Nurses as emergent prescribers in New Zealand: A descriptive comparative study using a multiple case approach

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ABSTRACT

In the past decade, New Zealand has followed other countries in introducing the role of nurse practitioners with the right to prescribe. The proposition provoked debate and criticisms reflecting similar concerns as in other countries, with claims that nurses’ inadequate biomedical knowledge and diagnostic skills could put patient safety at risk, and that changes to the traditional doctor-nurse boundaries could create confusion and undermine teamwork.

Using a multiple case narrative methodology, this study collected accounts from nurses, junior and experienced doctors and midwives to answer the question: “what are the experiences of nurses in becoming prescribers and how do their experiences compare with those of other prescriber groups?”

The study found that experienced nurses learn to prescribe as clinicians with a clinical area of practice that has developed over time through extensive clinical experience, while doctors begin with a solid foundation of diagnostic knowledge integrated and consolidated over time with prescribing, a skill considered embedded in practice. This study showed that the journeys of both nurses and doctors as learner prescribers are similar. They begin as novices, and over time develop skills of reasoning as they gain more clinical experience in prescribing.

Both medical and nurse practitioner prescribers are confronted with challenging situations that demand specific approaches to treatment management. In some situations, nurses, as non-medical prescribers, may well be best positioned to deliver the outcome required for a more “individualised” intervention. In others, the expertise of medical prescribers as diagnosticians may be required to ensure a better outcome.

Importantly, there was no evidence in this study that nurse prescribers usurped doctors and confusion resulted. This study showed that nurse practitioners prescribers were better able to work collaboratively with the medical practitioners as a common knowledge and language to communicate their clinical reasoning was developed. The study also identified that the completion of educational programmes in prescribing was but the beginning: ongoing support and education in the clinical setting was needed to support clinical reasoning skills and capabilities.
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GLOSSARY

Authorised prescribers
Prescribers (e.g. doctors, midwives and dentists) with prescriptive authority as outlined in New Zealand’s Medicines Act 1981, the Medicines Regulations 1984 and the Medical Practitioners Act 1955.

Designated prescribers
In NZ this term is used to refer to regulated health practitioners, other than medical practitioners, dentists or registered midwives, to prescribe any specified class or description of prescription medicines, subject to the satisfaction of requirements specified in or imposed under regulations relating to their designated prescriber status.

Medication management
Medication management refers to the accountable and safe use of medications.

NCNZ
Nursing Council of New Zealand

Nurse practitioners
Registered nurses who are practicing at an advanced level. In New Zealand, the title is protected by the Nursing Council of NZ that approves each Nurse Practitioner.

RMO
Resident medical officer

RN
Registered nurse

SMO
Senior medical officer

Scope of practice
There are three scopes of nursing practice in New Zealand that are regulated by NCNZ:
- Registered Nurse
- Nurse Practitioner
- Enrolled Nurse


Standing orders
Legally defined as a written instruction by a medical practitioner, authorising any specified class or description of prescription medicines or controlled drugs to any specified class of persons.
CHAPTER 1: CONTEXT OF THE STUDY

1.1 Introduction

The role of nurse practitioner with prescriptive authority was introduced into New Zealand in 1999 through legislative and policy changes. While the role has been recognized in other countries for a number of years, nurse practitioner prescribers are relatively new to New Zealand. As in other countries, the role of nurse practitioner was not opposed but the granting of prescriptive authority to nurses was questioned (C. Bradley, Taylor, & Blenkinsopp, 1997).

The primary arguments against nurse prescribing were that the level of bioscience taught in nursing undergraduate and post-graduate curricula did not provide adequate therapeutic and pharmacological knowledge base at the level perceived by doctors and others as essential for prescribing (Latter, Rycroft-Malone, Yerrell, & Shaw, 2000). Medical practitioners were concerned that patient safety would be at risk because they believed nurses to have had insufficient medical diagnostic training to safely prescribe (Moller & Begg, 2005). More importantly, nurse prescribers themselves have voiced uncertainty with the process of diagnosis (Lockwood & Fealy, 2008). In the case of committing an error while performing in the ‘traditional medical role’, nurses have expressed litigation concerns where the nurse is judged on the basis of how a ‘reasonable doctor’ would have acted in similar situations (Tingle, 1990, p. 86).

Since prescriptive authority for nurses has been introduced in New Zealand, there has been little research into nurse prescribing, or as it is known internationally, ‘non-medical prescribing’. Little is known about non-medical (e.g. nurse practitioner) prescribing decision-making, more importantly, whether processes of reasoning and learning differ between medical and non-medical prescribers.

This study set out to explore the processes taken by experienced nurses participating in preparation for prescribing as post-graduate students, and by nurse practitioners approved to practise as prescribers, with a focus on how they learn the science and apply the art of prescribing. To better understand how health professionals learn to prescribe is worthy of study in its own right. In the context of the present study, with its particular focus on nurses learning to prescribe, it is important to determine whether medical and non-medical prescribers differ in how they learn to prescribe. It is also valuable to identify how the professional frames of reference or models of practice might differ in context and philosophical underpinnings, and to determine if the medical model is equally appropriate for non-medical prescribers. Therefore, learning journeys taken by medical prescribers and on other non-medical prescribers (i.e. midwives) were
also documented in order to sharpen the account of nurse prescribing through comparative analysis.

Given that a wider group of non-medical prescribers will seek prescribing rights (e.g. pharmacists and podiatrists) in New Zealand in the future, it is crucial to better understand how best to prepare health professionals for the activity of prescribing. Anecdotal evidence suggests that for many years senior nurses have guided junior doctors as they begin to prescribe (Castledine, 2006) and have influenced doctors’ prescribing practices (Jutel & Menkes, 2010). However, the nursing profession historically has not engaged in prescribing and it is therefore important to consider how knowledge of pharmacology and therapeutic skills can be improved for nurses, not only as potential prescribers, but also as non-prescribers, as they play an essential role in the administration, monitoring, and evaluation of drug effects (Castledine, 2006).

To appreciate the professional and political contexts of nurse practitioner prescribing, this chapter will provide the background to the development of nurse practitioner prescribing in New Zealand with reference to other countries.

1.2 Introduction of the Nurse Practitioner role, with prescribing

Introduction of nurse prescribing in New Zealand has developed concurrently with the role of the nurse practitioner (Nursing Council of New Zealand, 2005). A report on the Nurse Practitioner of New Zealand, (Ministry of Health, 2002), described how advanced nurses could play an important role in the government’s Health Strategy. As a result, the role of advanced nurses has undergone significant expansion in New Zealand. A number of factors have been shown to drive the changing scene of nursing practice including economic circumstances (e.g. medicalisation and commercialisation of health), a diminishing number of medical providers and more importantly, unavailability of adequate health services in underserved and rural areas (Ministry of Health, 2001a).

Nurse practitioners are described as nurses with advanced skills in assessment, diagnosis, health promotion and prevention and are regarded as a vital workforce of the future to improve service delivery and service provision (Ministry of Health, 2000a). The introduction of the nurse practitioner role also represented a significant advance for professional nursing and positioned nurses to practise as autonomous practitioners. Taking on an extended role in service provision and delivery, including performing comprehensive health assessments, clinical diagnosis and prescribing treatments, was seen as presenting new opportunities to nurses. In addition, an expanded role underpinning the development of a clinical career pathway was anticipated as
enhancing and improving autonomous practice, as well as increasing job satisfaction (Ministry of Health, 2002).

In New Zealand, the title of Nurse Practitioner (NP) is regulated by Nursing Council (Nursing Council of New Zealand, 2005). At the time of the writing, there are 91 nurse practitioners in New Zealand, of whom 68 have prescribing rights (Source: New Zealand Nurses Organization, May 11, 2011). All NPs require a Master’s degree in nursing, most are employed in secondary care, with some in the primary care setting (Nursing Council of New Zealand, 2008).

1.2.1 Health Policy Contexts

The health policy context for the introduction of NPs in New Zealand was The New Zealand Health Strategy, with its vision that all New Zealanders should enjoy good health and well-being throughout their lives (Ministry of Health, 2000a). The Ottawa Charter, developed by the World Health Organization in 1986 (Ministry of Health, 2000a; World Health Organization, 1986), was influential in the development of the New Zealand Health Strategy. The wide scope for public health action advocated by the Ottawa Charter was explicitly reflected in New Zealand’s health goals. For example, the New Zealand Health Strategy (Ministry of Health, 2000b) includes goals for healthy social and physical environments, as well as healthy lifestyles. The Ottawa Charter outlines an approach to improving the health of populations and individuals which recognises the contribution of broad social, economic and physical factors to health. This also includes reducing inequalities in health, collaborative health promotion and injury prevention.

Primary health care (PHC) is a key strategy to deliver the New Zealand Health Strategy (Ministry of Health, 2001c). PHC is an approach to health care that includes a range of services designed to keep people well, including promotion of health and screening for disease, to assessment, diagnosis, treatment and rehabilitation. Nursing was identified as a key profession to implement these strategies where, for example, nurses working in rural settings were seen to be already providing some of the needed services (Ministry of Health, 2002). The “untapped potential” of the nursing workforce reported in the Ministerial Taskforce on Nursing (Ministry of Health, 1998) aimed to release the potential for nurses to use their skills and knowledge more effectively, pioneer innovative service provision, enhance access to and quality of primary care, and to contribute positively to health gain. However, barriers to the utilization of nurses were also identified in the report, including poor access to postgraduate education, legislative and funding barriers and the conditions under which many nurses practise. To deliver quality services,
collaborative health services and innovative and efficient health care, the Report emphasised that these barriers must be addressed to enable the nurse practitioner role to develop and flourish.

1.3 International Context

The introduction of Nurse Practitioners in New Zealand needs to be considered in the context of a global trend of expanding nursing roles. The role of nurse practitioners has its roots in the United States in the early 1960’s where, due to a shortage of primary medical practitioners, nurses’ roles expanded (Dahl, 2001). A review of the literature suggests a similar trend in Canada and the United Kingdom, where implementation of advanced nursing roles were advocated to address health service delivery inequalities (Courtenay, 2008; Dahl, 2001; Dresser, Herzberg, & Yoder, 2001; Hales, 2002).

Several studies have demonstrated the advantages of the expanded role (Banning, 2003; Hales, 2002; Hales & Dignam, 2002; Horrocks, Anderson, & Salisbury, 2005; Latter & Courtenay, 2004). These studies have indicated that nurse practitioners have become a significant part of the health sector environment in the past twenty years. Nurse practitioners are seen as ‘boundary spanners’-experts who interface between service providers and ultimately demonstrate differences in health outcomes for their client populations or group (Ministry of Health, 2002).

1.3.1 Extension and expansion of the role of nurses

In the last ten years, in many countries there has been an unprecedented upsurge in the numbers and types of nursing roles. Advanced Practice Nurses (APN), Clinical Nurse Specialists (CNS), Nurse Practitioners (NP), Advanced Nurse Practitioners (ANP), Higher Level Practitioner (HLP) and Nurse Consultant (NC) are examples of the titles being adopted in a variety of health care settings, but there is little understanding or agreement as to the nature of and the differences between such roles (Daly & Carnwell, 2003). To address this growing trend, the International Council of Nurses (ICN), launched an International Nurse Practitioner/ Advanced Practice Network (INP/APNN) in 2000, to facilitate communication amongst nurses worldwide who shared similar interests (Sheer & Wong, 2008). The purpose was to facilitate a dialogue among global nursing communities towards an agreement on the role, nature, and meaning of advanced practice.

A definition provided by the ICN described nurses with advanced practice as:

...a registered nurse who has acquired the expert knowledge base, complex decision-making skills, and clinical competencies for expanded
While ‘Advanced Nursing Practice’ is a term used to represent nurses practicing at a higher level of practice, the concept ‘advancing nursing practice’ describes an ongoing process of moving practice forward for the benefits of consumers (Por, 2008). Debates are ongoing in the global nursing communities in “.... defining what advanced nursing practice is and what it might become as the terms advancing nursing practice, advanced nursing practice and advancing health care practice have been used in many different ways...” (Por, 2008, p. 85). Furthermore, Rolfe (1998) suggested that although a majority of professional nurses involved in the debate agreed on what nurses could do, and what they should do, dissent remained on the nature of the role, and who decides on the criteria for identifying such roles (Por, 2008).

In Por’s (2008) view there are two essential features of advanced and advancing practice. Firstly, shortages of doctors in particular specialties have created gaps in service provision, and consequently, emergence of clinical posts at the nurse-medical interface has resulted in nurses taking on tasks that were previously considered a doctor’s domain. Secondly, there is widespread agreement that advancing practice is concerned with process, rather than with content, with the ‘how’, rather than with the ‘what’ of practice (Bryant-Lukosius, DiCenso, Browne, & Pinelli, 2004; Por, 2008; Rolfe, 1998; Sheer & Wong, 2008). The processes that make practice ‘advanced’ are closely linked to the personal development of the practitioner (Fulbrook, 1998), as advanced practitioners characteristically possess high levels of communication skills, the ability to reflect on practice and have a heightened self-awareness (Por, 2008). Experiences in different countries agree that APNs emerged as a result of the need to improve access to care particularly for underprivileged people, and reduce costs, improve affordability. Benefits are commensurate and included improved waiting-time, promotion of health and improved maintenance care for certain populations (Sheer & Wong, 2008).

Taking on an extended role is, therefore, necessary to enable nursing to participate in responding to changing healthcare situations. Advancement in the range of skills, and changes in boundaries have been discussed in the works of Lovett and Norwood (1995, as cited in Daly and Carnwell, 2003) and signified by the terms role extension, role expansion and role development. Role extension and role expansion are described as additional responsibilities which are learned and recorded after initial training (Lockwood & Fealy, 2008). Daly and Carnwell (2003) referred to role extension as “the inclusion of a particular skill or area of practice responsibility that was not
previously associated with the nurse’s role” (p. 160). These roles, the authors explained, tended to be associated with another professional domain (e.g. that of medicine) or where there are increasing demands. For example, nurses take on extended roles to provide continuity of aspects of care, which were previously provided by doctors. Role expansion, on the other hand, has been widely referred to as ‘expanded practice’ where core elements of nursing practice still apply but additional skills and areas of practice are included (Rushforth & Glasper, 1999). Role expansion widely refers to expanded nursing practice, where the essence of a holistic approach to care still applies, but additional skills (not associated with nursing) and areas of practice are added. Nurses working in an expanded role commonly practice holistically with a specialist clinical focus, in a role that includes management and specialised skill sets. Role development implies a new role that embraces aspects of role extension and expansion and higher levels of clinical autonomy. Clinical autonomy is significant in that it allows a practitioner to complete episodes of care, from self or professional referral to discharge.

While dissent remains in defining the nature of advanced nursing practice, there is an emerging agreement that advancing practice is not static, and that practice development is needed to ensure nursing continues to address the needs of a changing health care environment (Wilson-Barrett, Barriball, Reynolds, & Ryrie, 2000). As new roles emerge, retaining the essence of nursing becomes a major concern. Two controversial additions to advanced nursing roles, that continue to be debated, are prescribing and diagnosis (Schober & Affara, 2006).

Debates have focused on the suitability of these functions for nurses, and in some countries, such as Sweden, nurse prescribing is not always associated with advanced practice roles (Schober & Affara, 2006). Walsh (2001) points out that because diagnosis is “working out what is wrong with the patient” and giving it a label (p. 8), nurses tended to oppose including this concept in the nursing function, as the use of the word ‘diagnosis’ was restricted to ‘medical diagnosis’. Schober and Affara (2006) argued, that just as nurse prescribing provokes controversy, the issue of diagnosing similarly points to “…a need for considerable deliberation…” (p. 40). These authors suggested that if consistency of care is a goal for health services, using a common diagnostic language is one way to attain this goal.

1.3.1.1 Nurse Practitioners and the Prescribing Role

Prescriptive authority for nurses has been debated since long before 1965 in the United States, when workforce shortages were threatening health care delivery in some areas. It quickly became apparent that nurses were best positioned to address the gap, as many were already working in an
extended role which included prescribing (Schober & Affara, 2006). Nurses across all 50 states in the United States now have prescriptive authority. The idea of nurses taking on practitioner roles with prescribing rights resonated closely with Canada and Australia, where improvement of service delivery and access was also sorely needed, especially in the rural areas, with doctors’ shortages and reducing doctors’ workload as main drivers for the changes (Courtenay, Carey, & Burke, 2007a).

Although the impetus for nurse prescribing in the United Kingdom was similar to that in the United States and Canada, prescriptive authority was sought for other professionals as well, for example pharmacists and midwives. The Cumberledge Report (Department of Health & Social Security, 1986) first recommended nurse prescribing in the United Kingdom and put forward the challenge of extending prescriptive authority to other health professionals to allow for improved access, reduced cost and greater flexibility of health care services and delivery. The notion of non-medical prescribing was thus introduced and legislation changes were made to allow other health professionals prescriptive authority (Baird, 2001). District Nurses and Health Visitors were the first health professional groups to be granted prescriptive authority as non-medical prescribers in the United Kingdom, following appropriate training (Otway, 2002). The move to give legislative authority for nurses to prescribe in the United Kingdom is probably the most extensive development of non-medical prescribing anywhere in the world. However, formal evaluation of the adequacy of nurses’ educational preparation for the role, and investigation into the post-qualification professional development needs and experiences of nurse prescribers, have been lacking (Latter, Maben, Myall, & Young, 2007c).

Schober and Affara cite Buchan and Calman (2004) as stating that there is “little consistency across the countries as to exactly what role nurses should take in prescribing” (2006, p. 35) and methods of educational preparation for prescribing are varied. Common approaches for deciding on what model of nurse prescribing is adopted include, “the level of acceptance for nurse prescribing within the health care setting; the method for designating which nurses will prescribe; strategies for implementation and the feasibility from an administrative as well as a health policy perspective” (Schober & Affara, 2006, p. 36). Four models of nurse prescribing were identified by Buchan and Calman (2004) ranging from ‘autonomous nurse prescribing to a very limited authority for medicine administration under medical supervision’ (Schober & Affara, 2006, p. 37).
1.4 Prescribing models

Non-medical prescribing is defined as prescribing by non-medical practitioners (e.g. nurses, pharmacists, and others). The introduction of non-medical prescribing in the United Kingdom was in order to provide patients with better and cheaper options to health care (Jones & Harborne, 2009) and the initiative led to different styles of medicines management. Several prescribing approaches or models have been proposed in the international literature for non-medical prescribers; these are reviewed below. There are differences among non-medical prescribers’ professional contexts and practices, and these differences have guided the selection of the prescribing models most appropriate to each non-medical prescriber group, such as nurses, pharmacists, and physician assistants. Dominant models include independent (autonomous), dependent and supplementary prescribing (Dawson & Hennel 2007), and within supplementary prescribing are several sub-models of prescribing e.g. under supervision, group protocol and time dose prescribing (Buchan & Calman, 2004)

It is important to note that the main difference between each model is that independent prescribing allows the practitioner to diagnose the condition then initiate appropriate treatment, while dependent models restrict prescribing of drugs to a limited group of medications and/or particular conditions and diagnoses. The Scottish Executive Social Research report (2004) stated that no work had yet been published that focused on the extension of nurse prescribing from a wide range of formularies and across a range of primary and secondary care. A description of each model is provided below, with reference to nurse prescribing.

1.4.1 Independent/autonomous Prescribing

Independent or autonomous prescribing is a prescribing practice model that legally authorises practitioners to independently prescribe or advise about medications. Legislation and policy determine the drug formulary that will be used and the specific medications to be prescribed in different localities. The prescribing process is included in the health professional’s overall care of the patient. Independent prescribing requires the prescriber to take responsibility for the clinical assessment of the patient, establishing a diagnosis and the clinical management required, as well as responsibility for prescribing where necessary and the appropriateness of any prescription (Luker, Hogg, Austin, Ferguson, & Smith, 1998; National Prescribing Centre, 2004). An Independent Prescriber requires legally defined levels of knowledge and skill that are monitored through a licensing process (M. Pearson, 2003). Internationally, nurses and midwives utilising this prescribing practice model have typically been registered practitioners for a number of years.
and have undertaken preparatory post registration education. The prescribing practice model in New Zealand for nurse practitioners is the independent or autonomous approach to prescribing (Nursing Council of New Zealand, 2005).

1.4.2 **Supplemental/Collaborative prescribing**

The supplemental prescribing practice model (also termed as dependent, collaborative, semi-autonomous, and supplementary prescribing) legally authorises practitioners to prescribe medications in collaboration with a medical practitioner. Supplementary prescribing is defined in the United Kingdom as a voluntary partnership between an independent prescriber (a doctor or a dentist) and a supplementary prescriber (e.g. a nurse, a pharmacist) to implement an agreed patient-specific clinical management plan with the patient’s agreement (Hay & Nolan, 2004). This prescribing practice model incorporates more restriction on prescribing activities, via protocols or formularies. For example, prescribing by protocol is the most common form of dependent prescribing and is defined as a “delegation of authority from an independent prescribing professional” (Emmerton, Marriott, Bessell, Nissen, & Dean, 2005).

Collaborative prescribing differs from supplementary models in that the delegated prescriber assumes responsibility for her/his actions. A collaborative prescribing model, for example, legally authorise a nurse to prescribe medications in collaboration with a medical practitioner. Legal requirements of what is meant by collaboration may differ, but commonly direct onsite supervision of a doctor is not be required (The Women's Health Council, 2009) and the nurse is fully accountable for the assessment, treatment plan and decision to prescribe the medication for a specific patient population. In some situations, prescribing responsibility may be limited to adjusting the patients’ medication only, such as time and dosage changes.

1.4.3 **Group protocol / Standing Order**

While these models are a subset of supplemental prescribing models, they are the most restrictive.

Group protocols are specific written instructions about what medicine may be administered and in what situation. In New Zealand, the use of a legal document to authorise the issue of drugs under the supervision of a medical practitioner is known as prescribing under Standing Orders. A Standing Order is legally defined as a written instruction by a medical practitioner, authorising any specified class of or description of prescription medicines or controlled drugs to any specified class of persons (Shaw, 2002).
Standing Orders are also currently legislated in New Zealand and are used in many clinical areas, and extension of Standing Orders has been proposed as a preferred approach (to independent non-medical prescribing) to deal with workforce pressure in the primary care setting (Scott-Jones & Lawrenson, 2008). Similar to the Standing Order model are physician’s assistant, patient group directives, and group protocol models. Physician’s assistant prescribing practice is similar to dependent prescribing, as they are always under the supervision (direct or telephone) of a designated physician. This prescribing model was popular in the United States in the 1960s to address the shortage of primary care medical providers (Hales, 2002; Hales & Dignam, 2002; Hutchinson, Marks, & Pittilo, 2001)

The Ministry of Health (2002) reported that in order for nurse practitioners to fulfil the requirements of an expanded role, prescriptive authority would be an essential component of drug management. It was further suggested that nurse practitioner prescribers would maximise the use of resources by making the best use of skill mix of the workforce (Ministry of Health, 2002; Nursing Council of New Zealand, 2005). In spite of dissenting views on nurse prescribing, authorising nurse practitioners to perform comprehensive health assessments, make clinical diagnosis and prescribe treatments remains the preferred way forward for a new model of health care provision in New Zealand.

1.5 Prescribing and prescriptive authority in New Zealand

In New Zealand, prescriptive authority is outlined in the Medicines Act 1981, the Medicines Regulations 1984, and the Medical Practitioners Act 1955. Prescriptive authority refers to a practitioner’s right to issue a medical prescription, an order (often in written form) by a qualified health care professional to a pharmacist or other therapist, for a treatment to be provided for the patient. A prescription is therefore a legal written document which not only instructs in the preparation and provision of medicine or device, but more importantly, includes the prescriber’s responsibility for the clinical care of the patient and the outcomes to be achieved (Maxwell & Walley, 2003).

For decades, only three professions were granted prescriptive authority in New Zealand: medical doctors, dentists, and veterinarians. These professionals were considered ‘authorised prescribers’ under the Medicines Act 1981 (Ministry of Health, 1981). As a consequence of an amendment to the Nurses Act 1977, amendments to the Medicines Act 1981 gave midwives, the right to practise autonomously and legislative amendments included the right to prescribe. Currently, on
graduation midwives have prescriptive authority, although it is limited to normal prenatal, intra-natal, and postnatal situations.

Introducing nurse prescribing in New Zealand also required amendments to the Medicines Act 1981 and to the Medicines Regulations 1984. After consultation with key stakeholders, amendments made in 1999 to the Medicines Act gave nurse practitioners working in aged care and in family health the authority to prescribe from a limited formulary. The term ‘designated prescribers’ was introduced to refer to regulated health practitioners, other than medical practitioners, dentists or registered midwives, able to prescribe any specified class or description of prescription, medicines subject to the satisfaction of requirements specified in or imposed under regulations relating to their designated prescriber status ("Medicines Regulation," 1984).

In law, there is little difference in terms of prescriptive authority, between *authorised* and *designated* prescribers, except by virtue of their training and education. Authorised prescribers have prescribing rights upon completion of an undergraduate programme and registration, whereas designated prescribers have to undergo credentialing and training at the post-graduate level to be afforded prescriptive authority (Ministry of Health, 2001a). Medical doctors, dentists, and midwives are therefore authorised prescribers, while nurse practitioners are designated prescribers. Moreover, unlike medical practitioners, nurse practitioner prescribers and midwives are only able to prescribe from a list of medicines related to their designated scopes of practice.

In May 2004, the Ministry of Health issued a statement regarding the need to amend the regulatory framework for designated prescribers. The benefits identified in the report suggested that changes to the Act would “foster best practice as designated prescribers will have access to the most appropriate treatments for conditions requiring up-to-date medicines” ("Medicines Regulation," 1984; Nursing Council of New Zealand, 2005). In addition, the amendments would be of benefit to current prescribers as the regulatory arrangement would ensure a consistent approach to all prescribing by existing designated prescribers in relation to monitoring arrangements and access to new medicines. Hence the Medicines Regulations were amended in 2005 to allow new prescribers legal access to all Pharmacy-only, Prescription and General Sales Medicines listed in the Medicines Regulations.

The Medicines Regulations 2005 came into effect on 1 November 2005, allowing those nurse practitioners who had met the qualifications and competencies of the Nursing Council to prescribe medicines within their specialty area. It was envisaged that the change to the prescribing regulations would allow nurse practitioners to collaborate with doctors to ease
workloads and improve patient access to health care delivery (Nursing Council of New Zealand, 2005). Health practitioners, especially nurses, welcomed the changes to the Act and the amendments would be instrumental in improving the flexibility of health professionals to adapt to the needs of consumers.

As referred to above, the first example of non-medical prescribing in New Zealand was in 1990, when midwives were granted prescriptive authority as independent practitioners. The historical events that led to independent midwifery practice really started in 1904 when the Midwifery Act (1904) provided for state-regulated maternity services for working class women. Although the Act allowed midwives to practice autonomously in the community as independent practitioners, this was not so in the hospital setting, where midwives were subordinate to the medical profession. Overtime, community-based maternity care declined, and by 1977, maternity services were largely confined to hospital settings, with childbirth services, including midwives firmly under the control of the medical profession ("Nurses Act," 1977). Nonetheless, the notion of childbirth as a normal event prevailed, and the feminist movement in the 1970s was instrumental in providing the strong direction midwives needed to reassert and redefine the values of maternal care (Kate Sheppard Midwifery, 2009) that culminated in the Nurses Amendment Act of 1990. Not only did midwives regain the legal right to autonomously practice in the care of women throughout normal pregnancy and childbirth but were granted prescriptive authority to prescribe for women with normal pregnancies without the control and supervision of the medical profession. The intent of the legislation was to expand the choices of women in relation to childbirth and it was thought at that time that a team approach would ultimately benefit women.

The extension of prescribing rights to other health professionals such as podiatrists, and pharmacists, is currently being considered in New Zealand to address service delivery (Health Workforce New Zealand, 2010). In preparation for these developments, a committee (New Prescribers Advisory Committee) was established in 2001 to assess applications for extending limited independent prescribing authority to new groups of health practitioners and to provide recommendations to the Minister of Health. This committee was disestablished in July 2006, and applications for extension of prescribing rights are now put directly to the Ministry of Health, where a process to assess the appropriateness of an extension of prescribing rights will be determined upon receipt of an application (Ministry of Health, 2001b).
1.6 The Health Practitioners Competence Assurance Act 2003

The Health Practitioners Competence Assurance Act (HPCA) was introduced in 2003. Its purpose is to protect the health and safety of members of the public by providing mechanisms to ensure the lifelong competence of health practitioners. The Act provides a consistent framework for the regulation, maintenance of competence, and discipline of all regulated registered health practitioners.

All registered health practitioners are covered by the Act. The HPCA replaced all previous Acts particular to each regulated profession (e.g. Medical Practitioners Act, Nurses Act). However, each regulatory authority, such as the Medical Council of New Zealand, the Nursing Council of New Zealand and the Midwifery Council of New Zealand are legally endorsed to administer the Act in relation to its own profession. The HPCA Act made provision for the Nursing Council of New Zealand to take responsibility for the approval, registration and monitoring of nurse practitioner prescribers in New Zealand ("Health Practitioners Competence Assurance Act," 2003).

The Nursing Council of New Zealand has determined the requirements that must be met by nurse practitioners who wish to prescribe. Regulation 6 outlines the requirements for commencing prescribing in relation to the education and training that must be undertaken, and Regulations 7 and 8 outline the requirement for ongoing professional education and monitoring ("Health Practitioners Competence Assurance Act," 2003). Legislative changes to the Medicines Regulations (1984) granted the Nursing Council full administrative responsibility for establishing competency requirements of advanced specialty practice and the approval of educational institutions that prepare and provide experience and training of nurse practitioners including prescribing ("Medicines (Designated Prescriber: Nurse Practitioners) Regulations," 2005).

1.7 Educational preparation for nurse prescribers

Educational preparation for a nurse practitioner role that includes prescribing is essential if nurses are to competently practice in the extended and designated roles. Countries that have introduced nurse practitioners have developed different educational models to prepare them for the role. In a social context where there are concerns about the adequacy of nurses’ knowledge and skills, a burden is placed on educational providers to ensure that the public is not exposed to risk from incompetent nurse practitioner prescribers.
In the United States, nurse practitioners are one of a number of advanced nursing roles, along with clinical nurse specialists, nurse midwives and nurse anaesthetists, considered under the umbrella title, Advanced Practice Nurse (APN) (Schober & Affara, 2006). Pharmacology and science education for nurses is strongly supported at the undergraduate level. Nurse practitioners are certified by the Board of Nursing and are required to complete an organised educational programme to gain additional knowledge and skills to practise in an advanced practice role (American Academy of Nurse Practitioners, 1993). What began as certificate level programmes, have now evolved to Master’s degrees in many cases. In the year 2006, there were 334 institutions in the US enrolling 20,965 students, producing 6552 graduates (Hales, 2002). In Canada, nurse practitioner education was first introduced in 1975, and regulation of advanced nursing practice is seen to be “…within the current scope of nursing practice” (Canadian Nurses Association 1999).

In contrast to the United States and Canada, in the United Kingdom a post-registration educational qualification is not required for district nurses and health visitors prescribing under patient group directives or from a formulary. However, a 26 day course completed over three to six months in higher education is mandatory for nurses who are prescribing from an extended formulary through a supplementary prescribing model where course outcomes and content are based on the 25 competencies stipulated by the Nursing and Midwifery Council of the United Kingdom (Jordan & Griffiths, 2004). Although nurse practitioners have an established presence in the provision of health care in the United Kingdom, they do not have prescriptive authority incorporated into their scope of practice, and are required to undertake additional educational courses to be able to prescribe (Schober & Affara, 2006).

In comparison to the United States, Canada and the United Kingdom, from the beginning of nurse practitioner development in New Zealand, the right of nurse practitioners to prescribe, if appropriate education is acquired and approval given has been supported (Ministry of Health, 2002). In 2002, the Nursing Council of New Zealand determined at the outset that a clinically focused Master’s degree level of education or its equivalent be required for entry into practice as a nurse practitioner and additional approved pharmacology courses relevant to the nurse practitioner’s specialty are mandatory, if prescriptive authority is also sought (Nursing Council of New Zealand, 2002). The competencies expected of advanced nurses in New Zealand are reflected in educational programmes, that aim to prepare professionals with expert skills, who are able to think critically and autonomously, and are accountable for their own practice (Gardner, Gardner, & Proctor, 2004). A mutual agreement between Australia and New Zealand related to
the preparation of Nurse Practitioners at Master’s level, that included standards of education for advanced nursing practice, enabled both countries to develop a dual country recognition system required to meet the provisions of the Trans-Tasman Mutual Recognition Act 1977 (Gardner, et al., 2004).

Support for Master’s degree preparation of nurse practitioners, where the principles of pharmacology and therapeutics are included, is growing internationally (American Academy of Nurse Practitioners 1995; Davidson 1996; van Soeren 2000). In addition to support for formal higher education of nurses in prescribing, some educationalists (Hemingway & Davies, 2006) are pointing to a need for on-going post-registration support and continual clinical development in the area of prescribing.

1.7.1 Educational preparation for nurse prescribers in New Zealand

As this study is focused on the experiences of nurses as prescriber learners, it is therefore important to describe the relevant framework used to educate experienced nurses in preparation for prescribing in New Zealand. In New Zealand, there are five schools of nursing (each programme approved and the schools regularly accredited by the Nursing Council of New Zealand) that offer educational courses to prepare nurse practitioners for prescribing. These educational institutions have however, developed their own masters’ programmes. The Nursing Council of New Zealand sets the competencies required for safe and effective prescribing, and monitors and audits each programme and its courses; however, wide variation exists between each institution with regard to the content delivery and processes of assessments (Lim, Honey, & Kilpatrick, 2007). The programme that the participants of the present study completed (University of Auckland’s School of Nursing) has a strong focus on pharmacology, therapeutics, and clinical decision-making.

There are three core pharmacology courses offered that can be taken as part of a master’s programme, or as a post graduate certificate in Prescribing for those who have already completed a master’s degree. A nursing ‘Applied Science’ paper that supports pharmacology knowledge is a mandatory prerequisite and provides the basic scientific knowledge. All students will also have completed courses in assessment and diagnostic reasoning as part of a master’s degree. A course on ‘Principles of Pharmacology and Pharmacokinetics’ provides an introduction to the principles of pharmacology by covering the basic principles of pharmacology, pharmacodynamics, and pharmacokinetics. The importance of learning the basic principles is that it will provide a basis
for assessing and using drugs both currently available and those that could be developed in the future.

Then, a course in therapeutics addresses the legislative framework and practical considerations for nurse prescribing, and includes the principles of medicines evaluation, pharmaco-economics, and therapeutics for prescribing. Some of the basic principles learnt from the pharmacology course continue into the therapeutics course, as it relates to clearance, plasma levels, dosing and dosing intervals, drug interactions, and toxicology. Having in these two courses been grounded in the knowledge base essential to making prescribing decisions, finally a ‘Nurse Prescribing Practicum’, is completed. This course provides nurses with the opportunity to apply their knowledge and skills in pharmacotherapeutics to prescribing practice, specific to the student’s area and scope of practice. The prescribing practicum ensures that postgraduate nurses can apply the basic principles of pharmacology and pharmacotherapeutics to their particular scope of practice and explore pharmacological reasoning in the clinical context. During the practicum, students work closely with and under the supervision of a senior medical colleague, who provides direct supervision and mentoring in prescribing activities in the clinical area. The mentor prescribers must be practicing in the same clinical area as the nurse.

1.8 New Zealand research and commentary on nurse practitioner prescribers

There has been little published research on nurse prescribing in NZ, partly reflecting its recent introduction. Early literature mainly describes the issue of whether or not nurses should be allowed to prescribe. The introduction of a nurse practitioner role in New Zealand was not itself opposed, but the medical profession heavily contested extending prescribing rights to nurse practitioners. Critics, (for example Moller & Begg, 2005), argued that as nurses did not undergo the same level of educational and clinical preparation as undertaken by doctors at undergraduate level and through clinical training, patient safety may be compromised if nurses engaged in prescribing. In contrast, advocates of nurse prescribing claim that nurses have always attended to a crisis when doctors have been unavailable, and that has included advising doctors on what to prescribe for the patient (Hales & Dignam, 2002). Furthermore, while there may be an inadequate emphasis on pharmacology and diagnostic knowledge in the undergraduate nursing curriculum, this deficit is to be addressed through the required master’s degree.

Other potential concerns in relation to nurse prescribing regarded possible impacts on teamwork. Baird (2001) pointed out that when nurse prescribing was introduced in the UK, changes in the balance of power and blurring of boundaries between nurses and general practitioners followed.
Most general practitioners were reported to be apprehensive about nurse prescribing where they feel they were still liable for the actions of the practice nurses and would be left to manage complex medical cases (Banning, 2004). Blurring of roles and team work issues were also raised as concerns in New Zealand (Moller & Begg, 2005; Renouf, 2005) where two different prescribers may differ in prescribing decision which may impact on the team’s dynamics. A small survey of 50 rural general practitioners in New Zealand showed support for nurse practitioners carrying out a traditional nursing role, such as health education, home visiting and taking health histories, but expressed concern about their undertaking functions traditionally those of doctors such as prescribing, ordering laboratory tests and physical assessments (Mackay, 2003).

Many studies that have explored nurse prescribing internationally and in New Zealand share concerns about extending prescriptive authority to nurses (King, 2004; Moller & Begg, 2005; Otway, 2002; Sodha, McLaughlin, Williams, & Dhillon, 2002). Similar concerns to those raised in the United Kingdom and in the United States, especially in the early stages of nurse practitioner prescribing where a lack of specialist training and competence were the predominant issues raised (Chaston & Seccombe, 2009), have been echoed in New Zealand.

1.9 **Significance of the study**

Non-medical prescribing by Nurse Practitioners (and earlier by midwives) has been implemented in New Zealand and further extension of non-medical prescribing to other health care professions is being debated and negotiated. Given that a wider group of practitioners will be involved in the future, it is important to better understand how best to prepare health professionals for prescribing. While there is an extensive literature on medical prescribing (reviewed in Chapter 2), to date research on non-medical prescribing, including nurses, is limited. The only two groups of health professionals approved for non-medical prescribing in New Zealand are midwives who (like doctors) are prepared at undergraduate level, and nurses whose preparation for prescribing is at post-graduate level. To date, research is lacking as to the relative merits of each educational approach. More importantly, there is a paucity of research on the impact non-medical prescribing may have on the dynamics of the multi-disciplinary health care team. Is there an argument, for example, for inter-professional education in prescribing for all health professionals? Should this be at undergraduate or postgraduate level or both? Moreover, how can continuing education and support for prescribing for both medical and non-medical prescribers’ best be addressed? These are important questions facing New Zealand, as in other countries where non-medical prescribing is being extended.
The debates and the criticisms surrounding the extension of prescriptive authority to Nurse Practitioners in New Zealand centred on the following concerns. Firstly, it is claimed, nurses lack, or have inadequate knowledge of, biomedical and pharmacological sciences and lacks the associated diagnostic and clinical reasoning capabilities as prescribers. Secondly, these lacks and deficiencies may adversely influence nurses’ competence in making prescribing decisions and put patient safety at risk. Thirdly, the extent to which the prescribing roles of doctors and nurses overlap and how they interact has not been investigated; therefore, the third main concern is related to the effects of nurse prescribing on teamwork.

1.10 The research questions and objectives of the study

Medical prescribing, both in terms of educational preparation and practice, has been extensively researched and written about (reviewed in Chapter 2). This is not the case with nurse prescribing, to some extent because of its fairly recent introduction and that prescribing is restricted to a relatively small group of advanced nurses. Much of the literature on nurse prescribing reflects a deficit perspective, in its focus on how nursing education differs from (and is inferior to) medical education. No studies were identified that questioned whether medical prescribing (as reflected in education and practice) is the only or the best model, or whether alternative models could also be used in the context of patient care?

This study set out to address the following research question:

What are the experiences of nurses in becoming prescribers and how do their experiences compare with those of other prescriber groups?

In order to answer the question, this study sets out to address the following objectives:

1. To determine how experienced nurses acquire the pharmacological knowledge and therapeutic skills necessary for safe and confident prescribing practice;
2. To compare the experiences of nurses and doctors in their journeys in becoming prescribers;
3. To explore the perspectives and experiences of nurse practitioners as beginning prescribers; and to determine their ongoing needs in knowledge and skill development

In this thesis, the nurses’ experiences and perspectives are privileged. However, in the light of the recent introduction of nurse prescribing in New Zealand and limited published research on nurse prescribing education and practice compared into medical prescribing, the perspectives of
doctors and midwives are added. A multiple case narrative strategy was employed, through which the perspectives and experiences of three groups of prescribers (doctors, nurses and midwives) were captured, reflecting different points in their prescribing careers (learner, novice and experienced).

1.11 Structure of the thesis

This thesis comprises nine chapters.

Chapter 1 has introduced the subject of nurse prescribing in New Zealand and in other countries and briefly summarized concerns held regarding non-medical (especially nurse) prescribing. The case for nurse prescribing and the underlying context (health service delivery, health policy and legislation), are described and the educational preparation nurses undertake to become prescribers outlined. The gaps and challenges identified in New Zealand and the international literature that justify and support the intention of the current study are summarised.

Chapter 2 presents a comprehensive review of literature on past, current and ongoing investigations into the role of education in preparing nurse prescribers for prescribing. Literature on the role of biomedical education in relation to diagnosis and prescribing, as this applies to doctors, was also reviewed for this study as a point of reference to understanding how prescribers develop prescribing knowledge and how this knowledge is applied in practice. The role of clinical reasoning as this applies to both medical and non-medical prescribers was also explored, to compare similarities and differences. Finally, current literature on nurse prescribing practices, decision making and effectiveness was reviewed to gain an understanding of the ongoing issues and concerns on non-medical prescribing as this unfolds internationally.

Chapter 3 describes narrative inquiry and the philosophy behind this methodology, as well as the method of multiple case narratives, the process of data collection and analysis as used in this study. In particular, within-case analysis and across-case analysis were described. Ethical considerations are discussed as well as how methodological rigour was ensured.

Findings are reported in four chapters. The first three of these three chapters draw on the experiences described by all participants corresponding with pharmacology educational preparation, application, and clinical reasoning. The fourth chapter expands on the experiences and considers the wider organisational professional context of nurse prescribing. In all four findings chapters, the participants’ voice is represented using verbatim quotes indicated in italics.
Chapter 4 describes the knowledge and skills essential for learning to prescribe. Core knowledge related to pharmacodynamics and pharmacokinetic principles considered essential to safe and rational prescribing was identified across-cases, as central to the processes upon which therapeutic reasoning operates.

In Chapter 5, the characteristics, behaviour and decisions perceived to be typical of novice prescribers and those characteristics, behaviours and decisions considered distinctive of more experienced prescribers, are described and compared. Similarities and differences between nurses and junior doctors are compared, both groups being new prescribers. The views, experiences, and perceptions of all participants are reported to understand how novice prescribers differ from those who are more experienced, and to present perspectives of experienced doctors who have mentored nurses in prescribing.

Chapter 6 describes participants’ experiences, views, and perceptions of the factors that influence the development and progression of knowledge and skills in clinical reasoning, including both diagnostic and therapeutic reasoning.

Chapter 7 reports on the narratives of advancing practice, including prescribing and diagnosis, from the perspective of nurse practitioners. More importantly, the narratives provided some insights in the development of the nurse-prescribing role in NZ, the contexts, attitudes, and perceptions that these pioneer nurse prescribers encountered and their responses and actions in bedding nurse prescribing into the health service delivery system.

Chapter 8 discusses the findings of the study, highlighting the complexities and the challenges of prescribers as learners and as prescribers. The role of education and training, clinical experience and mentorship were all identified as key inputs to the development of skills common to all prescribers. The dual role of clinical reasoning, as a component of therapeutic and diagnostic reasoning, and as an outcome of decision-making, was highlighted.

Chapter 9 concludes the thesis by highlighting the implications of findings for education, practice, organization, and policy. Also considered is the practical significance of the research to the extension of prescribing rights to other non-medical professionals. Limitations of the research and areas for future research are identified to further enhance understanding of the complexities associated with prescribing practices, behaviour, and education.
CHAPTER 2: UNDERSTANDING PRESCRIBING – A REVIEW OF LITERATURE

2.1 Introduction

This chapter reviews literature that addresses theoretical perspectives (i.e. education, practices and decision-making processes) related to the education and training of both nurses and doctors, with the aim of uncovering the multifaceted process and complexity of prescribing. The literature is reviewed under three thematic categories to provide the context of the study, and inform the debate on key issues related to the education and practice of both medical and non-medical prescribers.

The first thematic category (2.2 and 2.3) explores issues related to prescribing education and practice. There is limited research about the processes associated with non-medical prescribing; therefore, the majority of studies reviewed in relation to this theme refer to medical prescribing. The second thematic category (2.4) reviews theoretical aspects of clinical reasoning in relation to current research trends, practice development, and other educational facets including the role of the biomedical sciences in diagnosis and reasoning. An appreciation of the similarities and commonalities of methodology and theory as related to nursing will be explored. It is important to note that while diagnostic reasoning has been extensively studied in the medical literature, this is not the case with therapeutic reasoning. The third thematic category explores the educational preparation for prescribing first in relation to doctors (2.5). This discussion will serve as a point of reference for the section (2.6) that examines literature on the pharmacological education and preparation of nurses in prescribing.

The literature selected for this study was mainly focused on education, practice and clinical decisions. Studies published from 1995 to 2010 were selected from literature sourced from the following databases: CINAHL, EMBASE, EBSCO HOST, Web of Science, Web of Knowledge, and MEDLINE. The following search terms were used: medical prescribing, nurse prescribing, medical prescribing practice, decision-making and clinical reasoning.

2.2 Complexities of prescribing

Prescribing in medical terms refers to numerous actions by a medical practitioner; for example ordering of any treatment, giving advice, referral of a patient to the hospital or other agency, and the issuing of a certificate for unfitness to work. The prescribing of drugs must therefore be viewed in perspective, within the whole concept of medical care as one aspect of the total prescribing activity. (Parish, 1973, p. 213)
Prescribing is a core skill and an activity that is commonly associated with the practice of medicine. In Pillan’s (2009) opinion, in the past, “prescribing has been viewed as a skill that could be acquired on the job, as have managing workload, being on call and performing clinical procedures” (p. 425). However, the last 10 years have witnessed an increase in the number of adverse drug events and drug errors. With an increasing number of newer, more potent drugs, increasing complexities of diagnosis and drug management, the need to improve prescribing knowledge and skills amongst both junior and senior doctors has been suggested (Aronson, 2006; Barber, Rawlins, & Franklin, 2006; de Bruin, Schmidt, & Rikers, 2005; Denig, Wahlstrom, de Saintonge, & Haaijer-Ruskamp, 2002; Franson, Dubois, de Kam, Burggraaf, & Cohen, 2009; Leone et al., 2008).

Schwertz, Piano, Kleinpell and Johnson (1997) described prescribing as a particular thinking process; where the pharmacological management of patients requires critical thinking based on fundamental principles. According to these authors, prescribing skills included the process of analysis, wherein a clinician makes decisions based on risk/benefit considerations, and that therefore competency for prescribing clearly requires skills that are not limited to understanding pharmacology and therapeutics, but support the process of clinical decision-making.

For Gwee (2009), prescribing is becoming increasingly complex, as the inherent risks and interactions of drugs has increased with the introduction of more potent drugs. This is reinforced by Aronson (2006) who also noted that drugs with more complex mechanism of actions are increasingly available. In addition, there is a greater complexity of treatment regimes, which can lead to inappropriate polypharmacy such as prescribing decisions related to the ‘right dose of the right drug at the right time for the right patient’.

Medication errors are also on the increase, and poor prescribing by junior doctors is a common cause of preventable error in hospitals (Likic & Maxwell, 2009). Junior doctors’ practices have been investigated in terms of their prescribing knowledge and skills upon completion of medical education and training (Nierenberg, 1990a). Literature on junior doctors’ and interns’ prescribing reflected an inadequate knowledge base, which was poorly integrated with scientific knowledge, including pharmacology (Barber, et al., 2006; Gwee, 2009; Likic & Maxwell, 2009). More importantly, some studies (cited by Castledine 2006, p. 4) have shown that “many of the associated errors were linked with junior doctors’ lack of training and education in prescribing”. Deficiencies of clinical knowledge and lack of confidence, were some of the factors associated
with prescribing errors amongst junior doctors (Ross & Yoon, 2009). Likic and Maxwell (2009) suggested:

*It should come as no surprise that prescribing is associated with errors, as prescribing is a complex and challenging task that requires diagnostic skills, knowledge of medicines, communication skills, an understanding of the principles of pharmacology, appreciation of risk and uncertainty and ideally, experience.* (p. 656)

The prescribing task demands a thorough understanding, not only of the pathophysiology of the diseases but, more importantly, the pharmacological profile of the drugs. The pharmacological profile includes the pharmaceutical, pharmacodynamics, pharmacokinetic properties, and how these properties can be translated into a therapeutic effect via a chain of biochemical and physiological events (Aronson, 2006). In addition, the prescriber also needs to understand how to use and assess evidence for and against the use of the drug/drugs, the effects of co-morbidity, adverse drug reactions and cost-effectiveness of therapy, “a task formidable even for the most experienced prescriber” (Aronson, 2006, p. 488).

As prescribing is a complex and challenging task (Aronson, Henderson, Webb, & Rawlins, 2006), educating prescribers to develop appropriate skills in rational therapeutics has been suggested as one approach to improving prescribing practices (Pirmohamed & Ferner, 2003). Strickland and Hodge (2008) argued that prescribing is more than a physical act of ordering medicines, and prescribers need more than knowledge of pharmacology. Prescribing requires skills of clinical reasoning and decision-making and most importantly, medication management. Ross and Yoke (2009) share similar views, noting that the range of skills required for safe and appropriate prescribing creates a major challenge for those involved in designing training programmes for good prescribing. They argued that while prescribing a one-off drug prescription for the younger patient may be relatively simple, rational prescribing in the case of an elderly patient with co-morbidities of chronic diseases and multiple drugs could be difficult and challenging. Writing a prescription, therefore, requires more than just textbook knowledge of pharmacology; it requires deliberate judgment and an ability to carry out a practical and complex task (Braunwald, 2005).

### 2.2.1 Core knowledge, skills and attitudes

Walley and Webb (1997) proposed that a core content curriculum be developed for medical students to become competent in prescribing drugs safely and effectively, and the curriculum must be based on the principles of rational therapeutics. Core courses should start with basic pharmacology and therapeutics, gradually moving to more clinically based courses with a greater
emphasis on clinical pharmacology and clinical therapeutics. To enhance ‘retention effects’ and ‘transfer effects,’ the authors suggested introducing concepts including pharmacology and therapeutics in small amounts over the full medical course, building on what was previously learnt, and with key points frequently recurring.

Naritoku and Faingold (2009) support a more enhanced structure underpinning the therapeutic curriculum in medical schools, including an added emphasis on pharmacovigilance. Pharmacovigilance has been defined in this context as the epidemiological study of drug-related events or adverse drug effects (ADEs), which includes drug-to-drug interactions, estimated to be the fifth leading cause of death in the United States (Lazarou, Pomeranz, & Corey, 1998). Furthermore, Naritoku and Faingold insisted that poor integration of the clinical science curricula in medical schools, limits the effectiveness of pharmacology and therapeutics education. In their view, acquiring a thorough and current knowledge of clinical pharmacology and therapeutics is best addressed through education, as such information may not be systematically covered during internship and residency.

Core knowledge, skills and attitudes for prescribing were proposed in many studies (Gwee, 2009; Naritoku & Faingold, 2009; Walley & Webb, 1997). Core knowledge included: basic pharmacology, clinical pharmacokinetics, inter-individual variations and responses to drugs, monitoring of drug therapy, adverse drug reactions, drug interactions, medication errors, toxicology, altered pharmacokinetics across the lifespan, especially among the young and elderly, legal aspects, developing new drugs, medicines management, ethics of prescribing, commonly used drugs, common therapeutic problems and complementary and alternative medicines. Core skills included: taking a drug history, prescription writing, drug administration, prescribing drugs in special groups, monitoring adverse drug reactions and interactions, drug allergy, clinical pharmacokinetics, use of evidence, obtaining accurate and objective information to support safe and effective prescribing. In addition, obtaining informed consent to treatment, as well as the importance of a rational approach to prescribing and therapeutics, risk-benefit analysis, recognising personal limitations and one’s responsibility as a medical doctor, and ongoing professional development, are all essential attitudes that need to be developed and promoted for prescribers, in rational therapeutics (ibid).

Some authors (Gwee, 2009; M. Pearson, 2003; Richir, Tichelaar, Geijteman, & de Vries, 2008; Ross & Loke, 2009) have called for the use of a multidisciplinary team to be involved in the design of a therapeutics curriculum in medical schools, as no single educational intervention can
be relied upon to improve prescribing. Aronson (2006), however, proposed that education must be the “kingpin”. Education should be taken as often as possible, and learning should be ‘life-long’. He asserted:

\[
\text{See one, do one, teach one' runs the old adage. But if we do not increase the amount of time we spend teaching future prescribers, doctors, dentists, nurses, pharmacist, and others, we may soon be saying 'See one, prescribe one, harm one.} \text{ (Aronson, 2006, p. 490)}
\]

### 2.3 Prescribing decisions

To date, research in drug prescribing has predominantly focused on documenting variations in rates and cost among individuals and populations, with very few attempts to explain the variations observed beyond the level of correlation. Christensen and Bush (1981) argued that the majority of these studies raised questions, but did not explain the decision making process related to prescribing. They went on to say that many structural and non-voluntary mechanisms have been implemented to affect drug prescribing, such as drugs removed from and added into formularies, therapy protocols, and others. However, in the most rigid of these mechanisms, the prescriber continues to have a great deal of freedom in the prescribing process (C. Bradley, 1991). Therefore, if the goal is quality prescribing, as much as possible should be known about the decision-making process.

#### 2.3.1 Practice focus

Literature reviewed on medical prescribing focused on two areas, prescribing practices and prescribing education. There are three types of decisions that medical practitioners make that have a crucial influence on the patterns of their prescribing. First, there are decisions about whether or not to deal with the problem or problems presented by patients for prescribing a medicine. Second, there are decisions about which medicine to prescribe. Third, decisions need not be taken in a single consultation, but may evolve over time (C. Bradley, 1991).

Several prescribing models have been proposed that continue to be influential in understanding prescribing practices. Hemminki (1975) proposed a model of factors affecting drug prescribing decisions. The major factors were demands from patients and society, drug firms, research, and governmental control forces. The model purported that prescribing physicians are primarily influenced through education, colleagues, scientific journals and advertising, each of which is directly influenced by research, drug firms, and societal demands. Drug firms are portrayed as having close and interdependent relationship with research, and as mutually affecting societal demands and pressure groups. In addition, physicians’ personal characteristics, work situations,
and therapeutic resources were identified as factors that affect physicians’ decisions. Although this model offers a useful framework for discussion purposes, it remains untested, and it does not address the cognitive processes of prescribing in relation to decision-making. The biggest criticism of the above model is that the factors that represented the most important determinants of prescribing, and under what circumstances these factors become important, were lacking.

