opposed to 33% of respondents who preferred pharmacist prescribers be located in their own office and 16% who preferred GP's surgery.

#### 4.4.2.3 Prescribing model and preferred therapeutic areas of pharmacist prescribing

Less than one third of respondents (29%) preferred pharmacists prescribing all medicines for which they needed prescriptions from their doctor. A similar percentage of respondents (33%) would accept pharmacists both diagnosing and prescribing for the condition diagnosed. These data are reported in Table 4.5.

**Table 4.5 Pharmacy clients' attitudes on the extent of pharmacist prescribing (n=400)**

Interviewer administered statements	Level of agreement n(%)				
	SD*	D	N	A	SA
I would prefer my pharmacist write prescriptions for ALL medicines that I currently need a prescription from my doctor.	48 (12)	214 (54)	24 (6)	107 (27)	7 (2)
I would accept my pharmacist diagnosing a condition (e.g. asthma) and writing prescriptions for the same condition diagnosed.	32 (8)	180 (45)	58 (15)	127 (32)	3 (1)

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree

Respondents who did not prefer (strongly disagree/disagree and neutral) pharmacists prescribing all medicines for which they currently needed a prescription from doctors and those that preferred pharmacists diagnosing and prescribing for the condition diagnosed were separately asked to indicate therapeutic area preferences for pharmacist prescribing. In both groups, pain management followed by anti-infectives were the most preferred therapeutic areas for pharmacist prescribing. These data are summarised in Tables 4.6a and 4.6b.

**Table 4.6 Therapeutic area preferences for pharmacist prescribing**

a)	<b>Preferred therapeutic areas of pharmacist prescribing for respondents not supporting pharmacists prescribing all medicines that they currently need a prescription from their Doctor [n(%), n=251]</b>				
	<b>SA*</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>
Antibiotics	1(0)	115(46)	23 (9)	89 (35)	23(9)
Diabetes	0(0)	43(17)	44(18)	139(55)	25(10)
Blood pressure	0(0)	51(20)	29(12)	145(58)	26(10)
Heart conditions	0(0)	13(5)	27(11)	173(69)	38(15)
Asthma	0(0)	64(25)	29(12)	130(52)	28(11)
Pain management	6(2)	192(76)	25(10)	24(10)	4(2)

b)	<b>Preferred therapeutic areas respondents supporting pharmacists diagnosing a condition and prescribing for it [n(%),n=130]</b>				
	<b>SA*</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>
Antibiotics	2(2)	95(73)	14(11)	18(14)	1(1)
Diabetes	2(2)	40(31)	15(12)	69(53)	4(3)
Blood pressure	0(0)	45(35)	15(12)	67(52)	3 (2)
Heart conditions	0(0)	17(13)	13(10)	93(72)	7(5)
Asthma	1(1)	57(44)	20(15)	48(37)	4(3)
Pain management	8(6)	107(82)	9(7)	6(5)	0(0)

\*SD=strongly disagree, D=disagree, N=neutral, A=Agree, SA=strongly agree



### **4.4.3 Statistical Analysis**

#### **4.4.3.1 Chi-Square testing**

Chi-square testing was used to evaluate the relationships between categorical variables such as: respondents' age, gender, education level, income, employment status, number of prescriptions filled, whether respondents also used OTC medicines and whether they used the same pharmacy. In cases where data violated assumptions of Pearson's correlation, Spearman's rank order correlation was conducted.

Pearson's chi-square testing indicated no significant difference between respondents age and whether they obtained their prescriptions at the same pharmacy and whether they also purchased OTC medicines ( $p=0.357$  and  $p=0.094$ ). A significant difference was found between different age-groups in terms of the number of medicines they purchased (Spearman's  $\rho=0.254$ ,  $p<0.001$ ). As expected, younger age-groups obtained fewer medicines in comparison to age-groups of 51-65years and >65years. These data were cross-tabulated and are illustrated in Table 4.7.

**Table 4.7 Comparison between respondents' age groups and number of prescriptions filled in the pharmacy.**

Age group		Number of prescriptions obtained from Pharmacies				Total
		1 per month	2-5 per month	> 5 per month	Other	
< 30	n	22	13	7	2	44
	%	50.0	29.5	15.9	4.5	100
30-50	n	57	38	12	1	108
	%	52.8	35.2	11.1	0.9	100
51-65	n	38	59	17	2	116
	%	32.8	50.9	14.7	1.7	100
>65	n	24	75	33	0	132
	%	18.2	56.8	25.0	0.0	100
Total	n	141	185	69	5	400
	%	35.2	46.2	17.2	1.2	100

No significant difference was found between male and female respondents in terms of whether they obtained their medicines at the same pharmacy ( $p=0.421$ ). No significant difference was found between male and female respondents in terms of the number of medicines they obtained (Spearman's  $\rho=0.04$ ,  $p=0.422$ ). However, Pearson's chi-square testing suggested that male respondents used OTC medicines more than female respondents ( $p=0.01$ ).

No significant difference was found between respondents' level of education completed and use of the same pharmacy and use of OTC medicines (Spearman's  $\rho = 0.054$  &  $p=0.281$ , Spearman's  $\rho= -0.011$  &  $p=0.825$ ). However, a significant difference was found for respondents' level of education and number of prescriptions obtained (Spearman's  $\rho= -0.156$ ,  $p=0.002$ ). These findings are illustrated in Table 4.8.

**Table 4.8 Comparison of respondent’s education completed and number of prescriptions obtained**

Education completed		Number of prescriptions obtained from Pharmacies				Total
		1 per month	2-5 per month	> 5 per month	Other	
Primary	n	5	11	9	0	25
	%	20.0	44.0	36.0	0.0	100
Secondary	n	73	113	40	5	231
	%	31.6	48.9	17.3	2.2	100
University	n	43	41	13	0	97
	%	44.3	42.3	13.4	0.0	100
Other	n	18	19	6	0	43
	%	41.9	44.2	13.9	0.0	100
Prefer not to disclose	n	2	1	1	0	4
	%	50.0	25.0	25.0	0.0	100
Total	n	141	185	69	5	400
	%	35.2	46.2	17.2	1.2	100

No significant difference was found between respondents’ household income and whether they also used OTC medicines ( $p=0.411$ ) and whether they used the same pharmacy ( $p=0.365$ ). However, Spearman’s correlation indicated a significant difference (Spearman’s  $\rho = -0.120$  &  $p=0.017$ ) between respondents’ household income and number of medicines obtained. Respondents with lower household income indicated they obtained more medicines compared to those with higher household income. These data were cross-tabulated and are illustrated in Table 4.9.

**Table 4.9 Comparison between respondent’s household income and number of prescriptions obtained**

Household income in \$1000s		Number of prescriptions obtained from your Pharmacies				Total
		1 per month	2-5 per month	> 5 per month	Other	
< 20	n	8	18	12	0	38
	%	21.0	47.4	31.6	0.0	100
20-50	n	41	85	23	1	150
	%	27.3	56.7	15.3	0.7	100
50-100	n	52	42	13	3	110
	%	47.3	38.2	11.8	2.7	100
> 100	n	10	11	6	1	28
	%	35.7	39.3	21.4	3.6	100
Prefer not to disclose	n	30	29	15	0	74
	%	40.5	39.2	20.3	0.0	100
Total	n	141	185	69	5	400
	%	35.2	46.2	17.2	1.25	100

To further explore the issue of level of education, household income and age versus the number of prescriptions obtained, since significant differences were found for these categories, respondents’ age, education level and household income were cross-tabulated. Given that Pearson’s assumptions were violated by the data, Spearman’s correlation was obtained in order to interpret the results.

As expected, a significant difference was found (Spearman’s rho= -0.174 and p<0.0001) between respondent’s age group and their level of education completed with older respondents being more often educated at a primary level and less often at a university level. Also, it was found that younger respondents (i.e. <30yrs of age & 31-50 yrs of

age) had higher household incomes compared to older respondents (i.e. 51-65yrs of age & >65yrs of age), Spearman's rho= -0.292 and p<0.0001. These findings indicated that education and household income did not determine the number of medicines respondents obtained but age was the main determinant. These data were cross-tabulated and are illustrated in Tables 4.10 and Table 4.11.

**Table 4.10 Comparison of respondent's age and education completed**

Age group		Education completed					Total
		Primary	Secondary	University	Other	Prefer not to disclose	
< 30	n	0	23	16	5	0	44
	%	0.0	52.3	36.4	11.3	0.0	100
30-50	n	2	60	33	13	0	108
	%	1.8	55.6	30.6	12.0	0.0	100
50-65	n	4	74	21	15	2	116
	%	3.4	63.8	18.1	12.9	1.7	100
>65	n	19	74	27	10	2	132
	%	14.4	56.1	20.5	7.56	1.5	100
Total	n	25	231	97	43	4	400
	%	6.2	57.7	24.2	10.7	1.0	100

**Table 4.11 Comparison of respondent's age and their household income**

Age group		Household income in \$1000s				Prefer not to disclose	Total
		< 20	20-50	50-100	> 100		
< 30	n	2	14	17	2	9	44
	%	1.9	31.8	38.6	1.9	2.2	100
30-50	n	2	23	50	10	23	108
	%	1.8	21.3	46.3	9.3	21.3	100
50-65	n	13	41	25	12	25	116
	%	11.2	35.4	21.6	10.3	21.6	100
>65	n	21	72	18	4	17	132
	%	15.9	54.5	13.6	3.0	12.9	100
Total	n	38	150	110	28	74	400
	%	9.5	37.5	27.5	7.0	18.5	100

#### **4.4.4 One-way ANOVA**

##### **4.4.4.1 Satisfaction with current professional services offered by pharmacists**

One-way ANOVA was used to explore the differences between categorical variables in the interview questionnaire (see Appendix 8) in relation to continuous variables (measuring the level of agreement on a five point Likert scale), which pertained to respondents' satisfaction with pharmacists' current roles i.e.

- S9\* (\*Statement 9 in Appendix 8): I am satisfied with my pharmacists' professional advice I receive for medicines
- S10: I am satisfied with my pharmacists' level of drug knowledge
- S11: I am satisfied with the level of assistance my pharmacist provides when I purchase medicines from the Pharmacy
- S12: I am satisfied with how my pharmacist diagnoses minor ailments such as cold & flu, indigestion, hayfever, headache, conjunctivitis.

##### **a) Respondents' Age**

One-Way ANOVA identified no significant difference between respondents age groups (<30, 30-50, 51-65 and >65years) and their level of satisfaction with pharmacists' professional services offered and current level of drug knowledge [i.e. statements 9,10,11 in Appendix 8; ( $p>0.05$ )]. The only significant difference identified with ANOVA was for the level of satisfaction with how pharmacists diagnosed minor ailments (i.e. Statement 12 in Appendix 8;  $p=0.043$ ) with respondents >65years of age showing a lower agreement level. However, this significance was not confirmed with

Tukey’s post-hoc comparison ( $p>0.05$ ). Mean and standard deviation values for each age group in relation to their agreement level for satisfaction of with pharmacists’ diagnosis of minor ailments are summarised in Table 4.12.

**Table 4.12 Mean and standard deviation values for the influence of age on the level of satisfaction with pharmacists’ diagnosis of minor ailments**

Age group	Mean and standard deviations values	
	$\bar{x}$	SD
<30	3.86	0.67
30-50	3.88	0.61
51-65	3.89	0.61
>65	3.69	0.64

**a) Gender, education level, employment status, number of prescriptions obtained, use of the same pharmacy and use of OTC medicines**

No significant differences were found between respondents’ gender, level of education, employment status, number of prescriptions obtained, use of the same pharmacy and use of OTC medicines in relation to respondents’ level of satisfaction with pharmacists’ current level of drug knowledge and professional services provided [i.e. Statements 9,10,11,12 in Appendix 8; ( $p>0.05$ )].



#### **4.4.4.2 Respondents' perception of trust on pharmacist expanded prescribing**

One-way ANOVA was used to explore the differences between categorical variables in the interview questionnaire and the continuous variable measuring the agreement levels on a Likert scale i.e.: respondents' perception of trust for pharmacists assuming an expanded prescribing role (i.e. Statement 14 in Appendix 8)

##### **a) Respondents' age, gender, education level, household income and employment status, number of prescriptions obtained, use of the same pharmacy and use of OTC medicines**

One-way ANOVA identified no significant differences between respondents' age ( $p=0.592$ ), gender ( $p=0.255$ ), level of education ( $p=0.802$ ), household income ( $p=0.998$ ), employment status ( $p=0.476$ ), number of prescriptions obtained ( $p=0.272$ ), use of the same pharmacy ( $p=0.838$ ) and use of OTC medicines ( $p=0.084$ ) in relation to respondents' perception of trust for pharmacists assuming an expanded prescribing role.

#### **4.4.4.3 The extent of expanded prescribing**

One-way ANOVA was used to explore the differences between categorical variables in the interview questionnaire and the continuous variable measuring the agreement level on a Likert scale i.e. whether pharmacists should prescribe all medicines (i.e. the extent of expanded prescribing) for which respondents currently needed a prescription from their doctor (i.e. Statement 15 in Appendix 8)

**a) Respondents' age, gender, education level, household income and employment status, use of the same pharmacy and use of OTC medicines**

One-way ANOVA identified no significant differences between respondents' age ( $p=0.173$ ), gender ( $p=0.185$ ), level of education ( $p=0.215$ ), household income ( $p=0.119$ ), employment status ( $p=0.647$ ), use of the same pharmacy ( $p=0.439$ ) and use of OTC medicines ( $p=0.528$ ) in regards to whether pharmacists should prescribe all medicines for which they currently needed a prescription from their doctor.

**b) Number of prescriptions obtained**

One-way ANOVA indicated a significant difference between respondents' number of prescriptions obtained ( $p=0.05$ ) and whether pharmacists should prescribe all medicines for which they currently needed a prescription from their doctor. However, this was not conferred by Tukey's test ( $p>0.05$ ). Mean and standard deviation values are summarised in Table 4.13.

Prescription number	Mean and standard deviations values	
	$\bar{x}$	SD
1 per month	2.40	1.03
2-5 per month	2.57	1.05
>5 per month	2.59	1.14
other	3.60	0.89

#### 4.4.4.4 Pharmacists diagnosing and prescribing medicines for conditions diagnosed

One-way ANOVA was used to explore the differences between categorical variables in the interview questionnaire and the variable measuring the agreement levels on a Likert scale i.e.: whether pharmacists should diagnose medical conditions and also prescribe medicines for those conditions diagnosed (Statement 19 in Appendix 8).

##### a) Respondents' age

One-way ANOVA indicated a significant difference ( $p=0.03$ ) between respondents' age groups in regards to their preferences for pharmacists diagnosing and prescribing medicines for conditions diagnosed. However, Tukey's post-hoc comparison did not identify a significant difference between age groups ( $p>0.05$ ). Mean and standard deviation values are summarised in Table 4.13.

**Table 4.14** Mean and standard deviation values for preferences of different age groups regarding whether pharmacists should both diagnose and prescribe.

Age group	Mean and standard deviations values	
	$\bar{x}$	SD
<30	2.95	0.96
30-50	2.68	0.96
51-65	3.03	0.96
>65	2.70	0.93

### **b) Gender**

A significant difference was found between female respondents and their preference for pharmacists diagnosing and prescribing for conditions diagnosed. Female respondents indicated a stronger support for pharmacists diagnosing and prescribing compared to male respondents ( $\bar{x}=2.81$ ,  $SD=1.0$  vs.  $\bar{x}=2.59$ ,  $SD=1.04$ ,  $p=0.035$ ).

### **c) Education and Household income**

No significant difference was identified between respondents' level of education ( $p=0.279$ ) and household income ( $p=0.801$ ), and their preference for pharmacists diagnosing and prescribing for conditions diagnosed.

### **d) Employment status**

One-Way ANOVA indicated a significant difference ( $p=0.005$ ) between respondents employment status and their preferences for pharmacists diagnosing and prescribing medicines for conditions diagnosed. Tukey's post-hoc comparison identified respondents working part-time to significantly more favour pharmacists both diagnosing and prescribing for conditions diagnosed, in comparison to respondents working full-time ( $p=0.023$ ) and those retired ( $p=0.005$ ). Mean and standard deviation values are summarised in Table 4.14.

**Table 4.15 Mean and standard deviation values for preferences of respondents with different employment status regarding whether pharmacists should both diagnose and prescribe.**

Employment status	Mean and standard deviations values	
	$\bar{x}$	SD
Full-time	2.66	1.05
Part-time	3.20	0.98
Casual	2.55	0.96
Retired	2.57	0.97
Unemployed	2.94	1.09
Prefer not to disclose	2.67	1.16

**d) Number of prescriptions obtained, use of the same pharmacy and use of OTC medicines**

One-way ANOVA indicated no significant differences between respondents' number of prescriptions filled ( $p=0.571$ ), use of the same pharmacy ( $p=0.516$ ) and use of OTC medicines status ( $p=0.511$ ) in regards to whether pharmacists should both diagnose and prescribe medicines for conditions diagnosed.

#### 4.4.4.5 Access to medicines

One-way ANOVA evaluated whether respondents would find it easier to access their medicines without delay if pharmacists were involved in expanded prescribing (Statement 17 in Appendix 8).

##### a) Age, Gender, Education and Employment status

One-way ANOVA found a significant difference between respondents' age groups and their attitudes on whether pharmacist prescribing can lead to easier access without delay to medicines ( $p < 0.0001$ ). Tukey's post-hoc comparison identified that pharmacy clients under 30 years of age were more in favour of this as opposed to pharmacy clients over 65 years of age ( $p = 0.001$ ). Tukey's post-hoc comparison also identified a significant difference between pharmacy clients aged 50-65 years and those over 65 years of age with the younger population sub-group being more in favour of improved access to medicines with pharmacist prescribing ( $p = 0.003$ ). Mean and standard deviation values are summarised in Table 4.15.

**Table 4.16 Mean and standard deviation values for preferences of age groups in regards to whether pharmacist prescribing enables easier access to medicines.**

Age group	Mean and standard deviations values	
	$\bar{x}$	SD
<30	3.82	0.84
30-50	3.52	0.93
51-65	3.62	0.83
>65	3.21	1.02

The results of One-way ANOVA indicated that there was no significant difference between respondents' gender, level of education, household income and employment status in regards to their attitudes on whether expanded pharmacist prescribing enables an easier access to their medicines without delay ( $p=0.351$ ,  $p=0.311$ ,  $p=0.402$  and  $p=0.082$ ).

**b) Number of prescriptions obtained, use of the same pharmacy and use of OTC medicines**

One-way ANOVA indicated no significant difference between respondents' number of prescriptions obtained and the use of the same pharmacy in regards to whether pharmacist prescribing would enable them an easier access to medicines without delay ( $p=0.452$  and  $p=0.787$ ).

A significant difference was identified between respondents who also used OTC medicines in comparison to those who did not, in terms of whether pharmacist prescribing leads to an easier access to medicines without delay ( $p=0.044$ ). Respondents who also obtained OTC medicines, in addition to their prescription medicines, were more in favour of pharmacist prescribing leading to easier access to medicines without delay ( $\bar{x}=3.54\pm 0.917$  vs.  $\bar{x}=3.32\pm 1.003$ ).

#### 4.4.5 Reliability and Factor Analysis

With the aim of reducing the number of questionnaire items and hence facilitating the regression analysis, scores of four statements related to pharmacy clients' satisfaction with pharmacists' current roles were combined (i.e. Statements 9, 10, 11 and 12 in Appendix 8). These statements were:

- i) I am satisfied with my pharmacists' professional advice I receive for medicines
- ii) I am satisfied with my pharmacists' level of drug knowledge
- iii) I am satisfied with the level of assistance my pharmacist provides when I purchase medicines from the Pharmacy
- iv) I am satisfied with how my pharmacist diagnoses minor ailments such as cold & flu, indigestion, hayfever, headache, conjunctivitis

The result of reliability analysis for combining scores of statements using Cronbach's alpha was 0.63. Item reduction was confirmed using Principal Component Analysis which extracted one factor. Kaiser-Meyer-Olkin measure of sampling adequacy ( $>0.695$ ) and Bartlett's test of sphericity ( $<0.0001$ ), confirmed the suitability of factoring these variables.

The variable extracted using the Principal Component Analysis and Cronbach's alpha test was named: "*Pharmacy clients' satisfaction with pharmacist's current roles*".



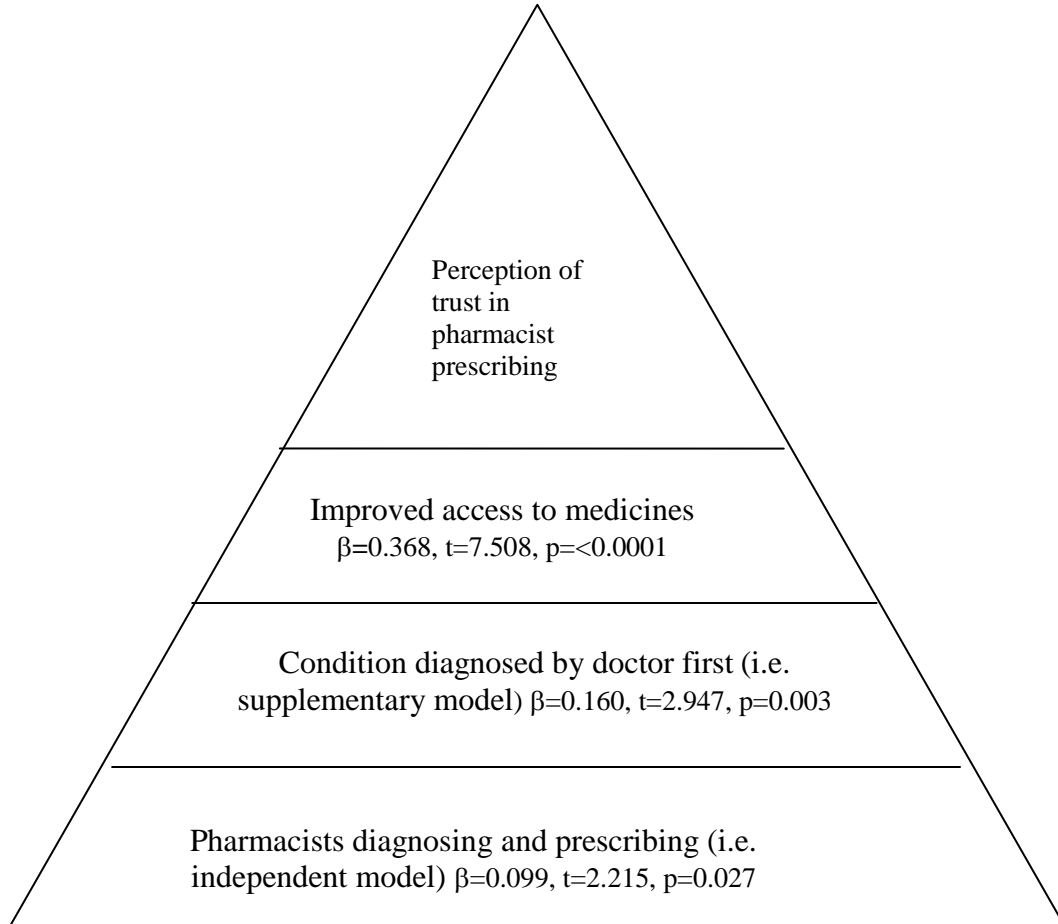
#### 4.4.6 Regression analysis

The regression analysis examined key factors that positively predicted pharmacy clients' perception of trust on pharmacists expanding their prescribing role (i.e. the dependent variable). Factors examined (i.e. independent variables) were:

- a) Improved access to medicines, i.e. easier access without delay (statement number 16 in Appendix 8);
- b) Pharmacists diagnosing and prescribing (statement number 18 in Appendix 8)
- c) Respondents being comfortable with pharmacist prescribing only if doctors make the diagnosis first (statement number 17 in Appendix 8)

This model explained 19.8% of the variance and the F value (32.6) indicated significance ( $p < 0.0001$ ).

