Pharmacist Prescribing in Australia

An exploration of current pharmacist capabilities, required education and training to prescribe medicines and a process for moving forward

A report commissioned by the Pharmacy Board of Australia
October 2017

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Table of Contents

List of Tables

List of Figures

Abbreviations

Abbreviation	Meaning
AHPRA	Australian Health Practitioner Regulation Agency
Board	Pharmacy Board of Australia
CMP	Clinical management plan
CPD	Continuing professional development
LO	Learning outcomes
MO	Medical officer
NCSFP	National competency standards framework for pharmacists in Australia (2016)
PBA	Pharmacy Board of Australia
PC	Performance criteria
PCF	Prescribing competency framework (NPS MedicineWise Competencies required to prescribe medicines) (2012)
QUM	Quality use of medicines

Executive Summary

Prescribing by pharmacists is an established component of practice in a number of countries including New Zealand (NZ), the United Kingdom (UK), Canada and the United States of America (USA). Catalysts for the introduction of prescribing by health professions not typically associated with this role are similar world-wide and include the need to improve access to medicines and to ensure the efficient use of healthcare resources, while maintaining patient safety.

Evidence indicates that prescribing by pharmacists is clinically appropriate and safe. (1, 2) Patients appear satisfied with the experience of pharmacist prescribing and identify improved access to medicines as a positive outcome for the expanded role of pharmacist prescribing. (3)

Australian pharmacists working in a number of healthcare settings have indicated a desire to include prescribing in their practice scope. (4-7) Australian pharmacy clients have expressed support for an expanded role for pharmacists that includes prescribing, however would prefer their doctor to undertake the diagnosis. (8)

In order to progress the issue of pharmacist prescribing in Australia, it would be useful to understand how the current teaching curriculum prepares graduates to prescribe medicines, and to identify teaching considerations required to prepare pharmacists for an expanded scope that includes prescribing. In addition, an understanding of the implications of prescribing for existing registrants is important.

This report explores the existing curriculum through an extensive review of the content of seven representative programs of study compared to the current Australian standards for prescribing. Evidence of teaching relevant to prescribing was identified, components of prescribing that do not currently appear taught were highlighted and teaching that may require a refocus should prescribing be included in practice identified.

A review of the current practice standards relevant to registered pharmacists was completed to identify aspects of prescribing evident in the standards. This exercise was undertaken to explore the impact of prescribing on currently registered pharmacists and to answer the question 'are there prescribing models under which current pharmacists (who meet the standards of practice) are able to practice?'

A conservative approach was taken when preparing this report. Mapping of both the supplied curricula and practice standards to the Australian prescribing standards was undertaken with a high degree of scrutiny in order to ensure a realistic (some may suggest pessimistic) view of current pharmacist capabilities.

Pharmacists appear well prepared to take their place within the multidisciplinary team as medicines experts. Quality medicines management is a significant component of the current curriculum and a clear requirement of practicing pharmacists. Aspects of practice that currently do not appear in the curriculum, and hold relevance to prescribing, include those

pertaining to the diagnosis of disease (including undertaking physical examinations and relevant investigations) and aspects of patient monitoring (for example examining and observing the patient to determine the response to therapy).

Traditionally, pharmacists have provided information to other health professionals, including prescribers, to inform therapeutic decision making. Should prescribing be included in the practice of pharmacists, a refocus of this communication from the provision of information to a discussion designed to inform colleagues of the prescribing decision would be required.

Similarly, current practice includes the provision of advice to patients with a recommendation to see another health professional should the advised course of action not prove effective. Prescribing decisions would require pharmacists assume responsibility for those decisions and ensure patients return for monitoring where required. This represents another focus shift.

The review has recommended three actions to progress the matter:

Recommendation One: A national symposium be held, attended by representatives of professional, regulatory, academic and accrediting organisations to further explore the process for, and requirements of, pharmacist prescribing in Australia.

Recommendation Two: Following the symposium, details of the proposed prescribing activities and the process and educational requirements to undertake prescribing be provided to the profession (and relevant other health professions) for consultation using a survey format.

Recommendation Three: Academic staff and professional representatives consider in detail the autonomous prescribing model and associated implications for education and training. In particular, the prescribing content identified in this report as lacking in the current curricula, the feasibility of developing additional education and training in relation to these aspects of practice, the possibility of including additional or refocused content in the registrable qualifications and the likely costs associated with prescribing specific education.

Introduction

A report commissioned by the Pharmacy Board of Australia in 2015 highlighted that Australian pharmacists appear to lag behind other countries in the achievement of prescriptive authority. The report provided evidence indicating that prescribing by pharmacists, and other non-medical prescribers, is safe, effective and well-received by patients. (9)

Prescribing medicines is a complex task that carries significant risk of patient harm. The expansion of the pharmacist scope of practice to include prescribing requires careful consideration of a number of factors and extensive profession-wide consultation. It also will benefit from a review of the unique skills and knowledge registered pharmacists have to contribute to the multidisciplinary team and patient care.

This review will follow from the previous report to specifically identify:

- how prepared pharmacy graduates are to undertake the task of prescribing as defined in the NPS MedicineWise Competencies required to prescribe medicines (the Prescribing Competency Framework (PCF))
- gaps in the current pharmacist curriculum relevant to prescribing
- gaps in the National Competency Standards Framework for Pharmacist (NCSFP) relevant to prescribing
- possible education and training requirements for pharmacists to prescribe under a structured prescribing arrangement and those required to prescribe autonomously

The findings of the review will inform ongoing conversations within the profession in relation to the expansion of current practice scope to include prescribing.

Method

The review was undertaken in three parts:
- Part A: Review of the curriculum content of a representative sample of pharmacy programs of study in relation to the Australian standard for prescribing (PCF) to identify gaps in current teaching relevant to prescribing *(the curriculum mapping exercise)*
- Part B: Review of the current pharmacy practice standards (NCSFP) in relation to the PCF to identify gaps in the current practice standard relevant to prescribing *(practice standards mapping exercise)*
- Part C: Analysis of the above findings and identification of considerations for the profession

Part A Curriculum Mapping

Process
The review team identified a number of sites relevant to the review. Sites were chosen to represent the breadth of programs currently offered in Australia and included those offered by both metropolitan and rural education providers, and a range of program structures (Bachelor, Bachelor (Hons) and Masters programs).

Sites were contacted by the review team and invited to submit program information to contribute to the review. Details of the review, including the background and aims of the work were provided. Formal approval to undertake the review was received from all sites. Ethical approval was not required for the review.

A total of seven programs of study were reviewed. Each site provided an overall program structure and the learning outcomes (LO) for all units of study. For five sites, the required information was accessed via the internet; the remaining sites provided specific details directly to the review team.

The Australian standard for prescribing consists of seven competency areas, 23 elements and 73 performance criteria (PC) as shown in Figure 1. Evidence examples are provided for each performance criterion. Curriculum mapping was undertaken by comparing LO with each performance criterion to determine the relevance to prescribing. LO were identified as directly relevant to, not relevant to or supportive of the task of prescribing. Those identified as supporting prescribing included LO that describe required knowledge and/ or skill but are not specific to the task. For example, the ability to retrieve literature is required to undertake the task of critically appraising therapeutic options, but is not specific to the task.

For each PC, LO were recorded as completely mapping to the PC (all components evident) or partly mapping (aspects of, but not the entire PC evident; or the focus of the LO is inconsistent with the PC). For example, LO that describe identification, evaluation and application of evidence to the needs of the patient map partly to PC 2.2.2 *(Obtains, interprets, and applies current evidence and information about medicines to inform decisions about incorporating medicines into the person's treatment plan)* due to a lack of specificity regarding the evidence relating to medicines or prescribing.

The curriculum mapping process was undertaken by three registered pharmacists according to the process summarised in Figure 2. All details were recorded in a separate EXCEL[R] spreadsheet for each site. Details were checked by one team member.

A high level review of the data was undertaken by members of the review team not involved in the original mapping process, to ensure consistency across sites and to check the analysis for accuracy.

Figure 1 Structure of the Prescribing Competency Framework (2012)

Figure 2 Curriculum mapping process

Process establishment

An initial review of one program of study was undertaken individually by the review team. General principles of mapping, the process (including templates) were discussed, agreed and developed. EXCEL[R] software was used to record mapping details

Identification of required material

Learning outcomes (LO) were obtained and recorded in the mapping spreadsheet for that site. LO were reviewed to determine if relevant to, or supporting of, learning applicable to prescribing

Mapping 1

| LO were compared to each PCF performance criterion | LO were identified as mapping completely, partly or not at all | LO that did not map but were considered important supporting learning were identified |

Review & Mapping 2

| Ambiguities were discussed within the review team and a decision made and recorded | Mapping was refined and a summary prepared |

Checking

Mapping checked across all sites to ensure consistency in approach and accuracy of detail

Analysis by site

| Each performance criterion was reviewed to determine if taught when all LO considered | Overall view of each competency area was undertaken |

Combined Analysis

An analysis of all sites combined was undertaken and gaps relevant to prescribing identified
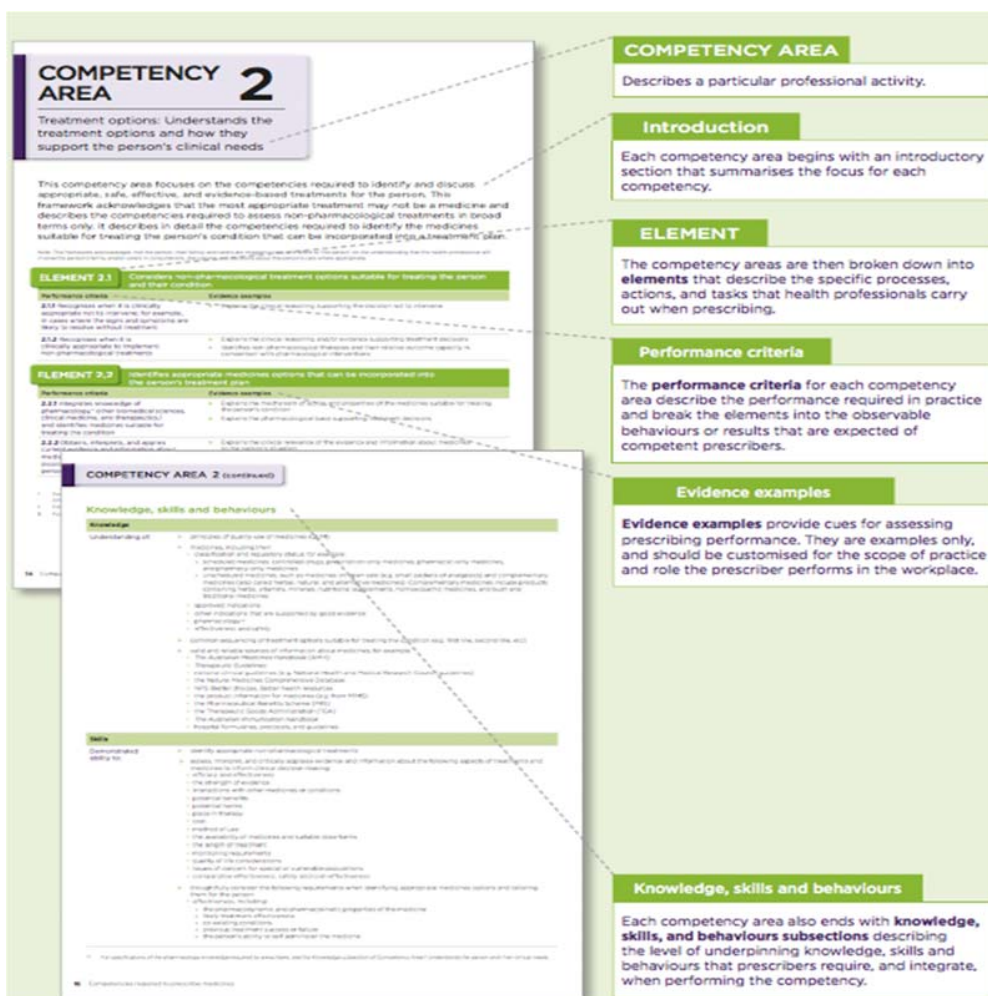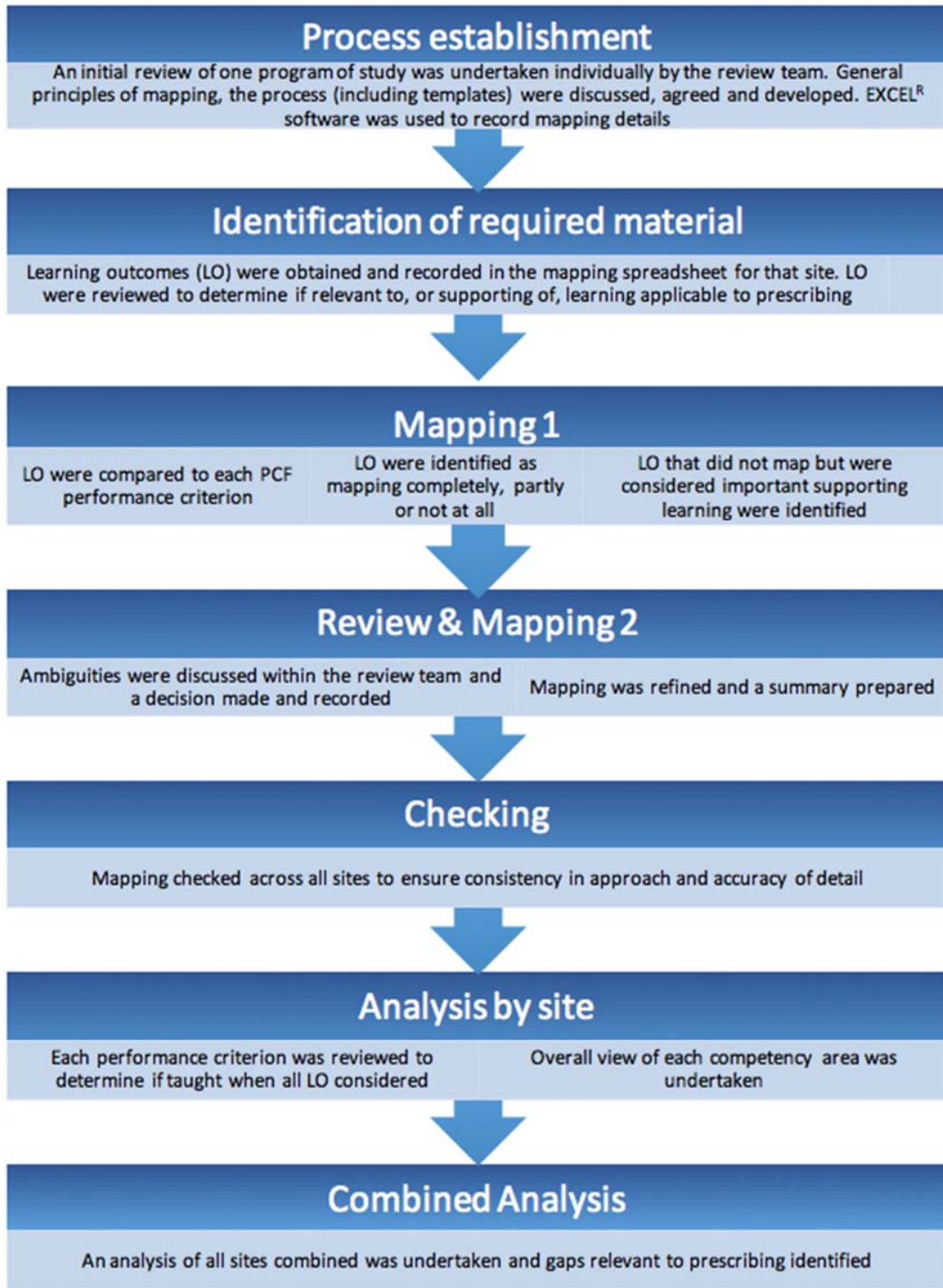
Assumptions and general principles

In order to ensure a consistent approach to the mapping process, the review team identified a number of assumptions and general principles that were applied.