Knapp and Oeltjen (1972) proposed a model of prescribing decisions as influenced by appraisal of benefits versus risk in specific situations; therefore prescribing decisions could vary considerably, according to the seriousness of the illness and physicians’ characteristics. The authors argued that the context of decision-making under conditions of risk is the most appropriate way of delineating the problem, since almost all drugs have the potential for side effects in addition to potential benefits. The risk-benefit prescribing model draws on the social learning theory and is one of cognitive decision-making under conditions where known harmful, as well as beneficial, effects occurring. The risk-benefit is also referred to as expectancy value model. The variables in this “expectancy value” model are subjective probability or an expectancy that a beneficial effect will occur; the amount expected of beneficial effect that will occur; a subjective appraisal or expectancy that a harmful effect will occur; and the extent of the potential harmful effect. In applying this model, the researcher ascertains the relative weightings given by physicians to each of the four factors when determining the choice of drug.

Another model for prescribing, proposed by Raynes (1980), is an interactional model and takes into account the behaviour of patients. She suggested that the standard consultation model of a patient who presents with symptoms to a physician, who in turn asks questions in order to come to a therapy determining diagnosis, is inadequate to explain much prescribing behaviour. Raynes suggested, instead that the therapy itself may be used as a diagnostic tool or test, and that doctors may use an empirical evaluation process, which will depend upon a patient’s responses to the question asked, and which may involve the use of a prescription, as a step leading to a diagnosis. Rayne’s model is the only model, to date, that includes the patient’s behaviour as a factor influencing the choice of drug. Her critiques raise the possibility that the diagnostic model is totally inadequate to explain prescribing variations among prescribers. She further proposed that the routine diagnostic search model, where the drug becomes part of the search routine, may be a better model in ambulatory care, particularly when there is uncertainty about whether the patient’s complaints were caused by social, psychological, or physical problems.
2.3.2 Education focus - Rational prescribing

In an effort to improve prescribing decisions of newly graduated medical doctors, current medical literature on prescribing has argued for a process of rational prescribing using principles of drug selection (Aronson, 2006; Coombes, Mitchell, & Stowasser, 2008; Dean, Schachter, Vincent, & Barber, 2002; Denig & Haaijer-Ruskamp, 1992; Denig, Witteman, & Schouten, 2002; Gwee, 2009; Likic & Maxwell, 2009; Ross & Loke, 2009; Ross & Yoon, 2009). Clinicians prescribe in a variety of circumstances and often make treatment choices in the absence of evidence (Maxwell & Walley, 2003), and therefore rational prescribing follows a logical sequence from diagnosis to follow-up. Many studies also identified sequential steps (de Vries, 1993; Denig & Haaijer-Ruskamp, 1992; Maxwell & Walley, 2003; Richir, et al., 2008; Ross & Loke, 2009). However, Maxwell (2009) went further in claiming a moral element in the intent of rational prescribing, being to maximise clinical effectiveness, minimise harm, avoid wasting scarce resources, and to respect patients’ choices. Further, a confirmed, relevant primary and secondary diagnosis is the first step in prescribing decisions. He advised that prescribers must be conscious of varying degrees of uncertainty, when making diagnostic decisions, as this can influence their assessment of benefit-to-harm balance of treatment. Maxwell’s steps of rational prescribing, including principles of drug selection, are outlined in Figure 1.
Maxwell’s (2009) model of rational prescribing stressed the importance of prognosis as this will affect rational treatment choice. Partnership with the patient makes an important contribution to rational prescribing, as their beliefs and expectations affect goals of therapy, and patients play a key role in monitoring their own treatment, in improving compliance, and in judging the acceptable benefits to harm ratio when selecting treatment options.

In common with Raynes’s model (1980, see section 2.3.1), Maxwell’s model placed an emphasis on patients’ involvement in all steps of the process (Steps 3 to 7), after diagnosis and prognostic decisions has been confirmed by the prescriber.
The last three steps (Steps 5 to 7) of Maxwell’s (2009) model focused on treatment selection where, in most situations, prescribers are faced with more than one treatment choice, including non-pharmacological approaches. Knowledge of the drug’s profile, its pharmacodynamic and pharmacokinetic properties, were important in the prescriber’s reasoning processes, as well as the therapeutic, safety, and cost considerations of the treatment choices. The prescribers’ knowledge of clinical pharmacology and therapeutics dictated the selection of the drug in terms of its efficacy, dosing, route of administrations, potential for and severity of adverse effects, and drug interaction profiles, inter-subject variability and appropriate pharmacogenetics deliberations. Pharmacogenetics is generally regarded as the study or clinical testing of genetic variation that gives rise to differing responses to drugs, and refers to the genetic differences in metabolic pathways which may affect the individual’s responses to drugs, both in terms of therapeutic effects as well as adverse effects (Klotz, 2007). Although individualising drug therapy is regarded as the way of the future, such an approach is limited, because many of the variables outlined in Maxwell’s model are unaffected by genetics.

Maxwell’s last step (Step 7) of the process of rational prescribing considered fundamental, involves monitoring and evaluation of treatment. This process that Maxwell refers to as pharmacovigilance involves the monitoring of medicines, to identify previously unrecognised adverse effects, and assessing the risks and benefits of medicines in order to determine what action, information, and subsequent monitoring, if any, is necessary to improve their safe use. The World Health Organisation (2002) Report on Pharmacovigilance places the onus on the prescriber, to monitor and evaluate drugs commonly used in clinical practice. The degrees to which clinicians are informed about the principles of pharmacovigilance and its practice have a major impact on health care quality. The Report further showed that education and training of health professionals in drug safety, exchange of information between national centres, the coordination of such exchange, and linking clinical experience of drug safety with research and health policy, were all fundamental to enhance effective patient care (World Health Organization, 2002).

Included in Maxwell’s (2009) model of prescribing is the act of writing prescriptions. Prescribing error has been related to prescription writing, including when prescribers’ handwritten orders are illegible, incomplete and ambiguous (Garbutt et al., 2006). Prescription errors are the most frequent cause of preventable drug events, yet the act of prescription writing is seldom a focus in intern doctor education. A study by Pearson et al. (2002) concluded that around 80% of intern prescribing practices involved charting previously prescribed medications, or charting under the
instruction of colleagues. Without good understanding of the therapeutic reasoning behind individual therapeutic decisions, or broad based knowledge of drugs, interns are unlikely to question or have the time or confidence to alter a patient’s existing medication regime (S. Pearson, Rolfe, & Smith, 2002).

To conclude this discussion on prescribing decision-making, a range of literature has been reviewed that advocated knowledge, skills, attitudes, and processes of reasoning, as vital to the learning and development of skills in medical prescribing and therapeutic reasoning. Much of this literature has centred on intern and junior doctors’ prescribing practices, behaviour and educational needs. As new learner prescribers, this literature offers a useful reference in extending understanding of how, and in what situations, can learning about prescribing be enhanced or inhibited for nurses. However, as clinical reasoning is not the domain of only one academic discipline (Dowding & Thompson, 2009b), a review of literature exploring decision making and clinical reasoning models that are presented for nursing is now reviewed. These models show some similarities with those of medicine and other health professions.

2.4 Clinical reasoning amongst health professionals

Having examined current thinking on prescribing as practice in relation to the discipline of medicine, and implications for medical education, in this section, the processes of clinical reasoning is explored. Reflecting on the idea of rational prescribing in medicine, the hypothetical-deductive reasoning model is favoured in medicine, and used also in nursing. However, other models of knowledge and knowing also influence clinical reasoning, and these are examined in this section

Diagnostic reasoning has been extensively studied in medical literature but little is known about therapeutic reasoning (Richir, et al., 2008). Therapeutic decision-making, or therapeutic reasoning, is defined as the step in clinical reasoning that relates to the prescriber’s choice of therapy. Both therapeutic and diagnostic reasoning are key components of the process of clinical reasoning (Richir, et al., 2008).

Review of current literature on clinical reasoning was undertaken for this study, as it is central to prescribing practice. Clinical reasoning is a thinking process that requires some measure of judgment and the ability to tackle a complex practical task (Aronson, 2006). In some literature, clinical reasoning is viewed as a critical skill central to the practice of professional autonomy, as
it permeates throughout one’s professional practice (Benner, Hughes, & Sutphen, 2008; Higgs & Jones, 2008).

Studies exploring clinical reasoning processes seek to understand how professionals make decisions. However, after 30 years of research, little consensus among investigators exists, even on some of the most basic characteristics of clinical reasoning (Norman, 2005). Studies on clinical reasoning and decision-making of doctors, in relation to prescribing, illustrates that prescribing (therapeutic) reasoning related mostly to behaviour, practice and decision-making processes. Amidst a plethora of studies, many of these studies have been inconclusive and conflicting as “there is no single model of clinical reasoning that adequately represents what clinical reasoning is in the context of different professionals and different workplaces” (Higgs & Jones, 2008, p. 4).

So what is clinical reasoning? Simply defined, clinical reasoning is the “sum of the thinking and decision-making processes associated with clinical practice” (Higgs, Jones, Loftus, & Christensen, 2008, p. 4). The authors went on to argue that clinical reasoning is a critical skill for health professionals and is central to autonomy. Higgs and Jones (2008) described clinical reasoning as a context driven and context dependent way of thinking and decision-making in professional practice to guide practice action. The authors’ advice is that health care professionals wishing to use their judgment and decision-making skills face a key challenge, as in most situations, each decision they make requires them to think about an uncertain future; indeed, health care decisions are usually made under conditions of uncertainty. This clearly applies to therapeutic reasoning (prescribing), where the prescriber weighs up risk versus benefit when deciding a course of action.

Benner et al. (2008) shared a similar view, referring to much literature where clinical reasoning has often been subsumed under other modes of reasoning such as critical thinking, creative thinking and critical reflection. These authors argued that clinicians need these multiple modes of thinking strategies to enhance their understanding and assessment of clinical situations. They further suggested that each mode of thinking is used for different purposes and different logics; however, in the practice traditions of medicine and nursing a point of tension and confusion arises when clinical reasoning becomes entangled with critical reflection.

Both critical thinking and clinical reasoning are essential for clinicians to use in practice, as their ability to reason, think and judge are essential to providing quality patient care. Clinicians need
to act in particular situations with the best clinical evidence and scientific knowledge available. When clinicians are confronted with a clinical situation they engage in multiple modes of thinking, where essential knowledge, experiences and clinical reasoning skills are stimulated and integrated, a process Benner et al (2008) described as critical thinking. Clinical reasoning, on the other hand, is situated in practice, because clinical reasoning occurs within social relationship or situations involving patient, family, community, and a team of health providers. Clinical reasoning therefore is more of a practice-based reasoning that requires practical ability to discern particular evidence and how this applies to the patient situation.

The context dependent nature of clinical decision-making in action, where decision-making environments are uncertain, can challenge the understanding of clinical reasoning. Early research into clinical reasoning emerged from the medical problem-solving tradition, predominantly focused within the hypothetico-deductive method which has its roots in behavioural psychology (Fleming & Mattingly, 2008). Many theorists argue that this cognitive view of clinical reasoning is too narrow and does not show the complexities and nuances of everyday clinical practice. In recent years, a variety of research approaches have emerged into the study of clinical reasoning; these include medical decision theory, novice to expert differences, and research situated under the interpretive and critical paradigms (Loftus & Smith, 2008).

To guide the literature review on clinical reasoning for this study, two particular aspects of clinical reasoning were investigated. As the study focuses on nurses as learners and as beginning prescribers, much of the literature reviewed focused on capability and knowledge development, two important core dimensions of clinical reasoning.

2.4.1 Clinical reasoning and capability

With an increasing number of adverse drug events and reactions, concerns have been raised regarding the knowledge and skills of novice prescribers. Ways, in which novice prescribers can be guided towards development of prescribing capability, during professional entry education, has been investigated in numerous literatures. The study by Christensen, Jones, Higgs and Edwards (2008) described the concept of clinical reasoning capability and the factors that led to the development of that capability during the professional entry education of physiotherapy students in California. As the focus of this current study was on health professionals (nurses, doctors, and midwives) in learning and developing skills in prescribing, the concept of capability warrants consideration.
An important aspect of clinical reasoning relates to attributes of individuals that influence decision-making. Decisions individuals make are greatly influenced by how they conceptualise the decision and the outcome they want to achieve. Different factors may be considered important depending on the individual’s mental representation of the situation, a process Schön (1988) described as problem setting. Problem setting refers to the process where interactively individuals name the things to which they will attend and frame the context in which they will attend to them (M. Smith, Higgs, & Ellis, 2008). In other words, the clinical decision maker will be partly influenced by the formulation of the problem and partly by their norms, habits, and personal characteristics. These authors argued that professionals are likely to have a number of personal qualities or capabilities in decision-making that enables them to make effective decisions in relation to the task.

Capability in clinical reasoning is described as the integration and the effective application of thinking and learning skills to make sense of, learn from, and generate knowledge within familiar and unfamiliar clinical experiences (N. Christensen, M. Jones, J. Higgs, & I. Edwards, 2008). Christensen et al. suggested that descriptions of characteristics of the clinical reasoning and practice of expert physiotherapists show deep similarities to descriptions of performance of capable individuals. In addition, the key elements of capability are directly applicable and recognisable in the clinical reasoning of skilled individuals. They described these skills as confidence, effectiveness in decision-making, providing contextual justification for actions and decisions, motivating self and others, communication and collaborating with others to effect change, and critical and reflective thinking.

Similarities between capability with the Aristotelian notions of practical knowledge and reasoning has been elaborated on by Higgs et al (2004), who described the key feature of practical reasoning as both the application of knowledge and, most importantly, experiential knowledge. The authors purport that clinical reasoning is the vehicle for experiential learning from practice. They concluded that not only does clinical reasoning serve to develop practice; its use can also demonstrate practice capability. They proposed that learning from clinical practice requires thinking and learning skills to be integrated and applied to both the doing of the clinical reasoning and the processing of the experience of clinical reasoning.

Educating health care practitioners for capability, rather than competence, has been put forward as an argument in the preparation of professionals in today’s health care environment. The ability to adapt to change, generate new knowledge, manage one’s own professional development and
contribute to shaping the future, are characteristics that extend beyond the level of competence (Higgs, et al., 2004). Therefore Higgs et al. (2004) argued that educating health professionals needs to focus on the development of generic thinking and learning skills and clinical reasoning skills.

Higgs and Jones (2008) went on to propose a model of clinical reasoning as an upward and outward spiral, a cyclical and developing process, where each loop of the spiral incorporated data input, data interpretation, and reinterpretation and problem formulation and reformulation. The intention is to achieve a progressive, broader, and deeper understanding of the clinical problem. However, several core dimensions play a key role in the development of the process of clinical reasoning. These are knowledge, cognition, and meta-cognition.

2.4.2 Knowledge development

The second core dimension of clinical reasoning relevant to this study is knowledge development. Knowledge development is a dynamic and context bound concept that uses language to construct meaning. In learning to prescribe, the role of biomedical knowledge, clinical knowledge and practical knowledge has been discussed in much of the medical and nursing literature reviewed for this study. As a construct, a review of literature on the relevance of knowledge to learning and practice was undertaken to provide some understanding of the philosophical underpinnings of diagnostic and therapeutic reasoning.

Language serves as a tool of rethinking, learning, and making meaning (Vygotsky, 1986). The definition of knowledge from a traditional sense (episteme) states that knowledge emerged from what we believe or hold true and accept as justified. In the fourth century BC, Aristotle added to episteme, the concept of techne and phronesis. These are two forms of knowledge that deal with science: production/creativity; and practical wisdom/ethics respectively. These form different ways of knowing the physical and human world (Higgs, Jones, & Titchen, 2008). The shift in focus to practical knowledge occurred in the 1980s, influenced by international, technological, and economic developments, where the content of practical knowledge and its relation to professional competence became an emergent concept (Higgs et al. 2008). This move shifted the view of theoretical knowledge, previously seen as separate to practical knowledge, and disseminated via experts, to seeing such knowledge as embedded in practical actions and activities.
Author and philosopher Michael Polanyi proposed a categorisation of knowledge that reflected the views of contemporary Western society. He proposed two distinct knowledge categories, ‘knowing that’ (propositional knowledge) and ‘knowing how’ (non-propositional knowledge) (Polanyi, 1958). Propositional knowledge is generated formally through research and scholarship. This includes scientific knowledge (from the sciences), logic (from philosophy), and aesthetics (from the arts). It represents the ‘knowledge of the field’. Non-propositional knowledge is generated primarily through practice experience (Higgs, Jones, Loftus, et al., 2008). In the field of nursing practice, Benner (1984) introduced the notion that there are two broad knowledge types that guide decision-making in nursing, ‘theoretical knowledge’ and ‘practical knowledge’. According to this view, theoretical knowledge is formalised in terms of general abstract rules and principles, while practical knowledge is derived from experience. Theoretical and practical knowledge are highly inter-related, but in some ways, distinct kinds of knowledge (Tanner, 1989).

Higgs, Joy and Christensen (2008) argued that propositional knowledge (‘knowing-that’) is commonly regarded, in modern society and in professional discourse, as having a higher status in reflecting the domination by the physical sciences and the scientific method. Ryle (1949), however, opposed this view and argued that procedural (practical) knowledge has primacy over propositional (theoretical) knowledge, as this follows, rather than drives, procedural knowledge. His view was that some theory is inside (part of practice) while other (external) theory is utilised in practice. Barnett (1990) asserted that where problems are not discrete, or solutions definite, knowledge beyond science are needed, and in the realm of a prescribing encounter, each way of knowing has a place in clinical reasoning.

Benner, Tanner and Chesla (1997) argued that practical knowledge is itself a form of knowledge, not merely the application of knowledge. That is, practical knowledge is a knowledge that individuals possess not in isolation but based upon the “shared life of a work group”, whereby clinicians learn from watching and interacting with others in cooperative and collaborative teamwork. This view was also supported by Higgs, Jones and Christensen (2008) who referred to practical knowledge as “professional artistry”.

Professional artistry reflects a unique individual view within a shared tradition involving a blend of practitioner qualities, practice skills and creative imaginative processes (Paterson & Higgs, 2008). The authors call this “professional practice judgement artistry,” a fusion of professional judgement and practice artistry. Professional practice judgment artistry is concerned with
“practical knowledge, skilful performance or knowing as ‘doing’” (p. 182). Professional artistry is developed through the acquisition of a deep and relevant knowledge base and extensive experience (Beeston & Higgs, 2001); yet being cognisant of the role of theoretical knowledge or scientific evidence for practice. The professional artist practitioner is described as one who uses such knowledge as a significant part of the range of knowledge, including experience-based knowledge, as tools, and as a framework for clinical decision-making (Paterson & Higgs, 2008).

Experiential knowledge is based on the nature of subjective context provided by personal experience. Prosser and Walley (2006) explained that experiential knowledge is essentially a reflective process grounded in actual prescribing, for example, in the prescribing of new drugs, as this allows doctors to test its therapeutic outcomes and interpret the evidence in the light of experience. Thus, the authors concluded, actual prescribing or ‘doing’ prescribing, is an experiential learning process with further prescribing reliant upon examination of uses, experience and familiarity.

Health professionals bring their own personally owned and formally assessed propositional knowledge to prescribing. This will include knowledge, in personalised form, together with procedural knowledge, process knowledge, experiential knowledge, and impressions in episodic memory that may be explicit or ‘tacit’. Polanyi (1958) suggested that personal knowledge arises from personal and professional experience. Personal knowledge that is accompanied by reflection provides the individual’s frame of reference, and promotes wholeness and integrity in the personal encounter. Polanyi termed this “the tacit dimension” because although expert clinicians are able to act on the knowledge, they cannot always verbalise exactly what they were doing. Through action and reflection, practitioners build a stock of tacit knowledge, which becomes increasingly nuanced with further experience. Tacit knowledge is therefore developed in action. Tacit knowledge is also derived from social influences, interprofessional relations, and professional networks (Prosser & Walley, 2006).

A strong discipline specific knowledge base, whether derived from theory and research (propositional), or from the clinician’s professional and personal experience (non-propositional), is necessary for sound and responsible clinical reasoning. However, without reflective inquiry or cognition (ability to analyse, synthesise and evaluate data collected), a clinician will not be able to adequately process clinical data against their discipline specific and personal knowledge base while taking into consideration the patient’s needs, and the clinical problem. Cognition therefore follows knowledge, as a key step in clinical reasoning to deepen one’s understanding of the
decision of the intervention and actions taken (Higgs, Jones, Loftus, et al., 2008). Clinical reasoning among practitioners also utilised core dimensions of practice knowledge reasoning, and meta-cognition. Meta-cognition, or reflective self-awareness, enables clinicians to identify limitations in the quality of information obtained, inconsistencies, or unexpected findings. For Higgs et al (2008), meta-cognition is a key principle, as it serves to bridge knowledge, and cognition.

Several approaches have been influential in providing the theoretical background of diagnostic reasoning in medicine. The early work of Newell and Simon (1972) presented a problem-solving approach to diagnostic reasoning in medicine. Research in this area has focused on how an ill-structured problem situation is defined and structured and on identifying the strategies of experts in a field with the aim of facilitating the acquisition of these strategies for learners (Schwartz & Elstein, 2008). The second approach has been on decision making, which contrasts human performance with a normative statistical model of reasoning under conditions of uncertainty that shows the cognitive processes by examining errors in reasoning. Examples of these approaches are described further in the following section.

2.4.3 Hypothetico-deductive model

Thompson and Dowding (2009, p. 140) stated that the hypothetico-deductive model is generally held up as the “gold standard” in terms of approaches to clinical diagnosis. A number of studies (Bornstein & Emmer, 2001; C. Bradley, 1991; Cader, Campbell, & Watson, 2005; Harbison, 1991; Lauri & Salantera, 1998) have examined the reasoning of both nurses and doctors using the hypothetico-deductive model, which seeks to explain the process of how individuals go through a number of phases in their reasoning processes. The hypothetico-deductive reasoning or the information processing model is rooted in medical decision making (Joseph & Patel, 1990). Reflecting the biomedical model, the scientific or hypothetico-deductive approach is basic to the meta-cognitive reasoning that is essential to making a medical diagnosis. There are several stages outlined in the hypothetico-deductive model. These are cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation.

Elstein, Shulman and Sprafka’s (1978) well known research in medical problem-solving was based on elements from this early cognitive work in clinical reasoning and problem-solving. The authors used various methods to analyse the subjects’ reasoning processes, including the use of simulated patients, recall tasks and verbalisation or thinking aloud. Several major findings of this
research had a strong influence on education in medicine and other health care professionals, including nursing.

A second major development in clinical reasoning theory based on the hypothetico-deductive model, proposed the linking of the reasoning process to the specific knowledge that a clinician held in a certain speciality area, called ‘case specificity’ (Garbutt, et al., 2006). The authors proposed that in case specificity, a successful reasoning strategy used in one case, may not apply in a second case, because the practitioner does not know enough about the area of the patient’s problem. Clinical experts were found to have not only a method of problem solving, but also to combine that with specific, organised knowledge in solving the problem. Research on clinical reasoning of experts showed that in familiar, non-problematic situations, experts did not display hypothesis testing, but used pattern recognition processes. This process of reasoning is called “forward reasoning” (Higgins & Tully, 2005; Higgs, 2000).

Forward reasoning is described by Higgs (2000) as a process of reasoning where medical clinicians see patterns, from the cues gathered from a patient in the interview or data collection, that conform to a previously learned picture or pattern, also called “illness script”. This pattern recognition comes from the experts’ well-structured clinical knowledge, and is used in solving routine cases in areas of speciality, where experts make connections or inferences from the data, recognising patterns and links between clinical findings, and a highly structured knowledge base (Higgs, 2000).

For novices or students the process can be different. Students and novices would rely on the hypothetico-deductive process, setting up hypotheses and gathering clinical data to prove or disprove cues. This process of clinical reasoning is called ‘backward reasoning’. Schmidt (1990) proposed that this same process is also used where experienced clinicians lacked specific clinical knowledge when dealing with a patient. Both forward and backward reasoning has been proposed in one study (M. Fonteyn & Fisher, 1995) that examined nurses’ decision making when monitoring unstable patients immediately after surgery. The study suggested that forward and backward reasoning are approaches that are also used in nurses’ clinical decision-making.

Hammond (1996) examined the use of the hypothetico-deductive model by nurses during clinical decision-making, and the findings highlighted the difficulties encountered by nurses on reflection due to caution when producing hypotheses. The incorporation of decision trees improved the decision-making ability of nurses, and assisted in the likelihood of nurses making the correct
diagnosis (Lipman & Deatrick, 1997). Decision analysis theory (DAT) was introduced into medicine in the 1990s and includes the use of Bayes’ theorem and decisions tree. Many nurses adopt this approach to assist clinical decision-making, using decision trees to numerically assess potential outcomes. However, some decisions have to made under conditions of uncertainty, and in many situations, there is an element of risk involved in the decision (Harbison, 1991; Kuipers, Moskowitz, & Kassirer, 1988).

In the medical literature (Charlin, Tardif, & Boshuizen, 2000), early work in clinical reasoning centred on the conceptualisation of a problem-solving process. General methods or heuristics for problem solving were proposed for use across the field. An expert was someone who was particularly skilled in doing this heuristic search. ‘Heuristic’ is an adjective for methods that help in problem solving, in turn leading to learning and discovery. Fonteny and Grobe (1993) argued that “heuristics are mental rules of thumb that assist reasoning” (p. 239) and are obtained over time through exposure and experiences with similar patient cases. These methods (heuristic) in most cases employed experimentation and trial and error techniques. A heuristic method is particularly useful to rapidly come to a solution that is reasonably close to the best possible answer, or ‘optimal solution’. Heuristics are ‘rules of thumb’, educated guesses, intuitive judgments, or simply common sense.

Fonteny and Grobe (1993) purported that in many cases more nurses’ reasoning tasks are not aimed at diagnosis and hypothesis generation. They argue that nurses reason to distinguish between relevant and irrelevant patient data, determine its significance, and make decisions that assist in completing the overall treatment plan. However, Cioffi and Markham (1997) asserted that nurses’ reliance on this method of clinical decision making needs further study, as using heuristics to simplify task complexity may lead to inaccurate diagnosis and treatment.

2.4.4 Role of intuition in decision making

Nursing practice is characterised by making clinical judgements in everyday practice (Thompson & Dowding, 2009). Nurses spend a good deal of their time identifying clinical deterioration, assessing a patient’s current and previous condition and predicting potential events in relation to the patient’s condition (Cioffi, 2000). Within nursing literature a number of terms are used to describe clinical decision-making including: clinical judgment (Benner & Tanner, 1987), clinical inference (K. Hammond, Kelly, & Castellan, 1966) and in more recent nursing literature, clinical reasoning (Grobe, Drew, & Fonteyn, 1991) and diagnostic reasoning (Radwin, 1990). Although
these terms can be used interchangeably, Thompson and Dowding (2009) advised that each term entailed a different type of thought process.

Studies examining the focus of nursing practice suggest that nursing practice is characterised by making judgements (Cioffi, 2000; Lamond, Crow, & Chase, 1996); and most of the judgements nurses make are based on information collected about, or from, the patient (Thompson, et al., 2009). When these judgements are carried out in the clinical setting, they are called clinical judgments, and clinical decisions normally follow clinical judgements. Thompson and Dowding (2009) explained that clinical judgement and clinical decisions vary, depending on the topic, for example, “when one is trying to describe how nurses reach their judgements and decisions, or provide ways of improving those judgements and decisions” (Thompson, et al., 2009, p. 3). It is important to recognise exactly what it is one is describing or improving. A clinical judgement is described as “assessing between alternatives”(Dowie, 1993), while clinical decision is defined, as a “choice between alternatives” (Thompson, et al., 2009, p. 4).

According to Thompson and Dowding (2009, p. 2) “each judgement and decision a nurse makes will require them to think about an uncertain future, in the present, using evidence that comes from a (more) certain past”. There are many uncertainties in delivering health care, including uncertainty about illness and health as there is no clear definition even of “disease.” As with all clinicians, nurses vary in their ability to recognise the signs, ask the right questions and apply diagnostic criteria. Thompson and Dowding (2009) suggested that understanding how these judgements and decisions are made is vital to understand why nurses do what they do, and just as importantly, why they fail to do what they should do.

Smith (2006) described clinical decision-making as paramount to the development of nurses’ intellectual and cognitive skills that are needed to manage complex information and make judgments. To develop nurses as autonomous clinical decision-makers, pre-registration education and training programmes need to incorporate an educational framework that supports the development of clinical decision-making. Clinical decision-making is a complex activity that requires practitioners to be knowledgeable in relevant aspects of nursing, and to have access to reliable and appropriate sources of information. The process of making judgements and decisions involves using information; how individuals use information, the type of information, and where that information comes from, are all key to successful decision-making (Dowding & Thompson, 2009b).
The work of Benner, Tanner and Chesla (Benner, et al., 1997) focused on understanding the practical reasoning of the clinician while engaged in practice. Their work suggested using the term ‘clinical judgment’ in nursing, rather than ‘clinical reasoning’, to represent the multiple ways in which nurses come to understand the problems, issues and concerns of patients and families. However, one could also argue that although the study of clinical judgment using cognitive models is important in clinical practice, it has limited the possibility of seeing other vital aspects of clinical judgments. The authors purported, that such aspects include the reasoning, that is a significant part of the everyday practice of expert clinicians that relies on “intuition”, including deliberate rationality, or a disposition towards what is good and right; on practice wisdom gained from experience; on involvement in the situation, and on knowing the particular patient through being attuned to his pattern of responses; and through hearing narrative accounts of his/her illness experiences (Benner & Tanner, 1987).

Benner and Tanner (1987) initially identified six characteristics as components of expert nurse’s intuitive judgment.

These are “pattern recognition, the ability to perceive relationships between concepts in order to identify a relevant pattern of care provision, similarity recognition, ability to recognise resemblance of patient case to past cases, common sense understanding, when one sees the cultural and emotional meaning of patient illness, skilled know-how, and cognitive abilities acquired through clinical experience, sense of salience, an ability to distinguish between important and unimportant events and deliberate rationality, a strategy for maximizing judgement by considering several options “ (p. 12).

It is also important to note that from the seminal work of Benner and colleagues on differences in thinking skills of experts (experienced nurses) and novices (new nurses or those new to an area), it is known that clinical experience is necessary for the development of nurses’ clinical reasoning and decision-making skills. Benner (1987) further contended that the use of intuition is a legitimate part of nursing practice, and has described aspects of judgement such as pattern and similarity recognition, common sense understanding (derived from culture, society and language), skill ‘know-how’, sense of salience (distinguishing meaningful events) and deliberate rationality (adopting a new perspective on a situation) fundamental to nurses’ reasoning.

Harbison (1991) argued that it is not only difficult, but impossible, to teach “intuitive judgement”, as this is developed when the nurse becomes an expert (Benner, 1984). The development of quality critical reflection or reflection in action, as vital to the development of intuitive experts, is
recommended by Schon (1983). Traditionally, in nursing, new staff nurses have learnt informally by observing, working with experienced nurses, and adopting the observed practices, but in the process, gained little understanding of the nature of expert judgement.

For Benner (1984) expertise in a situation always involves accurate interpretation of specific responses to a specific situation. It also involves discretionary judgment and often risk. She suggested that if one tries to de-contextualize and standardize the “essential features” of expert human decision-making, the result is, at most, a minimal level of competency, similar to what can be achieved through systems analysis and computer programs (H. L Dreyfus, Dreyfus, & Athanasiou, 1986). Benner (1987) further suggested that the nurse clinician is often confronted with complex and ambiguous patient care situations. Sometimes decisions are made to meet one important patient care need at the expense of another important need. Uncertainty is usually inherent in clinical practice and not even expertise can rid the clinician of that. She added that difficult choices are made based on the best judgement in the particular situation (setting priorities) but cautioned that the language of priority setting betrays the complexity and residual uncertainty of the choices made. She emphasised the need for research into expanding the way we think about describing and thinking about nursing expertise, and about nursing practice itself. Experience, for Benner, refers to a very active process of refining and changing preconceived theories, notions, and ideas when confronted with actual situations.

The rationalistic perspective is in agreement with the current trend in nursing toward research/rationale-based nursing and accountability. It is also well recognised that decision making is concerned with managing a range of information from diverse sources in order to make professional judgment (Orme, Frolich, & Vrhovac, 2002). However, within the ambiguous and uncertain world of clinical practice, the scientific and rational approach to decision making may be inappropriate.

In summary, several factors have been identified as key to the integration and consolidation of pharmacology knowledge and development of therapeutic reasoning and decisions. Clinical knowledge, practical knowledge, and experience, together with professionalism and reflexivity were considered core to the development and consolidation of skills in therapeutic reasoning. To make sense of the multiple factors and interests that are pertinent to the reasoning analysis, construction of narratives may be required as an approach to capture the clinician’s thought processes (Higgs, Jones, & Titchen, 2008)
To further understand medical and non-medical prescribers’ experiences in how they learn to prescribe, literature on the differences between medical and non-medical (e.g. nurses) prescribers’ professional preparation in prescribing was also reviewed. The purpose is to expand on the issues presented in Chapter 1 related to concerns about the adequacy of nurses’ knowledge in diagnosis and pharmacology.

2.5 Educational preparation for prescribing- the medical literature

The educational preparation of junior doctors for prescribing and prescribing practices of doctors are being debated internationally (Aronson, et al., 2006; Dean, et al., 2002; Gwee, 2009; Mackay, 2003; Maxwell & Walley, 2003). The proliferation of literature suggesting the need to review and improve the delivery of pharmacology and therapeutic education in medical schools has emerged in the last decade or so as a consequence of the Nierenberg report (Nierenberg, 1990a, 1990b, 1991).

Nierenberg, an academic clinical pharmacologist with experience in undergraduate teaching, developed a set of core elements and principles related to the teaching and learning of clinical pharmacology and therapeutics designed for the medical curriculum. These core principles, knowledge, skills and attitudes, have since featured in medical curricula to improve the education and training of interns and junior doctors in prescribing (S. Pearson, Rolfe, Smith, et al., 2002; Prosser & Walley, 2006; Richir, et al., 2008; Ross & Loke, 2009).

2.5.1 Initial preparation for doctor prescribing

In many medical curricula, the teaching and education of doctors is centred on symptoms and diagnosis, with little or no time given to the principles of drug treatment (Richir, et al., 2008). The authors stated that in the past, information of drug treatment was presented in the “form of dogmatic indications of which drug to use, and when” (p. 218), and education was usually given in the early part of the curriculum. The traditional teaching approach has been criticised in some studies (e.g. Maxwell & Walley, 2003; Oshikoya, O Senbanjo, & Amole, 2009; Walley & Webb, 1997) as often leaving students with an excessively high burden of factual drug information and an emphasis on basic science, but very little focus on other patient-centred activities. Numerous studies have reviewed and audited medical curricula in the United Kingdom (Aronson, 2006; Aronson, et al., 2006; Maxwell & Walley, 2003; Oshikoya, et al., 2009; Walley & Webb, 1997; Weingart, Wilson, Gibberd, & Harrison, 2000) and in the European Union (de Vries, 1993; de Vries et al., 1995; Denig & Haaijer-Ruskamp, 1992; Richir, et al., 2008). These studies were
mainly focused on the pharmacology and therapeutic knowledge of undergraduate medical students and interns and many concluded that undergraduate medical students learn little about the therapeutic use of drugs even after graduation.

Some studies (Boreham, Mawer, & Foster, 2000; Scobie et al., 2003) that have investigated the initial preparation of doctors for prescribing have concluded that medication errors occur as students failed to effectively integrate scientific and clinical knowledge. Recommendations advocated a curriculum that integrates a grounding in medical science, clinically appropriate skills, and structured clinical experiences that should follow structured teaching.

In the context of medical education, pharmacology may broadly be defined as the science of drug actions, and drug effects produced in living cells, cellular structures, tissues, organs and whole organisms occurring in both animals and humans (Gwee, 2009). Pharmacodynamics is the core pharmacology knowledge fundamental to understanding drugs. As a basic medical science discipline, pharmacology knowledge provides the scientific basis of therapeutics (Gwee, 2009), this being the scientific foundation for safe and rational prescribing of drugs of various human ailments and diseases.

However, Gwee (2009) suggested that the relevance of pharmacology requires a more contextualised definition, as this will put into perspective the scientific foundation for the safe and rational prescribing of drugs. Braunwald (2005) suggested that learning pharmacology requires a significant integration of basic and applied medical knowledge, as pharmacology is uniquely positioned among the biomedical sciences. He asserted that pharmacology depends on, and contributes to, genetics, biochemistry, cell biology, organ physiology, and clinical medicine.

Context learning is defined as learning in a setting that is similar to the practice setting of the future professional. Ritchir et al. (2008) proposed that the so called ‘context learning’ seems to be effective in teaching clinical pharmaco-therapeutics for medical students as knowledge is gained at the same time as applying this knowledge in practice. Several authors suggested that knowledge stored this way in the brain is essential for recall and application (Regehr & Norman, 1996; Schmidt, Norman, & Boshuizen, 1990), and that storing pharmaco-therapeutics knowledge in combination with the situation in which knowledge will be applied, benefits the speed and quality with which the information is recalled.
Learning pharmacology can be overwhelming for medical students if they are expected to remember the pharmacology knowledge for every drug. Several studies (Braunwald, 2005; de Vries, 1993; Gwee, 2009; Maxwell & Walley, 2003) have indicated that the large number of drugs that they encounter during their clinical internship years beleaguers medical students. Maxwell and Walley (2003) advised that medical schools should create a list of drugs, referred to as a “formulary”, that will help students prioritise learning. The list should include commonly used drugs in both primary and secondary settings that are used to treat common ailments and are representative of classes of drugs. Newly qualified doctors can use the formulary to initiate or prescribe from, under the direction of a senior doctor. According to these authors, even if students are not expected to know the exact doses for each drug, they should know where to find the information quickly and easily, and should be expected and encouraged to look up the doses before prescribing any drug.

The literature concerned with prescribing education in medical schools has revealed differences in views on the knowledge and skills expected of new doctors, what is required of junior doctors in their workplaces, the level of supervision received, and more importantly, how safe prescribing is assessed. A study by Heaton and colleagues (2008) reported on medical students expressing concerns about their training at individual medical schools. Many felt they needed more education in clinical pharmacology and therapeutics. More importantly, many felt underprepared for prescribing. Weaknesses in the area of pharmacology knowledge underpinning prescribing, practical elements of calculating dosage, writing up scripts and drugs sheets were some factors identified in the study (Likic & Maxwell, 2009).

The principle of therapeutic balance, to prescribe drugs only when the benefits are expected to outweigh harm (Gwee, 2009), focuses medical education on the processes of judgement, and decision-making practice. Studies of medical judgement and decision-making in the last decade or more have informed on how prescribing decisions can improve.

2.5.1.1 Role of biomedical knowledge in diagnostic reasoning

Physicians are trained to solve diagnostic problems, and a plethora of studies of a process or a set of processes, variously labelled “problem-solving”, “clinical reasoning”, “diagnostic reasoning” and “medical decision-making”, has been presented in literature, to provide some descriptions of how physicians behave, and prescriptions of how they should behave (McGuire, 1985). The assumption that biomedical knowledge plays an important role in diagnosis and prescribing in
medical decisions has been discussed in many studies (Joseph & Patel, 1990; Patel, Arocha, & Groen, 1986; Patel, Evans, & Groen, 1989; Woods, 2007). The role of biomedical knowledge in medical diagnosis has also been questioned (Woods, 2007), and the issue of whether biomedical knowledge plays an indirect role in clinical reasoning and in other medical decisions related to treatment remains unresolved.

The process of diagnosis is integral to the practice of medicine at every level. Without the proper diagnosis, a label for a disease or set of symptoms, the proper treatment or plan cannot be chosen. The role of biomedical knowledge in medical diagnosis and treatment has been extensively studied, especially as it related to its role in everyday practice. Cognitive theories of medical diagnosis assume biomedical knowledge, a process of comprehension, and problem solving (H. P. Boshuizen & Schmidt, 1992). This position has been elaborated by Feltovich et al. (1984) who described the representation of a diagnostic problem as taking the form of an “illness script” in which patient characteristics, signs and symptoms of the disease and knowledge of underlying processes are organised. These illness scripts describe the patient’s present condition, and how it came to be understood through biomedical knowledge. This refers to the knowledge for anatomy, physiology, pathology, pathophysiology, microbiology, and pharmacology.

Comprehension, and therefore diagnosis, is derived from biomedical knowledge, a view supported by other investigators of medical diagnosis (Kuipers, 1984; Kuipers & Kassirer, 1984). However, this viewpoint has been challenged in some studies (Patel, et al., 1989; Schmidt, et al., 1990), who suggest that biomedical knowledge places constraints on the ways in which patient characteristics, signs and symptoms are interpreted. For these investigators, medical experts predominantly use clinical knowledge, not biomedical knowledge, to represent and diagnose a patient problem. Clinical knowledge is defined as the knowledge of attributes of sick people, and the ways in which disease can manifest itself in patients, including the kinds of complaints, the nature and variability of the signs and symptoms, and the way diseases are managed (Patel, et al., 1989). Biomedical knowledge, in contrast, explains the pathological principles, mechanisms, or processes underlying the manifestations of the disease. These authors point out that the application of biomedical knowledge is a particular characteristic of non-expert reasoning. They propose that clinical knowledge is just as important to the expert clinician’s deliberations.

Notwithstanding its importance in medicine as a science, the role of biomedical knowledge in medical diagnosis and treatment in everyday practice is not clear. Boshuizen & Schmidt (1992) suggested that research findings in relation to medical diagnosis have been contradictory, and a
theory explaining these diverging research outcomes is still lacking. In their investigation of the role of biomedical knowledge in medical diagnosis and clinical reasoning, the results suggested an abrupt shift from the application of biomedical knowledge to clinical knowledge associated with expertise. A peak in the functionality of the biomedical knowledge applied was observed at the lower intermediate level (second year medical students), while use of biomedical knowledge decreased with clinical experience. The results suggested that biomedical knowledge is acquired, and used, as a major instrument in interpreting clinical information in the early stages of medical students’ skill development in clinical reasoning. However, its applicability was reduced amongst medical doctors who were more clinically experienced (H. P. Boshuizen & Schmidt, 1992).

Several important issues were addressed in that particular study (H. P. Boshuizen & Schmidt, 1992). First, that biomedical knowledge for intermediate level medical students is a reliable tool for forming coherent mental representation of a case, but does not endure. The transition to the next stage (experienced doctor) seems to be initiated by the effect of the practical experience, where at this stage (experienced clinician) the application of biomedical knowledge appears to be virtually absent. Instead, clinical knowledge appears to be predominantly applied. However, the issue of which mechanisms underlie this shift in knowledge application remained unclear.

The study concluded that its hypothesis was proven, that an increase in the application of biomedical knowledge reflects an increase in availability whereas a decrease in the application reflected a decrease in availability (H. P. Boshuizen & Schmidt, 1992). This would imply that biomedical knowledge is acquired, and applied, at the early stages of the intellectual development of doctors-to-be, and may initially be advantageous in the student’s understanding of the clinical phenomena. However, after experiences with real patients, and their diseases, biomedical knowledge might become less important, and may eventually become inaccessible or rudimentary. Clinical knowledge, on the other hand, continuously increases.

A second hypothesis seeking to explain a decrease in the clinical application of biomedical knowledge amongst medical professionals is that biomedical knowledge does not seem to play an active role in clinical reasoning. While biomedical knowledge is remembered, it is not drawn on actively; it is inert. Clinicians may use experiential knowledge instead. The experiential knowledge referred to here by Patel et al. (1986; Patel, et al., 1989) were those acquired as a result of extended practice, and continued exposure to the many different ways in which a disease manifested itself. Thus, biomedical knowledge and clinical knowledge are two distinct yet influential aspects of medical prescribers’ prescribing decisions.
Schmidt et al. (2005) suggested that biomedical knowledge and clinical facts become increasingly integrated as the clinician gains experience, which they termed ‘encapsulation theory’. In encapsulation theory, knowledge in one category is translated into and subsumed within another category. The authors proposed that for medical experts, basic science and biomedical concepts become encapsulated under clinical facts in the mental representation of a disease. Over time, the clinicians can then recognise a group of clinical facts linked by biomedical knowledge, without needing to overtly describe the underlying pathophysiology.

However, Woods (2007) argued that although encapsulation theory, considered in isolation, tells us that expert mental representation of any disease can include biomedical knowledge embedded in clinical knowledge, it does not explain whether encapsulated biomedical knowledge is a causal factor in expert performance, or simply a by-product of years of clinical experience. For Woods, just because biomedical knowledge can be encapsulated under clinical knowledge, it does not mean it must be, in order for expert clinical performance to be attained. The view that clinicians can perform equally well without these types of knowledge structure remains plausible. Reference was made to using encapsulation theory approach in the teaching of diagnostic accuracy to medical students, where additional clinical exposure or alternate reasoning strategy can be combined with the teaching of science and biomedical knowledge. Studies have shown that like experts in the encapsulation studies, students with causal knowledge structure were also able to quickly recognise ‘encapsulated’ terms presented after studying a related clinical case (de Bruin, et al., 2005; Rikers, et al., 2005; Woods, 2007).

In summary, the role of biomedical knowledge and clinical experience are essential forms of knowledge, in the training and education of doctors, but concerns linger about the need to improve doctors’ clinical reasoning in relation to prescribing. Although literature has predominantly focused on diagnostic and clinical reasoning, less is known about the processes of reasoning behind treatment selection or therapeutic reasoning. Since the focus of this study is the development of knowledge and skills in prescribing amongst non-medical prescribers, the prescribing education and prescribing practices of nurses are reviewed to highlight differences between nurses (as non-medical prescribers) and doctors in their education and preparation for prescribing.

2.6 Research on nurse prescribing

Medical prescribing, both education and practice, has been extensively researched, and written about. This is not the case with nurse prescribing, to some extent because of its fairly recent
introduction. More importantly, because there have been “several prescribing models for nurses that has emerged in the last twenty years due to international differences between legislative procedures, and the professional bodies responsible for the regulation of nursing practice” (An Bord Altranais & The National Council for the Professional Development of Nursing and Midwifery, 2005, p. 613). These factors have contributed to the diversity of research in the area of nurse prescribing, education and practice. The majority of the literature on nurse prescribing education was from the United Kingdom. A few studies came from the USA, Australia, and Sweden.

Given that the United Kingdom has recently introduced non-medical prescribing, not only for nurses but also for other health professionals, prescribing is not limited to a single model (see Chapter 1). Many studies to date were aimed at evaluating and investigating the adequacy of the initial preparation and training of nurse prescribers. In the United Kingdom, the delivery of the prescribing education programmes is based on curriculum requirements specified by the Nursing and Midwifery Council (2006). Latter, Maben, Myall and Young (2007b) completed the first evaluation of the adequacy of these educational programmes in the training, education and the continuing professional development of non-medical prescribers. The training for Health Visitors and District nurses to become an Extended Formulary Nurse Prescriber (EFNP) consisted of 25 days of taught content in a Higher Educational Institution (HEI) including 12 days of supervised practice with a prescribing mentor. In 2002, nurse prescribing was extended to a wide range of nurses who, after successful completion of a longer training programme, were able to prescribe over 180 Prescription Only Medicines (POMS) and all General Sales List and Pharmacy medicines for around 80 clinical conditions.

Creedon, O’Connell, McCarthy and Lehane (2009) undertook a systematic review of all published research on nurse prescribing from 1993 to 2009. The aim was to present an overview of published research on nurse prescribing worldwide to guide policy development in the Irish health service and to identify the gaps in the current research. The authors identified eight recurrent themes in the 44 selected studies that met the inclusion criteria: confidence, relationships, education, patients’ perspectives, practices, and benefits.

In the USA, nurse practitioners were accredited to prescribe more than 30 years ago. The role of nurse practitioners with prescriptive authority was initially introduced in collaboration with supervising physicians. Currently, 12 of the 50 states have legislation allowing nurses to prescribe without physician involvement, including for controlled drugs. A further 34 states have
authorised nurse prescribing inclusive of controlled drugs with some medical involvement (Pearson, 2007). Nurse prescribing education in the USA is incorporated in the training and preparation of accredited nurse practitioners at a Master’s level (Towers, 2005). In the USA standardisation of nurse practitioner educational programmes has been achieved through the implementation of the Essentials of Master’s Education for Advanced Practice Nursing (American Association of Colleges for Nursing, 1996) and The National Task Force for Quality Nurse Practitioner Programmes (NONPF, 1997, 2002). Both are requirements for programme accreditation in the USA (Towers, 2005). Literature on nurse prescribing from the USA are mainly focused on the prescriptive patterns of nurse practitioners and physicians in terms of medicines prescribed, benefits to patients, cost and safety (Running & Kipp, 2006).

Countries such as Canada, Ireland, Australia, and New Zealand that have introduced nurse prescribing or non-medical prescribing only in the last 10 years differ in legislation and prescribing models. Hence there is variability in how prescribing education at post-registration level through to Master’s preparation level (where pharmacology and therapeutics are included as core subjects) are introduced. In Canada, Australia and New Zealand, nurse prescribing education has been developed as part of the nurse practitioner role, while in Sweden prescriptive authority has been limited to healthcare settings outside the hospital (An Bord Altranais & The National Council for the Professional Development of Nursing and Midwifery, 2005). Studies investigating the adequacy of the educational preparation, prescribing practice and clinical decisions of non-medical prescribers are therefore in their infancy.

While the introduction of nurse prescribing in NZ generated some commentary type articles in medical literature (see chapter 1), articles reporting on research in New Zealand investigating nurse prescribing education and preparation are few. It is important to note that the prescribing preparation of nurses in New Zealand differs to that of the United Kingdom. In NZ, schools offering advanced nursing programmes that include prescribing are accredited by the Nursing Council of New Zealand and are at Master’s level. Unlike in the United Kingdom, nurse practitioners in New Zealand may be granted independent prescribing authority. Since the inception of nurse practitioner prescribing in New Zealand, very few studies have investigated the educational curricula for preparing nurses for prescribing in New Zealand and even fewer specifically on the adequacy of the educational programmes at a Master’s level (Gardner, Dunn, Carryer, & Gardner, 2006; Gardner, et al., 2004; Lim, et al., 2007; Spence & Anderson, 2007).
2.6.1 Education for prescribing

International literature reviewed for this study on the educational preparation of nurses in pharmacology and therapeutics presents two important arguments. First, pharmacology education is either lacking (While & Rees, 1993) or is inadequate (Sodha, et al., 2002) to prepare a nurse for a safe and effective role in prescribing and medication management (Manias, 2008). Secondly, if nurses are to take on extended and advanced roles, they need to ensure their knowledge and skills in diagnostic reasoning is essential for safe, effective (Latter, Maben, Myall, & Young, 2007a) and confident (Courtenay, Carey, & Burke, 2007b) prescribing practice.

In addition, several studies have advocated for the need to improve pharmacology education at the undergraduate level as nurses are ideally placed to promote safe and effective medication management interventions (Boggs, Brown-Molnar, & DeLapp, 1988; Manias & Bullock, 2002). The need to improve pharmacology education for nurses has been addressed, not only to prepare nurses for prescribing, but also to improve their knowledge and skills in medication management. Therefore, literature reviewed for this study was further categorised into two sections, pharmacology education at the undergraduate level in relation to medications, and pharmacology education at the postgraduate level in relation to prescribing, as both are essential aspects of medication management.

2.6.1.1 Undergraduate educational preparation

During the last 20 years of nursing education, in both New Zealand and elsewhere, there has been considerable development to prepare registered nurses for current and future role in medication management. With expanded roles that include diagnosis and prescribing, new challenges have emerged for educationalists to review the underlying holistic philosophy of nursing with its emphasis on ‘caring’, rather than ‘curing’, and to include specific training and education in pharmacology (Morrison-Griffiths, Snowden, & Pirmohamed, 2002).

Much literature suggests that many nurses lack not only sufficient knowledge in pharmacology, but in bioscience in general (Banning, 2003; Bullock & Manias, 2002; King, 2004; Larcombe, 2003; Manias & Bullock, 2002; Schwertz, Piano, Kleinpell, & Johnson, 1997; Sodha, et al., 2002). However, the issue of how much depth in bioscience is needed remains unresolved (Jordan, 1994). Some studies have indicated that although integrated curricula enhanced the “epistemological basis of holism in nursing” (Morrison-Griffiths, et al., p. 453), the development of a core pharmacology module in pre-registration programmes would raise the profile of
pharmacology, and provide nurses with a sound knowledge base for safe and effective medication management (Larcombe, 2003; Morrison-Griffiths, et al., 2002).

In addition, some studies have highlighted variability in preparing nurses in pharmacology. A study of nursing curricula throughout Australia shows an apparent lack of emphasis on pharmacology, especially in undergraduate programmes (Bullock & Manias, 2002). Where pharmacology was included in the curriculum, a high number of differences existed as to the content, delivery, style, and design.

A lack of time devoted to the teaching of pharmacology and therapeutics in undergraduate curricula has been criticised in many studies (Bullock & Manias, 2002; Jordan, 1994; Manias & Bullock, 2002). Too little (or insufficient) emphasis in pharmacology and bioscience in the undergraduate level, has led some authors to conclude that nurses are not well prepared for their responsibilities in administering drugs, and that their self-rated knowledge was higher than their actual knowledge (Ives, Bullock, & Marriott, 1996). More importantly, the way nurses make decisions regarding medication administration is unclear, and therefore, many nurses find it difficult to articulate the knowledge base upon which they make decisions (Luker & Kenrick, 1992).

A study by Wolf, Haakenson, Jablonski and McGoldrick (1995) revealed that nurses are more likely to learn the effects of medications through experiential learning, and sometimes through medication errors, with consequential negative outcomes for both patients and carer. Their study gave the impression that much pharmacology learning occurs in the clinical environment. Honey and Lim (2008) supported this view, but argued that integration of pharmacology in the clinical setting contributes to knowledge consolidation and application in pre-registration students. However, integration and application of pharmacology knowledge in the clinical setting for undergraduate nursing students was inhibited in clinical areas where registered nurses were not supportive. A study by Manias et al. (2002) argued that the lack of integration, and reinforcement of pharmacology knowledge in the clinical setting, contributed to the theory-practice gap currently observed in nursing education.

One study on nurses, including Registered Nurses (RN) and License Practical Nurses (LPN) in the USA found that knowledge levels were highest for RNs and LPNs for clinical indications of the drug, but a declining level of knowledge occurred for side effects, dosage considerations, mechanisms of action, drug interactions and pharmacokinetics (Boggs, et al., 1988). Nurses are
often required to give information about prescribed medication to patients, and a study by Bray and Ghose (1993) found that nurses lacked knowledge about the effects and precautions even of medications they themselves were taking. The investigators expressed concerns about nurses’ responsibility when offering advice on patients’ medication, when they themselves lacked knowledge, and understanding of the medications they were personally taking.

To enable nurses to perform their functions safely and effectively, Bullock and Manias (2002) proposed that nurses must have a comprehensive understanding of the scientific principles underpinning medications, as well as the ability to contextualise medication management to the complex and changing needs of patients. The authors added that inadequate knowledge of pharmacology at the undergraduate or pre-registration level may influence graduates’ perceptions of their roles as registered nurses in the teaching, mentoring, and supervision of undergraduate students. According to Bullock & Manias (2002), deficiencies in the level of knowledge in pharmacology may be a reason for registered nurses’ reluctance to adopt a teaching role with graduate nurses.