Pharmacists diagnosing and prescribing ( $\beta = 0.099$ ,  $p = 0.027$ ), diagnosis of the condition by a doctor ( $\beta = 0.160$ ,  $p = 0.003$ ) and improved access to prescription medicines ( $\beta = 0.368$ ,  $p < 0.0001$ ) were positive predictors of pharmacy clients showing trust in their pharmacists to assume an expanded role in prescribing. These drivers were ordered on how strongly they predicted pharmacy clients' perception of trust in pharmacist expanded prescribing and hence potentially leading to their acceptance of this role. This is illustrated in Figure 4.1.

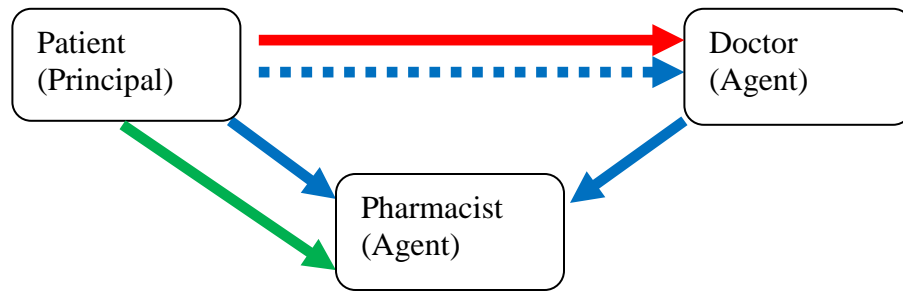


**Figure 4.1 Key factors contributing to pharmacy clients’ perception of trust in pharmacists assuming an expanded prescribing role.**

Linear regression was used to see how ‘pharmacy clients’ satisfaction with pharmacists’ current roles’ (i.e. summary score extracted with principal component analysis) separately predicted pharmacy clients’ perception of trust in pharmacists assuming an expanded role in prescribing. Satisfaction with pharmacists’ current roles positively predicted pharmacy clients’ perception of trust (dependent variable) in pharmacists’ expanding their prescribing role ( $\beta=0.291$ ,  $p=0.01$ ).

#### **4.4.7 Agency Theory implications**

Agency theory defines a relationship between the three main stakeholders regarding a change to expanded pharmacist prescribing. Pharmacy clients' preference for doctors to retain their role in diagnosis illustrates a strong agency relationship already exists between doctors and patients. Furthermore, findings of this study indicated that a doctor diagnosing the condition was a positive predictor to pharmacy clients' perception of trust in pharmacist prescribing. This makes the agency relationship between doctors and patients an important component in an expanded pharmacist prescribing domain. However, in introducing expanded pharmacist prescribing, particularly the supplementary model which involves an agreement between a doctor, pharmacist and patient, Agency Theory would predict disruption of the agency relationship that already existed between doctors and patients. As illustrated in Figure 4.2, this disruption involves the introduction of a decision making authority of a second agent (i.e. pharmacist) into an already established relationship between patients and doctors. Independent prescribing by pharmacists requires establishment of new stakeholder relationships. However, this model was not preferred by respondents.



\* Prescribing authority delegation prior (—) and after (—) introducing the supplementary prescribing model. Potential disruption of the existing relationship (....). Prescribing authority delegation after introducing an independent prescribing model (—).

**Figure 4.2** An illustration of prescribing authority delegation between patients, doctors and pharmacists using the Agency theory

## 4.5 Discussion

This is the first study that has investigated views of pharmacy clients who had not previously experienced expanded pharmacist prescribing on pharmacist prescribing. These patients accessed prescription related services in pharmacies across Australia. This study has applied a theory to explain the potential influence of expanded pharmacist prescribing on relationships between doctors, pharmacists, and pharmacy clients.<sup>1,2,3</sup>

The respondents' locations around Australia were reflective of the end of June Quarter 2008 Australian population distribution obtained from the Australian Bureau of Statistics.<sup>14</sup> While the spread of respondents' locations around Australia improved the study representativeness, it was limited by a low response rate (34.7%). The fact that respondents were only those that had not experienced expanded pharmacist prescribing may also be a limitation in terms of a broader exploration of patients' perspectives. However, an expanded role in prescribing for pharmacists in Australia is not yet established. It should also be emphasized that the interview questionnaire was previously validated by a small pharmacist focus group and the company administering it which were members of the lay public and experienced in this form of surveying. However, the face validity and questionnaire piloting was not done with target respondents and key study findings relied on pharmacy clients' interpretation of terms such as 'trust in pharmacist prescribing'. These potential limitations should be taken into consideration by future policymakers when the findings of this study are considered.

Most respondents supported pharmacists prescribing medicines for which doctors currently write repeat prescriptions. These attitudes are consistent with results reported by Stewart et al.<sup>5</sup> and Hobson et al.<sup>6</sup> where expanded pharmacist prescribing was generally supported by patients regardless of the fact that not all respondents they recruited were regular pharmacy clients.

Respondents of this study also indicated that pharmacists would need further training if additional prescribing responsibilities were assumed. In this regard, pharmacy clients and pharmacists shared similar views (see Chapter III for views of pharmacists on training requirements). Furthermore, pharmacy clients' support for expanded prescribing was reflected from the fact that less than one third (32%) were unwilling to pay pharmacists when prescribing medicines.

A majority of respondents opposed pharmacists prescribing all of the medicines for which they currently needed a prescription from their doctor (29% agree/strongly agree). These findings were similar to those of Stewart et al. who have also reported that only 25% of respondents agreed/strongly agreed to pharmacists prescribing the same range of medicines as doctors. Furthermore, our respondents indicated that they supported pharmacists' expanded prescribing only if the diagnosis was first made by a doctor. This is an indication that, although supporting an expanded role for pharmacists in prescribing, pharmacy clients did not support pharmacists engaging widely in disease diagnosis.

Respondents who supported pharmacists carrying out diagnosis of the disease and prescribing, most strongly favoured this for infections and pain management. Interestingly, pharmacists who preferred the independent prescribing model (see Chapter III results), which involved pharmacists making the diagnosis and prescribing for the condition diagnosed, showed strongest prescribing support for the areas of a limited number of infections and pain management.

Improved access to medicines was a significant driver to the introduction of expanded pharmacist prescribing in the UK.<sup>2</sup> Bessell et al. have proposed prescribing models for pharmacists in Australia with the aim of improving patients' access to prescription medicines.<sup>15</sup> The issue of accessing doctors and medicines was also considered in this study. Almost half of respondents (47%) agreed/strongly agreed that they had difficulties in accessing doctors and therefore would prefer pharmacists prescribing. However, the majority of respondents (64%) considered that their medicine access

would be improved if pharmacists had expanded prescribing rights with younger respondents being more in favour of this.

Improved access to medicines positively contributed to an increased respondents' perception of trust in pharmacists performing an expanded role in prescribing, as shown in Figure 4.1. Accessibility to medicines was also identified by Hobson et al. to be an important reason for patients accepting pharmacist as prescribers.<sup>6</sup> Doctors making the diagnosis, and improved access to medicines positively contributed to an increased patients' perception of trust in pharmacists performing an expanded role in prescribing. It should be emphasized that in comparison to doctors diagnosing the disease (i.e. a supplementary model of prescribing), pharmacists diagnosing and prescribing (i.e. an independent model of prescribing) was a weaker contributor to an increased patients' perception of trust in pharmacist expanded prescribing. These findings are consistent with a previous finding in Chapter III of this project where an independent prescribing model was a weaker predictor than a supplementary model to expanding pharmaceutical services through prescribing.

Respondents of this study indicated high levels of satisfaction with pharmacists' current professional roles. This satisfaction also had a positive effect on predicting pharmacy clients' perception of trust in pharmacist expanded prescribing, therefore placing pharmacists in Australia in a good position in terms of patients' acceptance of expanded prescribing. No significant difference was found between pharmacy clients' level of satisfaction with pharmacists' professional roles dependent on their level of prescription use, use of OTC medicines and use of the same pharmacy. This may indicate similar quality level services offered by pharmacists and pharmacies regardless of the number of medicines per patient, as pharmacists overall professional role is similar for single or multiple medicines, although more interventions are possible with an increased number of medicines.

Stewart et al. found that the general public supported pharmacists having an expanded prescribing role.<sup>5</sup> As mentioned above, this is consistent with findings of this study

which suggest respondents' support for this role. However, in the study conducted by Stewart et al. only 40.5% of respondents had confidence in pharmacists' abilities to prescribe as opposed to 71% of respondents in this study who trusted their pharmacists to prescribe medicines for which they currently need repeat prescriptions from the doctor. The explanation for this difference in attitudes may be due to the fact that less than half of respondents in the Scottish study had visited a pharmacy in the past 12 months, in comparison to the respondents of this study who were obtaining at least one ongoing prescription medicine in a pharmacy and therefore were all regular pharmacy clients.

These differences in findings can be explained using the Agency Theory given that pharmacy clients have an established principal agency relationship with their pharmacist. According to this theory, there is an assumption that principals encounter problems with the lack of information about agents' abilities and interests to perform actions on their behalf (information asymmetry).<sup>8,9</sup> Mott et al. have emphasized that the longer the relationship between agents and principals the more the principals learn about their agents. This in turn enables the principal to more easily assess agents' capabilities.<sup>8,9</sup> Therefore, Agency Theory suggests that information asymmetry between principals and agents is greater with the general public than regular pharmacy clients. This would apply to respondents of this study (i.e. pharmacy clients) who already have an established relationship with their pharmacists. The information asymmetry identified with Agency Theory, may also explain why the majority of pharmacy clients in this study preferred pharmacist prescribers to be located in community pharmacies in contrast to patients recruited by Hobson et al. who had an established relationship with prescribers in a clinical setting. Hobson et al. have concluded that, when it comes to pharmacist prescribing, the public may be hesitant of clinics in community pharmacies regarding their standards of professionalism, quality and clinical governance.<sup>6</sup>

This study found through application of Agency Theory that expanded pharmacist prescribing would cause a disruption of the relationship that currently exists between doctors and patients. Findings from this study have suggested that the existing



relationship between doctors and patients is in fact a positive predictor of patients' perception of trust and therefore acceptance of expanded pharmacist prescribing. This indicates that pharmacist expanded prescribing should be introduced in a form that it does not negatively affect the existing principal-agent relationship between doctors and patients. Such a change should be facilitated by addressing issues with patients that highlight access to medicines, easing the current high workload of doctors and better utilizing pharmacists' skills. This study demonstrates that pharmacy clients would then support its adoption.

## 4.6 References

1. Tonna AP, Stewart D, West B, McCaig D. Pharmacist prescribing in the UK; a literature review of current practice and research. *J Clin Pharm Ther* 2007; 32: 545-56
2. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, James V, Lymn J, McIntosh A, Murphy E, Ratcliffe J, Read S, Ward P. Nurse and pharmacist supplementary prescribing in the UK—A thematic review of the literature. *Health Policy* 2008; 85: 277–92
3. Kay O, Brien J. Pharmacist Prescribing: Review of Literature. *J Pharm Pract Res* 2004; 34:300-4
4. Smalley L. Patients' experiences of pharmacist-led supplementary prescribing in primary care. *Pharm J* 2006; 276:567-9
5. Stewart DC, George J, Diack HL, Bond CM, McCaig DJ, Cunningham IS, Munro K, Pflieger D. Cross sectional survey of the Scottish general public's awareness of, views on, and attitudes toward nonmedical prescribing; *Ann Pharmacother* 2009; 43: 1115-21
6. Hobson R, Scott J, Sutton J. Pharmacists and nurses as independent prescribers: exploring the patient's perspective. *Fam Pract* 2010; 27: 110-2
7. Qureshi K, Kashani S, Robbie S, Malik N. Perceptions of patients to extended prescribing to nurses and pharmacists. *Eye* 2007; 21: 1005-6

- 8 Mott DA, Schommer JC, Doucette WR, Kreling DH. Agency theory, drug formularies, and drug product selection: Implications for public policy. *J Public Policy Mark* 1998; 17: 287-95
- 9 Eisenhardt KM. Agency Theory: An assessment and review. *Acad Manage Rev* 1989; 14: 57-74
- 10 Jensen M, Meckling W. Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *J Financ Econ* 1976; 3: 305-60
- 11 Harris D, Grimshaw J, Lemon J, Russell IT, Taylor R. The use of computer assisted telephone interview technique in a general practice research study. *Fam Pract* 1993; 10:454-58
- 12 Ketola E, Klockars M. Computer-assisted telephone interview (CATI) in primary care. *Fam Pract* 1999; 16: 179-83
- 13 Smith F. Conducting your pharmacy practice research project. London. Pharmaceutical Press, 2005
- 14 Australian Bureau of Statistics, 2006 Census; [online] <http://www.censusdata.abs.gov.au/> (Accessed 10/04/2010)

15 Bessell T, Emmerton L, Marriot J, Nissen L. Improving Australians' access to prescription medicines: proposed practice models; June 2005; Pharmacy Guild of Australia; Canberra;[online]  
[http://www.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2003-017\\_fr.pdf](http://www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2003-017_fr.pdf) (Accessed 7/04/2010)

# **Chapter V**

## Medication supply systems in RACFs

## 5.1 Introduction

A significant number of Australia's elderly population currently live in RACFs.<sup>1</sup> Most of the RACFs' residents are on multiple medications and have a high prevalence of disease and co-morbidities.<sup>1</sup> Furthermore, as the Australian population ages, there is an increased demand for services delivered to RACFs.<sup>2</sup> There are signals suggesting that there are difficulties in current medication supply systems. These include difficulties in obtaining services from residents' GPs, low level reimbursements as well as time consuming procedures.<sup>2-9</sup>

There is a lack of literature exploring new models of medication supply to RACFs especially those which also consider expanded pharmacist prescribing. The HMAs have suggested some models to address current difficulties in medication supply to RACFs while Bessell et al. suggested the 'medication maintenance' model.<sup>8,9</sup> In this model the doctor would initiate the medication while an accredited pharmacist would review, monitor, and renew medicines provided the residents' condition was stable. Bessel et al. also proposed that medicines supplied under the 'emergency supply' system should be increased from three to 30 days duration or otherwise one 'unbroken' pack.<sup>8</sup>

This study focuses on identifying current difficulties with medication supply systems in RACFs and potential models that could address these difficulties. It has explored the views of pharmacists, doctors and nurses/carers directly involved in medicine supply to RACFs.

## 5.2 Aims

The main aims of this part of the project were to:

1. Explore and analyse pharmacists, doctors and nurses/carers views on current difficulties with the medication supply system in RACFs

2. Explore and analyse pharmacists, doctors and nurses/carers views on improved medication supply models, including expanded pharmacist prescribing, which could address deficiencies in the current systems in RACFs.

## **5.3 Methods**

This study was approved by the Human Research Ethics Committee of Curtin University of Technology (See Appendix 7).

Focus groups were used as the model to collect the data. As a qualitative technique, this method allows exploratory work in order to meet the research aims. This method was also chosen because it allowed a timely and cost effective collection of information and it generated interaction between participants.<sup>10</sup> Individual interviews were not used for data collection since a synergistic effect of different participants in a focus group can generate ideas and discussion which may not arise during individual interviews.<sup>11,12</sup>

### **5.3.1 Study participants**

All focus group participants were currently working with at least one RACF. The aim was to capture the views of the main healthcare professionals involved in medication provision to RACFs therefore doctors, pharmacists and nurses/carers were recruited. Focus groups were organised separately with doctors, pharmacists and nurses/carers. Every focus group was homogenous in terms of participants. The literature has suggested that homogenous groups (e.g. same profession participants) are preferred to better capitalize on common experiences.<sup>13</sup> Two focus groups were organised with

doctors, two with pharmacists and three with nurses/carers. The reason for organising three focus group discussions with nurses and carers was to ensure a wide representation of ideas was captured since these groups, unlike pharmacists and doctors, contained both nurses and carers.<sup>13</sup>

### **5.3.2 Focus group location**

Focus groups with doctors were organised and conducted in two different areas of Perth i.e. Fremantle and Osborne Park. This was done in order to have a wider range of doctors who work with RACFs across the Perth metropolitan area. Focus groups with pharmacists were conducted in facilities of the Curtin University of Technology, School of Pharmacy. However, participants came from different areas of the Perth Metropolitan Area. Each focus group had pharmacists who were not working in the same pharmacy. The two biggest pharmacy groups that work with multiple RACFs had one pharmacist participant in each focus group. This was done to ensure a wider representation of pharmacies involved in supplying medications to RACFs. Focus groups with nurses/carers were conducted in respective RACF facilities. The first focus group was conducted with nurses/carers in Bicton. The second group was conducted at in Myaree and the third group was conducted in Belmont. Nurses had experienced working at different RACFs around Perth Metropolitan Area. The RACFs were purposely chosen in different locations to ensure a wider representation of participants. For this purpose RACFs that were managed by different companies were chosen.

### **5.3.3 Recruiting focus group participants**

Participants for the doctors focus groups were recruited through contacting the respective Divisions of General Practice (GP) aged care panels in the Fremantle and Osborne Park areas. All potential doctor-participants received an information letter and



invitation to attend the focus group. Eight doctors from the Fremantle area and 12 doctors from Osborne Park area were contacted via telephone.

Participants for the pharmacists focus groups were recruited through contacting pharmacies that supply medicines to at least one RACF. This task was difficult as there was no official available list of pharmacies that worked with RACFs. Therefore, pharmacies were identified by contacting pharmacies initially known to researchers that provide services to RACFs. From these pharmacies information was gathered about other pharmacies that service RACFs. This process was continued until a sufficient number of pharmacists agreed to participate in the focus groups. A total of 14 different pharmacies were contacted. Two of them included major groups that deal with multiple RACFs. All potential pharmacist-participants were contacted via telephone to seek agreement to participate and received an information letter and invitation to attend the focus group (see Appendix 9).

Participants for the nurses/carers focus groups were recruited through contacting the manager of RACFs who then gave the information letter and invitation (see Appendix 9) to attend the focus group to potential participants. The manager who invited nurses and carers to participate was informed about the approximate preferred number of participants in focus group meetings.

#### **5.3.4 Focus group design and protocol**

The focus group questions and protocol were designed with the aid of the relevant literature. This was also assisted by a consultation meeting with researchers involved and the facilitator of the focus group. This resulted in minor changes to focus group questions. The focus group facilitator was a staff member of School of Pharmacy but was not part of research team of this study. This was done to ensure a degree of neutrality and avoid bias. The final focus groups questionnaire had an opening question

(icebreaker), six transition questions and three key questions (See Appendix 10). The opening question pertained to participants' opinion on current medication supply systems in RACFs. Transition questions pertained to difficulties with current medication supply systems, potential improvements and potential new models of medication supply, including pharmacist prescribing. Key questions pertained to model preference and additional training needed (see Appendix 10).

Before commencement of each focus group meeting, the facilitator made a brief introduction of the project and also asked participants' agreement for audio-recording. All focus group meetings were audio-recorded using a digital recorder. To ensure effective audio-recording and to take notes about contributions made by each participant, one of the main investigators attended all focus group meetings and acted as an observer and did not participate.

All participants signed a consent form to participate in the focus group (see Appendix 11). Participants were also reimbursed for their time to participate in the focus group. Reimbursement rates were as follows: doctors AU\$200, pharmacists AU\$100 and nurses/carers AU\$100. All focus groups were conducted during February 2009.

### **5.3.5 Data analysis**

Audio-recorded data from the focus group meetings was transcribed into Microsoft Word. In order to perform a secondary content analysis, audio-recorded data was re-listened to and also compared with field notes taken. Transcribed data was analysed using NVivo® v8 software. This data was imported and thematically coded into the NVivo® program and was organized according to topics. This assisted the management of a large amount of data and aided further analysis and interpretation of participants' views and experiences. The main themes identified are listed in the results section. Selected comments are also given to illustrate participants' views.

## 5.4 Results

The focus group with Fremantle area doctors had four participants out of eight doctors contacted. One of the doctors agreed to participate but cancelled just before the meeting. The focus group with Osborne Park area doctors had seven participants, out of 12 doctors contacted. A total of 11 pharmacists agreed to participate in focus group meetings out of 14 pharmacies contacted. One pharmacist cancelled his participation before the meeting due to an emergency. Pharmacists were divided in equal focus groups consisting of five participants. The two biggest pharmacy groups with multiple RACFs had one pharmacist participating in each focus group. The focus group with nurses/carers at Bicton RACF location had six participants. The focus group with nurses/carers of Myaree RACF location had five participants. The focus group with nurses/carers of Belmont RACF location had five participants.

The main themes and sub-themes identified using NVivo® v8 are given in Table 5.1. Potential improved models of medication supply to RACFs are given in Table 5.2.

The relevance of each sub-theme was ranked according to their appearance in focus group meetings. A sub-theme which has appeared in at least one focus group meeting in all three health professional groups (i.e. nurses/carers, pharmacists and doctors) has been ranked with ‘high relevance’ and assigned ☆☆☆. A sub-theme that was appeared in at least one focus group meeting of two different health professional groups or in more than one focus group meeting of one health professional group was ranked with ‘medium relevance’ and assigned ☆☆. A sub-theme that has only appeared in one focus group meeting of one health professional group was ranked with ‘low relevance’ and assigned ☆. A comment that appeared more than once in another focus group meeting consisting of same health professionals was marked with an additional †.

It should be noted that positive aspects of current medication supply systems have not been the focus of this study. Therefore, those opinions were not part of the study.

**Table 5.1 Themes and sub-themes identified from data collected in focus groups**

<b>Main theme</b>	<b>Sub-themes</b>	<b>Ranking</b>
Difficulties with medication supply systems	Medication wastage	☆☆☆
	After hours/weekends	☆☆☆
	Communication	☆☆☆
	Medication charges to the residents	☆☆☆
	Delivery of medication	☆☆☆
	Difficulties after hospital discharge	☆☆☆
	Medication changes	☆☆☆
	When required (PRN) and short term medications	☆☆☆
	Packaging – the sachet system	☆☆
	Inaccurate packaging and discrepancies	☆☆
	Faxed orders	☆☆
	Medication brands	☆☆
Prescription and dispensing difficulties related	Authority prescriptions	☆☆☆
	‘No script no supply’	☆☆☆
	Owing prescriptions	☆☆
	Backdating prescriptions	☆☆
	Paperwork with writing prescriptions	☆☆
	Missing prescriptions	☆☆
	Overprescribing	☆☆
	Difficulties with doctors in obtaining prescriptions	☆☆
	Labeling and instructions of medications dispensed	☆
	Low care facilities	☆
Lack of government audit	☆	

**Table 5.2 Potential improved models of medication supply to RACFs**

<b>Main theme</b>	<b>Sub-themes</b>	<b>Ranking</b>
Medical Director	General assessment	NA*
Medication chart	Support for using the medication chart system	NA
	Reviewing the medication chart	NA
	Current problems with medication profiles and potential disadvantages of using medication chart system	NA
Repeat extension	General assessment	NA
Non-medical prescribing	Comments in favour of non-medication prescribing	NA
	Comments against non-medical prescribing	NA
	Additional training	NA
Other proposed solutions to improving medication supply and management in RACFs	Sharing PRN medications/Imprest system	☆☆
	Pharmacist on site	☆
	Using the local pharmacy	☆☆
	The government taking over the supply of medications to RACFs	☆
The 'best' model	General assessment	NA

\*Not Applicable – i.e. these models were proffered to focus group participants

### 5.4.1 Difficulties with current medication supply systems

Focus groups participants indicated a number of difficulties they are facing with the current medication supply systems to RACFs. A summary of these ranked difficulties is presented below:

#### a) Medication wastage ☆☆☆

Wastage of medication was identified to be one of the most significant concerns raised by all three groups of health professionals that participated in focus group meetings. The main reason for this wastage generation was that generally the pharmacy does not repack medication which comes back from RACFs, since accreditation requirements do not allow medication repackaging. Nurses and carers indicated wastage of medication seemed to occur in different instances. For example, when a resident goes to the hospital on Monday, they have a medication supply until Sunday and the following week they come back with new medications while previous medication is discarded and therefore wasted i.e. when there are changes to residents' therapy. Additionally, the residents have to pay for discarded medication since the pharmacy has already supplied and they cannot be repacked. This was illustrated by a participant in nurses/carers focus group: *"...if there are any changes you have to take the whole pack away, three or four days worth of medication. It is a waste of medication ††"*. Nurses and carers also highlighted the issue when residents refuse generic brands of medications and because of that all medications packed for that week are wasted because the DAA has to go back to the pharmacy and medication replaced.