Assumptions

- A health record may include dispensing software and clinical notes
- The term 'medication history' is taken to include all accepted elements of this process including an assessment of risk factors relevant to medicines adherence
- The term 'medication review' is taken to include identification of possible contraindications to therapy
- Use of the term 'appropriate management' or 'appropriate treatment' is taken to imply that no treatment may represent the best option
- Complementary therapies are taken to include non-pharmacological therapies
- Identification of an appropriate medicine or treatment strategy is taken to include consideration of pharmacology, clinical medicine, biomedical sciences as described in PC 2.2.1 *(Integrates knowledge of pharmacology, other biomedical sciences, clinical medicine, and therapeutics, and identifies medicines suitable for treating the condition)*
- The term "all parties" in PC 3.1.2 *(Ascertains that all parties have a common understanding of the therapeutic goals and how they will be measured)* is taken to include the patient and/or family/carer
- "Counselling" in the context of a pharmacist scope is taken to include being aware of patient preferences and goals; ensuring the patient knows how to use/take the medicine; the indication for the medicine and when it should be reviewed.

General Principles

- An understanding of pathophysiology or the clinical presentation of disease is important to, but not the same as undertaking a physical examination, irrespective of scope.
- Broad LO that discuss the general principles of treatment are not considered adequately specific to map to the choice of therapy as described in PC 2.2.1. LO that describe identification of an appropriate medicine in relation to a particular disease (e.g. demonstrate knowledge of the therapeutic management of asthma) are considered relevant to this PC.
- General principles are considered supporting, but inadequately specific to map to most PC e.g. the general principles of drug management of a disease as opposed to the specific therapeutic options.
- The format of information provided should be relevant to the needs of the patient. Therefore, LO that describe the provision of information in a relevant format or use of appropriate communication aids are considered relevant to 2.2.7 *(Supplements verbal information with written information about the condition and treatment options (where appropriate))* regardless of whether the specific format (oral/written) is described.
- Given the variable content of elective units, the decision was made not to include LO pertaining to electives in the mapping exercise.

- Where the same LO is included in multiple units of study, it is mapped for each unit. This is based on the assumption that the LO will be taught in different contexts within each unit.
- LO for clinical units were reviewed in the context of the clinical area e.g. use of the term 'treatment' in the context of a final year clinical unit is taken to include medicines. This may not hold true for a first year introductory unit.

Given the above principles, the mapping undertaken represents a conservative view of the curricula. Clear evidence of teaching pertaining to aspects of the PCF were required in order to include in the mapping. There was no intention to 'fit' the LO to the PC, rather to identify aspects of prescribing clearly evident in the LO.

Mapping analysis

Data from each site was reviewed and the following undertaken:

- For each PC, an overall analysis was undertaken to determine whether the teaching content (when all mapped LO were considered) mapped completely, partly or not at all.
- Mapping relevant to individual PC was combined to describe each competency area in terms of the proportion of LO that mapped completely, partly or not at all.
- Data from all sites was combined and an analysis of the overall mapping undertaken to determine the proportion of PCF performance criteria and competency areas that appeared completely, partly or not evident in the curricula.
- An analysis of potential gaps relevant to prescribing was undertaken.

Part B Practice Standards Mapping

Process

Review of the NCSFP was undertaken by the review team to identify gaps relevant to the task of prescribing. The NCSFP consists of five practice domains under which sit relevant standards, enabling competencies and performance criteria, as shown in Figures 2 and 3.

Similar to the process followed for curriculum mapping, the review of the NCSFP was completed in stages. A template for mapping was developed and an initial map undertaken by each member of the review team, followed by a detailed discussion to ensure agreement for each mapped performance criteria.

Mapping was undertaken by comparing individual NCSFP PC (at the General level) to the PCF PC. The content of the NCSFP PC was identified as either completely, partly or not relevant to the PCF PC. Aspects of general practice that may develop post initial registration (unshaded in the NCSFP General level column) were included in the mapping exercise. Detail provided by the evidence examples in the NCSFP were used to clarify meaning.

Mapping was checked for accuracy and consistency by a team member before a high level review undertaken by a second team member who had not contributed to the mapping exercise.

Figure 3 The Domains of the National Competency Standards Framework for Pharmacists in Australia (2016)

Figure 4 The structure of the National Competency Standards Framework for Pharmacists in Australia (2016)

Analysis

Individual PCF PC were reviewed to determine whether, when all mapped details were considered, there was adequate evidence to map completely or partly, or whether insufficient evidence could be identified to map at all.

An analysis of the proportion of each element and each competency area that mapped completely, partly and not at all was undertaken to identify possible gaps relevant to prescribing.

Part C Considerations and Recommendations

Mapped data from Part A were reviewed to identify aspects of the current curricula that may require enhancement and/ or development should prescribing be included in the pharmacist scope of practice. Areas of prescribing practice that were not identified in the curricula were highlighted and their relevance to prescribing discussed. This exercise provided evidence regarding the skills and knowledge new graduates are equipped with at the point of graduation, and the likely impact prescribing may have on the curricula.

The NCSFP describes practice expectations of a registered pharmacist. As such, the framework reflects the knowledge, skills and attributes a pharmacist is required to achieve through a combination of formal university training and the experiential learning undertaken during the compulsory intern training period. The mapping undertaken in Part B highlights gaps in the practice standards that would require consideration, should prescribing become an additional skill pharmacists seek.

Part C placed the data obtained from the mapping exercises in the context of possible pharmacist prescribing in Australia. Considerations posed for the profession were developed sensitive to the available international literature regarding pharmacist prescribing.

Findings

Part A: Curriculum Mapping

Seven programs of study, sourced from seven individual education providers, were selected for review as part of the curriculum mapping exercise. Sites were chosen to provide a broad overview of the programs currently offered. Programs differed in their structure (graduate entry, undergraduate, Bachelor, Bachelor (Hons), Masters programs) and setting (metropolitan and rural). Further details of the programs of study included in the review may be found in Table 1.

A total of 188 units of study and 1179 LO were reviewed as part of the curriculum mapping exercise. Overall, 37% of all LO reviewed mapped to at least one of the performance criteria described in the PCF, although many mapped to multiple PC. Just under half (44%) of all LO reviewed were considered supportive of learning required to prescribe medicines.

Table 1 Summary of the programs of study reviewed

	BPharm 1	MPharm 1	BPharm (Hons) 1	BPharm (Hons) 2	BPharm (Hons) 3	BPharm 2	MPharm 2	**TOTAL**
Total units of study reviewed	28	17	34	32	31	28	18	**188**
Total learning outcomes reviewed	138	132	134	150	161	101	363	**1179**
Total mapped learning outcomes	58	43	58	41	57	38	146	**441**
Proportion of total learning outcomes that map to PCF	42%	33%	43%	27%	35%	38%	40%	**37%**
Total supporting learning outcomes	55	54	61	74	78	41	158	**521**
Proportion of total learning outcomes considered to support prescribing	40%	41%	46%	49%	48%	41%	44%	**44%**
Average number of learning outcomes per unit	4.9	7.8	3.9	4.7	5.2	3.6	20.2	

Comment re Learning Outcomes

The LO used to describe the teaching of each program of study varied considerably across the reviewed curricula. Differences were identified in the complexity and number of LO assigned to each unit of study. For some sites, outcomes were succinct and minimal, while others used a large number of outcomes (and/ or more complex descriptions) to describe the unit content unit. The average number of LO identified per unit ranged from 3.6 to 20.2.

Evidence of prescribing competencies in reviewed curricula

Individual LO were reviewed to determine those that taught aspects of the PCF completely or partly. The number of LO dedicated to teaching aspects of the PCF was reviewed to provide an indicator of the volume of teaching applied to that area of practice.

Overall view: learning outcomes identified as relevant to prescribing competency areas
Review of the supplied curricula provided an indication of the volume of teaching considered relevant to prescribing, and whether that teaching was specific to, or supportive of, the prescribing process as articulated in the PCF competencies.

Combined data indicates that the largest proportion of mapped LO are dedicated to teaching competency areas two (Understands the treatment options and how they support the person's clinical needs) and H1 (Practices Professionally). Competency area four (Co-ordination. Communicates the treatment plan clearly to other health professionals) was the focus of the smallest proportion of teaching.

Figure 5 Number of learning outcomes mapped to PCF competency areas
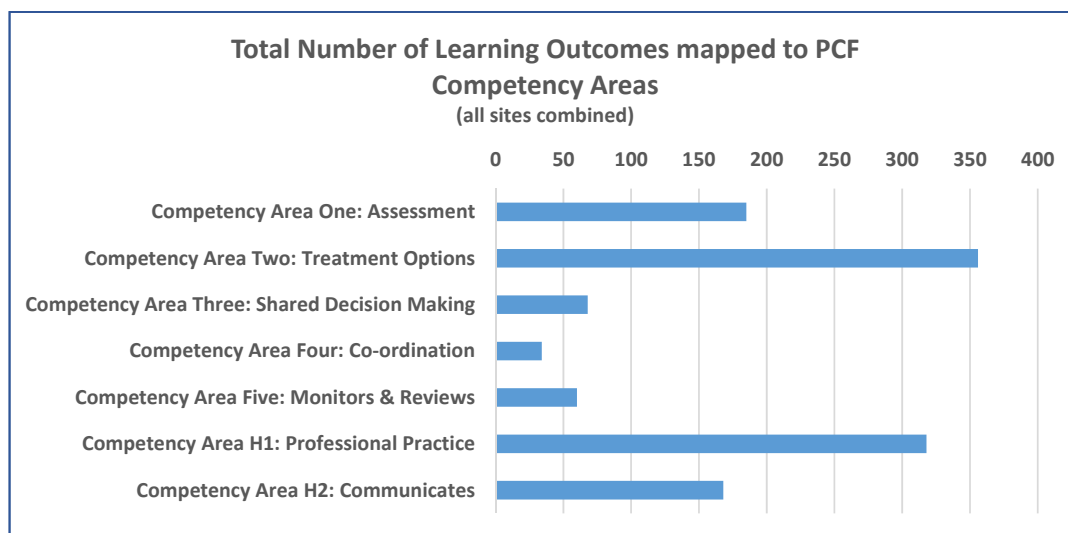
While it should be noted that individual LO may map to multiple PC, these figures provide an indication of the relative volume of teaching applied to each competency area.

It is not surprising that a large proportion of teaching relates to developing student understanding of treatment options, including an awareness of the evidence for treatments and an understanding of when *not* to treat. The professional practice competency area (H1)

includes an understanding of legal, professional practice and scope requirements and the demonstration of skills related to the quality use of medicines. Students appear to receive a significant amount of teaching in both of these areas.

Communication of prescription details was commonly not evident in learning outcomes, consistent with the current scope of practice.

The highest proportion of LO that mapped completely were identified in competency areas two (Understands the treatment options and how they support the person's clinical needs), one (Understands the person and their clinical needs) and H1 (Practices Professionally). Competency areas for which LO were most frequently not identified were five (Monitors and reviews) and three (Works in partnership with the person to develop and implement a treatment plan).

Detailed view: learning outcomes identified as relevant to performance criteria

A more detailed review of the performance criteria within each element of the PCF provides a deeper understanding of the aspects of prescribing currently included in the reviewed programs of study. Within each competency area, the following graphs provide an indication of the proportion of the seven curricula reviewed for which relevant content was identified to map either completely, partly or not at all to the individual performance criteria of the PCF.

Competency Area One. Assessment: Understand the person and their clinical needs

This competency area describes the assessment process, including the development of rapport with the patient, the conduct of a scope-relevant assessment (including undertaking physical examination and/or review of appropriate sources of information) and the interpretation of findings to determine a diagnosis.