A recent New Zealand study (Jutel & Menkes, 2010) investigating the activities of senior nurses (who are not prescribing), and their influence on the prescribing habits of doctors, showed that there are many ways in which nurses can potentially influence the prescribing decisions of doctors in both the primary and secondary care settings (Jutel & Menkes, 2010, p. 95). Although the main reason for the study was to investigate senior nurses’ ‘tacit’ powers in influencing doctors’ prescribing decisions, it was the ‘source’ of the senior nurses’ knowledge that the authors challenged. No other study was found that has investigated the potential role of senior nurses’ influence on doctors prescribing decisions. However, a study by Castledine (2006) suggested that nurses had a central role in reducing medication errors and in monitoring the prescription decisions of doctors. The authors of both studies concluded that pharmacology education was fundamental, even for non-prescribing nurses.

In summary, a lack of, or inadequate emphasis and integration of pharmacology education in pre-registration nursing education, and its integration in clinical practice, has been associated with registered nurses’ lack of knowledge and skills in some aspects of medication management in clinical practice. Two important issues were identified in the literature. First, nurses’ lack of knowledge in the area of pharmacology in their undergraduate training will influence their potential roles in medication management, especially in the area of monitoring, patient education,
and evaluation. Second, the lack of pharmacology education at the undergraduate level will influence nurses’ safety and confidence as future prescribers.

2.6.1.2 Postgraduate education in prescribing

Many of the above issues have been used to judge the adequacy of nurses’ education at postgraduate level in relation to prescribing education. Several studies have indicated that the gaps in bioscience knowledge and the lack of pharmacology education, at the undergraduate level, may present difficulties for many nurses taking on extended roles, especially in prescribing (Banning, 2004; E Bradley, Hynam, & Nolan, 2007; Castledine, 2006; Courtenay, 2008; Couternay, Stenner, & Carey, 2009).

Banning (2003), on the other hand, argued for education to enable nurses to be capable practitioners, rather than merely competent to undertake specific skills and utilise specific knowledge. For this objective to be achieved, educational curricula need to include teaching nurses not only medication management, but also skills in clinical reasoning, which includes clinically based decision-making (Carr, 2004). Others suggest that although pharmacology is recognised as an important and essential foundation for drug therapy, delivery, education, and prescribing, it is the expanded role (of which pharmacology becomes an integrated dimension) of nursing in the 21st century, that warrants more attention (Caress, 2002; Latter, 2004; Lewis-Evans, 2004).

Offredy, Kendall and Goodman (2008) concluded that the lack of appropriate pharmacological knowledge, coupled with lack of confidence in prescribing, will require urgent attention if nurse prescribers are to be seen as safe, efficient and effective. Offredy (2002) concluded that:

_Little is known about why nurses make decisions to prescribe for some patients, and not others, how they judge when they have reached the limits of their competence, and how the relationship between pharmaceutical knowledge, clinical experience, and the patient’s problem, influence the decision to prescribe or refer to a medical practitioner (Offredy, 2002, p. 84)._  

Bradley et al. (2007) investigated the safety of nurse prescribing in the United Kingdom and revealed that many nurse trainee prescribers recognised that their previous education around therapeutics and pharmacology was not adequate for the task ahead. Participants attributed their lack of confidence and perceived ability to prescribe safely, to an inadequate understanding of biomedical science, and deficiencies in their prescribing knowledge. The authors, however,
highlighted that the majority of the nurses who participated in the study had only completed three weeks of education in clinical pharmacology and therapeutics at the time of the study. Since that study, the curriculum for preparing nurse prescribers in pharmacology and therapeutics in the United Kingdom has increased to six months.

Early studies after first introducing non-medical prescribing amongst nurses in England revealed that some nurses’ pharmacology knowledge was inadequate for a prescribing role (Otway, 2002; Sodha, et al., 2002; While & Rees, 1993). The authors argued that although these findings suggest a lack of pharmacology knowledge for a small minority, the vast majority of nurse prescribers considered they had up-to-date knowledge of pharmacology (Latter, et al., 2007b).

Studies from the United Kingdom that examined the educational requirements for nurse prescribing, found that education for prescribing is inadequate, requires specifics, and that prescribers require continuous updates (Creedon, et al., 2009). The authors advised that these findings need to be taken into consideration when designing an educational programme for nurse prescribers into the future.

A longitudinal study which evaluates an educational programme may be necessary to study nurse prescribing students’ views before, immediately after, and several months after completion of the programme to determine the extent to which the programme met their needs and how it could be improved for future students (Creedon, et al., 2009, p. 1326).

An important theme running through the majority of research on nurse prescribing is the importance of continuing professional development (CPD) for nurse prescribers, expanded upon below.

2.6.1.2.1 Continuing education and support for nurse prescribers
Continuing education for nurse prescribers has also been investigated (Humphries & Green, 2000; Otway, 2002). Studies have highlighted the importance of organisational support, regular update on pharmacological issues, peer support (e.g. such as networking), and mentorship, as fundamental to the success of nurse prescribing. Also reported was that although individual doctors were actively engaged in the education, supervision and support of both trainee nurse prescribers, and qualified nurse prescribers, the majority of doctors were either unaware or unsupportive of the nurses’ prescribing role (Humphries & Green, 2000; Otway, 2002). A contrasting study (Latter, et al., 2007a) showed that many nurse prescribers continue to receive
support and supervision from medical colleagues for their prescribing, even after qualifying as prescribers.

Latter et al. (2007a) also evaluated nurse prescribers’ education and continuing professional developments for independent prescribing in the United Kingdom and showed that although the majority of nurses was able to maintain a range of prescribing competencies in practice, two thirds of the sample reported that they continued to seek continuing professional education. The lack of organisational support, in terms of providing continuing education for nurse prescribers, has been discussed elsewhere (E. Bradley, Blackshaw, & Nolan, 2006; Humphries & Green, 2000; Latter et al., 2005). These studies have concluded that organisational support is generally lacking for nurse practitioners. Nurse practitioners also lacked access to computer-generated scripts, access to prescription analysis, and cost data analysis software.

Some investigators (E Bradley, et al., 2007) suggested that a multi-disciplinary approach to Continuing Professional Development (CPD) sessions, could be a way forward in the future, as this can encourage collaboration across teams, at the same time as providing nurses with a source of information to keep their prescribing up-to-date. The same study also found that some nurse prescribers, who have been in the role for six to 12 months, considered they had up-to-date knowledge of pharmacology and were confident in their prescribing practices, but a majority still felt they needed more pharmacology education. Latter et al. (2007b) however, argued this was no longer an issue for many nurse prescribers: nurses’ focus on more pharmacology knowledge may be a reflection of diligence and motivation to learn, rather than a reflection of inadequate knowledge per se.

A recent study by Green, Westwood, Smith, Peniston-Bird and Holloway (2009) was undertaken to investigate the training needs of all non-medical nurse prescribers (District Nurses, Health Visitors and Nurse Practitioners). They found that as pharmacology and prescribing is a rapidly changing discipline, regular CPD must be provided to non-medical prescribers for them to keep up-to-date with latest developments. The authors also suggested that as non-medical prescribing is a comparatively recent innovation, those non-medical prescribers need mentorship from experienced prescribers as well as their encouragement to be confident prescribers.

Another important finding of Green et al. (2009) study was the need for more CPD in the area of physical and diagnostic assessment skills which was highlighted by the interviewees across all professional groupings and viewed as a significant issue for non-medical prescribing practice,
especially for those on the extended nurse prescriber formulary. The authors suggested that to develop those clinical specialties new to nonmedical and diagnostic skill and prescribing, for example, mental health and substance abuse. Green et al. concluded that close contact with medical assessors after qualifying should be provided for non-medical prescribers. This can take the form of support groups or individual networking. Training in clinical skills should be linked to non-medical prescribing courses and “examples of ‘best practice’ from other health authorities where there are well established non-medical prescribers should be examined and where appropriate, considered for implementation by health providers” (Green, et al., 2009, p. 613).

2.7 Prescribing practice

There have been few studies that consider how medical prescribing practice differs from non-medical prescribing in terms of safety. However, early studies of community nurse prescribers in the United Kingdom concluded that some nurses based their prescribing decisions principally on experiential knowledge of the patient (C. Bradley, Taylor, & Blenkinsopp, 1997; Skingsley, Bradley, & Nolan, 2006). Although such practice is common with experienced prescribers, relying on experiential and routinised behaviour, rather than a research-based knowledge when making prescribing decisions, may lead to inaccurate drug or patient information and, as a result, lead to prescribing errors (E Bradley, et al., 2007).

Difficulties in coming to terms with the increased responsibility associated with prescribing has also been an issue amongst nurse prescribers in community settings in the United States (Running & Kipp, 2006). Working in isolation is an issue for these nurses, especially for those who work in less-defined areas of nursing practice as in primary care. The lack of support from other prescribers, and a much broader scope of practice, such as in primary health, has contributed to nurse practitioners’ anxieties, especially for those who worked in areas where they may have to deal with patients with co-morbidities, or where standard evidence-based treatment management does not exist (E Bradley, et al., 2007).

Concerns about the safety and appropriateness of nurse prescribing took centre-stage in a study done by Mayo and Duncan (2004). The authors conducted a survey on medication errors, and 63.8% of nurses admitted to committing an error, while administering medications. They concluded that if nurses have the propensity to commit errors when they are administering drugs, committing prescribing errors is just as likely. Without the research to show otherwise, it is therefore important to investigate how the prescribing practices of non-medical prescribers differ from medical prescribers in terms of safety and appropriateness.
A systematic review was undertaken by Van Ruth, Mistiaen and Francke (2008) and concluded that the overall effects of nurse prescribers’ prescribing practice in the USA were positive. The review found that the overall health outcomes for patients prescribed for by nurses, compared to patients prescribed for by doctors in terms of clinical parameters and quality of care, and were either similar or better. The findings of that above study were consistent with a meta-analysis performed by Horrocks, Anderson and Salisbury (2005) of the care provided by nurses compared to physicians, except the nurse prescribers in this study carried out more investigations. Other anticipated benefits of nurse prescribing, such as benefits for the professional, or benefits for the health care system regarding accessibility and costs, cannot be confirmed in the systematic review because of lack of substantial comparative research in this area. The authors concluded that no research was found to report on better use of the skills and experience of nurses, recognition of their competence and expertise, and improved working relationships between health care professionals.

A review undertaken by Creedon et al. (2009) evaluating nurse prescribing practices showed that the majority of the findings of the studies relating to patients’ perspectives and other professionals’ perspectives were generally positive. However, the majority of the studies included are varied and ‘context-specific’ to the practices of nurse prescribers. They advised that further studies may be useful to determine benefits of nurse versus doctor prescribing, in relation to patient outcomes. They also suggested that comparing nurses’ prescribing practices with that of doctors would be useful to determine if there are differences in styles and decision-making processes.

A study in the USA by Running and Kipp (2006) investigating prescribing patterns of nurse practitioners (NPs) and physicians in a primary care setting for the treatment of sinusitis, bronchitis, musculo-skeletal injury and back pain, concluded, that NPs are ‘cautious prescribers’ who provide more non-pharmacological interventions. They also suggested that both professional groups prescribe similar types of drugs for common conditions in accordance with accepted medical practice. However, their findings also revealed that NPs prescribed more over-the-counter (OTCs) drugs, for example, analgesics, antipyretics, cough mixtures, and nasal sprays compared to physicians. In addition, although the two provider groups were similar in their prescribing patterns related to controlled substances, NPs prescribed non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants less often than physicians.
In summary, a growing number of studies have investigated nurse prescribers’ practices. The heterogeneity of the research makes it difficult to compare these studies as they are considered in different categories of nurse prescribing practices, settings, and different patient groups, and used different outcomes and measurements. More research is needed on the potential differences or similarities in the quality of care, adherence, patient outcomes, and costs when non-medical prescribing is compared to medical prescribers. The differences between nurse and physician prescribing, in the type of medication being prescribed, the appropriateness of prescribing, the potential for adverse effects and for medication errors are also areas that need to be addressed in the future.

2.8  Clinical reasoning skills

Clinical reasoning that includes critical thinking and decision-making are concepts that have been leading the way to advance nursing education and practice. Similar trends have also been noted in medical education. The notion of students as lifelong learners, and self-directed individuals as the centre of learning has become the norm in the delivery of course content and process (Banning, 2003, 2004).

A study by Sodha et al. (2002) showed that the majority of nurse prescribers surveyed were inadequately prepared to undertake prescribing roles due to poor comprehension of medication related knowledge and clinical reasoning capabilities. The authors suggested that educational programmes need to include not only medication management principles, but also development of skills in clinical reasoning, as skills in prescribing follow the same processes of clinical reasoning.

2.8.1  Education related to skill in clinical reasoning

Using information has been highlighted by Dowding and Thompson (2009b) as essential for decision-making. In other literature (Cogdill, 2003; McCaughan, Thompson, Cullum, Sheldon, & Raynor, 2005), the use of information, and information-seeking practices of doctors in primary care, has been explored in relation to its role in clinical decisions. Developing ways of seeking accurate and relevant information is considered an important skill in clinical reasoning (Dowding & Thompson, 2009b).

An exploratory study of physicians working in primary care settings (Dee & Blazek, 1993) showed that the common types of information needs were related to diagnosis and treatment. In contrast, a study of information needs and information seeking practices of nurse practitioner prescribers in Canada revealed that NPs were more likely to consult medical colleagues for
information needs related to diagnosis, and used print materials for information needs related to drug therapy (Cogdill, 2003). In addition, participating NPs reported that they were often uncertain about issues, such as what dosage of a drug they should give a patient, what the result of a diagnostic test meant, and whether or not a specific nursing intervention was effective. The authors concluded that nurse practitioners were more likely to consult physicians and colleagues, in preference to drug reference manuals, textbooks, protocols and research based materials (Cogdill, 2003). Similar concerns have been raised in a study questioning whether nurse practitioners are adequately prepared for autonomous decision-making (Kassirer, 1994). Making autonomous decisions in diagnosis and prescribing involve dealing with diagnostic uncertainties and complexities. Not having the necessary skills to implement evidence-based practices, may have an influence on how nurses present their deliberations and decisions, it was concluded.

Thompson and Dowding (2009) asserted that nurses choose not to use research-based information, even if this information is likely to answer their clinical question or in the context of their clinical decision making. The authors believed that this is because nurses believe they do not have the authority to change procedures or policies, and not enough time to implement ideas or read research. Other skills that nurses need to further develop in relation to clinical reasoning and decision-making are diagnosis and prognosis.

Dowding and Thompson (2009a) argued that prognosis is often an overlooked area of decision-making in nursing. They explained that prognosis is related to the concept of risk, and is vital when clinicians are involved in decisions related to potential benefits of interventions versus their potential risks. Prognostic as well as diagnostic skills are not commonly taught in nursing, and when faced with conditions of uncertainty, skills in these areas are fundamental to the process of clinical reasoning. Although a wealth of literature (Baird, 2001; Banning, 2004; E Bradley, et al., 2007; Cioffi, 2000; Cioffi & Markham, 1997; Creedon, et al., 2009; M. E. Fonteyn & Ritter, 2008) has described how nurses make decisions related to nursing practice, decision-making related to prescribing was excluded. In summary, numerous studies have shown that the lack of diagnostic and prognostic knowledge and skills has some impact on new nurse practitioners’ clinical reasoning and decision-making.

2.8.2 Education related to diagnostic knowledge

One study on prescribing nurses in the USA (Hadley, 1989) concluded that nurses need to develop the ability to diagnose, in addition to having an adequate knowledge of pharmacology, in order to prescribe competently. The need to improve nurses’ knowledge in the areas of diagnosis
and pharmacology has been the focus of nurses’ advanced postgraduate education in many schools in the USA (Schwertz, et al., 1997). Some studies have argued that not only are nurses lacking in pharmacology knowledge, but also lacking in both practical aspects of prescribing (Department of Health, 1989), and in some level of medical diagnosis (Moon, 1990). A prescriber will require the knowledge and skills to recognise and interpret a range of physical complaints and discriminate these from major illnesses (Pickersgill & Clarke, 1990). Some level of knowledge in medical diagnosis is required in order to decide when treatment is needed, not all of which will be pharmacologically sound (Moon, 1990). Although experienced and qualified nurses ‘have considerable knowledge of common conditions encountered in their practice’ (Department of Health, 1989), there is evidence to suggest that uncertainty associated with diagnosis remains a major concern for new nurse prescribers (Latter & Courtenay, 2004; Luker, Willock, & Ferguson, 1997; Otway, 2002).

Studies that have investigated nurses’ diagnostic abilities are few and are limited compared to those that have investigated nurses’ knowledge deficiencies in pharmacology and therapeutics. This may be an important observation as prescribing is emblematic of nursing autonomy. One study that investigated the diagnostic abilities of community nurse prescribers in the United Kingdom concluded that while nurses have some knowledge of selected products (medicines), most nurses’ knowledge on these products was generally incomplete (While & Rees, 1993). Further, while the study showed that some knowledge of common conditions was evident, such knowledge was also incomplete (Baird, 2001; Luker, Austin, Hogg, Ferguson, & Smith, 1998).

Diagnosis and treatment decisions have also been investigated in a more recent study (Latter, et al., 2007a). The majority of the nurses in the group were working in senior clinical roles, and were academically prepared, indicative of good pre-existing knowledge and experience levels prior to engaging in a prescriber’s role. Self-reported responses showed that the majority felt they were able to diagnose and generate treatment options, and took personal responsibility for their decisions. However, a small proportion of the sample still had some anxieties about making an incorrect diagnosis. A possible explanation for why these results differed from earlier studies appears related to the length of educational preparation and experience, as well as pre-existing relationships with doctors and primary health care teams. Where medical colleagues resist collaboration with non-medical prescribers, such as nurses, such relationships had a major influence on nurse prescribers’ decision to diagnose and prescribe treatment (E Bradley, et al., 2007).
In summary, it is important to note, that the literature reviewed for this study on both medical and nurse prescribing, revealed similar themes and issues (Otway, 2002; M. Pearson, 2003; S. Pearson, Rolfe, & Smith, 2002; Richir, et al., 2008; Schwartz & Elstein, 2008; Schwertz, et al., 1997; Standing, 2008; Weiner, 2004a, 2004b). For example in improving prescribing practices, educational approaches, and rational and appropriate prescribing. With the advent of nonmedical prescribing, debates on nurse prescribing education has mainly focused on pharmacology knowledge, bioscience knowledge, and clinical decision-making. In contrast, in the medical literature, discourse has mainly centred on issues related to core content courses in clinical pharmacology and therapeutics being integrated with other subjects, and the skills and attitudes introduced in undergraduate being refined during the pre-registration house officer year. This is because medical students are legal prescribers when they complete their education and training, whereas for nurses the journey is different and involves extensive clinical experience and postgraduate education before they become legal prescribers.

2.9 Summary and Conclusions

This chapter reviewed literature relevant to prescribing and decision-making with an emphasis on nurses’ and doctors’ clinical reasoning, and the development of therapeutic reasoning. From the literature reviewed, it is evident that the ongoing debate relating to safe and appropriate prescribing for both medical and non-medical professionals is characterised by complexity and contradiction. The studies reviewed raised some concerns about the adequacy of educational preparation for prescribing and other medicines-related roles for non-medical prescribers. Research into medical prescribing indicates that a direct relationship between biomedical knowledge and prescribing is weak. This is important as the medical biomedical model (hypothetico-deductive) has been proposed as a prescribing model for non-medical prescribers. A description of a prescribing model by Maxwell (2009) has been discussed, to provide a framework for rational prescribing proposed to improve prescribing education for medical practitioners. This model provides the core knowledge, skills, and attitudes required of prescribers in today’s complex prescribing world. Its suitability for non-medical prescribers should be investigated.

In this review, an attempt to synthesise heterogeneous literature to provide a descriptive, rather than a prescriptive view of prescribing decisions, practices, and behaviour of medical prescribers has been undertaken, to understand the role of knowledge and skills in clinical reasoning as this relates to prescribing. However, this is the state of knowledge, and the standards against which
the debates, comments, criticisms and concerns, about nurse prescribing were based on. What is not known is which of these issues are particularly applicable to nurses as beginning prescribers, and the development of therapeutic skills and knowledge.

Although the hypothetico-deductive model is widely held as the “gold standard” for clinical decision-making, favoured in medicine, and proposed as the preferred model for nursing and other non-medical prescriber groups, contesting models were reviewed. Models of reasoning reviewed in this chapter (2.4), theoretically inform the present study as the ways in which nurses develop and apply prescribing knowledge and documented and compared with their counterparts in medicine and midwifery.

From the review of current and past literature, some areas for further research on non-medical prescribing have come into focus. One such focus is the adequacy of experienced nurses’ educational preparation in relation to prescribing, as in the case of New Zealand, where the core subjects pharmacology and therapeutics are integrated within a Master’s programme. How do experienced nurses develop knowledge and skills in prescribing? Another focus is the translation of prescribing knowledge to prescribing practice. What factors contribute to the development and progression of prescribing skills as they relate to practice? For nurses as beginner prescribers, how do nurses’ prescribing practices compare to those of doctors? Are there differences in styles and decision-making processes? These are some of the issues that will be investigated in this study.
CHAPTER 3: METHODOLOGY AND METHODS

3.1 Introduction

In the context of the recent introduction into New Zealand of the advanced role of nurse practitioner (NP) with prescribing rights, literature reviewed in Chapter 2 highlighted that prescribing is a complex, yet poorly understood, practice. Most research into prescribing has been in the context of medical prescribing, a discipline based on biomedical knowledge and hypothetico-deductive reasoning approaches. When compared with medical prescribing, nurse prescribing is a relatively recent introduction in most countries. As in NZ, it has only recently been introduced in the United Kingdom, Australia, Canada and Sweden. Prescriptive authority for nurses has been implemented in the United States for forty years. However, these nurse practitioners “continues to struggle with issues related to prescriptive authority in some states’ (Running & Kipp, 2006, p. 232). A more recent study has investigated how NP prescribers in the United States who, “limited by law, adapt their practice to specific constraints and then make the transition to a new scope of practice when the law changes”(Kaplan & Brown, 2007, p. 184). These issues continue to be debated in the United States even after forty years of nurse practitioner prescribing.

As documented in Chapter 2, literature on medical prescribing positions the prescriber as the focus of the clinical decision and highlights the challenges they encounter in every situation where context and situation can be unique and where conditions of uncertainty exist. This too, will apply to the non-medical prescriber, yet very little is known about the similarities or differences between prescribers of different professional models of practice, frames of reference, and philosophical underpinnings and approach to clinical reasoning. To understand these differences, a qualitative approach was used for this study to advance the understanding of a complex phenomenon as in the case of learning to prescribe and the art of prescribing.

In Chapter 3, I will present an overview of constructivism as a qualitative research approach, and discuss the use of multiple case narratives and their suitability for this study. The research design and the research procedures governing data collection and analysis, recruitment of participants and ethical issues will be discussed.

3.2 Research Question and Objectives

This study was guided by a constructivist narrative approach and a narrative inquiry using a multiple case narrative strategy. As New Zealand nurses have recently been given the opportunity to prescribe (see Chapter 1), their experiences, views, and perceptions were
investigated to determine how experienced nurses acquire the pharmacological knowledge and therapeutic skills necessary to safely and confidently prescribe. Other groups of prescribers (doctors and midwives) were also included to compare the similarities and the differences between nurses and doctors in their journeys in becoming prescribers. This study was undertaken from 2006 to 2009, ten years after the introduction of prescriptive authority for nurse practitioners in New Zealand. Six groups of participants participated in the study, detailed in section 3.8.

This study set out to address the following research question:

What are the experiences of nurses in becoming prescribers and how do their experiences compare with those of other prescriber groups?

*The specific objectives of the study are to:*

1. To determine how experienced nurses acquire the pharmacological knowledge and therapeutic skills necessary for safe and confident prescribing practice;
2. To compare the experiences of nurses and doctors in their journeys in becoming prescribers;
3. To explore the perspectives and experiences of nurse practitioners as beginning prescribers; and to determine their ongoing needs in knowledge and skill development

### 3.3 Research Design

A qualitative approach was selected as the most appropriate research strategy for this study because it enables access to context-specific knowledge that is embedded in the learning and practice of prescribing. As prescribing is a complex phenomenon, qualitative research approaches offer a useful way to describe and explain phenomena narrated by the participants and to develop theory regarding these constructed phenomena (Shkedi, 2005).

Many attempts have been made to characterise qualities that differentiate qualitative work from other approaches. Hatch (2002) reviewed several widely cited sources to identify certain characteristics of qualitative research to give novice researchers a starting place for understanding the dimensions of qualitative work. For Hatch, participants’ perspectives or voices were used as a basis for their actions in specific social settings and therefore qualitative researchers sought to understand the world from the perspectives of those living in it. The lived experience of real people and real settings are the object of studies where the intent is to explore human behaviours.
within the contexts of their natural settings, so the researcher can make sense of their everyday lives (Hatch, 2002).

Centrality of meaning is the aim of qualitative research, where it is important to describe the meanings individuals use to understand social circumstances, rather than trying to identify the “social facts” that comprise a positivist social theory. Blumer (1969) proposed symbolic interactionist theory be employed as a conceptual tool for systematically exploring understanding. While not all qualitative research is carried out using symbolic interactionist framework, all qualitative research is about understanding the meanings individuals construct in order to participate in their social lives (Charmaz, 2000; Creswell, 2009; Hatch, 2002; Lincoln & Guba, 2000; Maykut & Morehouse, 1994).

Stake (2000) asserted that in the constructivist approach, researchers comprehend human action not by taking the position of an outside observer who “sees” only the physical manifestations of these acts, but by seeking to understand what the actors mean by their actions from their own point of view. Qualitative approaches seek to understand the perceptions and motivations of the research participants, allowing the researcher to acquire a rich knowledge about the participants’ emotions, perceptions, and actions, focusing upon the lived experience, as they understand it to be. Therefore researchers using qualitative constructivist methods will need to strive to understand the phenomena and situations as a whole (Lincoln & Guba, 2000).

Constructivist qualitative researchers seek to understand a situation as it is constructed by the participants. Constructivism, as a philosophical position, views knowledge as the outcome of experience mediated by one’s own a priori knowledge and experience of others. Because the study focused on understanding the participants’ experiences, views, and perceptions as learners and as prescribers, a constructivist approach gives voice to the participants’ reality in how they learn and work.

For Shkedi (2005) constructivist researchers valued contexts’ sensitivity and tended to place considerable emphasis on situational and structural context that understood a phenomenon in all its complexities and within its particular situation and environment. This approach is in contrast with the positivist quantitative approach, which may be multivariate, but which eliminates all of the unique aspects of the context in order to apply the results to the largest possible number of subjects and experiments (Maykut & Morehouse, 1994).
3.4 Methodology - Multiple Case Narratives

For a complex, interactive phenomenon like prescribing, the power of narrative is important to make narrative sense of the clinical encounter. Similarly, narrative reasoning is needed when clinicians want to understand concrete events that cannot be comprehended without relating an inner world of desire to an outer world of observable actions and states of affairs (Fleming & Mattingly, 2008).

Shkedi (2005) stated that narratives referred to the structure, knowledge, and skills required to construct a story. Stories are modes of knowing that capture in a special fashion the richness and nuances of meaning in human affairs, which cannot be captured in definitions or statements of fact, or abstract propositions. Such knowledge can only be told through stories (Carter, 1993). Narrative reasoning constitutes a form of meaning making, which is a pervasive human activity and in recent years, narrative thinking has been recognised as important in clinical judgement (Fleming & Mattingly, 2008).

While the narrative researcher starts out with a focus and a set of research questions, as does the positivist-quantitative researcher, during the course of a study the focus of the research may change, as may the procedures of the research (Lincoln & Guba, 2000). Narrative research does not necessarily proceed with a linear logic, from review of literature to the definition of a problem, to the location of an appropriate setting for the study. The narrative approach to research demands flexibility in the overall research design so that the narrators (informants) selected can respond to increasingly refined research questions. According to Marshall and Rossman (1989) in narrative research, the general research questions (or focus), relevant literature, research location, informants, and research design are all interrelated, each one being dependent on the other.

The Multiple Case Narrative is a qualitative research strategy, which can deal with a large number of case narratives and is distinct from other research strategies of a similar nature, such as the collective case study, case survey, and meta-ethnography (Shkedi, 2005). The Multiple Case Narrative borrows elements from each of these methods and is similar to them in some aspects. However, both case survey and meta-ethnography aim to synthesise already completed studies and tend to ignore the interpretive nature of qualitative research. Multiple Case Narratives, in contrast, may include a large number of case narratives as part of the same research. Even though it focuses on many narratives, it preserves its narrative-qualitative nature (Shkedi, 2005).
Multiple Case Narratives are concerned mainly with the instrumental type of case study. Unlike the intrinsic case study where interest in individual narrative is the goal, in the instrumental case study, case studies are related to a need for a general understanding and insight into the question by studying particular case narratives. Instrumental case studies seek to achieve a degree of generalisation from the cases and the choice of informants is influenced by their being seen as representative of the broad group (Stake, 1995).

The purpose of Multiple Case Narratives is not simply to understand a specific issue, but also to help identify in which site or population this particular issue is present. Researchers may ask how, where, and with whom the particular phenomenon exists (Marshall & Rossman, 1989). The focus of narrative research questions is not the discovery of new elements, as in the case in a natural science study, but rather to heighten awareness and clarify understanding of phenomena and experiences (Creswell, 1998).

In Bruner’s (1996) view, the basis for data collection in the Multiple Case Narrative was the assumption that the data we seek to collect is constructivist-narrative by its nature. The Multiple Case Narratives reflect an effort to expand the single narrative method to encompass as many narratives as possible (Shkedi, 2005). Data for the Multiple Case Narrative are gathered from people and focuses on their stories, “their explanation for the activities they participate in and the meaning they give to the phenomena they engage in...” (Shkedi, 2005, p. 45)

Simons (1996) asserted that by studying the particular, we come to understand the universal. The claim for generalisation was the strongest advantage of the multiple case narratives. The approach allows for generalisation, and not just case-to-case and analytical generalisation, as in single and collective case study, but generalisation to a population, which is generally afforded only by the positivist-quantitative approach (Shkedi, 2005).

3.4.1 Standard of trustworthiness

According to the constructivist-narrative approach, truth is necessarily subjective. Shkedi (2005) defined ‘truth’ in this context, as a way to describe not the underlying scientific attributes, but of perceptions and understanding that comes from immersion in and a holistic perspective on the phenomenon at hand. He went on to explain that the aim of narrative research is to arrive at an understanding of the meaning of the phenomenon under examination.
In dealing with trustworthiness, Shkedi (2005) argued that the primary emphasis was placed on making the steps and influences conscious to the researcher and visible to the reader, as it had to do with how one approaches, collects, analyses, interprets, and reports data. He referred to Lincoln and Guba’s (2000) description of trustworthiness, which consists of credibility, transferability, dependability, and confirmability for testing qualitative research assumptions. However, Shkedi suggested the adoption of three conventional terms of validity, reliability, and generalisation instead, to communicate with those who are not in the field of constructivist-qualitative research. Shkedi excluded using the fourth conventional term, objectivity, as this was in contradiction with the constructivist-narrative research assumptions and should be replaced with perspectivity. Perspective, he maintains, is the point of departure for research verification and is the basis for measuring validity, reliability, and generalisation. Generalisation, validity, and reliability in the Multiple Case Narrative, as in other narrative genres, are meaningful only in reference to a perspective.

3.4.1.1 Validity and Reliability

Researchers employing a constructivist-narrative approach should take care that their research processes and products not only are technically sound, but also have deep plausibility (Creswell, 2009). Articulating one’s theoretical views and conceptual consciousness and their impact on how researchers ask questions will help reduce validity errors (Creswell, 2009). In Multiple Case Narrative, as in qualitative designs generally, validity must be verified by going back to the empirical world under study and examining the extent to which the emergent analysis fits the phenomenon (Huberman & Miles, 1994).

The transcribed documentation of interviews, analysis trees, and other documents are kept by the researcher to preserve the chain of evidence of each analytic step (Sandelowski, 1996). The explanation of the use of a procedure detailing stages of analysis, and preserving the documents of each analysis, have assisted researchers to examine and re-examine data for validation (Sandelowski, 1996). Shkedi (2005) advised that moving back and forth between induction and deduction, between experience and reflection on experience, between data and our conceptual perspective, between our perspectives and our conclusion, would ensure validation.

3.4.1.2 Generalisability

In Multiple Case Narrative, naturalistic generalisation as suggested by Stake (1995), rather than formalistic generalisation, is the preferred approach. In this study, an attempt was made to show case-to-case generalisation, as the study focused to some degree on which situations studied
matched other situations of interest. Geertz (1973) described case-to-case generalisation as a
dialogue between the analysis of a particular event and more universal audience. This process,
“enables us not to predict but to anticipate what might be involved in analogous situations...”
(Shkedi, 2005, p. 191). It will help to explain how things may connect and interact.

A thick, rich description of data is crucial since without such thickness, one does not have the
information necessary for an informed judgment. Shkedi (2005) cautioned that what is found in
some particular context has meaning generally only in the idiographic sense, that is, concentrating
on specific cases and their unique trait or functioning, rather than broad generalisations of human
behaviour. This may have an impact on multiple case studies because in this approach, most of
the case narratives are not represented as distinct entities in the final report. However, Shkedi
(2005) suggested that generalisation does not necessarily mean we seek transferability of the case
narrative as a whole to other situations, but that it is possible to pinpoint a few elements of the
case narratives, which may have the potential to shed light on other situations. In this sense, case-
to-case generalisation makes the final report on the Multiple Case Narrative, which focuses on
conceptual and case detail description appropriate for case-to-case generalisation.

Tellis (1997) observes that while case study research is not sampling research, selecting cases
must be done to maximise what can be learned in the period of time available for the study.
Hence, the unit of analysis is a critical factor in the case study. The unit of analysis referred to in
this study are the six groups of prescribers, where their narratives were analysed within cases and
across cases to provide a sense of “naturalistic” generalisation. Stake (1995) argued that data
generated by case studies would resonate experientially with a broad cross section of readers,
thereby facilitating a greater understanding of the phenomena under study.

3.5 The Researcher

Creswell (2010) notes, that qualitative research is an interpretive research where the researcher is
involved in a “sustained and intensive experience with participants” (pp.177), where a host of
ethical and personal issues can be introduced into the qualitative research process and may
introduce biases, values and shape the interpretations of the research design. Creswell (2010)
advised that researchers must keep this in mind and explicitly identify their biases, values, and
personal background.

According to the constructivist paradigm, the researcher needs to consider which values - their
own as well as those of the people being studied involved and what implications these values hold
for truthfulness of findings (Shkedi, 2005). In a constructivist paradigm, meanings are inter-
subjective and partially constitutive of the practices to which they refer and unlike the natural science traditions, interpretations are most meaningfully constructed in the light of the particular cases they intend to represent (Moss, 1996). Maykut and Morehouse (1994) explained that researchers need to be vigilant to the prejudices, viewpoints, insights, or assumptions they hold regarding the phenomenon under investigation. The notion of reflexivity must be considered at all times and the researcher must suspend their judgement in order to see the experience for itself.

The researcher of this study has more than 25 years of experience in both academic and clinical fields. For ten years of my academic life, I have been involved in the education of postgraduate students, experiences that have influenced and informed the design of the study (emic perspective). As an educator, I am also involved in the design and delivery of courses at the University of Auckland, to prepare nurses for prescribing and I had a professional relationship with some participants. The approaches that I took to ensure that I continued to address these concerns are explained in the section below.

I am aware that my views, beliefs, and perceptions of the phenomena under investigation reflect my professional and academic philosophy as an educator and as a researcher. As an educator, I hold beliefs and values related to what constitutes effective learning underpinned by a constructivist-learning paradigm. The thoughts and emotions that influenced upon me throughout the process of this study led to critical awareness and a questioning of my own preconceived idea as an academic and educator. This awareness led to checking and rechecking my interpretations of the categories with my supervisors to ensure that the meanings reported were not mine but those of the participants. The stages of analysis categorisation, mapping, and focused analysis illustrate the rigour of analysis undertaken to ensure credibility.

3.6 Ethical Considerations

The study was ethically reviewed and approved by the University of Auckland Ethics Committee (Ethics Approval 2007/249- Appendix A). All participants volunteered to be included in the study in response to a general invitation to participate, and received an information sheet and consent form at least one week before data collection. A signed consent form was then gained from each participant prior to data collection. Each participant was given anonymity and confidentiality assurance that their identity would not be revealed in the reports of the study. The anonymity of participants was protected in all openly available documents related to this study. Any information linking participants to data are stored in an electronic data file system and are password protected. A third party who signed a confidentiality agreement transcribed the
interview data. An information sheet (see Appendix B – B1-B5) and a consent form sheet (see Appendix C) were provided to all potential participants who indicated their willingness to participate. Data will be stored for ten years separately from the consent form. The electronic data, together with the participants’ written transcribed scripts will be stored in a secure unit at the School of Nursing University of Auckland. My primary and secondary supervisors who have advised and guided me throughout the study to check that my interpretations of the data have been accurate have also viewed the un-named transcripts.

As stated previously, I had a professional relationship with some of the participants as an educator. Any potential conflict between my role as lecturer and researcher was reduced by inviting only those students who had completed the prescribing course to participate in the study. Students of the School of Nursing are advised to take the Prescribing practicum on the last year of the master’s programme. The majority of the participants therefore will have completed not only the practicum but the master’s programme as well. Once the participants have completed the practicum, I have no ongoing relationship with the participants. Therefore, the academic performance of the participants will not be affected.

3.7 Participants

The primary way to investigate any phenomenon is through the experience of the individual person, who is part of an organization or a participant in the particular phenomenon or process under investigation (Shkedi, 2005). Shkedi suggests that it is important to consider each participant as a single case, as one studies the phenomenon through the eyes of the person who experiences that phenomenon. As learning and doing prescribing is the phenomenon of interest in this study, prescribers, both medical (doctors) and non-medical (nurses and midwives) were chosen as the selected study sample, and were invited to the study on the basis of their potential to collectively provide a broad range of perspectives as learners and as prescribers.

3.7.1 Purposive selection of groups and criteria for participation

In this study, a purposive sampling approach was used. The idea of purposive sampling in qualitative research is to purposefully select participants or sites that will best help the researcher understand the problem and the research question (Creswell, 2009). The participants invited to participate in this study were selected based on their ability to meet the following criteria: participants had to be prescribers or would-be-prescribers (active learners), be willing to participate in the study, and be able to share their experiences as learners and prescribers. There
were six groups of participants selected for the study and each group is further subdivided into specific group described in Table 1 below:

Table 1: Description of participants (n=43) selected for the study

<table>
<thead>
<tr>
<th>(N= 43)</th>
<th>Participant groups</th>
<th>CRITERIA</th>
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<tbody>
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<td></td>
<td></td>
<td>INCLUSION</td>
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<tr>
<td>NURSES</td>
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</table>
| 10      | Nurse learner prescribers | • Postgraduate students who have completed the postgraduate prescribing courses prescribing practicum  
           |         | • Current employment as registered nurses in an area of practice |
| 20      | Nurse practitioner prescribers | • Approved nurse practitioner prescribers with a scope of practice  
           |         | • Current employment as nurse practitioners with prescriptive authority  
           |         | • Prescribing experience of three months or more |
|         |                     |           |           |
| DOCTORS |                     |           |           |
| 10      | SMOs (n=8) | • Registered medical practitioners with between two to ten years’ experience  
           |         | • Current employment as resident medical officers |
| 16      | RMOs (n=2) |           |           |
| 6       | Mentor prescribers | • Consultants and senior doctors who have mentored registered nurses for prescribing through a formal mentorship programme |
| MIDWIVES|                     |           |           |
| 4       | Nurses who then qualified as midwives (NDE) | • Practicing prescribers 1 or more years  
           |         | • Practicing midwife |
| 7       | Direct entry (DE) midwives | • Practicing prescribers 1 or more years  
           |         | • Practicing midwife |

Based on the data presented in Table 1, the majority of the participants shared common characteristic in relation to length of clinical experience. Although each group differed in their professional frame of reference, they were all practicing healthcare professionals who had completed an approved educational programme in prescribing either at undergraduate level (in the case of the doctors or direct entry midwives), or postgraduate and post-experience (nurses and
NDE midwives). Overall, differences in terms of clinical and practical experience in prescribing were evident amongst all groups.

3.8 Recruitment procedures

Each participant group and the make-up of each sub-sample will be discussed separately below.

3.8.1 Nurse learner prescribers

The School of Nursing at the University of Auckland holds records on postgraduate nurses (refer to Chapter 1 for description of the programme) enrolled in the prescribing courses from 2002 to 2004. The researcher had the right to access those records throughout the period as an academic in the school and after ethical approval accessed the list for the purposes of selecting potential participants, and an email was sent to the first twenty students on the list inviting them to participate. From 2002 to 2004, only twenty students were listed as having completed the prescribing practicum, ten of whom were in the process of completing their application to the Nursing Council for Nurse Practitioner registration. Five were still completing their master’s degree and were excluded from the study. Five former students declined to participate, as prescriptive authority was not a consideration in their application to NZNC. Table 2 sets out characteristics of the nurse learner participants group. This includes the area of practice and the clinical experience of each participant.

Table 2: Description of Nurse Learner Participants (n=10)

<table>
<thead>
<tr>
<th>Pseudonyms</th>
<th>Area of practice</th>
<th>Clinical experience (Area of practice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassey</td>
<td>Ophthalmology</td>
<td>10 years</td>
</tr>
<tr>
<td>Margo</td>
<td>Public Health -Youth</td>
<td>10 years</td>
</tr>
<tr>
<td>Sam</td>
<td>Mental Health</td>
<td>8 years</td>
</tr>
<tr>
<td>Barb</td>
<td>Ear specialist</td>
<td>10 years</td>
</tr>
<tr>
<td>Anne</td>
<td>Paediatrics</td>
<td>12 years</td>
</tr>
<tr>
<td>Kitty</td>
<td>Sexual health</td>
<td>15 years</td>
</tr>
<tr>
<td>Marilyn</td>
<td>Emergency Care</td>
<td>10 years</td>
</tr>
<tr>
<td>Lynn</td>
<td>Primary care</td>
<td>15 years</td>
</tr>
<tr>
<td>Tom</td>
<td>Gerontology</td>
<td>15 years</td>
</tr>
<tr>
<td>Christine</td>
<td>Primary Health Care</td>
<td>10 years</td>
</tr>
</tbody>
</table>
3.8.2 Mentor Prescribers

In my capacity as coordinator of the prescribing practicum paper, I was acquainted with senior medical consultants who have been approached by nurse learners to be their prescribing mentors, and were mentoring nurses learning to prescribe. Mentors were approached directly and invited to participate. Six mentors agreed to participate in the study. Table 3 summarises their characteristics.

Table 3: Description of Mentor Prescribers (n=6)

<table>
<thead>
<tr>
<th>Pseudonyms</th>
<th>Area of practice</th>
<th>Clinical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phil</td>
<td>Neonatal Services</td>
<td>More than twenty years</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>Older Adults</td>
<td>More than twenty years</td>
</tr>
<tr>
<td>Geraldine</td>
<td>Youth Health</td>
<td>More than twenty years</td>
</tr>
<tr>
<td>Sean</td>
<td>Ophthalmology</td>
<td>More than twenty years</td>
</tr>
<tr>
<td>Ian</td>
<td>General Practice</td>
<td>More than ten years</td>
</tr>
<tr>
<td>Ross</td>
<td>General Practice</td>
<td>More than ten years</td>
</tr>
</tbody>
</table>

3.8.3 Doctors

Two recruitment strategies were used. The New Zealand Resident Doctors’ Association of (NZRDA) holds a list of resident medical doctors in New Zealand. A letter was sent to the NZRDA to disseminate to all resident medical doctors, but this approach was unsuccessful in generating responses. The other strategy was to disseminate information in Auckland, North Shore and Middlemore hospitals inviting resident doctors to participate. Table 4 sets out characteristics of doctors who participated.

Table 4: Description of doctors (n=10)

<table>
<thead>
<tr>
<th>Pseudonyms</th>
<th>Area of practice</th>
<th>Clinical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiffany</td>
<td>Older people</td>
<td>More than ten years</td>
</tr>
<tr>
<td>Sarah</td>
<td>Women’s’ Health</td>
<td>More than eight years</td>
</tr>
<tr>
<td>Susan</td>
<td>Primary care</td>
<td>More than eight years</td>
</tr>
<tr>
<td>Ramis</td>
<td>Surgeon</td>
<td>More than four years</td>
</tr>
<tr>
<td>Teddy</td>
<td>Emergency</td>
<td>More than four years</td>
</tr>
<tr>
<td>Susie</td>
<td>Mental Health</td>
<td>More than four years</td>
</tr>
<tr>
<td>Kate</td>
<td>Primary care</td>
<td>More than four years</td>
</tr>
<tr>
<td>Freda</td>
<td>Primary Care</td>
<td>More than four years</td>
</tr>
<tr>
<td>Sam</td>
<td>Resident Medical Officer</td>
<td>More than two years</td>
</tr>
<tr>
<td>Su Lin</td>
<td>Resident medical Officer</td>
<td>More than one year</td>
</tr>
</tbody>
</table>

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3.8.4 Nurse practitioner prescribers

A public website lists all nurse practitioners registered in New Zealand including their names and addresses. Not all nurse practitioners are prescribers. At the time of data collection, (April, 2007), only 11 nurse practitioner were also prescribers. All 11 were invited to participate in the study, of whom one declined. Nurse prescribers are described in Table 5.

Table 5: Description of nurse practitioner prescribers (n=10)

<table>
<thead>
<tr>
<th>Pseudonyms</th>
<th>Area of practice</th>
<th>Clinical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanda</td>
<td>Primary Care</td>
<td>More than ten years as nurse specialist. More than two years as NP prescriber</td>
</tr>
<tr>
<td>Chrissie</td>
<td>Ophthalmology</td>
<td>More than fifteen years as clinical nurse specialist. Less than one year as NP prescriber</td>
</tr>
<tr>
<td>Abby</td>
<td>Paediatric cardiology</td>
<td>More than ten years as clinical nurse specialist. More than five years as prescriber overseas and recently in New Zealand (three months)</td>
</tr>
<tr>
<td>Rebecca</td>
<td>Respiratory</td>
<td>More than ten years as nurse specialist. More than one and a half year as a NP prescriber</td>
</tr>
<tr>
<td>Jane</td>
<td>Palliative Care</td>
<td>More than fifteen years as nurse specialist. Nearly one year as NP prescriber</td>
</tr>
<tr>
<td>Mark</td>
<td>Emergency</td>
<td>More than ten years as a senior nurse in A&amp;E and nearly a year as NP prescriber</td>
</tr>
<tr>
<td>Maggie</td>
<td>Liver Transplant Unit</td>
<td>More than fifteen years as senior nurse and clinical nurse specialist. More than one year as NP prescriber</td>
</tr>
<tr>
<td>Di</td>
<td>Primary care</td>
<td>More than fifteen years NP prescriber overseas and only six months in New Zealand</td>
</tr>
<tr>
<td>Anita</td>
<td>Cardiology adult and paediatrics</td>
<td>More than fifteen years clinical nurse specialist. Less than one year as NP prescriber</td>
</tr>
<tr>
<td>Paige</td>
<td>Paediatric and family</td>
<td>More than ten years as NP prescriber overseas and more than three years NP prescriber in New Zealand</td>
</tr>
</tbody>
</table>
3.8.5 Midwives

The College of Midwives was contacted to seek advice regarding recruitment of midwives for the study. The College advised the researcher to contact individual midwives directly. I contacted midwives by phone, using the list provided in the public Telecom Directory. Initially two midwives responded and participated and the remainder recruited through those two using snowball technique. Four had become midwives after first qualifying as nurses (non-direct entry) and similar to nurses, learnt prescribing knowledge in PG courses. The remainder entered midwifery directly and like doctors, prescribing was included in the bachelor’s programme. Midwives are described in Table 6.

Table 6: Description of Midwives (n=7)

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Area of practice</th>
<th>Clinical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-direct entry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sue</td>
<td>Primary care – Independent MW</td>
<td>More than ten years as senior nurse and more than ten years independent midwifery practice</td>
</tr>
<tr>
<td>Sarah</td>
<td>Primary care – Independent MW</td>
<td>More than five years as senior nurse and more than five years independent midwifery practice</td>
</tr>
<tr>
<td>Breeda</td>
<td>Primary care – Independent MW</td>
<td>More than five years as senior nurse and more than five years independent midwifery practice</td>
</tr>
<tr>
<td>Ann</td>
<td>Midwife- Secondary setting</td>
<td>More than five years as senior nurse and more than five years midwifery practice – secondary care</td>
</tr>
<tr>
<td><strong>Direct-entry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jenna</td>
<td>Midwife- Secondary setting</td>
<td>Less than two years</td>
</tr>
<tr>
<td>Aveline</td>
<td>Midwife- Secondary setting</td>
<td>Less than two years</td>
</tr>
<tr>
<td>Noleen</td>
<td>Midwife- Primary setting</td>
<td>Less than three years</td>
</tr>
</tbody>
</table>
3.9 Data Collection

A Multiple Case Narrative design focuses on participants’ stories, their explanations for the activities they participate in and the meaning they give to the phenomenon they engaged in (Shkedi 2005). Prescribing is an activity that is context bound and Shkedi (2005) suggested there is always a tension between the informant’s world as it is simply articulated, and the unseen wider cultural context within which the informant lives their life. Therefore, it is necessary that the researcher examines the effects of the cultural environment on people’s experience of the phenomenon when collecting data, and should determine which arenas are the most relevant for understanding. Through the prescribers’ narratives, their experiences are investigated and explored in this study. Collecting data from prescribers with different professional frames of reference have several circles of cultural context, each containing properties of time and place (Strauss & Corbin, 1990).

The researcher as a ‘human-as-instrument’ has been elaborated by Lincoln and Guba (2000) and in the Multiple Case Narrative as “the person is the only instrument flexible enough to capture the complexity, subtlety and constantly changing situation which is the human experience, as expressed in stories” (Shkedi, 2005, p. 46). The researcher therefore conducted in-depth interviews in order to compare these stories.

In-depth interviews is used in many qualitative research design (Lincoln & Guba, 2000) and in Multiple Case Narratives, in-depth interviews are used to understand the experiences of participants and the meaning they make of their experience. According to Seidman (1991), interviewing provided access to the context of human behaviour and a way for researchers to understand the meaning of that behaviour. In keeping with the research design, in-depth minimally structured interviews were used to gain the necessary information, in order to understand the participants’ perceptions, views, and experiences in their own words. The interview guide is appended in Appendix D (D1 doctors and nurse prescribers and D2 mentors and nurse learners).

The venues and times for the interviews were planned to suit the participants. The majority of the interviews were taking place in the participants’ clinical settings. Each interview began with a brief introduction of the study using the information sheet to guide the discussion, and then participants were asked to sign the consent form. The right to stop or withdraw from the interview was reiterated to participants, as the interviews were tape-recorded. Informal conversation with participants before the interview was initiated mainly to put them at ease. Tape
recording was initiated at this time. All interview recordings were clear with minimal interruptions. The formal interviews began with an open-ended question asking participants about their views experiences and perception of prescribing, both as learners and as prescribers. From there, very little prompting was needed from me to cover the topics in the interview guide. The majority of interviews lasted from 45 minutes to an hour with a few lasting more than an hour. Recorded interviews were transcribed verbatim.

3.10 Data analysis

Data analysis is a process of making meaning out of data and Shkedi advised researchers to be mindful of their conceptual perspective, particularly conceptual frameworks that orient their inquiry into the person and/or phenomenon. Mindfulness to conceptual perspective is parallel to theoretical sensitivity in the grounded theory tradition (Shkedi, 2005) and refers to the personal quality of the researcher. Shkedi urges researchers to focus on their implicit and explicit understanding of the material, for example, the researchers’ professional or disciplinary knowledge, as well as both research and personal experience. Strauss and Corbin (1990) suggested that researchers come to the research situation with varying degrees of sensitivity depending upon previous reading and experience with or relevant to an area. Throughout data collection and the preliminary analysis processes, including and during the categorisation phase, I was therefore continually mindful of my role and involvement in the process as researcher, and my interpretation as a non-naive researcher of the meaning and words of the participants.

After the written transcriptions were returned, I reviewed the transcripts while listening to the interviews for each participant. This was necessary for two reasons, firstly, as a way of reviewing the transcripts for accuracy and to become familiar with the data, and secondly, to begin the interpretation process. Interpretation inevitably pervades the whole research process from conception to reporting. The transcript was first read in its entirety several times as advised by Shkedi (2005) He called this “formal analysis”. It is very important to become familiar with the data to get a sense of the data as a whole, i.e., to understand the larger picture before breaking this down into parts. I wrote down notes on the transcripts while listening to the audio-tape recording to get a sense of the participants’ feelings and expressions, and to identify aspects of the data that were particularly relevant, and more importantly, to capture the language and the descriptions of the phenomenon from the participants’ perspectives.

The first stages of data analysis commenced at the start of the data collection process, as it was important to make sense of what I was hearing in the next interviews. Analysis involves breaking
down the data and reorganising the data into units of meaning. Shkedi (2005) described data analysis as the process of bringing order, structure and coherence of data collected for a study. Data analysis in the Multiple Case narrative follows four stages, where the data is initially analysed for themes and patterns, through categorisation and forming core categorise, and narrative-based theory analyses (Shkedi, 2005). Each stage of the data analysis follows a systematic process and analysis could not proceed to the next step without completing the methodological step/steps outlined for that particular process. According to Shkedi, the judgement of the researcher is important throughout, as he or she could decide at which stage the analysis ends, depending on the research intention. Each stage of data analysis is further discussed in this section and examples of documents are provided in the Appendices during the period of data description and classification for this particular study.

3.11 The Narralizer Software

Many programmes are available to assist the researcher with the analysis of qualitative data. Software programmes are important tools that researchers use to analyse qualitative data; however, such programmed do not substitute for mastering data analysis methods or being personally involved in it. In Multiple Case Analysis, part of the interpretive work is gaining a sense of the whole, the whole interview, the whole story, and the whole body of data. No matter how helpful computer programmes may prove for managing the parts, Charmaz (2000) argued that we can only see the fragments of data in the screen. She differentiated between several modalities of qualitative research according to the degree to which sophisticated analysis programmes may be applied to them and put forward the view that software analysis programmes appeared more suited for the qualitative-positivist approach than for the qualitative-constructivist approach. As Multiple Case Narrative follows the qualitative-constructivist approach, a software called Narralizer was developed based on the analysis procedure described by Shkedi (Shkedi, 2005) and suited to analysis of narrative data. The use of the Narralizer software was used to provide a tool for the researcher to link “bits” of data extracted from text where thematic analysis was employed to analyse blocks of text (and not separated words) as the analysis unit.

Narralizer is user-friendly, qualitative research software, which allows the researcher to conduct qualitative and textual data analysis, develop a comprehensive narrative description, store bibliographic items, conduct a literature review, and build theories grounded in data. The Narralizer software is not intended to replace researchers, but to help them organise their data, divide their data into meaningful units, categorise their data, and reorganise data in a meaningful new order. The range of applications of this software makes it suitable for almost all forms of
qualitative research, from the more structured “objective” qualitative type, to the more constructivist type. The use of *Narralizer* as the software of choice was made based on the basis that this particular study followed the Multiple Case Narrative approach, which is a qualitative-constructivist method of study.