Pharmacists explained how all sachets which come back from RACFs have to be discarded due to storage requirements. This especially becomes an issue when in those discarded packs there are medications for which doctors need authority approval prior to prescribing. Medications that are prescribed for short term use as well as broken packs that come from RACFs are also discarded. This is illustrated by one of the pharmacists: *"One day a month we have two staff members that go through the Drugs of Dependence*

*(DD) returns and write them up. Broken boxes and short dated products that go through the DD inspector get destroyed and there are full boxes of morphine in date that come back...etc. Currently there is massive wastage ††*". In some cases pharmacists send medications for short term or PRN use to RACFs and unfortunately residents pass away very soon after. In these cases those short-term or PRN medications are sent back to the pharmacy and discarded, even if not used at all.

Doctors indicated they think they are writing more prescriptions than their patients require because of the system generating large amounts of wastage. In some instances medications are also stopped by the pharmacy as a result of doctors not being able to get authority prescriptions for medications which have been wasted (i.e. discarded) by the pharmacy. This is illustrated by a doctor who said: *"Medications are stopped without me saying so. I have written the last prescription in November so there was three months (of medication supply) left. With sachets system they say, and I don't know whether it is true, that they throw away old sachets they get back and replace them all again so basically what they are doing is they are chewing patients' drugs. They can't do that because that is patients' property. That is a huge waste ††"*.

Doctors also highlighted the issue of medication wastage as a result of changes made to residents' therapy. Medications are usually packed for a week at a time and when changes are made to residents' therapy old packs are discarded. Again, medication wastage seemed to be particularly an issue of concern with authority medications which are often very expensive. This is illustrated by a doctor *"...if you make a change, one day after the medication pack arrives, some not all pharmacies, will not repack the medication so a whole weeks' supply is thrown away. So you are losing a lot of medication. Some are authority medications and very expensive. Sometimes you can have problems getting a supply of Authority medications ††"*.

## **b) After hours/weekends ☆☆☆**

Accessing pharmacies after hours and weekends was identified as causing major difficulties in supplying medications to RACFs. Nurses and carers highlighted the difficulty with weekend pharmacists which are often different to pharmacists they deal with during the week. This seems to be when mistakes happen because “...*pharmacies got no (regular) pharmacists and training †*”. Nurses and carers were stressed on occasions when therapy changes occurred during the weekend and the update with new medication profile and signing sheets’ did not occur until Monday. In these scenarios they find discrepancies between medications given and their signing sheets and they would not have the updated profile to compare.

Pharmacists also indicated how after hours work tended to be more difficult because in some instances medications were supplied by other pharmacies. This would be the case with pharmacies that were not open late and/or during the weekend. In this regard, pharmacists were particularly concerned with DDs i.e. “...*the main problem, weekend or during the week (after hours), is with DDs if we run out and we have an urgent change to make †*”.

For doctors, the issue of accessing pharmacies after-hours was mainly a concern when they need to introduce a therapy change when seeing patients at night for acute conditions such as urinary tract infections (UTI) and the pharmacy not being available to supply the medication. In these cases medication is sent the next morning by the pharmacy. This is illustrated by a doctor who said that “...*if you are called on the weekend or after hours to see a patient, you issue the script today but the pharmacy cannot supply. You are restricted to what the pharmacy can supply. There is a lapse between doctors willing to respond and the pharmacy willing to supply. So this part is not meeting the needs ††*”.



### c) Communication ☆☆☆

Difficulties which pertained to communication between staff in RACFs, doctors and pharmacists were identified. Participants in nurses and carers focus groups emphasized how it was better when the pharmacy was smaller. In those cases when the pharmacy was contacted you could get a more personalized response unlike today when *“the pharmacist is on duty and then when you ring back to find out what has happened, you get a different pharmacist. A bit like the agency nurses in a hospital, you don’t get the response to your questions until three days later †”*. Nurses and carers also highlighted some other issues which pertained to a potential lack of good communication between them and the pharmacy staff. When medication orders are sent to the pharmacy, the pharmacist sometimes has difficulties in interpreting what the nursing staff has requested and according to nurses and carers the pharmacist often has the same information that the nursing staff has and still rings to clarify instructions. This is illustrated by a comment from a RACF carer *“...they don’t seem to know what we are requesting when it is there written in black and white and they deal with this sort of thing every day ††”*. This issue tends to be more problematic when nurses and carers are outside their office performing other duties and dealing with residents. In these cases they would not have direct access to their office so they cannot immediately communicate the information requested back to the pharmacist. One of the carers also mentioned the pharmacy not passing the information on residents’ current safety net status. This could also be solved through a better communication between the pharmacy and RACFs.

Communication between the main stakeholders involved was also a significant issue for pharmacists. They emphasized a breakdown in this communication when residents use GPs that do not normally deal with that RACF. Another communication difficulty appeared when pharmacists were not informed on the urgency of new medication to be delivered when these medications are not usually indicated for urgent conditions. A pharmacist mentioned that this issue depends on the experience of the nursing staff, for example an experienced nursing staff (if the medication is not urgent) will tell the pharmacy to deliver the medication with the next delivery but an inexperienced staff member or an agency will ask for the medication to be sent immediately hence creating

a delivery problem for the pharmacy. This issue is more complex when pharmacists do not have the information on the particular indication of that medication and they do not know the urgency of it so they are not in a position to make a clinical decision. According to a pharmacist, many of those changes can be done within the next two to three days. This is illustrated by a pharmacist who said: *“You ring the nursing home and say the doctor has ordered the drug X he hasn’t indicated when he wants it... †”*.

Pharmacists sometimes have to pay overtime and extra delivery cost for their staff to deal with after-hours changes because requests come much later than when the doctor has seen the resident. This is illustrated by a pharmacist comment: *“patient got a UTI and has seen the doctor. The fax comes to us at around 5.30 pm. Better communication (needed) I suppose †”*. Pharmacists also mentioned how sometimes the doctor cannot be contacted to clarify potentially incorrect instructions on medications requested. This problem could also be addressed through better communication access between pharmacists and doctors.

Doctors suggested difficulties which pertain to inadequate communication between them and pharmacists. A doctor mentioned instances when the medication was about to run out and then they got a fax from the pharmacy saying ‘we need this script now, could you fax a copy and then send the script to us in the mail’. This creates problems for doctors as it consumes a lot of their time and they have to leave other duties to address pharmacists’ prescription request. This becomes more complex in cases when doctors have already written a prescription being requested. This is illustrated by a doctor who mentioned that *“...sometimes you write the script and a week later immediately you get the request for the same script, in a mass they send you. I have about 150 patients and this takes a lot of our time on the weekend writing out scripts, even on a computer ††”*.

#### **d) Medication charges to the residents ☆☆☆**

Nurses and carers, as well as doctors and pharmacists were all concerned with how the current medication supply system to RACFs allows for certain medication charges to the residents. A nurse stated that dealing with residents' accounts is the biggest issue they have with residents. The problem arises when pharmacy supplies the medication but actually receives the prescription and claims it much later. As a result, this owed prescription is dispensed within a time interval that is too close to the next due prescription for that drug. This creates confusion for the residents and their families who query their accounts, as illustrated by a nurse: *"...some of the tablets are for 28 days in the month and they want to know why they have been charged twice for the month ††"*. Another issue which emerged in nurses and carers' focus groups is charging of the residents for medications which accidentally get dropped from DAAs before their actual administration. In these cases often the whole sachet gets discarded, replaced and residents are charged for it. In some cases nursing staff cannot identify medication spilled out accidentally. Complaints of family and residents about their accounts are frequent.

Pharmacists highlighted the issue of lack of residents' information when they are admitted to the facility. As a result residents get overcharged because the pharmacy does not have their concession details at the time of dispensing. There are also cases when doctors charge residents for writing prescriptions. The pharmacy passes on this charge to the resident. A pharmacist mentioned an amount of AU\$2 or more per script. Another issue which emerged in pharmacist focus groups was charging patients for authority prescriptions which are not approved, especially in situations when residents were discharged from hospitals. This was illustrated by a pharmacist: *"often there are hospital situations requesting authority items (eg. 21 augmentin forte, ciprofloxacin). We put that through as an authority and three months down the track when the authority does not become possible we have to charge the patient and then we hear from the family: 'you have billed me for mum who died three months ago and what is this charge of \$90 for Ciproxin, she is a pensioner'. So the problem starts †"*.

There are situations where patients complain to the doctor about their accounts querying the amount of medications charged by the pharmacy. A doctor suggested how his patients call asking “...*How can I have 100 Panadol tablets this week and next day have another 100 †*”. This is the same issue also reported by nurses which in essence results from pharmacy receiving the owed prescription late, claiming it and then charging the resident within a time interval which is too close to the next allowed regular supply. Another doctor was concerned when medications which are not subsidised by the PBS are prescribed because according to this doctor patients are forced to pay a high price set by the pharmacy.

**e) Delivery of medications ☆☆☆**

Difficulties with delivery of medications from the pharmacy to RACFs were raised by nurses/carers, doctors and pharmacists. Nurses and carers were concerned with residents’ health being compromised in situations when medications are needed after the cut off pharmacy delivery time. A comment from a nurse illustrates this “...*anything after that time is not delivered. But then the residents care is compromised, they might be in pain ††*”. A nurse also mentioned problems with courier drivers sometimes giving the medication directly to the resident and not the RN and considered this to be very dangerous.

For pharmacists delivery of medication did not seem to be an issue when the medication was for an acute condition as this was considered to be a straightforward decision for delivering the medication. However, delivery problems seemed to emerge when pharmacists did not have clear instructions from doctors when the medication should be started, particularly in cases when that medication was not usually indicated for an acute condition. There was a perception that RACF staff have different opinions on the urgency of that delivery dependent on their experience, with less experienced staff usually requesting the medication (even when it is not usually indicated for an acute

condition) to be delivered immediately. Pharmacists highlighted the need for doctors to clarify when the medication should start. This was illustrated by a pharmacist comment: “...you ring the nursing home and say the doctor has ordered the drug X he hasn't indicated when he wants it. The nursing home always says we need it now because they don't want to take the risk. So you have a delivery issue to deal with yourself. The doctor should say to the patient: 'You'll get the medication tomorrow afternoon and will sort it out but they don't, they just sign the script... †”.

Doctors considered it was difficult if they go to see a patient in the middle or later in the day since the medication cannot be delivered to the resident immediately. A doctor did emphasize the issue of difficulty with delivery when changing residents' therapy in dealing with a pharmacy which was actually located interstate.

#### **f) Medication changes ☆☆☆**

Nurses and carers as well as pharmacists and doctors identified difficulties during changes to residents' therapy. For nurses this was when mistakes occurred including incorrect paperwork with signing sheets and residents' profile. This was illustrated by a nurse comment: “I think (medication) changes are always difficult. That is where you can get mistakes or incorrect paperwork which comes from the pharmacy ††”.

A few issues were raised by pharmacists when changes were made to residents' therapy. They identified lack of doctors' specification on the urgency of medication initiated or changed to be an issue. Additionally, changes to residents' therapy seem to be more difficult when residents are taken by their family to see their own GP not at the RACF and they get the prescription somewhere else. The pharmacy usually finds out about this when they get a call from carers asking the pharmacy to include the medication they have in their hands in DAAs. However, the pharmacy or RACFs do not have any documentation about it. The frequency of changes made to residents' therapy was also identified in a pharmacist focus group to be an issue. This is illustrated by a pharmacist

who said: *“We got one doctor who continually accuses us over using medication. He makes ten changes a week. What physically he wants us to do. We can’t do everything †”*. It should be noted that every time a change is made, the DAA goes back to the pharmacy and is often discarded and medication therefore wasted.

Doctors identified delays for changes to residents’ therapy to be implemented. Additionally, doctors were also concerned with medication wastage which occurs when changes are made to residents’ therapy. This is illustrated by a doctor who said: *“Medications have been packaged for quite a number of weeks at a time and if you make a change, one day after the medication pack arrives, some, not all pharmacies, will not repack the medication so a whole weeks supply is thrown away, so you are losing a lot of medication, some very expensive ††”*.

#### **g) Difficulties after hospital discharge ☆☆☆**

Difficulties with residents discharged from hospitals were identified by all three groups of health professionals. Nurses and carers highlighted how there are problems in cases when residents are discharged from hospitals and the pharmacy does not have the information on residents discharge medication. Sometimes residents are discharged with medications not packed in a DAA. In these cases carers cannot administer that medication and send it back to the pharmacy for packaging. Accreditation requirements prevent the pharmacy from packing medications which were not dispensed by the pharmacy hence compounding this problem. This seemed to be more complex when RACFs do not have after-hours access to the pharmacy since the abovementioned procedure causes delays and often residents’ therapy is not given until the next day or over the weekend. This is illustrated by a carer comment: *“The biggest problem in hostels is the medication control when people are returning from hospitals because they don’t let the pharmacy know what scripts they are on. They give them (carers) bottles. They cannot give them Webster packs and they think there is trained staff to dispense the medication. That is a big problem. They come back with a box of antibiotics. Staff here*

*cannot give it to them. Even this week we had tablets from the hospital. We had to send them back to the pharmacy. We are okay because we have 24/7 service but small hostels using a local pharmacy which is shut. The medication is required to be given doesn't occur until the next day, over the weekend or Monday. The pharmacy does not pack if medications are sent in boxes ††”.*

Pharmacists also highlighted the lack of residents' medication discharge summary when they are transferred from hospitals to RACFs. This seems to waste a lot of time for pharmacists who then have to follow up and contact the hospital to find the information. Pharmacists often get prescriptions instead of the residents' discharge summary. These prescriptions sometimes are given to the residents or their family which also creates confusion because often they are filed away in RACFs and get lost. Receipt of incorrect medication discharge summaries were also pointed out by a pharmacist. This is illustrated by a pharmacist comment who said: *“From Hospitals the biggest issue is with residents' medication discharge summary. They are incomplete or doctors' notes do not match the discharge summary and when you call them sometimes they cannot tell you exactly what patients are on so there is a lot of chasing around ††”.* A pharmacist also pointed out that once she could not obtain residents discharge summary due to confidentiality issues. Pharmacies often supply medications prescribed in the hospitals assuming that an authority prescription will be approved and given to them. When the medication supplied does not get approved the pharmacy ends up charging the resident full price for the medication supplied. This may suggest lack of PBS knowledge by hospital doctors prescribing PBS items 'off-label'.

A doctor also pointed out the problem with hospitals supplying medications which then doctors cannot continue to prescribe as they were initially prescribed 'off-label' by the hospital. This is illustrated by his comment *“patients come out from the hospital and have their own medications 'off label'...there is no indication on PBS for it and you are now asked for a script for it, which is not legal and it doesn't seem to be any way around that...there should be an easier path for the hospitals prescribing “off label” and for the GP to continue supplying the prescription †”.*

**i) When required (PRN) and short-term medications ☆☆☆**

All three groups of health professionals in focus group meetings highlighted concerns with PRN and short-term medications. Nurses and carers pointed out the wastage of PRN medications and difficulties with identifying PRN medications from antibiotics and short term medications.

Pharmacists' appeared concerned with charging the resident for short-term medication which may only be used a few of times or none. This is illustrated by a pharmacist who said: *"We have someone who is written up for morphine, hyoscine and midazolam. We sent them down at 10 o'clock at night and unfortunately the patient dies the next morning and they send the medication back and you can't do anything with it. You have to charge the patient †"*.

Doctors pointed out how sometimes they want to give the patient a PRN medication and there may be availability of that medication at that facility but under the current system the facility will not use any medication that has not got a resident's label on it i.e. a new medication has to come up from the pharmacy. This is illustrated by a doctor who said: *"...terminal patients who just need morphine at the end of life and they might only get one dose e.g. 2mL out of 200mL bottle Ordine and that is just discarded after and then when you do need it, it would be useful to be just be there at the facility †"*. The current system of with PRN medications, in addition to potential wastage, may also be unnecessarily consuming doctors' time in writing prescriptions. A doctor pointed out: *"I would spent nearly two hours during the week just doing prescriptions and the annoying thing for me is that a lot those prescriptions are unnecessary for a one-off PRN medication †"*.



#### **j) Packaging – the sachet system ☆☆**

In both nurses/carers and doctors focus group meetings, the sachet system of packaging medication came up as a potential difficulty with medication supply to RACFs. However, it should be noted that not all comments compared this system with the blister system of packaging implying that these difficulties are not necessarily excluded with the blister method of packaging. Nurses and carers highlighted the issue of perforation with sachets i.e. how the sachets do not tear out very easily so when it is opened the medication spills out. This is illustrated by a nurse who said: *“I think the sachets in themselves are very good. I think the perforations on the sachets cause quite a few incidents when we were opening medications because the sachets are torn and the medication spills out †”*. The issue of difficulties with identification of antibiotics, PRN and short term medications from packs containing regular medication was also raised by nurses and carers.

Doctors identified the sachet system of packaging to be an issue when changes are made to residents’ therapy. This is illustrated by a doctors’ comment: *“Most of the places I work supply sachets. The sachet system is good, neat, it reduces errors, but there is a problem, sachets are meant for no changes, for those who continue with the supply †”*. A doctor pointed out how when changes to residents’ therapy are made and pharmacies use the sachet to repack the medication it generates errors and confusion.

#### **k) Inaccurate packaging and discrepancies ☆☆**

Nurses/carers highlighted issues related to inaccurate packaging of medications in DAA’s. Sometimes there is less or more medications packed in DAAs than is supposed to be and often the nursing staff cannot identify the medication. This is illustrated by a carer who said: *“...sometimes medication is missing from certain sachets. We have to make sure that the correct number of medications is given and because we don’t know*

*particular tablets we find it difficult. So, when one tablet is missing we don't know which particular tablet that is ††*".

Nurses and carers also highlighted issues with discrepancies between patients' profile and medications supplied. Paperwork discrepancy is illustrated by a carer who said: *"The sachet may say it has Panadol but it actually has a dose of Panadol Osteo and then underneath it will have 500mg but the actual paperwork will say it is Panadol Osteo (i.e. 665mg), so there is that discrepancy ††"*.

#### **l) Faxed orders ☆☆**

Nurses and carers emphasised that they were having difficulties with faxing orders and prescriptions through to the pharmacy. These difficulties pertained to faxed orders going missing between RACFs and the pharmacy. This is particularly an issue when DD's or antibiotics are ordered because they are expected to arrive at RACFs within a certain time frame. Nurses reported getting frustrated with chasing up faxed orders and they indicated that doctors are frustrated with this as well. This is particularly relevant with DD patches which are required to be replaced within a specific period of time. This is illustrated by a comment which emerged from nurses and carers' focus groups: *"we know that we have sent it to the pharmacy because we will get a report saying that it has gone through but then we ring up and they say we haven't received it ††"*. Another problem for nurses and carers with faxed orders is that once orders are faxed through they get constant calls from the pharmacy to confirm their order.

#### **m) Medication brands ☆☆**

Nurses/carers identified difficulties with use of different brands of medications in RACFs. In this regard, they did report difficulties in explaining to the residents the equivalence of brands which are substituted by the pharmacy. In cases when the resident

refuses the substituted brand the medications are wasted since the DAA goes back to the pharmacy and discarded before repackaging is done. The brand substitution may especially be an issue for carers in cases when the pharmacy does not let the nursing staff know about the brand substitution. A comment from a carer is given to illustrate this: “...sometimes they pack a different brand of medication and they don’t let us know. We run back annoying the RN saying this is a white tablet but still has the description of the original tablet on the pack and not the new description. There is no note to let you know they are going to change the brand. It is still the same medication †”

#### **5.4.2 Prescription and dispensing related difficulties**

Focus group participants indicated a number of prescription and dispensing related difficulties when supplying medications to RACF residents. A summary of these ranked difficulties is presented below:

##### **a) Authority prescriptions ☆☆☆**

A major difficulty for focus group participants was dealing with medications that require authority approval by the PBS in order for them to be supplied to the residents. A nurse pointed out how pharmacists cannot supply these medications as owed prescriptions and as a result they discontinue supply without notice. This is illustrated by a nurse who said: “...you have got a resident with behavioural issues and they stop the drug because they haven’t got an authority script and the behaviour problems escalate. Sometimes the drug can only be written by specialists so it is not a good system †”.

Pharmacists emphasized the difficulties they encounter with obtaining authority prescriptions and this becomes more complex when doctors write a prescription which

does not get approved because the pharmacy then returns the prescription back to the doctor so the approval is obtained. This also creates further delays in prescription dispensing interval. This is illustrated by a pharmacist comment: *“I had a doctor who has written an authority prescription which did not get approved but sent it to us anyway. We did put it through and a month later we got it back rejected. So we were six weeks behind again, and we have made the supply meantime ††”* Pharmacists also pointed out the lack of authority prescriptions when residents are discharged from hospitals. This means the medication cannot be supplied as a PBS item.

Doctors pointed out how pharmacies often supply medication as owing and then ask doctors for prescriptions without realising that the resident is not eligible under the PBS rules to have that medication subsidised. Lack of timely notification of doctors by the pharmacy when residents are about to run out of their authority prescription was also emphasized.

**b) ‘No script no supply’ ☆☆☆**

For nurses/carers, pharmacists and doctors the issue of non-supply as a result of lack of prescriptions for pharmacists emerged to be a significant issue of concern. Nurses and carers reported how sometimes there are stickers on DAAs indicating ‘no supply because no script’. In these cases, a nurse illustrated how *“medication chart indicates that it is still there and when the pharmacist is contacted about it he/she will say ‘well the doctor hasn’t supplied the script’... † “*. This is particularly a problem with authority prescriptions and especially for medications used in psychiatric conditions because when the medication is stopped residents’ behavioral problems escalate.

Pharmacists suggested they get into a position of (not) supplying medications when new residents are admitted to RACFs. A comment from a pharmacist illustrates this: *“If a new resident comes in the facility, they can give you a bunch of prescriptions they expect you to dispense and pack with no proper directions on the script and you can’t expect us*

*to really do that †*". A pharmacist indicated how sometimes the process of getting all the required information can take almost all day. Difficult decision making situations of medication supply were also reported when doctors do not supply prescriptions for medications which have been repeatedly supplied more than once based on the owing system.

Doctors confirmed the issue of non-supply as a result of lack of prescriptions. According to a doctor, sometimes this is not a particularly friendly situation since prescriptions requested are well in excess of what they really should be. A doctor suggested that sometimes the medication is discontinued because doctors cannot prescribe due to the PBS authorization restrictions. This issue of therapy discontinuation is illustrated by a doctor: *"Occasionally, the issue is pushed that if we (do not) sign and provide those prescriptions your patients will not get their medications so we are held to ransom to do the scripts that are demanded of us. But I cannot do more Galantamine than the Government will authorise and so they stop the supply of that medication if they haven't got the prescription right when it is due ††"*. As mentioned above, discarding medications when changes are made to residents' therapy plays a big role in these situations where the interval of their prescribing is subject to authorization by the PBS.

### **c) Owing prescriptions ☆☆**

Pharmacists and doctors highlighted the issue of supplying medications to RACFs based on an owing system. For pharmacists it seemed that a good part of their medication supply is based on an owing system which leaves pharmacists waiting to receive the prescriptions for medications already supplied. The system of supplying medications to RACFs based on an owing system may also be financially affecting pharmacists since they supply the medication without being reimbursed for it until the prescription is received. A comment from a pharmacist illustrates this: *"You provide all these drugs and you haven't been reimbursed for it and you have to bear this cost †"*.

Doctors also recognised the fact that supplying medications based on the owing system is a problem for pharmacists because pharmacists are worried about missing out on finance if they do not get the scripts from doctors. Doctors raised the issue of pharmacists requesting more prescriptions than they expect their residents to consume during that period of time. However, it should be noted that not repacking (i.e. discarding) DAAs after changes are made to residents' therapy plays a big role in this problem for which some doctors did not seem to have a clear understanding. Doctors also raised the issue of pharmacists supplying based on an owing system medications which residents are not eligible to have under the PBS. This is a comment by a doctor which illustrates this particular problem generated by supply of medications based on an owing system: "*Medications like Gabapentin and Lactulose, pharmacists are tricky. Not all of residents are actually eligible to have them under the PBS. They just supply and ask you to do a script. So when you are doing owing prescriptions it is quite difficult to go through so many patients †*".