Figure 6 Mapping of learning outcomes to performance criteria (competency area one)
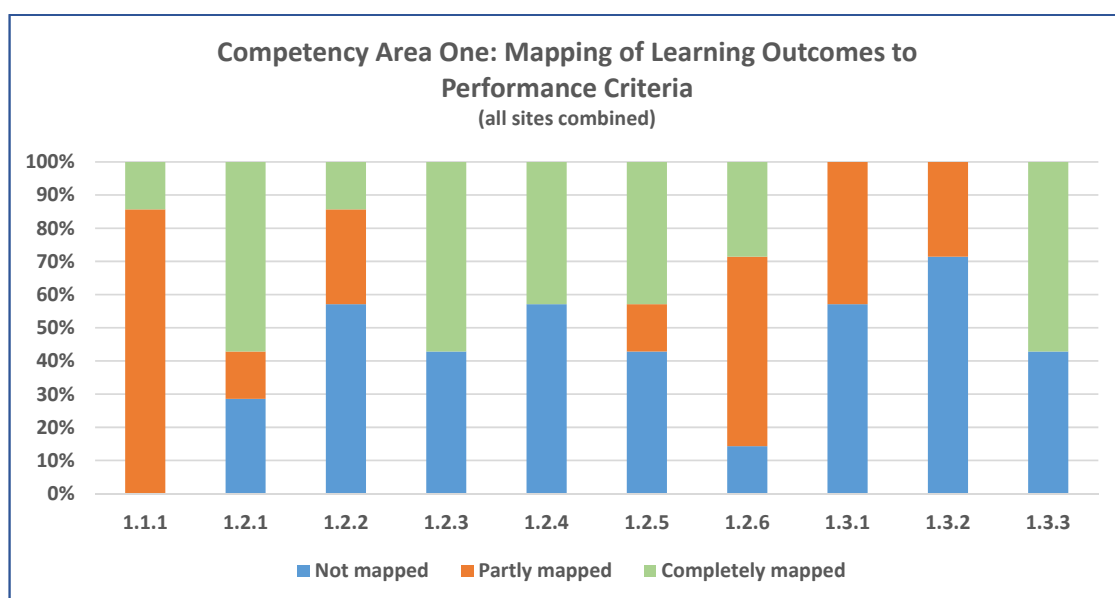
Key: Competency Area 1 Performance criteria
1.1.1 Uses appropriate communication strategies to establish a therapeutic partnership with the person
1.2.1 Conducts an assessment that is appropriate to both the health professional's scope of practice and the person's clinical context
1.2.2 Reviews and interprets information in the person's health records
1.2.3 Obtains relevant information from the person about their medicines, and their medical and clinical history, including their co-existing conditions, treatments, alcohol and substance use, allergies and social context
1.2.4 Assesses the person's risk factors for poor adherence; for example: social isolation, physical impairment, cognitive impairment or disturbance, low English proficiency, low health literacy, financial disadvantage
1.2.5 Ascertains that sufficient information has been obtained about the person's co-existing conditions and current treatments to identify possible risks and contraindications for treatments
1.2.6 Performs clinical examinations that are within the health professional's own scope of practice and relevant to the person's problem and interprets the findings of these examinations
1.3.1 Synthesises information from the comprehensive assessment and develops provisional and differential diagnoses
1.3.2 Develops a diagnostic strategy and performs relevant investigations
1.3.3 Explains the clinical issues and their implications to the person

Performance criteria evident in reviewed curricula
Learning outcomes relating to the obtaining of relevant patient information, undertaking a scope-relevant patient assessment and explaining clinical issues to the patient were commonly identified.

Performance criteria infrequently evident in reviewed curricula
The synthesis of information to inform generation of a diagnosis and the process of undertaking investigations to support a diagnostic strategy were infrequently evident in the reviewed curricula, although learning outcomes that describe the clinical presentation of illness were identified.

Features of the performance criteria that mapped partly
The development of rapport, specifically, was observed infrequently despite a number of LO related to the development of effective communication skills. Undertaking physical examinations was infrequently observed although interpretation of results was more commonly noted.

Competency Area Two. Treatment Options: Understands the treatment options and how they support the person's clinical needs

This competency area includes the identification of appropriate medicines, access and review of available literature regarding medicines, consideration of appropriate non-pharmacological therapies and an understanding of when the most appropriate approach is not to treat. The tailoring of therapy to meet patient needs is also included in this area, including consideration of the cost and community impact of chosen/ proposed medicines. The competency area also includes discussing treatment options with the patient and a referral to another health professional where appropriate.

Figure 7 Mapping of learning outcomes to performance criteria (competency area two)
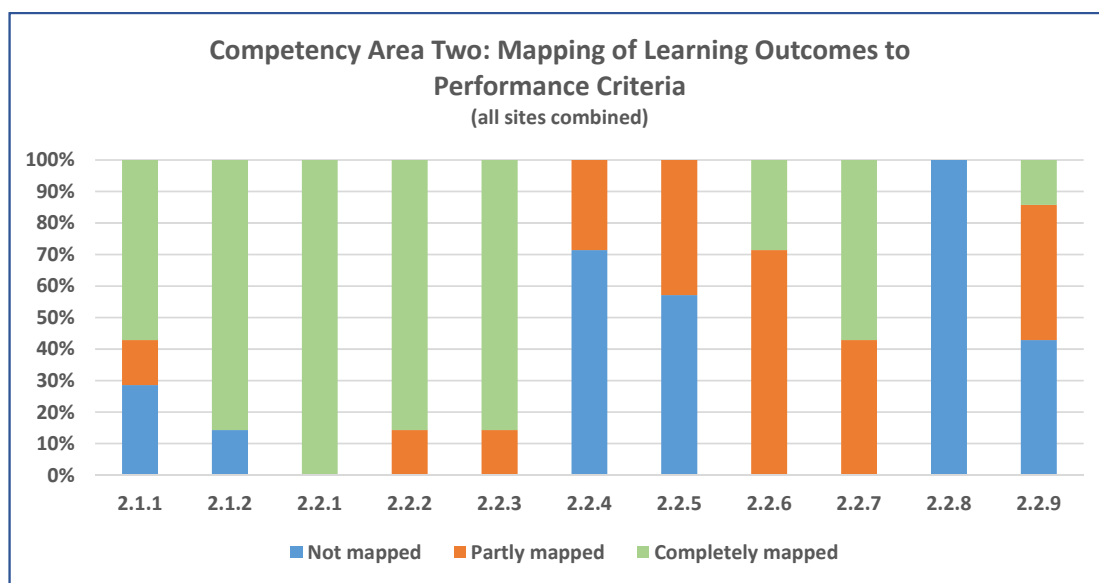
Key: Competency Area 2 Performance criteria

2.1.1 Recognises when it is clinically appropriate not to intervene; for example, in cases where the signs and symptoms are likely to resolve without treatment

2.1.2 Recognises when it is clinically appropriate to implement non-pharmacological treatments

2.2.1 Integrates knowledge of pharmacology, other biomedical sciences, clinical medicine, and therapeutics, and identifies medicines suitable for treating the condition

2.2.2 Obtains, interprets, and applies current evidence and information about medicines to inform decisions about incorporating medicines into the person's treatment plan

2.2.3 Identifies medicines options that are likely to provide therapeutically effective and safe treatment and tailors them for the person

2.2.4 Considers the cost and affordability of the medicines to the person

2.2.5 Considers the implications to the wider community of using a particular medicine to treat the person

2.2.6 Discusses the treatment options and medicines with the person, considering: the priorities for treating their current condition and co-existing conditions (if required), their readiness to address the current condition, their expectations of treatment

2.2.7 Supplements verbal information with written information about the condition and treatment options (where appropriate)

2.2.8 Allows the person time to make an informed decision about their treatment

2.2.9 Refers the person for further assessment or treatment when the suitable treatment options are outside the health professional's own scope of practice

Performance criteria evident in reviewed curricula
Learning outcomes that describe the recognition of when non-pharmacological therapy may be appropriate, the choice of a suitable medicine, the obtaining and interpretation of information to inform a decision regarding treatment and the tailoring of therapy were commonly evident.

Performance criteria infrequently evident in reviewed curricula
Consideration of medicines cost as it impacts the patient and the provision of time for the patient to make a decision regarding treatment were less frequently observed in LO.

Features of the performance criteria that mapped partly
Teaching that highlights consideration of the implications of a chosen therapy to the wider community was observed but could be strengthened. Learning outcomes often referred to the provision of information to the patient, rather than discussing possible treatment options with the patient. Similarly, recognition of patient preference and consideration of this within the process of choosing medicines were less frequently evident. While the process of referral was evident in LO, referral specifically in relation to the choice of medicines was not visible.

Competency Area Three. Shared decision making: Works in partnership with the person to develop and implement a treatment plan

This competency area describes the process of working with the patient to negotiate relevant goals of therapy, acknowledging patient preferences, and tailoring therapy to ensure goals are met.

Figure 8 Mapping of learning outcomes to performance criteria (competency area three)
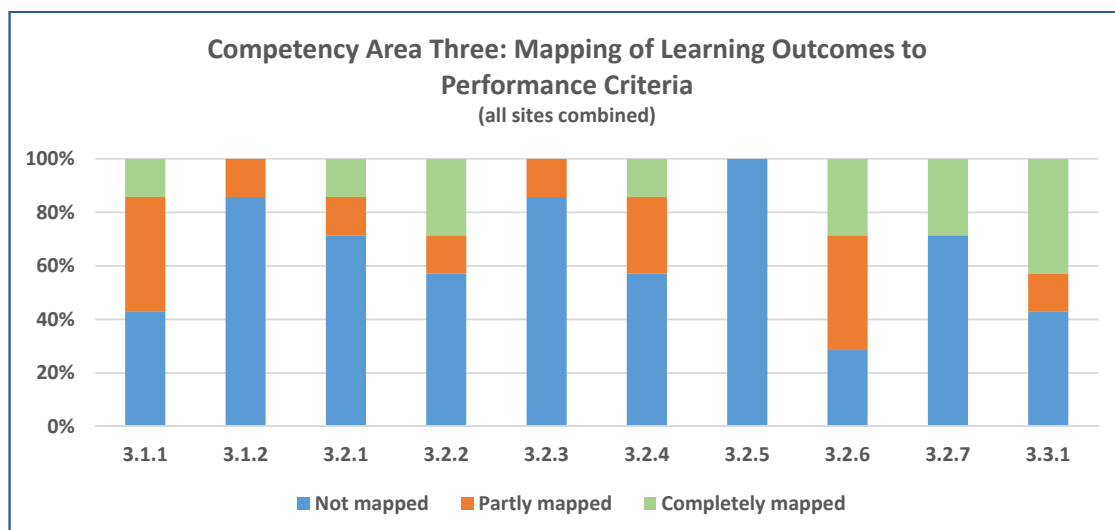
Key: Competency Area 3 Performance Criteria
3.1.1 Negotiates therapeutic goals that enhance the person's self-management of their condition
3.1.2 Ascertains that all parties have a common understanding of the therapeutic goals and how they will be measured
3.2.1 Explores the person's opinions and preferences concerning medicines and the treatment plan
3.2.2 Consults other health professionals about potential medicines and the treatment plan
3.2.3 Reaches agreement with the person about medicines to be used to treat their condition
3.2.4 Develops the treatment plan in partnership with the person
3.2.5 Obtains approval to use the medicines (where relevant)
3.2.6 Stops or modifies the person's existing medicines and other management strategies if required
3.2.7 Ensures the person understands the treatment plan and how to use the medicine safely and effectively
3.3.1 Identifies the need for, and develops, a review plan

Performance criteria evident in reviewed curricula

The performance criteria most commonly evident was that relating to the development of a review plan for therapy.

Performance criteria infrequently evident in reviewed curricula

Obtaining approval to use the medicines was not identified in the learning outcomes for any program of study. Reaching agreement with the patient regarding the treatment strategy and ensuring the goals of therapy are understood were both infrequently observed.

Features of the performance criteria that mapped partly

The term 'optimise therapy' was frequently used in LO and may hold relevance to the performance criterion 3.2.6 *(stops or modifies the person's existing medicines and other management strategies if required)* however a lack of detail prevented complete mapping. Partnering with the patient to negotiate the goals of therapy was partly observed but without an adequate level of specific detail to map completely.

Competency Area Four. Coordination: Communicates the treatment plan clearly to other health professionals

Competency Area Four describes the provision of information to other health professionals to ensure the treatment plan is appropriately implemented. This includes the preparation of legal and specific instructions in the form of a prescription to be dispensed and the obtaining of appropriate approvals to prescribe medicines.

Figure 9 Mapping of learning outcomes to performance criteria (competency area four)

Competency Area Four: Mapping of Learning Outcomes to Performance Criteria
(all sites combined)

	Not mapped	Partly mapped	Completely mapped
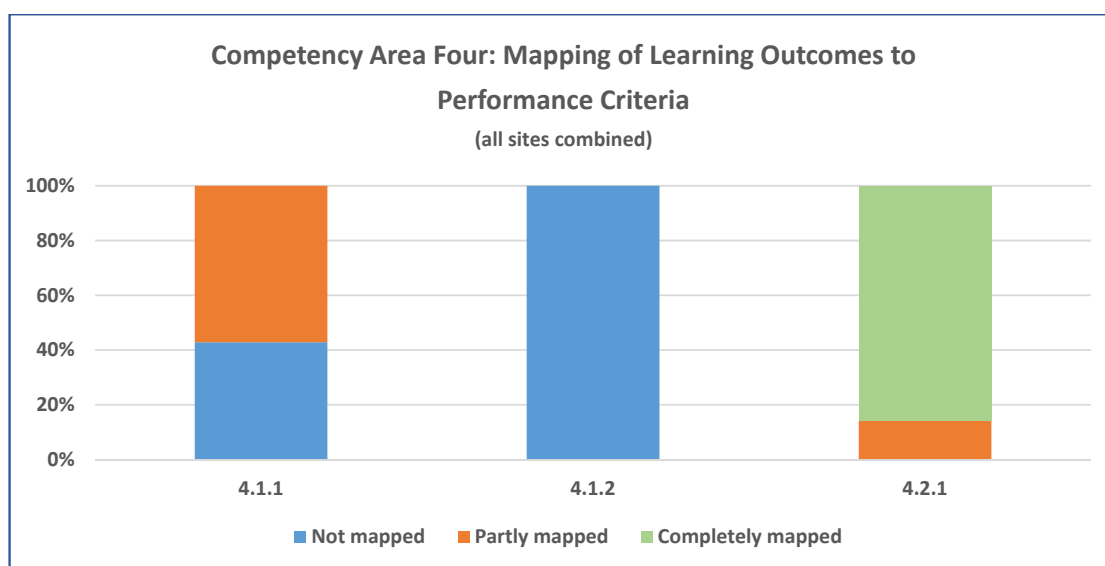
Key: Competency Area 4 Performance Criteria
4.1.1 Prepares prescriptions or medication orders that comply with relevant legislation, guidelines or codes of practice, and organisational policies and procedures
4.1.2 Provides accurate and clear verbal medication orders that comply with relevant legislation, guidelines or codes of practice, and organisational policies and procedures (where relevant)
4.2.1 Provides information for collaboration to members of inter-professional healthcare teams both within facilities and the community

Performance criteria evident in reviewed curricula
Communication with the healthcare team is clearly evident in the reviewed LO.