3.12 Thematic analysis

Structural analysis and thematic analysis are two forms of analysis specified in narrative research. Structural analysis of narratives focuses on the formal elements of the narratives and treats text as objects of units of narrative and linguistic analysis. According to Shkedi (2005) structural analysis orders all possible elements that appear in the stories, and “the way that they are arranged in sequence, in a way that can be compared across the narratives and related to the context variable...” (p. 80). Thematic analysis, on the other hand, treats text as a window into human experiences, wherein the text is segmented into its most basic meaningful components, words, and where meanings are found in large blocks of text (Riessman, 2008). Thematic analysis uses a form of qualitative content analysis (Sandelowski, 1996). In the Multiple Case Narrative, thematic analysis use blocks of text (and not separate words) as the analysis unit, as in the constructivist-narrative approach. The context is of critical importance and one cannot separate words outside of their immediate and peripheral context (Lincoln & Guba, 2000). Analysis is complete when the core variables are defined, the relationships amongst them established, and when they are integrated into a meaningful collective description or story line (Shkedi, 2005), i.e. single story is constructed out of many stories.

3.12.1 Within-case analysis and Across-case analysis

Data analysis makes meaning out of data and in Multiple Case Narratives, many cases are considered. Shkedi (2005) maintained that researchers must take into consideration the importance of data reduction. Data reduction is related to the intentional selection of materials in a purposeful, non-random manner, where qualitative data were reduced by a process of selection. In Multiple Case Narratives, this can be performed in two ways, within cases and across-cases. As the primary intention of the study is to understand nurse learners’ and nurse practitioners’ journeys in learning and doing prescribing, data reduction was pertinent particularly for other groups (i.e., midwives and doctors) as there were some non-relevant data for a case narrative.

In Multiple Case Narrative, an approach is recommended that consists of an analysis procedure based on continual stages. Each level is constructed based on the level “below” it and cannot be
constructed without this previous level of analysis. For Shkedi (2005), each level could be a terminal stage of the analysis process, depending on whether the purpose of the research was to construct a focused narrative description, or a narrative-based theory. In a narrative-based report, the use of theoretical terms in all aspects of the report is integrated with the participants’ views and interpretations, as well as the contextual components, which are the general, common, and comparative descriptions of the participants, and includes authentic pieces of narratives from many of the cases. The narrative based report is the translation of the informants’ narratives into theoretical academic language, within a conceptual framework. In order to achieve this, Shkedi (2005) presented a schema of data analysis that involved four stages. These stages were followed in the analysis of within and across-cases. Each of these stages is described below.

3.12.1.1 Stage 1 – Initial stage of analysis

The first stage is described as the initial stage of analysis, wherein the data are transcribed and analysed for themes using Narralizer software. As explained above, the transcribed interview data were read repeatedly to allow the researcher to become familiar with the script. Based on the assumption that narrative inquiry relates to the data as holistic and contextual, I had to read a reasonable amount of data (at least three to four interview scripts per group) to give a holistic data orientation. Agar (1980) suggested that the transcripts should be read in their entirety several times, and the researchers must immerse themselves in the details in order to get a sense of the data as a whole, the larger picture before breaking it into parts. This is described as comprehensive analytical reading, not merely passive and superficial.

Shkedi (2005) argued that the aim of the initial analysis was to open up the inquiry; every interpretation, and every category, is tentative at this point. This categorisation is based on the informants’ descriptions, and to relate exactly to what informants said. As suggested by Charmaz (2000), data were interpreted and analysed by sentence and by paragraph, but without losing the whole picture. This approach was particularly important in this study, as interviews were undertaken in groups of participants with different professional frames of reference, a factor relevant to the study.

After a thorough reading of transcripts, units of data selected from each case, within each group were entered in the Narralizer software. A preliminary analysis of patterns and themes were undertaken in this initial stage. Analysis was performed within cases for each group of prescribers (e.g., nurse learners, mentor prescribers, doctors, midwives, and nurse practitioners)
and tentative groupings of themes and patterns were identified. An example of the work that was done at this stage of analysis is included in Appendix E.

In Shkedi’s (2005) view, the demands of narrative inquiry on a researcher’s intellect, ego, and emotions were far greater than any positivist-quantitative research strategies, as data collection procedures are not routinised. There are no \textit{a priori} questions or hypotheses to guide decisions on data collection and data analysis (Shkedi, 2005). After the preliminary analysis of the data for the first group of participants (nurse learners), I was able to generate more in-depth questions related to the phenomenon to discuss further with the next group of participants. Using the same principles of data analysis, the data for the second group of participants (mentor prescribers) were entered in \textit{Narralizer} for coding and categorisation. This process was repeated for other groups (i.e. doctors, midwives, and nurse practitioners).

\subsection{3.12.1.1.1 Categorisation}

Categorisation is a process of classification. Categorisation is based on classification and is a conceptual process (Shkedi, 2005). The process of grouping together components of data that pertain to the same phenomenon is called \textit{coding} and in Multiple Case Narrative is referred to as \textit{categorisation}.

Categorisation is an important process in Multiple Case Narratives. Categorisation is not only a process of classification, but it is also a way to expose and make meaning of data. Strauss and Corbin (1990) asserted that categorisation represented two phases in which data was first broken down and conceptualised, then put back together in new ways. They called this the “concept-indicator” model, where \textit{indicators} (i.e., descriptions of actions, events or beliefs, thoughts) are examined comparatively by the analyst who categorises and names them, naming them as indicators of a class of narrative fragments.

Narrative researchers are urged to not merely use categories, but to develop \textit{data-driven} categories. Data-driven categories are categories, themes, and patterns, which emerge from the data. Shkedi (2005) suggested that categories were various themes and perspectives that cut across the selected subtext, and provided a means of classifying its units - whether words, sentences, or group of sentences. It is designed to maximise references to data in as many categories as the data demands. Classifying data into categories provides a dual challenge for researchers, where on the one hand, categories must be empirically grounded and defined in relation to chunks, and on the other hand, must be related to the wider conceptual frameworks,
which acquire meaning only in relation to other categories. Therefore when assigning data into categories, categories must be both meaningful in relation to the data and must be meaningful in relation to other categories (Shkedi, 2005).

The use of Narralizer was vital at this stage to assist me in handling the enormous amount of data that were generated from the interviews of the participants. Using the above principles, the data for each case (within cases) was broken down into discreet parts, examined closely, and compared for similarities and differences. The data that were thus identified were entered into the Narralizer software, where they were assigned categories and simultaneously examining the data in relation to the categories that these were assigned. An example of this stage of the data analysis within cases is provided in Appendix E.

The naming of categories remained the most challenging stage of my data analysis. In Multiple Case Narratives, the naming of categories must be taken directly from, and specified in, the language of the participants (Shkedi, 2005). Following initial annotation of each transcript, I went back and systematically considered the annotation in each transcript to check that the code name captured the essence of what the participant had said. To do this, I had to read the subtext as openly as possible and to define the major content categories that emerged from the reading. By following and applying these processes within cases, the result led to a continuous refinement of categories, where initial categories were changed, merged, and scrapped; and new categories generated and new relationships discovered.

### 3.12.1.2 Stage 2 Mapping stage - Formal categorisation and naming of themes as categories

Formal categorisation and naming of themes as categories follows the initial stage of the data analysis. Shkedi (2005) described this stage as the mapping stage of analysis. While in the initial stage, every case narrative is categorised separately with a common conceptual perspective, in the mapping stage all the case narratives (across-cases) are categorised congruently. I began to examine all connecting categories and identified connections between categories. Each category was compared for similarities and differences, and degrees of consistency of meaning among categories were also examined. Shkedi (2005) argued that by showing the relationships between categories in ways that explained the people, issues, or events studied; the mapping analysis would provide the groundwork for developing deep descriptions and explanations.
The mapping stage of analysis was an important process in my data analysis phase. Refinement and review of the data categorisation in the first stage was continually undertaken even during the writing stage of the thesis, where questions were continually asked about the types of categories and relationships and going back to the data to look for evidence that supported or refuted the categories that were created in the mapping stage. In the mapping stage, families of categories and sub-categories were beginning to emerge. At this stage, I continued to use, as much as possible, the participants’ actual words to relate to the categories, but as the data and the categories were united into ‘families’, I began to create new broad terms for some of the categories. Not all of the category names could be taken directly from the language of the participants. However, I endeavoured to ensure that the category names remained as close as possible, to the content of the data and to the language of the informants (Shkedi, 2005). An example of the audit trail for this process is in Appendix F (F1 –F5).

3.12.1.3 Stage 3 – Focused stage of analysis

The focused stage of analysis can be regarded as the stage where core categories are created. In the focused categorisation stage, the researcher now focuses the elements of the data into a coherent developmental account of core category (Shkedi, 2005). The core category is the highest “indication” category, where several main categories and subcategories are assigned. An example of the focused stage of analysis is provided in Appendix G. This stage of data analysis was vital in identifying the main themes. Identifying core categories compelled me to see the data from a different perspective. Strauss and Corbin (1990) suggested a procedure for identifying the core category by configuring the elements of data into a coherent narrative that unites and gives it meaning. Researchers are advised to ask analytical questions about what area of the study seems the most striking.

At this stage of the data analysis, I was beginning to see core categories across-cases, describing the participants’ journeys as learners and prescribers. Where initially, I was under the assumption that as each group was of a different professional affiliation, their journeys would be different as learners and as prescribers, the focused stage of analysis guided me to delve deeper into how these experiences were in fact similar or different. Focused analysis continued until the writing-up of the findings, where core categories were created and modified to present a coherent narrative. For Shkedi (2005) the Multiple Case Narrative, as with other qualitative strategies that deal with several cases, it was desirable to find patterns under the core categories. He asserted that after arriving at a tentative picture of the focused categories, the researcher could determine patterns, which are based on the correlations between different categories.
Correlation is taken to mean that some groups of case narratives are characterised by “similarities and/or dimensional likeness of several main categories...” (Shkedi, 2005, p. 129). The challenge of organising categories into storylines using core category remained in the writing of the report or findings as more than one dominant core category was found and the decision made on whether to focus on one or several simultaneously. By revisiting the data analysis completed in the Mapping stage (Stage 2), the decision of which of these core categories represented meaningful patterns and characteristics that were different from others was made.

In summary, interviews from each case within each group (nurse learners, nurse practitioners, doctors, mentors, and midwives) were transcribed, and analysed into categories of themes as described in stage 1 and 2 and then interpreted.

3.12.1.4 Stage 4 – Theoretical stage of analysis – Narrative based theory

The difference between the stage of theoretical analysis (Stage 4) and the stage of focused analysis (Stage 3) is the emphasis put upon conceptual-theoretical descriptions and on the explanation of the phenomenon under inquiry. The intention of focused stage analysis is to construct focused narrative descriptions of the phenomenon under study. In Stage 4, the emphasis is put upon the “conceptual-theoretical descriptions and on explanations of the phenomenon under inquiry” (Shkedi, 2005, p. 131).

In a systematic process through the three successive stages as indicated in Stage 1, 2, and 3, I have examined the informants’ narratives in order to extract the descriptions and explanations relevant to my investigations. Shkedi (2005) referred to the four stages as the stages of building a theory. He argued that this theory was a theoretical explanation for the specific body of case narratives under examination. He added that the categories created in Stage 1, 2, and 3 provided a fertile field for theoretical explanation. After reviewing the core categories and subcategories, I decided that there was enough description to move on to the last stage of data analysis, the narrative-based theory. Maykut and Morehouse (1994) asserted that the approach used in the last stage of data analysis required the highest level of interpretation and abstraction from the data in order to arrive at the organising concepts, and tenets of a theory, to explain the phenomenon. By showing the relationships between categories in ways that explain the issues and events studied, focused analysis (Stage 3) forms the basis of, and provides the groundwork for, developing narrative-based theory.

In the early part of the analysis process, I was convinced that the extent of the analysis of the data would remain descriptive, and therefore, the intention of the data analysis was to follow Stages 1,
2, and 3, and in the end produce a focused narrative report. However, as I became more familiar with the data and the participants’ stories and experiences, I began to ask more questions that related to their experiences, both as learners and as prescribers. Following the steps outlined for each stage allowed me to revisit, reorder, reorganise, and reclassify the data until a coherent interpretation was formed of the participant’s perceptions and journeys.

Shkedi (2005) asserted that narrative-based theory was built from ‘blocks’ made up of fragments of the participants’ narratives, the insider’s points of view of the phenomenon under inquiry. He argued that people indeed had theories, and that behind their actions and words was some kind of “theoretical structures” (Shkedi, 2005, p. 131). However, in many cases these are not necessarily coherent or consistent theories, unlike formal academic theories, which claim coherence and consistency that provide other elements of ‘good’ theory. The participants’ theories are based more on tacit knowledge rather than an overt knowledge, and it is only through the interview process that researchers help informants to make tacit explicit, the unconscious, conscious. The theory that is grounded in what participants raise is more a ‘lived theory’, one that is described as similar to that of a constructivist approach to grounded theory (Charmaz, 2000).

The theoretical analysis proposed in the Multiple Case Narratives is a type of constructivist grounded theory (Charmaz, 2000). Researchers are familiar with the notion of grounded theory, designed and developed by Glaser and Strauss (1990), where the emphasis is the generation of theory from the data in which that theory is grounded (Strauss & Corbin, 1990). There are several modes of qualitative interpretation, and Strauss and Corbin (1990) point to qualitative interpretation running along the scale, from “let the informants speak and don’t get in the way” (p. 278) through to, theme analysis, elucidating patterns, and theoretical frameworks and models. This scale discriminates not only between description-laden and theory-laden qualitative analysis, but between several levels of theoretical analysis.

Traditional grounded theory as developed by Glasser and Strauss (1990) claims to be conceptually dense with many conceptual relationships. It assumes an external reality that researchers can discover and record by following a systematic set of methods that lead one to discover reality and to construct a provisionally true, testable, and ultimately verifiable theory. Charmaz argued this followed the positivist or post positivist orientation (Charmaz, 2000).

Shkedi (2005) considered the theoretical analysis in Multiple Case Narrative to be, “low-level” theory, unlike mid-level or formal and grand theories, where the relationships and concepts of theories have greater abstraction and applicability, the low-level theory is applicable only to the
immediate situation. This theory evolved from the study of a “phenomenon situated in one particular situational context” (Shkedi, 2005, p. 131). Constructivist grounded theory reveals less density and more loosely theoretical interpretation, than theory generated through the conceptions of the traditional-objectivist grounded theory.

Low-level theory is constructed in Stage 4 of the data analysis processes outlined in the Multiple Case Narratives. This theory according to Charmaz (2000) is the theoretical explanation for the specific body of case narratives under examination. The aim of low-level theory is to increase complexity, not reduce it, by including context, and is a researcher’s theory on the way people who experience the phenomenon perceived it. Mason (1996) called this process, “the theory that comes last” view (p. 142), where the researcher will develop theoretical explanations and propositions or explanation of the data.

3.12.2 The use of theoretical literature in theoretical analysis

As I followed the stages of data analysis advocated in the Multiple Case Narrative approach, the core categories that were created reflected such categories and concepts in the literature. For example, knowledge, skills, and clinical decisions were reflected in the focused stage (Stage 3) analysis and in the initial analysis of theoretical categories in Stage 4. These concepts were also reflected in the literature reviewed for the study (see Chapter 2). Shkedi suggested that researchers consult professional literature and other critical materials throughout all phases of the research. Throughout the phases of data collection and the first three stages of analysis, I used literature mainly to identify and focus on conceptual perspectives. I was careful not to bring theoretical terms used in literature when I was coding and categorising the transcripts. However, as I read the transcriptions of the focused stage of analysis (Stage 3), I concluded that the participants’ stories were unique, context-specific, value-laden, dynamic, and therefore could not be illustrated in any existing theories. I found the literature guided my interpretations of some concepts, but no single piece of literature led to a theoretical explanation of the phenomenon that was emerging from the data analysis.

Theoretical interpretation is an important step in the development of narrative-based theory. In Multiple Case Narratives, Stage 4 is about constructing theoretical categories, unlike Stage 3, where the intent is to construct a descriptive presentation of the narratives. Shkedi (2005) asserted that once the researcher had developed a fresh set of categories, these could be compared with concepts in literature. Araujo (1995) described the process of theoretical categorisation as an important intermediary in translating meaning from the frames of social actors, into frames of
theoretical discourse. Therefore Shkedi (2005) asserted that in the theoretical categorisation stage, the picture changed completely and researchers did indeed use concepts taken from literature. He added that at this stage, the researcher sought to explain the participants’ narratives in the light of the theoretical frameworks that evolve during the research itself. The literature could be used to “stimulate theoretical consciousness by providing concepts and relationships that could be checked against the actual data...” (p. 136).

The process that was taken in Stage 4 proved to be challenging and at times difficult for me as I attempted to define and succinctly analyse each term, and to code to a conceptual level, rather than merely as a descriptive code or topic. I went back and forth from data to literature in search of appropriate concepts and relationships and continued to review participants’ transcripts to re-familiarise myself with the data. Of all stages of data analysis, Stage 4 proved to be the most challenging in relation to wording of the terms of the conceptual categories, where I retained as much as possible the terms generated by the participants instead of conceptual terms taken from literature. In situations where names of the core categories were taken from literature, participants’ terms and names were retained in the subcategories or family of categories for that particular conceptual core category. In Multiple Case Narrative, this process is referred to as the continual process of testing concepts against data.

3.12.3 The process of testing concepts against data

Shkedi described this process as an integral part of the conceptual categorisation process. To systematise and solidify connections, the researcher must use a combination of inductive and deductive thinking in which they must constantly move between asking questions, generating presumptions, and making comparisons. Testing is an important and integral part of the process where the researcher is continually comparing presumptions (the theoretical concepts) against the data, making modifications, and then testing again. Strauss and Corbin (1990) asserted that narrative-based theory must always be traceable to the data that gave rise to it within the interactive context of data collection and analysis. The researcher becomes a crucial and significant player in the analysis process. Scrutinising the literature for received theories that may be relevant to the emerging theory developed through continuing handling of data leads to theoretical sensitisation (Strauss & Corbin, 1990).
3.12.4 Writing the theoretical story line

After the conceptual analysis of core categories, themes, and patterns, I embarked on a journey of writing the results into a logical storyline. Writing the storyline contributed tremendously to my thinking and understanding of prescribing as this related to the participants’ perceptions and experiences.

Shkedi (2005) asserted that the theoretical story was a description of the phenomenon under examination. It is the conceptualisation of a coherent descriptive story about the central phenomenon. Using the story as a guideline, the researcher can begin to arrange and rearrange the categories until they seem to fit a proper theoretical story and to provide analytical versions. He added that it was the theoretical storyline that provided the conceptual-descriptive rendition of what the research was all about. The researcher searches for an order to the categories that contributed to the construction of a conceptual story, providing a coherent theoretical explanation of the phenomenon under investigation (Shkedi, 2005).

3.13 Summary

In Chapter 3, the research approach used for the study is described in detail. Based on the nature, purpose, and intent of the study, the constructivist-qualitative research approach or the constructivist-narrative approach was chosen. Standards of trustworthiness, validity, reliability, generalisability, and mindfulness were detailed, to show how I approached, collected, analysed, interpreted, and reported data. Extensive descriptions were also provided for each stage of the four stages of data analysis, including the transcription documents (attached as appendices) that were generated to demonstrate the processes undertaken in each step of the research design and organisation of data. Included in Stage 4 is the process of conceptual-categorisation, an important step in the final analysis of Multiple Case Narratives.

Although one can argue that some more precise methods are better suited for conducting research of human experiences and construction, no one would argue that a single method or a collection of methods is the “royal road to ultimate knowledge” (Lincoln & Guba, 2000, p. 178), as long as the researcher attends to the methodological questions and clarifies them in detail in the methodological explanations of the research report. The focus of the Multiple Case Narratives is to present the understanding of the participant’s world, as they see it, not to examine hypotheses derived from theory. The progression of the research is flexible and does not follow a linear logic, but each phase is inter-related and depends on the others. The Multiple Case Narrative was favoured in comparison to other research methods as it has the ability to handle multiple cases.
and provide a more in-depth analysis of the phenomenon, while preserving the narrative-qualitative nature of the findings.

3.14 Presentation of findings chapters

Having examined the phenomenon of learning and doing prescribing from the perspectives of nurses, midwives and doctors, while privileging those of nurses, and representing different stages of the journey (learner and prescribers) and levels of experience (novice to experience), and having analysed qualitative narratives using the approach described in the chapter, four thematic areas emerged.

a. Acquisition of pharmacology knowledge – the expert clinician learning new theoretical material
b. Skill development – the nurse as a novice/beginner prescriber
c. Consolidating skills in clinical reasoning
d. Context of nurse prescribing – the nurse practitioner prescriber

Shkedi (2005) explained that there is no single method of narrative writing but rather a spectrum of approaches to text that takes a narrative form. In all four findings chapters a mixture of direct quotations (generally brief), and some longer summaries, and interpretive commentaries, which knits the writer’s voice to some disparate elements of the text are provided (Shkedi, 2005). Pseudonyms have been selected by participants and are used in conjunction with the verbatim quotes.
CHAPTER 4: LEARNING TO PRESCRIBE

4.1 Introduction

With the focus of this study being on the journey of nurses in learning to prescribe, nurses’ views and experiences in pharmacology education are presented to illustrate the stages of that journey: prior to, during and after prescribing educational preparation. The perspectives of other prescribers are also described, to compare how they differ from or, are similar to, nurses. Chapter 4 reports on the findings of the knowledge development of Registered Nurses who had recently completed postgraduate studies in preparation for prescribing, and who were asked to recall their experiences of learning about pharmacology.

There are five sections in this chapter. Firstly, the profiles of the participants are presented to provide an overview of their professional background and clinical experience. The section that follows, readiness to prescribe, describes nurses as expert clinicians working in extended roles that include the management of medication. Although working in an extended role, the legal limitation of not having prescriptive authority imposes restrictions on aspects of practice thus preventing advanced nurses from completing management of care. The following two sections present nurses’ experiences of learning prescribing theory and the benefits of prescribing education. The experiences of nurses are compared with other learner prescribers to illustrate similarities and differences, as, unlike doctors, nurses learning to prescribe have extensive clinical backgrounds. However, nurses are unfamiliar with and untrained in the processes of clinical reasoning in diagnosis and prescribing. The last section focuses on the experiences of nurses learning the process of clinical reasoning from doctors (who are mentoring them), thus exposing nurses to the hypothetico-deductive approach to clinical decision-making. Although the nurses in this study were expert clinicians, in learning the new skill of prescribing, the nurses were at the level of a novice (Benner, 1984), a beginner practitioner in a prescribing role.

4.2 Participants’ profiles

There were 43 participants interviewed for this study, comprising six groups of prescribers representing three professions (medicine, nursing, and midwifery). The make-up of each group is provided in Table 7.
Table 7: Breakdown of participant groups

<table>
<thead>
<tr>
<th>Participants</th>
<th>Groups</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURSES</td>
<td>Nurse learner prescribers</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Practitioner prescribers</td>
<td>10</td>
</tr>
<tr>
<td>DOCTORS</td>
<td>Mentors</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Senior Doctors</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Resident Medical Officers</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>RMOs)</td>
<td></td>
</tr>
<tr>
<td>MIDWIVES</td>
<td>Direct Entry midwives</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nurse Midwives</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>43</td>
</tr>
</tbody>
</table>

Nearly half (47%) of all participants were nurses (n=20). Prior to undertaking Master’s preparation, ten nurses (hereafter referred to as nurse learners) had been working as clinical nurse specialists in a speciality practice setting for between eight and fifteen years. At the time of the interviews, all ten had completed a Master’s degree that included pharmacology and prescribing preparation. Nearly half of the nurse learners were in the process of applying for registration in the nurse practitioner scope of practice with prescriptive authority through the Nursing Council of New Zealand.

The other ten nurses had been practising as nurse practitioner prescribers (hereafter referred to as nurse prescribers) for one to two years. These nurses were very experienced in their clinical field having been working as clinical nurse specialists in the same area of practice for extended periods. Eight nurse practitioner prescribers were working in secondary care, while two were in primary care.

Of the doctors who participated in this study, six were senior medical doctors who regularly mentored doctors as learner and beginner prescribers. These senior doctors, hereafter just referred to as mentors, who had previously been mentoring resident medical officers, were mentoring nurses for the first time. These mentors were working in the same clinical area of
practice as the nurse learners. In the context of this study, the term “mentorship” refers to educational and clinical support for those learning to prescribe. A further eight doctors were senior medical officers, in New Zealand known as medical specialists or consultants. In addition, two resident medical officers (who were in the first one to two years of medical practice) were recruited for the study. Among the doctors, the perspectives of experienced consultant doctors as mentors were of primary importance, because, as long-time mentors of medical students and junior doctors and now of nurses, their perceptions of nurses setting out to prescribe, and on the educational preparation of nurses, provided a rich seam of data.

Midwives also participated in this study, and comprised two distinct groups. Three are referred to as ‘direct entry midwives’ who were trained and educated in midwifery only, without first qualifying in nursing, after legislation changes were introduced in 1999 that included prescriptive authority (see Chapter 1, page 12, paragraph 3). Direct entry midwifery education is of three years duration at a tertiary institute. Of the three direct entry midwives, at the time of the interview two were employed as independent midwives in a secondary setting and one in a primary health care setting. The other four midwives had first qualified in nursing and subsequently in midwifery and are referred to as nurse midwives. Nurse midwives had to undergo additional training in prescribing when the Medicines Act 1981 was amended in 1990, before they were granted prescriptive authority.

4.3 Readiness to prescribe

All the nurses in this study were experienced and already working at an advanced level. They considered themselves ready to prescribe, but needed the knowledge to do so. Nurse participants were asked to reflect on their roles prior to undertaking formal educational prescribing preparation. Nurse learners saw themselves as “practicing at an advanced level,” with some having the opinion that they were “practicing at a Nurse Practitioner level”, as they were “already prescribing under standing orders and delegated authority”. To understand the participants’ views of their extended roles and self-identified need for prescriptive authority, participants were asked to describe their experiences in the process of development to becoming advanced nurses. In particular, the skills and knowledge deemed necessary to advancing practice were explored. Three themes emerged to depict advancing practice; working in an area of practice, nurses as holistic and autonomous practitioners, and medication management experience. The discussion that follows is intended to provide insight into working at an advanced level in nursing to portray some key features from the perspectives of the participants themselves, not to produce a representative picture of the role of an advanced practitioner.
4.3.1 Working in an area of practice

All nurses who participated in this study were currently working in an area of practice they referred to as their “scope of practice.” A legal use of the term scope of practice (refer Glossary) has also been put forward by the Nursing Council of New Zealand however, for the purposes of this study, the term scope of practice as defined by the nurse participants is employed. The nurses described having usually had a generic focus in their first three to four years in nursing. As they became more experienced, they eventually settled into a specific area that became their “chosen scope or chosen field” of practice. Participants considered that their experiences, clinical maturity, and knowledge base in their scope of practice contributed significantly to their clinical expertise. Nurses highlighted the prior experiences that prepared them for the specific contribution they made to clinical situations, and acknowledged the experiences and skills of the doctors they worked with.

Working within a chosen scope of practice over a period of time contributed to development and consolidation of both knowledge and skills related to a specific area of practice, which was viewed as an advantage. One nurse explains:

> We [nurses] have time within our chosen scopes to select that field, to really grow in it, and to know it well. Moreover, I think, because we know that field so well, and we do not go out of that scope or that field. I think we are experts in it. Abby (nurse prescriber)

Awareness of one’s scope of practice was one of the core categories that emerged when exploring how nurses develop knowledge and skills in prescribing. Participants gave numerous examples of working within their scope of practice, outlining where their scope begins and ends.

> I think we all practice within our scopes of practice. We [nurses] know our limitations, our strengths and weaknesses and if we come across a situation that we cannot deal with, we refer these patients to the doctors. Marilyn (nurse learner)

This quote showed how the nurse viewed her scope of practice, and the boundaries and limitations of the particular scope that was vital to safe and competent practice.

Nurse midwives held the same views as the nurses in that they agreed that awareness of one’s scope of practice was fundamental to safe practice.

> I do know when I am practicing beyond my scope. Like, for example if a woman develops diabetes... I will refer her to the Diabetes Clinic because now she needs to see a specialist. Her glucose needs monitoring. If she is
just diet controlled I could manage her, but if it [her care] is going beyond that, then that is totally beyond me. Sue (nurse midwife)

Nurses developed advanced skills in medication management as their experience increased in an area of practice. All nurses described how they referred patients to a doctor for prescriptions when needed, or for further evaluation and management in areas where they considered they did not have the required expertise.

...as my role developed I would actually often go along and say to somebody that this is what I would recommend... the treatment that was needed. My experiences with patients of similar conditions in the past have shown me this drug will work... and I have seen doctors prescribing it. Sam (nurse learner)

...I was certainly identifying when they [patients’ medications] needed to be adjusted and then saying to the physician “look this is what’s happening, can we change this now?” Maggie (nurse prescriber)

The majority believed they participated in and influenced clinical decisions. While being able to practice in an extended role was highly satisfying and nurses felt confident in their clinical expertise, they also described the limitations posed by being unable to prescribe.

....because of my role now... not being able to prescribe can be frustrating; it is so hard, difficult to do, not prescribing. Anne (nurse learner)

4.3.2 Holistic and autonomous practice

Participants reflected on the different services provided for patients and how nursing services compared with the services doctors provide. The broader context of services that included frequent visits and holistic approaches to care provision were described as major points of differences. Examples of holistic care were described by some participants and included: “dealing with health issues of lifestyle and risk taking behaviour”; “arguing for psychosocial intervention and not being limited to a medical model approach”; “delivering outreach clinics to ensure continuity of care and providing access to primary care services for people who normally do not have access to health care”. Kitty sums up the essence of nursing for her by comparing with medicine:

I truly do think that nursing does look at the person in a broader more holistic way... I really do think that. I think that I work with wonderfully compassionate people that are sensitive ... I’m talking about the doctors, but I think nurses, by virtue of their training... see people in the context of their broader lives. Kitty (nurse learner)
Most nurse participants felt that nurse training is different to doctors, as nurses are not working from a medical model: instead, they were more “patient centered” and “holistically focused.” Nurse learners reflected on their education and training and the philosophical and professional underpinnings of their undergraduate programme. To illustrate a holistic approach of taking care of patients, Margo explained:

Generally, because of the way of working from the nurse’s view, is working from the holistic model. I’m not working from a medical model. I’m looking at the social impacts on that young person. I am looking at all aspects of that young person’s life. Yes, the difference between what I would see my role as a nurse, and what the doctor’s role is... and I can’t speak for the doctor, but I think we’re [nurses] looking at a lot of the health issues that are related to behavioural and lifestyle thing. That’s why nurses sit within that holistic, caring, anticipatory guidance, health promotion model. Margo (nurse learner)

Nurses were not alone in seeing themselves as holistic in their practice. A mentor also believed it was nurses’ holistic view of care that was the unique contribution of nurses to the health care team.

Nurses have a more holistic view of the determinants of health. That is something they have that is unique to offer as members of the health team. Ross (mentor)

Not only were these advanced nurses practicing holistically, they also saw themselves as practicing autonomously. Nurses were confident in performing many clinical activities such as providing patient care, performing physical, psychosocial, and other health assessments on patients on their own, a role they considered “autonomous practice.”

People in rural areas doing Nurse led Clinics, a lot of the times have been making their own professional judgments autonomously and they don’t have the doctor in the next office you know. Lynn (nurse learner)

Where there are gaps in service delivery and service provision nurses have “stepped-in” to ensure that patients receive the health care they require. The majority of nurses were already engaged in practice where they saw patients on their own, made referrals where needed, and provided comprehensive care and interventions. Tom described his view of autonomous practice:

I thought that the main fact that you’re consulting tells me that you’ve actually practiced very much autonomously. Autonomous not just meaning on your own, but you know where to find, you know what your
Participants also referred to boundaries to autonomous practice. Examples were patients with long-term conditions and less complex presentations. Providing patient care and completing “episodes of care” were viewed as essential for their role. One participant explained:

Being autonomous means... being able to make decisions to a certain point. It means being able to manage patients with lower complexities on my own. Being able to provide ‘episodes of care’... and for some patients, it may be a chronic [conditions] episode of care and for others, little episodes of care. Cassey (nurse learner)

Participants described their interactions with patients as “episodes of care.” To be able to provide holistic care, nurses needed to be able to complete an episode of care. Not being allowed to prescribe meant that they could not autonomously complete an episode of care. Therefore, prescribing was considered essential to providing holistic care. Explained one:

I need a prescribing role to finish episodes of care and I think what this will allow me to do is actually complete the whole event of care for the patient. Anne (nurse learner)

Several examples of the notion, “episodes of care” were offered. To Cassey, episodes of care provided to patients may be episodic in nature (a series of interventions and intervals), while for others, episodes of care were characterized as continuous care. Nurses saw themselves as being available to the patient, monitoring health needs, and working closely with families. Being unable to prescribe limited the nurse’s ability to complete episodes of care, therefore, to work autonomously, and they expressed frustration at having to find a doctor to sign the prescription or “rubber stamp” treatment decisions that they felt they were capable of making.

...he [doctor] was rubber stamping things and so it became very frustrating to have to be always referring when I knew that I could actually take that next step. Cassey (nurse learner)

Before prescriptive authority, one nurse prescriber described how she could practice at a higher level, for example, prescribing under standing orders. In addition to enhancing autonomous practice, participants indicated that this contributed to better patient outcomes.

I deal with families, both individuals and both family groups, as my clinical context. So given that I tend to triage a lot of the complex chronic conditions like diabetes, even before I was a prescriber, in the particular region where this is prevalent combined with obesity, combined with hypertension and given that this population group don't readily access
primary health care, it’s not uncommon for me to initiate treatment or to extend treatment or to change treatment for people with those common conditions. I do that under Standing Orders. Abby (nurse prescriber)

Nurse participants, very experienced in a field of practice, described themselves as practitioners working autonomously in providing holistic care to patients. They conveyed confidence in providing most aspects of care that were needed, but frustration at being unable to prescribe in situations for which they considered themselves ready, about which they already advised doctors, and without which they were unable to complete episodes of care thus limiting their contribution to the healthcare team as holistic and autonomous practitioners.

4.3.3 Medication management experience

Administration of medication is an important role that nurses provide for patients on a daily basis. In order to understand nurses’ perceptions of the skills and knowledge required for prescribing, the nurse learners were asked to describe their current knowledge and skills in medication administration, skills which would contribute to a prescribing role.

Medication management in practice refers to the safe use of medications (see Glossary) and includes the administration, storage and dispensing of medications. The nurse participants in this study have indicated that they have worked with patients in improving the management of medications, especially in the area of adherence. Participants viewed adherence as a key focus in medication management in order to achieve therapeutic benefits and ensuring patient adherence was also essential in prescribing practice. In the following example, a holistic appraisal of the patient’s situation is reflected in Margo’s approach to medication management.

For example, I have this one patient. He has medications he does not really understand why he has to take it. I have been working with this young boy who’s on Cilazapril [antihypertensive]... so when I get a snapshot of this person’s profile, I know, if I give that young person, for example a prescription, they’re never going to get it filled, because there is no income to actually fill it first of all. Margo (nurse learner)

Patients’ contexts are an important consideration for nurses. For the nurse participants, context referred to “patients’ preferences and choices in making decisions.” Nurses also identified situations that are likely to contribute to non-adherence, and an awareness of these factors was important for effective medication management. Examples related to non-adherence given by nurses included frequency of dosing without considering a patient’s lifestyle and lack of patient involvement in treatment decisions. However, considerations of the patient context, such as “lifestyle, social and personal situations”, “providing choices”, “taking into consideration a
patient’s ability to make decisions” and the need to “monitor patient situations”, were areas identified to increase adherence in patients. An example of a situation where assessment of the ‘at-risk’ population was important is described by Margo:

*Developmentally they might not be able to, emotionally they might not be able to, physically, the environment they’re in they might not be able to actually keep them [medication], you know. I mean, I work with a broad range of young people, and the ones in care are obviously the most risk takers, higher need young people. Margo (nurse learner)*

Bringing together the perspectives of nurse participants reflecting on the advanced nursing role without the right to prescribe, nurses conveyed a sense of frustration in what they described as being unable to complete an “episode of care.” Having settled into a particular ‘scope of practice’ in which they worked in a way they characterised as holistic and autonomous, they could do everything for patients and families except write the necessary prescription. They indicated a readiness to take on the added responsibility of prescribing, as they had extensive experience in medication management to draw on, and in addition some were already prescribing under standing orders or recommending to doctors what should be prescribed.

### 4.4 The experience of learning prescribing theory

The previous section highlighted that as nurses progressed in their professional careers they settled into a scope of practice and developed their role within that scope to increasingly autonomous levels. They retained a strong holistic approach. Although they felt ready to take on the responsibility of prescribing, first they were required to complete an approved postgraduate programme in prescribing. This section begins by briefly discussing participants’ perceptions on the adequacy of their prior education in biomedical science and pharmacology. It then goes on to describe nurses’ perspectives and experiences in engaging with prescribing knowledge. To better understand the nurses’ experiences, the perspectives and experiences of doctors and midwives are also presented and compared with those of nurses.

#### 4.4.1 Existing biomedical and pharmacology knowledge

Although the majority of nurses indicated that biomedical sciences were included in their undergraduate training and education, they thought it was to a limited level when compared to medical training.

*But, I do feel nervous that I don’t have that biomedical background, but it’s interesting, when I do listen to [Doctors], they have the ability. They*
have more knowledge in the realm of diseases. I remember my mentor challenging me on pathophysiology... and I had to look it up. **Tom** (nurse learner)

Participants agreed their learning was “less extensive” to that of doctors in relation to medications and prescribing.

...when I entered nursing I had no notion that I would ever prescribe a medication, whereas presumably a doctor admittedly started medical training knowing that someday they’re going to be prescribing. So, I’ve had 20 odd years of nursing without any intention of prescribing. I think one of the things that will make us nurses less of...let’s say more cautious in their prescribing is the fact that we [profession] don’t have a history of a hundred years of prescribing. **Sam** (nurse learner)

For the majority of nurses the knowledge and skill learnt from their undergraduate training and education provided a “generic knowledge base” considered relevant to basic nursing practice. The undergraduate nursing education and pre-registration programme prepared participants for a nursing role, but not for a prescribing role.

### 4.4.2 Clinical context- “preparedness to learn”

In contrast to nurses who first studied pharmacology after several years’ of clinical experience, doctors were exposed to pharmacology education during their undergraduate student years when they had no clinical context to draw on. Doctors in this study indicated that for them, learning pharmacology did not provide a ‘sense of relevance’, as they had little or no clinical experience at the time.

And so, of course, you don’t... you’ve never heard of digoxin, you know... they do throw in the odd medical example, and digoxin is a very common one that they teach in pharmacology lectures, but when you’re a pre-clinical med student, who cares about digoxin. **Tiffany** (senior medical officer)

One doctor described learning pharmacology like - “broad brush strokes,” where pharmacology knowledge was combined with pathophysiology and biological sciences, providing a more generalized approach. One participant conveyed this saying:

So we would do the anatomy and the physiology and the pharmacology and, you know, clinical relevance all at one time, so we would get a little bit of prescribing information at that time but very broad brush strokes as in, you know, “What medicine would you use? How would you manage this condition?” **Sarah** (senior medical officer)
At the same time, for doctors those ‘broad brush strokes’ became embedded in memory, and a foundation for subsequent clinical decision-making. Several doctors reflected on the relevance of their undergraduate learning and on the integrated approach to clinical practice.

I think it’s one of those things [biomedical and pharmacology knowledge] that I probably know a little bit about without realizing. When I think back, you’ve got to think about renal function when you are prescribing...but it is something you learn a lot from the textbooks, and then when you get into the clinical situation, you don’t recall it and you know a lot of people would say “well why bother having it in a pathophysiology paper?” But I do actually think some of it sticks. Kate (senior medical officer)

In the context of mentoring nurses learning to prescribe, the mentors reflected on their own experiences of pharmacology education during their undergraduate years. The limited clinical exposure of medical students was considered to contribute to the theory-practice gap.

You see, as doctors we start first with a prescribing qualification, you know, and we don’t actually know what to do with it (laughter), because we haven’t got the clinical experience to go along with it. Nurses come at it the other way round, they gather their clinical experience first, and the very few of them that have done so, achieve their prescribing rights later. So they may be in a better position to be able to avoid some of the learning that goes on with us as doctors. Phil (mentor)

For some nurse-midwives, pharmacology study extended the depth of their knowledge of drugs used in normal pregnancy and childbirth. One nurse-midwife suggested that, “as an adult learner with extensive clinical experience and potential prescriber responsibilities,” she was better prepared to learn from her pharmacology education. In this, the nurse-midwives perspectives of clinical experience supporting their knowledge and skills in prescribing were similar to those of the nurse participants.

I learnt more about ecbolics, for example and why people vomit so much with Syntometrin. I never actually thought about it [ecbolic's effects] and then I was reading it and I was thinking...and it was hard work in terms of learning and I got carried away. So I actually thoroughly enjoyed it [pharmacology courses] but it was hard work. Ann (nurse midwife)

A further example shows how learning pharmacology was facilitated by being able to draw on clinical situations. The majority of nurse learner prescribers and nurse-midwives had extensive prior clinical experience in the relevant clinical area that enabled them to immediately grasp and apply new knowledge, and to recall clinical situations where side effects and sometime adverse effects had been experienced by some patients they had been caring for.
...so basically I went down and said “Look this is what he’s on [drug] and he’s sitting there breathless [adverse effect] on my chair, he’s [patient] got to come off it [drug]”... and there was no argument [referring to the doctor]. And I’ve had a couple of patients like that. Christine (nurse learner)

Nurses were thus able to draw on their extensive clinical experiences in relation to medication administration and previous knowledge of drugs commonly used in their area of practice. As learners, they were better able to integrate the new pharmacology knowledge they have learnt during their education to the practice setting than were their counterparts (medical and direct entry midwifery students) who had no clinical experience to draw on.

4.4.3 Applying prescribing theory to practice

As described above, nurses were able to draw on their clinical experience to make sense of new pharmacology knowledge during their post-graduate programme in prescribing. Participants cited how new learning added to their knowledge of different aspects of medication management. Numerous examples were cited by nurses that illustrated how pharmacology knowledge contributed to their understanding of the drug and its “side effects,” and how this improved their practice in terms of monitoring “how patients were managing these side effects.” For example:

I’ve seen that risk factors are a problem...especially in the use of medication for older people. Usually the polypharmacy aspects of prescribing is a problem for them, you get drug to drug interactions. So that knowledge [pharmacokinetics] is important for my practice. Tom (nurse learner)

For some participants, unwanted side effects of drug therapy had previously been “difficult to understand,” but studying pharmacology extended their knowledge of the predictable mechanisms associated with side effects. The majority agreed that as they acquired additional knowledge, they had a base on which to assess and monitor medications.

...knowledge of the medications and things and just the side effects of those medications, and their systemic effects are important to understand how patient are managing. Cassey (nurse learner)

By understanding predictable and unpredictable side effects, nurses felt better able to anticipate potential side effects that could lead to non-adherence, and this improved their practice of monitoring and evaluation of the drugs patients were taking. The knowledge gained in relation to pharmacology was considered to have positively contributed to the nurse’s day-to-day practice in medication assessment and administration. One participant indicated:
So that’s my background from a young nurse to 20 years later... 30 years later. I don’t find medication as scary now. I think having the understanding of the pathophysiology knowledge and all other aspects of medications helped too. But what it does tend to do to you, I think is realize how much I don’t know, as well. Does that make sense? So even if I didn’t become a prescriber for some reasons, say if I failed a [nurse] practitioner application, what this paper’s [pharmacology and therapeutic courses] done for me is... I’ve now reached a level, to critique the medication quite carefully. **Tom (nurse learner)**

Nurses described how being able to integrate the principles of biomedical sciences and understand potential effects of insufficient and compromised liver and renal functions to prescribing some drugs facilitated their understanding of dosing. Prescribing knowledge, however, was seen as only one aspect of the whole patient presentation that must be considered.

*It is not just the prescribing papers that you have to go through; it is a building of the whole, whole of it. So although the prescribing papers are part of it, you need to do the Science papers and the other papers that focus you towards looking at how your role can advanced. **Cassey (Nurse Learner)***

Greater pharmacological knowledge enabled the majority of the participants to ask more questions about the “suitability of the drug for the patient” and “its efficacy in certain situations.” In addition, this knowledge helped decisions based on determining whether risk outweighed benefits. Indeed, some nurses remarked on their level of prior knowledge as “superficial” and the “need to increase their knowledge” as fundamental to prescribing.

*So that’s why I chose to extend myself further by doing the assessment paper and then the prescribing papers to supplement my Masters because I knew there was there was this gap in knowledge. **Kitty (nurse learner)***

In summary, nurse learners were prepared to take on a prescribing role, however they all felt they had gaps in biomedical and pharmacology knowledge. Having completed the postgraduate pharmacology courses, their learning was extended to understanding the drug’s potential benefits and harm. As learners, previous clinical experience and understanding of patient context were factors that contributed to consolidation of pharmacology knowledge. As adult learners with extensive clinical backgrounds, nurses and nurse-midwives were similar as learners, in that the knowledge was consolidated and immediately applied. In this, the nurses contrasted with doctors’ experiences in first learning pharmacology, in that the perceived relevance was less in the absence of a clinical context to draw on.
4.5 Benefits of the learning experience

The benefits of completing an approved postgraduate programme in prescribing are multiple. These are first discussed generally, before focusing on the specific benefit of increasing nurses’ confidence in their advanced practice role.

Learning the fundamental principles of pharmacology and pharmacokinetics contributed to enhancing nurses’ skills in assessment of drug effects, drug interactions and adverse effects, which are all aspects of prescribing. Learning was made easier for nurses because they could apply these principles immediately to patients.

That pharmacology preparation was really useful for me...for example, I can’t remember all the medications this young person was on, but I looked at what she was presenting with, like headaches, and I looked at what she was on [drugs], and I could see there were interactions. I can see it better, maybe, because I can understand why patients behave that way when they are on certain drugs. **Margo** (nurse learner)

As their knowledge of pharmacology increased, nurses’ sense of responsibility also increased. Whereas previously they had seen themselves as responsible simply for the administration of the medication that was prescribed, now that sense of responsibility extended to other factors needing consideration, such as monitoring and assessing patients taking drugs with high risk profiles. For example, one nurse participant who works in ophthalmology had to broaden her knowledge for ophthalmic medication to learn about other drugs causing systemic effects (e.g. blood pressure), that led her to question drug interactions:

So if I was looking at the medication this patient was on, for example a beta blocker, I can now ask myself, is this patient suitable for a beta blocker or not? Now I look at their age and their medical condition. For example, if they are asthmatic or whether they have any chronic cardiac problems or whether they’ve ever had it before and so on. These can affect the way the patient will handle the drug. **Cassey** (nurse learner)

Both nurses and nurse-midwives were similar in that both groups found their pharmacology courses provided a depth of understanding they viewed as important to clinical practice. Nurse-midwives felt that having nursing experience was an advantage, as it gave them “confidence in the use of medications.” They described having a sound sense of understanding of what certain drugs and classes of drugs are used for. One nurse-midwife explains:

* I would say having the nursing background is a bonus... a 100% bonus. You have midwives out there who are also nurses. Probably different from midwives from the direct entry programme. They [direct-entry] don’t have
that much experience because they don’t have the nursing background.

Sarah (nurse midwife)

Having extended their knowledge about drugs and their actions, effects and potential harm, nurses thinking about the drug and the purposes of treatment was broadened.

So, I think understanding the medication, and understanding the pharmacokinetic dynamics has really made me look at what they’re on. Even when I am assessing a person, I always ask, “What do you want? What are you taking? What are you buying over the counter?” And I probably wouldn’t have done that so much before doing the pharmacology paper. Margo (nurse learner)

The postgraduate programme in prescribing includes a practicum where nurses learn under the supervision of a mentor. Nurses select their own mentor and all participants had a good working relationship with their mentors (senior medical colleagues) before the prescribing practicum. Nurses described doctors as having been supportive of the role of nurses in carrying out standing orders. The prescribing practicum, however, changed their professional relationship to a different level, described by Cassey:

It certainly has improved our relationship, but however I was very lucky in some respects in that I have a good working relationship with S [mentor] anyway. Cassey (nurse learner)

Nurses felt that mentoring not only enhanced their relationship with the doctor, but it also provided them with a lens to understand what doctors go through in the process of clinical reasoning as it relates to prescribing. One nurse described the experience as providing a greater insight into what doctors actually do.

I would say doing the training certainly has changed my practice up to this point... I’m a lot more aware of what’s happening whenever we use medication. I now have a greater insight into where some of the doctors are coming from. Lynn (nurse learner)

4.5.1 Building confidence

Developing the nurse’s knowledge in pharmacology enhanced their confidence. For example, the ability to think through which of the potential drugs to use in a specific situation increased their confidence and involvement in the decision to prescribe a particular drug. One participant explained:

So for me, the therapeutic paper gave me a real overview of what other medications were out there and what they did and how they worked. Now
that works very importantly when I come to take a history on a patient, because patients don’t always come knowing their medications. However, the knowledge that I gained over those papers, gave me the confidence to actually be able to say “Okay, so you’re diabetic, you’re likely to be on these sort of medications” and as soon as you can say some names of these drugs, you can often work out what medications they’re actually on. Cassey (nurse learner)

Another benefit related to the nurses’ professional self-image, reflecting their experiences in being listened to and consulted with on prescribing decisions. The opportunity to discuss prescribing decisions with doctors also provided opportunities to have feedback on suggestions and decisions.

Learning pharmacology was actually a good experience, because you felt reinforced and actually got some positive feedback about your ability to practice or prescribe. Barb (nurse learner)

I think it builds your confidence... that your decisions were right. Kitty (nurse learner)

Although nurses were experienced clinicians, they had not previously seen it as their place to question doctors’ prescribing decisions. The knowledge and skills gained during their pharmacology education provided some nurses with the needed confidence to participate in discussing prescribing decisions.

I would attend multi-disciplinary team meetings and make suggestions of medication regimes that I might not have done before. It has definitely influenced a couple of cases that I’ve worked on. Actually, in both instances, I felt the person was under treated and I sort of pushed for not only a change in medication, but also a change in the whole treatment plan. Sam (nurse learner)

For some nurses, the increased confidence was directly related to their increased pharmacological knowledge, giving them the ability to more effectively advocate for patients in their care. For others, increased knowledge raised their confidence to speak up within the health care team. Nurses interviewed described being empowered to change their strategies from indirect influence to actively engaging in clinical discussions.

I’m more confident in arguing my point of view when I have disagreements particularly about the medication regime, and rather than trying to subtly influence the doctor now, I’ll probably be, hopefully, arguing with them on a level footing, you know. I mean, I don’t mean arguing, I mean having clinical discussions...its empowering really. Lynne (nurse learner)
In addition to enhancing confidence in presenting their viewpoints, nurses felt that a good understanding of pharmacology gave them the confidence to discuss their prescribing decisions with other prescribers and their mentor. One participant described pharmacological knowledge as “tools” to challenge medication practices, which in turn can make a difference to their patients’ clinical situations. It also gave them a ‘common language’ in which to engage.

And, I think one thing is, it makes you speak the same language, gives you a language to speak to the doctors as well. So we have this common language around medications, you know, which we can then translate to clients. Anne (nurse learner)

A by-product of the nurse’s increased confidence was a closer professional relationship with doctors. The stronger professional relationship was based on two mechanisms. For nurses their respect for medical colleagues knowledge and skills increased. On the other hand, the doctors became more aware of the nurses knowledge, skills and limitations. There was evidence that the mentors were more trusting of the nurses’ level of knowledge and skills after working with them in their practicum. As one nurse described:

So you know they’ve formed an understanding about where my knowledge sits with pharmacology, and they understand it. And so, you know, at the beginning of my practice, they would come and assess a patient with me, but now they trust my knowledge and they work with me now. Margo (nurse learner)

In summary, all nurses viewed their programme in prescribing as fundamental to knowledge development and an increase in confidence. Although pharmacology theory was new to many participants, nurses’ learning was facilitated because they were able to reflect on previous clinical experience and apply experience to theory. At the same time, they could immediately apply new knowledge and client situations, thus enhancing learning. Gaining pharmacological knowledge enhanced nurses’ respect for their medical colleague, while at the same time, through giving them a shared language in pharmacology, increased their confidence and empowered them as members of the health care team.

4.6 The experience of being mentored

To this point, nurses highlighted the benefits of an approved postgraduate programme in prescribing as being much broader than simply providing the theory necessary for a prescribing role. The final component in the prescribing educational programme is the prescribing practicum (see Chapter 1, page 16), which entails nurses making prescribing decisions under the supervision of and with the support of a mentor. As prescribing is traditionally a medical role, doctors were
viewed as best positioned to mentor nurses in prescribing. Although mentoring is commonly used in teaching and learning approaches in both medicine and nursing, the mentors and mentees are usually of the same professional group and its associated frame of reference. As learner prescribers, nurses were mentored by doctors who, by virtue of their training and discipline, have different professional points of reference and philosophical underpinnings (see Chapter 2.4). In this section first, a discussion about nurses learning from their mentors is presented. The views of nurses learning from mentors and mentors views of nurses as mentees are described to explore the participants’ perceptions of skills required for safe prescribing, followed by a discussion of the differences in the frames of references between the mentors and the nurses.

4.6.1 Learning from the mentor

Although the nurses in this study were practicing at an advanced level and had developed some skills in decision-making, learning to prescribe, extended these skills. Increasing decision-making skills was primarily learnt during the prescribing practicum with mentors. As indicated above, doctors described “prescribing as a process of analysis and a step-by-step method of problem-solving”. This method of problem solving was one of the skills identified by nurses as “new.” For example, they had not previously been exposed to making decisions related to choosing a drug. Some nurses considered the systematic process of analysis needed for prescribing as a skill that would take time to develop and gain confidence in. One nurse described how this process had merged with his day-to-day nursing practice after learning it from his mentor:

*I know that she [mentor] uses this sort of format to go through the prescribing, and I’ve learnt that from her really, for example, what are my other options? What is the best drug for this patient? So learning that sort of way from her, watching her process it, has been extremely beneficial.*

*Tom* (nurse learner)

Prescribing decisions and risk benefit analysis were some of the learning that nurses considered essential for prescribing that was learnt during their mentorship. One nurse describes the experience as providing greater insight into what doctors actually do.

*Working with a prescriber mentor during my prescribing practicum dug me deeper into what the drugs actually do and how they actually worked, which is very important. [Mentor] gave me some aspects of prescribing I never knew before. *Cassey* (nurse learner)*
The majority of mentors indicated that when deciding on choices of treatment and deliberating on the potential diagnosis, risk assessment was an important skill. One mentor articulated a situation of risk-benefit analysis:

*Now, you see, if you just turn the whole thing around, if you talk to nurses about prescribing the whole focus is on the drug. And it shouldn’t be. What prescribing is about is saying, “What is this patient’s problem?” Then saying, “what is that problem due to?” Then, at the end of this process, “Do I have a drug available to me that is going to do more good than harm?” That’s actually the process. **Geraldine** (mentor)*

There is always an element of risk and the mentors were cognizant of the fact that learning to balance the risk and benefit takes time to develop. Mentors were similarly aware that the majority of the nurses found this difficult and were reluctant to take risks.