#### **d) Backdating prescriptions ☆☆**

The issue of backdating prescriptions were raised by both doctors and nursing staff. For nursing staff the backdating of prescriptions seemed to be particularly an issue when accounts with prescriptions dispensed are explained to the patient or their family. Backdating of prescriptions becomes an issue when they are received after the medication has already been supplied as owing and as a result nursing staff get worried about the correct charging of residents. Furthermore, nurses may be wasting valuable time in matching when the medication was supplied and when the prescription dispensed for claiming purposes by the pharmacy since often they need to explain the account discrepancies to their residents. A comment from a nurse illustrates this: "*...I have to calculate how many tablets she would have had then. When was the last time they had it, and then I have to ring up the pharmacy, find out when was the last time they were charged because they don't look at all that. They are not going to count it all out. How*

*many medications are in a box of so and so and it can take me ages to sort it out for them. I don't think the pharmacies are ripping them off. I don't believe that is the case, it is just a process that they don't understand †*".

A doctor expressed concerns with pharmacies asking for backdated prescriptions for medications already supplied since this is against prescribing rules. A comment by a doctor illustrated how prescriptions are sometimes requested for medications already supplied for patients who already passed away: "*A patient died six or nine months ago. Pharmacy kept sending a script from last year to a patient who died six months ago. It happened quite often... †*". It should be noted that this problem directly arises from pharmacies supplying medications based on an owing system and delays until those prescriptions are received from doctors. In cases when patients pass away and medications are already supplied, the only way for the pharmacy to get reimbursed is to get prescriptions dated on the day the actual medication was supplied. There appeared to be a lack of understanding by some doctors about this particular issue.

#### **e) Paperwork with writing prescriptions☆☆**

Doctors expressed concerns with the amount of paperwork they have to go through when managing their patients at RACFs. These paperwork concerns were mainly related to writing prescriptions. This suggested that a significant amount of doctors' time which could be spent on reviewing patients was actually spent in writing prescriptions for the pharmacy. A doctor even suggested: "*I cannot possibly get through the paperwork generated by the pharmacy in a working week ††*".

**f) Missing prescriptions ☆**

Doctors raised the issue of missing scripts in RACFs. This seemed to happen especially when prescriptions are written at the facility and doctors end up writing the prescription again. A comment to illustrate this was made by a doctor: *“I might write down the antibiotic or eye drop and quickly scribble a script and give it to them. That script disappears never to be found again. I end up doing it again ††”*.

**g) Difficulties with Doctors in obtaining prescriptions ☆☆**

Pharmacists identified difficulties they encounter with doctors during their supply of medications to RACFs. These difficulties mainly pertain to delays obtaining prescriptions for medications supplied. Currently most pharmacies send reminders for the doctors when residents' repeats are about to run out and then doctors supply a new prescription with repeats. This is illustrated by a pharmacist who said: *“Every five months we require prescriptions, this leaves us one month (before prescription runs out) to get other repeats. I go through all patients to check what they need. One doctor did that in one week, the other one we are still waiting... †”*.

**h) Labelling and instructions of medications dispensed ☆☆**

Nurses/carers identified problems with labelling and instructions on medications dispensed by pharmacies. Identification between short-term, antibiotic and PRN medications was a difficulty that nurses and carers highlighted. Additionally this generated other problems because antibiotics needed to be recorded in the infection control surveillance sheet and when they do their end of month reports the data entered does not match. Nurses and carers also pointed out the lack of instructions on PRN



medications supplied by pharmacy. This is illustrated by a nurse who said: “*With the PRN packs, there is not enough information on the pack, when and why we should be giving them e.g. when the patient is vomiting ††*”. In cases where topical products are labelled as ‘apply to affected area’ nursing staff is not aware which area is that and often residents, especially those with conditions such as dementia, cannot tell the nursing staff where the affected area is.

**i) Overprescribing ☆ ☆**

The issue of prescriptions issued in excess of residents’ needs’ was stressed by doctors. This was illustrated by a doctor comment: “*Why is it that I have been asked to supply 25-50% more prescriptions for that period of time that you would normally expect ††*”. As in the case of the difficulty with ‘no script no supply’, wastage of medication in RACFs as a result of current rules allowing no re-packing of DAAs may be a major contributing factor for doctors prescribing in excess of what they think their residents’ needs are.

**j) Low care facilities ☆**

Doctors identified issues with dispensing of medications in low-care facilities where carers dispense medications occasionally. According to a doctor, this is a problem that is prone to errors and creates situations where residents may receive someone else’s medication. This doctor also mentioned another issue in low care facilities where nursing staff were not allowed to dispense Schedule Eight drugs on a PRN basis so when they have terminal patients or need a PRN Scheduled Eight drug to cope with significant pain there are difficulties.

**k) Lack of government audit ☆**

Lack of audit by the PBS on dispensed medications was brought up by a pharmacist. According to this pharmacist “*current PBS supply arrangements are not good because the PBS is not able to audit ahead of time what supply against the demand is... †*”.

**5.4.3 Potential improved models of medication supply to RACFs**

Focus group participants were asked to comment on potential improved models of medication supply to RACFs. These models included: a) use of Medical Director computer program at the facility to write prescriptions b) use of a centralized medication chart, c) extending the number of repeats and d) non-medical prescribing (i.e. expanded pharmacist and nurse prescribing). Findings from focus group discussions are summarised below:

**5.4.3.1 Medical Director**

In discussing the use of a Medical Director as a way of improving medication supply to RACFs, some potential advantages and limitations were identified. A nurse suggested that in the RACF she works, one of the doctors uses the Medical Director program when visiting the RACFs and the experience with this is that you know immediately what is written and the pharmacy gets the prescription straight away. However, a problem that other nurses and carers highlighted with this system was that usually doctors have other priorities when visiting RACFs and do not have time to sit down and write prescriptions. This is illustrated by a nurse who said that: “*Doctors don’t have time when they visit. They rush in and out. You are lucky to get what you need done ††*”.

Pharmacists who had experience with doctors using the Medical Director program noted that prescriptions for medications initiated during the time the doctor visits RACFs are received much sooner. However, this system does not address other regular prescriptions when repeats run out. This is illustrated by a pharmacist who said: *“You have the same problem, you have someone on medication every day and the script runs out. You need something like a medical chart that satisfies the prescription for example for six months ††”*.

Doctors did not appear to be very keen in using the Medical Director when visiting residents at RACFs. A doctor suggested the issue of writing prescriptions in different places was difficult while another doctor suggested that when she tried writing prescriptions at RACFs she ended up writing them again as they get lost in paperwork. However, it seems that the main issue with this system is the fact that doctors generally have limited time and other priorities when visiting RACFs. This is illustrated by a comment from a doctor: *“It is generally a time issue that during the day when you do the consulting, you want to see as many patients as you can and spend other time to do the scripts. I do my scripts on the computer at the surgery for the requirement that is generated by a fax or mail from the respective pharmacies ††”*.

#### **5.4.4.2 Medication chart**

The use of a medication chart/profile as a legal document for supplying medications was generally supported. Pharmacists preferred this being done electronically. There were a few sub-themes that emerged under the medication chart model. These sub-themes were not ranked since it was the focus group facilitator who prompted participants to give their comments on the relevant subject. These themes pertained to: a) support for its use, b) reviewing the medication chart and c) difficulties with current medication charts and potential difficulties with using the medication chart as a central document. These are given below:

### a) Support for using a medication chart

Focus group participants were supportive of using a centralized medication chart as a legal document which enabled prescribing and dispensing of medications to RACFs residents without prescriptions. A nurse considered that medication charts clarify what is given to the resident by instantly knowing that is the medication the doctor has authorized to give. In some RACFs, medication charts are already the official documents by which the nursing staff is guided when giving medications to residents. A comment to illustrate this was given by a nurse: *“Most of the time we use the medication chart as an official document. The only time we have a script is if one of our residents has an outside GP, then they come back with the script, we photocopy it and fax it through to the pharmacy and they pick up the script when they deliver the medication †”*.

Pharmacists were also supportive of medication chart use. In addition to the advantage of not having to deal with prescriptions, a pharmacist also specified that there would be no variance in repeats' frequency when medication charts are used as central legal documents directing the medication supply for RACF residents. Most pharmacists in focus group meetings favoured the use of electronic medication charts (i.e. profile) instead of the hardcopy ones. Some of the advantages of using electronic medication charts included: enabling doctors to change residents' therapy electronically and pharmacists responding in real time, accuracy by which the pharmacy could see what stock would be required to dispense ahead in time. A pharmacist illustrated how an electronic medication chart enabled the pharmacist to log in online and dispense the medication whilst the PBS could easily see what had been dispensed and therefore claimed for each month of supply. This was a comment that illustrated pharmacists' support for using electronic medication charts: *“With an electronic medication profile, the doctors change the medical profile in real time and you responds in real time if he doesn't change you don't respond, no change you don't have to worry about it. The nursing home or hostel becomes central to everything. They retain control of the whole process as they should ††”*.

Doctors were generally supportive of using medication charts and not spending their time writing prescriptions. Centralization of medication supply and clarification of medication deliveries were reasons for this support. Doctors also emphasized retaining control over what medications their patients had also was an advantage of using medication charts. This is a comment that illustrates doctors' support for using medication charts: *"We already have medication profiles in most of the facilities and they work well. They are easy to read and understand and I think it is reasonable to understand that if the profile says that the medications are to be delivered we should be able to get away from us having to provide personal prescriptions. Then it comes more centralized ††"*.

#### **b) Reviewing the medication chart**

Focus group participants highlighted the need for a regular review of medication charts. In nurses and carers' focus groups, reviewing medication charts emerged as a necessity from the experience with the current use of medication charts. A comment from a nurse illustrates this: *"Sometimes I don't think they even review the medication profile because if someone is started on Panadol as a regular dose, you would still find it as PRN on the bottom so you could find they have had a double dose of Panadol in a day †"*. A pharmacist went even further to actually put an expiry date on medication charts so that it makes it necessary for doctors to review i.e. *"they should be valid for six months as it forces the doctor to review the patient monthly †"*.

The need for medication charts to be reviewed regularly to make sure it was up to date was also highlighted by doctors. A doctor also proposed a review interval on medication charts. This is illustrated by his comment: *"I foresee that it could work provided we were required to review it on a quarterly basis. I don't know that I would want have to review it sooner than that, it is just not feasible ††"*.

**c) Current problems with medication profiles and potential disadvantages of using medication chart system**

Nurses and carers as well as pharmacists identified difficulties they currently encountered when working with medication charts. All three groups of health professional identified some potential difficulties with using a centralized medication chart as a legal document without prescriptions.

Nurses and carers identified difficulties such as changes of residents' therapy during the weekend. An example is with cases where medication charts do not correspond with what the nursing staff actually administers as the doctor might have not written it in the chart and the pharmacy does not supply a new medication profile until Monday. Another current difficulty is occasional lack of residents' photos on their medication profiles. Residents' photo in their medication profile is part of the checking process when medications are administered by the nursing staff. Another interesting potential problem for nurses and carers with using medication charts as central documents was the fact that it may not solve the problem of medications prescribed for short-term or PRN use. This was illustrated by a comment from a nurse: *"Medication chart model will not entirely solve our problem. Although the medication chart is your legal document you still need medications prescribed for different conditions at different times like urine infection, vomiting and diarrhoea, constipation so you still need someone to add those medications onto that document †"*.

Pharmacists raised the issue of legible writing with paper-based medication charts, especially when working with duplicates, as a potential problem. Another pharmacist queried the claiming procedures with using paper-based medication charts as it may create confusion as to whether that was the original medication chart that had not been submitted for claiming. When using electronic medication charts one pharmacist questioned potential technical problems with computers affecting the process. Another pharmacist suggested that older doctors may not be comfortable with using the

electronic version of medications charts.

For doctors, the main difficulty that needed to be addressed when using the medication chart model was the potential lack of control of medications that are dispensed by the pharmacy. This is illustrated by a comment from a doctor: *“I would be in favour of using medication charts but that would require somebody to monitor the pharmacies delivering medications. How many prescriptions they dispense in our name because we will then no longer be responsible for the number of scripts going out in our name ††”*.

#### **5.4.4.3 Repeat extension**

Extending the current number of repeats was discussed in focus group meetings as an option which could improve current medication supply system to RACFs.

Nurses/carers attitudes on extension of repeats varied in different focus group meetings. Some suggested that extending the number of repeats would make no difference to their practice. However, the nurses that supported the extension of repeats highlighted medications for which currently the PBS does not allow any repeats such as Temazepam and combination of Paracetamol with codeine products. This was illustrated by a nurse who said: *“Absolutely (i.e. a good idea), especially in aged care. If someone is on Temazepam, are they ever going to go off Temaze? Very rarely. The same with Panadeine Forte. In young people, sure they can do lots of stuff with it but for severe pain management in the elderly where they need to have one Panadeine Forte and one Panadol and you know that that is going to carry on QID until the year dot for their pain management †”*. A carer suggested that extending the number of repeats would not pose an overdosing risk to the residents since the administration is restricted to what is on the prescription and the nursing staff has to follow that.

Pharmacists generally did not show support for extension of number of repeats as for them problems remained the same since the repeats would eventually run out and they

would again have to ask doctors for their prescriptions. Additionally, short-term medications would not be addressed by this model. A pharmacist even suggested that doctors are not using the recent extension of repeats for certain medications on the PBS. A pharmacist illustrated the extension of repeats model by saying: “...for the first six months it would be great, it stretches out but it catches the tail eventually ††”.

Doctors who did not support an extension of repeats model highlighted issues such as the model requiring a care plan to be in place for the resident and lack of time for doctors to implement that. A doctor considered this model to be a fine tuning to start with and pointed out how using the medication chart model would enable getting away from having to write prescriptions in the first place. Another doctor was concerned with the model potentially generating difficulties when for example the dose of the same medication was increased and hence having to re-write the prescription with an extended number of repeats. A doctor did say that he was not using the current extension of number of repeats (which allows up to eleven repeats for certain medications) because the patient has to be reviewed at least twice in six months.

A doctor stated that while he still preferred the medication chart model, the extension of repeats model would allow him to have control over the medication that was dispensed on his name and he would accept it since it was a one step closer to writing fewer prescriptions. A doctors' comment illustrated the attitude of doctors that partially support the extended repeats model: “I still have to write the scripts. I think theoretically at the most it would halve our time we spent in writing scripts but that is a theoretical level. It might improve by 30% at the most. For some specific things such as hypertension this would be okay ††”.



#### **5.4.4.4 Non-medical prescribing**

Expanding the prescribing role for pharmacists and nurses was discussed in focus group meetings as an option which could improve current medication supply system to RACFs. This section was divided into a) support for non-medical prescribing and b) attitudes against non-medical prescribing

##### **a) Comments in favour of non-medical prescribing**

Nurses and carers that were in favour of non-medical prescribing considered that it would be convenient in certain situations to have an RN with prescribing authority. These situations pertained to acute short-term conditions such as nausea and vomiting. A nurse suggested that in many occasions doctors ask her about what to prescribe suggesting it is just a matter of not having the power to prescribe.

A nurse who supported nurse prescribing indicated that there should be a list of what medication can be prescribed. This was her comment: *“I think there should be a list of what can be initiated when prescribing because then you got that confirmed...you know they have been vomiting for all day so it would be great if I could just give them the medication for it and relieve their symptoms rather than wait for the doctor to come up so I could give the medication †”*.

A nurse that supported expanded pharmacist prescribing believed that pharmacists have the knowledge to prescribe and that even now when they have cases of residents experiencing adverse effects to medications, pharmacists are capable to advise what medication they can take.

Pharmacists who were in favour of extended pharmacist prescribing considered that this model is a better model than the current one however ‘you need a system that just flows’. Another pharmacist who supported this model commented: *“I think pharmacist prescribing would help. Something has got to change because doctors don’t have time to write scripts †”*.

Doctors who were not against non-medical prescribing indicated they would not oppose such as model as long as they were not responsible for the medication prescribed. In this context, doctors were happy to make the diagnosis but not be responsible for someone else writing prescriptions and continue the supply of that medication. As with the medication chart model, the doctors raised the issue of not having control over the amount of medication that comes from the pharmacy. A doctor that supported non-medical prescribing suggested that: *“Time spent in re-writing scripts would have to be re-deployed from script-writing time to really go through those medication profiles a lot more diligently and we would certainly benefit from doing that †”*. A doctor suggested that pharmacist prescribers should come from the government since there would be no conflict of interest between pharmacists prescribing and dispensing that medication. Another advantage for the idea of the government pharmacist prescriber was that it is *‘governments’ medication and they would make sure the authority scripts were correct, restrictions were correct and the amounts were correct †’*.

#### **b) Comments against non-medical prescribing**

Nurses and carers who were against expanded pharmacist prescribing suggested that such a model would not change the situation as their problems were not attached to prescription writing. It was suggested that pharmacists not being located in the pharmacy means the problems would be the same as with doctors. This was illustrated by a comment: *“Who will give the prescribing pharmacist information about the resident, the carer? They would have to come to the facility same as the doctors so I cannot see the difference ††”*. The nurses and carers who rejected pharmacist prescribing because of this reason suggested that a non-medical prescriber would need to be located in the facility.

In terms of nurse prescribing specifically, it was indicated that it could solve pharmacy problems only. A nurse suggested how some years ago they would write prescriptions and doctors would sign on them. This nurse was concerned with the lack of knowledge

that nurses have on PBS rules and pharmacology.

Pharmacists who were against non-medical prescribing questioned the need for prescriptions in the first place i.e. the medication chart model would solve the prescription problem. It was indicated that non-medical prescribing could only be 'shifting deckchairs' rather than solving the current difficulties. In terms of pharmacist prescribing specifically, pharmacists raised the issue of increased cost with hiring a prescribing pharmacist and indemnity. In terms of dependent prescribing, a pharmacist indicated that he would not take the responsibility of continuing to write prescriptions when doctors initially diagnose and prescribe highlighting the legal liability to be an issue.

Pharmacists who were not in favour of non-medical prescribing, considered that nurse prescribing would not make any positive difference for them. A comment illustrates this: *"I don't think a nurse practitioner writing scripts would make any difference. Just like the doctor, the nurse would say: I do not have time or I am too busy administering a medication, change a dressing ††"*. A pharmacist considered that the only way pharmacist prescribing in RACFs would work is if this pharmacist was from the government since a prescribing pharmacist from the same pharmacy that supplies the medications constituted a conflict of interest.

Doctors that were not in favour of non-medical prescribing considered that medication chart model would make the concept of someone else prescribing unnecessary. This is illustrated by a comment from a doctor: *"I think the biggest problem we have with the current system that I see from a personal time point of view, is having to sit down and write scripts. If we can get rid of that and I think we should, as long as checks and balances are in place, you don't have to worry about this concept of someone else writing scripts ††"*. Confusion between prescribers with generated prescriptions and potential duplication of tasks when seeking authority approvals also emerged as reasons for rejecting such a model. A doctor described how re-writing prescriptions helps with 'mentally checking' if that resident still needed that medication, so this would be lost. A

doctor also mentioned the lack of the same RNs in facilities that could deal with prescribing.

#### **5.4.4.5 Training for expanded non-medical prescribing**

Focus group participants were asked to comment if additional training would be needed if nurses or pharmacists would assume further prescribing roles. A nurse considered that if the diagnosis was done by a doctor, there would be no need for training nurses on prescribing repeat prescriptions. A nurse also considered that the current knowledge that pharmacists have would be enough for them to assume further prescribing roles. This is illustrated by a nurse comment: *“My understanding is they know what they are making up and they know what that medication is for. Nine times out of ten I have gone in for a personal prescription, the chemist will turn around and say “have you got so and so?” They know what the medication is for so they understand †”*.

Pharmacists were generally of the opinion that more training, guidance and accreditation would be needed if they would assume further prescribing responsibilities.

A few doctors considered that nurses would need so much training with focus on PBS rules up to the point that it questions whether they need to go through that process. In comparison, doctors considered that pharmacists already had the knowledge to continue prescribing repeat prescriptions for conditions they diagnose. This is illustrated by a doctor comment: *“I don’t see a point in training a nurse. There are too many drugs and too many rules. A pharmacist knows that. I don’t see a point in training a nurse to do a pharmacists’ job †”*.

#### **5.4.4.6 Other proposed solutions to improving medication supply and management in RACFs**

Focus group participants made a few other suggestions which in their opinion could improve medication supply and management in RACFs. A summary of these proposed suggestions is given below:

##### **a) Sharing PRN medications/Imprest system ☆☆**

A nurse suggested that when you had medications such as paracetamol to share amongst the residents for PRN use there was not so much wastage.

The issue of PRN and short-term medications was also raised by a doctor who considered that there were cases where there may availability of these medications at the facility but they cannot be used due to current legalities. His comments illustrates this: *“If I wanted to give a PRN medication, such as Mylanta or GTN, there may be availability of that medication at that facility but under the current system the facility won’t use any medication that has not got a patients’ label on it, so it has to come up from the pharmacy. A full bottle of Mylanta or GTN and the patient might only have just one dose of it. Another example would be terminal patients who just need morphine at the end of life and they might only get one dose e.g. 2mL out of 200mL bottle Ordine and that is just discarded after and then when you do need it, it would be useful to be just be there at the facility. I am in favour of any imprest of medications at the facility that could be used...I’m not in favour of all medications need to be packed †”.*

Use of the imprest system was also supported by another doctor who suggested that this avoids delays in getting medications to the resident and that it is very useful for situations like when antibiotics are needed. Her experience with a RACF that uses this system was positive. This doctor suggested that if you are going to a nursing home and you need an antibiotic at that time there is no other way to get that medication at that time for that patient. A doctor who was not in favour of using this system highlighted

concerns such as high burden on nurses, their lack of dispensing knowledge and he was also worried about the legality of medications being at RACFs whilst ‘nobody owns them’.

**b) Pharmacist on site ☆**

A nurse explained how the system was very good when RACFs had a dispensary and a pharmacist on site i.e.: *“we would go into the pharmacy and there was a book and we would write down if you take something. We never had any problems it was a very good system †”*.

**c) Using the local Pharmacy ☆☆**

Using the local pharmacy emerged as a theme in a nurse/carer focus group and a focus group consisting of doctors. A nurse indicated how when the pharmacy was smaller the relationship between the nursing staff and pharmacy was better because they used to get a more personalized response. Furthermore, she indicated in the current system there is a high changeover rate of pharmacists to deal with. This is illustrated by her comment: *“these days you wonder which pharmacist is on duty and then when you ring back to find out what has happened, you get a different pharmacist. A bit like the agency nurses in a hospital, you don’t get the response to your questions until three days later †”*.

Doctors in a focus group also considered that it was easier to deal with smaller local pharmacies. This was illustrated by a comment: *“local small Pharmacy would be easier to deal with and less things to do. It is friendlier and easier ††”*.

#### **d) The Government taking over the supply of medications to RACFs ☆**

A doctor proposed the idea of the government take over medical supply to Aged Care facilities. The main reason for this, according to this doctor was since the government subsidised a significant amount of these medications and therefore their takeover of medication supply would address the issue of medication wastage. This could make the system more efficient and could generate positive changes in both pharmacies and RACFs. This is a part of his comment: “...it is in their interest to be in control of it and look at the wastage that is going on. They could do it a lot more efficiently and I think when they see how the system is working at the moment, I think changes will happen because anyone who was actually paying for this medication and not just using the Government funding to supply it would not tolerate the amount of wastage. There would be changes at the pharmacy end and the facility end †”.

#### **e) Pharmacy printing scripts for doctors to sign ☆**

A pharmacist mentioned the system of using an electronic software that generated prescriptions in printed form for doctors to sign. This could ease the burden associated with large amounts of prescriptions that doctors have to write. Her experience with this system was positive.

#### **5.4.4.7 “The best model”**

Focus group participants were asked about which out of all models of medication supply to RACFs discussed would be the best in their opinion. Using the centralized medication chart as a legal document was the most preferred model. As a supplementation of the medication chart model, nurses and carers proposed the idea of an RN working in the facility that is trained for prescribing short-term medications. Pharmacists proposed the electronic version of medication chart model while the doctors proposed contracting the local pharmacy to the current system.