Performance criteria infrequently evident in reviewed curricula
The preparation of verbal medication orders was not observed in any of the reviewed LO.

Features of the performance criteria that mapped partly
Although LO describing the preparation of a legal prescription were infrequently observed, the legal and professional requirements for prescriptions were evident.

Competency Area Five. Monitors and reviews: Monitors and reviews the person's response to treatment

This competency area describes the process of reviewing prescribed therapy to determine effectiveness, ineffectiveness or harm.

Figure 10 Mapping of learning outcomes to performance criteria (competency area five)

Competency Area Five: Mapping of Learning Outcomes to Performance Criteria (all sites combined)
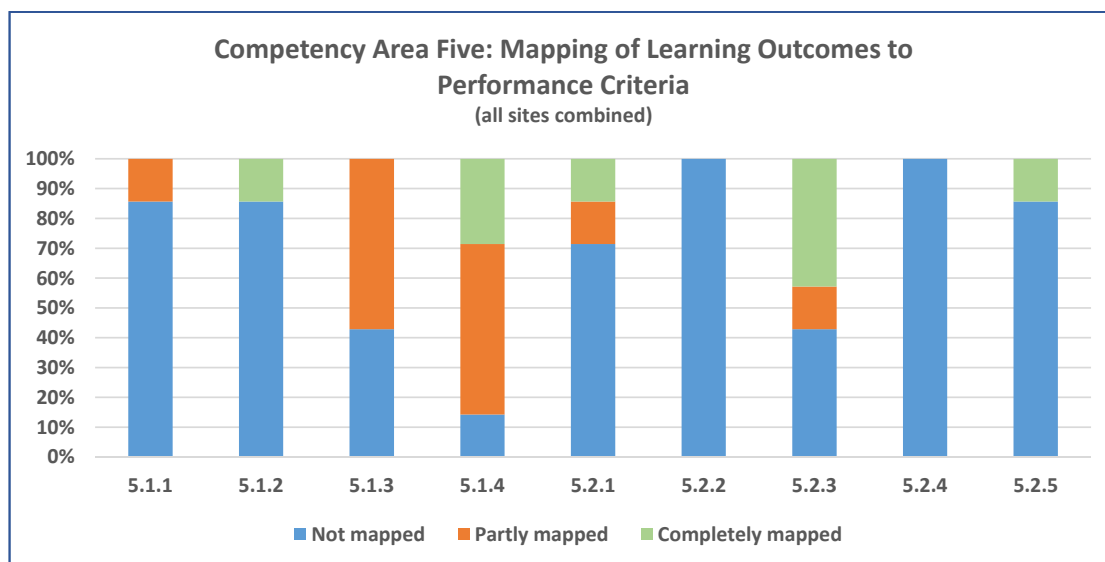
Key: Competency Area 5 Performance Criteria
5.1.1 Observes the person to ascertain their response to treatment (where relevant)
5.1.2 Discusses with the person and other health professionals, their: experience with implementing the treatment plan, adherence, including any issues arising and possible ways to improve adherence, perception or observation of the medicines' benefits and adverse effects, assessment of whether the therapeutic goals have been achieved
5.1.3 Obtains additional information to assess whether the therapeutic goals have been achieved by examining the person, requesting investigations, and interpreting the findings (where relevant)
5.1.4 Synthesises information provided by the person, other health professionals, and from clinical examinations and investigations to determine whether: the therapeutic goals have been achieved, treatment should be stopped, modified, or continued, the person should be referred to another health professional
5.2.1 Discusses the findings of the review with the person
5.2.2 Identifies if the person requires a comprehensive medicines review
5.2.3 Works in partnership with the person and other health professionals to modify the treatment plan to optimise the safety and effectiveness of treatment (where relevant)
5.2.4 Reports issues arising from the review
5.2.5 Organises the next review

Performance criteria evident in reviewed curricula

Learning outcomes related to modifications to therapy to ensure safe and effective treatment were seen in a small number of curricula.

Performance criteria infrequently evident in reviewed curricula

Reporting issues identified as part of the review process and identifying the need for a comprehensive medicines review were not observed.

Features of the performance criteria that mapped partly
The review process was evident in part, although it was difficult to identify LO that specifically related to: observing and examining the patient and/or obtaining additional information, including discussing outcomes with the patient to determine the response to treatment.

As for competency area three above, use of the term 'optimise therapy' may indicate modifications to therapy made to ensure safety and effectiveness, which would be relevant to 5.1.4 *(Synthesises information provided by the person, other health professionals, and from clinical examinations and investigations to determine whether: the therapeutic goals have been achieved; treatment should be stopped, modified or continued; the person should be referred to another health professional)*, however these were present in insufficient detail to map completely to this performance criterion.

Competency Area H1. Professional: Practices professionally

This competency area describes the legal, regulatory and professional aspects of prescribing and the application of quality use of medicines to the prescribing process.

Figure 11 Mapping of learning outcomes to performance criteria (competency area H1)

Competency Area H1: Mapping of Learning Outcomes to Performance Criteria
(all sites combined)

■ Not mapped ■ Partly mapped ■ Completely mapped
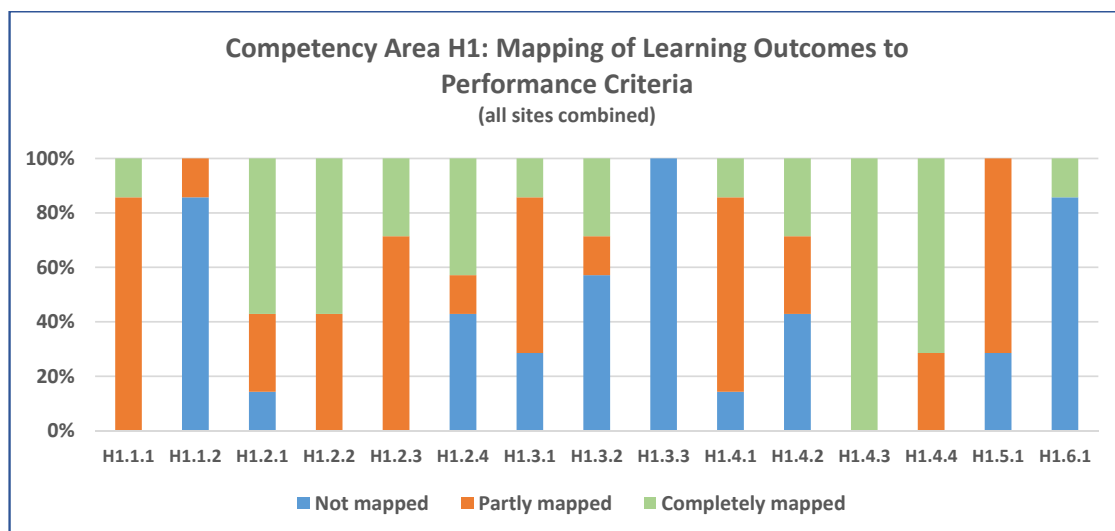
Key: Competency Area H1 Performance Criteria

H1.1.1 Demonstrates knowledge of, and complies with, legislation, regulations, and common law applicable to prescribing
H1.1.2 Maintains accurate and complete records of: the consultation, clinical examinations and investigation results, risk factors for medicines misadventure, the person's decision to decline treatment (where relevant), changes to the person's medicines management plan, including the rationale behind these changes, the review plan, recommendations, and date for next review, outcomes of the treatment
H1.2.1 Demonstrates knowledge of and complies with: professional standards, codes of conduct, scope of practice statements or guidelines
H1.2.2 Practices within the limits of the health professional's own education, training, and scope of practice
H1.2.3 Demonstrates respect for the scope of practice of other health professionals and their contribution within a collaborative care model, particularly that of the person's main healthcare provider
H1.2.4 Accepts responsibility and is accountable for the care provided to the person
H1.3.1 Demonstrates knowledge of and complies with national, state and territory, and facility policies and procedures in relation to prescribing
H1.3.2 Demonstrates appropriate professional judgement when interpreting and applying guidelines and protocols to the person's situation
H1.3.3 Contributes to the improvement of policies and procedures for the judicious, appropriate, safe, and effective use of medicines
H1.4.1 Applies quality use of medicines principles when prescribing medicines
H1.4.2 Identifies common causes of medicines errors and adverse events, and implements strategies to reduce the risks of these occurring
H1.4.3 Demonstrates knowledge of the medicines commonly prescribed
H1.4.4 Critically evaluates information about medicines and makes evidence-based decisions about medicines in the health professional's own practice
H1.5.1 Engages in ongoing professional development and education to improve prescribing practices
H1.6.1 Implements strategies to address influences that may bias prescribing decisions, including: marketing influences, possible personal, professional, or financial gain, conflicts of interest, the health professional's own beliefs, values, and experiences

Performance criteria evident in reviewed curricula

All sites included LO specifically related to medicines knowledge. For most sites, outcomes that discuss the appraisal of relevant information to inform therapeutic decisions were apparent.

Performance criteria infrequently evident in reviewed curricula

Learning outcomes specific to the maintenance of appropriate records regarding the consultation and those that indicate a contribution to policy improvement in relation to medicines use were difficult to find. In addition, teaching related to strategies designed to reduce the potential for bias in prescribing decisions were infrequently found.

Features of the performance criteria that mapped partly

Although LO describing applicable legislation, codes and standards of practice were apparent, specific application to prescribing was not less commonly seen. Learning outcomes that describe the general principles of the quality use of medicines (QUM) were clearly evident, however the application of QUM specifically to the prescribing process was less commonly seen. Similarly, the process of continuing professional development (CPD) was identified in LO, however CPD specific to prescribing practice was less evident. Respect for the scope of other health professionals was apparent, however could be enhanced.

Competency Area H2. Communicates: Communicates and collaborates effectively with the person and other health professionals

This competency area relates to the communication and collaboration between health professionals as part of the prescribing process.

Figure 12 Mapping of learning outcomes to performance criteria (competency area H2)

Competency Area H2: Mapping of Learning Outcomes to Performance Criteria
(all sites combined)

Legend: Not mapped, Partly mapped, Completely mapped
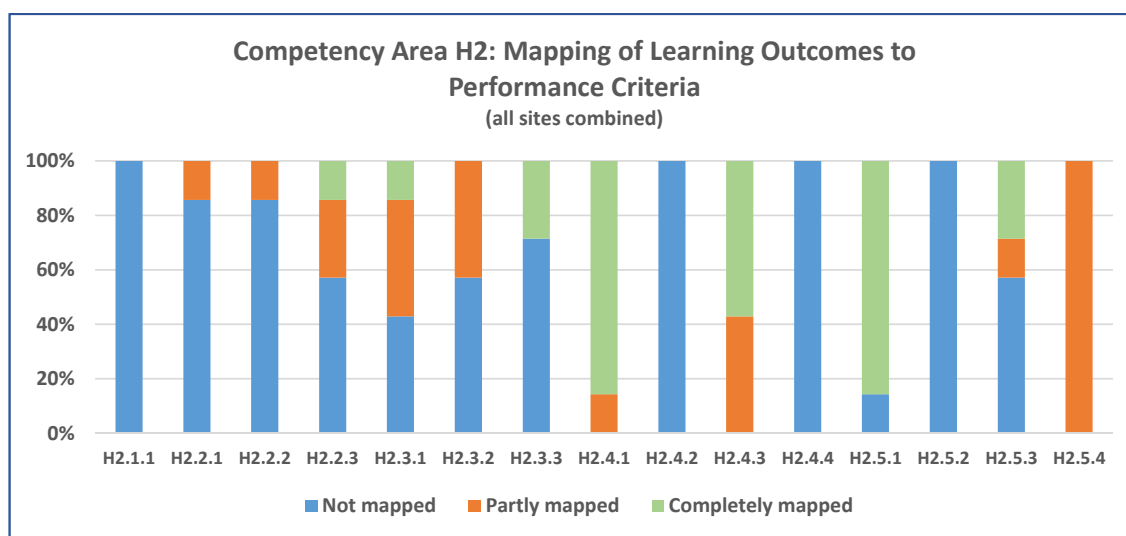
Key: Competency Area H2 Performance Criteria

H2.1.1 Adheres to legislative and workplace requirements for obtaining and recording consent for: accessing health records; obtaining information from, and providing information to, other health professionals; conducting a clinical examination; providing clinical services; the potential benefits and harms of treatment; the financial aspects of the treatment

H2.2.1 Involves the person's family or carers in the consultation where appropriate

H2.2.2 Explores and responds appropriately to the person's concerns and expectations regarding; the consultation; their health; their own role and that of health professionals in managing their health; the health professional's scope of practice; the use of medicines and other treatments to maintain their health

H2.2.3 Establishes a therapeutic partnership that accords with the preferences expressed by the person
Identifies circumstances where consent may need to be obtained in consultation with a third party (e.g. involuntary patients, children, or young people)

H2.3.1 Respects the person's values, beliefs, and experiences

H2.3.2 Respects the person's privacy and confidentiality

H2.3.3 Respects the person's healthcare decisions

H2.4.1 Assesses the person's preferred language, communication style, communication capabilities, and health literacy, and adjusts the health professional's own communication style to interact effectively with them

H2.4.2 Considers the potential issue of perceived power differences between the health professional and the person

H2.4.3 Provides clear and appropriate written and verbal information to the person to enable them to make informed choices and achieve optimal health outcomes

H2.4.4 Ascertains that the information provided has been received and understood correctly

H2.5.1 Engages in open, interactive discussions with other health professionals involved in caring for the person

H2.5.2 Confirms that their own understanding of information provided by other health professionals is correct

H2.5.3 Responds appropriately to communication initiated by other health professionals

H2.5.4 Provides clear verbal and written information to other health professionals by secure means when implementing new treatments with medicines or modifying existing treatment plans

Performance criteria evident in reviewed curricula

Learning outcomes that describe communication with other health professionals and with the patient were frequently seen, as were those related to use of appropriate communication strategies specific to patient needs.