*In risk assessment, I mean that you may have a differential diagnosis of three diagnoses. Your first diagnosis is the one that’s 80% likely to be right. Your next one is 15% and your last one is 5%. But if your 5% chance of being correct in differential diagnosis carries a very high risk, then that needs to influence your prescribing pattern. Now I suspect that for many nurses they will go on the 80%. But they need to remember that if you’ve got a high risk of missing that 5% that could be critical. **Elizabeth** (mentor)*

Nurses found that risk-benefit deliberation in relation to prescribing was a skill they were still in the process of learning. Instead, nurses were more likely to use guidelines and protocols where the benefits of treatment are more established.

*I certainly think nurses will be closer to prescribing guidelines and follow the best practice routes rather than being (pause) innovators in terms of prescribing practices. **Sam** (nurse learner)*

Being mentored by a doctor exposed nurses to the way doctors think and reason. For doctors, it is essential that first a “diagnostic problem” is defined: The first step in prescribing being to identify or set about tracing the cause. The diagnosis is, therefore an “explanation of the malfunction,” where a possible causal explanation is identified. This diagnostic reasoning follows a similar step-by-step method of problem solving to prescribing.

Learning the process of diagnostic reasoning, however, was new for nurses and unfamiliar to them. Prior to nurses seeking prescriptive authority, the patients referred to nurses for management had an existing diagnosis or, in many cases, the doctors were responsible for the
diagnosis of the patients. Prescribing under standing orders did not require nurses to go through the process of diagnostic reasoning, and nurses were aware that they were limited in this.

*We do follow standing orders but that is completely different from making a diagnosis. I did go through that [diagnostic reasoning] in my mind at time, but probably not to the same extent as I do now. Doctors’ thinking [in diagnostic possibilities] is far more extensive than mine. And the difference now I think is, as a future prescriber, it is more my responsibility to make that definitive diagnosis, not only the doctor’s.*

**Kitty** (nurse learner)

The nurses reflected further on the benefits of being mentored. Working with a mentor enhanced not only their analytical reasoning, but also their diagnostic reasoning skills.

*I remember one doctor, who was one of my mentors. He was great. When we’d see a kid and I’d be saying “well it could be this and this. And he used to say... he said to me on several times “if you hear hoofs’ pounding towards you in the dark it is probably a horse, it’s probably not a zebra”. And it was really funny, ’cause I was always saying “but it could be this” you know. So, I think working with the doctors, you do have to think that you don’t want to miss something. You can’t just think “oh well this is the symptoms so it’s this”. You do have to kind of think out of the box.*

**Paige** (nurse prescriber)

For some nurses, working with doctors strengthened their existing knowledge of certain conditions and their repertoire of differential diagnoses.

*The way I look at differential diagnosis did probably change when I started working with the doctor. It probably did change a bit, though I think that I always have sort of been tending to look at, try to look for other possibilities.*

**Chrissie** (nurse prescriber)

Nurse participants felt that while some aspects of diagnosis were learnt during their professional undergraduate preparation, the majority of their learning occurred by chance, as a “serendipitous accident,” as a result of taking on extended roles and by working closely with doctors. As “experiential learners,” nurses were most likely to extend their knowledge of diagnoses in informal ways. In contrast, doctors have formal systems in place to measure and evaluate their diagnostic knowledge. For example, doctors sit “specialist examinations” and “competency exams.” These formal evaluation systems have not been introduced into nursing.

*The nurses’ scope needs to have as a prerequisite, measured and evaluated diagnostic skills. One of our nurses here who has done the prescribing papers, he isn’t registered as a prescriber but has done the prescribing papers. But you know, I think, until you’ve actually satisfied an evaluator that your diagnostic skills are up to the match for your scope*
of practice, and then I don’t think that prescribing can work effectively and safely. This is the process that occurs in medicine. Therefore, it should also be the same for nursing. **Phil** (mentor)

Despite completing their prescribing practicum, some nurses felt they still lacked the knowledge, skills, and experience in relation to certain aspects of prescribing. For example, “**decisions to initiate drug therapy**”, “**choice of drug/drugs**” and “**other diagnoses to consider in certain situations**.” More importantly, a number of nurses reported that while they may have previously been comfortable advising doctors what to prescribe, the processes that led to actual prescribing decisions, was unfamiliar to them. Nurses with experience in prescribing suggested “**a crossover to the medical model**,” so nurses could learn more about diagnostic reasoning and prescribing repertoires.

> But I see prescribing as definitely a crossover into the medical model, you know? And I think to do it well, you have to embrace the medical model.  
> **Paige** (nurse prescriber)

In summary, the majority of nurse learners benefitted from the mentorship of doctors. While nurses have indicated that they are familiar with the processes of clinical decision-making, mentorship extended their clinical reasoning process in diagnosis and prescribing deliberations. Mentors were also of the opinion that while nurses have existing skills in clinical reasoning in diagnosis and prescribing, they purport that nurturing further skills in clinical reasoning and in risk assessment is fundamental.

**4.7 Nurses’ skills in prescribing – medical mentors’ reflections**

Mentors were also asked to reflect on the knowledge and skills of nurses in prescribing. The majority of mentors agreed that their views were influenced and biased by “**their professional affiliation**.” They surmised that although nurses may lack some knowledge and skills in diagnosis and prescribing, they suggested that nurses have existing knowledge and skills that are “**transferable**” to the practitioner prescriber role. However, some mentors believed that the lack of knowledge and skills in differential diagnosis contributed to beginner nurse prescribers’ deficiencies in risk assessment analysis. Mentors suggested that nurses need to improve and extend their knowledge and skills in clinical assessment and drug management. One mentor made specific reference to a situation where a nurse needed to focus on important clinical cues that were vital:

> Now, you will notice that in some nurses they will look at the drugs list, and they have knowledge in their heads that this drug may cause a patient
to fall. But some of them will not think ahead. They wouldn’t do a lying and standing blood pressure. Then the patient had a fall, and then they call the doctors in because the patient’s fallen. Geraldine (mentor)

Being able to identify relevant information and to distinguish it from less relevant information was described by mentors as a key skill in decision-making. Mentors explained that nurses often used other doctors to find information about effectiveness of treatment, choices of treatment and disease processes. Mentors suggested that this lack of knowledge on how to find information would limit nurses’ abilities in seeking important clues, and not identifying certain conditions, which could compromise patient safety.

They [nurses] say, “I’ve rung up to put past you, starting, you know, Mrs Brown is on a month’s course of Prednisone for poorly controlled asthma.” I’d say to them, “Hang, on, let’s go through what you [nurse] have done.” They [nurses] often say “Oh, I’ve tried that, that didn’t work.” And I’d say, “Could you explore why it didn’t work?” Geraldine (mentor)

Mentors described nurses as not being risk takers, or being more reluctant than doctors to take risks, as another barrier to the consolidation of prescribing skills. Risk assessment was described as a process whereby clinicians take calculated risk against a perceived benefit, which was considered fundamental to making risk-benefit decisions. One mentor articulated:

So, if you’re looking at prescribing, you need to say, “What is the balance of good and harm that I am doing with this drug?” And if a patient has a postural drop you may still need to give them a drug that’s going to make it worse. Nurses are not used to this kind of thinking so as prescribers they may be reluctant to take that risk. Elizabeth (mentor)

Another mentor shared his observations about some of the nurses he had worked with in the past, even senior nurses, where the nurses referred patients to him with the notion that the patient needed to start on a particular drug, without first considering the underlying cause or the problem.

My feeling is that what I observed from the nurses is that they’re more prone or have a propensity to anticipate and expect medications to be prescribed in given situations and have scant regard for the potential consequences ...the obvious consequences. They see the anticipated therapeutic benefit of a pharmacology agent but don’t necessarily consider the adverse consequences of it. Phil (mentor)

4.7.1 “Patterns of events”

Mentors reflected on the extensive clinical experience of their nurse mentees. As clinicians, nurses were described by mentors as clinically “experienced and able in the clinical management
of patients.” Experience in clinical management provided a solid foundation for advanced nurses embarking on prescribing, as they came with ‘patterns of events’. One mentor stated, “previous experiences create patterns of events that allow a practitioner to remember cases encountered in the past”. Therefore, the clinical experience gained during a nurses’ career “provided the basic knowledge to apply to other extended areas of analysis,” and the pattern recognition capability upon which to build.

But what you maintain is the image of the knowledge. And one more, another way of looking at this is, I mean it’s a truism to say, the human brain is a pattern recognition organ. Pure and simple. So what that gives us, I’ve talked about it being concepts, but you could possibly, more accurately, call it patterns. We get patterns from that basic knowledge which we then apply at higher and higher levels. But what you maintain is the image of the knowledge. Elizabeth (mentor)

Another mentor gave an example of a nurse drawing on her past clinical experience:

...clearly, in some of those cases and it has almost nothing to do with a prescribing nurse, that’s just with experience. Advanced nurses basically are practitioners who recognize a sick condition and can immediately then, appropriately refer it through. Ross (mentor)

Nurses also described situations where they saw “patterns” that guided their thinking. One nurse explained:

And so you might say “okay well normally in this situation we do this”. They are like patterns... so I feel comfortable with weaning the diuretic myself or with what the plan had been and to continue to increase the drug to a therapeutic dose. I have seen this approach before and am confident to carry out the intervention. Amanda (nurse prescriber)

Mentors were also of the view that clinical diagnosis relates to medical diagnosis of conditions, and one mentor suggest, “pattern recognition is vital to the learning of medical diagnosis.” For doctors, learning medical diagnosis is enhanced with clinical experience. Some doctors described the “learning as developmental” and as one mentor explained:

“... the more experienced and the more exposure you get, the more you remember, and at the same time realize how much you actually don’t know, or need to know”. Ross (mentor)

Learning clinical diagnosis, as one mentor described, is “enhanced when doctors are exposed to certain areas” of specialty. Some specialty aspects of diagnosis were highlighted while doctors were working in these specific areas. They described their learning and consolidation of
diagnosis as a “little bit at a time” depending on clinical exposure, continued ongoing education and credentialing in preferred clinical areas. As doctors, the need to learn the range of clinical diagnostic possibilities is crucial to safe medical practice. The pattern recognition of diagnostic possibilities already partially exists in nurse prescribers. As one mentor explained, this area of diagnostic possibilities can be exploited in teaching nurses the skills of clinical diagnosis:

...where you’ve got a clinical corner where the diagnostic possibilities are relatively constrained, then you can get nurse practitioners working well at it [autonomous prescribing], so that’s why it works in neonates and diabetes and sexual health and mental health, where you can train someone to understand the range of possibilities that they might encounter and to be able to deal with them effectively. Phil (mentor)

A “clinical corner of diagnostic possibilities” was viewed as an advantage to nurses because it could “limit them to only a certain number of drugs”, “being able to change drugs within set limits,” and “adjusting current treatments.” Nurses’ own views were similar to those of the mentors’ and the mentors’ perspectives on limiting nurses prescribing are discussed later in Chapter 7.

Mentors were also concerned about nurses prescribing in a broader scope, as they may not have the necessary extensive knowledge base in diagnosis. Some mentors were adamant that “a more extended scope requires more extensive knowledge of diagnosis.”

But to have a big wide open field ...it’s certainly not ideal, and I don’t think any of us [doctors] expect them [nurses] to prescribe in that broad scope and really wouldn’t allow them to just work with a free rein and in an open environment like that... it's dangerous. Ian (mentor)

4.8 The professional frames of reference

Nurses and doctors have different professional frames of reference and this can affect experiences for nurses in learning to prescribe. While making a diagnosis and diagnostic reasoning are important focuses in medical education, these have not been a focus in nursing. For doctors, knowledge in the biomedical sciences forms the basis to understand diseases and pathology, which is an important aspect of clinical reasoning. Doctors reported that their undergraduate preparation included a strong focus on “biomedical knowledge” and in establishing differential diagnosis. One participant used the metaphor of a ‘surgical sieve’:

And when you’re first starting you get used to get taught this thing called the ‘surgical sieve’, where it’s like a sieve and you just virtually sieve through, get rid of, cross off ... you go through in a systematic way...and
you go through that processes and eliminating the ones that are not there and then you come to a few and that’s your list of differential diagnosis. **Teddy** (senior medical officer)

In this way, doctors described how their preparation and training was centred on the processes of how to solve a diagnostic problem. They referred to being taught the skills of assessment in order to identify information needed to recognise a situation, what aspect of the situation needed attention and what situations can safely be set aside. One senior medical officer reflected on her experiences in the early years of her education.

“I think right from the first day you’re stuck on a ward as a medical student it’s drummed into you - differential diagnosis. The way we take history, do examination, form a differential diagnosis. You take a history, examine and do some investigation; you come up with the differential diagnosis, you add the most appropriate treatment, and we’re always thinking in that order. **Sarah** (senior medical officer)

In medical training, biomedical knowledge is seen as the bedrock of knowledge to understand the range of disease processes, from those commonly encountered in clinical practice, to those that may be less common, or rare. Two Senior Medical Officers described the extensive biomedical knowledge doctors require.

**I tend to go with the common variety one [common conditions] first because eventually that’s what’s going to help. You have to think about the process involved, the problem in front of you. **Tiffany** (senior medical officer)

**It’s not possible to be able to have seen everything and done everything before you’ve done your exams or become a Consultant. Obviously you sit the exam and you know, you get really familiar with the common causes, or list of differentials and then as you’ve read and you go along your career you have more experience you can grab the rare cases and you can put it in the bottom end of your possible differentials. **Teddy** (senior medical officer)

This difference in the focus of undergraduate medical education leads to doctors’ perceiving a gap in the nurses’ skills in differential diagnosis. Mentors claimed that this was attributable to a lack of focus and depth in nurses’ undergraduate education. One mentor argued:

*Prescribing knowledge is one thing, but more importantly, the nurses have also got to have some input in conditions [differential diagnosis], so that they appropriately prescribe to the condition, and that is not often taught*
in the nursing environment. It [differential diagnosis] needs to be, but not often taught... or less often... in the nursing schools. **Ross** (mentor)

Although mentors were critical of nursing undergraduate education in relation to diagnostic knowledge, they were quick to point out that the main difference lies in the purpose of the nurses’ education at the undergraduate level. One mentor suggested that diagnostic thinking is a “natural deficit” in the majority of nurses’ undergraduate training:

> I think we, as health care leaders, need to understand that it [differential diagnosis] is a natural deficit of the majority of nurses because they get training in different areas and their training is a lot shorter. It’s the key difference, I think, or one of the key differences between doctor training and nurse training...to a graduate level anyway, where a knowledge gap exists due to the nature of training of these two professions. **Phil** (Mentor)

However, mentors were also of the view that nurses can subsequently be taught diagnostic knowledge because they possess a “depth of knowledge and skill” and “level of experience.” Mentors suggested that the majority of nurses were not only experienced, they were also, “broad minded,” “able to embrace different ideas in different ways,” and were “prepared to learn.”

In summary, the experience of being mentored by senior medical colleagues supported the nurses’ skill development in clinical reasoning related to diagnosis and prescribing decisions. Despite having different frames of reference, the mentors acted as role models and demonstrated the step-by-step process to diagnostic and prescribing reasoning. The prescribing practicum provided the nurses with the opportunity to practice and exercise their judgments, and therefore, their confidence and capabilities in clinical reasoning were enhanced. As experiential learners, nurses had to learn many aspects of diagnosis informally through clinical exposure. Doctors, on the other hand, learn diagnosis of common diseases in their undergraduate training and education, and through formal mentorship support and supervision, and so their knowledge in diagnosis is extended as they entered clinical practice. To continue to develop skills in clinical reasoning, nurses, too, will require formal ongoing mentorship and support in the clinical setting.

**4.9 Conclusions**

As experienced clinicians with in-depth knowledge and skills in their area of practice, the nurse participants in this study were ready to learn to prescribe. The process of learning to prescribe included both theoretical aspects, based on bioscience and pharmacology, together with a practicum where they worked with a mentor. This chapter highlights the differences in nurses’ and doctors’ approaches to applying diagnostic reasoning to making a diagnosis and a prescribing
decision. While nurses did not have well-developed skills in clinical reasoning, nor a repertoire to support decision-making, they did have clinical experience and an aptitude to learn the processes of diagnosis and diagnostic reasoning that underpin prescribing decisions. Learning to prescribe increased nurses’ confidence, and empowered them by giving them the language to engage in clinical decisions. Being mentored added significantly to the nurses’ learning. Nevertheless, nurses who had completed the prescribing education programme and nurse practitioners now actively prescribing acknowledged the limitations in nursing knowledge and skills compared with their medical colleagues in relation to differential diagnosis and prescribing decision-making. While Chapter 4 explored nurses learning to prescribe with a focus on their readiness and early preparation for prescribing, Chapter 5 describes the experiences of nurses as beginner prescribers, and the strategies and approaches that contributed to the beginner’s skill development and progression in clinical reasoning.

The findings reported in this chapter also shed light on concerns of critics (mainly of the medical discipline) of the prospect of nurse prescribing. Not only is undergraduate nursing education shorter than medical education, the theoretical underpinnings are different. Both nurse and doctor participants agreed on these points, and both saw nursing’s holistic, patient-centred approach as nursing’s contribution to the health care team. Doctor participants highlighted other issues from their experiences in mentoring nurses that reflected both their own educational and socialisation processes (in the hypothetico-deductive model grounded within biomedical sciences), and their experiences with nurse learners. These included the importance of differential diagnosis skills development, evaluating the risks and benefits of a prescription, and skills in identifying information needs and finding information.
CHAPTER 5: PRESCRIBING IN PRACTICE: DEVELOPING THE SKILLS

5.1 Introduction

Having described the experiences and perspectives of nurses, doctors and midwives learning to prescribe through their formal education in pharmacology in Chapter 4, this chapter shifts the focus to the application of that learning to prescribing in practice. This chapter illuminates an under-researched phenomenon, finding that the differences in preparatory educational and professional philosophy tended to disappear as novice prescribers begin practice in the field as beginners then emergent prescribers. Chapter 5 presents the findings on skill development and progression of novice prescribers. The findings firstly describe the experiences of nurses, as new prescribers. The strategies and the methods they employ as beginner prescribers are explored and compared with those of other beginner prescriber groups. Next, the prescribing practices and decisions of experienced prescribers are compared with those of beginner prescribers, focusing on the differences between nurses and junior medical officers as beginner prescribers. Then, finally, the proposition that nurses are emergent prescribers is developed, raises the possibility that nurse prescribers’ skills reflect both of beginner prescribers (as for junior doctors), but also include elements of experienced prescribers reflecting their extensive clinical experience.

For the purposes of this study, the terms “beginner”, “emergent” and “experienced” prescriber are used to denote differences in the level of skills a prescriber may be performing, as seen by other prescribers. The delineations are useful particularly when comparing nurse practitioners, as new prescribers, to junior medical officers, who are also new to prescribing. While actual behaviour and practices were not observed in the study, the meanings, expectations and aspects of skill development and progression in prescribing, as perceived by beginner prescribers, were encapsulated in the participants’ stories.

5.2 Characteristics of beginner prescribers

In Chapter 4, nurse learners as “pre-beginner” prescribers (those participants engaged in a postgraduate programme of prescribing but not yet approved to prescribe) depicted their performance in prescribing as at a beginner stage. As described, nurse learners were initially exposed to prescribing decision-making under the supervision of their mentors during their practicum. Cautious prescribing and a high focus on considerations of risk over harm were some of the issues voiced by the nurse learners and noted by their mentors. These nurses (who seem to attract international public criticism regarding a lack of pharmacology knowledge (see Chapter 1,
section1.1), begin their journeys as prescribers, as expert nurse clinicians setting out to learn a new skill. In this chapter, the beginner prescribers are the nurse practitioners, junior doctors, and midwives with prescriptive authority all legally prescribing and working in their clinical area of practice. All beginner prescribers were asked to share the approaches and strategies that were commonly used to ensure safe prescribing practices. Mentors and senior medical officers were also asked to reflect on their experiences as beginner prescribers which, for some, were many years previously.

Doctors and direct-entry midwives are similar in that, as beginner prescribers, they commence practice with little or no prior clinical experience of the situations in which they are expected to perform. In comparison, experienced nurses and nurse-midwives begin prescribing having had extensive clinical experience. However, as beginner prescribers, all groups share many similar experiences and characteristics as they begin to take responsibility for their prescribing decisions. Through participants’ narratives it became possible to identify the characteristics of the beginner prescribers: fear and anxiety when taking on prescribing responsibility; the strategy of using a personal list of medicines to support safe practice; how this list was expanded over time; deferring to senior colleagues; and (in the case of junior doctors) a propensity to prescribe. These are presented below.

5.2.1 Fear and anxiety: “taking on the responsibility”

On interviewing nurse practitioners about actually beginning to practice prescribing, they shared that they were “very scared,” fearful of “making errors in diagnosis” and fearful of “drug choice and dosing.” They showed heightened concern that the drug they prescribed had the “potential to harm the patient.” These nurses, highly experienced in their clinical areas, long had a role in prescribing decision-making under standing orders and as members of interdisciplinary teams. Without ultimate responsibility for the decisions, they had participated under standing orders with confidence. The simple act of putting their name to the prescription changed this, and the weight of responsibility made them cautious in decision-making.

*I used to write prescriptions for doctors and get them to sign them. When I was actually writing it myself and signing on the dotted line at the bottom, gee whiz, I became far more cautious about that. I keep checking it [prescription] and I use the reference viewer on our computer that we’ve got in our clinics. I use that all the time to make sure what I’m doing is spot on.*

*Maggie (nurse prescriber)*
As beginner prescribers, all nurses were aware of the responsibilities associated with prescribing, and were fully informed of the limits and boundaries of their prescribing role. As new prescribers, they described their prescribing practices as “cautious”, “vigilant” and “extremely careful,” as one nurse prescriber explained:

*So the main thing about being a cautious prescriber is that, and this had come through very strongly with Nursing Council, is that nurse prescribing must be safe. And I think it would just be irresponsible if we weren’t cautious prescribers. I think all prescribers need to be cautious.*

Di (nurse prescriber)

The majority of nurses doubted their capability in making decisions. While nurses’ doubts and anxieties were similar to those of other beginners, nurses were more fearful of making mistakes and this made them very cautious. Ensuring the prescription was safely written was a priority for the majority of nurses.

*Well, for me personally, when I first started prescribing, I was very anxious, very nervous about prescribing. Although, I wasn’t prescribing anything more or less than what I’d been advising for the last 7 years, but me actually putting pen to paper, I sort of kept looking over my shoulder thinking somebody was going to say, “Hold on a second, you can’t do that.”* Jane (nurse prescriber)

*Every time I do a prescription, and I can honestly say this, I rationalize in my mind the consequences of a bad outcome, okay. And that’s what I do with every prescription and that’s how I try to make myself safe. So I look at the bad outcome and I think to myself if I sign that prescription off that I’ve gone through all the parameters of prescribing to ensure that I’ve made it absolutely as safe as I possibly can.* Abby (nurse prescriber)

Abby and Jane’s experiences indicated high levels of anxiety, nervousness and hypervigilance as they first prescribed, found also in other prescribers’ narratives. For the majority of the participant groups, being a beginner prescriber was not a comfortable place to be. All practitioners new to prescribing shared similar concerns and indicated a lack of confidence. They were fearful of making mistakes, fearful of causing more harm than good, and viewed their level of knowledge as not sufficient. However, as they continued to prescribe, their confidence grew.

*It does grow… the confidence does grow in the knowledge and the skills. Before as a new prescriber, when you write a script out, you look at it 20 times (laughter), and before you sign it, you are always thinking of the risks. Over time, you still think of the risk and I am aware of the risks and was something I really needed to think carefully, but it was factored into my thinking, every time I write the script. It’s become second-nature. I am no longer afraid of prescribing it [drug].* Anita (nurse prescriber)
For the beginners, prescribing responsibility is not taken lightly, and when writing prescriptions, care is taken to ensure that every aspect of the script is properly written up, and sufficient detail of information provided. The narratives below illustrated the views shared across all groups.

As a House Officer, when I first started, and when you don’t know very much, you do feel a little bit threatened when people are questioning what you do. But I do get nervous of making a mistake. Sarah (senior doctor)

At the first I was a bit nervous... that was probably because you’ve signed it [prescription]...so at the end of the day you’re responsible, so I suppose it’s really mostly to do with drug reactions... if somebody reacted to a drug that you prescribed at the end of the day everybody points the finger at you. Noleen (midwife)

Doctors and midwives agreed that their confidence grew as they gained experience in prescribing and their knowledge of drugs improved. They became more familiar with the drugs and the conditions they were prescribing the drugs for.

I think the more times we [doctors] put our signature next to a drug and it works... well, the more confident we will feel to do [prescribe] it. Kate (senior medical officer)

...that first period when I was out [became a new practitioner]...and I was new, I thought about it a lot and I wrote everything really carefully on the prescription. But now, I have been in practice for three years, I am still careful but more confident. Jenna (midwife)

As the most experienced prescribers, the mentors were of the view that confidence in thinking through prescribing decision-making flourishes with clinical experience and exposure. In addition, as clinicians become more experienced in prescribing, they are better able to deal with the fear of prescribing drugs that may cause more harm than benefit.

Yes, I think it comes with clinical experience. Because from that, you learn the confidence to sort of move on, and inevitably, you’ll get it wrong once or twice... you know, drug interactions and adverse events are going to happen. And they happen quite frequently, and so, you know, we need our prescribers to understand that it’s not their fault when that happens, as long as they’ve taken the necessary care at the initial decision making. They don’t need to feel responsible for it, they’re doing it to sort of try and, you know, do what they can to fix it. Phil (mentor)

In summary, fear and anxiety were common to all beginner prescribers. Those new to prescribing characteristically doubted their ability to safely and competently prescribe. High anxiety about causing potential harm, or making the wrong decisions resulted in beginner prescribers being
hyper-vigilant and careful. Nonetheless, with continued experience, confidence grew. As these beginner prescribers became more confident in their deliberations, the harmful consequences were factored into their decisions, resulting in a balanced view of weighing up potential benefits against harm. The section that follows describes the strategies and the approaches that were employed by beginner prescribers to ameliorate nervousness and anxieties.

5.2.2 Propensity to prescribe

The propensity to prescribe drugs without due deliberation of other factors is characteristic of a beginner doctor prescriber and examples are provided below. Unlike beginners, experienced prescribers consider other factors before they prescribe and have the tendency to prescribe less if deemed appropriate. As experienced prescribers reflected on their own beginning prescribing practice, they described a tendency to take action and prescribe as typical.

> And also as a junior doctor, you then think you need to do something actively. If I prescribe a drug I’ve done something. You get asked to see a patient who’s got a problem. And you think okay, well I’ll give them a drug. **Kate (senior doctor)**

> If we’re careful prescribers, we tend to shy away from introducing new medications where we can. If you’re a novice prescriber, or if you’re unfamiliar with the territory, you tend to think there’s got to be a drug answer to this problem, let’s just prescribe it. **Phil (mentor)**

In contrast, nurses did not write a prescription as an action of first resort. For nurses prescribing was but “a tool that enables and enhances the nursing role.” This difference between doctors and nurses as beginner prescribers could be explained by nurses’ extensive clinical experience, and in this, they show more similarities to experienced prescribers who also regard drugs as only one of the range of therapeutic tools.

> It’s not in isolation to the overall, the holistic role of being a Nurse Practitioner I really do see it [prescribing] as a tool. So it’s something that I may choose to use and it’s something that I may choose not to use during the consultation process. It depends on what the client presents with. **Abby (nurse prescriber)**

As beginner prescribers, nurses and midwives were particularly reluctant to take risks for fear of harming patients. Some nurses were already involved in the care of patients with multiple problems and were more inclined to consider the harm prescribing would cause.

> And again, I think that was a scary thing [prescribing], but yeah, I’m aware of the risks of, you know, prescribing and I obviously work with a
very complex patient population, so that kind of limits the sort of risks I was prepared to take. Anita (nurse prescriber)

I wouldn’t prescribe something unless it, we always do that approach [non-pharmacological] first with the UTI and then if it becomes symptomatic of course we treat it with antibiotics yeah. You try and avoid prescribing in pregnancy if you can help it. Breeda (nurse midwife)

In summary, all beginner prescribers demonstrated similarities in their prescribing experiences. They were reluctant to take risks, reflecting a lack of clinical experience, knowledge, skills, and practical “know-how” of a drug’s effects. Doctors described themselves as quick to prescribe when beginner prescribers, believing there was a drug available for any problem. In contrast, nurses and midwives saw prescribing as one of a range of therapeutic tools, reflecting both their extensive clinical experience and holistic model of practice.

5.3 Strategies of beginner prescribers

In the context of beginner prescribers’ state of heightened anxiety and lack of confidence, they characteristically developed strategies to support safe practice. One strategy, commonly used by all beginner prescribers, was to prescribe from a “personal list” (also referred to as personal formulary) of drugs familiar to them.

5.3.1 The “personal list”

Beginners were particularly concerned about prescribing drugs that were unfamiliar or new to them, so creating a personal list helped to differentiate between those drugs that were familiar and unfamiliar.

But I also have to work within the environment that I’m in, and the Consultants, for my own protection have requested a list... So the list as it stands involves 10 or 11 medications ...everything outside that can either be on medical advice or like a standing order, for example, for a drug like amiodarone which has numerous side effects. Anita (nurse prescriber)

Unlike doctors, nurses tended to continue to use their personal list to limit the drugs they would prescribe hence narrowing the choice of drugs they would use regularly.

Having now prescribed for 18 months, I would say that I probably used 20 drugs, maybe 20 drugs regularly. You use that repertoire. It’s only when you step out of that repertoire that you really start to sort of ask about “What do I know or don’t know, about this drug? What do I need to know? Who should I ask?” All those things, but often, you’re not actually extending yourself beyond those drugs. Mark (nurse prescriber)
For the majority of nurse practitioners and midwives beginning to prescribe, the “personal list” was related to their scope of practice and using that list on a day to day basis reduced their initial anxieties about the potential harm profiles of medications they used. Indeed, the limited list was also used as a guide on when to refer to a medical colleague.

*Obviously, the medicines I know straight off are easy. But the ones that I’m a little bit unfamiliar with, and it might be just a repeat prescription of, you know, a thyroxie tablet or something like that, which is not in my expertise, I just double check [with the doctor] to make sure that that’s all spot on.* Maggie (nurse prescriber)

For both nurses and midwives, prescribing drugs that were unfamiliar or new were viewed as “too risky.” They were adamant that drugs with high risk and toxicity profiles were not within the domain of nurses’ and midwives’ prescribing practice, as one midwife explained:

*So we were told we had an open formulary, but that you’ve got to be really careful what you prescribe, because you need to work within your scope of practice. The information [list of drugs] we got during our preparation was really good as this gave us the basic list and its indications... things we can apply in practice.* Jenna (midwife)

Midwives and nurses shared similar views, suggesting they were confident in prescribing from a limited list of drugs commonly used in their clinical practice. Drugs that were not included in the list were best avoided, which is when these beginner prescribers would refer to a medical colleague.

*I do have groups of drugs that I am, well... confident in prescribing, as I’ve been doing that for a long time. I’ve not written for medications that are outside my scope of practice, I would never start one of those medications unless it was under the guidance of one of the physicians. But I will write a prescription for a repeat of those medicines for the patient.* Maggie (nurse prescriber)

*One of those drugs...pethidine is really the only one I can prescribe, the rest [pain relieving drugs] would have to be anaesthetist prescribing or a doctor as well can prescribe.* Noleen (midwife)

Unlike nurses and midwives, doctor beginner prescribers do not refer to medical colleagues when they encounter an unfamiliar drug. However, by nature of the way junior medical officers work, they are often guided and directed in their prescribing by their seniors.

*So you’re building your own ... drug repertoire. It’s just in my own comfort zone, like you’ve got to figure out what you’re happy to do and what drugs you are comfortable with ... you take more responsibility as*
you evolve over time and become more confident. I feel I am doing more now... two years out. Day by day, I learn more new drugs and I add these to my list. Stephanie (junior doctor)

Drugs with known safety profiles were easier for beginner prescribers, as they got to know the drug’s mechanism/s or effects and the safety profile which eased their anxiety in prescribing these drugs, without having to consult other prescribers. Therefore, they were confident prescribing these drugs knowing they were not likely to interact with other medications or cause harm.

*I usually feel confident prescribing something like paracetamol without having somebody else suggesting that was the right drug, and the BNF [British National Formulary] on hand to check the doses and interactions and side effects...as a junior doctor and now as a senior clinician. Paracetamol has always been a safe and simple drug to prescribe really... and I think that is for anyone.* Kate (senior doctor)

*Like treatment for UTIs [urinary tract infection] and wound infections and Mastitis and baby’s eyes ...they are really all the same conditions. So I am quite confident with the use of antibiotics in my list to treat those conditions without consulting anyone.* Noleen (midwife)

To summarise, the use of a personal list of drugs was a strategy common to all beginner prescribers. Familiarity with some of the common drugs and having a good understanding of their specific therapeutic profiles provided a sense of security in their prescribing decisions. The list expanded and grew as beginner prescribers gained experience in prescribing, and as they became more familiar and exposed to different drugs to use in clinical situations.

5.3.2 Expanding and consolidating knowledge of drug profiles

Developing a personal list was useful initially for beginner prescribers. Over time, as experience increased, and their knowledge of and confidence in prescribing grew the list was expanded. Building on the knowledge base of the commonly used drugs, beginner prescribers expanded the list through seeking information on other drugs from more experienced prescribers or clinicians. Familiarity with the profiles of drugs came with clinical use, and prescribers became increasingly confident in prescribing from a range of medications, and were more likely to use these drugs sometimes rather than those listed in best practice guidelines, as a mentor explains:

*I think it’s a learning curve that you look at and see. With time you start getting to know certain drugs very well, and that develops. You develop certain favourites... if you want to call it a list, or things that you feel much more comfortable with and have certain, sometimes preferences that is not always absolutely according to guidelines.* Ian (mentor)
While the doctors begin with a personal list, they were not constrained by or limited by the list. As they became exposed to different clinical areas, their personal lists were bound to expand. Therefore, keeping updated about new drugs, new findings and research that pertain to new and commonly used drugs in the market is required for safe and competent practice. Strategies doctors commonly used to improve their knowledge and understanding of new drugs included getting information from medical drug sources, attending presentations from the pharmaceutical industry, consulting drug leaflets, and textbooks. Consulting other doctors and the health care team was also a strategy utilised when the safety profile of a drug was unknown.

*And again, it all depends on, or part of it depends on, whether you’ve seen this drug before, or read about the drug somewhere in the journal article. Or seen it[drug] on, maybe on TV ...and that can sometimes come up in real life and you can just go, “Oh yeah, I’ve seen that before, even though this is not common. Or I’ve read a record somewhere, this could be that, but I’m not sure because I’ve never seen it before. *Teddy* (senior doctor)*

For doctors, the process of getting information about new and untested drugs exemplifies the level of skill denoting those who are experienced prescribers. Unlike beginner prescribers, experienced prescribers are confident in their approaches when confronted with new drugs or drugs that are unfamiliar to their scope of practice.

*Every day you would come across somebody that’s from overseas that’s on a medicine that you don’t work with everyday. And they are on something that you’re not sure of. This usually puts you in a situation to potentially prescribe a medicine that you don’t prescribe on a routine basis. You need to just go back to some manual, be it New Ethical or whatever. Now that I am more experienced, I am more confident in looking it up on the computer. You just have to be resourceful. But you have to just be sure of what you’re dealing with and what you want to achieve with your medicines. *Phil* (mentor)*

Unlike doctors, nurses and midwives prescribe from a more limited and generally familiar (from prior clinical experience including medication management) list of commonly used drugs in their area of specialty, and for the majority expanding on this list was not a common practice. When nurses were challenged to think of situations where they might encounter a patient already taking an unfamiliar drug, they described approaches that would ensure safe prescribing by acknowledging their limited knowledge of that particular drug. Strategies nurses were likely to use included “seeking information from doctors and consultants,” “referring to drug leaflets,” and “seeking information from drug companies.” In this, nurses were similar to their medical
colleagues, except having access to presentations by pharmaceutical companies was not mentioned.

...if you don’t get the information from them [doctors and consultants], if they [sources] can’t give you the information, that’s when you start looking sort of elsewhere. You occasionally come across new drugs that they haven’t heard of, and you haven’t heard of. But if you know the group, the family they belong to, you can pretty much determine their [drug] side effects and speculate what the effects will be. There was one the other day, Solox, which is a proton pump inhibitor. I hadn’t heard of that particular drug before. But I know the proton pumps. So once I knew it was a proton pump inhibitor, I was like “Right, fine. I understand that drug.” **Mark** (nurse prescriber)

In building up their repertoire of medicines, and expanding their personal lists, beginner prescribers were resourceful in approaches used. Nurse prescribers were similar to doctors in their information seeking methods. However, beginner and experienced prescribers diverged, in that the latter [doctors] over time became more self-directed and less fearful of prescribing unfamiliar or new drugs.

5.3.3 **Deferring to experienced prescribers**

Experienced prescribers described prescribing, in the words of a mentor, as “context-based, situated judgments that can be obtained only when prescribers have encountered these in real situations.” Experience was therefore seen as an important aspect of prescribing. Beginner prescribers embark on prescribing practice with little understanding of the contextual meanings of many prescribing situations, whereas the experienced prescriber had repeatedly been exposed to similar situations. The section below describes the approaches beginners used when confronted with situations where prescribing decisions were not clear-cut and where there was a high potential for risk, despite the benefits of treatment.

For the majority of beginner prescribers, a lack of practical experience limited their knowledge of the risk profiles of certain drugs. For example, beginner doctor prescribers were more likely to defer prescribing decisions to experienced prescribers when they were unsure of the risk profiles of the drug or with the diagnosis.

*When you are new to prescribing you always have to look up information about drugs...sometimes not easy to find. But, it doesn’t matter if you go back and read about it [drug] at that stage or you go and ask somebody else, it’s just being aware of it [risk] before you do it [prescribe]. Otherwise to be absolutely sure, I will have to get the SMOs to make the final decisions.* **Kate** (senior medical officer)
Several factors were presented by participants in this study to explain beginner prescribers’ limitations in considering risk-benefit factors when prescribing. These included “limitations of knowledge” and a “lack of clinical experience in the use of the drug” which could lead to becoming reliant on “significant others’” to make the clinical decision, an example of deferring to experienced prescribers.

When you start off as a House Officer, you’re the most junior doctor on the team and so, you know, at the end of the day the responsibility goes to your Registrar or your Consultant, so I would not feel personally responsible if my Consultant or my Registrar had asked me to do something. **Sarah** (senior doctor)

*I do have groups of drugs that I am well... confident in prescribing as I’ve been doing that for a long time. I’ve not written for medications that are outside my scope of practice, I would never start one of those medications unless it was under the guidance you know of one of the physicians, but I will write a prescription for a repeat of those medicines for the patient. **Maggie** (nurse prescriber)*

Doctors recalled situations where their clinical reasoning was strongly influenced by more senior doctors. For beginner doctor prescribers, the decision to prescribe a particular drug, the dose, and prescription writing was, to a large extent, dictated by those more senior, as one explained:

When you are in your first year, you pretty much go with a doctor, you know, all the time, and you look at their prescribing. You learn from it [process] and you are asked, “Why do you give this dose” or “why do you use this medication and not the other one”. You’re not really writing the prescription yourself, or in many ways... the decision to prescribe is not really yours... that is, as a junior doctor. **Susan** (Junior Doctor)

Nurse beginner prescribers were similar to doctors in their approaches in that they, too, deferred to experienced prescribers. However, the context was different. When they were unsure of the drug’s adverse effect profiles, “the dosing parameters” or the use of the drug in “patients highly at risk to the potential adverse effect profile of the drugs” they would defer to doctors. While junior doctors deferred to experienced prescribers because of their lack of experience, nurses came to prescribing with clinical experience. Moreover, rather than defer, they tended to look for collaborative opportunities to support their prescribing decisions.

*If I’m prescribing a drug that I haven’t prescribed before, that I’m not familiar with, then I would always go back and talk to one of the SMOs [senior medical officers] about it, and discuss it with them in terms of whether it’s appropriate, and what other drugs, interactions and things we might need to look at. **Jane** (nurse prescriber)*
Nurses would look for support for their decisions, not somebody to make the decision for them. Even as beginner prescribers, the nurses were acutely aware of the complexities in their everyday practice and their limitations in diagnosis and prescribing. The nurses described doctors as predominantly responsible for the final diagnosis of patients; therefore, nurses need to work closely with doctors.

...there are still times where I see a patient and I’m not sure what is actually wrong with them. I may have a good idea about what should be happening, but I’m not a 100% sure of the diagnosis and for patient safety, I do often consult with our hepatologist to make sure that he is in fact happy with what I’ve prescribed or what I’ve done. Maggie (nurse prescriber)

A strategy to manage fear and anxiety common to nurses, doctors and midwives as they commenced prescribing was the use of a “personal list”. As responsible clinicians, they were aware that lack of knowledge and practical experience placed them in a vulnerable position with the potential for prescribing errors. As experience grew, so did the list; the more so for doctors who are not limited to a clinical area, than for nurses and midwives. However, there was also evidence of fundamental differences between doctors and nurses in their reliance on drugs as a therapeutic tool. Addressing safety concerns was the main reason for all beginner prescribers to defer to more experienced prescribers. There were similarities between junior doctors and beginner nurse prescribers in that they deferred prescribing decisions to experienced doctors: when drugs were unfamiliar; in situations when patients might be at risk because of the side effect profiles of the drug, and when dosing parameters were not straightforward. However, nurses were different to junior doctors as beginner prescribers, as they tended to share responsibility with medical colleagues as they established the diagnosis, and nurses preferred to collaborate, rather than defer, to medical colleagues.

5.4 Experienced prescribers

While the above sections have described the characteristics of beginner prescribers, this section describes the experienced prescribers. Mentor prescribers and senior medical officers were the experienced prescribers in this study, and they were asked to describe characteristics and practices that distinguish a beginner from an experienced prescriber. The findings are presented first generally, and then focus on how experienced prescribes exercised options of whether or not to prescribe and finally, how they take calculated risks, a process they referred to as “clinical reasoning.”
The previous discussion proposed that considering the patient context is core to nurses’ prescribing behaviour. In contrast, beginner doctor prescribers’ prescribing behaviour characterised as having a propensity to prescribe without taking account of contextual factors that may influence on patients. In the case of experienced medical prescribers, patient context, rather than consideration of the drug only, influenced the reasoning process. Experienced prescribers viewed this practice as a more “conservative approach” to prescribing.

But actually I think over time, with experience, I have learnt that they [drugs] don’t always do what they say on the bottle and they [drugs] don’t always work. And I’m certainly becoming more conservative in my general practice about lots of thing, but also with medications, and also we’ve pushed towards informed consent, actually make sure patients are aware of what the drugs potentially do, what the side effects are, and also the fact that they may or may not work, and then giving them an option on that. Kate (senior doctor)

Furthermore, unlike beginner prescribers, experienced prescribers consider a wider range of information in prescribing decision-making. For example, in situations where patients have multiple drugs (“polypharmacy”), “patients’ preference”, “ability to give informed consent” and “the impact of the drug’s side effects on patients’ quality of life”, were all considered. One doctor recalled:

I feel a little bit more responsible now as a Registrar in that matter, not as a junior doctor though. And polypharmacy is something that’s so common in medical patients, especially in the elderly population. And I do make it a practice in my ward round to do a chart review every day. Tiffany (senior medical officer)

The knowledge that is gained through clinical experience provides the experienced prescribers with knowledge that compares previous and current situations. A mentor described this, saying, “clinical reasoning in prescribing is situation-based”. In many cases, prescribers need to evaluate and re-evaluate situations before decisions are formulated. Taking into consideration patient and clinical contexts illustrate the level of reasoning of an experienced prescriber.

5.4.1 To prescribe or not to prescribe: exercising options

Experienced prescribers consider the options on whether to prescribe or not in any situation and this can be considered to demonstrate how they draw on their clinical reasoning patterns. The complexities associated with prescribing encounters were elucidated by mentors in describing the cyclical patterns involved in therapeutic reasoning. The re-consideration and re-evaluation of
clinical situations that denote a risk-benefit approach to reasoning were offered as methods crucial to therapeutic reasoning.

If you take the scenario of someone presenting with a simple problem, it might be abdominal pain or headache But it’s actually really important to go through the process and think, well, why is this headache here, what are the particular characteristics about this headache that make me think that it’s going to respond to this drug, rather than this other drug and why should I have the freedom to assume that panadol is going to do it, when the problem might be something completely different. It’s not going to respond to that, or it might suppress or mask the symptoms, when the symptoms need to be out there and made available so you can then follow the path to the proper diagnosis. Phil (Mentor)

Phil demonstrates the skills of clinical reasoning, involving diagnosing, and finally prescribing. A cyclical approach to thinking shows a process of going back and forth from knowledge at a conceptual level, to knowledge learnt from clinical experience. When dealing with cases where conditions may be new clinical reasoning was crucial.

That you’ve got your basic pharmacology knowledge, which some of us forget a bit. Your therapeutics is sort of the key thing. And then you apply it to the patient and then you think, “Oh, I may have a bit of a problem there,” and you come back down again. Yeah. I frequently go from that [differential diagnosis] down to that [patient condition], and probably, less frequently I go down to the basic pharmacology, but far less frequently. So I’m frequently cycling between there and there. But in terms of interactions or in particular states, I go back down to the basic level. Elizabeth (mentor)

Elizabeth’s description of a cyclical pattern exemplifies an experienced prescriber’s way of re-assessing and re-evaluating the situation to come up with a decision. This high-level skill of clinical reasoning is perceived to be still developing in beginner prescribers. Instead, Elizabeth suggested that a novice clinical reasoning processes follows a “linear pattern.” She contrasted the thinking patterns of the novice to the more experienced prescriber below.

I think when you start off prescribing you have very linear thought patterns. You’re going, you know, “This is the symptoms, this is the diagnosis, this is the drug.” And you are unaware that in fact prescribing is not a linear process. And yet it is frequently taught as a linear process. Elizabeth (mentor)

The decision not to prescribe a medication may be chosen if the risk is deemed greater than its benefit profile. More importantly, experienced prescribers view collaboration and interaction with other health professionals as an essential step in making prescribing decisions, the more so in
situations where uncertainty and safety of medication, in terms of adherence and monitoring, are a concern. Mentors agreed there are many factors to consider when one is prescribing in situations of uncertainty.

*And the other aspect of prescribing is, always think of non pharmacological ways of achieving this aim. And, maybe, multifarious dietary, exercise, appliances, stockings, whatever. But it’s always important to use that to back up your prescribing. Again with older people, you’re looking at a range of conditions. And it’s very simple to say, “Right, for this condition, this is the drug. For this condition, this is the drug.” The problem is that this affects that, this interferes with the metabolism of this. And I think, again, that isn’t what is taught in therapeutics. What you’re taught is, “For this condition the evidence base is this drug works the best.” But, in fact, the drug that works second best may be the best fit for this patient because of something else. Elizabeth (mentor)*

Similarly, non-pharmacological approaches, patient situations, social and cultural contexts were also identified as important factors that can affect prescribers’ decisions. Doctors described prescribing in the context of the clinical situation a “real challenge of pharmacotherapy.” As prescribers become more experienced, a more conservative approach (especially as it relates to polypharmacy and identifying the best drug as shown by evidence-based studies, treatment versus non-treatment options and patient preference) may become the main focus of the prescribing encounter, as one prescriber described:

*Because coming out of Med School, it’s okay to prescribe for an ear infection, you prescribe this and it’s not cook book, you know, that’s what you learn and that’s what you do so, you go, “Okay, I’ve got a kid with an ear infection I’m going to prescribe Amoxicillin.” Done. But now, and I guess part of that is just that the management of an ear infection isn’t necessarily quite so kind of clear cut anymore. And there’s lots of evidence to show that antibiotics don’t actually make much of a difference at all, except in certain situations. Sarah (senior doctor)*

In summary, contextual factors are nuances that influence experienced prescribers’ decisions. All experienced prescribers recognised the need to consider context in making prescribing decisions and, therefore, they had a choice to prescribe or not to prescribe. Experienced prescribers are confident practitioners. Previous and existing knowledge of patient situations and their knowledge of medications that may or may not be effective extend their thinking processes to reconsider the best management for patients in their specific context. This process was described as “cyclical” thought processes unlike that of novices’ thought processes, which was described to be “linear.”
5.4.2 Taking calculated risk – therapeutic reasoning

Thinking through prescribing decisions requires prescribers to consider the risk-benefit equation, where decisions are justified in terms of the appropriateness of the drug to particular situations. Compared to beginners, experienced prescribers are more likely to discuss elements of risk versus benefits in their prescribing practices, but beginner prescribers lacked the clinical experience to deliberate on risk-benefit in their clinical reasoning. As one mentor put it:

*I think the older you get, the more you’re viewed as being sometimes a bit slow up top. What you’re actually doing is, there’s far more factors to take into account. So you’re standing there taking into account a wide range of factors before you decide what to do, in prescribing for this patient. Whereas when you’re younger in your career, you’re so certain and you’re so much more linear. “Well, they’ve got this, so why don’t you prescribe that.” “What on earth is the old duffer thinking about?” The old duffer is actually thinking about twelve other factors that this youngster has not even thought about taking into account. *Elizabeth* (mentor)

The decision to prescribe, or not to prescribe, included weighing up potential risks against benefits. In every prescribing encounter, decisions have to be made, even in situations where risks are greater than the benefits of treatment. Experienced prescribers were more skilful in risk versus benefit deliberations.

*The right to prescribe and the right for the patient to have the opportunity to see what a trial of drug therapy can do for them should not be denied because we overdo the caution. However we don’t want someone to suffer serious adverse effects or die, so as long as you’re not looking at death and serious adverse effects, there are always risks in prescribing.* *Ross* (mentor)

Mentors agreed, “*such factors are fundamental to making risk-benefit decisions*”. However, in their view a beginner prescriber will lack skills of risk-benefit (therapeutic reasoning) deliberations. As beginning prescribers gained clinical experience and became more familiar with the uncertainty and the variability of clinical situations, risk-benefit considerations, patients’ contexts, potential drug interactions and unwanted side effects would all be taken into their deliberations, as some mentors suggested:

*We learn the analytical process first, where we looked at potential conditions to exclude and include, then narrow that down. Initially as junior doctors, we just tend to look at the conditions but little of the context to weigh risk versus benefits.* *Ross* (mentor)
Beginners were depicted by experienced prescribers as confident in prescribing for situations where the benefit of treatment outweighs the risks, or where situations are familiar and common. Experienced prescribers are prepared to take a calculated risk, a skill that is learnt and consolidated with clinical exposure and practical experience.

*To constantly ask yourself, “Could this be something else?” Looking at a patient you think has got Parkinson’s but saying to yourself, “Is this really Parkinson’s or could this be just vascular dementia with a gait abnormality and what would be the differential things I’d look at?”*  
_Elizabeth (mentor)_

The experienced prescribers are described as having the capacity of advanced diagnostic and therapeutic reasoning, which they can apply, to varied patient situations, and this contrasts markedly with the beginner prescribers. Table 8 provides a tabulated summary of behaviours and practices of beginner prescribers, both nurse and doctor. This facilitates a comparison of the characteristics of beginners with experienced prescribers as described above. A comparison was made only between doctors and nurses as the narratives of these two groups most closely identify the similarities and differences. The characteristics listed in Table 8 were discussed in the previous section. The left hand side show the characteristics, behaviour and practices that were similar or different between beginner nurse prescribers compared to beginner doctor prescribers. The differences in the characteristics, behaviour, and practices between a beginner nurse prescriber compared to beginner doctor prescribers is highlighted in *bold* letter.
Table 8: Comparison of the characteristics, behaviour, and practices of beginner nurse prescribers and beginner doctor prescribers.

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>NURSES</th>
<th>DOCTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Confidence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious and fearful of making errors</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Lacking confidence in prescribing skills</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td><strong>Personal list</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal list</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Can confidently expand list</td>
<td>Limited</td>
<td>Present</td>
</tr>
<tr>
<td>Use more common drugs with low toxicity profiles</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td><strong>Prescribing practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consideration of patient context</td>
<td>Experienced level</td>
<td>Limited and guided</td>
</tr>
<tr>
<td>Preference for commonly used drugs with known therapeutic profiles</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Tend to prescribe more</td>
<td>Unlikely</td>
<td>Present</td>
</tr>
<tr>
<td><strong>Risk Taking behaviour</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk-averse</td>
<td>Risk-averse</td>
<td>Takes risk with supervision</td>
</tr>
<tr>
<td>Decision-making</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclical pattern</td>
<td>Still developing</td>
<td>Still developing</td>
</tr>
</tbody>
</table>
As shown in the previous section, there were many similarities across all groups as beginner prescribers, but also some differences reflecting junior doctors’ willingness to prescribe and experienced nurses’ extensive clinical experience. One of the mentors referred to the beginner nurse prescribers as being “emergent prescribers.” This section describes the nurses as emergent prescribers, who transfer their experience, existing knowledge and skills to their practice as beginner prescribers. However, as beginner prescribers, the nurses in this study were already aware of the issues that can influence their prescribing practice. They described themselves as “cautious prescribers.” Although their concerns were similar to other groups of prescribers in terms of causing harm to patients, nurses’ previous experiences dictated their perceptions of harm cause by inappropriate and unsafe prescribing. In addition, as holistic practitioners, they saw “prescribing as a tool” and the patients’ context, as an important consideration in the clinical decision. Patient-centred prescribing was reflected in the narratives of nurse prescribers, and they were more likely to work closely with patients when prescribing, a pattern not reported in relation to doctors when first engaged in prescribing. These practices are more characteristic of emergent rather than beginner prescribers.

### 5.5.1 Cautious prescribers

Nurses reflected on their potential prescribing characteristics and they cited examples of how their prescribing practices reflect that of a novice prescriber. However, the majority were of the view that being novice in prescribing did not necessarily mean they were novice practitioners. The nurses purport that they can revert from novice to expert practitioners if they were dealing with issues that were familiar to them.

*When I become a prescriber, I do know that I have to revert away from the expert again, back to being novice in regards to prescribing and I am happy with that.* Anne (nurse learner)

Nurse participants described novice prescribers as cautious in their prescribing decisions. Several factors were discussed as reasons for being cautious in prescribing. For example, they were cautious with specific patient populations as the patients were more at risk to the effects of drugs because of their pharmacokinetic profiles.

*The risk factor, especially for older people, medication, usually the polypharmacy aspects of prescribing, you get drug-to-drug interactions.* Tom (nurse learner)
Potential harm that drugs can cause due to side effects and toxicity profile was also cited as one factor that would make a novice prescriber cautious in taking risk. The knowledge and skills that they have learnt in completing the prescribing courses have provided the pros and cons of prescribing particular drugs.

... so I am cautious in what I would be prescribing particularly when you look at things like steroids ...cautious because I now understand the characteristics of the drug and its potential harm. Cassey (nurse learner)

Nurses explained that previous clinical experiences have given them insight into the effects and harm of some drugs on patients. The negative effects of these drugs on the patients affected some participants’ perception of good prescribing. They described these practices as bad prescribing, as one participant described:

Yes I am just going to say experience regarding how I have seen other prescribing practices over my time. I think when things go wrong, or things have failed, it is a learning opportunity and I have seen that. Lynn (nurse learner)

5.5.1.1 Consideration of the patient context

Nurse prescribers had previously worked in an environment where they were familiar with the complexities inherent in prescribing for specific populations and the role of nurses in medication management were described in Chapter 4. Nurses, therefore, believed that they were familiar with the additional demands, resources and constraints that come into play when a particular patient and context were taken into consideration in medication adherence. Beginner nurse prescribers explained that even as beginner prescribers, they already have existing skills related to administering, evaluating and monitoring treatment, and an understanding of the factors that need to be taken into consideration in medication management.