#### **5.4.4 A summary of medication supply models and their relationship with difficulties identified**

The following illustrates the potential of the main models of medication supply to RACFs discussed in this study to address the difficulties identified by focus group participants with current medication supply systems to RACFs.

It should be emphasized that the level to which these models address a particular difficulty is not explored and there are certainly instances whereas a model may address one aspect of a particular difficulty but not others. For example, the medication chart model may address the difficulty of ‘after hours/weekends’ by making the system easier to manage during pharmacists’ changeover or with reduction of paperwork related discrepancies with medication changes during weekend. However, the difficulty with availability of pharmacy to deal with medication changes and initiations during weekends and after hours when that pharmacy is unavailable remains unaddressed.

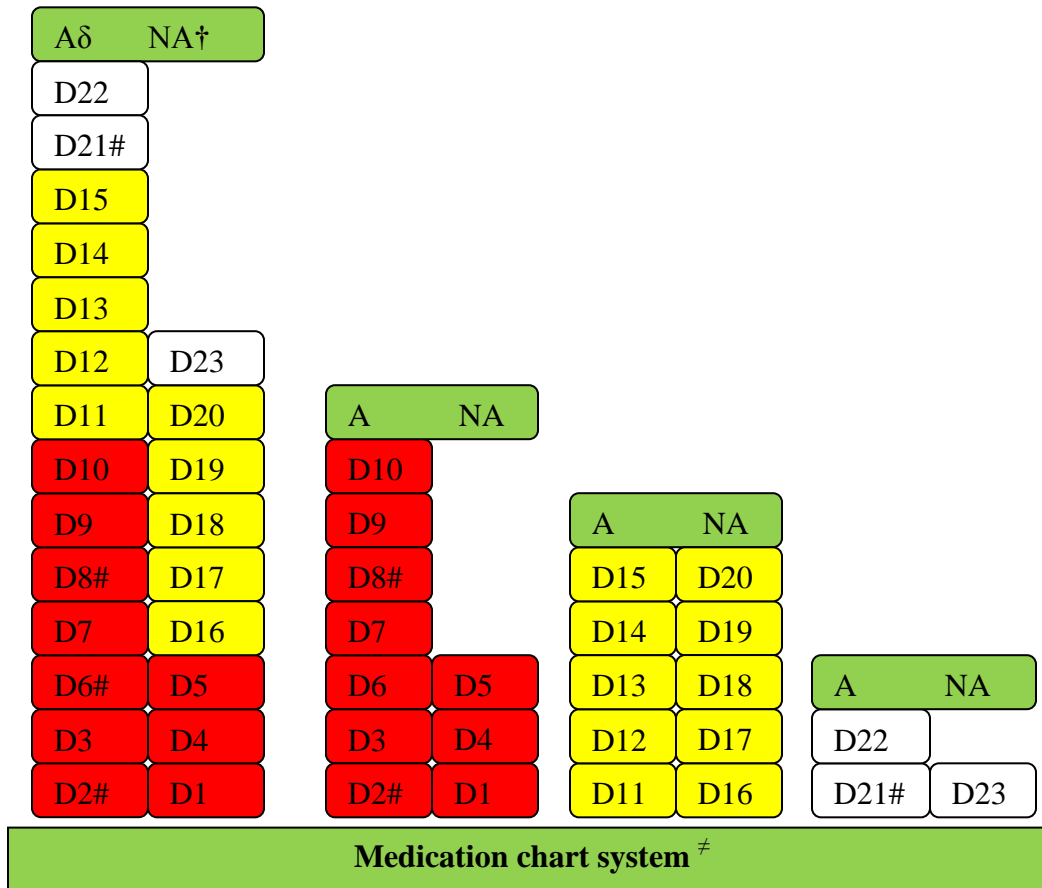
Boxes in red represent difficulties classified as highly relevant (i.e. ☆☆☆ difficulties). Yellow boxes represent difficulties of medium relevance (i.e. ☆☆ difficulties) while white boxes represent difficulties of low relevance (i.e. ☆ difficulties). These are given in Table 5.3 and Figures 5.1, 5.2, 5.3, 5.4 and 5.5 below.



**Table 5.3**      **Ranked difficulties identified in focus group meetings**

*** difficulties	code	** difficulties	code	* difficulties	code
Medication wastage	D1	Obtaining prescriptions	D11	Lack of government audit	D21
Hospital discharge	D2	Owing prescriptions	D12	Missing scripts	D22
Medication charges to residents	D3	Backdating prescriptions	D13	Low-care facilities	D23
Delivery of medication	D4	Overprescribing	D14		
PRN medication	D5	Prescription paperwork	D15		
After hours/weekends	D6	Labelling and instructions	D16		
Medication changes	D7	Inaccurate packaging and discrepancies	D17		
Communication	D8	Medication brands	D18		
Authority prescriptions	D9	Faxed orders	D19		
'no script no supply'	D10	Packaging- the sachet system	D20		

- Difficulty of high relevance (\*\*\*)
- Difficulty of medium relevance (\*\*)
- Difficulty of low relevance (\*)

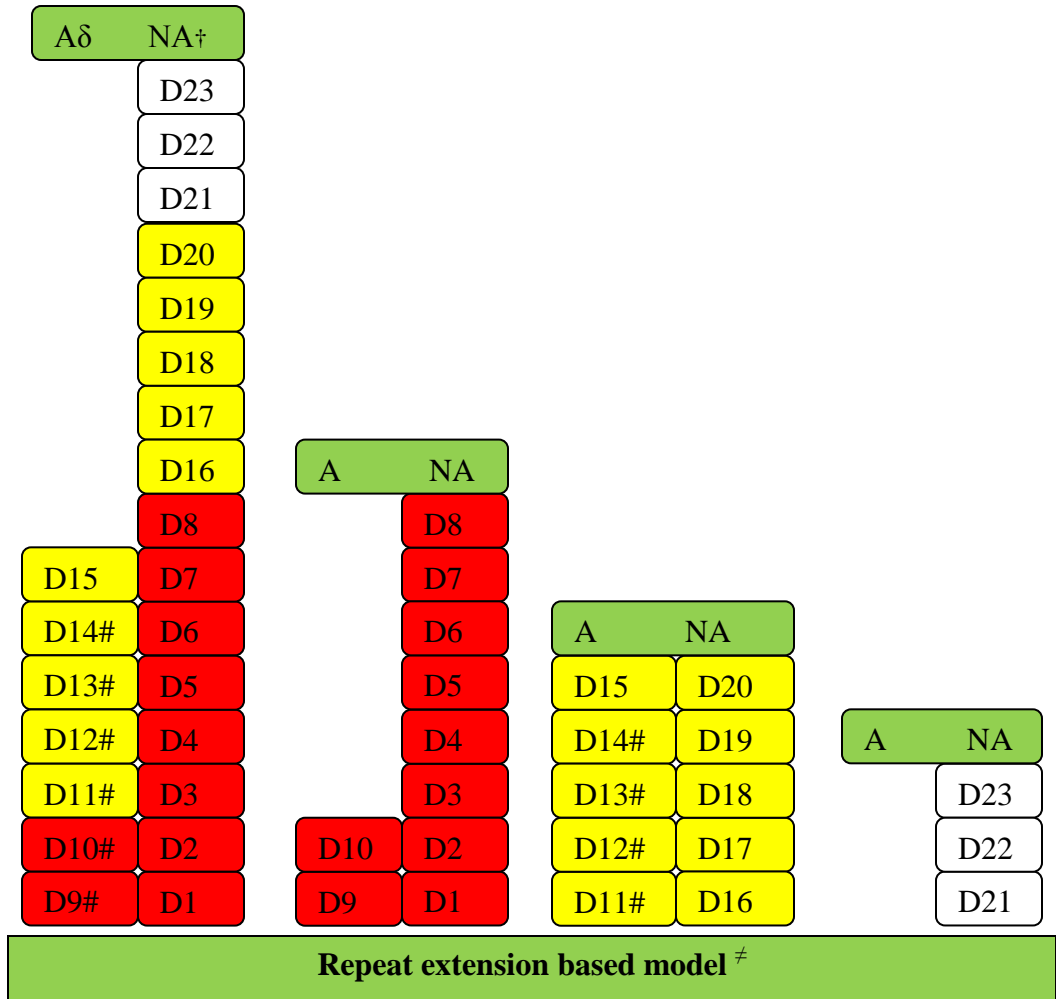


$\delta$ Addressing difficulties,  $\dagger$ Not addressing difficulties, #Electronic based medication chart especially,  
 $\neq$  unicolour columns represent one category of ranked difficulties

- Red box: Difficulty of high relevance (\*\*\*)
- Yellow box: Difficulty of medium relevance (\*\*)
- White box: Difficulty of low relevance (\*)

**Figure 5.1 Medication chart system and its potential for addressing of current difficulties identified**

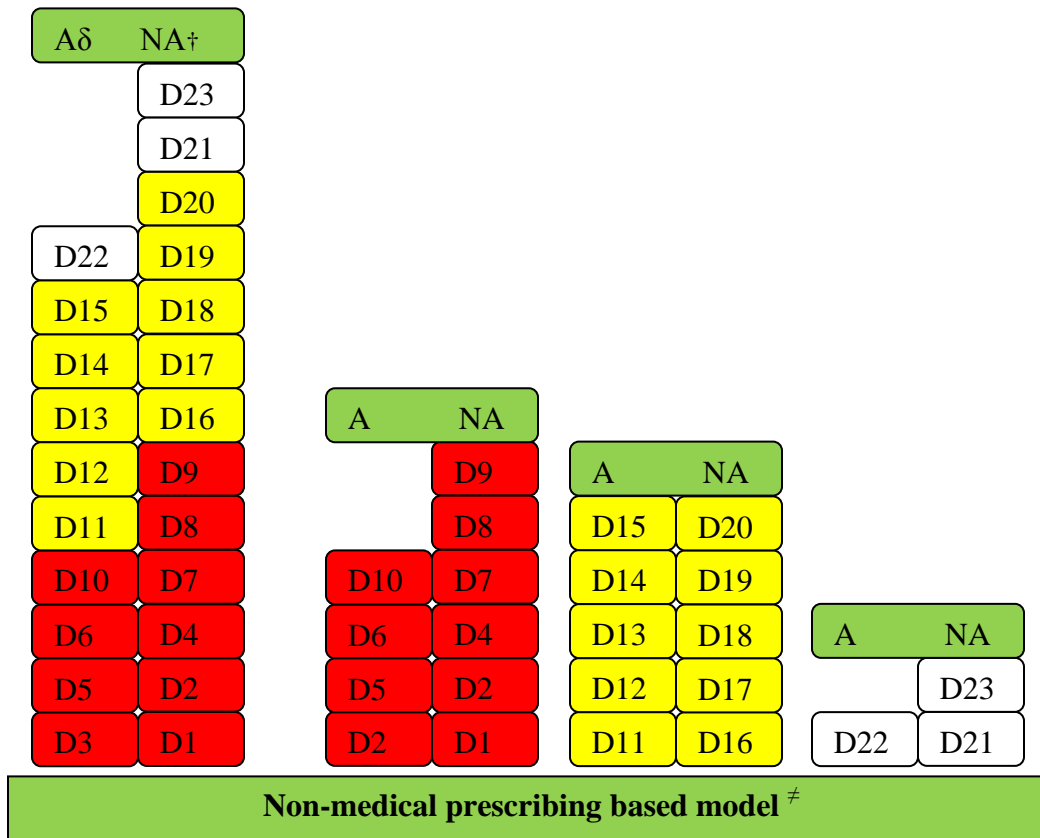




δAddressing difficulties, †Not addressing difficulties, #up to a period of repeat extension, ≠ unicolour columns represent one category of ranked difficulties

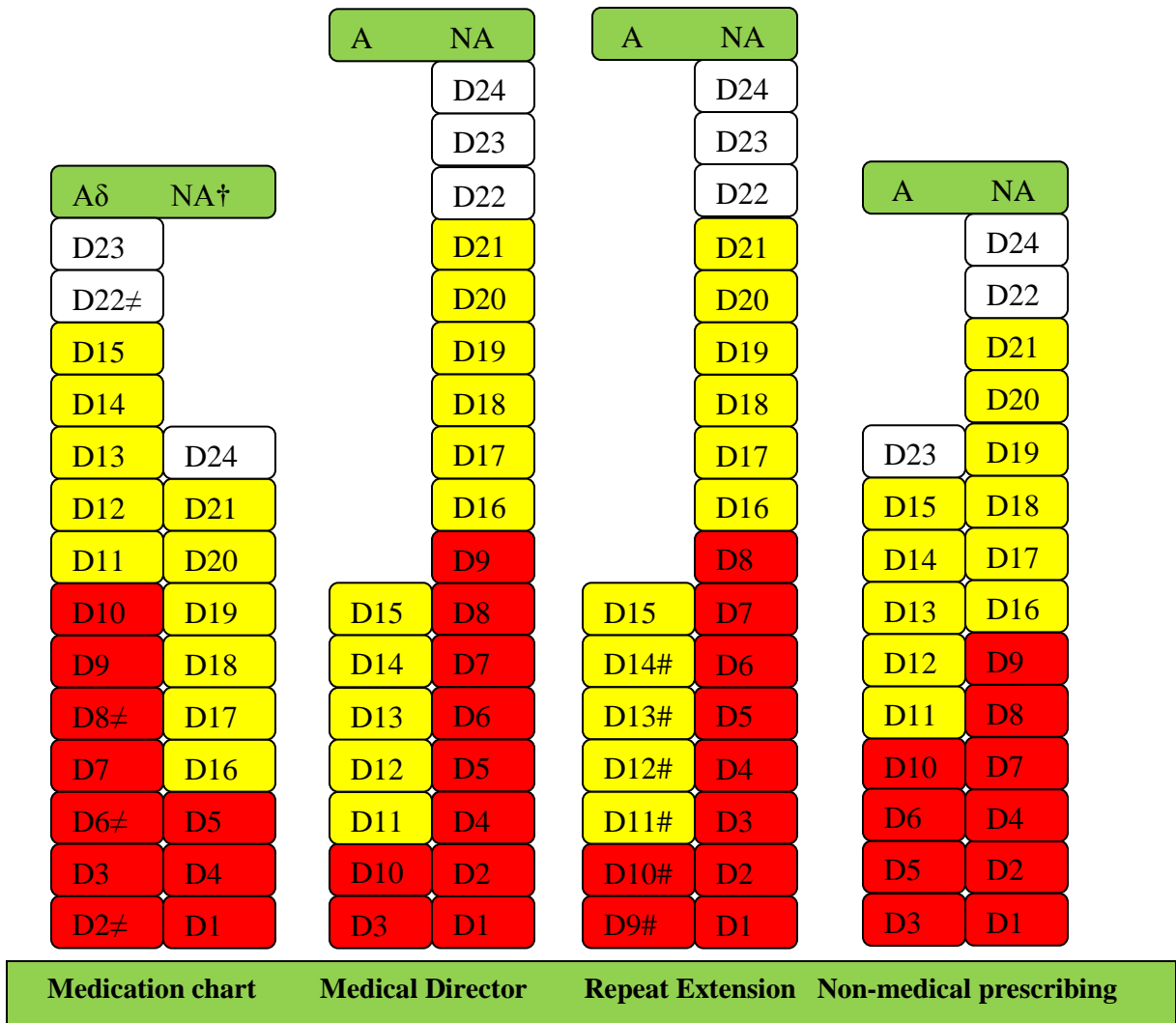
- Difficulty of high relevance (\*\*\*)
- Difficulty of medium relevance (\*\*)
- Difficulty of low relevance (\*)

**Figure 5.3 Repeat extension based model and its potential for addressing current medication supply difficulties identified**



δAddressing difficulties, †Not addressing difficulties, ≠ unicolour columns represent one category of ranked difficulties

**Figure 5.4 Non-medical prescribing based model and its potential for addressing current medication supply difficulties identified**



$\delta$ Addressing difficulties,  $\dagger$ Not addressing difficulties, $\neq$ Electronic based medication chart especially , #up to a period of repeat extension

- Difficulty of high relevance (\*\*\*)
- Difficulty of medium relevance (\*\*)
- Difficulty of low relevance (\*)

**Figure 5.5 A summary of main models of medication supply to RACFs discussed and their potential address current difficulties identified**

## 5.5 Discussion

This study has explored the data collected from three main health professional groups involved in therapeutic management of residents currently living in RACFs. Carers working in RACFs did also participate. As a result, this study has identified some key difficulties that are present in the current systems of medication supply to RACFs. Additionally, potential models which could improve the current systems of medication supply to RACFs have been proposed.

The main strength of this study is the representation of doctors, pharmacists as well as nurses and carers in focus group meetings. These health professionals were all experienced in dealing with medication supply to RACFs and they were currently working in at least one RACF.

The main weakness of this study is the fact that it was conducted only in WA and did not include participants from other Australian States and Territories. Therefore participants' representativeness may be limited. However, the limitation to WA may be considered to be of minimal effect to the overall study results given the achievement of a saturation point in terms of new ideas and comments made by focus group participants as well as the similarity of medication supply systems to RACFs across the Australian States and Territories. This study used homogenous groups of participants (i.e. same professionals) in focus group meetings. The aim was to capitalize on common experiences of participants.<sup>13</sup> Segmentation of focus group participants also facilitates a comparative data analysis.<sup>14</sup> However, it should be emphasized that an exploration of different perspectives with diverse focus groups of health professionals dealing with RACFs is a potential advantage which may have been missed with the use of homogenous focus groups.<sup>13</sup> As suggested by Kitzinger, the professional hierarchy of focus group participants (in this study consisting of nurses and carers) may have also affected the data.<sup>13</sup> However, overall the method minimized hierarchical input.

### **a) Difficulties identified**

Difficulties with medication supply systems to RACFs identified by focus group participants were grouped into two main themes: a) difficulties with medication supply to RACFs and b) prescription and dispensing related difficulties. The most highly ranked medication supply difficulties (i.e. ☆☆☆ difficulties) identified were: medication wastage, after hours and weekends works, communication, medication charges to the residents, delivery of medication, medication changes, residents' discharge from hospitals and PRN/short-term medications. Residents' discharge from hospitals was also identified by the HMAs to be an issue of concern.<sup>9</sup> In addition to HMAs concerns with transfer of residents from hospitals to RACFs, this study has also found issues such as: lack of trained staff at RACFs to handle medications supplied to residents by the hospital, inaccurate or lack of discharge summaries and the difficulty for doctors in continuing to prescribe medications which were initially prescribed as non-PBS items and 'off label' in the hospital.

Medication wastage has been reported by the HMAs as a result of changes to residents' therapy and discarded DAAs.<sup>9</sup> In this study medication wastage was one of the most significant concerns that focus group participants had with the current system. In addition to the HMAs reasons this study has identified that the current system of supplying short term and PRN medications induced significant wastage as well.

Difficulties with current medication supply systems to RACFs ranked as 'highly relevant' were followed by difficulties of 'medium relevance' (i.e. ☆☆ difficulties). These were: faxed orders, medication brands and inaccurate packaging and discrepancies. Carruthers et al. have also highlighted the issue of inaccurate packaging of DAAs.<sup>15</sup> This needs to be interpreted in the context of the fact that supplying medicines from a bulk stock resulted in a rate of administration errors of as high as 15-20% in comparison to individualized supplies (i.e. DAAs) which reduces this error to 5-8%.<sup>15,16</sup> Focus group participants also identified issues with the sachet system of packaging. However, as previously stated with the sachet packaging, not all comments compared this system with the blister system of packaging implying that these



difficulties are not necessarily excluded from the blister method of packaging. Therefore, more research is needed to explore and compare this method of packaging with the blister packaging.

Most highly ranked prescription and dispensing related difficulties identified were difficulties with authority prescriptions and the issue of no supply without a prescription. Difficulties with the doctors obtaining authority prescriptions were also identified by the HMAs who suggested that the time consumed in obtaining authority prescriptions may be an unnecessary use of doctors' time and skills.<sup>9</sup> Prescription and dispensing related difficulties ranked as 'highly relevant' were followed by difficulties of 'medium relevance'. These were: backdating prescriptions, labelling and instructions of medications dispensed, overprescribing and the amount of paperwork with prescription writing. Difficulties with prescription writing were also reported in the literature.<sup>2,3</sup> Bessel et al. identified how in some cases doctors decide to discontinue the therapy hence leaving pharmacists without a prescription.<sup>8</sup> Difficulties for pharmacists in obtaining prescriptions from doctors was one of the difficulties of 'medium relevance' identified by this study as well. This process may be an unnecessary use of pharmacists' time and skills.

Difficulties with owing prescriptions, ranked with 'medium relevance' in this study, were also reported by the HMAs who stated that pharmacies often supplied PBS medicines without a prescription, which should then be received from doctor within seven days.<sup>9</sup> However, sometimes doctors do not send their prescriptions within seven days hence pharmacists have to remind doctors about their outstanding prescriptions.<sup>9</sup>

Findings from this study are also in line with the HMAs who suggested that due to 'owing prescriptions' pharmacists performed additional tasks in requesting prescriptions from doctors and that doctors were concerned with duplicating tasks. Additionally, HMAs have suggested that pharmacists have delays submitting claims to the PBS which results in their cash-flow being affected.<sup>9</sup> This is illustrated by a comment from a focus group pharmacist in this study who stated: *"You provide all these drugs and you haven't*

*been reimbursed for them and you have to bear this cost*". Furthermore, the system of 'owing prescriptions' may be also negatively affecting the relationship between pharmacists and doctors with doctors sometimes being concerned with pharmacies requesting prescriptions in excess of what they think their patients could use.

The current system generated significant amounts of wastage through DAAs not being repacked. This induced wastage of medication which affects the interval of prescriptions dispensed by the pharmacy. Accreditation requirements prevent pharmacies from re-packaging medications. These accreditation requirements are in place to protect patients since the quality of medications to be re-packaged is no longer certain and potentially dangerous given that they are not fully labelled. Medications in DAAs are removed from original packages and not stored under initial packaged requirements.

#### **b) Main models of medication supply discussed**

Out of all potential models discussed, the medication chart model was the most preferred one amongst focus group participants. There were indications that in some RACFs the medication chart was already the central document that superseded prescriptions. This emerged in pharmacists' focus group meetings with pharmacists saying: a) *"Facility calls to say the script written is different to the medication profile. So we go based on the medication profile not the script"*, b) *"My experience is that the medication profile always wins over the script. This problem would not be there if the only focus was the medication profile."*

The medication chart model was also proposed by the Australian government under the Fifth Community Pharmacy Agreement. According to this model, there would be no need for prescriptions and a medication chart would be the central legal document by which medication supply to RACFs would take place. In this study, pharmacists favoured this be done electronically. The medication chart model, especially when done electronically, appeared to address more difficulties identified by focus group participants than other models. Focus group respondents stressed the need for a regular

review of medication charts and cautioned about legible writing and claiming procedures which could be eliminated by an electronic medication chart system. A pharmacist also suggested that *“with electronic medication profile and no prescriptions you can very accurately see what will be required a month ahead of time to dispense.”* This could have positive effects in stock management for pharmacies. Furthermore, theoretically, an electronic medication chart system accessible to hospitals could also improve current difficulties when residents are discharged from hospitals.

The medication chart model has the potential to partially or fully address most of the difficulties identified by focus group participants. However, some ‘highly relevant’ difficulties such as medication wastage, PRN medications, delivery of medication and difficulties with packaging using the sachet system still may remain unaddressed with this model. This model does not overcome having to re-package medications when changes to residents’ therapy occur. It also does not address the issue of pharmacists’ reimbursement when wastage occurs since cost recovery for medication wastage when re-packaging is required cannot occur by writing a new prescription.