Performance criteria infrequently evident in reviewed curricula
The obtaining and recording of consent; the consideration of possible power differential in relation to prescribing; ensuring communication with the patient has been understood and the confirmation of own understanding during communication with other health professionals were not seen. Involving, and responding to, the patient and family/carer as part of the consultation is infrequently evident in the LO.

Features of the performance criteria that mapped partly
Many of the reviewed LO contained broad statements relating to communication and working as part of a healthcare team but did not specifically address the detail contained in the PCF. Often, the LO described the provision of information rather than engagement in a discussion either with other health professionals or the patient/family.

Analysis by program structure

The curriculum mapping included a range of program structures including Bachelor, Bachelor (Hons) and graduate entry Masters programs. An analysis according to program structure revealed similarities with respect to the teaching of skills and knowledge applicable to prescribing medicines.

Given that both Masters programs were graduate-entry in structure, it may be expected that the proportion of supporting teaching might be less when compared to the undergraduate degrees (having been undertaken at the undergraduate level). However, this was not observed.

When grouped according to structure, little difference was noted between programs in terms of the proportion of LO that either mapped or were considered supportive learning in relation to prescribing medicines (refer Table 2).

Table 2 Details of learning outcomes according to program structure

	Master	Bachelor (Hons)	Bachelor
Learning outcomes mapped to PCF	38.2%	35.1%	40.2%
Learning outcomes considered supportive of prescribing (not mapped)	42.8%	47.9%	40.2%

When individual prescribing competency areas were reviewed, it was difficult to identify specific trends in teaching. Masters programs (when viewed together) appeared to frequently have the lowest proportion of performance criteria for which no mapped LO could be identified and frequently contained a high proportion of completely mapped LO. However, these differences were small and, overall, there appeared little difference between the programs in terms of identified teaching related to prescribing.

Part B National Competency Standards Mapping

Review of the NCSFP indicates that the majority of tasks associated with prescribing (as defined in the PCF) align with the expectations of a general level pharmacist.

For all competency areas, the majority of performance criteria were completely evident in the NCSFP (range 60%-87% of the PC within each competency area, as shown in green in Figure 13). A small number of performance criteria were considered partly evident in the NCSFP (range 13%-30% of the PC within the competency area) and a limited number were unable to be identified (range 7%-33% of the PC within the competency area). Figure 13 provides a general overview of the representation of PCF performance criteria in the NCSFP.

Figure 13 Summary: Mapping of NCSFP to PCF Competency Areas
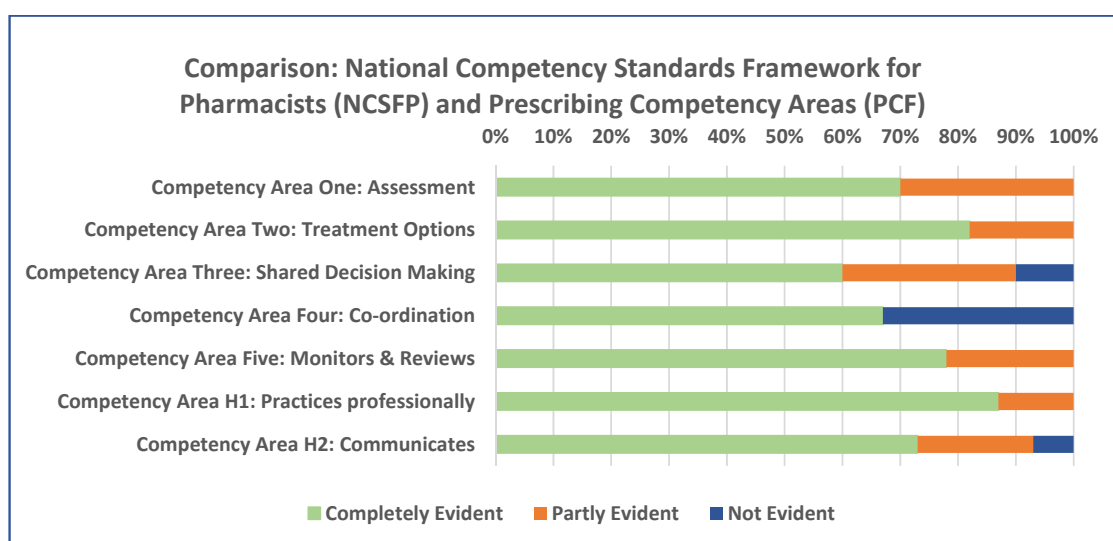
Within each competency area of the PCF, the elements group performance criteria reflective of practice activities required for safe and effective prescribing. Figure 14, on the following page illustrates the comparison of NCSFP with the PCF at the Element level of the PCF.

When the content of the 23 elements described in the PCF was reviewed, 10 elements (43.5%) were completely evident in the NCSFP (i.e. evidence could be found in the NCSFP for all performance criteria within the element). For a further 10 elements (43.5%) evidence could be found in part, and for three elements (13%) evidence for one performance criterion was unable to be identified in the NCSFP.

Figure 14 Summary: Mapping of NCSFP to PCF Elements
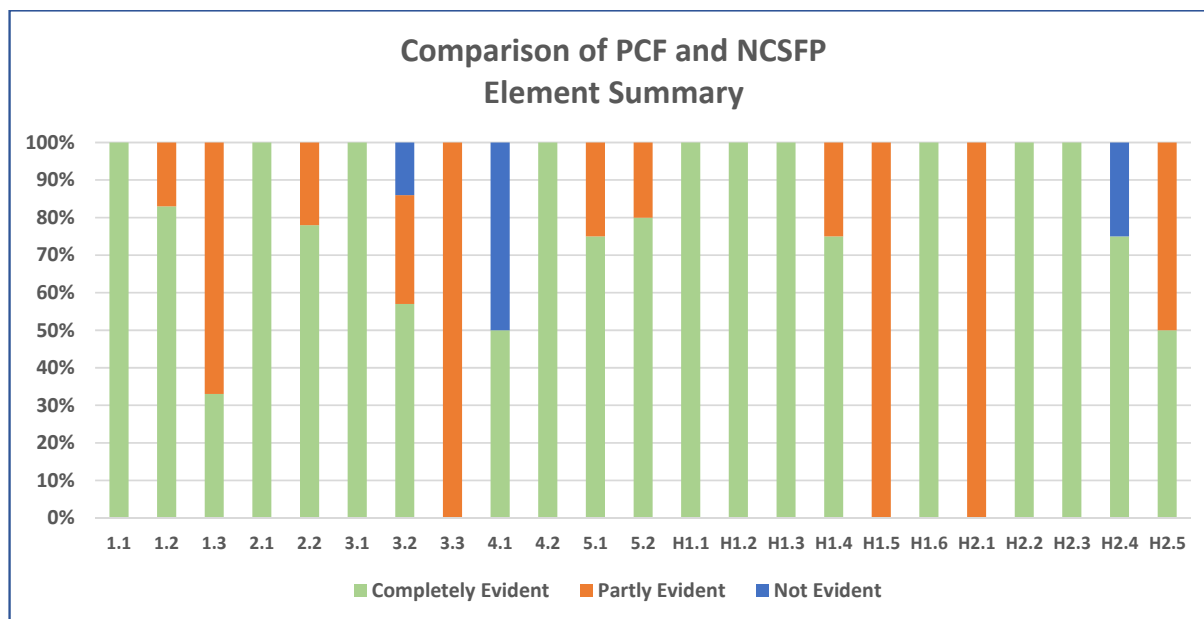
For those elements that did not map completely, a review of the reasons for incomplete mapping was undertaken. In some instances, the wording of the PCF was more detailed when compared to the NCSFP e.g. the process of undertaking a patient assessment is clearly described in Domain 3 Standard 3.1 *"Completes a medication history (including clarification of allergies and adverse medicines events) and, where possible, a medication reconciliation"*, however the specific sources of information used to undertake the assessment are not. The PCF addresses this in performance criteria 1.2.2 *"Reviews and interprets information in the person's health records"*. In other areas, the content of the PCF was specific to the writing of a prescription, which currently falls outside the scope for a pharmacist and is therefore absent in the NCSFP.

A review of the individual performance criteria in each element revealed only three that could not explicitly be identified in the national competency standards; all of which relate to the prescribing process. For example, Domain three of the NCSFP discusses prescribing medicines but not specifically the process of obtaining approval to use medicines.

Table 3 Performance criteria not identified in NCSFP

Performance Criteria	Detail
3.2.5	Obtains approval to use the medicines (where relevant)
4.1.2	Provides accurate and clear verbal medication orders that comply with relevant legislation, guidelines or codes of practice, and organisational policies and procedures (where relevant)
H2.4.2	Considers the potential issue of perceived power differences between the health professional and the person

Summary and relevance of findings

Review of the curriculum content

Review of the supplied curricula reveals a clear emphasis on teaching students to use their knowledge of medicines to identify appropriate therapeutic options for their patients, to apply the principles of quality use of medicines to practice according to current scope and to communicate effectively with both patients and other health professionals. These findings are consistent with existing practice scope and the boundaries provided by relevant legislation.

The prescribing of medicines requires the acquisition of skills and knowledge relevant to four essential steps: information gathering, clinical decision making, communication and monitoring/ review of prescribed therapy. (10, 11) Review of the curriculum mapping in relation to these tasks is provided below.

Information gathering

Pharmacists appear capable of eliciting a clinical and medication history using a variety of information sources, however it was surprising how infrequently specific detail relating to the process of obtaining a medication history (including aspects that inform an adherence assessment) and performing a medication review was identified.

Specific training in the process of undertaking a physical examination and other relevant investigations was not identified, although patient review in the context of minor ailments was noted, consistent with current scope.

Significance to prescribing. Further training will be required should pharmacists prescribe under an arrangement that requires them to undertake a physical examination or to arrange suitable investigations. Regardless of prescribing model, the ability to develop a therapeutic relationship will be essential, and for some sites this was not specifically evident.

Clinical decision making

Pharmacists appear well placed to make decisions regarding the choice of therapy (including understanding when not to treat and when to use non-pharmacological therapies) and to tailor chosen therapy for the patient. The identification and appraisal of appropriate evidence to inform therapeutic decisions was apparent.

The generation of an accurate diagnosis (including use of an appropriate investigative strategy to support diagnostic reasoning) was not evident and represents a significant consideration for prescribing. Consistent with current practice in many settings, pharmacists receive teaching regarding the interpretation of clinical findings but not commonly to consider, arrange or undertake, the most appropriate investigation.

Supporting patients to make decisions relevant to their needs, including working together to develop goals and review the outcome of instituted therapy was evident, but could be enhanced. The process of referral to another health professional is evident, however referral specifically to identify appropriate therapy is not.

Significance to prescribing. A prescribing arrangement that does not require a pharmacist to undertake investigations and generate a diagnosis may be considered. Teaching related to shared decision-making across multiple areas of practice (e.g. to determine a therapeutic strategy as part of a review of therapy) could be enhanced. Identifying that referral to another health professional to discuss therapeutic options may be an appropriate course of action is a consideration for prescribing.

Communication

Pharmacists receive significant education focused on effective communication, both with the patient/ family and other health professionals. In addition, respect for other health professionals and their contribution to patient care is evident. However, communication is often taught with the emphasis of providing information to support therapeutic decision making undertaken by colleagues, rather than negotiating or discussing possible therapeutic options with the patient or colleague. Consistent with current practice, communication specifically related to a verbal medication order was not identified. Understanding the legal requirements of prescriptions is evident although not in relation to the generation of a prescription.

Significance to prescribing. Communication is a significant component of prescribing and appears well taught in the reviewed curricula. The focus of communication in the context of prescribing may require a shift from delivering information to negotiating outcomes and providing advice regarding prescribing decisions. Pharmacists understand the legal requirements of prescribing, however this is currently in the context of reviewing, rather than generating prescriptions.

Monitoring and Review

Pharmacists may currently provide information and/ or recommendations regarding therapy with the caveat that if symptoms do not improve, a medical officer should be consulted. Consistent with this approach, teaching that focuses on arranging a review of therapy, undertaking a physical examination as part of a review and discussing the outcomes of therapy with the patient are difficult to identify.

Determining whether therapy has achieved intended goals and possible modifications to therapy are partly evident.

Significance to prescribing. The review of therapeutic outcomes is a significant component of the prescribing process. Pharmacists appear to receive teaching related to interpreting the outcomes of instituted therapy and making recommendations to prescribers regarding modifications to therapy with the intention of improving outcomes. However, undertaking examinations, and observing patients to determine therapeutic response was less apparent. In most instances, prescribing will require pharmacists to institute a review process, which represents a new focus.

Professional Practice Considerations

The application of current teaching to prescribing as a specific clinical skill will require slight modifications to existing curricula. Considerations that focus on: understanding legislation as it pertains to prescription generation (rather than review); the specific application of the principles of QUM to the process of prescribing; the process of continuing professional development (CPD) and maintenance of fitness to prescribe will be required.

Review of National Competency Standards Framework for Pharmacists in Australia

The competency standards describe the knowledge, skills and attributes required to practice effectively as a pharmacist in the current environment, reflective of a combination of formal university based training and the required period of experiential learning. The project compared the competency standards for a General Level pharmacist with the PCF.

There is clear evidence of many aspects of prescribing in the NCSFP, with just under half of the elements of the PCF completely evident in the standards. The primary reason for the competency standards appearing to partly, rather than completely, address the prescribing competencies described in the PCF was a lack of detail describing components of the prescribing task. In a select few areas, an absence of standards that address specific aspects of the prescribing process was observed.