For beginner nurse prescribers, establishing a therapeutic relationship based on trust with patients was cited as vital to prescribing. Knowing the patient, their needs and issues were important to the context of prescribing. When working with patients, gaining their confidence was viewed as key to a therapeutic relationship where prescribing the drug is only one aspect of the management plan, as one nurse explained:

And again, that’s about being able to establish a therapeutic relationship with patients and families very quickly, so that the prescribing is one aspect of your management plan, and it consolidates everything. And patients feel confident with that. Mark (nurse prescriber)
Establishing a trusting relationship with patients and providing continuity of care were described by nurses as fundamental to contextualizing prescribing decisions. All nurses had worked in their specific area of clinical practice for a number of years and, in many cases worked with patients presenting with chronic conditions who needed to be seen more often, which allowed nurses to get to know their personal circumstances. One nurse practitioner described how she used this knowledge in her prescribing decisions:

> I have a group of patients who I see quite often who will often flare up. So over the three years I’ve seen these patients, I know how quickly some of them settle down and how slow some are. So I can tailor their treatment based on that experience as well and the fact that I actually know these patients. **Chrissie** (nurse prescriber)

The social context, described as relating to the “patients’ financial situation and support systems,” is important in a nurse’s prescribing reasoning. The fundamental issues of whether a patient can afford to buy a drug, has access to transport, or would adhere to treatment were identified as factors that influenced considerations in decision-making on whether or not to prescribe. This holistic approach to care that many nurses espoused, is also reflected in their prescribing decisions.

> It’s [prescribing] not necessarily used all the time. There are choices, there are challenges, there’s decision making that goes behind the process of applying the prescription or the medicine whatever that is. **Abby** (nurse prescriber)

Doctors explained that though they were also aware of these issues, as beginner prescribers they were less able to extend their thinking to the patient’s social and personal contexts as they lacked the clinical experience, and were more focused on the actual drug.

> But I was already aware of those kinds of issues [adherence] during [my junior years], and it was reinforced through our contact with patients and so on. But I think it would be fair to say that it didn’t really click when you first came out... you were kind of limited in your thinking really. **Teddy** (senior doctor)

Lacking clinical experience, junior doctors relied on nurses, who were more familiar with the patients’ contexts, and how the health system worked.

> ...that's where they [nurses] assist junior doctors largely, I mean the junior doctors have no idea about those types of conditions and referral systems often, and they just haven’t got the clinical experience, and many nurses obviously, just through years of experience have vast amount of
experience with these types of conditions and they [nurses] really complement the team. *Elizabeth* (mentor)

The ability to take the patients’ context into account in prescribing decisions is a skill that junior doctors have not yet developed as beginner prescribers. In contrast, nurses bring to the prescribing role extensive prior clinical experience and a holistic approach to clinical decision-making. Nurses are not only familiar with the patients’ situations and needs; a therapeutic and trusting relationship with patients had, in most situations, already been established. In summary, beginner nurse prescribers are different to junior doctors in some areas of their prescribing practices. Unlike junior doctors, beginner nurse prescribers are more likely to take patient context into consideration when prescribing, a characteristic inherent in experienced prescribers prescribing practices. These characteristics, behaviour, and practices are tabulated in the left hand corner of Table 9 below. In the table below, the comparison is made only between the nurses and the doctors as beginner prescribers to allow for consistency of comparison. The difference is highlighted in *bold italic* letters.

**Table 9: Characteristics of experienced prescribers compared to beginner junior prescribers and beginner nurse prescribers**

<table>
<thead>
<tr>
<th>Experienced Prescribers</th>
<th>Beginner nurse prescribers</th>
<th>Beginner doctor prescribers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal list</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive repertoire of drugs</td>
<td>Learnt over time but limited to scope</td>
<td>Learnt over time</td>
</tr>
<tr>
<td>Adapt skills to new and unfamiliar drugs</td>
<td>Learnt over time</td>
<td>Learnt over time</td>
</tr>
<tr>
<td><strong>Prescribing practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considers patient context</td>
<td>Highly aware</td>
<td>Learnt over time</td>
</tr>
<tr>
<td>Confidence to use new and unfamiliar drugs</td>
<td>With mentor supervision</td>
<td>With supervision</td>
</tr>
<tr>
<td>Tend to hold back in prescribing until absolutely necessary</td>
<td>Learnt over time</td>
<td>Learnt over time</td>
</tr>
<tr>
<td><strong>Risk Taking behaviour</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takes calculated risk</td>
<td>Learnt over time</td>
<td>Learnt over time</td>
</tr>
</tbody>
</table>

**5.6 Conclusions**

Nurses first setting out to apply pharmacological knowledge to prescribing practice shared some similarities with junior doctors as beginner prescribers, but also differences. The similarities
between nurses and doctors as beginner prescribers reflected fear and anxiety that mistakes could be made, and strategies they developed in response to their anxiety, for example developing a personal list of familiar medicines that, over time, they expanded, and deferring to experience in the use of unfamiliar medications. There were also differences, reflecting the prior clinical experience nurses brought to the prescribing practice, and in some respects, nurses’ prescribing practices were more similar to those of experienced doctors. These similarities included a cautious approach to prescribing (as opposed to a propensity to prescribe), a cyclical thinking pattern, awareness of patient context, and regarding a prescription as but one of many available therapeutic tools. Therefore, nurses beginning to prescribe have been categorised by mentors as neither ‘beginner’ nor ‘experienced’ prescribers but as ‘emergent’, displaying characteristics of both beginner and experienced.

Chapter 5 highlighted the differences between beginner and experienced prescribers, Chapter 6 builds on this by exploring how the critically important skills in clinical reasoning are developed. Consideration is also given to what ongoing support is provided and needed for beginner prescribers.
CHAPTER 6: THE DEVELOPMENT OF CLINICAL REASONING IN PRESCRIBING

6.1 Introduction

As health practitioners begin prescribing in practice, they developed strategies and skills in the clinical practice setting, described in Chapter 5. The findings presented in Chapter 5 showed that the practices and decision-making skills of beginner prescribers were still developing when compared to experienced prescribers. Beginner prescribers’ clinical reasoning was revealed as limited, as they had little understanding of the contextual meaning of the clinical situation or setting, shown to be a fundamental aspect of the clinical reasoning skills of experienced prescribers. Chapter 5 also highlighted that although nurses were in many respects similar to junior doctors, their prior clinical experience and holistic approach were evident, and in that at the same time, they shared some characteristic of experienced prescribers. Clinical reasoning skills can only be developed over time as clinicians gain experience in clinical settings, and is dependent on the approaches that extend the prescribers’ capabilities in thinking, which Chapter 6 describes.

Chapter 6 has four sections. The first section describes the benefits of clinical experience and a “hands-on” approach in the development of the beginner prescribers’ skills in clinical reasoning. The section that follows describes the role of mentors, an established formal support structure that has long facilitated the development of clinical reasoning skills in beginner doctor and more recently, nurse prescribers. Reflective practice is the theme of the next section, which draws on the use of clinical case discussions. While the use of clinical case discussions is a tradition available for beginner doctor prescribers, nursing does not have a history of prescribing and so has not developed comparable formal approaches. The final section of this chapter presents the mentors’ views and perceptions of the potential barriers, including the lack of formal support systems, which may limit beginner nurse prescribers’ capabilities in clinical reasoning.

6.2 “Hands-on” experience

All prescriber groups highlighted that clinical experience and a “hands-on” approach were vital to the consolidation of clinical reasoning skills. In this respect, developing clinical reasoning skills is unlike learning the theory underpinning prescribing (pharmacological sciences), that is taught away from a clinical context while developing clinical reasoning skills was attributed to the “know-how” that is acquired through clinical experience. It was in the context of clinical
situations that knowledge and skills developed after starting to prescribe. Experience was described as essential to building beginner prescribers’ confidence in prescribing.

As described in Chapter 5, nurse prescribers have extensive clinical experience in providing care to patients, including some aspects of medication management. However, prior to becoming prescribers, nurses were not responsible for decisions related to diagnosis and treatment. Therefore, as beginner prescribers they lacked confidence in their skills in clinical reasoning in diagnosis and prescribing. With clinical experience, their confidence and capabilities in prescribing progressively increased.

[It’s] true, that the more experience you get, the more confident you are with prescribing. I work in [area of practice] and I know many conditions. However, for other conditions, it’s actually a matter of identifying them. The more you see those conditions, the more familiar you get with what they are and how they are treated. Chrissie (nurse prescriber)

Having responsibility for prescribing increased nurses’ familiarity with the drugs they were prescribing. Repeatedly using a given drug in a given clinical situation improved their ability to consider the drug’s potential for harm and good. One nurse reflected on this:

We tend to use the same drugs over and over again, so you can become quite familiar with them. I suppose before we were prescribing, we do know some aspects of the drug... but in a superficial way. Now, we understand more about their [drugs] effects and potential for harm. You become a Nurse Practitioner, or you’re a prescriber, and that’s when you begin to learn again. I would say most of the time I’m confident in my prescribing practice, but there are times when you think “Hmm, is that drug liable to have an interaction with another drug or is this the best drug to give?” Mark (nurse prescriber)

Beginner doctor prescribers shared similar views, in that they too, found that clinical experience improved their understanding. Beginner doctor prescribers first engaged in prescribing with very little clinical experience to draw on; therefore, having experience improved their “perceptual grasp” of the clinical situation. Doctors found experiences were useful for providing a point of reference for subsequent clinical cases that were encountered in practice.

When you have the confidence and the experience that you know that condition well... and the medication well, its effects on the patient, then next time you prescribe it, you may even prescribe more than what the book tells you and you will still feel confident that you have made the right decisions. Susan (senior medical officer)
Susan’s comments above illustrated how she utilized her previous encounter with a clinical situation as a foundation to further recognise similar clinical conditions. One mentor suggested that this is because clinical conditions can be seen as, “patterns of events” that can be used to guide the prescriber’s analysis of the situation.

You know, as you get more clinical experience, you then continue to get used to medications that can cause harm, and that you’ve got to adjust your dose appropriately, particularly if the patient is old and has kidney failure or liver failure. Because what you give to them... it always comes across your mind, you know, whether you giving this medication would actually do this patient more harm than good. **Teddy** (Senior Doctor)

Clinical experience improved the beginner prescribers’ understanding of the different responses that can occur with each patient with the use of some drugs. For example, a midwife shared her experience:

*I think of a drug we use for pain. I feel like I really need to think carefully about that [drug] as well because of the side effects. The side effects of Pethidine can really be quite huge and quite different for everyone. Like you know, you get people who go to sleep and then you get people who can have hallucinations and panic, and they feel like they can’t breathe and get really stressed. That’s not the side effect that you want in a labouring woman... all these I am more aware of now that I have more experience of dealing with them [side effects of the drug].** J**enna** (midwife)

All participants in this study commented that individuals do not respond to treatment the same way. Being “hands-on” in managing patients and their treatments, enabled participants to observe individual differences in response to drugs, and this could only come from being actively involved in the care of the patient. The “hands-on” approach, referred to here by the participants, is the “doing of prescribing”. The doing of prescribing, as one doctor highlighted, refers to prescribers’ “exposure and thinking through actual encounters with many practical prescribing situations,” and it was these encounters that added the nuances and shades of differences to the context.

*The more you see patients, the more clinical problems you encounter and therefore, the more you learn from. And even if it’s something very simple, a sore throat, for example, you’ve seen a thousand times. You become familiar with the management of the condition and the more you see, the more confident you become. So what I am trying to say is that experience helps gel it up for you.** T**iffany** (senior medical officer)

The development of skills in clinical reasoning takes place as prescribers gained experience in the elements that contribute to skilled prescribing. These elements include: “dosing”; “prescription
writing”, “developing a list of certain drugs to use” and “familiarity with common drugs”. These all continually evolve and improve with further hands on experience. Indeed, learning did not stop; and clinical exposure and learning continued in an iterative manner. One midwife explained:

I don’t think it’s [learning prescribing] ever complete. I think there’s always so much more that you can learn and the more experience you get. Experience is really crucial in midwifery and I am sure it’s the same in nursing and medicine. What you see, what you learn, what you’re exposed to, all of that contributes to how you practice and to your knowledge base. And a lot of, there’s a lot of things I’ve learnt just from being a part [of the health team] and I think there’s still lots more to learn. Jenna (midwife)

In summary, clinical experience is essential in the formation of prescribers’ skills in clinical reasoning and to increase their confidence to practice. Nurses, doctors and midwives were similar in their views, in that all agreed that capabilities in thinking through prescribing were enhanced when they were actively engaged in prescribing and being exposed to clinical experience.

6.3 Mentorship as a professional practice

In the light of the fact that historically, doctors have been the only health professionals authorised to prescribe, within the medical profession both formal and informal approaches were established over time to support new prescribers to develop their clinical reasoning skills. Narratives from doctors indicated the critical importance of mentorship to help them in developing clinical reasoning skills. Informal approaches include the ongoing support from colleagues. Unlike medicine, nursing do not have comparable formal and informal mechanisms to support beginner nurse prescribers, given nursing’s recent introduction of prescribing, and with there being few nurse prescribers to provide mentorship. Nurse participants in this study needed to develop their own support systems as beginner prescribers; such a system was not already in place. The majority maintained a collegial relationship with the senior doctor who was their prescribing mentor as a learner prescriber and identified other doctors to consult with to ensure safe prescribing practices and decisions.

6.3.1 Mentoring in the practice of medicine

In the medical profession, mentorship is fundamental for beginner prescribers for two reasons. First, mentors are expert clinicians, who model the dynamic transactions between personal knowledge and the clinical situations to achieve safe prescribing practices. Secondly, mentors’
guidance and supervision shapes the development of the beginner’s frame of reference for clinical practice.

Mentorship was identified by doctors as a formal support mechanism that provided dedicated time for reflection when the “mentor listened actively” and “challenged [their] thinking” which assisted junior doctors in developing strategies towards clinical reasoning. Doctors viewed mentors as experienced clinicians with the practical knowledge or “know-how” that can only be generated through years of experience and clinical practice. Having a senior person to supervise and guide junior doctors was considered vital to ensure the development of safe prescribing practices.

*The mentorship, it’s extremely important in that, for some years, after initiating prescribing practice, prescribing habits are overseen. Now for doctors, it’s because we work as a junior person in a team, and all of what we do is being checked by the next level up. The Registrar checks us, the Consultant checks the Registrar, and it takes years before you reach a level that nobody’s actually overseeing what you’re doing. I think it’s wrong to assume that someone can be a safe and competent prescriber within a year of starting out.*  
*Phil (mentor)*

Confidence in prescribing continued to increase with clinical experience under mentorship and with support. The majority of junior doctors had their prescribing decisions guided by their mentors.

*When I started out, I thought “Oh my goodness I feel really like a bit of a fraud” because we never prescribed on our own. I never had to do what they [nurse prescribers] are doing, like go off on their own and take the responsibility in prescribing a drug...we were supervised really into making that decision initially.*  
*Kate (senior medical officer)*

Senior medical officers described how they continued to use the support of their seniors and peers throughout their practice. As the clinical situation became more complex and demanding, the support system of being able to draw on the experience of peers or those senior continued to be useful for experienced prescribers as they engaged in the processes of decision making. Teddy explained:

*I’m sure we give someone [patient] something [drug] without knowing the risks... just based on the information of this drug, you know. If everyone just gives everyone that, but hey, does it actually work? Not everyone knows, and there is no definite answer out there. And I would say, you know, having some mentor or senior to discuss prescribing or things with is very useful.*  
*Teddy (senior medical officer)*
Beginner doctor prescribers found having a senior person to guide their learning especially important in the first two to three years. Formal support systems were described as providing “the checks and balances necessary” for safety. Senior medical officers included among their resources the senior nurses and pharmacists in the health care team who were viewed as fundamental sources of support.

Now, when you start off prescribing as a junior doctor, there are massive checks and balances in the system. Because when you start off as a doctor, you’re in the hospital, you do have pharmacists there, you’ve got registrars [senior medical officers], and you’ve got experienced nurses telling you, “That’s the wrong dose doctor.” Elizabeth (mentor)

6.3.2 Peer-support for nurses

Nurses, on the other hand, begin prescribing within a specific scope of practice and bring to prescribing prior extensive clinical experience. Therefore, they begin as prescribers with established professional identities where their professional frames of reference have been determined. As beginner prescribers, nurses were dissimilar to junior doctors in how they viewed the role of mentors. For beginner nurse prescribers, a consultative and collaborative relationship with mentors was already established through working together in the health care team. These medical colleagues then took on the additional role in mentoring nurse colleagues to promote safe prescribing practices. The nurses referred to the relationship as being “mainly collaborative and interprofessional,” “discussing rather than being directed” and “referring rather than being supervised.”

Nurses learning to prescribe selected a senior medical officer in their area of practice to act as a mentor. Unlike junior doctors, whose mentor was from the same discipline, for nurses as students in prescribing, a doctor was their prescribing mentor. This occurs in part because there are currently very few sufficiently experienced nurse prescribers to provide mentoring. However, this study highlighted a sense of benefit of being mentored by medical colleagues, including being coached in differential diagnostic decisions, challenged in making risk-benefit assessments, and in having a greater insight into the way doctors’ practice (see chapter 5). When nurse participants became prescribers, there were not the same formal mentorship support systems in place compared to that described by doctors. However, as the nurses in this study began to prescribe in practice, they maintained close working relationships with their former mentors, augmented by the guidance and support from other doctors, to form their own kind of prescriber-peer support.
Learner nurse prescribers had seen the benefits of the formal mentorship approaches used by doctors and had themselves experienced mentorship during their prescribing preparation. As beginner prescribers, they developed mechanisms to ensure that they could continue to avail themselves of prescriber peer support:

*I think if you’re coming in as a new prescriber, preparing your environment really very well is really important. So being able to recognise and acknowledge the support structures that you actually have in the environment you work in, and make use of them. Because these support systems do not exist for us as it does for doctors.* Jane (nurse prescriber)

Informal “peer-support” mechanisms were used to discuss clinical decisions:

*I could make that decision but I just want the backup still. So I don’t go off completely independently. I don’t think in the environment I work in I’ll always have that support and even if I don’t have it right on that particular day I can always consult further down the track, a couple of weeks even, if they’re [consultants] on holiday and go, “this is what I’ve done”.* Chrissie (nurse prescriber)

In summary, the guidance of mentors played a crucial role in the development and progression of clinical reasoning skills for both nurses and doctors as beginner prescribers. So important was the mentorship relationship that even when no longer required (as part of an educational and professional requirements) to be mentored, nurse prescribers themselves maintained such relationships. In the clinical context, where clinicians are confronted with challenging and complex conditions in their day-to-day practice, support mechanisms such as referring to mentors and other members of the health care team are needed to promote safe prescribing practices.

6.4 Clinical discussions

This study revealed another approach widely used by practitioners in the clinical setting to develop skills in clinical reasoning, referred to as *reflective practice*. Clinical reasoning, as described in Chapter 2, (section 2.4) is made up of both diagnosis and prescribing decision-making. Reflective practice was described by all three prescriber groups (nurses, doctors and midwives), but not in the same way.

Doctors’ reflective practice was described as *“clinical discussions”*: formal interactions that occur between doctors or with other health professional groups, such as pharmacists. Clinical discussions represent actual patient encounters where presenting clinical issues in the context of a patient's situation are discussed. Engaging and participating in clinical discussions were
described as enhancing the practitioners’ “clinical judgments and perceptions.” Discussion of a case was seen as “an effective tool for demonstrating clinical decision-making in diagnosis”; offering “an opportunity to develop a prescriber’s analytical and problem-solving skills”; and “allowed for the pragmatic application of new knowledge and skills to challenging situations.”

When nurse participants became practicing prescribers, they were invited to participate in clinical discussions. Nurses commented on how much they valued their participation in these sessions, referring to these as “a reflective tool” in practice. Engaging and participating in clinical case discussions, consultation and collaboration with other members of the health care team, were all approaches that all prescribers referred to and valued, because active participation in thinking and in communicating clinical reasoning in diagnosis and prescribing were encouraged.

*If I’m prescribing a drug that I haven’t prescribed before, that I’m not familiar with, then I would always go back and talk to one of the SMOs [senior medical officers] about it [prescribing decisions], and discuss my decisions with them in terms of whether it’s appropriate, and what other drugs, interactions and things we might need to look at. This process has really helped me sharpened my thinking and my abilities in making decisions.*  

*Jane (nurse prescriber)*

Doctors argued that when treatment options were new or there was the risk of adverse effects and harm, the need to discuss and debate prescribing decisions was essential. Amongst doctors, clinical case discussions in relation to diagnostic and prescribing considerations were suggested as a method useful for both new and experienced prescribers, where the clinical reasoning processes associated with the case were discussed and explored in depth. The need to discuss clinical decisions in a collegial manner was described as a “process of peer reviewing,” wherein doctors presented cases to a group of clinicians for critique in relation to the management of that case.

*We present cases all the time. Ever since we started doing clinical we were expected to present cases for other doctors to critique and examine. It’s a great way to learn and extend your understanding of why and how cases can be different.*  

*Sarah (senior medical officer)*

Nurses and midwives also felt that clinical discussion with doctors and attending clinical meetings were important, especially when cases were presented with high-risk profiles and where diagnostic and prescribing practices and decisions were not straightforward:

*So even though I might take kids on my own, completely manage them and organize their treatment, I would go sort of back to discussing things with consultants.*  

*Paige (nurse prescriber)*
We [midwifery teams] have high-risk meetings but not regarding prescribing. However, when a woman gets a bad infection and you know she ended up in ICU then the case is reviewed. But like that woman with mastitis and querying the antibiotics? Something like that would not be reviewed to see if the right antibiotics or right drugs were to be given. Avelina (midwife)

The majority of beginner doctor and nurse prescribers found their decision-making on prescribing was substantiated when an experienced colleague engaged with them in their deliberations related to diagnosis and prescribing choices. This in turn enhanced their confidence.

The first few months of your practice year, you get a bit nervous, and you know this is the correct thing to do, but you have never done it before, and that you just want confirmation from your senior. Teddy (senior medical officer)

The support that you get also gives you confidence... consolidated your knowledge and skills. Maggie (nurse prescriber)

Nurses described “a more intensive discussion with consultants” and “attending case study presentations where these conditions were discussed” as processes of “learning as you go along.” This was viewed as a “valuable strategy” for improving and extending their skills in differential diagnosis and clinical reasoning.

Differential diagnosis knowledge and skills do develop over time. It did with me. You know, it can be very difficult to keep up to scratch with everything, but it does help if you work in a dynamic kind of practice. So, you know, going through the case studies is valuable. The education sessions are hugely variable... for example some are drug related and some are, you know, management of patients in other ways. Maggie (nurse prescriber)

Such activities were not available to some of the nurses, or were not encouraged in some settings. The “lack of opportunities to attend” and “participate in discussion groups and ongoing education seminars” were perceived by nurses to be limiting.

Well if there’s a prescribing workshop I usually go. In fact there’s one going on this year at Auckland I want to go to that. And it just updates you and reminds you about certain things yeah. But, we do not get formally asked to join doctors. Noleen (midwife)

And because we’re a specialist team that sits apart from the other entire ward based teams, you know, I could spend every day going to different forums throughout the hospital. I do this myself and do not wait to be invited; otherwise, it will never happen... being invited to attend doctors’ forums. Jane (nurse prescriber)
Therefore, as beginner prescribers they created discussion opportunities they described as “paper rounds” where they discussed their patients and management with other nurses. Over time, some nurse prescribers extended these discussions by inviting doctors and pharmacists to join in.

*We have paper rounds every morning in our team. And that’s actually an opportunity to present patients. You present your management plan. So all the nurses in our team do that now, have an open discussion, which includes registrar, and pharmacists and SMOs. So that is a forum by which you can talk about what your management plan.* Jane (nurse prescriber)

Midwives explained that they, too, do not have formal processes of discussing prescribing decisions. However, they took the opportunity of “tagging along with a more senior midwife” with whom they discuss clinical situations.

*And my first two years of private practice I would be on the phone with W[mentor] and H [mentor] saying “okay this is what’s happening, is this okay?”* Sarah (midwife)

In summary, while nurses were used to reflecting on their practice, the use of clinical discussions as formal interactions to deliberate on diagnosis and prescribing decisions were not part of usual practice. However, they readily recognized the value of this approach to support the consolidation of their skills in clinical reasoning and developed strategies to take part in activities that were available for doctors to benefit their ongoing learning.

### 6.5 Mentors’ views of potential barriers for nurses

The section above shows that mentoring and clinical case discussions were approaches that played a pivotal part in fostering the development of clinical reasoning skills, particularly amongst beginner doctor prescribers. For doctors, clinical reasoning skills are a key requirement in establishing a diagnosis and in determining treatment approaches. These clinical reasoning skills were developed through mentoring and clinical case discussions; both well-established structured strategies in medicine. As already discussed, nurses put in place, their own structures and processes. Mentors were of the opinion that nurses do not have the same formal support systems automatically provided to beginner doctor prescribers and were concerned that only minimal support was available for beginner nurse prescribers. Furthermore, mentors felt that the lack of formal mentoring and support could disadvantage nurses’ skill development in clinical reasoning in relation to diagnosis and prescribing.
Mentor prescribers shared their observations that the majority of nurses were hospital based, where doctors were always available to discuss issues with, and in most situations, doctors remained the dominant practitioners providing the diagnosis. Establishing diagnosis was described as the first step in the process of prescribing. Lack of diagnostic abilities were considered to potentially limit the practice of nurses working as autonomous practitioners and this might result in nurses remaining dependent on doctors for diagnostic decisions.

*Now the essence of nurse practitioners is absolutely the key. They, like independent midwives, are independent health practitioners. But that goes with consequences and the responsibility of your decision making. And most of them [decisions], being based especially in hospital practice, have always had underpinning by medical staff there. Is this going to change when they become prescribers?*  
**Elizabeth** (mentor)

Mentors observed that nurses are likely to be exposed to clinical decision-making as it relates to diagnosis and treatment approaches. Mentors reflected on several instances where nurses were performing excellent assessments and report writing, but were less skilled in planning interventions. For example, one mentor described a recent incident in the clinical setting where she observed nurses completely assessing patients and documenting these assessments, but not linking their assessment to the appropriate intervention. The mentor concluded that some nurses are not suited for prescribing, as they still have to develop a stronger knowledge and skill base.

*They [nurses] will observe a patient getting more dehydrated, and they have wonderful assessments and documentation to show that. To increase the fluids, they give them tea and coffee. What do you know about caffeine and theobromine having diuretic effects? There’s no electrolytes. They are encouraging them to eat or drink but they won’t jump to the next level of making a major decision... what about a simple lucozade for this patient? And that’s the challenge for some nurses, possibly, because they have been, handmaidens for too long.*  
**Elizabeth** (mentor)

Mentors also questioned the lack of initiative amongst some nurses. They described clinical situations where nurses had been reluctant to make treatment decisions. In the situation described by Elizabeth above, she argued that some nurse prescribers were still dependent on doctors to make decisions or verify decisions, and another mentor agreed:

*They (nurses) are ‘scared’ to take that one step higher to say... “this is my decision and therefore I stand by this”.*  
**Phil** (mentor)

References by two mentors to the dependence of nursing to medicines (as in “handmaidens” and “too scared” to take the next step) importantly alluded to characteristics in the culture of nursing, borne out of its long history of dependence on medicine. A support system for nurse beginner
prescribers would, therefore, not simply be there to coach and support the development of clinical reasoning skills, as in the case of doctors. It would also need to support a culture change in nursing in expanded roles to overcome the fears, reluctance to take decisions and seeking information approved from medical colleagues.

All mentors believed that it was important to address the issue of education to prepare nurses as autonomous practitioners, not only for the role of prescribing. Such education needs to include critical thinking, using a decision-making framework, alongside strong assessment skills and a sound knowledge base.

*And I’m going to put to you that for nurses to become prescribers, it is actually not about that pharmacological knowledge, that’s a tool. It’s a mindset. It’s a framework. And in particular it’s a decision making framework, within an environmental context. Including, what is the diagnosis? Nurses are not used to making diagnostic decisions without doctors.* Elizabeth (mentor)

While mentors agreed that many nurses made everyday decisions about patient care and management, it was the decision-making skills related to diagnosis that needed to be addressed. Mentors reflected on their experiences working with nurses, and as one mentor described, “the focus is on prescribing and not on diagnosing.” They explained that mentoring nurses learning to prescribe was different to mentoring junior doctors, in terms of the mentoring approaches they might use.

*And I think that for nurses to be decision makers they need to be mentored through making decisions. I think many nurses I have worked with want me to prescribe the drug.* Phil (mentor)

Mentors argued that as beginner prescribers, nurses, just like doctors, need “ongoing support” to allow them “to continue to develop and extend their knowledge and skills in diagnosis and prescribing.” Learning to prescribe takes time, and therefore lack of support structures could be a barrier for nurses as new prescribers for their continued development and gaining of new skills in clinical reasoning.

*It actually takes a lot longer than that [prescribing education] to become experienced. So what we need is a mechanism to ensure that their [nurses] prescribing habits are not independent and that they are getting vetted all of the time and that can be via a mentor relationship.* Ross (mentor)

A particular concern was expressed by mentors about nurse prescribers working in primary health care, where nurses may have minimal support from doctors. Compared to general practitioners
working in primary health care, nurse prescribers’ knowledge and skills in diagnosis are more limited.

Now, with nurse prescribers, you’re actually looking at people starting off their prescribing career, however experienced, on their own. It’s totally different; they are on their own [primary care], with no support and yet they are really only [beginner] prescribers. Geraldine (mentor)

A “back-up system” where prescribing risks were debated and discussed with doctors and other colleagues was seen by mentors as important for developing skills in clinical reasoning. Where junior doctors have structures, checks and balances, in place to support, emerging prescribing practices, and decisions, these do not exist for nurses.

And nurses will find, just as doctors find, that they’ll emerge as a fully trained professional and still feel rather a novice in this whole area [prescribing]. You do learn as you go and you need supervision and you need someone overseeing you. You need to be coached in the whole thing. Phil (mentor)

In summary, nurses received mentorship during their educational preparation; however, compared to junior doctors, nurses do not have structures in place for the ongoing support for their prescribing practices as skills in clinical reasoning are developed. Several barriers were cited by mentors that were considered as inhibiting the development and progression of prescribing skills among nurses. Some nurses were thought to be not ready or suited for prescribing, mostly due to their lack of knowledge and ability to work autonomously. The need for nurses to develop their knowledge and skills in clinical reasoning and decision-making was highlighted.

6.6 Conclusions

Prescribing utilizes clinical judgments that require practical experience and exposure. This chapter focused on the role of clinical experience to support the consolidation of skills in clinical reasoning. Skill acquisition in the area of clinical reasoning is described as developmental and progressive, and all prescribers undergo similar processes of consolidation. Continued learning in the area of clinical reasoning in diagnosis and prescribing is a process for all prescribers that can progress with ongoing support, guidance, and mentorship. For doctors there are formal support mechanisms that are well established in the clinical setting. In contrast, nurses do not have systems in place to guide practice and to support their need for ongoing skill development and consolidation in clinical reasoning. Mentors working with nurses learning to prescribe shared their views of the potential barriers nurses face.
Findings of this study highlighted that as beginner prescribers going on to develop clinical reasoning skills, nurses differ from their medical counterparts in several important respects. By virtue of their extensive clinical nursing experience, nurse beginner prescribers shared some characteristics with experienced medical prescribers. However, nurses were disadvantaged professionally in two ways. Firstly, the strongly developed mechanisms embedded in the medical profession that support junior doctors in the development of clinical reasoning skills were not there for nurses. Moreover, it can be argued that nurses had particular needs in developing diagnostic reasoning skills, not having had these as a focus in their education. Secondly, nurses had a professional culture in which they did not make diagnostic and therapeutic decisions. There were indications that a professional culture of dependence could constitute a challenge when beginning prescribing decision-making, and in this nurse prescribers needed support.

Clinical reasoning is a key skill for nurses, doctors, and midwives in prescribing. However, nurse prescribers have to contend with more than just developing skills in diagnosis and prescribing. As autonomous practitioners with prescribing rights, the need to show that they can practise safely is essential. Chapter 7 describes the journey of nurse prescribers as they first take on the unfamiliar prescriber’s role in the clinical setting. The issues that they encountered will be described and the approaches they employed to cope with a role fraught with controversy and professional upheaval are explored.
CHAPTER 7: NURSE PRACTITIONERS – PIONEERS IN THE NEW ROLE

7.1 Introduction

While the findings in Chapters 4, 5 and 6 described the experiences of nurses as learners and then as beginner prescribers with reference to those of other prescriber groups, Chapter 7 gives attention to the experiences of the ten nurse practitioners approved as prescribers, as they embarked on the practice of prescribing. As beginner prescribers, all groups identified the need for ongoing support and mentorship as key to skill development in clinical reasoning, the focus of Chapter 6. As part of this, the support and the approaches beginner nurse prescribers employed in proactively seeking ongoing support in the clinical setting are discussed, as unlike beginner doctor prescribers, there are not the same support structures in place for nurses. The ongoing concerns of mentors for the need for nurses’ knowledge in differential diagnosis and skill development in clinical reasoning have also been highlighted in Chapter 6.

The first section of Chapter 7 describes the lack of preparedness of organisations that employed the first nurse practitioners who could prescribe and consequently the challenges these nurses faced. This section also discusses the approaches these nurse practitioners used to promote their prescribing role in an environment where non-medical prescribing was unfamiliar and sometimes contested. Secondly, this chapter describes the participants’ approaches to educate and inform other health professionals (e.g. pharmacists, doctors) and patients about their role as nurse practitioners authorised to prescribe. The section that follows describes the approaches nurse prescribers employ to negotiating the boundaries of prescribing practice where two prescribers were involved in the care of patients. The final section explores the participating nurse practitioners’ perspectives on their prescribing practice into the future, as they continue to negotiate the boundaries of their new role.

7.2 The unprepared organisation

Prior to being approved to practice as nurse practitioners, all nurses who participated in this study were already working in advanced roles. They were working with other health professionals and in interdisciplinary teams. The majority of nurses were well acquainted with the daily activities of their specific areas of specialty and of inter-disciplinary teams. For the majority, much of their role remained the same after they had been approved to practice as nurse practitioners, except with approval, they could then prescribe.
So my role over the last 7 years prior to becoming nurse practitioner was very much around providing care, giving prescribing advice [to doctors] and ensuring patients get their medication and that has not really changed. It is the same, only now I can prescribe. Jane (nurse prescriber)

However, not many health professionals were informed about the nurse practitioners prescribing role. In addition, once the nurse prescriber embarked on their new role, they felt they were confronted with an organisation that was “not prepared” or “funded” for nurse practitioners.

It wasn’t so much extra money to go from nurse specialist to nurse practitioner as what it was to go from a brand new role as a nurse practitioner. And so what we did is we managed to keep our nurse specialist role in the budget and the nurse practitioner budget was a whole new one. Chrissie (nurse prescriber)

The nurses themselves were also unsure of what support they needed in terms of their prescribing role.

I'm not quite sure as a nurse practitioner who should be doing it [providing ongoing support] or whether we should be forming a group ourselves. I've talked to some of the nurse practitioners suggesting that maybe we should have a monthly or two monthly meeting and to support ourselves, especially as prescribers. Maggie (nurse prescriber)

In addition, nurses also felt that there was an overall lack of support from employing organisations in terms of the nurse prescribers’ role. A lack of understanding of the differences between the prescribing role of a nurse practitioner, and that of a doctor, was a significant factor, not only in terms of funding for the nurse’s position, but also for establishing a framework to provide ongoing support and clinical education. Organisations not adequately prepared for nurse prescribers put the participants in a “challenging position.” Nurse prescribers felt that their organisations were not prepared for the new nurse practitioners who had prescriber roles. One nurse reflected on her previous few years of prescribing experience:

I think there was always that potential threat that we may take business away. I think if we had funding streams that were put into place, clear clinical guidelines, mentorship put into place, ongoing clinical education for prescribers, nurse prescribers, and if the legislation had been prepared prior to this happening, it would have been a lot easier. But as it currently stands now, we have to work backwards in a way before we can come forward. Abby (nurse prescriber)

Unlike doctors, nurses do not have formal support structures for prescribing in place. All new nurse prescribers took on the responsibility of “promoting” their role. They were mostly self-
directed in their efforts in forming informal support structures. By working closely with doctors and other health professionals, nurses felt supported, not just in relation to the nurse practitioner role, but also as prescribers. The clinical and educational support gained, provided the necessary support for nurse prescribers’ continued development and growth.

I think within the Unit they have been incredibly supportive. They [consultants], in fact are pushing me all the time to try and get better. They’re [consultants] supportive in education and so I think from that respect that’s been really good. We also do journal clubs. Meaning the doctors…and I now join them. I mean the Journal Clubs can be on a wide variety of things but they are on new protocols, new drugs, new studies that are out there. We have mortality and morbidity meetings on patients that have either died or had a terrible time post transplant and I get invited to those too. Maggie (nurse prescriber)

Positioning the prescribing role was described as one of the key challenges for nurse prescribers at the outset. Nurses were of the view that both doctors and nurses were accepting of their new and extended role as nurse practitioners. However, at the same time their competence to prescribe was often questioned. Nurse prescribers, therefore, suggested that promotion of the prescribing role was essential as, unlike prescribing by doctors, prescribing by nurses was unprecedented in New Zealand and no examples of communicating the place of the role, other than by the nurses themselves, were encountered.

You have to realize that this is a new role. It is a new thing [nurse practitioner prescriber], and you’re breaking boundaries all the time. It is obvious that the first thing you need to do is tell people what you do.

Anita (nurse prescriber)

Nurse prescribers were of the view that whilst the roles and area of practice for nurse practitioners were more defined and delineated, this was not the case with prescribing. As the demarcations and the boundaries of nurse practitioners’ prescriptive authority were not definitive, they argued that this gave rise to miscommunication and misinformation. Mark explained:

I still don’t think that either the other nurses or the doctors truly understand what the prescribing role is all about. And so at times, there’s a bit of miscommunication or different expectations on what you should or shouldn’t be doing or what you can and cannot prescribe. Mark (nurse prescriber)

Prior to being approved as a nurse practitioner, a collaborative but dependent relationship with doctors was described. Nurse prescribers advocated for continuing such a collaborative relationship. They felt the term, “independent prescribing,” a term that was used through some
international circles, was misleading. Such a term was described as being negatively associated with the thinking that they worked alone and have no need for collaboration and teamwork.

*I never went in thinking I could do this on my own, and I still don’t think like that. I don’t see myself as an independent prescriber. That can be confusing, as no one really is an independent prescriber, in a sense. It’s all team work. I don’t know that anybody should ever consider themselves, an independent prescriber or an independent practitioner.*  
*Jane (nurse prescriber)*

### 7.3 The challenges faced

Most nurse prescribers were positive about their new prescribing role and provided examples of how this had enhanced their day-to-day practice, especially as it applies to their relationship with patients and other members of the health care team. However, they were aware that others were not familiar with the nurse prescribers’ role and so explanation and education was a key challenge for the nurse prescribers.

*Yeah, to be honest I actually don’t know that an awful lot of the families recognise that I’m different from the doctor, you know, we’re all on ward rounds, now it’s not so clear cut. It used to be that doctors were men and nurses were women and at least that way you could kind of guess. I always introduce myself as a nurse practitioner but I’m not sure that they quite understand what it is. And I sometimes take the time to explain what it is. But sometimes it’s just not appropriate you know, we just need to get on and do the job.*  
*Anita (nurse prescriber)*

#### 7.3.1 Responding to challenges from doctors

Despite being positive about other health professionals’ acceptance of their prescribing role, nurse prescribers were concerned that there were “still a number of health professionals who have remained critical of their role in the hospital setting.” For participants, this has been “challenging and difficult”, as such attitudes were “not conducive to good working relationships”. There was some scepticism from doctors who were not working in teams with NPs, specifically directed at nurse prescribing. Doctors who did not know a particular nurse, their background and previous experience, sometimes challenged or criticised them in relation to prescribing.

*It’s mostly the senior people, for example, some consultants or Registrars I find really challenging, because they think they know they’re better than me. These are not the people who work within my team. These are the consultants and registrars of different wards that I have to deal with. It’s an issue when you have more senior people who may not know of my area of expertise.*  
*Amanda (nurse prescriber)*
In contrast, those doctors who were close colleagues of the individual nurse were more confident of the nurses’ prescribing ability. Doctors who worked closely with the nurse prescribers became aware of and accepted their prescribing roles over time.

*Within the department, it’s pretty much, there’s no arguments, no questions about our role, no challenges to the role. Whereas before, it’d be “oh, urgh”. And some doctors were sort of not too sure whether nurse prescribers should take the referral or not. So even that has changed, most of the time.* Mark (nurse prescriber)

The initial scepticism from doctors was evident by their questioning the nurses’ actions and role. Many nurse practitioners found a way to resolve this scepticism through informing doctors about their role and demonstrating their abilities. Chrissie described one approach with new doctors to her team:

*And we’ve just had a new run of Registrars. They needed to be informed of the new policy that works for the treatment of patients with this condition. So I take the opportunity to introduce my role.* Chrissie (nurse prescriber)

However, over time, the majority of nurses felt that doctors became more accepting of the nurse-prescribing role. As doctors became more aware of the boundaries of their prescribing role, they were able to accept the nurse practitioners practice and prescribing decisions.

*Doctors on the wards, because I’m seen as a specialist, are actually fine as well in terms of accepting decisions that I now make. I wouldn’t jump in and prescribe something if I had a house officer sitting next to me. Because part of that education is to say to him “This is how you prescribe medication via a Grasby pump. So you’ve got to be very careful not to just jump in and prescribe it, because you lose an opportunity to educate them.* Jane (nurse prescriber).

*I think I’ve been around this area for so long now. I think I’m known by [doctors] that look after our patients very well by just the communication that I’ve had over the years with them. And I guess they read my letters from clinics and understand what I do and what I know. You have the expertise and many doctors need to see that before they accept you in that level.* Maggie (nurse prescriber)

7.3.2 Educating pharmacists

Nurse practitioners identified pharmacists as another group of professionals who were not familiar with nurses having a prescribing role. Written prescriptions are processed through prescribing systems, which check the prescriber against a database with their prescriber number. This system recognises doctors and midwives as *authorised* prescribers; however, because of the
recent introduction of the role, it did not automatically recognise the nurse prescribers. In addition, pharmacists were not familiar with nurses as designated prescribers as nurses were the first designated prescribers in New Zealand (see Chapter 1, section 1.5). One nurse prescriber explained his frustrations.

*When I first started prescribing, I had a few Pharmacies that would ring up and say “I can’t see your number anywhere”. That was a bit tedious, and again it’s tedious for the patient. I could not introduce myself to all pharmacists because these are pharmacies throughout the country.*  
*Mark (nurse prescriber)*

Every prescriber has a prescribers’ registration number identifying them as an authorised prescriber. Pharmacists were unfamiliar with the prescribing numbers of nurse prescribers as designated prescribers. Initially designated prescriber’s registration numbers were not automatically recorded in the pharmacists’ database and the nurses’ registration numbers had to be entered separately.

*I ended up being talked about on the pharmacist website, on their chat room saying, “do you know who this person is?. And basically, what is she allowed to prescribe?” Why is she allowed to prescribe xalatan when that is a special authority medication?”*  
*Chrissie (nurse prescriber)*

Some nurse prescribers described a predicament where the parameters of their prescribing role were so broad, with a list of almost three thousand medicines available for nurse prescribers, that the pharmacists were unsure of the individual nurse prescribers’ prescriptive authority. Some participants’ narratives described this in some detail, and the strategies they developed to clarify any confusion.

*I’ve had a couple of instances where pharmacists have rung me and asked me for my doctor’s registration number so I’ve had to educate them about nurse practitioner and prescribing. I’ve got a little stamp now... because you have to write designated prescriber’ on each prescription. So I’ve got a little stamp now that I put that on, and I think that makes it a little bit more formal, I guess.*  
*Chrissie (nurse prescriber)*

Pharmacists as a profession were “central to the working environment of new prescribers.” Pharmacists were viewed as professionals who could support, guide and advise nurse prescribers. Introducing oneself to the pharmacists was considered by NP participants as essential. For some nurses, “a letter and a phone call to pharmacy departments were insufficient” and “considered unprofessional,” as these were not adequate or appropriate approaches to establish and nurture good working relationships. Instead, the nurse prescribers thought more formal and effective approaches to introducing the new role were needed. For example, “arranging a meeting with
the director or head of the pharmacy department”, followed by a “discussion session with another pharmacist informing them of my new role”, to “providing a brief outline of what the role entailed” were all advocated from the experience of this early cohort of nurse practitioners who were prescribing.

And we [nursing director and nurse prescriber] worked out a plan as we were coming up to that point to prepare the hospital. Particularly the pharmacists, cause they’re the ones that audit the drug chart regularly, and we have a pharmacist that works with our team, and so she was a good conduit to her department, so she was able to share that information with her colleagues in the department. Jane (nurse prescriber)

7.3.3 Educating other nurses

Not all nurses welcomed the nurse prescribers. However, in general, participants indicated that most nurses welcomed the opportunity of having nurse prescribers working with them in the clinical area. Nurse prescribers could work closely with other nurses and guide them in their practice.

Well, certainly the two nurses that I work with as coordinators think it’s great, because I’m there to help them straightaway if need be. And also they’re learning as well, and also they’re getting advice from a source that they think they can trust. Maggie (nurse prescriber)

Some nurses were also unfamiliar with nurse practitioners’ new prescribing role. Most nurses were under the impression that nurse prescribers could prescribe any medication for any patient, and that their prescribing role was similar to doctors. In every encounter with nurses, nurse prescribers ensured that nurses were informed of their prescribing limitations.

There are occasional times, when some of the other nurse specialists go, “oh, can you come and review this patient for me?” So instead of them going up to a house surgeon or a Registrar for a review, they come to me. Some of the cases were appropriate for my level, but others [cases] would require further interventions from consultants or doctors. So I made sure that I made my limitations clear. Chrissie (nurse prescriber)

In situations where access to doctors was difficult and where doctors were not always available for nurses, nurse prescribers were sometimes seen as more accessible.

There are things like panadol that you need a doctor to prescribe. So I’ll just write it up for them [nurses], they [nurses] find that handy. They just love the easiness, ’cause I’m a lot more accessible, they can call me up. If I come round, I’ll write it up. So, for them [nurses], it’s a really useful thing, makes their practice a lot easier. Anita (nurse prescriber)
7.3.4 Educating patients

Mixed reactions on the part of some patients were referred to, while for others, acceptance of the new role and of nurse prescribing was not an issue. However, not all patients were confident of nurses providing services they viewed as part of “doctoring.” In acute settings, such as Accident and Emergency, patients expected services to be delivered by doctors. Nurse prescribers found that a brief explanation of the new role, assuring patients that they (nurses) were competent and able to look after them (patients) in these situations, usually sufficed.

I had the odd sort of funny look at the clinic when I was seeing patients independently. So you know, I was saying “I’m doing sort of, things that are traditionally doctors’ tasks, and that’s to help with the clinic flow.” I got the odd sort of... odd look, but it wasn’t, it didn’t carry on as an issue.

Anita (nurse prescriber)

Nurse prescribers perceived that patients, in general, were not aware of the nurse practitioners’ role and their right to prescribe. Although the majority of patients were under the care of the participants when they were specialist nurses, prior to their approval as nurse practitioners, they were not well informed of the differences between that nursing role and that of the nurse practitioner. One nurse prescriber described her approach to informing patients.

I gave my patients a piece of paper that says who I am, and my prescriber’s number, and told them that if there was problems with the pharmacist then they can look me up on the website because it tells them that I’m authorized to prescribe. And of course it had my number on my prescription anyway so they could look it up, and where to look it up.

Chrissie (nurse prescriber)

Examples were also given of patients satisfied with the care they received, saying to the nurse “thank you doctor” on their way out of the clinical setting. Reflecting on these experiences, nurse practitioners commented that “the new role will take time to sink in” and patients will continue “…to seek doctors to deliver services” that are now within the domain of nursing. However, in general, patients were accepting of nurses prescribing as the service they received had not been interrupted.

In summary, nurse prescribers identified a number of challenges at the outset while they were embarking on their new role in the clinical setting. However, nurse prescribers were unanimous in their views that organisations needed to improve the way they launched the role of nurse prescribers. Although their individual approaches and efforts were perceived to be successful, the active involvement and acknowledgement of organizations in the promotion of the new role would have been useful as well, as this would have minimised misconceptions that other health
professionals had of their prescribing role. More importantly, improving formal organisational support could provide better communications between nurse prescribers and pharmacy providers.

7.4 Negotiating prescribing boundaries

Nurses, as a new group of non-medical professionals with prescriptive authority, were of the opinion that “there will always be challenges at the outset,” as they were breaking the “invisible structures and boundaries that defined professional roles.” Where formerly doctors were the dominant professional in the health care team, symbolised by having prescribing responsibilities, the nurse practitioners with prescriptive authority challenged this traditional professional demarcation. The nurse prescribers all felt that their performance was constantly being compared to the prescribing abilities of doctors. Being very clear about their limitations and boundaries were strategies to present themselves as safe and competent prescribers.

*Right at the beginning I wrote out a list of the medications that I could prescribe, and I also wrote these down on the website where the pharmacist could look it up, and also my Nursing Council number to see that I was authorized to prescribe and what I was authorised to prescribe.*

*Chrissie (nurse prescriber)*

When interviewed, the nurse prescribers referred to the list of prescriptive medicines that were outlined in the Medicines Regulation (1984). They were all aware that they were allowed to prescribe from an extensive list of medicines outlined in the regulations for designated prescribers (see Chapter 1). However, they argued, although by law they were allowed to prescribe from an extensive list of drugs, in practice their prescribing was limited to those drugs commonly used in their scope of practice.

*There’s no doubt that it’s [prescribing] enhanced my ability to deliver care in a more immediate fashion for clients and the open list [legislated medicines] has been marvellous. I think the scope [scope of practice] should determine what can be prescribed.*

*Amanda (nurse prescriber)*

Nurse prescribers were well informed of the legislation that governs their prescribing practices. By law (Medicines Act, 1981), nurse prescribers are considered Designated Prescribers, as opposed to being Authorised Prescribers (see Chapter 1). However, many of the health professionals that these nurses worked with did not as well understand the difference between designated and authorised prescribing. The nurse practitioners surmised that it was essential that they explained the boundaries of their prescribing scope. Prescribing within the limitations of the boundaries of their scope of practice was considered to be practicing within the legal limitations outlined by law for designated prescribers.
"I have those four years of experience of working within that scope [area of clinical practice] and with medicines. If you don’t have it, you’re not going to be prepared, and you’re going to be unsafe. So I had that knowledge and ten years of primary health care exposure at the front line. I was very lucky to have that experience and I had good colleagues who supported me through that. You’ve just got to be really clear about your personal boundaries, about what your strengths are and about what you will choose to prescribe and not. And if you go outside those prescriptive boundaries that you have chosen within your scope of practice, know that you’re going to practice unsafely, and know that you potentially leave yourself wide open [to risk]. Abby (nurse prescriber)"

However, promoting an understanding of the boundaries of the nurse’s prescribing practice based on their specific scope was questioned by some doctors. Unlike nurses and midwives, doctors were not limited to prescribing within a “scope of practice” (see Glossary of terms for legal definition of scope of practice), as the practice of the entire field of medicine was viewed as the doctors’ scope of practice. Doctors differed in their understanding of the term, in that they saw “scope of practice” related to a specialized clinical area of practice. One doctor reflected on this:

"Nurses are taught right from the beginning to know their scope. Now they don’t necessarily teach GPs or doctors that, so we’re [doctors] thinking that we can prescribe in any scope. So at the beginning, I was not so sure what prescribing ‘within a scope’ meant [for nurses]. Geraldine (mentor)"

Setting the prescribing boundaries was fundamental in the early stages of the nurse prescribers’ practice as they insisted that there were some unclear expectations of the role, and “a lack of understanding amongst nurses and doctors of what their prescribing boundaries entails.”

"But I also have to work within the environment that I’m in and the Consultants, for my own protection, have requested a list. So the list as it stands, involves 10 or 11 medications that they’re comfortable for me to prescribe independently. Everything outside that can either be on medical advice or like in a standing order. Anita (nurse prescriber)"

Participants were obliged to negotiate situations where their prescribing roles overlapped with that of doctors. Although nurses previously managed, coordinated and organized clinical interventions for patients, including drug management, this did not include prescribing except under standing orders. Therefore, nurse prescribers saw the negotiating of the limits of their prescribing boundaries with the doctors they worked with as an important early step. In some situations the decision about where the boundaries were, was left to the discretion of the nurse prescriber."
I work in A&E and I am still gaining more experience in diagnosing other kinds of conditions. I am still learning that and also learning what I need to prescribe. So I work closely with the doctors in our team to make sure I can safely practice in that level. Mark (nurse prescriber)

Mark described a collaborative and interdependent role where his decisions on clinical management were made by either the nurse practitioner or doctors. In these situations, nurse prescribers worked closely with doctors in their area of practice to establish diagnoses and treatment. In other areas, nurses preferred direction from doctors when it came to the drugs to prescribe, as this was thought more suited to their area of practice.

So when I started prescribing, what we talked about with the Clinical Director was that I should only be prescribing for certain steroids for a particular condition. They [consultants] told me to be very wary of prescribing for anything sort of falling outside that range. Chrissie (nurse prescriber)

Participants were also asked to describe approaches they employed to ensure clarity of their professional roles and boundaries. Collaborative management, frequent consultation, and team discussions were viewed as necessary. In some situations, where patients were under the care of consultants, “professional courtesy” was suggested as one approach to ensure consistency in management was maintained.

But now I tend to just make my own decisions to a certain degree, it just depends... it’s just professional courtesy really. Often what I’ll do is, if it’s their [consultant’s] patients, to me professional courtesy means it’s their patient, it’s their final decision. But I usually go along and say “this isn’t working, this is what I think we should actually be doing”. Most of the time, they will agree with me, and say yeah go ahead with the changes, that’s fine”. Chrissie (nurse prescriber)

Safety was a vital consideration to the nurses’ understanding of limitations. Practicing within a scope and knowing their limitations were described as elements of “safe practice.” When there were two potential prescribers for a given patient, both need to clearly delineate their role. Participants were asked to provide examples of activities they performed that were not within their defined scopes. Those who worked in speciality areas referred to situations where they were ideally positioned to give advice and assistance to general practitioners in the treatment and management of patients requiring special care, a role that, while not within their usual scope, was within their expertise.

Well it [scope of practice] is a specialized area...and I can tell you some examples of doctors who ring me and ask me questions about liver transplants. There are a number of them [doctors] now that ask me
7.4.1 Extending the boundaries

All participants reported increasing skill levels as they continued to engage in the “doing of prescribing”. Nurse prescribers discussed how their practice was extending to managing patients that are more complex. For some, dealing with patients with more complex needs was regularly occurring, as they were more available to respond to patients needs when consultants and registrars were unavailable.

Now they [patients] come back to me first. Before, most of them [patients] need to be under a Consultant’s team. But I have patients that flit back to me very regularly now and because I’m available by phone five days a week, we can often monitor their medications by phone. That’s extended my practice really. Chrissie (nurse prescriber)

As they continued to prescribe, their confidence in making clinical decisions grew and in turn, improved their clinical practice.