The use of a Medical Director program by doctors appears to address only two ‘highly relevant’ difficulties identified by focus group participants. Doctors using the Medical Director program at RACFs may be in a position to provide prescriptions in a timelier manner to the pharmacy and hence alleviate the difficulty with pharmacy charging residents when late owing prescriptions are received, which creates confusion for residents and their families. However, this does not address the problem of charging the residents when their medication is wasted. Using the Medical Director may also improve issues with ‘no script no supply’, again through doctors providing prescriptions in a timelier manner. However, this may be very limited given that focus group participants mentioned medications requiring special authority for prescribing to be the core issue of this difficulty. This model appears to address none of the difficulties ranked with ‘low relevance’ in this study. Additionally, there appeared to be concerns with doctors not having time to use the Medical Director when visiting RACFs since their focus during this time was on other priorities.

The repeat extension model may address some prescription and dispensing related difficulties of ‘medium relevance’ as well as ‘highly relevant’ difficulties with authority prescriptions and the issue of pharmacies not supplying as a result of a lack of prescription. However, this model appears to temporarily address these difficulties and hence postpone rather than provide a solution to them. This model does not address any of the difficulties of ‘low relevance’. Additionally, it may have the potential for causing a greater confusion when medications are changed. Nevertheless, repeat extension model may reduce the amount paperwork for doctors in prescription writing.

In general, the non-medical prescribing model was perceived with mixed support by all three groups of professionals. This model, which included expanded pharmacist prescribing and RN prescribing, may have a greater potential for addressing more ‘highly relevant’ difficulties, in comparison to the repeat extension and Medical Director model. It could alleviate the issue of medication charges to the residents by provision of prescriptions to the pharmacy in a timelier manner and therefore less confusion for residents and family with their accounts when owed prescriptions are received late and dispensed to replace a previous supply. However, the problem of charging the residents as a result of medication wastage still remains unaddressed.

The ‘after hours/weekends’ and ‘PRN/short-term medications’ difficulties may be addressed through the availability of an extra non-medical prescriber which could avoid the delay in doctors getting located to the facility. However, this may not apply to pharmacists who are usually not at the facility. This was also illustrated by one of the nurses who said *“Pharmacists have to come to the facility, so the same problems like the doctor have. It is best to have someone within the facility”*. On the other hand, pharmacists were also sceptical of nurse prescribing with one pharmacist emphasizing: *“I don’t think nurse practitioner writing scripts would make any difference. Just like the doctor, the nurse would say: I do not have time or I am too busy administering a medication, change a dressing”*. In terms of pharmacist prescribing specifically, pharmacists emphasized a few limitations such as: cost of pharmacist prescribers, professional indemnity and legal liability. They also questioned the need for such a

direction since the medication chart model in their opinion was a better model. Doctors also questioned the availability of RNs and did not seem to see the need for expanded prescribing given that a medication chart model would be a better solution. This was illustrated by one of the doctors saying: *“I think if we go with that (i.e. expanded prescribing) you would introduce another person in the system that does not have to be there to start with if we would use the medication profile as your legal document. I feel like answering the question that does not have to be there”*.

Possibly due to lack of trust on pharmacies supplying medications without doctors’ control and potential conflict of interest, prescribing by a government pharmacist emerged as an option in a doctors focus group meeting if an expanded pharmacist prescribing model was adopted. This same idea also came out in a pharmacist focus group in which the conflict of interest in pharmacists prescribing and supplying the medication prompted one pharmacist to suggest a government pharmacist as a suitable pharmacist for such a role.

In relation to pharmacist and nurse prescribing, it should be noted that there may be a difference in terms of workforce availability for these two groups of health professionals. The Hogan Review has highlighted a current shortage of trained nurses in RACFs as well as ageing of nurses, compared to other areas.<sup>17</sup> On the other hand, the workforce availability may be different for pharmacists with pharmacy degrees almost tripling over the last decade.<sup>18,19</sup> Furthermore, in January 2010, Human Capital Alliance (HCA) projected an oversupply of pharmacists by 2025.<sup>20</sup> These circumstances may place pharmacists in a better position than nurses when it comes to assuming new professional roles such as expanded prescribing, even in RACFs.

Although it was clear that the medication chart model emerged as the model of choice in focus group meetings, there could be some room for this model to be supplemented by an expanded prescribing role for pharmacists and RNs. As stated by a participant from nurses/carers focus group meeting: *“Medication chart model will not entirely solve our problem. Although the medication chart is your legal document you still need*

*medications prescribed for different conditions at different times like urine infection, vomiting and diarrhoea, constipation so you still need someone to add those medications onto that document*". An expanded role in prescribing for suitably trained pharmacists and RNs, in addition to the medication chart model, could address the abovementioned difficulty.

In this study, focus group participants came up with other potential ways which could improve medication supply to RACFs. They suggested: sharing PRN medications and a wider availability of an imprest system, the availability of a pharmacist on site, use of local pharmacies, an RN at the facility in charge of monitoring prescriptions written at RACFs, the Government taking over the supply of medications to RACFs and pharmacy printing scripts for doctors to sign. More research is needed to ascertain the benefits and feasibility of each of these options proposed by focus group participants. Sharing PRN medications has the potential to reduce wastage. However, this needs to be weighed against the risks involved when doing this.

It should be noted that none of the main models of medication supply to RACFs discussed in this study appear to address the issue of medication wastage which mainly occurs during changes to residents' therapy, discarded DAAs and discarded or unused PRN and short-term medications. The medication wastage has largely arisen from a lack of suitably trained staff to administer medications in RACFs. This cost has been passed to the pharmacy and the PBS. More research is needed to explore ways of reducing medication wastage in RACFs.

## 5.6 References

- 1 The Royal Australian College of General Practitioners, 'Silver Book' National Taskforce; Medical care of older persons in residential aged care facilities; 4<sup>th</sup> Edition; 1-19
- 2 Australian Government Department of Health and Ageing. Aged Care GP Panels Initiative. 2004 aged care homes survey. Canberra: DoHA, 2005. [online] <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pcd-programs-acgppi-homessurvey> (Accessed 5/04/2010)
- 3 Gadzhanova S, Reed R. Medical services provided by general practitioners in residential aged-care facilities in Australia. *Med J Aus* 2007; 187: 92-4
- 4 Australian Medical Workforce Advisory Committee. The general practice workforce in Australia: supply and requirements to 2013. Sydney: AMWAC, 2005. [online] [http://www.health.nsw.gov.au/amwac/pdf/gp\\_2005.pdf](http://www.health.nsw.gov.au/amwac/pdf/gp_2005.pdf) (Accessed 6/03/2010)
- 5 Australian Medical Association and Royal Australian College of General Practitioners. GP services to residential aged care facilities. Canberra: AMA, 2006. [http://www.ama.com.au/web.nsf/doc/WEEN-6VT8LA/\\$file/GP\\_Services\\_to\\_Residential\\_Aged\\_Care\\_Facilities.pdf](http://www.ama.com.au/web.nsf/doc/WEEN-6VT8LA/$file/GP_Services_to_Residential_Aged_Care_Facilities.pdf) (Accessed 6/03/2010)
- 6 Siggins Miller Consultants and School of Population Health, University of Queensland. A report to the Brisbane North Division of General Practice (BNDGP). The residential care project. Brisbane: BNDGP, 2002
- 7 Lewis GA, Pegram RW. Residential aged care and general practice: workforce demographic trends, 1984–2000. *Med J Aust* 2002; 177: 84-6

- 8 Bessell T, Emmerton L, Marriot J, Nissen L. Improving Australians' access to prescription medicines: proposed practice models; June 2005; Pharmacy Guild of Australia; Canberra; [online]  
[http://www.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2003-017\\_fr.pdf](http://www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2003-017_fr.pdf). (Accessed 22/03/2010)
- 9 Healthcare Management Advisors. The Fourth Community Pharmacy Agreement. Review of the Existing Supply Arrangements of PBS Medicines in Residential Aged Care Facilities and Private Hospitals. Final Report. 30 September 2009.  
[online] <http://www.health.gov.au/internet/main/publishing.nsf/content/pharmacy-4cpa-reviews> (Accessed 10/09/2010)
- 10 Smith F. Conducting your pharmacy practice research project. London. Pharmaceutical Press; 2005
- 11 Stewart D, Shandasani P: Focus groups: Theory and practice. Thousand Oaks: Sage; 1990
- 12 Forster D, McLachlan H, Rayner J, Yelland J et al. The early postnatal period: Exploring women's views, expectations and experiences of care using focus groups in Victoria, Australia; *BMC Pregnancy and Childbirth* 2008, 8:27
13. Kitzinger J. Qualitative Research: Introducing focus groups. *BMJ* 1995; 311:299-302
- 14 Morgan D. Focus groups. *Annu Rev Sociol* 1996; 22:129–52
- 15 Carruthers A, Naughton K, Mallarkey G. Accuracy of packaging of dose administration aids in regional aged care facilities in the Hunter area of New South Wales. *Med J Aust* 2008; 188: 280–2



16 Runciman WB, Roughead EE, Semple SJ, et al. Adverse drug events and medication errors in Australia. *Int J Qual Health Care* 2003; 15: Suppl1, i49-i59

17 Aged Care Price Review Taskforce, *Review of Pricing Arrangements in Residential Aged Care, Final Report* (Prof. W.P. Hogan, Reviewer), Canberra, 2004

18 Human Capital Alliance, *Pharmacy Workforce Planning Study (Literature Review)*, 2008, p.3

19 The Pharmacy Guild of Australia. *The Roadmap – The Strategic Direction for Community Pharmacy*. May 2010. [online]: [www.guild.org.au/roadmap](http://www.guild.org.au/roadmap). (Accessed 9/06/2010)

20 Human Capital Alliance (2010) *Pharmacy Workforce Planning Project* (Pharmacy Guild, 4<sup>th</sup> CPA Commissioned Project RFT2007/08-01)

# Chapter VI

General discussion

### **3.1 General discussion**

This study has considered the likely acceptance of expanding pharmacist prescribing in Australia by the pharmacy profession and pharmacy clients. This is one way that should enable pharmacists to expand their professional role and better utilize their education and training.

Prescribing of medicines was considered as within the medical domain. This has its roots in the apothecary who prescribed and dispensed. Separation of these roles occurred with the establishment of pharmacists who dispensed and prescribed “over-the-counter” medications. Prescribing in Australia has been expanded to include dentists, optometrists, physiotherapists, podiatrists and nurses. The former prescribe within restrictions of their practice, whereas nurse practitioners prescribe within a range of defined specialty areas. Pharmacists have well established expertise in drug usage and their professional role is within the context of the quality use of medicines.

This project has evaluated Australian pharmacists’ and community pharmacy clients’ views on expanding pharmacists’ prescribing role. An emphasis was put on defining their preferred models and therapeutic areas of prescribing. The Agency Theory was used to explore the relationships between the main stakeholders involved in the domain of expanded pharmacist prescribing. In employing the Agency Theory, emphasis was given to explaining a possible disruption of this relationship by an introduction of expanded prescribing role for pharmacists. This project has also explored potential improved medication supply models, including expanded pharmacist prescribing, which could be developed to address deficiencies in the current systems of medication supply to RACFs.

### 6.1.1 Pharmacists' attitudes on expanded prescribing

Results from a large sample of Australian pharmacists suggested that pharmacists in Australia support an expanded prescribing role.

In this study, it was hypothesised that pharmacists' professional practice area would not affect their support for an expanded prescribing role i.e. *H1: There is no significant difference between pharmacists' support for expanded prescribing and their professional practice area.* This hypothesis was accepted since chi-square testing resulted in no significant difference ( $p=0.139$ ) between pharmacists' professional practice setting in relation to their support for expanded pharmacist prescribing. It was further hypothesised that pharmacists would prefer both supplementary and independent prescribing models i.e. *H2: There is no significant difference between pharmacists' preference for supplementary or independent prescribing models.* This hypothesis was rejected since a vast majority of pharmacists supported the supplementary model of prescribing. Of the respondents, 896 agreed that pharmacists should prescribe in a supplementary, independent or both models. Data cross-tabulation revealed that of these, 69.1% ( $n=620$ ) preferred pharmacists prescribing in a supplementary fashion only as opposed to 3.3% ( $n=30$ ) who supported independent prescribing only. Both supplementary and independent prescribing were positive predictors of expanding pharmaceutical services through prescribing ( $p<0.0001$ ), however, pharmacists who were in favour of supplementary prescribing showed a stronger association towards this expansion ( $\beta =0.52$  vs.  $\beta =0.18$ ). These findings suggest that expanded pharmacist prescribing in Australia would be strongly supported if introduced in a supplementary model. This role for Australian pharmacists should take into consideration potential limitations of the supplementary prescribing model reported in the UK.<sup>1,2,3,4,5</sup> It is worth mentioning that support for supplementary prescribing was also reported by Hobson and Sewell who suggested that despite concerns, pharmacists had a positive attitude towards this model.<sup>6</sup> The main drivers for Australian pharmacists supporting an expanded role in prescribing were: better use of pharmacists' skills, easing the burden from overloaded general practitioners and pharmacists' drug knowledge. In several 'Crown Reports', a greater

use of pharmacist skills was identified as one of the main drivers for expanding pharmacist prescribing in the UK.<sup>7,8</sup> All potential drivers of pharmacist prescribing identified in this study were positive predictors of an expansion of pharmaceutical services through pharmacist prescribing ( $\beta=0.747$ ,  $p<0.0001$ ). Additionally, pharmacists' opinion based upon their perceptions of their clients' and pharmacy ownership were also shown to be important positive predictors of expanding pharmaceutical services through prescribing ( $\beta=0.127$ ,  $p=0.005$  and  $\beta=0.01$ ,  $p=0.004$ ). Inadequate training in patient assessment, diagnosis and monitoring were perceived as the greatest barriers towards pharmacists assuming an expanded prescribing role. These potential barriers were also the strongest negative predictors of expanding pharmacists' role in prescribing ( $\beta=-0.098$ ),  $p<0.0001$ ), while increased cost and deterioration of patients' care were the weakest negative predictors for expanding pharmacist prescribing role ( $\beta=-0.075$ ,  $p=0.004$ ).

The vast majority of respondents considered further training was needed for pharmacists to assume additional prescribing roles. In this regard, strongest preferences for further training were shown for areas of pathophysiology of conditions, principles of diagnosis and patient monitoring. Respondents showed lower levels of support for training in pharmacodynamics and pharmacokinetics, adverse drug reactions and drug interactions and communication skills. Further training in clinical pharmacology as well as pharmacodynamics and pharmacokinetics was supported more by pharmacists who were registered for longer than 20 years ( $p<0.0001$ ). These findings should be interpreted in conjunction with evidence from the UK where Dawoud et al. that observed how pharmacists undertaking supplementary prescribing considered they were knowledgeable in areas such as pharmacology and pharmacokinetics but they needed more training in patient assessment and counseling.<sup>9</sup>

In Australia, the potential benefits of a supplementary prescribing model need to be weighed against current forms of dependent prescribing available to Australian pharmacists, particularly the repeat system of prescribing. In a supplementary prescribing model, special emphasis should be put on defining pharmacists'

remuneration, access to patient records and intervals of patient visits and reviews by prescribing pharmacists. Furthermore, the extent to which pharmacists should be able to stabilize or modify patients' therapy needs to be clarified. In the current repeat system of prescribing, pharmacists are not able to modify doctors' prescriptions whereas pharmacists' remuneration (of dispensing only) and prescription refill interval are regulated by the PBS.

The potential benefits reported with supplementary pharmacist prescribing in the UK which included improved patient management, job satisfaction for pharmacists and greater patient satisfaction should be taken into account when establishing an expanded prescribing role for pharmacists in Australia.<sup>10</sup> This also needs to be weighed against the fact that the health system in Australia is under stress from factors such as the ageing population, increased morbidity, increased chronic diseases and insufficient doctors to keep pace with population growth.<sup>11</sup> Insufficient numbers of health professionals is driving task transfer.<sup>12</sup> Furthermore, there are indications that fewer medical graduates are choosing general practice as a career, hence adding to the existing general practitioner shortage.<sup>13</sup> Joyce et al. projected a continued shortage of general practitioners in Australia, hence suggesting that innovative primary medical care policies were necessary.<sup>14</sup> Therefore, better utilization of pharmacists' skills in expanded pharmacist prescribing, highly supported by respondents in this study, should be interpreted having in mind the existing and projected shortage of general practitioners in Australia.

### **6.1.2 Community pharmacy clients' attitudes on expanded prescribing**

Most respondents trusted pharmacists adopting an expanded role in prescribing and like pharmacist respondents from the first part of this project, considered that pharmacists needed further training to assume further prescribing roles. The support shown by pharmacy clients in this study was in line with results reported by Stewart et al. who indicated that expanded pharmacist prescribing was generally supported by patients.<sup>15</sup> This was despite the fact that their respondents were drawn from a pool of the general public and hence were not pharmacy clients only used in this study. Hobson et al. also indicated patients' support for expanded pharmacist prescribing.<sup>16</sup>

A majority of pharmacy clients in this study supported expanded pharmacist prescribing only after a diagnosis had been made by a doctor. These findings further strengthen the idea of a dependent (i.e. supplementary) rather than independent model of prescribing for initial introduced in Australia. Pharmacy clients who supported an independent prescribing role for pharmacists preferred this be done for therapeutic areas of pain management and antibiotics for limited number of infections. Interestingly, pharmacists who supported independent prescribing showed strongest preference for independent prescribing in areas of pain management and antibiotics for limited number of infections. These findings are a good indication for narrowing down therapeutic areas for independent pharmacist prescribing, if this role is assumed by Australian pharmacists in the future.

This study hypothesized that pharmacy clients would prefer both supplementary and independent prescribing models i.e. H3: *There is no significant difference in pharmacy clients' support for supplementary or independent prescribing models.* This hypothesis was rejected since 77% (n=400) of pharmacy clients supported an expanded prescribing role for pharmacist only when the condition was first diagnosed by their doctor (i.e. supplementary model) with 33% (n=400) of respondents accepting pharmacists diagnosing a condition and subsequently prescribing (i.e. independent model).

This study hypothesized that doctors continuing to diagnose the condition does not significantly contribute to pharmacy clients' perception of trust in pharmacists assuming an expanded prescribing role i.e. *H4: There is no significant difference in pharmacy clients' perception of trust in pharmacists assuming an expanded prescribing role dependent on doctors continuing to diagnose the condition.* This hypothesis was rejected since a continuing role of doctors in patient diagnosis positively contributed to pharmacy clients' perception of trust in expanded prescribing role for pharmacists ( $\beta=0.129$ ,  $p=0.01$ ).

This study also hypothesized that medication access would not significantly influence pharmacy clients' perception of trust in expanded pharmacist prescribing i.e. *H5: There is no significant difference in pharmacy clients' perception of trust in pharmacists assuming an expanded prescribing role dependent on this role's potential to improve access to prescription medicines.* This hypothesis was rejected since improved access to prescription medicines ( $\beta =0.368$ ,  $p=<0.0001$ ) contributed positively to pharmacy clients' perception of trust in expanded pharmacist prescribing. In fact, improved access to prescription medicines was shown to be the strongest single positive predictor.

These findings should be interpreted having in mind that Bessell et al. developed four practice models where pharmacists could initiate, modify and monitor use of prescription medicines with the aim of improving patients' access to medications.<sup>17</sup> Additionally, improved medication access was one of the main aims identified by England's Department of Health for introducing independent pharmacist prescribing in the UK.<sup>18</sup>



### **6.1.3 Potential improved models of medication supply to RACFs**

A comment made by a doctor in a focus group meeting illustrated one of the most fundamental differences in medication access between residents living in RACFs and those in community i.e.: *“The patients in nursing home are far worse than those living in a community. Those living in a community when they get a prescription walk to the pharmacy and receive the medication immediately, but patients in RACFs can’t do that”*.

This study has identified a range of difficulties related to current systems of medication supply to RACFs. These included: medication wastage, after hours and weekends, communication between health professionals, medication charges to the residents, delivery of medication, medication changes, residents’ discharge from tertiary hospitals and PRN/short-term medications. The main prescription and dispensing related difficulties identified were with authority prescriptions and the issue of no medication supply without a prescription. Medication supply based on an ‘owing’ system was identified as an important difficulty as well. Many of these difficulties have also been reported by Bessell et al.<sup>17</sup> and the HMA review.<sup>19</sup>

Out of all potential improved models discussed, a centralized medication chart model was the most preferred amongst focus group participants. Furthermore, there were indications that in some RACFs the medication chart was already the central document that supersedes prescriptions. In comparison to other models discussed in focus group meetings, a centralized medication chart model appeared to have the potential to address most of difficulties identified by focus group participants. This was particularly likely with an electronic version of a centralized medication chart model. It should be noted that these charts currently do not meet all legal requirements for prescriptions in Australia. The medication chart model was also proposed by the Australian government under the Fifth Community Pharmacy Agreement and was overwhelmingly supported by stakeholders in the HMA review.<sup>19</sup> It should be emphasized that the HMA review suggested that a paper-based medication chart should be only a transition to an

electronic version and this version was strongly supported by stakeholders in this review.<sup>19</sup>

It should be noted that some ‘highly relevant’ difficulties such as medication wastage, PRN medications, delivery of medication and difficulties with packaging still remain largely unaddressed even with a medication chart model. A significant amount of medication wastage arises from medications not being re-packaged by pharmacies. This was also found in the HMA review. Pharmacies should not re-package medications due to accreditation requirements which protect patients since the quality of medications to be re-packaged is no longer certain. They have been removed from original packages, been stored in contact with other drugs and stored under conditions of temperature and light exposure that is unknown. It appeared that doctors especially, may lack an understanding of these limitations which in turn may be adversely affecting their relationship with pharmacists. For instance, doctors identified the need to write too many prescriptions, compared to the drug regimen. They consider pharmacists maybe over- servicing and did not appear to appreciate issues of medication wastage which as a result increases medication dispensing frequency. This was particularly evident with cases involving medications that require prior PBS authority approval for prescribing as their dispensing frequency is affected. In worse case scenarios this ultimately results in dangerous cases of medication discontinuation as a consequence of doctors being unable to obtain PBS authority approvals and pharmacists not supplying the medication as a result of lack of prescription. This emphasized the need for a modification of current PBS authority arrangements, as also highlighted in the HMA review.<sup>19</sup>

Medication chart model does not overcome the issue of medication wastage and could exacerbate the need for pharmacist payment when wastage occurs. Inevitably with DAA’s, medication wastage occurs and pharmacists need remuneration for medications dispensed. However, the HMA review concluded that no fundamental change in the remuneration system would be required with the adoption of the medication chart system. An electronic version of the medication chart model could address remuneration

concerns but more research is needed to identify ways of dealing with difficulties not addressed by a medication chart model.

Focus group participants generally did not see a need in expanding non-medical prescribing (i.e. pharmacist and nurse prescribing) role given the potential introduction of a centralized medication chart model which makes the prescription writing process unnecessary. A significant barrier to expanding pharmacists' prescribing role was the fact that pharmacists were not located within RACFs hence offering no significant advantage over doctors. Additionally, cost of pharmacist prescribers, their professional indemnity, conflict of interest with supplying and prescribing medications as well as the legal liability appeared to be potential barriers to expanding pharmacists prescribing role in RACFs. The availability (i.e. shortage) and current PBS-rules level of knowledge by nurses appeared to be limitations for nurse prescribing. Shortage of nurse practitioners was a reason that a collaborative nurse practitioner prescribing model was suggested by stakeholders in the HMA review to be considered in future when nurse practitioner numbers increase. Nevertheless, non-medical prescribing appeared to have a greater potential for addressing more 'highly relevant' difficulties identified by this study, in comparison to repeat extension and Medical Director model. Furthermore, non-medical prescribing could supplement the already preferred medication chart model in a limited supply of PRN and short-term medications.

In discussing pharmacist and nurse prescribing, it should be emphasized that this study did not consider the specifics of comparing the two professional groups. However, it is obvious that there may be a difference in terms of workforce availability for pharmacists and nurses. The Hogan Review has highlighted the current shortage of trained nurses in RACFs as well as ageing of nurses, compared to other areas.<sup>20</sup> The availability of pharmacists is set to change given that pharmacy degrees have almost tripled over the last decade and a projected oversupply of pharmacists by 2025.<sup>21,22,23</sup> These circumstances may place pharmacists in a better position than nurses when it comes to assuming new professional roles such as expanded prescribing, even in RACFs.

However, it should be noted that nurses are already prescribing in Australia and this role is expanding.