In general terms, this would indicate that where university based teaching, combined with the learning and instruction provided by the intern year, combine to meet the NCSFP, new registrants would be very well qualified to complete most prescribing tasks, as defined by the PCF. Similarly, the practice of currently registered pharmacists who meet the standards detailed in the NCSFP would reflect the majority of components relevant to prescribing.

Review of International models for pharmacist prescribing

International literature describes pharmacists working in a number of collaborative care prescribing models. Pharmacists working within these models are permitted to undertake activities not traditionally considered within a pharmacist scope of practice e.g. ordering of laboratory tests, administration of vaccines and both the initiation and modification of drug therapy. Significantly, these models are based on the premise that a collaborative approach is essential. For many pharmacists, this will take the form of a formal agreement between themselves and a medical officer/s. Consideration of the findings of the curriculum review in light of the international literature may contribute to the Australian discussion.

Possible prescribing models

The following table provides a brief summary of the prescribing models employed by pharmacists outside of Australia.

Table 4 Summary of prescribing models described in the international literature

Prescribing model	Model Features	Example Evidence	Requirements
Management of chronic diseases Prescribing according to an agreed protocol e.g. Collaborative Practice Agreement (CPA), Collaborative Drug Therapy Management (CDTM) Supplementary Prescribing (SP)	▪ Formal agreement (renewed annually or biennially) between pharmacist and medical officer (MO). ▪ Diagnosis made by MO who supervises care. ▪ Pharmacist manages patient care according to protocol (which dictates specific patient care functions to be undertaken by the pharmacist). ▪ Protocols may be agreed for individual patients or for groups of patients. ▪ Pharmacist role may include: initiation, modification, cessation of drug therapy; ordering, interpretation, monitoring of laboratory tests; development of therapeutic plans. ▪ Healthcare setting may include community and/ or acute care.	Kiel *et al.* describe the impact of a pharmacist-led diabetes management program in which pharmacists prescribed according to a CPA. Ordering of tests was undertaken according to standard operating procedures. (12) Irons *et al.* compared glycaemic control in patients undergoing pharmacist managed care with those receiving standard care. (13) Irons *et al*. studied a cardiologist-pharmacist collaborative care model for hypertension control. (14) Hunt *et al.* studied a collaborative physician-pharmacist model in the management of uncontrolled hypertension. Pharmacists included in the study were known as pharmacy practitioners and had completed a post-	▪ The specific training and education required to prescribe are defined within the CPA. ▪ State legislation and institutional requirements may include specific training ▪ Review of the agreement may be undertaken by the MO, the healthcare facility, the Board of Pharmacy and/ or an appropriate advisory committee

Prescribing model	Model Features	Example Evidence	Requirements
		graduate doctor of pharmacy degree, 1-2 years of residency training and were certified with the US Board of Pharmacy Specialties in Pharmacotherapy. (15)	
Initiation of therapy	This represents a more independent process however may also occur according to an agreed protocol. ▪ Hormonal contraceptives (oral and transdermal) initiated according to agreed protocols ▪ Initiation of prescription-only nicotine replacement products ▪ Independent initiation and administration of immunisations (to patients over 3-5 years of age unless according to a physician protocol) ▪ Provision of travel medications that do not require a diagnosis, according to Centre for Disease Control recommendations. ▪ Provision of emergency contraceptive therapy.	Gardner *et al.* studied pharmacist prescription of hormonal contraceptives (including screening for appropriateness) according to a collaborative drug therapy protocol. (16) As early as 1995, the role of pharmacists in prescribing smoking cessation therapy was described (17) Papastergiou *et al.* and Marra *et al.* both studied community pharmacist influenza immunisation in Canada. (18, 19)	▪ In some instances, completion of training is required, as directed by state legislation
Repeat Prescriptions	Pharmacist review of chronic medicines management and identification of patients for whom a requested repeat prescription could be safely filled and those requiring further review by an appropriate MO.	Nguyen M *et al.* studied the impact of a clinical pharmacist managing repeat prescriptions on MO workload. (20) McKinnon reviewed a collaborative model in which pharmacists reviewed requests for repeat prescriptions received by the primary care clinic from a community pharmacist (on behalf of the patient). (21)	

Prescribing example 1 (Canada)

Pharmacists in Alberta, Canada, are able to prescribe Schedule One medicines (prescription only medicines) according to three categories: Adapting a prescription, prescribing in emergency and additional prescribing. The first two categories were considered necessary to legitimise and recognise existing practice and require registration on the Alberta College of Pharmacist's (ACP) registry and completion of a CPD program delivered by ACP. Additional prescribing requires an application to ACP which is reviewed by peers according to a standardised evaluation process. Pharmacists with additional prescribing authority are able to select, initiate, monitor, continue and modify drug therapy.

Adapting a prescription (22)
- Modification to an existing prescription to meet the needs of the patient.
- For example, alter a dose, formulation or regimen to minimise the potential for adverse events.
- This category also includes substitution within a therapeutic class for patient-specific reasons (e.g. to avoid adverse effects) and issuing a supply of medicines to facilitate continued care (e.g. providing a short-term supply) when the original prescriber is unavailable.

Prescribing in an emergency
- May be undertaken only when it is not feasible for the patient to be reviewed by another prescriber and there is an immediate need for continued therapy.
- In this instance, the pharmacist is responsible for facilitating access to another health professional for further assessment.

Additional Prescribing (23)
- Pharmacists may apply for additional prescribing authorisation provided they have at least one year full-time direct patient care experience, strong collaborative relationships with other health professionals and support to prescribe (including access to required information). Pharmacists must also have maintained the required knowledge skills and attitudes to enhance patient care.
- A practice permit with additional prescribing authorisation is issued by the ACP to successful candidates after submission of an application that is assessed by two assessors using a criterion-based assessment process. Applications include details of education and training undertaken, experience, collaborative working relationships (including two letters of collaboration from health professionals) and evidence of care plans developed. An oral interview may also be undertaken.
- Prescriptive authority is not disease specific and relies on the individual practitioner maintaining their competence in relation to knowledge of the drugs, diseases and other relevant aspects of care specific to their prescribing area of practice.

Prescribing Example 2 (UK)

Suitably trained pharmacists in the UK may prescribe according to either a supplementary (dependent) or independent model. Supplementary prescribing (SP) requires completion of an approved program of study and relies on a collaborative arrangement between the pharmacist and an authorised prescriber (usually a MO) and the development of a Clinical Management Plan (CMP) that describes for each patient the details of the prescribing

arrangement (refer Figure 15 below). In this model, the MO is responsible for the diagnosis of disease.

> *Supplementary prescribing is defined as "a voluntary partnership between the independent prescriber (a doctor or dentist) and a supplementary prescriber to implement an agreed patient-specific Clinical Management Plan, with the patient's agreement" (24)*

Independent prescribers take responsibility for the entire prescribing process, including assessment, clinical decision making, communication and review of outcomes and may prescribe any medicine according to their competence.

> *Independent prescribing is defined as 'prescribing by a practitioner (e.g. doctor, dentist, nurse, pharmacist) responsible and accountable for the assessment of patients with undiagnosed or diagnosed conditions and for decisions about the clinical management required, including prescribing' (25)*

Figure 15 Sample Clinical Management Plan

Name of patient			Patient medication sensitivities/allergies	
Patient identification, e.g. ID number, date of birth				
Independent prescriber Can be more than one doctor from either primary or acute care			Supplementary prescriber Profession, e.g. nurse, pharmacist, physiotherapist	
Condition(s) to be treated Medical responsibility			Aim of treatment Agreement with prescribers	
Medicines that may be prescribed by supplementary prescriber				
Preparation Class or description of drugs, e.g. antihypertensives, section from BNF	Indication Detailed		Dose schedule References	Specific indications for referral back to independent prescriber Changes to BNF New Evidence
Guidelines or protocols supporting Clinical Management Plan BNF example and section. Practice guidance, policy dated review and when written				
Frequency of review and monitoring by				
Supplementary prescriber Date	Supplementary prescriber and independent prescriber Date			
Process for reporting adverse drug reactions Supplementary prescriber				
Shared record to be used by independent prescriber and supplementary prescriber e.g. Lloyd George record, hospital record				
Agreed by independent prescriber	Date	Agreed by supplementary prescriber	Date	Date agreed with patient/carer
Name		Name		Name

Source: Weeks GR, Marriott J, George J. Australian Hospital Pharmacists' Experiences of a UK Non-Medical Prescribing Course. J Pharm Pract Res. 2010;40(3):187-93.

Comments

The above examples demonstrate that pharmacists are recognised as medicines management experts internationally and contribute to safe and effective medicines use within the collaborative healthcare team. The contribution of pharmacist prescribers to medicines use appears well established. Where pharmacists manage complex disease therapy, they are highly qualified, experienced clinicians.

It should also be noted that within all of the described models of prescribing, a clear emphasis is placed on patient care provided by the collaborative team. This highlights the importance of recognising the skills and knowledge pharmacists bring to the care of their patients while remaining respectful of the contribution other health professional make to medicines management.

The prescribing models differ in the functions the pharmacist is authorised to undertake and the pre-requisite education and training they must complete in order to prescribe. The specific factors used to define the prescribing model differ considerably. For example, the development of a collaborative agreement may be undertaken for an individual patient or a group of patients; the education and training requirements may be defined by the agreement itself or state legislation; the achievement of a defined level of education and expertise may provide for prescribing without specific agreements, as is the case in New Mexico:

> *'In New Mexico, a pharmacist clinician is a registered pharmacist with advanced training in the areas of physical assessment and pharmacotherapy who is eligible for prescriptive authority and enters into a collaborative practice agreement with a supervising physician. A pharmacist clinician with prescriptive authority can prescribe, modify, and monitor drug therapy in accordance with a written protocol registered with the New Mexico State Board of Pharmacy"* (26)

Limitations of the review

Use of learning outcomes as an indicator of the curriculum
The project used LO as a surrogate indicator of teaching content. The review team acknowledge that this process may not capture the entirety of the teaching and learning content. However, we have assumed that approved LO represent the components of teaching that are assessed as an indicator of graduate capability and therefore represent the most significant aspects of teaching. Without undertaking an extensive review of the teaching material that includes the specific content provided via lecture, tutorial, practicum and placement experiences, it is not possible to identify the full detail of the teaching delivered. Learning outcomes provide an alternative measure but may not capture some of the more global objectives, such as those related to shared decision making.

As noted earlier, the language and complexity of the LO differed considerably across the programs of study reviewed. Some were written with broad language, making it difficult to map to the specific language of the PCF without additional information. It is acknowledged that this does not mean those aspects of prescribing are not taught, simply that a more in-depth review would be required to be certain. Such a review was outside the scope for this project.

Interpretation of the detail contained in the PCF varies between individuals. While this may be viewed as a limitation, it was acknowledged early in the review process and a robust process employed to ensure a consistent approach to the mapping by all contributors.

Practice Standards
It should be noted, although not a limitation per se, that the national competency standards framework for pharmacists in Australia was released post extensive review in 2016. As such, the reviewed document is a very recent version of the standards and may not yet be reflected in current teaching.

Part C: Considerations and Recommendations

The addition of prescribing to professional scope will require profession-wide consultation regarding a range of issues. The following represents a targeted summary of available literature, with a focus on pharmacist-specific evidence, and highlights issues for consideration by the profession.

Considerations and evidence

Perceived benefits of pharmacist prescribing for the patient

Drivers for the establishment of non-medical prescribing include the efficient use of limited healthcare resources and improved access to prescription medicines via an appropriate healthcare provider. (27, 28) From the perspective of the patient, improving the ability to access required medicines may be significant, particularly for those with chronic illness. Patients frequently visit their general practitioner to obtain a prescription. On average, Australian general practitioners prescribe 82 medications for every 100 patient encounters. (29) Within a collaborative model of care, pharmacist prescribing has the potential to contribute to efficient healthcare services by relieving the medical workforce of a proportion of the prescribing volume and providing access to medicines where medical practitioners are unavailable. (3, 30)

A small number of studies undertaken in the UK have described additional perceived patient benefits related to pharmacist prescribing. These include: reduced time delay between dose adjustments, improved continuity of care, improved patient adherence, and increased monitoring of therapy. (30, 31)

The views of patients regarding pharmacist prescribing have been investigated, both from the perspective of those who have been involved in the prescribing process and those who were asked to consider the possibility of pharmacist prescribing. The majority of patients who have experienced pharmacist prescribing appear satisfied with the expanded role. (2, 3, 24, 32) Patients appear to acknowledge the benefit of consulting a pharmacist to review their medicines with some expressing an improved level of medicines knowledge as a result of the consultation. (3) In Australia, patients have expressed satisfaction with, and trust in, pharmacist prescribing, (33) although appear to prefer a model in which the diagnosis is made by the medical officer. (8)

Pharmacists' expertise in medicines management places them in a strong position to contribute a comprehensive view of therapy within a prescribing role, with a consequent improvement in patient outcomes. (3, 34) This view is expressed in the following comment provided by a doctor in response to a telephone survey regarding pharmacist prescribers in the UK: (3)

'The main benefit for me is that it's good for the patients. Patients get a more detailed look at all their medication . . . pharmacists discuss the side effects of drugs better with patients. We should be able to as well but pharmacists have a better knowledge of drugs and this can only benefit the patient.' (GP (of pharmacist 4), cardiovascular)

Perceived benefits of pharmacist prescribing for the pharmacist

A ministerial taskforce reviewed the current practice of allied health professionals, including pharmacists, in the Queensland public sector and identified that a number of these professions were unable to perform to their full scope due to a range of identified barriers. Pharmacist involvement in the prescribing process was identified, among many strategies, as a potential contributor to improved patient care and optimal use of pharmacist skills and knowledge. (35)

Perceived benefits of pharmacist prescribing include both professional and personal aspects of practice. Improved job satisfaction and self-confidence have been quoted as personal advantages of pharmacist prescribing. (30, 36, 37) Increased responsibility, autonomy/ independence and professional recognition are considered professional advantages for pharmacists who prescribe. (30, 36, 37)