And this I say to you, that when you’ve got clinical experience and exposure it really helps. I am a lot more confident in the decisions that I have made. My knowledge has increased and so have my skills in making decision. So I believe it is not necessarily a gap in knowledge but a gap in confidence… in making decisions. It’s the confidence to actually do it - that is making decisions. Abby (nurse prescriber)

Participants cited examples of situations to which they would not previously have been exposed, and these new situations challenged the scope the participants defined for themselves when they first embarked on their prescribing journey. One participant called this ‘fluid’.

The scope of practice has definitely changed... a lot more complex cases. It’s [scope] become a lot more fluid than when I first started... and not as defined as when I first started. I guess we’re more confident and competent in what we do, so by virtue of that, we tend to be seeing a lot more cases, but still be in the parameters of cases that should be reasonably straightforward. The extended scope can be broadened the more experienced you are... it’s very fluid...it does change as you become more competent. Mark (nurse prescriber)

In clinical settings where doctors and nurses work closely together, participants suggested that different roles and responsibilities were needed to distinguish the boundary between one profession and the other. When participants were asked to elaborate on this view, even though
the majority agreed that knowing one’s boundaries and limitations is important for safe practice, such demarcation of a defined scope was not always as straightforward as first thought.

“I’d know full well when somebody needs it [a drug], but I just have a rule in my head that I wouldn’t start someone on it [drug], even if I could. In cases like this, I’d rather that they had a consultation first. But there are lots of areas like that where I’d just rather consult and get somebody’s opinion first. Paige (nurse prescriber)

In summary, nurse prescribers were highly cautious of the limits of their prescribing boundaries. Nevertheless, these prescribing boundaries were not all the same; therefore, it was important to set the limits of their prescribing scope. In areas where both doctors and nurses worked together, nurses developed strategies to negotiate prescribing boundaries where appropriate; a skill essential for teamwork and collaboration. By promoting their prescribing role, setting the boundaries of prescribing practice and negotiating prescribing roles with existing prescribers, nurse prescribers were confident that they could safely prescribe. From this “safe” base, through continuing clinical experience, boundaries gradually expanded and the nurse’s prescribing repertoire grew.

7.5 Prescribing in the context of the expanding role

In this section, nurse prescribers describe developing expertise in their prescribing practice. By reflecting on the way their role developed, the nurse prescribers go on to illustrate the benefits they believed they bring to patient care and service delivery. In addition, the reflections of nurses described examples of their practice as nurses, and how they use prescribing as a tool to support autonomous practice. They highlighted examples of how prescribing has enhanced their role as advanced practitioners.

7.5.1 Autonomous practitioners for the patient population

The nurse prescribers in this study had already been engaged in extended roles and prided themselves as being autonomous practitioners in the provision of care for patients (see Chapter 4). However, not having previously had prescriptive authority limited their ability to perform fully in an autonomous role. Looking back, the nurse prescribers saw themselves as “passive participants in decisions related to treatment choices.” With prescriptive authority, nurse prescribers saw themselves as “more actively engaged in the processes of thinking and decision makings”, and this enhanced their autonomous practice.

Being in an autonomous role and being accountable really helped in sharpening my decisions. I think it certainly made a big difference you
Many of the tasks nurses performed on a day-to-day basis as nurse specialists remained the same, in terms of providing holistic patient care, but prescribing was new to them and they found it particularly challenging. At the same time, by being given full responsibility for the care and management of patients, including the decision to discharge and provide complete treatment plans for patients, extended their practice, and allowed them to practice in an autonomous manner:

*I think as a nurse, we’re certainly not used to discharging patients or having to make that decision to discharge people. So that’s quite a big leap in your mentality really. It really is, as the buck totally does stop with you, so that’s something completely new. Mark (nurse prescriber)*

The prescribing role gave nurses a sense of confidence in the way they saw themselves in relation to others. Nurse prescribers felt that they were now equal participants in the healthcare team, and “a more effective team member.” One participant described how her perception of the role changed over time.

*I feel like, because I can now prescribe, I now feel like an equal participant in the back and forth situation. I still ask them [doctors] for help on things [diagnosis], they [doctors] also still ask me for help. But I feel like I can be a little bit more of an equal now. Maggie (nurse prescriber)*

The prescribing role allowed nurses to increase their confidence levels in terms of how they saw themselves as autonomous practitioners. One nurse practitioner illustrated this with her own experience:

...it sounds odd, but when I got endorsed, it really gave me a push... to be clear about what I’m saying, and to be firm about what I’m saying. In the nurse practitioner journey is where there is a sharp point in time where, you know, your attitude does change, and you know when your confidence immediately got a big boost. Paige (nurse prescriber)

### 7.5.2 Nurse prescribing in a context of practicing holistically

Nurses see themselves as autonomous practitioners in providing holistic care to patients (see Chapter 4). Nurses described the difference between services that they and doctors provide for patients that include more frequent visits and holistic approaches to care. Examples of holistic care included dealing with lifestyle and risk-taking behaviour and consequences for health, arguing for psychosocial intervention and not being limited to a medical model approach. As
nurse practitioners with prescribing, the nurses described delivering outreach clinics to ensure continuity of care and providing access to primary care services. One participant described her role.

*I have a group of patients who I see quite often who will often flare up. So over the three years I’ve seen these patients, I know how quickly some of them settle down and how slow some are. So I can tailor their treatment based on that experience as well and the fact that I actually know these patients.* Chrissie (nurse prescriber)

Having that “*depth of knowledge and ability to be able to talk in a way that patients and families understand around their medication and their condition*” helped in gaining patients’ trust and confidence, considered essential to their professional practice.

*Before I became a Nurse Practitioner essentially what I would be doing is I would identify potential changes, and then I would go to a Physician in that clinic and wait for him to finish with another patient and then say “this is happening with the patient, this is what I would like to do, is that okay?” He would say “either yes or no” or we would discuss it and then he would write the prescription. So I would have done the assessments and the consultant sort of ‘rubber stamp’ it in a way. I can provide that care now and I would see patients in Clinics and decide what needs to be done.* Maggie (nurse prescriber)

### 7.5.3 Completing the episode of care

Nurse participants described prescribing as an important “*tool*” to enable them to complete episodes of care of patients. Completing episodes of care was fundamental to the role of the autonomous nurse practitioner.

*But so you know we follow our patients for a long, long time for many, many years and I guess the longest one I’ve been following now is probably about eleven years. And so you actually know that patient very, very well and so you build up that rapport and I think over those years you know they certainly have a lot of confidence in what you’re saying and what you do [prescribing].* Maggie (nurse prescriber)

Establishing a therapeutic relationship based on trust was cited as vital to prescribing for patients. Knowing the patient, their needs and issues were important to the context of prescribing. Working with patients and gaining their confidence were viewed as key to the relationship, where prescribing the drug is only one aspect of the management plan, as one nurse explained:

*And again, that’s about being able to establish a therapeutic relationship with patients and families very quickly, so that the prescribing is one aspect of your management plan, and it consolidates everything.* And
patients feel confident with that. And a lot of our patients in the hospital have been sitting there with quite intractable symptoms. So if somebody comes along who talks with some confidence about, “We can manage this,” And get some results reasonably quickly, you gain their confidence. Mark (nurse practitioner)

Participants described establishing a trusting relationship with patients and providing continuity of care as fundamental to contextualizing prescribing decisions. The majority of nurses had been working in the specific clinical areas for a number of years. Many of the patients presented with chronic conditions and thus provided opportunity for the nurses to get to know their personal circumstances. One nurse practitioner described how he used this knowledge in his prescribing decisions:

So we do spend an awful lot of time on that, and we spend a bit of time actually sort of finding those unique resources that are out in the community, so that you can tailor people’s discharge care better to their needs than just sort of the standard back to your GP type thing. Mark (nurse prescriber)

7.5.4 Improved patient services and care

Being able to “provide holistic care” and “complete episodes of care,” were viewed as “rewarding” and “fulfilling”. One nurse prescriber summed this up:

I love my role actually... I love the patient contact and the fact that I can see a patient from the start of the condition right through, to such a degree that actually allows me to see improvements. Amanda (nurse prescriber)

For participating nurse practitioner prescribers, there have been many advantages in being an autonomous practitioner. Among these benefits, the improvements to patient service delivery were prominent as nurse practitioners are now able to “deliver and complete episodes of care in a more timely fashion.” Participants provided many examples of how the new nurse prescriber role improved patient services. Included were: “timeliness to service” has improved as patients no longer have to wait for doctors to sign prescriptions; “early and appropriate discharge of patients”; an ability to “write a more comprehensive discharge summary referral” as they were better positioned to be fully involved in the patient’s care, and working closely with doctors in all aspects of service delivery including “triaging in a speedy manner.” All these were considered important benefits to health care in terms of cost and patient outcomes.

It’s not in isolation to the overall, the holistic role of being a Nurse Practitioner I really do see it [prescribing] as a tool, it actually enables or enhances my nursing skills. So it’s something that I may choose to use
and it’s something that I may choose not to use during the consultation process. It depends on what the client presents with. Di (nurse prescriber)

7.5.5 Enhanced professional and organisational leadership role

Nurse prescribers were also of the view that their role opened up opportunities for teaching and education of other nurses and junior doctors. Participants cited examples of mentoring other nurses who were working toward the nurse practitioner role. They considered that other nurses intending to become nurse practitioners must be prepared to learn, develop, and extend their knowledge and skills in differential diagnosis and therapeutic reasoning:

There’s talk about doing a nurse specialist role to try and train more nurses into this advanced role, but the conditions that fall into my role are disease based, so that whoever [nurses] goes into this role must understand those diseases and those medications, and why you’re giving it, and how they work, and all the interactions. So they must be prepared to learn. Di (nurse prescriber)

Nurse prescribers gave examples of where they had worked closely with nurses who were already actively engaged in extended roles. The aim of working with these nurses was not only directed towards improving and extending the nurses’ specialist knowledge and skills, but also to help improve their skills in discussing and debating plans of treatment and management.

We have a paper round every morning in our team, and that’s actually an opportunity to present patients and you present your management plan. All the nurses in our team do that, and I encourage the nurses to. To be able to present a patient, be able to outline their management plan and this comes up for an open discussion, which includes the registrar, pharmacists and SMOs [senior doctors] and the whole lot. So that happens every morning for all the patients. So that is a forum by which you can talk about your management plan. Maggie (nurse prescriber)

The nurses described a different relationship with junior doctors, where the majority recognized how they were positioned in terms of education and mentorship of junior doctors.

Well yeah, I mean, you do pretty much…, teaching junior doctors. It is really part of your role as Nurse practitioner…you do on a day-to-day basis, procedural wise I’m teaching on their education programme in March. Anita (nurse prescriber)

Having experienced mentorship from doctors and understanding the differences in thinking through diagnosis and treatment, the majority of nurse prescribers preferred an analytical approach to teaching junior doctors. As one participant explained:
I'm the expert in the area [specialty], and the house staff are trained on a huge number of specialties and this [specialty] is my forte. So, it's the cooperation really, it's a matter of respect... it's a social skill really. I don't just say to them, “this is what I want you to do. You do it.” So it's a matter of cooperation and getting them on board, and sort of allowing them [junior doctors] to be involved in the decisions... allowing or involving them to say things to the benefit of the patient. Di (nurse prescriber)

Nurses also reflected on the importance of the knowledge and skills they have acquired as practitioners and how this can appropriately guide their teaching role:

I think what’s really important is that nurses that are giving prescribing advice have a depth of knowledge, so that you’re not there just telling the RMOs to prescribe something. That you can actually provide the rationale and you have that depth of knowledge to be able to talk about various pathways and why you would use one drug over another, the different actions and why you’re stopping one drug and starting another.

Anita (nurse prescriber)

7.6 Conclusions

The experiences and perspectives of nurse practitioners who have embarked on a prescribing role are the focus of this chapter. These nurse prescribers described working with others who at first did not understand their prescribing role, and within organisations not fully prepared for them. The skills of an expert ‘negotiator’ were evident in the approaches that were utilised by nurses in promoting the new role and in negotiating boundaries of prescribing practice.

This study has highlighted that while nurses face many similar challenges to doctors when beginning to prescribe (see Chapter 5 and 6), as pioneers in a newly introduced role they simultaneously needed to address a range of additional issues that compounded the process. The first nurse prescribers thus needed to address and overcome a widespread lack of information about their prescribing role, about their being ‘designated’ prescribers (as opposed to authorised prescribers), and being challenged by some in the health care team and general criticisms that they were approved to prescribe. At the same time, the NPs took it upon themselves to clearly define and articulate the limits of the boundaries of their prescribing role, to communicate this to medical and nursing colleagues, and to respect medical colleagues in relation to the boundaries as a matter of “professional courtesy.” The NP participants also explained how, over time, the boundaries expanded and became fluid, and the scope of their practice expanded.

Although many of their roles and responsibilities remained as they were prior to their being approved as nurse practitioners, being able to prescribe enhanced their autonomy as advanced
practitioners and gave the ability to complete episodes of care to the benefit of their patients. Time and experience have consolidated the nurse prescribers’ practice, so much so that they were able to describe expanding their scope of practice in innovative ways. As nurse prescribers grow in confidence and gain the support of colleagues, they have the ability to not only safely prescribe, but as competent practitioners they are able to provide comprehensive health care to their patient populations. Numerous benefits were cited by nurse practitioners including the added benefits to efficient and timely provision of services and care, as in most cases, patients no longer have to see multiple health care providers. Nurse practitioners as prescribers are now able to provide complete care for patients including treatment provisions. General practitioners and resident medical officers have also benefitted with having nurse practitioners working in specialised areas. Faster access to information and guidance can be provided by nurse practitioners when consultants are not always available. In addition, other nurses have also benefitted from having nurse practitioners. Having nurse practitioner prescribers has improved nurses access to medicines and drug therapy when doctors and consultants are unavailable to provide prescribing advice and support.
CHAPTER 8: DISCUSSION

8.1 Introduction

Likic and Maxwell (2009) describe prescribing as an activity that follows the processes of clinical reasoning which includes thinking, judgment and the ability to apply clinical reasoning to a complex practical task (see Chapter 2.4). The findings from this study show three core knowledge domains provide the foundation upon which prescribers operate and these inform the prescriber’s clinical reasoning. The three knowledge domains are: (1) theoretical knowledge, involving pharmacology (pharmacology and therapeutics) that is discussed in Chapter 4; (2) the clinical knowledge (the integration of knowledge to practice), described in Chapter 5; and (3) the practical knowledge of prescribing, involving clinical reasoning, in Chapter 6. Chapter 7 describes nurse practitioners as new prescribers and how these knowledge domains were developed alongside other issues they faced. This chapter discusses the findings and highlights how clinical reasoning is the core of safe prescribing practice, and applies equally to all prescriber groups, medical and non-medical.

Chapter 8 is presented in five sections. The first section discusses the three knowledge domains that inform the clinical reasoning process of prescribers. These are theoretical, clinical, and practical knowledge. Secondly, how nurses and doctors utilise these domains and their clinical reasoning process are compared to highlight the differences and similarities. The third section further discusses the differences and the similarities in how nurses and doctors acquire skills in clinical reasoning and finally, the fourth section presents the characteristics of the nurse prescriber as emergent prescribers, a characteristic that distinguishes nurses from doctors as beginner prescribers. The final section focuses on the nurse prescriber and their journey in learning to prescribe and as prescribers. The aim is to provide a more detailed comparison of the development of the nurse as learner prescriber and the transformation of skills that occur as they continue to embark on their journey as prescribers.

The focus of this study was on the experiences of nurses learning to prescribe, and as beginner prescribers. However, as nurses are new to prescribing, the views, and experiences of doctors and midwives as learners and as established prescribers were included to provide a deeper appreciation of the complexities and the challenges faced by health professionals in learning skills of clinical reasoning in prescribing.
8.2 Knowledge for clinical reasoning

The narratives of the participants from all groups described how the three domains of knowledge (theoretical, clinical, and practical knowledge) were essential for learning to prescribe and how together these knowledge domains form the foundation of clinical reasoning. Although nurses and doctors were different in their learning experiences and background, both agreed that the application of theoretical knowledge (pharmacology and therapeutics) needed to link to clinical practice. This notion is supported by de Vries (1993) who explains that basic pharmacology and therapeutics provide essential knowledge when learning to prescribe. He suggested that basic pharmacology, applied pharmacology, and therapeutics provided the background knowledge to understand how drugs work to produce both therapeutic and adverse effects. Numerous studies (de Vries, 1993; Gwee, 2009; Heaton, et al., 2008; Maxwell & Walley, 2003; Richir, et al., 2008), and the present study, have shown that integration and linking of theoretical knowledge and clinical knowledge are enhanced when clinical practice and experience are included in the learning processes. The inter-connectedness of these two forms of knowledge as reflected by the participants’ narratives are shown diagrammatically in Figure 2, which shows that theoretical knowledge is embedded and is integral to developing clinical knowledge. Braunwald (2005) describes pharmacology as uniquely positioned among the biomedical sciences. Theoretical knowledge draws on both the biomedical and social sciences and significant integration of basic and applied knowledge of both is needed.

![Figure 2: Relationship between theoretical and clinical knowledge](image)
The third domain of knowledge that is proposed from the participants’ narratives is practical knowledge. Practical or experiential knowledge is purported as the “knowing how” to perform the prescribing skills in a real setting, which is different from theoretical knowledge, or that learned in the classroom setting (Jensen, Resnik, & Haddad, 2008). Participants in the present study described this knowledge as, the ‘doing’ of prescribing: knowledge that can only be acquired with clinical experience. This demonstrates the importance of teaching pharmacology principles alongside clinical experience.

Practical knowledge was viewed as vital to developing the thinking processes of clinical reasoning. Clinical experience provided an opportunity to develop confidence and proficiency in the development of clinical reasoning skills in diagnosis and prescribing. Figure 3 shows the relationship between the three domains of knowledge and how theoretical knowledge and clinical knowledge are embedded within practical knowledge. There is inter-relatedness between all the three knowledge domains as they form the foundation of the clinical reasoning skills needed for safe prescribing.

Figure 3: Relationship between the three knowledge domains

Studies of twenty years ago (H. P. Boshuizen & Schmidt, 1992; Schmidt, et al., 1990) suggested that the complexities and the challenges presented in every prescribing encounter demanded not just the use and application of biomedical and pharmacology knowledge, but also diagnostic
skills, communication skills, and an appreciation of risk and uncertainty. Learning to prescribe has long been recognised as being associated with learning the skills of clinical reasoning.

The challenges of prescribing continue today. Higgs et al. (2008) asserts, that clinical reasoning is complicated as multiple variables exist and every patient encounter is unique and individual. The present study supports this view, as the findings illustrate that every prescribing encounter needs to be seen as particular to the patient. While Higgs et al. (2008) describes prescribing as “context-specific” and includes the broader climate in which the prescribing decisions occurred, the present study revealed that the integration and application of knowledge to the patient situation can present challenges, especially to beginner prescribers. The complexities of clinical reasoning as this relates to prescribing, lie in the very nature of the task faced by learner, beginner and experienced prescribers alike. The journey of nurses as learner prescribers is therefore similar to other health professionals in that they all benefitted from experience and that they all value the contribution of the three domains of knowledge (theoretical, clinical and practical) in shaping their clinical reasoning abilities in prescribing. Therefore, the findings support that clinical reasoning is the overall embracing framework for prescribers both in learning to prescribe and when prescribing. This is illustrated in Figure 4. Clinical reasoning provides the framework for the prescribers thinking and approach to consider prescribing options, but it is dependent on the use of the knowledge domains shown within the outer circle.

![Figure 4: Clinical reasoning and the knowledge domains](image-url)
The notion that clinical reasoning is the basis for prescribing is supported by literature. Both diagnostic and therapeutic reasoning are described as key components of the processes of clinical reasoning (Richir, et al., 2008). Higgs and Jones (2008) explain that making sound clinical decisions requires more than scientific knowledge and that clinical reasoning is the ‘core of practice’; it involves the metaskills of critical conversations, knowledge generation, practice authenticity and reflexivity.

However, in the present study, reflecting differences in their clinical experience and theoretical preparation, the journeys of the nurses, doctors and midwives were not the same when they first learnt to prescribe. Figure 5 illustrates the differences in the beginning journeys of nurses, doctors, and midwives. Nurses and nurse midwives were different to doctors and midwives, in that they were learner prescribers with extensive clinical experience, unlike doctors and midwives who lacked clinical experience when first exposed to prescribing.

![Figure 5: Differences in learner prescribers’ journeys](image)

In the section that follows the differences and the similarities between nurses and doctors in how they acquired and developed clinical reasoning skills in diagnosis and prescribing are discussed.

### 8.3 Learning clinical reasoning - differences between nurses and doctors

Several definitions of clinical reasoning in nursing were presented in Chapter 2, indicating overlaps between clinical reasoning, critical thinking and reflective judgement, with the terms
often used interchangeably. From a medical model that uses the scientific or rational model of decision making, diagnostic reasoning, together with therapeutic reasoning, are important components of clinical reasoning (Richir, et al., 2008). Diagnostic reasoning is the process of reasoning employed by doctors to solve diagnostic problems (Schwartz & Elstein, 2008) and biomedical knowledge is seen to play an important role in doctors reasoning processes (Rikers, et al., 2005). Unlike diagnostic reasoning, which has been investigated extensively in the medical literature, very little is known about therapeutic reasoning or the step in the clinical reasoning that pertains to the choice of therapy (Norman, 2005).

The doctors in this study, from the perspectives of junior doctors new to prescribing, to senior consultants reflecting back on years of experience, described how they learnt to prescribe, and this is presented diagrammatically in Figure 6. The doctors’ in this study described a hypothetico-deductive approach to clinical reasoning skills that started with diagnosis and treatment of familiar or common conditions. Eventually this experience extended to increasingly complex conditions or cases, until finally, over time and with clinical experience, mentorship, ongoing education and clinical support the doctor could apply their clinical reasoning skills to a wide range of conditions.

The participant doctors described how they had been taught differential diagnosis using the analogy of the “sieve”, which allows them to include and exclude potential disease conditions, then narrow it down (differential diagnosis), to conclude with a final diagnosis. For doctors, the decision-making tasks for prescribing rely primarily on the basis that a diagnosis of a condition is made. Doctors have been educated to perform the function of a “diagnostician.” The clinical reasoning processes for doctors reflect a broad range of diagnostic possibilities, but are not limited to the range of common conditions. Participants used the analogy of ‘hooves’ to show how they were trained to look for likely conditions on common diagnoses (illustrated as horses ‘hooves’) before going to less common cases of symptoms (e.g. zebras ‘hooves’). The doctors views are support by Schwarts and Elstein (2008) who explain that doctors are educated to solve a
clinical diagnostic problem. These authors purport that for doctors this means recognising a malfunction and then setting about tracing or identifying its causes. Doctors, therefore, approach a clinical situation with the intention of concluding with a diagnosis, using an analytical process of decision-making, reflecting the hypothetico-deductive model.

In comparison, the place of diagnostic and therapeutic reasoning for nurse prescribers feature in many studies (C. Bradley, 1991; E Bradley, et al., 2007; Carey & Courtenay, 2009; Couternay, et al., 2009; Creedon, et al., 2009; Luker, Hogg, et al., 1998). As nurses learning clinical reasoning in diagnosis and prescribing are the focus of this research, the journeys of doctors provide a reference point to better understand how nurses are different or similar. In the present study, while doctors rely on the hypothetico-deductive model, the nurses drew on their previous clinical experience, and intuition. Clinical reasoning is thought to represent the essence of nursing practice as it is fundamental to all aspects of care provision (M. E. Fonteyn & Ritter, 2008). This study clarifies that nurses’ clinical reasoning in relation to prescribing is aimed at decisions that assist in carrying out overall treatment plans and care for patients: and their clinical reasoning goes beyond the prescribing and management of medications. The nurses in this study acknowledged that while they had clinical experience in some areas of medication management, their knowledge and skills for prescribing and diagnosis were inadequate or still developing. This study supports literature that argues that unlike doctors, nurse’s clinical reasoning is not aimed at diagnosis and hypothesis generation (M. Fonteyn & Grobe, 1993). The nurses in this study saw themselves as holistic practitioners, in contrast to doctors who viewed themselves primarily as diagnosticians.

The nurses in this study also described developing skills similar to those of the doctors, especially with common conditions often seen in their area of practice, which they termed “crossing over” to the medical model (Chapter 4.6.2). The nurses noted they needed to improve their diagnostic and biomedical knowledge and they were often uncertain about issues related to diagnosis, and diagnostic testing. They welcomed the opportunity to learn how doctors reasoned and communicated their clinical reasoning. There have been some studies indicating that improving nurses’ knowledge in applied pharmacology and therapeutics is essential to ensure that nurses have the capability to take on the task of prescribing (Banning, 2004; E Bradley, et al., 2007; Bullock & Manias, 2002). In addition, a more recent study by Dowding and Rafferty (2009) show that nurses are not taught to diagnose diseases using the hypothetico-deductive approach. A report from the International Council of Nurses on Advanced Nursing Practice supports this, stating that “diagnosing some common diseases and prescribing are some of skills considered a
cross-over to the medical model that advanced nurses are involved in when performing extended roles” (Schober & Affara, 2006, p. 30).

The findings from this study suggest that nurses also drew on their intuitive judgement, which seems to link with literature acknowledging that familiarity of certain conditions results in a more ‘heuristic’ or intuition based approach (Benner, et al., 2008; M. Fonteyn & Grobe, 1993). Heuristics are “mental rules of thumb” that assist in reasoning and are acquired over time through multiple experiences with similar patient cases (M. E. Fonteyn & Ritter, 2008; Thompson & Dowding, 2009). Therefore, over time, the nurses in this study may have learnt many aspects of diagnosis and treatment related to their area of practice, which they described as “serendipitous learning.” Figure 7 illustrates, in comparison with doctors, the extent of nurses’ knowledge of diagnostic possibilities when nurses begin to prescribe. The findings showed that nurses with extensive clinical experience have a “corner of diagnostic possibilities” of common conditions. However, over time and with clinical experience, the nurses’ confidence and ability in diagnosis strengthened and their repertoire of diagnostic possibilities increased to include conditions, which may be uncommon to their area of practice, as shown in the broken lines.

**Figure 7: Illness categorisation applied to nurses**

For junior doctors in this study, clinical experience and mentorship were found to be vital to the development of clinical reasoning and the integration and application of clinical pharmacology in prescribing. Figure 8 illustrates the process doctors reflected in doctor’s narratives in developing the three knowledge domains.
Doctors described the process of being grounded in developing the three knowledge domains as developing over time, but at the same time as cyclical, with the continued incremental utilization of the different knowledge domains. Junior doctors viewed developing their skills in diagnosing and prescribing as precursors for clinical reasoning, which are dependent on clinical experience and mentorship, and this mentorship, was provided by consultants, other doctors, senior nurses, and pharmacists. Boshuizen and Schmidt (1992) suggest that formal mentorship can improve the junior doctors’ clinical reasoning skills. The findings of this study suggest that over time, with increasing clinical exposure and practice, both diagnostic and therapeutic skills expand and progress for doctors.

In comparison, the beginner nurse prescribers in this study were similar to junior doctors in that therapeutic and diagnostic reasoning improved with mentorship. Unlike doctors, the nurse prescribers described beginning with clinical and practical knowledge, but had more limited theoretical knowledge. For nurses, learning pharmacology as part of advancing their theoretical knowledge can be described as both retrospective and prospective. This is illustrated in Figure 9. In addition, theoretical knowledge improved and enhanced skills in medication management.

Figure 8: Developing theoretical, clinical and practical knowledge application: doctors’ account
while the nurses were learning to prescribe. While the doctors’ process of developing knowledge was incremental and also cyclical, the nurses’ processes was very dynamic, starting with their existing practical knowledge and moving both forwards and backwards between theoretical and clinical knowledge in a dynamic and iterative manner.

The diagnostic component of the nurses’ clinical knowledge was viewed by participants as an ongoing limitation to prescribing practice. The need for further diagnostic skill remained a key concern as an ongoing educational need for nurses from learners through to experienced nurse prescribers. However, this is not unique to nurses, and it is interesting to note that studies that have indicated ongoing learning in diagnostic knowledge is also essential for beginner doctor prescribers (Baird, 2001; Barber, et al., 2006; Schwartz & Elstein, 2008).

![Diagram: Developing theoretical, clinical, and practical knowledge: nurses’ accounts](image)

**Figure 9: Developing theoretical, clinical, and practical knowledge: nurses’ accounts**

In summary, there are some differences and similarities in the development of clinical reasoning for both doctors and nurse prescribers related to theoretical, clinical, and practical knowledge acquisition. Doctors begin with more diagnostic knowledge that is confirmed with clinical experience, while the nurses begin with more clinical experience but considered themselves lacking in diagnostic skills. However, doctors and nurses were similar, in that over time and with clinical experience, their knowledge and skills in clinical reasoning grew and developed.
8.4 From novice to expert as prescribers

While the section above focuses on the knowledge to prescribe, the following discussion will focus on prescribing skill development. The findings in Chapter 4 show that learning to prescribe is akin to learning the processes of reasoning where core knowledge, skills and attitudes shape the learners knowledge foundation in clinical reasoning. However, there is also a skill development aspect to clinical reasoning. Clinical reasoning is a critical skill and is central to professional autonomy as it enables practitioners to take the best judged action in a specific context (Higgs & Jones, 2008). Higgs and Jones (2008) argue that in the real world of clinical decision making, problems are often ill-structured, ambiguous and uncertain and that decisions contain elements of time pressure, personal stress and highly significant outcomes. Therefore, the complexities inherent in clinical reasoning make it challenging to learn.

The Dreyfus Model describes the development of skills in professionals using the terms novice and expert (H. L Dreyfus, et al., 1986). Novice and experts are considered fundamentally different as they perceive and react to the world in different ways, yet this can change when moving from being a novice towards being an expert. The Dreyfus model is a situational model where a person is neither expert nor novice at all things; rather they are at one of these stages within a particular context (H. L Dreyfus, et al., 1986). The present study shows that nurses begin their journeys as experts in their clinical practice performing advanced roles, but they are novices with respect to prescribing, as this is a new skill. Although the purpose of this study was not intended to describe the skills that characterize the prescribing novice and the expert continuum, many of the participants’ narratives shared a common view that prescribing skills develop and progress over time in conjunction with clinical experience. Chapter 5 describes the characteristics and practices of beginner or novice prescribers and compares them with those who have more experience in prescribing, and who may be thought of as expert (the mentors). The participants’ narratives constructed a way of understanding how novice prescribers may differ, in terms of the strategies and the approaches they use. What was similar between the nurses, doctors, and midwives was that skill and knowledge acquisition progresses when the novice is supported, guided, and mentored through their learning experience. This study has shown further that there are certain characteristics that differentiate the novice prescriber from those who are more experienced. The data from across all groups referred to certain characteristics and attributes that describe the novice prescriber from those who are considered to be more experienced. This is shown in Table 8 (Chapter 5.4.2) where the characteristics and the attributes were described and compared.
8.4.1 Linear versus cyclical thinking

This study highlighted the differences in the clinical reasoning skills of the beginner and experienced prescribers. Beginner prescribers are more linear in their thinking compared to experienced prescribers, where a cyclical process of analysis is utilised. All mentor participants described linear thought processes as beginning with presenting symptoms, providing a diagnosis and ending with treatment. Beginner prescribers did not seem to have the ability to perceive situations as a whole, unlike those who are more experienced. Benner (1984) suggests that performance for any health professional may be limited to a novice level if the goals and tools of patient care are unfamiliar or new, which describes the situation for beginner prescribers. Beginner prescribers use strategies to support their clinical reasoning including deferring difficult and challenging decisions to other more senior professionals because they are still developing knowledge and skills in some areas of prescribing such as risk-benefit considerations and taking calculated risks. In contrast, the findings illustrated that experienced prescribers consider multiple factors when prescribing. For example, experienced prescribers may consider past history and/or family context and are not limited to the situation that they are presented with. For experienced prescribers the cyclical thought process presents a way of thinking and reasoning that takes into consideration the context of that situation, where re-assessment and re-evaluation of decisions are thereafter applied. The cyclical thought process of experienced prescribers reflect the description of expert skills in the Dreyfus model of skills acquisition (H. L. Dreyfus & Dreyfus, 1996; H. L Dreyfus, et al., 1986). The authors described expert performers as “intuitive and deliberate rationality and where intuition is not developed, reasoning is applied” (2008, p. 125). Much of the experts’ performance is deliberate and they often bring more and better organised knowledge to bear on the situation (H. P. Boshuizen & Schmidt, 1992).

In this study, the difference between the clinical reasoning ability of the beginner prescriber is compared to those with more experience in prescribing by participants across all groups. This is illustrated diagrammatically in Figure 10 below, where the thought patterns of the beginner prescriber reflect a linear process, where they base their treatment decisions on the disease. In comparison, the findings show that experienced prescribers do more than make a diagnosis; they engage in the process of reasoning and decision making that includes the patient and the context. One area of skill that was reflected amongst the experienced prescriber pertains to their ability to take calculated risks. Beginner prescribers are described as risk-averse, and this is further described below (8.4.2).
8.4.2 Risk-aversion in beginner prescribers

The differences between beginner and prescribers that are more experienced are also highlighted in their risk assessment, risk-benefit decisions, and risk-aversion behaviour. Risk assessment is described as fundamental to making risk-benefit decisions (McCaughan, et al., 2005). Participants described risk assessment as a process whereby clinicians balanced calculated risks against a perceived benefit. The majority of mentors indicated that when deciding potential diagnosis and deliberating on the choices of treatment, risk assessment was an important skill. The mentors proposed that risk assessment therefore is a clinical reasoning skill of an expert clinician.

This study reveals that beginner prescribers are limited in skills related to cue recognition and they are risk-averse, whereas experienced prescribers are prepared to take calculated risks. However, this study has found that beginner junior doctor prescribers were less risk averse compared to beginner nurse prescribers, and beginner nurse prescribers were more likely to prescribe less than beginner junior doctor prescribers.

Cue recognition is dependent on clinical assessment skills. This study found that the need to improve and extend knowledge and skills in clinical assessment and drug management is a fundamental skill for beginner prescribers. Strong assessment skills allow for immediate processing of cues provided by patients and focusing on the important critical cues that are vital to a specific situation (Gwee, 2009). Being able to identify relevant information and to distinguish it from less relevant information is described as a key skill in decision making (Thompson, et al.,

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**Figure 10: Linear versus cyclical clinical reasoning process**

<table>
<thead>
<tr>
<th>BEGINNER</th>
<th>EXPERIENCED</th>
</tr>
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<tbody>
<tr>
<td><strong>Analytical - Linear</strong></td>
<td><strong>Analytical - Cyclical</strong></td>
</tr>
<tr>
<td>Presenting symptoms</td>
<td>Assess presenting sx</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Provide tentative diagnosis</td>
</tr>
<tr>
<td>Treatment</td>
<td>Review and re-evaluate</td>
</tr>
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The mentors in this study observed the different ways nurses sought information that influenced their decision-making. The nurse learner prescribers often used other doctors to find information about effectiveness of treatment, choices of treatment and disease processes. Mentors believed their lack of knowledge in these areas would limit nurses’ abilities in identifying important cues.

Beginner prescribers used a range of strategies to support their practice and manage possible knowledge deficits. Table 8 (see Chapter 5.4.2) shows that beginner prescribers tend to prescribe from a list of medicines that they are familiar with and are generally reluctant to prescribe drugs outside that list or those drugs with high risks profiles. Instead, experienced prescribers prescribe both new and unfamiliar drugs, after considering all factors. These characteristics were noted in both beginner nurses and doctor prescribers and this finding is unique to this study, as previous studies about risk taking prescribing behaviour comparing different professional groups were not found. In addition, the characteristics and the practices of beginner prescribers and the strategies that they often used in clinical reasoning were similar across all groups (nurses, doctors, and midwives).

8.5 Nurse practitioners as ‘emergent prescribers’

To be approved as a nurse prescriber in New Zealand, the nurse must also be approved as a Nurse Practitioner. As experienced nurses with prescribing rights for between one to two years, the NP participants in the study were no longer novices, nor yet experts. Mentors indicated the difference by referring to them as ‘emergent prescribers’. Emergent prescribers, as described in this study, have certain characteristics and patterns of recognition that distinguished them from medical beginner prescribers. These characteristics were described in the mentors’ narratives when they were asked to reflect on the knowledge and skills of their mentee. These characteristics are summarized in Table 10. The findings of this study indicate that the majority of mentors were satisfied that nurse learner prescribers have some of the necessary skills to move into prescribing.

<table>
<thead>
<tr>
<th>Table 10: Characteristics of an experienced nurse – the emergent prescriber</th>
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<tbody>
<tr>
<td>Good knowledge of the patients’ situation</td>
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<tr>
<td>Know their patients well</td>
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<tr>
<td>Familiar with the use of guidelines and protocols</td>
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<tr>
<td>Know and understands their limitations</td>
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<tr>
<td>Know how to work within those limitations and capabilities</td>
</tr>
<tr>
<td>Select cases they can manage within their bounds of practice</td>
</tr>
<tr>
<td>Good working relationships with doctors in their team</td>
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As clinicians, these emergent prescribers were described by mentors as using their previous experience to create patterns of events that allowed them to remember cases encountered in the past. This was viewed as an advantage for nurses compared to junior doctors, as these patterns became images and patterns of thinking that were applied to guide their analysis of a new case. Prescribers are known to use patterns in learning diagnosis and prescribing (M. E. Fonteyn & Ritter, 2008; Groen & Patel, 1985). Groen and Patel (1985) described pattern recognition as expert reasoning in familiar situations, explaining that experienced clinicians have a better sense of clinical realities and the likely diagnostic possibilities and as a result they can more effectively generate an early set of plausible hypotheses and avoid fruitless pursuit of unlikely diagnoses.

In this study, the nurses as emergent prescribers started with strong practical knowledge from their previous clinical experience and added theoretical and clinical knowledge to this as the basis of their prescribing. The combination of knowledge and skills working together in practice is described in the literature as encapsulation, and because it draws from an existing knowledge base and experience cannot be often observed in novices (L. J. Smith, 2005; Woods, 2007). However, the nurses in this study, as emergent prescribers, demonstrated beginning encapsulation but needed ongoing support to further develop the skill. Encapsulation is important for the development of clinical reasoning skills (M. Smith, et al., 2008), and the ongoing development of such skills are seen as life-long (Aronson, et al., 2006). This study found that emergent prescribers require mentorship to continue their ongoing education and knowledge of diagnostic possibilities.

A finding from this study that has not been reflected in the literature is that pattern recognition of diagnostic possibilities already exists in novice nurse prescribers. The mentor described this as a “clinical corner” of diagnostic and prescribing possibilities, and was viewed positively (Chapter 4.6.2). Practising in a broad and extensive area of practice was not viewed by mentors as appropriate for any beginner prescribers, including doctors and midwives, unless the practitioner had the level of knowledge and understanding of that broad scope. For example, a scope of practice such as aged care or primary care is likely to require more extensive knowledge of diagnostic and prescribing possibilities. While having a specific “clinical corner” was seen as an advantage to emergent prescribers, where a limited number of drugs are available to prescribe, there was concern from mentors and other more experienced doctor prescribers that this could
also be restrictive. Restrictions could result when the nurses begin to prescribe within an extended scope.

In a clinical setting where conditions of uncertainty are the norm, mentors from this study felt that emergent nurse prescribers who lacked clinical knowledge and the skills of diagnostics would not advance in their practice. They expressed concern that emergent prescribers without pattern recognition skills would continue to be dependent on doctors to make decisions related to the patients’ diagnosis (and some examples were cited), a practice they viewed as not autonomous, not suited for nurse prescribing in the future. Higgs and Jones (2008) advise that the development of clinical reasoning is a critical component and should be viewed as a continuum with multiple dimensions, thus is a skill that develops over time.

8.6 Nurse prescribers into the future

For reasons such as rising demands for specialized health services, increasing need for delivery of services for patients with chronic conditions, and shortages of doctors in rural settings, nurses are taking on extended and expanded roles to address the growing demands and changes in health care services and delivery (Ministry of Health, 2000b). The nurses in this study were clinical nurse specialists learning to prescribe in order to meet those demands and better service patient populations, and their narratives convey the situation of advancing practice and the early days of nurse prescribing in New Zealand.

Both nurse learner prescribers and their mentors described features and qualities of the advancing role of nurses that recognise the differences in the broad context in which practice occurs. The mentors in this study endorsed the place of nurse prescribing with the associated greater responsibility, accountability, and autonomy. However, the task of prescribing has been the domain of the medical profession and some studies continue to indicate that the development of nurse prescribing represents an incursion on doctors’ jurisdiction over prescribing (Kroezen, van Dijk, Groenewegen, & Francke, 2011). In the present study, the strategies of negotiating boundaries of practise and ensuring positive and courteous working relationships with doctors were illuminated, to show how nurse prescribing is initiated in situations where two prescribers from different professions (medical and non-medical) can and do work collaboratively to improve patient outcomes.

The journeys of nurses as learner and as prescriber are illustrated in Table 11 below. The four key stages of the nurses’ skill development in learning to prescribe and as prescribers are defined. They began as ‘expert clinicians’ who then reverted back to ‘novice’ as learner prescribers in
prescribing, before becoming emergent then experienced prescribers. These stages are broken down to provide further details in Boxes 1 to 4. Box 1 summarises the expert as advanced nurse clinicians, identifying the characteristics and the existing skills of these nurses. Box 2 identifies the key learning for the learner to beginner prescribers. Box 3 lists the beginning prescribers’ characteristics and new skills, while Box 4 identifies the nurse practitioner with prescribing as the nurses revert to expert again performing advanced role as nurse practitioner prescribers over a length of time. The lower boxes link the nurses’ features to the theoretical, clinical, and practical knowledge domains discussed in section 8.2. This journey completes the development of the nurses’ skills in clinical reasoning in diagnosis and prescribing.
<table>
<thead>
<tr>
<th>Box 1: Expert as Advanced Clinician Characteristics:</th>
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<tbody>
<tr>
<td>• Scope of practice</td>
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<tr>
<td>• Autonomous practitioners</td>
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<tr>
<td>• Providing holistic care</td>
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<tr>
<td>• Working in collaborative relationship</td>
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<td>• Providing episodes of care</td>
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<td>• Provide services in health care</td>
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<td>• Performing extended roles</td>
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<tr>
<th>Box 2: Learner – Beginner prescriber</th>
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<tr>
<td><strong>Learning to prescribe:</strong></td>
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<tr>
<td>• Postgraduate pharmacology education</td>
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<td>• Mentorship with mentor prescribers</td>
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<td>• Clinical experience in prescribing</td>
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<td>• Informal clinical support</td>
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<th>Box 3: Beginner Prescriber</th>
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<td><strong>New Skills:</strong></td>
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<tr>
<td>• Beginner practitioner/Prescriber</td>
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<tr>
<td>• Launching the role</td>
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<tr>
<td>• Negotiating prescribing boundaries</td>
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<tr>
<td>• Negotiating with doctors</td>
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<tr>
<td>• Negotiating with nurses</td>
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<tr>
<td>• Clinical education for others</td>
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<th>Box 4: Nurse practitioner With prescribing</th>
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<tr>
<td><strong>Extended scope of practice which now includes prescribing</strong></td>
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<tr>
<td><strong>Autonomous holistic practitioners</strong></td>
</tr>
<tr>
<td><strong>Continue to negotiate boundaries of prescribing practice</strong></td>
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<tr>
<td><strong>Shares prescribing decisions with doctors in the same team</strong></td>
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<tr>
<td><strong>Continue to take on more extended roles branching out into communities</strong></td>
</tr>
<tr>
<td><strong>Effective member of the health care team</strong></td>
</tr>
<tr>
<td><strong>Performing discharges</strong></td>
</tr>
<tr>
<td><strong>Continue to make an impact in their area of practice in terms of service delivery</strong></td>
</tr>
<tr>
<td><strong>Boundaries of practice continues to extend</strong></td>
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</table>
8.6.1 Taking on the challenge

The nurses in this study began their journey as expert clinicians performing advanced roles in service delivery and health promotion. The findings show that in New Zealand, the introduction of the advanced and autonomous nursing role of nurse practitioner was not itself contested by doctors or other health professionals. However, for NPs to take on a prescribing role was contested, challenging traditional professional jurisdictions and criticised on the basis of nurses’ lack of knowledge in bioscience and pharmacology. This view was supported by Schober and Affara (2006), who wrote that prescribing and granting prescriptive authority to nurses has always been regarded a contentious issue for many nurses internationally, adding that the suitability of this function for nurses has often been debated. Not all countries grant prescriptive authority for nurses taking on advanced roles. In New Zealand, nurse practitioners may prescribe or choose not to prescribe. Some nurses in this study have argued that prescribing is not always associated with advanced practice, a view also supported by Schober and Affara (2006). In their report to the International Council of Nurses on the advancing trends of nursing practice, it is stated that advanced practice may or may not include prescribing, and is best dictated by the nurses’ specific clinical context. Therefore, for the nurses taking part in this study, prescribing was but one aspect of an extended role that was recognised as desirable to their advanced role and autonomous practice.

As experienced clinicians with extensive clinical knowledge and experience, the nurses in this study were aware that prescribing is a new skill. Moreover, although they have been involved in the management of medications for patients, this did not include prescribing deliberations such as choice of drugs, dosing considerations, and clearance parameters. The main issue for these nurses is, therefore, acquisition of knowledge and skills in prescribing. Lack of knowledge and skills in pharmacology and prescribing have been raised in numerous literatures (An Bord Altranais & The National Council for the Professional Development of Nursing and Midwifery, 2005; Astles, 2006; Atkins & Ersser, 2000; Banning, 2003, 2004) and some studies suggest the need for ongoing education for nurse prescribers in the future (Humphries & Green, 2000).

In exploring nurses’ journeys in prescribing in New Zealand, it is helpful to provide insight into the elements of the nurses’ advancing role and to draw attention to the existing skills that nurses described in some detail in Chapter 7. As experienced clinicians, the nurse participants viewed prescribing as an additional tool that will enable them to complete “episodes of care” for their patients thus improving the quality of service. Existing skills related to medication management used in their area of practice, included medication administration, considerations related to patient
adherence and good knowledge of patient context, all described by the nurses in this study as clinical knowledge that can be “tapped on” in learning to prescribe.

Mentors were also of the view that nurses engaged in advanced roles do have some of the capabilities for clinical reasoning in relation to diagnosis and prescribing. The nurses in this study were certain that prescribing will provide the means to enable them to complete episodes of care for their patients specific to their area of expertise contributing to improved practice and enhanced autonomy as health practitioners. Banning (2004) supported the nurse participants, view. She explains that clinical decision-making is a process that nurses undertake on a daily basis when they make judgments about the care that they provide to patients. She argued that management issues and prescribing decisions are not discreet but an integral component of the nurses’ clinical decision-making and reasoning processes. Box 1 (see Table 11) presents the characteristics and skills of nurses that were illustrated in their narratives. The list captures the abilities of advanced nurses in New Zealand as they begin to embark on a journey in learning a new skill. They are expert clinicians with a mission and eager to walk a new road that can take them to a new path and new learning.

8.6.2 Benefits of learning

Postgraduate education and preparation for the nurse practitioner role has been advocated by Gardner and Gardner (2006; Gardner, et al., 2004) and in addition, postgraduate courses in pharmacology and therapeutics is mandatory for a prescribing role. All the nurses who participated in this study have completed the postgraduate courses, and what the findings suggest is that the postgraduate pharmacology education, that includes the pharmacology courses and the mentorship programmes, are key elements in the preparation of nurses for prescribing. The courses and the clinical experience contributed to the nurses’ development of clinical reasoning skills in diagnosis and prescribing. The pharmacology knowledge and education not only developed their skills in clinical reasoning as the basis for prescribing, but also more importantly, enhanced their practice in medication management. As prescribers, the nurses in this study began with considerable experience and knowledge about medications that they found could be transferred to their prescribing practices. Box 2 (see Table 11) identifies the key learning for nurses.

As nurses then began working as autonomous practitioners with prescriptive authority, they cited immense benefits from participating in clinical decision, not only in medication management, but more importantly, in communicating and discussing clinical decisions with doctors and other
health professionals in relation to drug choice and management. Where they had previously felt they lacked confidence and were held back in participating in the area of deciding treatment suitability, they were now more actively involved in the decision-making process, facilitated by a ‘shared language’ gained during the educational process. The new knowledge (theoretical, clinical and practical) gave them confidence as practitioners and empowered them to work to an equal level with doctors.

Nurse prescribers continued to gain new knowledge and skill, as they applied knowledge to practice, more importantly, they became confident in their role, reflective and experienced clinicians, as shown in Box 3 (see Table 11). More importantly, the nurse prescribers in this study initiated their roles as prescribers in the clinical setting by negotiating their boundaries of prescribing with doctors. In addition, although there are many studies (E Bradley, et al., 2007; Buchan & Calman, 2004; Kroezen, et al., 2011) that have focused on the effects of nurse prescribing, not many studies have explored how nurse prescribing is initiated in the clinical setting (Kroezen, et al., 2011).

8.6.3 Professional artistry at work

The findings of this study highlights the strategies that nurses newly approved as Nurse Practitioners with prescribing employed, to gain recognition and acceptance in settings where their capabilities and safety to practice were initially questioned, and in organisations unprepared for the new role. Contrary to the arguments presented in much literature on nurse prescribing and its negative effects on team work (refer to Chapter 1.8), the nurse prescribers in this study were active participants in the decision making process and continued to work collaboratively with other members of the team. They continued to work closely with doctors and employed strategies of establishing limits and boundaries in an environment where they collaborate with the more established prescribers.

One fundamental skill that characterised the nurse prescribers is their ability to negotiate boundaries of their prescribing role with doctors, the established prescribers, and senior colleagues in the health care team. The findings show that nurses works within the limitations of the boundaries of their practice and use prescribing as a tool to augment their clinical practice as autonomous practitioners. Such performance has been suggested in Chapter 2.4, as ‘professional artistry’, a blend of practitioner qualities, practice skills and creative imaginative processes, a concept related to professional expertise (Higgs & Jones, 2008).
For Higgs and Jones, professional artistry ‘reflects both high quality professional practice and the qualities inherent in such artistic or flexible, person-centred, highly reflexive practice’ (p. 10). While it is beyond the parameters of this study to discuss the construct of professional artistry, nonetheless, the qualities and the characteristics of the nurse prescribers illustrated in Box 4 (see Table 11) shows some of the qualities of ‘practice artistry’ described by Paterson and Higgs (2008). The authors suggest that practitioners with professional artistry are constantly reflecting on their judgements and their practice actions. It means knowing one’s professional identity and understanding professionalism as a means of engaging with people rather than distancing oneself from them. Practitioners practicing professional artistry continue to learn and deepen their professional craft, knowledge, and understanding of self and others. They concluded that articulating the decisions made requires that the practitioner understand and brings to awareness, through reflections and dialogue, the nature of the decisions. The issues and the decisions are subsumed into a holistic approach that places the patient firmly at the centre of practice (p. 188). The findings of this study have shown that many of the characteristics of professional artistry were reflected in the approaches and the strategies used by the nurse practitioner prescribers in the early years of initiating the nurse prescriber role.

8.7 Conclusions

The study has demonstrated the complexities underlying the process of learning to prescribe for nurses. Primarily, the challenge lies in the processes of clinical decision-making, where prescribing is embedded in the medical practice of doctors. As the professions of nursing and medicine are different, yet similar in some aspects, taking on a prescriber’s role will always be considered an extended skill that requires nurses to cross-over into the medical model. Experienced nurses are learning to prescribe as clinicians with a clinical area of practice that has developed over time through extensive clinical experience, while doctors begin with a solid foundation of diagnostic and pharmacological knowledge integrated and consolidated over time with prescribing, a skill considered embedded in practice. This study also shows some similarities in the journeys of both nurses and doctors as learner prescribers. They begin as novices and, over time, develop skills of clinical reasoning as they gain clinical experience in prescribing under the guidance and coaching of experienced colleagues.

As prescribers, both medical and nurse practitioners are confronted with challenging situations that demand specific approaches to treatment management. In some situations, nurses, as non-medical prescribers, may well be best positioned to deliver the outcome required for a more ‘individualised’ intervention. In others, the expertise of medical prescribers as diagnosticians
may be required to ensure a better outcome. For patients with more complex problems, a multidisciplinary approach may be required, as it can be argued that there can be tasks that are so complex, no one individual is ever expected to master all the skills and knowledge necessary for that particular situation.

For experienced nurses as learner prescribers, the educational preparation they received enhanced skills and attitudes in relation to drug administration and management. More importantly, pharmacology knowledge provided the means to further critical thinking and clinical reasoning skills in medication management that included prescribing. While there are clearly merits of this approach to the education of medical prescribers, the emphasis on diagnostic knowledge in skill development and enhancement can have a negative impact in how non-medical prescribers are perceived by other health professionals. This view has been noted in some studies on nurse prescribing in the United Kingdom, where doctors are still questioning the competence of nurse prescribers in relation to diagnosis.

Differential diagnosis, as viewed by the majority of mentors, is the core knowledge dominant in the training and education of medicine, which scaffolds the process of diagnostic reasoning, a method that precedes prescribing. Inadequate diagnostic knowledge and skills, was voiced as a major concern for nurses (non-medical professionals), as diagnostic knowledge was associated with prescribing knowledge. From the mentors’ perspectives, and those of other doctor participants, the lack of diagnostic knowledge therefore was linked to unsafe and dangerous prescribing. This fear was not supported in this study. Instead, the need to improve one’s knowledge of pharmacology and therapeutics was evident with all groups (doctors, nurses, and midwives).

Pharmacology knowledge was considered an essential knowledge domain in learning to prescribe. With the advent of new drug therapy, genetic polymorphisms, drug interactions and pharmacovigilance, both medical and non-medical prescribers continue to seek on-going learning and skill development in these key areas. What was also evident in the practical aspects of prescribing was the notion that prescribing involves multiple foci analysis that includes diagnosis, intervention, interaction, and evaluation with the patient’s context, key to one’s decisions.

While mentorship and even supervision by experienced medical practitioner enhanced the progress and advancement of diagnostic skills for both junior doctors and experienced nurses, the role of experienced nurses, if used appropriately in the clinical situation will, in turn, enhance the progress and context-learning of junior doctors as novice clinicians. What this study has shown
is that nurse practitioner prescribers are better positioned and a suitable alternative in delivering the mentorship of interns and novice medical clinicians in NPs’ areas of speciality, where experienced doctors or consultants may not immediately be available. Having been exposed to the mentorship of experienced medical practitioners, nurse practitioner prescribers have a better understanding of the processes of analysis expected of junior doctors. Benefits in inter-professional education were evident in both groups of practitioners.

In the midst of all these considerations is the patient. In today’s healthcare environment, the paternalistic model of care has been criticised and a model of shared decision-making is gaining popularity. The patient, as an active recipient of health services and delivery, plays a very significant role in the success and failure of treatment interventions. Perhaps the most challenging aspect of clinical reasoning lies in the fact that if the goal is to practise safe and rational prescribing, clinicians should be experts not only in the art of clinical reasoning, but also in gaining mastery of the language of communicating one’s reasoning to deliberately involve other health professionals, as well as the patient. The overall goal should take into consideration the best and most effective approach to ensure that patients receive safe and effective medication management services.
CHAPTER 9: CONCLUSIONS

9.1 Introduction

The introduction in 2002 of the nurse practitioner role and with prescribing represented a significant advance for the nursing profession in New Zealand. Nurses were positioned to be autonomous practitioners, with the potential to complete the episode of care for patients within a holistic practice framework. Viewed as greatly enhancing delivery of holistic care, prescribing is regarded as an important part of the extended and expanded nursing role.