#### **6.1.4 Agency Theory**

This study has found that the Agency Theory can be applied to explore the relationship between the main stakeholders of expanded pharmacist prescribing. Pharmacy clients' preference for doctors to retain their role in diagnosis illustrates a strong agency relationship that already exists between doctors and patients. Furthermore, pharmacy clients' preference for doctors retaining disease diagnosis was a positive predictor to their perception of trust and therefore acceptance of pharmacist prescribing. However, this study has suggested that from an Agency Theory perspective, expanded pharmacist prescribing may disrupt the relationship that currently exists between doctors and patients. This may be done through an introduction of a decision making authority of a second agent (i.e. pharmacist) into an already established relationship between patients and doctors. This may be particularly evident with the supplementary model which involves an agreement between a doctor, pharmacist and patient. It is worth emphasizing that a qualitative study on supplementary prescribing in the UK revealed that this model was perceived as a potential threat to independent prescribing and infringement of professional boundaries by pharmacists and doctors who participated in this study.<sup>2</sup>

The theory highlights the greater complexity of introducing supplementary prescribing as compared to independent prescribing. Supplementary prescribing requires the current principal-agent relationship to be disrupted by the introduction of a third agent and the already established agent to develop care plans and monitor the patient periodically. Independent prescribing establishes a new agency relationship and is not encumbered with the previous disruptions. However, this model was not preferred by pharmacists or pharmacy clients and compared to a supplementary prescribing model it was found to be a weaker predictor of expanding pharmacists' prescribing roles, in evaluating both pharmacists' and pharmacy clients' views. This suggests that pharmacist expanded

prescribing should be introduced in a form that it does not negatively affect the existing principal-agent relationship between doctors and patients. Such a change should be facilitated by addressing issues with patients that highlight access to medicines, easing the current high workload of doctors and better utilizing pharmacists' skills. This study demonstrates that pharmacy clients would then support its adoption.

## **6.2 Study limitations**

Although a response rate of 40.4% was achieved from postal surveying of pharmacists, it still leaves a possibility of some non-respondents not sharing the same views as respondents. Additionally, the method of using a postal questionnaire to collect the data may have limited a more in-depth expression of pharmacists' views hence potentially affecting the exploration of the issue of pharmacist prescribing in Australia. A lower response rate (34.7%) was achieved in telephone interviewing of pharmacy clients. The fact that respondents were only those that had not experienced expanded pharmacist prescribing may also be a limitation in terms of a broader exploration of clients' perspectives. However, an expanded role in prescribing for pharmacists in Australia is not yet established. It should also be emphasized that the interview questionnaire was previously validated by a small pharmacist focus group and the company administering it which were members of the lay public, which were experienced in this form of surveying. However, the face validity and questionnaire piloting was not done with target respondents and key study findings relied on pharmacy clients' interpretation of terms such as 'trust in pharmacist prescribing'. The question arrangement in the interview questionnaire may have influenced respondents' responses. However, due to the interview being conducted over the phone and time limitations involved the questions needed to be as clear as possible for respondents and focus their thinking.

In terms of data analysis, different factors might have been derived if factor analysis had been performed on the entire set of statements measuring attitudes using a Likert scale.

However, throughout the data analyses the intention was to reduce the number of variables within specific sections of the questionnaire since different sections related to various aspects of pharmacist prescribing. It should also be recognized that in both questionnaires used other dependent and independent variables could have been chosen which would have changed the permutations of regression analysis.

The main limitation in exploring potential improved models of medications supply to RACFs was the fact that it was only conducted in WA and did not include participants from other Australian states and territories. Therefore participants' representativeness may have been limited. However, the limitation to WA may be considered to be of minimal effect to the overall study results given the achievement of a saturation point in terms of new ideas and comments made by focus group participants as well as the similarity of medication supply systems to RACFs across the Australian states and territories. The abovementioned limitations should be taken into consideration by future policymakers when findings of this study are considered.

### 6.3 References

1. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, James V, Lymn J, McIntosh A, Murphy E, Ratcliffe J, Read S, Ward P. Nurse and pharmacist supplementary prescribing in the UK—A thematic review of the literature. *Health Policy* 2008; 85: 277–92
2. Lloyd F, Hughes CM. Pharmacists' and mentors' views on the introduction of pharmacist supplementary prescribing: a qualitative evaluation of views and context. *Int J Pharm Pract* 2007; 15:31–7
3. George, McCaig D, Bond C, Cunningham IS, Diack HL, Stewart D. Benefits and challenges of prescribing training and implementation: perceptions and early experiences of RPSGB prescribers. *Int J Pharm Pract* 2007; 15:23–30
4. Lloyd F, McHenry L, Hughes CM. Views of junior house officers/senior house officers on pharmacist supplementary prescribing. *Int J Pharm Pract* 2005; 13:R96
5. While AE, Mudaly M, Nathan A. Views of community pharmacists regarding supplementary prescribing. *Int J Pharm Pract* 2004; 12:R43
6. Hobson R, Sewell G. Risks and concerns about supplementary prescribing: survey of primary and secondary care pharmacists. *Pharm World Sci* 2006; 28: 76-90
7. Crown J. Report of the Review of Prescribing, Supply and Administration of Medicines, London, House of Commons, 1999
8. Tonna AP, Stewart D, West D, McCaig D. Pharmacist prescribing in the UK; a literature review of current practice and research. *J Clin Pharm Ther* 2007; 32: 545-56

- 9 Dawoud D, Goody L, Lovejoy A, Greene R. Perceptions and perceived competencies of pharmacists on supplementary prescribing training courses in London and the South East. *Int J Pharm Pract* 2004; 12:R40
- 10 George J, McCaig D, Bond C, Cunningham C, Diack HL, Watson A, Stewart D. Supplementary prescribing: early experiences of pharmacists in the UK. *Ann Pharmacother* 2006; 40:1843–50
- 11 Del Mar C; Dwyer N. A radical new treatment for the sick health workforce; *Med J Aust* 2006; 185: 32-4
- 12 Yong C. Task substitution: the view of the Australian Medical Association. *Med J Aust* 2006; 185: 27-8
- 13 Joyce C; McNeill J. Fewer medical graduates are choosing general practice: a comparison of four cohorts, 1980–1995. *Med J Aust* 2006; 185: 102-4
- 14 Joyce C, McNeil A, Stoelwinder J. More doctors, but not enough: Australian medical workforce supply 2001–2012. *Med J Aust* 2006; 184: 441-46
- 15 Stewart DC, George J, Diack HL, Bond CM, McGaig DJ, Cunningham S, Munro K, Pflieger D. Cross sectional survey of the Scottish general public's awareness of, views on, and attitudes toward nonmedical prescribing. *Ann Pharmacother* 2009; 43:1115-21
- 16 Hobson R, Scott J, Sutton J. Pharmacists and nurses as independent prescribers: exploring the patient's perspective. *Fam Pract* 2010; 27: 110-20



- 17 Bessell T, Emmerton L, Marriot J, Nissen L. Improving Australians' access to prescription medicines: proposed practice models; June 2005; Pharmacy Guild of Australia; Canberra; [online]  
[http://www.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2003-017\\_fr.pdf](http://www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2003-017_fr.pdf). (Accessed 20/03/2010)
- 18 Department of Health; Improving patients' access to medicines: A guide to implementing nurse and pharmacist independent prescribing within the NHS in England ; April 2006; [online]  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4133743](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4133743) (Accessed 18/07/2010)
- 19 Healthcare Management Advisors. The Fourth Community Pharmacy Agreement. Review of the Existing Supply Arrangements of PBS Medicines in Residential Aged Care Facilities and Private Hospitals. Final Report. 30 September 2009.  
[online] <http://www.health.gov.au/internet/main/publishing.nsf/content/pharmacy-4cpa-reviews> (Accessed 10/09/2010)
- 20 Aged Care Price Review Taskforce, Review of Pricing Arrangements in Residential Aged Care, Final Report (Prof. W.P. Hogan, Reviewer), Canberra, 2004
- 21 Human Capital Alliance (2008) Pharmacy Workforce Planning Study (Literature Review). 2008, p.3
- 22 The Pharmacy Guild of Australia. The Roadmap – The Strategic Direction for Community Pharmacy. May 2010. Available online: [www.guild.org.au/roadmap](http://www.guild.org.au/roadmap). (Accessed 9/06/2010)

23 Human Capital Alliance (2010) Pharmacy Workforce Planning Project (Pharmacy Guild, 4<sup>th</sup> CPA Commiissionet Project RFT2007/08-01)

*Every reasonable effort has been made to acknowledge the owners of copyright material. I would be pleased to hear from any copyright owner who has been omitted or incorrectly acknowledged.*

# **Chapter VII**

## Conclusions and Recommendations

## 7.1 Conclusions

This project has explored the issue of expanded pharmacist prescribing from pharmacists' and pharmacy clients' perspective. Additionally, this study has considered the potential value of an expanded prescribing role for pharmacists and improved medication supply systems in Australian RACFs.

Pharmacists strongly supported an expanded pharmacist prescribing role, despite perceived barriers. Pharmacists' preference was for a supplementary rather than independent prescribing model, with support of this model being a strong predictor for expansion of pharmaceutical services provision through prescribing.

In addition to known pharmacist prescribing drivers such as better utilization of pharmacists' skills and easing the burden from overloaded GP's, pharmacists' opinion based on their current perceptions of their clients acceptance of this role was also a significant predictor to expanding pharmaceutical services through prescribing. Important identified barriers were pharmacists' inadequate training in patient assessment, diagnosis and monitoring for assuming additional prescribing roles. Study findings indicated pharmacists' perceived need for training in these areas implied that pharmacists' current level of training in these areas should be expanded as a pre-requisite to assuming further prescribing roles.

Pharmacists diagnosing the condition appeared to be a perceived barrier for pharmacy clients as well given that their views indicated support for pharmacist expanded prescribing where doctors had made the primary diagnosis. Pharmacists' diagnosing and prescribing, doctors making the diagnosis, and improved access to medicines positively contributed to an increased patients' perception of trust in pharmacists performing an expanded role in prescribing. In comparison to doctors diagnosing the disease (i.e. a supplementary model of prescribing), pharmacists diagnosing and prescribing (i.e. an independent model of prescribing) was a weaker contributor to an increased patients' perception of trust in pharmacist expanded prescribing. This is consistent with

pharmacists' views which indicated that independent prescribing was a weaker predictor than a supplementary prescribing model for an expansion of pharmaceutical services through prescribing.

This project has shown that the Agency Theory can be employed as a model to explore the impact of expanded pharmacist prescribing. Application of this theory in this project indicated that pharmacist prescribing should be introduced in a way that it facilitates rather than disrupts the already established relationships between doctors and patients. This is because in introducing expanded pharmacist prescribing, particularly the supplementary model which involves a patient management through agreement between a doctor, pharmacist and patient, Agency Theory predicts a possibility for disruption of the agency relationship that already existed between doctors and patients. This disruption involves the introduction of a decision making authority of a second agent (i.e. pharmacist) into an already established relationship between patients and doctors.

A range of problems were identified in current systems of medication supply to RACFs. Compared to other potential improved models of medication supply to RACFs, a medication chart based model may partially or fully address a majority of difficulties identified. This was more likely with an electronic version. However, some highly ranked difficulties such as medication wastage, medication delivery and difficulties with PRN and short-term medications remain unaddressed by this model. These findings indicate that further research should explore ways of addressing these difficulties. The support for an expanded role in prescribing for pharmacists in RACFs appeared diluted by the support for medication chart model. However, there may be a limited role for expanded pharmacist prescribing supplementing the medication chart model with PRN and short-term medications.

## 7.2 Recommendations

Findings of this study have suggested a wide support for expanded pharmacist prescribing by pharmacists and community pharmacy clients. Therefore, the first recommendation of this project is:

**R1:** *“Australian regulatory bodies should note the wide support of pharmacists and pharmacy clients in future pharmacist prescribing”*

Pharmacists’ preference for supplementary prescribing as well as pharmacy clients’ support for expanded pharmacist prescribing provided doctors retain their role in diagnosis, suggest that a dependent (i.e. supplementary) rather than independent model of prescribing should be initially introduced in Australia. This was further supported by findings that views of both pharmacists and pharmacy clients indicated that independent prescribing in comparison to a supplementary prescribing model is a weaker predictor to expanding pharmacists’ prescribing role.

The second recommendation stemming from this project is:

**R2:** *“In expanding pharmacists’ role, Australian regulatory bodies should initially consider a supplementary prescribing model”.*

There was an interesting point of agreement in attitudes of pharmacy clients and pharmacists in their support for an independent prescribing role for pharmacists. Both pharmacists and pharmacy clients showed strongest support for independent pharmacist prescribing in therapeutic areas of pain management and limited range of infections. Additionally, findings from exploration of potential improved medication supply models to RACFs suggested that there may be some efficiency by introducing a limited expanded prescribing model to supplement the medication chart model for short-term and PRN medications, which mainly consist of antibiotics and analgesics. Therefore, the third recommendation of this project is:

**R3:** *“The feasibility of a limited independent prescribing role for pharmacists in therapeutic areas of pain management and limited number of infections should be assessed”.*

Findings from this project have indicated that both pharmacists and pharmacy clients considered that additional training is needed for pharmacists assuming further prescribing roles. Pharmacists identified therapeutic areas which are currently not taught in much detail in current Australian pharmacy courses as areas they needed most training. Training areas supported the most were: disease pathophysiology, disease diagnosis and patient monitoring. Therefore, the fourth recommendation of this project is:

**R4:** *“Australian pharmacists need additional training in order to assume expanded prescribing roles. This training should be focused around clinical areas specific to prescribing such as disease pathophysiology, disease diagnosis and patient monitoring”.*

Pharmacy clients’ preference for retaining their doctors’ role in diagnosis despite supporting an expanded prescribing role illustrated an established doctor-patient relationship. The Agency Theory predicts a potential disruption of this relationship by an introduction of a decision making third agent (i.e. pharmacist) into an already established relationship. Therefore, the fifth recommendation of this study is:

**R5:** *“Expanded pharmacist prescribing should take into consideration the existing agency relationship between doctors and their patients and should be introduced in a way that it maintains rather than disrupts this relationship”.*

Out of all potential improved medication supply models discussed in this project, a centralized medication chart model was the most preferred by doctors, pharmacists, nurses and carers working in RACFs. This model, particularly the electronic version of it, has the potential to address many difficulties identified and would make the use of prescriptions to supply medications to RACFs unnecessary. Therefore, the sixth recommendation of this project is:

**R6:** *“A medication chart system, preferably electronic, should replace the current prescription-based medication supply system to RACFs. Additionally, future research*

*should focus in exploring ways of dealing with difficulties not addressed by this model, especially medication wastage”.*

Findings from focus group meetings have indicated that there may be limited room for non-medical (nurse and pharmacist) prescribing in supplementing a future medication chart model in dealing with PRN and short-term medications. Pharmacists may be in a better position than nurses to assume this role, in terms of their workforce availability as well as their PBS and drug knowledge. However, nurses may be in a better position than pharmacists in terms of their location at RACFs. Therefore, the seventh recommendation of this project is:

**R7:** *“Non-medical prescribing as means of supplementing a future medication chart based model with PRN and short-term medications should be considered. Further research is needed to establish the benefits and practicalities of non-medical prescribing in RACFs”.*

This project, apart from the section of it exploring improved medication supply systems to RACFs, has quantitatively assessed the views of Australian pharmacists and pharmacy clients on expanded pharmacist prescribing. Additionally, this study has not explored any clinical and economical benefits of expanded pharmacist prescribing. Therefore, the eighth recommendation from this project is:

**R8:** *“Future research in the domain of pharmacist prescribing in Australia should consider the clinical and economical benefits of expanded pharmacist prescribing”.*



**Appendix 1**  
**Ethics approval for data collection in WA**

To	Mr Kreshnik Hoti
From	Mrs Jennifer Ramsay Ethics Committee Secretary
Subject	Protocol Approval <b>Hum PH- 07- 2006</b>
Date	10 <sup>th</sup> May, 2006
Copy	Professor V.B Sunderland Mr Jeff Hughes

**Division of Health Sciences**  
**School of Pharmacy**

GPO Box U1987 Perth  
Western Australia 6845

**Telephone** +61 8 9266 7528

**Facsimile** +61 8 9266 2769

**Email** pharmacy@curtin.edu.au

**Web** www.curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Minimal Risk (Ethical Requirements)" for the project titled "**PHARMACIST PRESCRIBING, WA PERCEPTIONS**". On behalf of the Human Research Ethics Committee I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months from May 2006 to May 2007.

If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately. The approval number for your project is **Hum PH-07-2006**. *Please quote this number in any future correspondence.*

Mrs Jennifer H. Ramsay  
Committee Secretary  
Human Research Ethics Committee

---

**Please Note:** The following standard statement must be included in the information sheet to participants:

*This study has been approved by the Curtin University Human Research Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784.*

**Appendix 2**  
**Ethics committee approval for data collection in Australia**

To	Mr Kreshnik Hoti
From	Mrs Jennifer Ramsay Ethics Committee Secretary
Subject	Protocol Approval <b>PH- 03/2007</b>
Date	13 September 2007
File	AL/CMU/2

Division of Health Sciences

**School of Pharmacy**  
GPO Box U1987  
Perth WA 6845

**Telephone** +61 8 9266 7528  
**Facsimile** +61 8 9266 2769  
**Email** pharmacy@curtin.edu.au  
**Web** www.curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Minimal Risk (Ethical Requirements)" for the project titled "PHARMACIST PRESCRIBING, IN AUSTRALIA". On behalf of the Human Research Ethics Committee I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months from **10 September 2007** to **9 September 2008**.

If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately. The approval number for your project is **PH-03-2007**. *Please quote this number in any future correspondence.*

Mrs Jennifer H. Ramsay  
Committee Secretary  
Human Research Ethics Committee

---

Please Note: The following standard statement must be included in the information sheet to participants. *This study has been approved by the Curtin University Human Research Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784.*

## Appendix 3

### QUESTIONNAIRE FOR PHARMACIST PRESCRIBING IN WESTERN AUSTRALIA

*The aim of this project is to assess pharmacists' perceptions on the role of pharmacists in prescribing. In particular, we are interested in investigating areas pharmacists feel they could contribute in prescribing and what additional training they feel that they would require in order to assume future prescribing responsibilities.*

This questionnaire consists of statements and questions which enable you to give your opinion on the issue of pharmacist prescribing. It is estimated it will take you approximately 10-15 minutes to complete this questionnaire. Your information will be treated with strictest confidence.

**To answer this questionnaire please CLICK ON THE BOX NEXT TO THE NUMBER that reflects your opinion regarding the statement i.e.: 1 = Strongly agree; 2 = Agree; 3 = Neutral; 4 = Disagree; 5 = Strongly disagree. (Some questions require typing the response in a yellow shaded area)**

1)

*In relation to the way you see the future of the Pharmacy profession, please answer the following:*

I would like the Pharmacy profession to expanded its scope of professional services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I would like the Pharmacy profession to expand its scope of services, by expanding the prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I see myself in future as having more expanded prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I am happy with the current pharmacist's prescribing role limited to S3's	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

2)

*Based on your experience with customers in the Pharmacy, please answer the following considering how they would react to expanded Pharmacist prescribing:*

Customers would accept pharmacists with an expanded prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers would trust pharmacists as prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers would have better access to their medications if pharmacists were prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers would have a safer access to their medications if pharmacists were prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers find accessing their GP's too difficult and may prefer Pharmacists having an expanded prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers appreciate pharmacist 's professional advice and may prefer pharmacists as prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

3)

*In relation to reasons for pharmacist prescribing, please answer the following:*

I believe customers would have better access to their medications if pharmacists were prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists prescribing would ease the burden from overloaded GP's and hence improve the functioning of our health system	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Expanded prescribing responsibilities is a direction that the Pharmacy profession should be headed in order to secure a more important role in health care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists are highly regarded by the community and therefore they should assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists have the necessary drug knowledge to assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists have the necessary patient assessment skills to assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input checked="" type="checkbox"/>
Pharmacist prescribing enables better use of pharmacist's professional skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Expanded prescribing will contribute to increased Pharmacy profits	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

4)

*For which of the following reasons do you believe pharmacists should not have expanded prescribing rights?*

Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Inadequate training in patient assessment and patient monitoring	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for a reduction in the quality of patient care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased patient costs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased hospital admissions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased government costs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Conflict of interest with pharmacists acting both as prescribers and dispenses	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists' lack of time	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Increased confusion amongst the public as to the role of GP's and pharmacists	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential decrease in quality of current services offered by pharmacists	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Inadequate facilities within pharmacies to allow pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
None of the above	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

5)

*Do you think pharmacists should have expanded prescribing rights?*

Yes  No

If YES please answer question A, if NO go straight to question B:

*A) I feel that pharmacists should have expanded prescribing rights in following areas:*

Antibiotics (limited number of infections)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Diabetes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Hypertension	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Heart failure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Asthma and other respiratory conditions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Anticoagulant therapies	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pain management	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Newly S4 scheduled Pseudoephedrine products	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
None i.e. maintain current prescribing responsibilities only (i.e. S3 products)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

*B) Do you believe pharmacists have the knowledge, skills and training to diagnose conditions such as:*

i) Common ailments

Hayfever	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Eczema	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Psoriasis	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Conjunctivitis	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Allergic Rhinitis	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Indigestion	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Headache	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

ii) Medical conditions

Hypertension	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Heart Failure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Diabetes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Asthma	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
COPD	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Peptic Ulcer	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Angina	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

6) *In relation to the way you believe pharmacists should assume expanded prescribing responsibilities, please answer the following:*

Pharmacists should be able to prescribe independent of medical practitioners, this includes assuming the responsibility of clinical assessment of the patient, establishing diagnosis and clinical management	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe in a <i>supplementary</i> fashion through a partnership with an independent prescriber (a doctor or dentist) implementing an agreed patient-specific management plan	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe expanded prescribing should be done by Hospital Pharmacists only	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe from a limited drug formulary	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe pharmacist prescribing and dispensing should be done separately	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe for Pharmacist Only (S3) products only	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe for 30 day emergency supply, rather than current 3 day limit	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe for limited repeats under GP supervision	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

7) *If I was about to assume additional prescribing responsibilities, I would need further training:* Yes  No

If NO please go straight to question 8.

A) *In order to assume expanded prescribing responsibilities I would need further training in following therapeutic areas:*

Clinical pharmacology	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacodynamics and pharmacokinetics	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Adverse drug reactions and drug interactions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pathophysiology of conditions that you would prescribe for	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Selection of drug regimen	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Physiological changes and drug response in different age groups	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

**B) In order to assume expanded prescribing responsibilities I would need further training in following areas:**

Patient consultation and decision making	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Communication skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Principles of diagnosis	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Evidence based practice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Legal and ethical aspects of prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Psychology of prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Principles and methods of patient monitoring (physical examination, laboratory results, patient compliance)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Public health issues	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

**C) In order to assume extended prescribing responsibilities pharmacist prescribers would need:**

A period of supervision by a Medical Practitioner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Demonstration of relevant Continuing Education that ensures their prescribing skills are kept to date	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Other, (please specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

8)

**In relation to reimbursement of pharmacists for their expanded prescribing role, I believe that pharmacists:**

Should charge the patients for their prescribing service in addition to charging for their medications	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Should be reimbursed by the Government for their prescribing services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Prescribing should be carried out free of charge as a part of free quality services offered by pharmacists to community	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Should be reimbursed by the Government for prescribing facilities needed (i.e. IT upgrades, consulting area)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Other sources, (please specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

9)

*In relation to the implications of pharmacist prescribing on pharmacy infrastructure:*

I believe additional IT resources in the Pharmacy would be needed to support pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe I have access to sufficient patient information in order to make prescribing decisions for them	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe prescribing and dispensing should be carried out in separate areas in the Pharmacy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe a separate quiet consulting area for pharmacist prescribing should be created in the Pharmacy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe current staff arrangements in the Pharmacy can support expanded pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly agree; 2= agree; 3= neutral; 4= disagree; 5= strongly disagree

10) *Please provide us with some further demographics information*

- Gender: M  F  Age: \_ years
- How many years have you been registered as a Pharmacist: \_ years
- Do you own a Pharmacy: YES  NO
- Where did you complete your undergraduate Pharmacy training
  - Western Australia
  - Other Australian State/territory (Please specify: )
  - Overseas  (Please specify the country: )
- Where do you work? Community  Hospital  Medication Reviews  Other
- Telephone contact:  (optional)

*Please feel free to contribute to this project by adding your personal comments on important factors for consideration related to pharmacist prescribing, which have not been addressed in this questionnaire:*

**THANK YOU VERY MUCH FOR YOUR TIME IN PARTICIPATING IN THIS SURVEY**

*Please ensure no answers have been left out as due to the nature of statistical data analysis applied, missing response can lead to exclusion of your valuable information*

---



## Appendix 4

### QUESTIONNAIRE FOR PHARMACIST PRESCRIBING IN AUSTRALIA

*The aim of this project is to assess Australian pharmacists' perceptions on the issue of extended pharmacist prescribing. In particular, we are interested in investigating their views on advantages and limitations of such a role as well as areas pharmacists feel they should have extended prescribing responsibilities, if any. Pharmacists' views are being sought on what additional training they would require in order to assume future prescribing responsibilities.*

This questionnaire consists of statements and questions which enable you to give your opinion on the issue of pharmacist prescribing. It is estimated it will take you approximately 10-15 minutes to complete this questionnaire. Your information will be treated with strictest confidence. Please reply by **26<sup>th</sup> of November 2007**.