Prescribing facilitators

A thematic analysis of nurse and pharmacy supplementary prescribing studies published over a ten-year period (1997 – 2007) identified a good pharmacist-doctor relationship, based on mutual trust as an important contributor to the prescribing process. (38) Communication and support from peers were also considered important to nurse prescribers. McCann *et al.* highlighted the significance of the inter-professional team to effective prescribing, and identified the importance of communication within the multidisciplinary team, a holistic team approach to patient care and clear definition of roles within the team as important to successful pharmacist prescribing.(34)

Prescribing barriers

Published studies investigating pharmacist's experience with prescribing have largely described the UK experience. Challenges to the role have been identified in relation to: a lack of policy at the local level governing implementation of prescribing, (37) resourcing issues resulting in an inability to commence the prescribing role while waiting for backfill arrangements and/ or difficulties associated with an inadequate number of prescribers to cover absences, (30, 31, 36, 37) the inability to generate electronic prescriptions (often through lack of access to required computers) (30, 31, 36) and a lack of support and awareness among other health professionals. (3, 30, 31) Pharmacists also noted a lack of appropriate and relevant CPD for prescribers. (3)

Perhaps the most commonly reported barrier to the implementation of the supplementary prescribing role in the UK relates to the practical requirements of developing the required CMP. The administrative requirements of the CMP have been described as onerous and a frustrating part of the prescribing role. (30, 36, 37, 39)

Evidence to support the safety of pharmacist prescribing

A recent review of 46 studies provides evidence for the effectiveness of prescribing by pharmacists and nurses in the setting of chronic disease management. (2) A meta-analysis conducted as part of this review provides evidence for the benefit of pharmacist prescribing in this subgroup of patients, as revealed by surrogate disease markers. Additional evidence indicates that prescribing by pharmacists and nurses under the independent model adopted in the UK is safe and clinically appropriate. (1, 40)

In Australia, prescribing has been studied by Hale *et al.* in both a pre-admission surgical clinic and a sexual health clinic and found pharmacists to undertake the role safely and appropriately with a reduction in unintended medication omissions and prescribing errors observed in the pharmacist prescribing group. (41) Marotti studied the effect of pharmacists undertaking medication histories and completing medication orders in a perioperative setting and identified benefits in terms of reduced prescribing errors and missed doses. (42)

Professional readiness

Perceptions of pharmacists

Australian pharmacists working in a variety of settings have participated in surveys exploring their perceptions of prescribing. The majority of pharmacists surveyed support the expansion of scope to include prescribing and consider a supplementary, or collaborative, model the most appropriate. (4, 6, 7) Hospital pharmacists identified a number of clinical specialties they considered appropriate for prescribing, including the management of chronic illness such as hypertension, diabetes and rheumatology and the adjustment of anticoagulation dosing. (4, 6) Practice settings considered ideal for implementing prescribing in the hospital setting included the admission, discharge and emergency areas (4). The majority of pharmacists considered additional training would be required to undertake a prescribing role (5-7) and identified disease pathophysiology, diagnostic skills, patient assessment and monitoring as the focus of potential training. (43)

Given that the views of surveyed Australian pharmacists indicate a desire for a supported prescribing model, the dissatisfaction expressed by supplementary prescribing pharmacists in the UK regarding the use of CMPs is relevant. (38)

The healthcare setting

Internationally, prescribing undertaken by pharmacists occurs in a variety of healthcare settings including primary and acute care. Australian pharmacists employed in hospital, community and consultant roles have indicated support for the expansion of their role to include prescribing. (4-7) Hospital pharmacists report undertaking "de facto" prescribing, in which they initiate prescriptions, for a range of medicines. (4) Further exploration of the applicability of prescribing across the range of settings in which pharmacists currently work is required.

Education and training

Internationally, programs of study specifically designed to teach prescribing are available. In New Zealand (NZ), training for pharmacist prescribers consists of a postgraduate certificate program accredited by the Pharmacy Council of New Zealand. (44) Entry requirements for the course are shown in Table 5. The one-year part-time program is available at two universities and comprises two units of study: the principles of prescribing and a pharmacy practicum undertaken with supervision from a designated medical practitioner. After successful completion of the program the pharmacist is eligible to apply for registration in the Pharmacist Prescriber scope of practice.

Independent prescribers (from multiple professions) in the UK are required to complete a program of study accredited by the General Pharmaceutical Council of Great Britain (GPhC). Universities offering accredited independent prescribing programs are available throughout the UK. Most programs are offered part-time and are approximately six months in duration consisting of both academic and practical components. Entry requirements are detailed in Table 5.

Learning outcomes for GPhC accredited programs are generic (i.e. not specific to an individual profession) and cover a number of areas of practice, including: *understanding the prescribing role and scope, development of effective relationships, pathophysiology, history taking and clinical assessment, use of diagnostic relevant aids, the application of clinical assessment skills to developing a diagnosis/formulating a treatment plan/monitoring the response to therapy, demonstration of shared decision making, maintenance of required records, understanding of legal, ethical and professional frameworks and other topics.* (45)

Supplementary prescribers in the UK are also required to complete a program of study accredited by the GPhC and many of the available independent prescribing courses are designed to prepare prescribers to undertake their prescribing role according to either a supplementary or independent model. There are also bridging courses that allow pharmacists who have completed a supplementary prescribing course to upskill to a qualification suitable for independent prescribing.

In Canada and the USA, required education and training for pharmacists who undertake a prescribing role is dictated at the provincial/ state level and may be included as a component of a collaborative agreement. Many pharmacists who prescribe are highly experienced and/ or have undertaken additional education, however there are no nationally agreed specifications for this.

Currently in Australia no accredited prescribing training for pharmacists is available. Australian pharmacists have indicated a desire to undertake additional education and training prior to assuming a role in prescribing, particularly in the areas of pathophysiology, principles of diagnosis and patient assessment and monitoring. (43)

Table 5 Entry requirements for selected prescribing programs of study

Program of study	Entry requirements
Postgraduate certificate in clinical pharmacy in prescribing (NZ)	- Current pharmacist registration and annual practicing certificate - Minimum two years recent, appropriate post-registration experience within a collaborative team - Demonstrated competence of applicable standards within the Pharmacist scope of practice - Identified area of clinical practice in which to develop prescribing skills. - Current clinical, pharmacological and pharmaceutical knowledge relevant to this area of practice - Demonstrated reflection and responsibility for CPD - Postgraduate diploma in clinical pharmacy/ equivalent - Identified designated medical practitioner who agrees to provide support - The intention to undergo prescribing training has been discussed within the collaborative team in which prescribing will occur - Management approval to undertake the training. Source: https://www.auckland.ac.nz/en/study/study-options/find-a-study-option/postgraduate-certificate-in-clinical-pharmacy-pgcertclinpharm.html
Independent prescribing programs throughout the UK	- Current registration - Minimum two years' patient-oriented, appropriate post-registration experience - Identified area of clinical practice in which to develop prescribing skills - Current clinical, pharmacological and pharmaceutical knowledge relevant to the intended prescribing area - Demonstrated reflection and responsibility for CPD - Identified appropriately trained and experienced designated medical practitioner who has agreed to provide support and is familiar with the GPhC requirements for the program. Source: https://www.pharmacyregulation.org/education/pharmacist-independent-prescriber

A modified version of a UK non-medical prescribing course was offered to Australian pharmacists. (46) Pharmacists reflected that the course provided them with a broad perspective regarding some aspects of practice, including patient consultation and communication. The practical component of the course was valued and appeared most useful when a good relationship existed between the designated medical practitioner and pharmacist. These findings are similar to early studies of supplementary training undertaken in the UK. (47, 48) Australian pharmacists appear to value and desire similar skills, knowledge and practical teaching to their UK counterparts.

The availability of suitable, accredited training therefore represents a considerable factor moving forward.

Additional considerations

The following issues are highlighted as important additional consideration for the profession.

Employment opportunity

The development of an appropriately trained pharmacist prescribing workforce will contribute to patient care where opportunities exist for employment. Ultimately, a number of changes are required to contribute to the availability of prescribing positions in various healthcare settings.

Potential risk

Prescribing is a high risk intervention that is subject to multiple sources of error, involving both human and system factors. (49, 50) The environment in which prescribing occurs is often busy, complex and error-prone. Adequate relevant education and training and the support of a collaborative working environment may serve to prevent error. Additional factors relevant to error reduction, such as the influence of computer prescription generation, should be given due consideration.

Economic impact

Costs associated with preparing to prescribe, including those incurred during the completion of required education and training and the ongoing maintenance of fitness to prescribe are important considerations, as is the potential remuneration for prescribers. An economic impact is also relevant to the patient should pharmacists be unable to prescribe under the Pharmaceutical Benefits Scheme.

Assurance of prescribing quality

Evaluating and maintaining the quality of a prescribing workforce (including all professions who prescribe) using sustainable processes, is significant to the prescribing conversation. This may include: processes to identify and manage inappropriate prescribing, specific CPD requirements for prescribers and the process required to demonstrate ongoing fitness to prescribe. Caddye *et al.* have identified validated assessment tools that may contribute to the reaccreditation process for non-medical prescribers in the UK. (51)

Regulatory and governance considerations

Enacting required legal, regulatory and professional amendments to support prescribing was highlighted in a previous report on pharmacist prescribing in Australia prepared for the Board in 2015. (9) Key stakeholders in the regulation of professional activities, including possible prescribing, include jurisdictions, the Australian Health Practitioner Regulation Agency (AHPRA) and accrediting agencies.

Views of other health professionals

The Australian Medical Council has expressed concern regarding non-medical prescribing and holds the view that prescribing by non-medical professions should take place in a "consistent and sustainable medically delegated environment" in which prescribers practice within their scope of practice, are competent in their prescribing decisions and refer patients when the clinical condition is outside the health professional's scope of practice and/ or when a patient fails to improve. (52) The views of Australian general practitioners regarding pharmacist prescribing were investigated in a study published in 2008. Although

the study included a small number of participants, concerns were raised that pharmacist prescribing would fragment care and result in the duplication of services. (53) General practitioners also expressed concern that pharmacists would not have expertise in all areas of medicine and thereby not treat the 'whole patient'. Given the importance of the multidisciplinary team to successful prescribing (regardless of profession), continued awareness of the views of colleagues regarding pharmacist prescribing appears warranted.

Possible Prescribing models
Pharmacist prescribing occurs according to different models internationally. Models are designed to ensure patient safety and maintain appropriate professional practice by defining the prescribing process (the medicines that can be prescribed, patient details, procedures to follow, required education and training and other relevant factors). The Health Professions Prescribing Pathway (HPPP) Project proposed three prescribing models for the Australian setting. (54) These include (1) prescribing via a structured arrangement such as according to a protocol, (2) prescribing via a collaborative model in which supervision is provided by an authorised prescriber, and (3) autonomous (or independent) prescribing. Regardless of model, the prescriber must recognise, and prescribe according to, their competence and with a collaborative approach to patient care.

It is worth noting that non-medical prescribing in the UK has moved from a supplementary to independent model, with some pharmacists considering the supplementary role a 'stepping stone' to the more independent model. (3, 30, 37, 39) A number of pharmacist prescribers have expressed a preference for independent prescribing after a diagnosis has been made by a medical officer. (31) Medical officers have raised concerns regarding the independent model on the basis that they perceive pharmacists' ability to diagnose as lacking. (3, 31)

Clear principles describing the proposed prescribing model/s for the Australian setting are required to ensure all members of the healthcare team are comfortable with a prescribing role for pharmacists. Learning from our colleagues in the UK, it would appear prudent to undertake regular review, including gathering of appropriate evidence, in relation to any adopted prescribing model.

What this review adds
There is clear evidence to support pharmacist prescribing in multiple settings internationally and in specific settings in Australia. Pharmacists who currently prescribe in other countries do so with a high level of education and training as defined in the collaborative agreements under which they work and/ or the legislation relevant to their workplace.

Review findings overall
This review has identified that Australian pharmacy graduates have the skills required to demonstrate expertise in medicines management and an ability to work as part of the healthcare team. Pharmacists currently practice according to a national competency standards framework that articulates many of the skills required to prescribe according to the Australian standard for prescribing. Table 6 summarises the key findings of the review in terms of the four recognised stages of prescribing and the twelve core prescribing competencies described by Lum et al. (10)

Table 6 Summary of the curriculum review findings in relation to the core prescribing competencies

Prescribing Stage	Core Competency	Relevant PCF Performance criteria	Reflected in NCSFP?	Identified in curricula reviewed*
Stage 1 Information Gathering	1.Take and/or review medical history	1.2.1 1.2.2 1.2.3	✓ ✓ ✓	71% 43% 57%
	2.Take and/or review medication history and reconcile this with medical history	1.2.3 1.2.5	✓ ✓	57% 57%
	3.Undertake further physical examination/investigations where appropriate	1.2.6 1.3.2	✓ ✓	86% 29%
	4.Assess adherence to current and past medication and risk factors for non-adherence	1.2.4	✓	43%
Stage 2 Decision making	5. Identify key health and/or medication related issues with the patient, including making or reviewing the diagnosis	1.3.1 (diagnosis)	✓	43%
	6. Determine how well disease and symptoms are managed/controlled	5.1.4	✓	86%
	7. Determine whether current symptoms are modifiable by symptomatic treatment or disease modifying treatment	2.1.1 2.1.2	✓ ✓	71% 86%
	8. Consider ideal therapy (drug and non-drug), taking into account actual and potential contraindications/concerns: drug–patient, drug–disease, drug–drug interactions	2.1.1 2.1.2 2.2.1 H1.4.3	✓ ✓ ✓ ✓	71% 86% 100% 100%
	9. Select drug, form, route, dose, frequency, duration of treatment	2.2.1 2.2.3	✓ ✓	100% 100%
Stage 3 Communicate decision	10. Communicate prescribing decision in an ambulatory care setting	4.1.1 4.2.1	✓ ✓	57% 100%
	11. Communicate prescribing decision in an inpatient setting	4.1.1 4.2.1	✓ ✓	57% 100%
Stage 4 Monitor and review	12. Review control of symptoms and signs, adherence, patient's outcomes	5.1.4	✓	86%

*Reflects the proportion of the seven sites reviewed that mapped either completely or partly to the performance criterion

Findings in relation to the reviewed curricula
The review identified strengths and possible gaps in university based teaching programs relevant to prescribing. In order to completely meet the competencies described in the PCF, some areas of the curriculum would require strengthening, or refocus; in other areas additional content would be required. Table 7 provides a summary of the areas of practice

that would require either additional or enhanced content in order for the existing curricula to meet the expectations of the PCF.