Although there have been numerous international studies showing the benefits of the nurse practitioner prescriber role in terms of service delivery, timeliness and patient satisfaction, how nurses actually learn to become safe prescribers is not addressed in the literature. Claims about a possible lack of or inadequacy in nurses’ pharmacology knowledge, which underpins prescribing, continue to be made as nurse prescribing is debated. More importantly, a paucity of research exists that considers how nurses’ learning to prescribe differs from how medical prescribers are prepared.

9.2 The present study

This study set out to answer the question: What are the experiences of nurses in becoming prescribers, and, how do their experiences compare with other prescriber groups?

A review of literature on nurse prescribing suggested other relevant questions. If nurses lack, or indeed are deficient in their knowledge of biomedical and pharmacology sciences and lack the associated diagnostic and clinical reasoning capabilities as prescribers, will patient safety be compromised? Can the level of biomedical knowledge in diagnosis and reasoning capabilities influence nurses’ confidence in making prescribing decisions? As there is a lack of clarity in the prescribing roles of the nurse practitioner and the doctor, the final question, does nurse prescribing have a detrimental effect on teamwork?

To answer these questions, a qualitative approach was used, employing a Multiple Case Narrative methodology to investigate how nurses make prescribing decisions in the context of clinical decision-making. As prescribing is an activity nurses do not traditionally perform, it is important to determine how experienced nurses acquire the pharmacological knowledge and skills to safely and confidently prescribe, and to understand how nurses, midwives and doctors differ in their journeys to become prescribers.
9.3 Contributions of the study

This research presents the journey of nurses as they participate in the learning and the practice of prescribing and compares nurses with other prescriber groups, namely doctors and midwives. The strength of this research lies in the rich data from the different prescribers and from different health disciplines. Although the views of nurse prescribers themselves are of themselves useful, very little research has been undertaken comparing nurses with other prescribers and on the insights of medical colleagues into nurse practitioners as prescribers (O'Connell, Creedon, McCarthy, & Lehane, 2009). In addition, a dearth of research exists that compares the experiences of different health professionals as learner prescribers and as prescribers. Having three prescribing groups, nurses, midwives and doctors, allowed for triangulation of data, which in turn, strengthens the findings of this study. In this respect, an examination of how concerns have been addressed in extending prescriptive authority to nurses may also be relevant for other non-medical prescribers (e.g. pharmacists, podiatrists and physiotherapists), to inform considerations on how best to meet the educational needs in prescribing when prescriptive authority is extended to these professions.

The contributions of this study are threefold. Firstly, the present study demonstrates the challenges and the complexities associated with knowledge and skill development and progression for health professionals, both medical and non-medical, and illuminated similarities and differences in the learning and practice of prescribing. Secondly, the study showed that beginner nurse practitioner prescribers have the knowledge and skills to safely prescribe and play a significant role in service provision and delivery. Thirdly, as New Zealand is currently embarking on extending prescriptive privileges to other health professionals, this study could inform the educational preparation, organizational support, and continuing educational needs of other non-medical prescribers.

9.4 Key findings

As learner prescribers, nurses are exposed to the hypothetico-deductive model, a reasoning process familiar to doctor prescribers but less so to nurses. From a medical model, pharmacology and biomedical knowledge are essential core knowledge for learner prescribers in making prescribing decisions. In addition, safety and effectiveness of prescribing may be compromised if clinicians do not have the capacity to reason effectively. In order to prescribe safely and effectively, beginner prescribers need both diagnostic and therapeutic reasoning knowledge and skills. This study has found that nurses have a broad reasoning ability to function not only as
prescribers, but also as professionals practicing within the confines and boundaries of their area of practice. As the study has found, nurse practitioner prescribers possess skills of professional judgement and critical self-evaluation, skills that are needed to cope with information processing constraints or bounded rationality. These are factors that can limit the prescribers’ ability to access knowledge and solve problems, and therefore safety is not an issue for new nurse practitioner prescribers.

A key finding in this study shows that nurses do have existing knowledge and abilities that are important for prescribing. Existing knowledge and skills, referred to by mentors as “patterns of recognition,” influence how the nurses continue to learn about diagnosis and treatment approaches. The contribution of nurses’ previous clinical experience and expertise in an area of practice is vital, as this has been shown to provide nurses with a more extensive patient, social and health care context to factor into their clinical reasoning and decision-making processes. Nurse practitioners as beginner prescribers, when compared to junior doctors, begin with knowledge and skills in medications administration that can be transferred to their prescribing deliberations. They are neither beginner (as are junior doctors and DE midwives) nor experienced (as are SMPs and mentors) in prescribing but are considered ‘emergent’ prescribers.

The nurse practitioner prescribers in this study clearly indicated a need for ongoing support. Nurses continue to seek formal and informal opportunities in the clinical setting to increase their knowledge and skills in both prescribing and diagnosis. However, ‘emergent prescribers’ they also seek opportunities for further learning to improve their knowledge and skills in diagnostic and therapeutic considerations. The need for continuing education in the clinical setting, along with ongoing clinical and organizational support and peer support, is vital to increasing nurse practitioner prescribers’ confidence and competence as new prescribers.

9.5 Implications for education

This study has shown that postgraduate education was strongly related with experienced nurses’ preparation and training in prescribing. As postgraduate students learning to prescribe, experienced nurses have the advantage of a rich experiential background on which to draw, and through the learning process, their knowledge becomes much broader than pharmacology and therapeutics. The nurses’ past clinical experience and expertise in many aspects of patient care provides some advantages to their learning the new skill of prescribing as they are able to identify and describe their learning needs and how this can be applied to practice. The findings show that while the formal postgraduate educational preparation for prescribing contributed significantly to
the advanced nurses’ development of prescribing knowledge and skills, the need for more experience in thinking through and doing prescribing, emerged as an important ongoing learning need.

Perhaps the most striking findings that related to the educational preparation of nurses are their increased awareness of, and respect for, the prescribing roles of doctors. Working with doctors as mentor prescribers extended the nurses’ thinking processes of the complexities of prescribing and diagnosis. Medical mentors helped improve nurses’ knowledge of diagnostic possibilities and clinical reasoning skills in prescribing. The importance of that support and collaborative relationship between the nurse practitioner prescribers and mentors and the need for this type of collegial relationship continuing emerged as a key finding.

This study has also shown that nurses and doctors, along with other health professionals, have a key role in medication management, in light of the increasing problems of adverse drug events and adverse drug reactions related to the inappropriate and unnecessary use of drugs. Therefore, the education and preparation of health professionals, both at the undergraduate and the postgraduate levels, needs to include pharmacology and therapeutics to improve knowledge and skills in safe and effective pharmacotherapy and in medication management. Inter-professional education in prescribing may be an effective strategy in the future to address the increasing incidence of adverse drug reactions and adverse drug events. A sound knowledge base in pharmacology and therapeutics has been shown to be related to minimising or reducing these adverse events and adverse drug reactions. This study has illuminated the benefits of a postgraduate education for nurses in pharmacology and therapeutics. The study has also shown that for doctors, preparation at the undergraduate level need to be built on after graduation to ensure that they too, benefit from the need for ongoing education in prescribing.

9.6 Implications for practice

The study found that the introduction of nurse prescribers had no negative effects on team work. Instead, the narratives of participants illustrated an efficient integration of nurse prescribers and improved collaboration in working together in the team. Nurse practitioner prescribers were affirmed by medical colleagues for their role in the team. As nurse practitioners, their ability in working collaboratively with practitioners was enhanced, as they felt more empowered and able to communicate their clinical reasoning. Nurse practitioner prescribers’ confidence in prescribing improved hand in hand with their gaining experience in prescribing decisions. The findings highlighted that it is important to continue to provide support and ongoing education in the
clinical setting to nurture the role of nurse practitioners as autonomous clinicians with prescriptive authority. Support from the members of the team, from doctors and from other professional groups (e.g. pharmacist, other nurses) is fundamental, to enable the nurse practitioner prescriber to develop confidence in her or his new role.

Support systems of mentorship, clinical experience, and ongoing practical applications through case study presentations encapsulated junior doctors’ skill progression, consolidation, and development as prescribers. Unlike junior doctors, non-medical prescribers do not have comparable well-developed structures in place to support ongoing education, skill development, and practical experiences in the practice setting. After the formal educational preparation, beginning non-medical prescribers (the nurses and midwives in this study) often lacked continued and ongoing support to skill progression and development afforded of junior doctors as beginning prescribers. The current findings show that there are elements already existing in the clinical setting to strengthen and consolidate the skills and the knowledge of nurse practitioners in prescribing. These approaches need to be nurtured and supported by institutions and organisations that advocate for the inclusion of nurse practitioner prescribers in service delivery.

9.7 Implications for further research

This study identified many possible areas warranting further research. The benefits of prescriber mentors in mentoring nurses in prescribing were well demonstrated. These prescriber mentors have to date been medical doctors. In the New Zealand setting, doctors are considered best positioned to mentor nurses, as they are established prescribers. However, with an increasing number of nurse practitioner prescribers already taking on a mentorship role for junior doctors, future research could determine if nurse prescribers can also be effective mentors for not only junior doctors, but also for nurse learner prescribers.

The importance of teaching pharmacology and therapeutics to all health professionals, not just new prescribers, is fundamental. How concerns about extending prescriptive authority to nurses have been addressed is equally relevant for other non-medical prescribers (e.g. pharmacists, podiatrists and physiotherapists), to inform educators and clinicians on how best to meet the educational needs of these professionals in prescribing. However, the different health professions have different frames of reference and this may influence how they make prescribing decisions. Therefore, research needs to explore the educational preparation of other groups of non-medical prescribers and also to investigate whether there are benefits of an interprofessional approach to the education and preparation of non-medical prescribers.
Problems related to poor prescribing are a global issue and are not related to any particular prescriber group. Adverse drug events, drug interactions, monitoring, evaluation, and better rational prescribing principles continued to dominate the respondents’ narratives. The current move to teach and train new and current prescribers to prescribe rationally and appropriately has been advocated (Aronson, et al., 2006; Weingart, et al., 2000; World Health Organization, 2002). This applies not just to doctors, but also to non-medical prescribers. Education needs to focus on the core principles of rational therapeutics, and to strongly endorse these principles, not only in the initial preparation and in education of beginning prescribers, but also for the more experienced prescribers.

This study has shown that nurse prescribers benefitted from a postgraduate educational programme in pharmacology and therapeutics as this contributed to the development of core knowledge and skills in medication management and prescribing. However, very little research has been undertaken in relation to other health professionals who are intending to become prescribers in the future. Further research may be needed to determine whether the teaching of the core principles of rational therapeutics will benefit other prescribers and whether this will address current issues related to inappropriate and unnecessary prescribing. Research is also needed focusing on whether delivery of rational prescribing education needs to be undertaken at the undergraduate or postgraduate level.

9.8 Limitations of the study

This study could have focused on nurse practitioners as beginner prescribers. However, there were only 11 eligible participants at the time of the study. The research therefore included the narratives and stories of multiple prescribers. Use of narratives has extended our understanding of the needs of learner prescribers and the challenges and the complexities of prescribing for all practitioners. Multiple Case Narratives provided in-depth descriptions of the participants’ stories as learners and as prescribers. This study provides a broad description of the phenomenon under study from the perspectives of three different groups of health professionals. It provided the depth of understanding required to begin to understand the similarities and the differences of prescribers as learners and highlighted the need for ongoing skill development and progression for all prescribers.

However, other health professionals (e.g. pharmacists, podiatrists, and physiotherapists) not yet approved to prescribe but who could potentially be approved as prescribers in the future, were excluded from the study. While the findings and the recommendations of this study will have
some relevance to the education and training of other health professionals, the infrastructural support for health professions approved to prescribe in the future and the context of prescribing will be different for each profession, and therefore, the focus of the educational preparation and training will need to be different.

9.9  Recommendations

Moves toward non-medical prescribing in New Zealand, and other countries, are unlikely to be reversed. I argue that extending prescriptive authority to nurses, and to other non-medical prescribers, who are educationally prepared for the role, need not bring with it the negative consequences feared by its critics. In New Zealand, the absence to date of feared consequences likely reflects policy requiring an adequate educational preparation of nurses for the new role. Our contention is that the focus of the debate needs to shift from arguing against non-medical (especially nurse) prescribing, to how these practitioners can be best prepared for the role, and to the health system, educational and regulatory contexts. This study has highlighted the need for ongoing support of employing organizations at all levels to address the ongoing needs of nurse prescribers and it is a recommendation of this study that these will also be useful for future non-medical prescribers.

9.9.1 Promoting the nurse practitioner

The success of nurse practitioner prescribing depends on a number of conditions, including the level of clarity within the organisation on the role of the nurse practitioner prescriber. Clarifying the level of autonomy at which nurses prescribe is still very much dependent on individual nurse practitioners and still lacked clarity at the organisational level. This study has shown that the nurse practitioner prescribers did not seek to take over from medical practitioners, but rather maintained a nursing model of care in which prescribing was an additional tool. This study also suggests that from the perspectives of nurses and other professionals in the health care team, the introduction of the nurse practitioner role in the clinical setting has resulted to numerous benefits to patient delivery, to the organisation and to the team. It is therefore important that institutions and organisations continue to support, promote, and nurture the role of nurse practitioners in service delivery and provision.

9.10 Conclusions

Nurse practitioners with prescriptive authority as an expanding nursing role is in its infancy in New Zealand. There was little attention in the literature on how nurse prescribing decision-making and practice differs from that of medical doctors. No other study has been located that
investigated the differences and the similarities between doctors and nurses in learning and skill development in prescribing. The multiple perspective approach allowed the generation of descriptive data that provided the depth and profundity of a complex phenomenon, not only in the processes of learning, but also in the art of prescribing.

The findings highlighted the importance of education and training in rational prescribing for both doctors and nurses, and potentially for other groups of non-medical prescribers. This study is timely, as New Zealand is currently embarking on extending prescriptive authority to other health professions (including pharmacists and podiatrists). Questions and concerns in relation to other professionals seeking to prescribe have similarly been raised as for nurses, particularly in relation to their capability and safety. The possible educational preparation and training approaches most suitable for preparing professionals for a prescribing role are now subjects for debate.

This study has contributed in several ways to our understanding of prescribing. Firstly, prescribers (medical and non-medical), share similar journeys in the learning and doing of prescribing. Prescribing is a practical skill, and skill development requires nurturing and support in the clinical context. This applies to all prescribers. Secondly, the nurse practitioners who participated in this study are safe prescribers. They have some existing attributes and characteristics of beginner prescribers. But nurses did not “cross-over” into the medical role, they maintained practice as nurses: holistic, patient-centred practitioners supporting patients and families in managing health in a context of illness. Learning pharmacology and therapeutics enhanced their professional identities and improved their skills in medication management. With ongoing support and mentorship in the clinical setting, their confidence and skills grew in both diagnostic and therapeutic reasoning.
REFERENCES


Higgs, J. (2000, May 5). The complexity of clinical reasoning: Exploring the dimensions of clinical reasoning expertise as a situated lived phenomenon. Paper presented at the Seminar Presentation at the Faculty of Health Sciences, University of Sydney, Australia


MEMORANDUM TO:
Anecita Gigi Lim / Anecita Gigi Lim
School of Nursing

Re: Application for Ethics Approval (Our Ref. 2007 / 249)

The Committee considered your application for ethics approval for your project titled "Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills".

Ethics approval has been given for a period of three years.

The expiry date for this approval is 11/09/2010.

If the project changes significantly you are required to resubmit a new application to the Committee for further consideration.

In order that an up-to-date record can be maintained, you are requested to notify the Committee once your project is completed.

The Chair and the members of the Committee would be happy to discuss general matters relating to ethics approvals if you wish to do so. Contact should be made through the secretary in the first instance, Lana Lon, l.lon@auckland.ac.nz.

All communications with the UAHPEC regarding this application should include our reference number - 2007 / 249.

Lana Lon
Secretary
University of Auckland Human Participants Ethics Committee

Anecita Gigi Lim
43 Exmouth Road
Northcote

Additional information:
1. Should you need to make any changes to the project, write to the Committee giving full details including revised documentation.
2. Should you require an extension, write to the Committee before the expiry date giving full details, along with revised documentation. An extension can be granted for up to three years.
3. At the end of three years, or if the project is completed before the expiry, you are requested...
Appendix B: Participant information sheet (Nurse Learners)

You are invited to take part in a study on “Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills.”

The aim of this study is to investigate how nurses make prescribing decisions in the context of nurses’ clinical decision-making. A sub theme of the study will be to explore the input of doctors as prescriber mentors and whether the differences between medical and nursing clinical decision-making give rise to some role confusion.

You have been selected to participate in the study due to your previous experience as a past student in the NURSING 721 course – a prescribing practicum paper.

I would like to request an interview with you and with your permission, the interview would be tape-recorded so that an accurate record of what you say is ensured. When the tape has been transcribed, you would be provided with a copy of the transcript, so that you can verify that the information is correct and/or request deletions. The estimated time commitment required of you is approximately one hour.

I intend to protect your anonymity and the confidentiality of your responses fully, within the limits of the law. Your name and contact details will be kept in a separate, password-protected computer file from any data that you supply. This will only be able to be linked to your responses by the researchers, for example, in order to know where to send your interview transcript for checking. In the final report, you will be referred to by a pseudonym. I will remove any references to you and personal information that might allow someone to guess your identity; however, you should note that as the number of people I seek to interview is very small, it is possible that someone will still be able to identify you.

Once the thesis arising from this research has been completed, a brief summary of the findings will be available upon your request. It is also possible that the results will be presented at academic conferences. The data will be kept securely at the University Of Auckland School Of Nursing for six years from the date of publication, before being destroyed.

Please be advised that your participation in this study is voluntary. Should you wish to withdraw at any stage, or to withdraw any unprocessed data you have supplied, you are free to do so without prejudice.

If you would like to participate, please indicate that you have read and understood this information by signing the accompanying consent form and returning it in the envelope provided. I will then contact you to arrange a mutually convenient time for the interview.

Should you require any further information, or have any concerns, please do not hesitate to contact me at the School of Nursing University of Auckland on (09) 3737599 extension 83782 or Associate Professor Nicola North my primary supervisor on (09) 3737599 extension 82931.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142, telephone (09) 3737599 extension 87830.

Thank you.
Sincerely yours,
Anecita Gigi Lim
APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13TH SEPTEMBER 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2009/249
Appendix B: Participant information sheet (Mentors)

You are invited to take part in a study on “Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills.”

My name is Anecita Gigi Lim. I am a registered nurse and a senior lecturer in the School of Nursing and a PhD student enrolled at the University of Auckland. This study contributes to my PhD and runs from July 2006 to July 2010.

The aim of this study is to investigate how nurses make prescribing decisions in the context of nurses’ clinical decision-making. A sub theme of the study will be to explore the input of doctors as prescriber mentors and whether the differences between medical and nursing clinical decision-making give rise to some role confusion.

You have been selected to participate in the study due to your previous involvement as a prescriber mentor to a student in the NURSING 721 course – a prescribing practicum paper and experiences in mentoring advanced nurses in prescribing.

I would like to request an interview with you and with your permission, the interview would be tape-recorded so that an accurate record of what you say is ensured. When the tape has been transcribed, you would be provided with a copy of the transcript, so that you can verify that the information is correct and/or request deletions. The estimated time commitment required of you is approximately one hour.

I intend to protect your anonymity and the confidentiality of your responses fully, within the limits of the law. Your name and contact details will be kept in a separate, password-protected computer file from any data that you supply. This will only be able to be linked to your responses by the researchers, for example, in order to know where to send your interview transcript for checking. In the final report, you will be referred to by a pseudonym. I will remove any references to you and personal information that might allow someone to guess your identity; however, you should note that as the number of people I seek to interview is very small, it is possible that someone will still be able to identify you.

Once the thesis arising from this research has been completed, a brief summary of the findings will be available upon your request. It is also possible that the results will be presented at academic conferences. The data will be kept securely at the University Of Auckland School Of Nursing for six years from the date of publication, before being destroyed.

Please be advised that your participation in this study is voluntary. Should you wish to withdraw at any stage, or to withdraw any unprocessed data you have supplied, you are free to do so without prejudice.

If you would like to participate, please indicate that you have read and understood this information by signing the accompanying consent form and returning it in the envelope provided. I will then contact you to arrange a mutually convenient time for the interview.

Should you require any further information, or have any concerns, please do not hesitate to contact me at the School of Nursing University of Auckland on (09) 3737599 extension 83782 or Associate Professor Nicola North my primary supervisor on (09) 3737599 extension 82931.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142, telephone (09) 3737599 extension 87830.

Thank you.
Sincerely yours,
Anecita Gigi Lim

APPRIED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12th September 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2007-249
Appendix B: Participant information sheet (Doctors)

You are invited to take part in a study on “Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills.

My name is Anecita Gigi Lim. I am a registered nurse and a senior lecturer in the School of Nursing and a PhD student enrolled at the University of Auckland. This study contributes to my PhD and runs from July 2006 to July 2010.

The aim of this study is to investigate how nurses make prescribing decisions in the context of nurses’ clinical decision-making. A sub theme of the study will be to explore the input of doctors as prescriber mentors and whether the differences between medical and nursing clinical decision-making give rise to some role confusion.

You have been invited to participate in the study about your experiences in prescribing at the beginning of your clinical career.

I would like to request an interview with you and with your permission, the interview would be tape-recorded so that an accurate record of what you say is ensured. When the tape has been transcribed, you would be provided with a copy of the transcript, so that you can verify that the information is correct and/or request deletions. The estimated time commitment required of you would be approximately one hour.

I intend to protect your anonymity and the confidentiality of your responses fully, within the limits of the law. Your name and contact details will be kept in a separate, password-protected computer file from any data that you supply. This will only be able to be linked to your responses by the researchers, for example, in order to know where to send your interview transcript for checking. In the final report, you will be referred to by a pseudonym. I will remove any references to personal information that might allow someone to guess your identity; however, you should note that as the number of people I seek to interview is very small, it is possible that someone who knew you participated in the study will still be able to identify you.

Once the thesis arising from this research has been completed, a brief summary of the findings will be available upon your request. It is also possible that the results will be presented at academic conferences. The data will be kept securely at the University Of Auckland School Of Nursing for six years from the date of publication, before being destroyed.

Please be advised that your participation in this study is voluntary. Should you wish to withdraw at any stage, or to withdraw any unprocessed data you have supplied, you are free to do so without prejudice, provided that this right is exercised within four weeks of the completion of your participation in the project. You are asked to notify the investigator by e-mail or telephone that you wish to withdraw your consent for your data to be used in this research project.

If you would like to participate, please indicate that you have read and understood this information by signing the accompanying consent form and returning it in the envelope provided. I will then contact you to arrange a mutually convenient time for the interview.

Should you require any further information, or have any concerns, please do not hesitate to contact me at the School of Nursing, University of Auckland on (09) 3737599 extension 83782 (email: g.lim@auckland.ac.nz) or Associate Professor Nicola North, my primary supervisor on (09) 3737599 extension 82931 (email: n.north@auckland.ac.nz). Further contact person is the Head of Department School of Nursing, Associate Professor Judy Kilpatrick on (09) 3737599 extension 82897 (email: j.kilpatrick@auckland.ac.nz).

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142, telephone (09) 3737599 extension 87830.

Thank you.
Sincerely yours,
Anecita Gigi Lim

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12th September 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2007-249
Appendix B: Participant information sheet (Midwives)

You are invited to take part in a study on “Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills.

My name is Anecita Gigi Lim. I am a registered nurse and a senior lecturer in the School of Nursing and a PhD student enrolled at the University of Auckland. This study contributes to my PhD and runs from July 2006 to July 2010.

The aim of this study is to investigate how nurses make prescribing decisions in the context of nurses’ clinical decision-making. A sub theme of the study will be to explore the input of doctors as prescriber mentors and whether the differences between medical and nursing clinical decision-making give rise to some role confusion. You have been selected to participate in the study due to your current role as non-medical prescriber.

I would like to request an interview with you and with your permission, the interview would be tape-recorded so that an accurate record of what you say is ensured. When the tape has been transcribed, you would be provided with a copy of the transcript, so that you can verify that the information is correct and/or request deletions. The estimated time commitment required of you would be approximately one hour.

I intend to protect your anonymity and the confidentiality of your responses fully, within the limits of the law. Your name and contact details will be kept in a separate, password-protected computer file from any data that you supply. This will only be able to be linked to your responses by the researchers, for example, in order to know where to send your interview transcript for checking. In the final report, you will be referred to by a pseudonym. I will remove any references to personal information that might allow someone to guess your identity; however, you should note that as the number of people I seek to interview is very small, it is possible that someone will still be able to identify you.

Once the thesis arising from this research has been completed, a brief summary of the findings will be sent to you. It is also possible that the results will be presented at academic conferences. The data will be kept securely at the University Of Auckland School Of Nursing for six years from the date of publication, before being destroyed.

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APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12th September 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2007-249
Appendix B: Participant information sheet (Nurse Practitioners)

You are invited to take part in a study on “Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills.

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The aim of this study is to investigate how nurses make prescribing decisions in the context of nurses’ clinical decision-making. A sub theme of the study will be to explore the input of doctors as prescriber mentors and whether the differences between medical and nursing clinical decision-making give rise to some role confusion.

You have been selected to participate in the study due to your current role as Nurse prescriber.

I would like to request an interview with you and with your permission, the interview would be tape-recorded so that an accurate record of what you say is ensured. When the tape has been transcribed, you would be provided with a copy of the transcript, so that you can verify that the information is correct and/or request deletions. The estimated time commitment required of you would be approximately one hour.

I intend to protect your anonymity and the confidentiality of your responses fully, within the limits of the law. Your name and contact details will be kept in a separate, password-protected computer file from any data that you supply. This will only be able to be linked to your responses by the researchers, for example, in order to know where to send your interview transcript for checking. In the final report, you will be referred to by a pseudonym. I will remove any references to personal information that might allow someone to guess your identity; however, you should note that as the number of people I seek to interview is very small, it is possible that someone will still be able to identify you.

Once the thesis arising from this research has been completed, a brief summary of the findings will be sent to you. It is also possible that the results will be presented at academic conferences. The data will be kept securely at the University Of Auckland School Of Nursing for six years from the date of publication, before being destroyed.

Please be advised that your participation in this study is voluntary. Should you wish to withdraw at any stage, or to withdraw any unprocessed data you have supplied, you are free to do so without prejudice, provided that this right is exercised within four weeks of the completion of your participation in the project. You are asked to notify the investigator by e-mail or telephone that you wish to withdraw your consent for your data to be used in this research project.

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Thank you.

Sincerely yours,

Anecita Gigi Lim

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12th September 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2007-249
CONSENT FORM

(THE CONSENT FORM WILL BE HELD FOR A PERIOD OF SIX YEARS)

TITLE: Prescribing decision making: An investigation of advanced nurses experiences of developing prescribing skills

Researcher: Anecita Gigi Lim

I have been given and have understood an explanation of this research project. I have had the opportunity to ask questions and have been answered.

I agree to take part in this research and understand that the methods to be used to collect information for this study are explained below.

• From the information provided by the researcher the interview is conducted in the course of a PhD research and a thesis will be produced. The method used for this study is called collective instrumental case study. This method has been chosen by the researcher as it will provide an in-depth description of my experiences in prescribing decisions.

• I understand that I can ask any questions at any time about the nature of the study and the methods that the researcher is using and that I can contact the researcher at any time at the address/phone number listed above.

• I understand that the information from this study is to be used to write a case report about me (the respondent). This report will be read by the researcher and by one other person (her supervisor) in order to check on the accuracy of the report. The case report will not be available to any other person to be read without my permission. The report will be sent to me for any changes or corrections before the reports are finalized.

The researcher guarantees that the following conditions will be met:

1) My real name will not be used at any point of information collection, or in the written case report; instead, I will be given pseudonyms that will be used in all verbal and written records and reports.

2) If I grant permission for audio taping, no audio tapes will be used for any purpose other than to do this study, and will not be played for any reason other than to do this study. At my discretion, these tapes will either be destroyed or returned to me. I also understand that the tape can be turned off at any time, at my request and that I can decline to answer any questions.

3) I understand that my participation in this research is voluntary; I have the right to withdraw at any point of the study, for any reason, and without any prejudice, provided that this right is exercised within four weeks of the completion of my participation in the project, and the information collected and records and reports written will be turned over to me.

4) I will receive a copy of the draft case report, so that I will have the opportunity to suggest changes to the researcher, if necessary.

5) I will receive a copy of a summary of the main results of the study

I grant permission to be quoted directly.

Yes ______ No ______

I grant permission to be audiotaped.

Yes ______ No ______

I agree to the terms:

Respondent ___________________________ Date _____________

I agree to the terms:

Researcher ___________________________ Date ______

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12th September 2007 FOR THREE (3) YEARS ON 2009, REFERENCE NUMBER 2007-249
Appendix D: Interview guide (D1)

**Interview Guide Questions**

**Doctors and Nurse Prescribers**

**NOTE:** The following questions will be used to guide the interviews and denote the areas to be explored. As the interviews proceed, it is anticipated that responses will bring into focus other questions to further clarify and open up the discussion.

| RESIDENT MEDICAL DOCTORS  
(also for DE midwives) | NURSE PRESCRIBERS  
(Also NDE midwives) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Can you tell me why prescribing is an important part of your role as a medical doctor (midwife)?</td>
<td>1. Can you tell me why prescribing is an important part of your role as a nurse practitioner?</td>
</tr>
<tr>
<td>2. The patient factor and the drug factor are both important elements in making prescribing decisions. Can you tell me which factors represent the most important determinant for prescribing, and under what circumstances do these factors become important?</td>
<td>2. The patient factor and the drug factor are both important elements in making prescribing decisions. Can you tell me which factors represent the most important determinant for prescribing, and under what circumstances do these factors become important?</td>
</tr>
<tr>
<td>3. Can you tell me what factors lead you to prescribe a drug, having made that decision to prescribe a particular drug?</td>
<td>3. Can you tell me what factors lead you to prescribe a drug, having made that decision to prescribe a particular drug?</td>
</tr>
<tr>
<td>4. Which element would be weighted heavily in your decision to prescribe; benefits more heavily than risk of side effects? Or risk (risk of side effects rather than RISK) weighted more heavily than benefits of the treatment?</td>
<td>4. Which element would be weighted heavily in your decision to prescribe; benefits more heavily than risk of side effects? Or risk (risk of side effects rather than RISK) weighted more heavily than benefits of the treatment?</td>
</tr>
<tr>
<td>5. Who do you frequently turn for advice in matters relating to prescribing and why?</td>
<td>5. Who do you turn for advice in matters relating to prescribing and why?</td>
</tr>
<tr>
<td>6. Can you please tell me if there are any gaps in your knowledge in relation to prescribing?</td>
<td>6. Can you tell me if you see any gaps in your knowledge in relation to prescribing?</td>
</tr>
<tr>
<td>7. Can you please tell me how your previous experiences have assisted you in making prescribing decisions?</td>
<td>7. Can you tell me how your previous nursing experiences influence your prescribing decision?</td>
</tr>
<tr>
<td>8. Can you explain your idea of medication management?</td>
<td>8. Can you tell me how your previous medication management experiences influence your prescribing decisions?</td>
</tr>
</tbody>
</table>
Appendix D: Interview guide (D2)

**Interview Guide Questions**

**Prescriber Mentors and Nurse Learners**

*NOTE:* The following questions will be used to guide the interviews and denote the areas to be explored. As the interviews proceed, it is anticipated that responses will bring into focus other questions to further clarify and open up the discussion.

<table>
<thead>
<tr>
<th>PRESCRIBER MENTORS</th>
<th>Advanced Nurses who were student Prescribers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Can you tell me why prescribing is an important part of your role?</td>
<td>1. Can you tell me why prescribing is an important role for a nurse practitioner?</td>
</tr>
<tr>
<td>2. The patient factor and the drug factor are both important elements in making prescribing decisions. Can you tell me which factor represents the most important determinant of prescribing and under what circumstances do these factors become important?</td>
<td>2. The patient factor and the drug factor are both important elements in making prescribing decisions. Can you tell me which factor represents the most important determinant of prescribing and under what circumstances do these factors become important?</td>
</tr>
<tr>
<td>3. Please think of a recent situation where you prescribed a drug. Explain the factors that influence your decision for prescribing this drug?</td>
<td>3. Can you describe a scenario during the practicum where you were working with your mentor prescriber that involved prescribing a drug? Moreover, can you tell me what factors lead you to suggest that a drug be prescribed, having made that decision to prescribe a particular drug?</td>
</tr>
<tr>
<td>4. In this case, which element would be weighted more heavily in your decision to prescribe, benefits weighted more heavily than risk of side effects? Alternatively, risk (risk of side effects rather than RISK) weighted more heavily than benefits of the treatment.</td>
<td>4. In this case, which element would be weighted more heavily in your decision to prescribe, benefits weighted more heavily than risk of side effects? Or risk (risk of side effects rather than RISK) weighted more heavily than benefits of the treatment?</td>
</tr>
<tr>
<td>5. As an experienced prescriber, who do you frequently turn for advice in matters relating to prescribing and why?</td>
<td>5. Who do you turn for advice in matters relating to prescribing and why?</td>
</tr>
<tr>
<td>6. Having mentored a nurse in a prescribing practicum, can you please describe the factors that you perceived inhibited or promoted safe and competent prescribing?</td>
<td>6. Having completed a prescribing practicum with a prescriber mentor, can you please describe factors that have promoted your skills and knowledge as potential prescriber? Can you also tell me what experiences were constraining your decisions to prescribe?</td>
</tr>
<tr>
<td>7. Did you have concerns and misgivings while you were mentoring a nurse into a prescribing role and did this change after you have mentored the student?</td>
<td>7. Can you tell me the main concerns that you felt or experienced being mentored by an experienced medical prescriber? Can you tell me if the mentorship of a mentor prescriber changed your nursing practice?</td>
</tr>
<tr>
<td>8. Can you explain your understanding of how medication regimes are managed?</td>
<td>8. Can you tell me how your previous nursing experiences influence your prescribing decision? Can you tell me how your previous medication management experiences have influence your prescribing decisions?</td>
</tr>
</tbody>
</table>
Appendix E: Example of initial categorisation of themes from *Narrizer*

**Mentor Prescribers:**

1. **Concerns from doctors – Negative concerns**

This category was created to address the concerns of doctors on prescribing by nurses.

1.1 **Focus on prescribing and not diagnosing**

*Comment:* This is an area that mentors perceive to be important in terms of learning differential diagnosis. The model of prescribing that doctors are referring to here is similar to GP’s scope of practice, where prescribing is similar to doctors - broad scope of prescribing. Need to consider especially for nurses working in primary care.

*Elizabeth* – Nurses have to be skilled at diagnoses. And I think what puts a lot of concern into medical people is the focus on prescribing and not diagnosing in this passage to a Nurse Practitioner with prescribing rights. And the whole thrust of the initial drive for Nurse Practitioners were about prescribing. It wasn’t about diagnosing. And, so, it’s the mindset on diagnosis, I think, is a key thing and not all Nurses have got that naturally.

*Geraldine* – And if we want to have effective prescribers we’ve got to have effective diagnosticians as well and it’s too much to expect that a nurse can become an effective diagnostician, unless you constrain the practice to a very small area of medicine.

*Phil* – Because I think prescribing in Primary Care is very squarely related to an understanding of differential diagnosis and drug interaction and I don’t think that the training that we offer in Nurse prescribing is anywhere near deep enough, it doesn’t include those aspects well enough, to be able to allow for safe prescribing.

1.2 **Prescribing in vulnerable groups**

*Comments:* The first scopes to be given prescribing authority were in Older adults and paediatric. Some criticisms were included in the mentors interviews that may have contributed to misunderstandings amongst doctors re nurse prescribing. Hence, Elizabeth’s comments re a group which is the most complicated to prescribe.

1.2.1 **Elderly and pediatrics**

*Elizabeth* – And we all know that the rationale for nurse prescribing was, that it was conceived by people who did not realize that the very conditions they wanted nurses to prescribe in, were ones [elderly and paediatrics] where diagnosis was actually fraught with danger.

*Phil* – We’ve talked about the diagnostic skills that are required but the other one is an understanding of interactions and it becomes particularly important in older age care. Now in older age there could be a really good one for nurse prescribing but they really need to understand the importance of interactions.
Doctors:

1. Beginning knowledge and skills

This category was created as it relates to the beginning journey of the junior doctors (new graduate to 8 years).

1.1 Undergraduate pharmacology education

1.1.1 Brush strokes -

Sarah — So we would do the anatomy and the physiology and the pharmacology and, you know, clinical relevance all at one time, so we would get a little bit of prescribing information at that time but very broad brush strokes as in, you know, “What medicine would you use? How would you manage this condition?” And it would just be, as I say, broad brush stroke so they would use something common like asthma and there would be, sort of, a little bit of information about how you would manage asthma in broad brush stroke.

1.1.2. Medical diagnosis

Sarah — And then you get, you get to a little bit more detail in the clinical years. But that’s fourth, fifth and sixth year. But again, my impression is that it tended to get a little bit more detailed the further out you got. So fifth and sixth year was really the, where, sixth year mostly, was where most of that teach, knowledge gathering occurred.

1.1.3 Case analysis approach

Sam — And he’d, you know, he was, that was his forte and he would sort of tell us, you know, he’d give us little like case studies and try and work it out and stuff, and that was really helpful.

Sam — I think it was, well we had because we in the clinical years so we did have some experience. But I think the best was like, it was small groups and we had like maybe, I don’t know, between five and ten students and one senior lecturer. You know, we had a handout of, with case presentations on them and we either chatted about them between ourselves or thought about them and then he, it was very casual, like had a white board and sort of went through the thing and just asked questions in a probing way to get you think, to think.

Sam — Not a lecture as such but like more like a tutorial I guess but it was very interactive. Yeah, I guess so, and it just made us think about what we were doing and why we were doing it...

Comments: Sam is a junior doctor of three years and graduated in the new medical education curriculum where it was integrated.

1.1.4 Prescribing

Sarah — You know, like you’re sort of, you’re nearly there and you need to know how to prescribe, so it was really the sixth year where that was fine tuned. Yeah.

1.1.4.1 small little steps
Nurse practitioner prescribers:

1. Prescribing issues - new prescribers

Initially - I divide this into two categories as I wanted to determine the initial problems that Nurse Practitioners encountered during their first year as prescribers so I can compare their experiences to midwives and doctors.

1.1 Misunderstanding in relation to prescriptive authority

1.1.1 From pharmacist

Chrisie -- ...right at the beginning I wrote out a list of the medications that I could prescribe and I also wrote these down on the website where pharmacists could look it up and also my Nursing Council number to see that I was authorized to prescribe...

Comments: Chrisie was describing the first time she was prescribing medications that happen to be specialist only medication. Because she was the first nurse practitioner to prescribe for this area, some pharmacists were not informed of what she can or cannot prescribe. This was one of the stories she gave to describe what she did at the beginning to get around the "red tape" that was still not clear... boundaries that were in a way blurred as nurse prescribing in this area is still new

Mark -- ...when I first started prescribing, I had a few Pharmacies that would ring up and say “I can’t see your number anywhere.” ...that was a bit tedious, and again it's tedious for the patient... I could not introduce myself to all pharmacists because these are Pharmacies throughout the country, throughout Auckland

1.1.2 Issues with special authority medications

Comments: issues with special authority medications is unclear for many nurse practitioners. The purpose of the special authority is for safety as majority of these medications are likely to cause adverse effects that require monitoring and evaluation by experienced clinicians. Because majority of the NPs are experienced in these area, they are used to seeing the drugs prescribed for specific conditions and have seen the safety aspects from that level.

1.1.2.1 Unclear about special authority medications

Chrisie -- Because I was under the impression when PHARMAC took the specialist recommendation off all of them and I hadn’t quite picked up that they hadn’t taken it off these three medications. So there was this big thing. I ended up being talked about on the Pharmacist website on their chat chat room saying you know who was this person basically and was she allowed to prescribe and then she prescribing Xeloda or something

Comments: Chrisie was describing a situation where there was miscommunication with the list of drugs she was able to prescribe.

Maggie -- ...cause a lot of our medications are specialist only or special authority but most of them I can prescribe.... it’s just that a Consultant has to actually apply for them.

Jane -- I guess, one thing I wouldn’t mind saying to you is that one of the only barriers that I’ve across in the issue around special authorities. Which is still a problem, and for two years... and in fact I’ve got the clinical director of our team onto PHARMAC as well now. I can start a drug in the hospital that has a special authority, but I can’t action the special authority when the patient’s discharged, even though I’m the one that would have started the drug. I have to get an SMG to do that

1.1.2.1.1 Need for more discussions with fellow NPs

Maggie -- Yeah, I must actually try and find out how you can change these things [special authority]. I cause I think one NP has done that... so I must try and find out how she did that but it’s just getting time to do, I guess yeah... this is where I think we need a group of NPs to discuss things like this.
Appendix F: Mapping – broad themes and categories within cases within cases (nurse learners)
Appendix F: Mapping-broad themes and categories within cases (Mentors)

ANALYSIS OF MENTOR PRESCRIBERS INTERVIEWS

1. **Lacking knowledge and skills of advanced nurses**
   1.1 focuses on diagnosing not prescribing  
   1.2 prescribing in vulnerable group  
   1.3 nurses lack confidence in decision making  
   1.4 threats for doctors

2. **Beneficial knowledge and skills of advanced nurses**
   2.1 relationship nurse and doctor  
   2.2 benefits of nurse prescribing  
   2.3 identifying key differences  
   2.4 prescribing as an important tool  
   2.5 advanced nurses and readiness to prescribe  
   2.6 support and structure  
   2.7. **novice vs. expert prescribers**

3. **Prescribing preparation A-doctors B-nurses**
   3A differences doctors/nurses'  
   3A.1 junior doctors and authority  
   3A.2 structure and support/doctors  
   3B nurses preparation  
   3B.1 different approaches  
   3B.2 scope of prescribing  
   3B.3 needs more emphasis in therapeutics

4. **Differential diagnosis**
   4.1 differential dx and process of reasoning  
   4.2 diagnostic reasoning and experience  
   4.3 diagnostic reasoning and clinical history  
   4.4 different approaches to differential diagnosis  
   4.5 risk assessment and differential diagnosis

5. **Advance nurses and junior doctors**
   5.1 nurses better than some junior doctor

6. **Decision making**
   6.1 decision making  
   6.2 lack of prescribing authority  
   6.3 straightforward interventions  
   6.4 risk assessment

7. **Advanced nurses and advanced skill**
   7A advanced nurses and clinical experience  
   7B other support, knowledge, structure needed to be safe and competent
Appendix F: Mapping - broad themes and categories within cases (Doctors)

ANALYSIS JUNIOR DOCTORS (RMOs) AND DOCTORS (SMOs)

1. **Beginning knowledge and skills**
   
   1.1 Undergraduate pharmacology education 1.2 Provided basic knowledge 1.3 Integration 1.4 Analytical reasoning 1.5 Factors that guide decisions

2. **Clinical experience**
   
   2.1 Novice prescriber 2.2 Experience prescriber 2.3 More experienced – Adaptive skills

3. **Prescribing rights and confidence**
   
   3.1 Prescribing rights on graduation

4. **High anxiety**
   
   4.1 Due to potential errors 4.2 OTHERS expectations 4.3 Due to first time prescribing 4.4 Need for more practice

5. **Practicing within the scope**
   
   5.1 Transition from hospital to community 5.2 Working as part of the team

6. **Ongoing need and education**
Appendix F: Mapping – broad themes and categories within cases (Midwives)

Midwives Prescribers

1. Educational preparation
   1.1 Education (emphasis on generic clinical areas, skills in drugs administration not prescribing, prescribing learnt on the job) 1.2 Education (focus on commonly used drugs in midwifery, able to integrate to midwifery, lacking principles for general application)
   1.3 Educational preparation – DE (prescriptive authority)
   1.4 Confidence in hospital setting

2. Clinical experiences
   2.1 RN/M nursing background vital
   2.2 DE – MW mentors vital

3. Clinical Practices
   3.1 Variability of practices with doctors (different training and approach)

4. Journey – Direct Entry
   4.1 High risk midwifery vs low risk midwifery
   4.2 Choices as postgraduates (scope of practice, high risk, low risk, difficult to define)
   4.3 Educational preparation (basic nursing training first year, more midwifery emphasis)
   4.4.1.1 Common conditions of pregnancy
   4.4.2.2 Lack of depth of knowledge – background knowledge in pharmacology and therapeutics, definition of normal, conditions, limited formulation
   4.4.3.3 Difficult to fit-in three years (variability of skills taught)
   4.4.4 Different reasoning for prescribing same drug

5. Prescribing decisions
   5.1 No “hard and fast rules”
   5.2 Learning from experience
   5.3 Common drugs
   5.4 Limited knowledge of drugs and conditions (rational for using multiple drugs)
   5.4.1.1 Unsure of side effects
   5.4.1.2 Unsure of integration to practice
   5.4.2.1 Conflict with doctors
   5.4.2.2 Conflict with diagnosis and treatment approach
   5.5 Problems with guideline interpretation (policy vs experience)
   5.6 Preference for herbal and homeopathic remedies
   5.7.1.1 Prescribing decisions (novice prescribers)
   5.7.1.2 Anxiety
   5.7.1.3 Lack of mentorship – difficulty to mentor (more experienced prescribers)
   5.7.2.1 Risk benefit
   5.7.2.2 Consultation
   5.7.2.3 Continue to improve knowledge fine-tuned
   5.7.2.4 Aware of legal responsibility and scope
   5.7.2.5 Cautious with common medications
   5.7.2.6 Fluid scope (variability)
   5.7.2.7 Patient context (pressure to prescribe – patients and in emergency situations)
Appendix F: Mapping – broad themes and categories within cases (Nurse practitioner prescribers)

NURSE PRACTITIONERS PRESCRIBERS

1. Prescribing Issues – new prescribers
   1.1 Misconceptions (pharmacist, special authority) 1.2 Prescribing boundaries (unclear expectations, consultants preference for limited list, knowledge of differential diagnosis, breaking boundaries) 1.3 Cautious prescribing (unfamiliar medications, concerns for side effects, more complex patient population)

2. Prescribing Issues – overtime (2 years)
   2.1 Confidence develops (prescription writing) 2.2 Confidence develops in prescribing decisions (differential diagnosis, diagnostic skills improve, continues to learn conditions) 2.3 Developing prescribing preferences 2.4 Develops confidence in extending use of other drugs 2.5 Diagnostic skills broaden (new drugs, new conditions extension of role) 2.6 Develop skills in professional courtesy

3. Prescribing decisions – cross-over to medical decisions
   3.1 Prescribing as a rational process 3.2 Learning analytical skills (Differential diagnosis 3.2.1.1 Diagnostic tools, Autonomous practice vital to skills development) 3.3 Strong holistic approach to prescribing decisions (factors that influence decisions 3.3.1.1 social context 3.3.1.2 Cost concern Mentors influence) 3.4 Consulting rather than referring (specialist level 3.4.1.1 Role in education of RMOs/colleagues)

4. Prescribing Practices
   4.1 Fluidity of scope 4.2 Developed a limited formulary list (question prescribing as an independent activity) 4.3 Enhanced collaborative practice (house surgeons, Registrars, GPs, Consultants) 4.4 Improved relationships with colleagues (teaching junior doctors) 4.5 Role more equal to SMOs 4.6 Evolving/expanding role (role changed)

5. Prescribing in the context of nursing
   5.1 Tailor to patient context (clinical decisions 5.1.1.2 Continuity of care 5.1.2.2 providing advice) 5.2 Benefits evident (benefit time, benefits follow-up and treatment, benefits to completing care, benefits to service delivery, benefits for NPs)

6. Perception of new role
   6.1 Patients perception (less educated patients) 6.2 Colleagues perceptions (nurses, other HPS, doctors and consultants) 6.3 Infrastructure (promotion of the new role, financial support, specialty area support) 6.4 Support from wider institution (network support, more support in PHC setting)
### Appendix G: Themes and categories across-cases

#### ANALYSIS OF ALL GROUPS

**THEME 2: PRESCRIBING AS AN ACTIVITY – SKILLS**

<table>
<thead>
<tr>
<th>RMOs/SMOs</th>
<th>NOVICE/BEGINNING</th>
<th>EXPERIENCED</th>
<th>ADAPTIVE – MORE EXPERIENCED</th>
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<tbody>
<tr>
<td><em>mentorship vital</em></td>
<td>Teddy — Because a lot of the times, I'm sure we give someone [patient] something [drug] without knowing the risks... just based on the information of this drug, you know, if everyone just give everyone that... but hey, does it actually work? Not everyone knows and there's no definite answer out there. And I would say, you know, having some mentor or senior to discuss prescribing or things with, would be very useful.</td>
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<tr>
<td><em>clinical experience vital</em></td>
<td>Rami — And like I said the more you use it [prescribing], the more you know what they do and you still learn everyday along the way the side effects, interactions of medications which you may not have learnt or you may have forgotten since you first learnt them.</td>
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<tr>
<td><em>clinical perspective</em></td>
<td>Kate – you definitely learn it as an undergraduate and then it's getting that clinical perspective of not fretting the whole time about whether or not you know that about every single drug but just having that little red flag go in your head of when you</td>
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<td><em>confidence improves</em></td>
<td>Kate — Responsibility in terms of prescribing, I think it's probably evolved over time, the level of responsibility changes you know certainly within the first few years I wouldn't have any confidence in starting somebody on you know the oral contraceptive pill or an anti-hypertensive and things</td>
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<td><em>individual choices</em></td>
<td>Kate — But I still don't think I would have made any big decisions on starting people on new drugs or changing doses without actually having some senior. And I think that's probably the difference as even now we're very lucky as Hospital Practitioners that we're always making team decisions and so there's not many times I think as Doctors we actually go and see a patient and make an individual choice to start them on a new medication without having had some team input</td>
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<tr>
<td><em>learning from mistakes</em></td>
<td><em>reverts back to novice</em></td>
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<td><em>adaptive skills</em></td>
<td>Tiffany — And something like, Cariprolol, you know, that's a very old fashioned beta blocker and that was probably way before Betaloc came around. But now that Betaloc's in fashion, the one's that used to be on Cariprolol are still on Cariprolol or maybe they started on Atenolol and their renal functions were fine and they developed renal dysfunction but no one stopped the Atenolol and changed that to Betaloc instead. You know, that's like something common that I see, and then I just swap it over. You need to be able to adapt the knowledge and skills ... to help you practice better,</td>
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<td><em>questions status quo</em></td>
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</tbody>
</table>

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### ANALYSIS OF ALL GROUPS

#### THEME 2: PRESCRIBING AS AN Activity – SKILLS

<table>
<thead>
<tr>
<th>Mentor Prescribers</th>
<th>EXPERIENCED</th>
<th>ADAPTIVE – MORE EXPERIENCED</th>
</tr>
</thead>
</table>
| **NOVICE/BEGINNING** | *Linear thought patterns*  
Elizabeth -- Yes, I think when you start off prescribing you have very linear thought patterns. You’re going, you know, “This is the symptoms, this is the diagnosis, this is the drug.” And you are unaware that in fact prescribing is not a linear process. And yet it is frequently taught as a linear process.  
*Novice better knowledge*  
Geraldine -- But the new prescriber may actually have better knowledge. She’s careful, before we judge that new prescriber. She knows up to date information. A young Doctor can have a awful lot to offer, whereas the old Doctor’s getting a little bit rusty. So both have for’s and against. You see what I’m getting at?  
*novice tendency to use drugs*  
Phil …If you’re a novice prescriber or if you’re unfamiliar with the territory you tend to think there’s got to be a drug answer to this problem let’s just prescribe it. | *Takes calculated risk*  
Ross -- So, then you say, “Well is there another drug that I can drop off to make room for this drug?” And that’s quite a common concept that I talk about with patients… I learnt to take risk… and can sleep through the night thinking I have what’s best  
*various lines of thought processes*  
Ross -- There’s various lines of thought processes that you use but you’ve got to try and categories what you’re dealing with to actually try and make a clear decision on what is wrong with the patient and then what type of medicine and, what type of treatment is going to be appropriate for this patient… I am sure as novice I was still learning that  
*careful with prescribing medications*  
Phil -- So whereas if we’re careful prescribers we tend to shy away from introducing new medications where we can.  
*experience prescribers learn to say no*  
Geraldine -- As I go on in my career, I realize the wisdom comes in saying no, not saying yes. You know, patient says, “I want you to prescribe me my repeat *Prescribing not a linear process*  
Phil -- And what, what I’m saying is that quite often prescribing is not a linear process, but it’s a circular process, that you’ve got your basic pharmacology knowledge, your therapeutics is sort of the key thing.  
*justify usage of drugs in other situations*  
Phil -- I didn’t wait, well I suppose I did and what I did it was late at night, it was midnight or something I can’t remember. I phoned up the Intensive Care Doctor and I said “I know you use this stuff (laughter) and what do you think of it in a neonate situation” and he thought “It seems valid”. And so I had, so I had him and I had the evidence base from the, from the computer which wasn’t great but it was good enough to justify usage and so it’s only retrospectively that my colleagues come in and say you know well that was good or that was bad.  
*use drug in patients with insufficiency (hepatic/renal)*  
Elizabeth -- And instead we focused everything on knowing about the drugs. And that’s actually out here. Because, don’t take this the wrong way, but any fool can go and look up a drug. It’s why I’ve got them |
prescription of morphine, or my repeat prescription of regular anti-inflammatory which Dr Brown has prescribed me, despite me being on anti-failure medication” It’s the wise doctor who says no. It’s really hard for some to understand that it is the wise Doctor who may say no. And it’s really hard too... you’ve got social pressure from your patient, from your colleagues, saying, “Why did you make such a fuss?”

*works with a team
Geraldine -- We need to be not acting alone. We need colleagues from our own discipline, like fellow Doctors, or nursing colleagues or, you know, from the different disciplines, to keep us safe and to say, “Should you be doing this?” The, as I go on in my career, I realize the wisdom comes in saying no, not saying yes.

*experience increase confidence
Phil -- Yes I think it comes with clinical experience yeah...Cause from that you learn the confidence to sort of move on and inevitably you’ll get it wrong once or twice and you know drug interactions and adverse events are going to happen and they happen quite frequently and so you know we need our, our prescribers to understand that it’s not their fault when they happen as long as they’ve taken the necessary care at the initial decision making.

on my PC and so on and so forth. And I frequently look up drugs, but usually it’s for something very technical. It’s not so much as to the how or where to use them, or for something very, very technical about an interaction or, more importantly....“Can I use it in renal failure or hepatic,” you know what I mean

*conceptual transfer
Elizabeth -- Now, what I’m actually saying is what you tend to pull out of this level is conceptual knowledge. That feeds up into the higher levels. And it’s an, it’s an informative, conceptual transfer, which includes the fact that in some instances you may need to go back down and break open, and get some more detail out, to inform you, and go back up. But what you actually maintain is, the stuff that we did in the sixth form or the stuff we did at undergraduate, you don’t maintain the detail of that.