**To answer this questionnaire please TICK THE BOX NEXT TO THE NUMBER that reflects your opinion regarding the statement i.e.: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree. (Some questions require writing the response in the area provided)**

1)

*In relation to the way you see the future of the Pharmacy profession, please answer the following:*

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

I would like the Pharmacy profession to expand its scope of professional services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I would like the Pharmacy profession to expand its scope of services, by expanding the prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I see myself in future as having more expanded prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I am happy with the current pharmacist's prescribing role limited to S3's	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

2)

*Based on your experience with customers in the Pharmacy, please answer the following considering how they would react to expanded Pharmacist prescribing:*

Customers would accept pharmacists with an expanded prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers would trust pharmacists as prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers would have safer access to their medications if pharmacists were prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers find accessing their GP's too difficult and may prefer Pharmacists having an expanded prescribing role	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Customers appreciate pharmacist's professional advice and may prefer pharmacists as prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

3)

*In relation to reasons for pharmacist prescribing, please answer the following:*

I believe customers would have better access to their medications if pharmacists were prescribers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Expanded pharmacist prescribing would ease the burden from overloaded GP's and hence improve the functioning of our health system	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Expanded prescribing responsibilities is a direction that the Pharmacy profession should be headed in order to secure a more important role in health care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists are highly regarded by the community and therefore they should assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists have the necessary drug knowledge to assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists have the necessary patient assessment skills to assume more prescribing responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacist prescribing enables better use of pharmacist's professional skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Expanded prescribing will contribute to increased Pharmacy profits	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

4)

*In relation to the way you believe pharmacists should assume expanded prescribing responsibilities, please answer the following:*

Pharmacists should be able to prescribe independent of medical practitioners, this includes assuming the responsibility of clinical assessment of the patient, establishing diagnosis and clinical management for a range of conditions within professional and clinical competence.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe in a <i>supplementary</i> fashion through a partnership with an independent prescriber (a doctor or dentist) implementing an agreed patient-specific management plan. In this model the doctor diagnoses and initiates therapy while the pharmacist continues prescribing as long as patient's condition is within agreed management plan parameters.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe from a limited drug formulary which would include current S2's, S3's and additional drugs depending on pharmacists field of specialization	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists should be able to prescribe for 30 day emergency supply, rather than current 3 day limit	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe any possible future expanded prescribing should be done by Hospital Pharmacists only	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

5)

*For which of the following reasons do you believe pharmacists SHOULD NOT have expanded prescribing rights?*

Inadequate training in diagnosis of disease (if this were the pharmacist's responsibility)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Inadequate training in patient assessment and patient monitoring	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for a reduction in the quality of patient care	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased patient costs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased hospital admissions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential for increased government costs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Conflict of interest with pharmacists acting both as prescribers and dispensers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists' lack of time	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Increased confusion amongst the public as to the role of GP's and pharmacists	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Potential decrease in quality of current services offered by pharmacists	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacists having commercial interest in prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Inadequate facilities within pharmacies to allow pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Increased likelihood of litigation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
None of the above	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

a) *Do you think pharmacists should have expanded prescribing rights?* Yes   
No

If answered NO please go to QUESTION 7

b) *Would you wish to take on an expanded role in prescribing?* Yes   
No

6)

*A) Please answer the question below if you consider that pharmacists should only have an expanded prescribing role in partnership with an independent prescriber (e.g. doctor) for any of the following chronic conditions.*

Antibiotics (limited number of infections)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Diabetes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Hypertension	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Heart failure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Asthma and other respiratory conditions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Anticoagulant therapies	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pain management	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
All of the above	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**B) Please answer the question below if you consider that pharmacists should have an independent prescribing role for any of the following chronic conditions.**

Antibiotics (limited number of infections)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Diabetes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Hypertension	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Heart failure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Asthma and other respiratory conditions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Anticoagulant therapies	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pain management	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
All of the above	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

7)

*If I was about to assume additional prescribing responsibilities, I would need further training:* Yes  No

If NO please go straight to question 8.

**A) In order to assume expanded prescribing responsibilities I would need further training in the following therapeutic areas:**

Clinical pharmacology	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pharmacodynamics and pharmacokinetics	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Adverse drug reactions and drug interactions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Pathophysiology of conditions that you would prescribe for	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Selection of drug regimen	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Physiological changes and drug response in different age groups	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**B) In order to assume expanded prescribing responsibilities I would need further training in the following areas:**

Patient consultation and decision making	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Communication skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Principles of diagnosis	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Evidence based practice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Legal and ethical aspects of prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Psychology of prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Principles and methods of patient monitoring (physical examination, laboratory results, patient compliance)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Public health issues	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**C) In order to assume expanded prescribing responsibilities pharmacist prescribers would need:**

A period of supervision by a Medical Practitioner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Demonstration of relevant Continuing Education that ensures their prescribing skills are kept to date	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Specializing in clinical areas that conform with additional prescribing rights assumed (eg. Diabetes, Cardiology, Asthma, Anticoagulation, Pain management, Infections)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Specialist registration as prescribers with the registering body	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Other, (please specify): _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**8) In relation to the implications of pharmacist prescribing on pharmacy infrastructure:**

I believe additional IT resources in the Pharmacy would be needed to support pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe I have access to sufficient patient information in order to make prescribing decisions for them	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe prescribing and dispensing should be carried out in separate areas in the Pharmacy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe a separate quiet consulting area for pharmacist prescribing should be created in the Pharmacy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe current staff arrangements in the Pharmacy can support expanded pharmacist prescribing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe independent prescribing by a pharmacist should NOT occur in a community pharmacy (excluding S3's)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**9) In relation to the extension of pharmacists' current roles in the management of minor ailments:**

**a)**

I believe a more defined consultation system should be set up for provision of Pharmacist Only Medicines (i.e. S3's)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe such a defined consultation system would require a separate consultation room and possibility for customers to make appointments with the pharmacist in regards to minor ailments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe that any extension of current role in the management of minor ailments would require remuneration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe medicines prescribed from an expanded role and consultations should be claimable from Medicare	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
I believe current staff arrangements in the Pharmacy can support an expanded pharmacist's role in the management of minor ailments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

**b)** I believe that the time required for such a consultation would have to be: 3 minutes , 5 minutes , 10 minutes

- c) I believe that Pharmacist remuneration (excluding medication cost) for such a service would have to be: \$\_\_\_\_\_ per consultation (please specify amount)

10) *Please provide us with some further demographics information*

- A) Gender: M  F  Age: \_\_\_years
- B) How many years have you been registered as a Pharmacist: \_\_\_years
- C) Do you own a Pharmacy: YES  NO
- D) Where do you practice:
  - Western Australia ; NSW ; VIC ; QLD ; SA ; TAS ; ACT ; NT
  - Overseas  (Please specify the country: \_\_\_\_\_)
- E) Where do you work? Community  Hospital  Medication Reviews   
Other
- F) Please provide Pharmacy or work location postcode \_\_\_\_\_
- G) If you work in community Pharmacy please indicate its size of operation: small   
(turnover < \$2m); large  (turnover > \$2 m)
- H) Telephone contact: \_\_\_\_\_ (OPTIONAL)

*Please feel free to contribute to this project by adding your personal comments on important factors for consideration related to pharmacist prescribing, which have not been addressed in this questionnaire:*

---

---

---

---

---

---

---

**THANK YOU VERY MUCH FOR YOUR TIME IN PARTICIPATING IN THIS SURVEY**

*Please ensure no answers have been left out as due to the nature of statistical data analysis applied, missing responses can lead to exclusion of your valuable information*

## **Appendix 5**

### **Invitation and information letter for pharmacist surveying**

**Dear Pharmacist,**

We are writing to seeking you input into the above research project being conducted at the School of Pharmacy, Curtin University of Technology.

The aim of this project is to assess Australian pharmacists' perceptions on the role of pharmacists in prescribing. In particular, we are interested in investigating areas pharmacists feel they could contribute in prescribing and what additional training they feel that they would require in order to assume future prescribing responsibilities.

#### **Usefulness of this project**

Extended pharmacist prescribing rights has been an issue of interest in many countries. Currently, pharmacists in Australia are restricted to prescribing over-the-counter medications only. In the UK pharmacists can act as supplementary prescribers or as independent prescribers depending on their level of advanced training. In most US states, pharmacists are involved in collaborative drug therapy management where they establish agreements with prescribers that allow them to initiate, modify, or discontinue medication therapy. Major developments in pharmacist prescribing are taking place in Canada as well with Alberta starting a two category prescribing model. One of which allows pharmacists to 'adopt a prescription' in consultation with a physician and the second model which allows them to initiate and manage drug therapy.

This project is likely to give as insight to the attitudes and perceptions of Australian pharmacists on the issue of extended pharmacist prescribing. There is no study to date that has assessed this issue in Australia and therefore results of this project would be valuable in constructing future recommendations on the issue of pharmacist prescribing in Australia.

#### **Confidentiality**

Your responses will be treated with strict confidentiality. For the purpose of analysis all data is to be group, and no reference will be made to any individual.

#### **How to participate in this project**

Please find enclosed a copy of the questionnaire. For completion of the questionnaire please follow instructions outlined in the introduction of the questionnaire. After completing the questionnaire please post it using the self-addressed envelope provided.

**If you have any questions about this project please contact me at**  
[pharmacy.survey@curtin.edu.au](mailto:pharmacy.survey@curtin.edu.au)

*Thank you for your time in contributing to this project.*

**Sincerely,**

Investigators: Kreshnik Hoti, Prof. Bruce Sunderland, Jeff Hughes

**Appendix 6**  
**Reminder letter**

Dear John,

Approximately three weeks ago, we sent a questionnaire to you seeking your perceptions on the issue of pharmacist prescribing. We are writing to you again to thank if you have for your participation or if you have not already done so to complete and return our questionnaire. A self-addressed return envelope was provided with the questionnaire; if you have misplaced it please send the questionnaire to the address below:

Mr K Hoti  
School of Pharmacy  
Curtin University of Technology  
GPO Box U1987  
Perth, WA, 6845

We see pharmacist prescribing as a very important issue, and a potential future role for pharmacists. Because of the importance of this issue for our profession we are seeking to obtain as large as possible cross section of opinions on the subject. The results from this project will be useful in designing future recommendations on the issue of pharmacist prescribing in Australia.

If you have misplaced our questionnaire please contact us:  
[pharmacy.survey@curtin.edu.au](mailto:pharmacy.survey@curtin.edu.au) , so we organise another questionnaire be sent to you.

If you have any questions about this project please contact us at  
[pharmacy.survey@curtin.edu.au](mailto:pharmacy.survey@curtin.edu.au) or Kreshnick Hoti on 0410823928.

Sincerely,

Investigators

Mr. Kreshnik Hoti, Prof. Bruce Sunderland, Dr. Jeff Hughes



**Appendix 7**  
**Ethics approval for CATI interviews and focus groups**

To	Mr Kreshnik Hoti
From	Mrs Daphne D'Souza A/Ethics Committee Secretary
Subject	Protocol Approval <b>PH- 10- 2008</b>
Date	24 November 2008
Copy	Mrs Pascale Ng

**Division of Health Sciences**  
**School of Pharmacy**

GPO Box U1987 Perth  
Western Australia 6845

**Telephone** +61 8 9266 7528  
**Facsimile** +61 8 9266 2769  
**Email** pharmacy@curtin.edu.au  
**Web** www.curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "**PHARMACIST PRESCRIBING IN AUSTRALIA**". On behalf of the Human Research Ethics Committee I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months from **21 November 2008** to **20 November 2009**.

If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately. The approval number for your project is **PH-10-2008**. *Please quote this number in any future correspondence.*

Mrs Daphne D'Souza  
A/Committee Secretary  
Human Research Ethics Committee

---

**Please Note: The following standard statement must be included in the information sheet to participants:**

*This study has been approved by the Curtin University Human Research Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784.*

## Appendix 8

### QUESTIONNAIRE FOR CUSTOMERS VIEW ON PHARMACIST PRESCRIBING IN AUSTRALIA

Hello, my name is XY. I am calling on behalf of Curtin University School of Pharmacy. Can I please speak to **an adult in the house?**

(Hello, my name is XY. I am calling from Curtin University School of Pharmacy)

I am calling to seek input into a research project being conducted at the School of Pharmacy, Curtin University of Technology. The aim of this project is to assess customers' views on the issue of extended pharmacist prescribing. This includes your pharmacist prescribing some of the medications that you currently get only through seeing your Doctor. This interview will take approximately 10 minutes of your time and your information will be treated with strictest confidence.

You were selected randomly from the public phone directory.

To be eligible to participate you need to have had at **least ONE prescription** filled in a Pharmacy regularly and be **over the age of 18 years.**

Eligible **YES** (continue); **NO**: Is there anybody in the household I could speak to who has at least one prescription medicine dispensed at a pharmacy regularly and is over the age of 18? If **NO**: Unfortunately you do not qualify to participate in this study. Thank you for your time.

- Would you participate? **YES** (Remind the participant that he/she can choose **NOT** to proceed at any time during this interview. Double check eligibility and go to question 1), **NO** (please go to question A)
  - A) Would you prefer us calling you at another time when you have some time? (if yes please specify \_\_\_\_\_ Log to 'convenient time calling register')
  - B) If the person appears to need assistance, ask if they need to discuss their participation with someone who is able to support them in making their decision (if yes and nobody there to assist, ask when would be convenient to call and log to 'assistance calling register')

S1 Age \_\_\_\_\_ [range eg <30; 30 -50; 50 – 65 >65 years]

S2 Gender\_\_\_\_\_

S3 Education completed:

- Primary
- Secondary
- University
- Other
- Prefer not to disclose

S4 Household income (in \$1000s):

- <20
- 20-50
- 50-100
- >100
- Prefer not to disclose

S5 Employment status

- Full-time
- Part-time
- Casual
- Retired
- Not currently employed
- Prefer not to disclose

S6 How many prescriptions do you approximately fill in your Pharmacy?

- 1 a month
- 2-5 a month
- >5 a month
- Other \_\_\_\_\_(please specify)

S7 Do you also get over the counter medicines (eg. Pain relievers-Panadol, vitamins, herbal products) from your Pharmacy, in addition to filling your prescription(s)?

YES  NO

S8 Do you usually get your prescriptions dispensed at the SAME Pharmacy?

YES  NO

*For the following questions please indicate your level of agreement to the given statement by answering:*

*Strongly Disagree; Disagree; Neutral; Agree; Strongly agree*

S9 I am satisfied with my pharmacists' professional advice I receive for medicines

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S10 I am satisfied with my pharmacists' level of drug knowledge?**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S11 I am satisfied with the level of assistance my pharmacist provides when I purchase medicines from the Pharmacy**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S12 I am satisfied with how my pharmacist diagnoses minor ailments such as cold & flu, indigestion, hayfever, headache, conjunctivitis.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S13 I find it difficult to access my Doctor, therefore I would prefer my pharmacist writing prescriptions for medicines for which I currently need repeat prescriptions from my Doctor.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S14 I would trust my pharmacist to write prescriptions for medicines that I currently need repeat prescriptions from my Doctor.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S15 I would prefer my pharmacist write prescriptions for ALL medicines that I currently need a prescription from my Doctor.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

*If neutral, disagree or strongly disagree go to question 16. If agree or strongly agree go to question 17.*

**S16 Are there medicines that you would prefer your pharmacist write prescriptions for? such as:**

Antibiotics	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Diabetes medicines	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Blood pressure medicines	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Heart medicines	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Asthma medicines	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Pain management medicines	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Other	Please specify:				
None	(If NONE, please tick the box and go to question 17)				<input type="checkbox"/>

***I ONLY HAVE A FEW MORE QUESTIONS BEFORE THIS INTERVIEW IS COMPLETED.***

**S17 I would find it easier to access my medicines without delay if prescriptions were also written by my Pharmacist.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S18 I would only feel comfortable to have my pharmacist write prescriptions for my medicines, if my condition is first diagnosed by my Doctor.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S19 I would accept my pharmacist diagnosing a condition (e.g. asthma) and writing prescriptions for the same condition diagnosed.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

***If agree or strongly agree go to question 20. If neutral, disagree or strongly disagree go to question 21.***

**S20 Which condition(s) would you accept your pharmacist diagnosing and writing prescriptions for?**

Infections	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Diabetes	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Blood pressure	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Heart problems	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Asthma	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Pain	Strongly disagree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Neutral <input type="checkbox"/>	Agree <input type="checkbox"/>	Strongly agree <input type="checkbox"/>
Other	Please specify:				

**S21 I would be willing to pay a fee for my pharmacist to write prescriptions for medicines for which I currently need prescriptions from my Doctor.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S22 I think that if pharmacists were to assume the expanded role of writing prescriptions, they would need further training**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**S23 Where do you think the pharmacist who writes the prescription should be located:**

- a) in community pharmacy
- b) at the GP surgery
- c) in their own office

**S24 I am happy with current arrangements where only my Doctor writes prescriptions and my Pharmacist dispenses my medications and no changes are needed.**

Strongly disagree ; Disagree  ; Neutral  ; Agree  ; Strongly agree

**THIS IS THE END OF THE INTERVIEW. THANK YOU FOR YOUR TIME. YOUR RESPONSES ARE MUCH APPRECIATED AND HELPFUL TO THIS PROJECT.**

## Appendix 9

### INVITATION TO PARTICIPATE IN A FOCUS GROUP MEETING

#### Dear Doctor

I am writing to seek your participation in a research project conducted by Curtin University of Technology School of Pharmacy. This involves seeking your views in a focus group discussion with other doctors currently offering services to aged care facilities.

*The focus group will be conducted at **LOCATION** conference room starting **DATE and TIME**.*

*The focus group discussion will last for **ONE hour**. You will be reimbursed **\$X** for your time spent in this focus group.*

#### The aims of this project are:

- 1) To assess if current prescribing arrangements in residential aged care facilities present doctors, facility staff or pharmaceutical service providers with any difficulties.
- 2) To examine current medication supply systems in order to determine whether there are models that can be developed to improve the current system in aged care facilities.

Exploring the abovementioned issues may help us improve current medication supply arrangements in residential age care facilities.

#### Confidentiality

Focus group participants will be asked to respect other participants' views and privacy. For the purpose of statistical analysis all data is to be grouped, and no reference will be made to any individual.

#### How to participate in this project

To participate in this focus group please complete the attached consent form and return it back to us using the self-addressed envelope provided or fax the consent form to:  
**9266 2769**

If you have any questions about this project please contact Kreshnik at [kreshnik.hoti@postgrad.curtin.edu.au](mailto:kreshnik.hoti@postgrad.curtin.edu.au) or telephone 0410823928

Sincerely,

Investigators: Prof. B. Sunderland; A/Prof. J. Hughes; Mr. K. Hoti

## **Appendix 10**

### **FOCUS GROUP QUESTIONS**

Good morning/afternoon,

Thank you for taking time to participate in this focus group. I know you all have a very busy schedule and therefore your participation is really appreciated. My name is \_\_\_\_\_, from\_\_\_\_\_. (The focus group facilitator will then make introductions). This meeting will last for 60 minutes.

The aim of this project is to examine current medication supply arrangements in residential care facilities with a focus on difficulties that health care providers are being faced with and potential new models that could improve medication supply and management..

As stated in your invitation letter, for the purposes of data analysis we will audio-record this meeting. I would like to ask for your permission to audio-record. No data that identifies any individual will be published and the tapes will be stored and disposed of according to NH&MRC ethical requirements.

The views of all of you are very important and you are urged to actively participate in discussions. There are no correct or incorrect answers to my questions. Negative comments are also very helpful in further understanding the issues being researched.

**Opening general question/‘Ice breaker’** - *This question is to be answered by all participants in turn*

**Q1** What do you each think about the current medication supply arrangements in this residential aged care facility?



**More specific questions/transition questions** – *anyone can answer, however the facilitator must cycle and make sure active participation is achieved.*

**Q2. What are the main difficulties, if any, which you are facing with the current medication supply arrangements**

- **Difficulties for the Doctor** (*Doctors to answer only*)
- **Difficulties for the Pharmacist** (*Pharmacists to answer only*)
- **Difficulties for the carer** (*Carers to answer only*)
- **Difficulties for the patient** (*All to answer*)

**Q3 How could current medication supply arrangements be improved in this residential aged care facility?**

**Q4 What do you think of the proposition that pharmacists be allowed under the PBS to continue supply medications to residential age care facility patients by extending the current repeat system beyond the current time allowed?**

- Period of repeat extension?
- Advantages/benefits of this model?
- Disadvantages/concerns of this model?
- Does this apply to all medications or those indicated in some way by the prescriber?

**Q5 In a residential age care facility setting, what do you think of the proposition that pharmacists are allowed to supply medications based on medications listed in a patient's medication chart for an unlimited period of time until the Doctor makes changes to the medication chart?**

- Advantages/benefits of this model?
- Disadvantages/concerns of this model?

**Q6 What do you think about the idea of having a medical directory facility available in residential aged care facilities?**

- Advantages/benefits of this model?
- Disadvantages/concerns of this model?

**Q7** What do you think about the idea of other health professionals (i.e. pharmacists and/or nurses) writing *some* prescriptions for residential aged care facility patients?

- Advantages/benefits of this model?
- Disadvantages/concerns of this model?

### **Key questions**

**Q8** Which one of these models discussed would you prefer?

**Q9** Do you believe pharmacists would need any additional training in order to implement either of these models?

**Q10** Concluding question

- Does anyone have anything to add to what we have discussed today?

THANK YOU FOR YOUR PARTICIPATION

## Appendix 11



### MEDICATION SUPPLY IN RESIDENTIAL AGED CARE FACILITIES

#### *CONSENT TO PARTICIPATE IN A FOCUS GROUP*

I agree to participate in a focus group meeting organised by Curtin University of Technology, School of Pharmacy. I understand that the discussion will focus on difficulties that health care providers are facing with current medication supply arrangements in residential care facilities and potential new models to overcome them.

By agreeing to participate in this focus group meeting, I accept to be interviewed by the focus group facilitator. I also understand that, for the purposes of data analysis, the discussions will be audio-taped and transcribed.

I also understand that:

- All data obtained in the focus group will be stored in a secure location at Curtin University of Technology, School of Pharmacy.
- There will be no publishing of data that will identify any of the participants of the focus group.
- Focus group participants are required to respect other participants' views and privacy.
- That Ethics approval has been given by Curtin University of Technology to conduct this study

Please note that your participation in this focus group is voluntary and you can withdraw at any stage, including during the meeting.

**Name:** \_\_\_\_\_

**Title:** Doctor  ; Pharmacist  ; Carer

**Signature:** \_\_\_\_\_

**\*In order to indicate your agreement to participate in this focus group, please sign this form and send it to us using the self-addressed postage paid envelope provided or fax it to: 92662769**