Table 7 Summary of curriculum review findings

Areas of the curriculum difficult to identify in the review and required to meet prescribing competencies *	Areas of the curriculum that may require additional/amended content in the context of prescribing **
The Assessment process ▪ Develop a diagnostic strategy ▪ Undertake/arrange required investigations according to the diagnostic strategy ▪ Generate an accurate diagnosis	*The Assessment process* ▪ Use of the health record as a source of patient assessment information ▪ Assessment of factors that may impact medicines adherence
The review process ▪ Observe the patient to determine response to therapy ▪ Undertake scope-relevant required physical examinations ▪ Report issues identified as part of the review of therapy	*The review process* ▪ Determine if therapeutic goals have been reached and take appropriate action to support therapeutic outcomes and patient safety
The consultation ▪ Allow the patient/family time to make an informed decision about treatment ▪ Consider the cost of medicines to the patient ▪ Consider the implications of possible therapeutic options to the wider community ▪ Reach agreement with the patient/family regarding the treatment strategy and goals ▪ Maintain records of the consultation ▪ Identify the need for a comprehensive medicines review	*The consultation* ▪ Develop a therapeutic relationship with the patient/family ▪ Discuss treatment options, negotiate therapeutic goals, understand patient preference and priorities ▪ Partner with the patient/family to develop and review the treatment strategy ▪ Ensure patient/family understand goals of treatment, monitoring requirements and how to use the medicine ▪ Apply QUM to the prescribing (rather than prescription review) process
The preparation of the prescription ▪ Obtain approval to use medicines as appropriate to the prescribing process ▪ Prepare a legal prescription, including verbal medication orders as appropriate ▪ Prevent bias in prescribing decisions	*The collaborative model* ▪ Strengthen respect for the scope of practice of other health professionals as part of the collaborative team with a renewed emphasis on the prescribing process ▪ Communicate with other health professionals as part of a therapeutic discussion rather than information provision

*PCF competencies infrequently identified in the reviewed curricula
**PCF competencies partly evident in the reviewed curricula

As noted, LO may not explicitly reflect the complexity of teaching delivered. Therefore, for some sites, teaching relevant to the above may in fact be provided in the context of current practice scope and may require small, if any, modifications to ensure prescribing competencies are addressed. For other sites, additional content may be required. In either

case, the inclusion of prescribing specific content in the learning outcomes to accurately reflect delivered teaching is prudent.

The intern training period is designed to consolidate and further develop undergraduate teaching through extensive experiential learning. It is also an important time of preparation for pharmacist to review their knowledge and skills in order to meet the national competency standards. As noted, future discussions may result in modifications to the undergraduate curriculum in line with prescribing requirements. These amendments will, however, always benefit from the important experiential learning opportunities the intern training period provides.

Australian registered pharmacists have indicated that an expanded prescribing role would require additional training beyond their registrable qualification. Specifically, additional skills in patient assessment and diagnosis and greater knowledge of pathophysiology have been highlighted. (43) As described above, these aspects of patient care have been included in both the UK and NZ prescribing programs of study.

In summary, within the context of an expansion of practice scope to include prescribing, aspects of practice may require modification in the curriculum. However, it is evident that pharmacists have expertise in medicines management and skills relevant to practice as part of a collaborative healthcare team. Should prescribing become an accepted component of pharmacist practice, an adjustment of the lens through which knowledge and skills are taught will be required to emphasise the prescribing role. The current curriculum was developed to align with existing practice scope and, although many of the skills and knowledge currently taught hold relevance to a modified scope that includes prescribing, in some areas a change of focus will be required.

Implications of the review findings for prescribing under a structured prescribing arrangement

It is a fundamental expectation that all health professionals undertake relevant professional development to support their practice. Pharmacists are trained as generalist practitioners at the point of graduation and subsequently develop additional skills, acquire additional knowledge and apply these to their practice area.

A structured prescribing arrangement provides an opportunity to utilise the unique skills of a pharmacist in the context of a clearly defined practice agreement that relies on a collaborative relationship with an authorised prescriber and the ability of the pharmacist to practice within both the agreement and their own professional limits. A credentialing process may therefore be considered applicable in this context, with individual pharmacists acquiring additional knowledge and skills according to the requirements of the prescribing arrangement e.g. point of care testing for particular diseases.

Given the findings of the review, in particular the comprehensive nature of the national standards, it would appear unnecessary for either current or future registrants to undertake additional formal education in order to prescribe via a structured arrangement; provided the arrangement explicitly details the requirements of the prescribing pharmacist, and these are adequately met by the pharmacist. In some instances, changes to the structure and

processes that support prescribing may be required. For example, ordering of tests not currently accessible within existing scope.

Board endorsement for pharmacists to undertake prescribing activities relevant to their area of competence and according to an agreed arrangement within jurisdictional requirements could be considered. Practice standards relevant to structured prescribing practice could address the following.

(a) Details of the protocol, which may include:
▪ An established diagnosis provided by an appropriately trained health professional.
▪ Clear definition of the boundaries of the prescribing agreement and associated processes e.g. the disease states, patient details (or patient groups) that the pharmacist may prescribe for, the medicines that may be prescribed and according to what evidence; the process to follow in the event of aspects of care falling outside the pharmacist's competence.
▪ Specific details of the referral process, identifying the circumstances in which the authorised prescriber is to be consulted.

(b) Requirements to be met by the pharmacist in order to prescribe according to the arrangement. Examples may include:
▪ Expertise in the area in which prescribing is proposed, including:
   o Demonstrated knowledge of the medicines commonly used and an ability to identify appropriate literature to support therapeutic decisions.
   o An understanding of appropriate monitoring specific to the clinical area (e.g. interpretation and relevance of common investigations, interpretation of relevant pharmacokinetic indices).
   o The ability to undertake relevant required physical examinations e.g. BP monitoring, and arrange relevant investigations to support prescribing decisions.
   o Demonstration of adequate experience in the area of practice (or relevant specialty studies as approved by the Board).
   o Demonstrated ability to interpret relevant protocols relevant to prescribing.

▪ Demonstrated ability to recognise personal and professional limitations and seek appropriate advice.
▪ Demonstrated ability to include the patient and/or carer in the decision making process as relevant to the protocol.
▪ Demonstrated ability to meet relevant standards within the NCSFP.
▪ Demonstration of the ability to meet CPD requirements specific to the pharmacist prescriber and the demonstration of a personal process for maintaining ongoing fitness to prescribe.

An example of prescribing via a structured arrangement may be the management of warfarin dose adjustments in a number of healthcare settings (general practice clinic, community pharmacy, hospital). The arrangement would detail the patient/s for whom warfarin may be managed (using specific patient details or a group directive), the target INR for each patient or group, specific knowledge the pharmacist is required to demonstrate, an appropriate referral model (e.g. INR results in excess of an agreed level; patients for whom

new medications are commenced without the knowledge of the authorised prescriber and with a potential to impact therapeutic outcomes) and other relevant details. Once agreed, the pharmacist is then responsible for appropriate dose adjustments to meet the required INR within the context of the arrangement.

Implications of the review findings for autonomous prescribing

The review has identified a number of practice areas in which additional education and training would be required should autonomous prescribing be integrated into practice. Considering the reviewed curricula and practice standards for alignment with the current Australian standards for prescribing, it is possible to identify specific elements essential to the prescribing process that would require content within an educational program designed to prepare pharmacist to prescribe autonomously. These include:

- Pathophysiology, physical examination, appropriate investigative and diagnostic processes, including a demonstration of clinical reasoning.
- In-depth understanding of complex care, including management of multiple disease states, the interplay between them and implications for prescribing decisions.
- Monitoring processes, including the ability to undertake and/ or arrange and interpret appropriate investigations relevant to the area of expertise.
- The process of shared decision making and a collaborative approach to the determination of relevant and appropriate therapeutic goals and the development of an appropriate treatment strategy.
- Collaborative discussion with other health professionals to develop the treatment strategy and to advise of modifications made to existing therapy by the pharmacist prescriber.
- CPD requirements specific to the pharmacist prescriber and the demonstration of a personal process for maintaining ongoing fitness to prescribe.

Proposed structure of pharmacist prescribing in Australia

When the review of selected Australian curricula and national practice standards is considered in light of the international literature, it is possible to propose a structure for pharmacist prescribing in Australia. It should be noted, however, that international health systems differ to the Australian context, and this should be borne in mind when reflecting on international literature.

The following structure of prescribing activities is proposed for Australian pharmacists. Table 8 summarises the proposal and required education initiatives.

- Prescribing of medicines classified as Schedule 2 (Pharmacy Only) and Schedule 3 (Pharmacist Only) to continue according to existing registrable qualifications.
- Structured prescribing according to Board approved practice standards and endorsement procedures, the establishment of a defined protocol and demonstration of relevant knowledge and skills.
- Autonomous prescribing according to Board approved practice standards and endorsement procedures, having completed relevant, accredited additional education and training.

Table 8 Proposed structure of prescribing for Australian pharmacists according to review findings

Qualification	Structure	Detail	Prescribing authority
BPharm, BPharm (Hons), MPharm	Existing programs of study	Addition and/ or refocus of education according to findings of the review	S2, S3 medicines according to current legislation
Credentialing according to practice scope	Demonstration of relevant knowledge and skills as defined in the structured arrangement e.g. point of care testing of blood pressure.	Board endorsement to prescribe according to practice standards and defined structured arrangement	Prescribing via a structured arrangement within a collaborative environment
Postgraduate Certificate	▪ Approximately 12 months FTE ▪ Academic & supervised practical components	▪ Content to include diagnostic processes, specific communication required to assist diagnostic process, shared decision making relevant to negotiating therapeutic goals and treatment/ monitoring strategy ▪ Board endorsement to prescribe according to practice standards	Autonomous prescribing within a collaborative environment

Recommendations

Given the evidence that describes pharmacist prescribing internationally, Australian pharmacists are well placed to learn from the experiences of pharmacist prescribers in many countries. From the perspective of patient safety, robust education and training to prepare prescribers is essential, as is adequate governance to support prescribers and ensure the ongoing quality of the pharmacist prescribing workforce.

Although there is some evidence to suggest that Australian pharmacists working in varied healthcare settings see a value in prescribing, the development of a sustainable pharmacist workforce that benefits patient care requires considerable thought. This review highlights areas of current teaching that would appear to require additional resources in order to meet the Australian prescribing standards. Further discussion regarding the process to achieve this is required. Given the barriers faced by pharmacist prescribers in the UK, consideration of the implications of that knowledge for prescribing in Australia would seem prudent. In addition, the implementation of non-medical prescribing in NZ has raised issues related to the development of a national implementation policy, which should be considered for relevance to the Australian context. (55)

The significance of the multidisciplinary team, and the need to ensure prescribing decisions are appropriately communicated between those who provide patient care has been highlighted. Given the concerns raised by the medical profession regarding the possibility of pharmacist prescribing, the inclusion of other health professionals in the pharmacist prescribing discussion appears important to a successful outcome.

The inclusion of prescribing in the pharmacist scope of practice requires the profession to carefully review a number of factors. Until the value of prescribing is considered by the profession and typical prescribing scenarios clearly identified, it is impossible to fully articulate the educational requirements for the pharmacy workforce. The findings presented in this report highlight possible areas which may require either additional formal education and training or a refocus within existing curricula. However, the specifics of an education and training model will require clear definition of how prescribing appears within the scope of practice for Australian pharmacists.

Recommendation One: A national symposium be held, attended by representatives of professional, regulatory, academic and accrediting organisations to further explore the process for, and requirements of, pharmacist prescribing in Australia.

Recommendation Two: Following the symposium, details of the proposed prescribing activities and the process and educational requirements to undertake prescribing be provided to the profession (and relevant other health professions) for consultation using a survey format.

Recommendation Three: Academic staff and professional representatives consider in detail the autonomous prescribing model and associated implications for education and training. In particular, the prescribing content identified in this report as lacking in the current curricula, the feasibility of developing additional education and training in relation to these aspects of practice, the possibility of including additional or refocused content in the registrable qualifications and the likely costs associated with prescribing specific education.

Conclusion

This review highlights international literature relevant to pharmacist prescribing in Australia. The majority of this evidence originates in the UK, where non-medical prescribing in general has moved ahead considerably over the last decade. Against this backdrop of published evidence, a review of selected pharmacy curricula contributes to our understanding of the possible educational and training needs of Australian pharmacists. A review of the standards applicable to all pharmacists who practice in Australia provides a clear view of the visibility of prescribing within our national competency standards framework. In summary:

- Pharmacists who practice in Australia do so according to comprehensive standards that include most aspects of the national prescribing standards, either completely or in part.
- The current pharmacy curriculum includes many aspects of prescribing however, consistent with the current pharmacist scope of practice, does not provide detailed knowledge or skills relating to diagnosis and some aspects of therapeutic monitoring. In addition, the focus of some aspects of practice, including communication, appears to be based on information provision, rather than negotiation or discussion. The curriculum is consolidated and enhanced by a required period of experiential learning, which may contribute to the development of global skills, such as communication, in the existing practice context.

In order to progress pharmacist prescribing in Australia, recommendations have been made, with the intention of (a) gathering clear opinion of those with a vested interest in the expansion of pharmacist scope to include prescribing and (b) determining a logical, robust (yet not onerous) process with which to move forward.

Canadian Meagan Rosenthal began a conversation in 2010 that identified pharmacists' ability to act as their own most significant barrier to practice change. (56) The author highlights personality traits often seen in pharmacists (lack of confidence, paralysis in the face of ambiguity, the need to obtain approval, risk aversion) that serve to challenge advancement. Prescribing is described as an example of an opportunity that has not been embraced as completely as it may have been. Taking responsibility for a prescribing decision (as opposed to making a recommendation and removing ourselves from the responsibility equation) is highlighted and relevant to the Australian context as the above issues are considered. We are challenged to redefine the 'culture of pharmacy' as we see fit.

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