

The Administration and Supply of Controlled and Restricted Medications by Queensland Rural and Remote Nurses.

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EXECUTIVE SUMMARY

Introduction

Nurses working in rural and remote areas of Australia often have an expanded role compared to their counterparts working in metropolitan areas. Recent changes in legislation recognise and attempt to accommodate some of these differences. The most important area in which differences exist is that involving the medication of clients. This report describes the results of a study of the medication practices of nurses extant in rural and remote Queensland in 2001 to 2002 and addresses issues concerning the compliance with recent state legislation of that practice.

The objectives of the study were as follows.

1. To describe the current practice of Queensland rural and remote area nurses when administering and supplying medications.
2. To describe the extent to which rural and remote area nurses' medication administration and supply practices comply with current legislation, patient management protocols, health policy, nursing standards and the Best Practice Information Sheet (BPIS).
3. To assess the impact guidelines embodied in current legislation, patient management protocols, Queensland Health policies and procedures have on the administration and supply of medications in the everyday practice of rural and remote area registered and enrolled nurses.
4. To assess to what extent the absence of other health care practitioners, the isolation of the health facility, and the demands of rural consumers explain examples of compliance or non-compliance with accepted norms.
5. To assess to what extent generic policies and guidelines on nursing practice accommodate the health needs of rural and remote populations in Queensland and the contextual needs of rural and remote area nursing practice.

Background

The *Health (Drugs and Poisons) Regulation 1996* and its amendments (hereafter called the *Regulation*) outline the practice requirements of registered and enrolled nurses (RNs and ENs) in Queensland with regard to S2 and S3 Poisons and controlled (S8) and restricted (S4) drugs. The *Regulation* authorises nurses who have been endorsed under the *Nursing Act 1992* to practice differently from other nurses (Queensland Government 2000). Sections within the *Regulation* outline the role and responsibilities of nurses with and without specific endorsements, of Directors of Nursing of Nursing homes or rural hospitals, and of nurses working in specific situations. The endorsed nurses that are the major focus of this study are the rural and isolated practice endorsed RNs and medication endorsed ENs, labeled respectively RINs and ENs (MED).

The *Regulation* states that ENs (MED) are able to possess a restricted drug at their place of work, administer a restricted drug (other than an anaesthetic) on a doctor's instruction and under the supervision of a registered nurse or doctor; and administer a restricted drug to a person for whom it has been dispensed under the supervision of a registered nurse or a doctor. ENs without a medication endorsement are authorised to administer an S2 or S3 poison under the supervision of a RN or medical practitioner.

RINs are required by the *Regulation* to work within a Drug Therapy Protocol (DTP), which is defined as 'a document certified by the Chief Executive and published by the Department

[of Health] stating the circumstances in which, and conditions under which, a person who may act under the protocol may use a stated controlled or restricted drug or poison for stated purposes' (Queensland Government 2003, p. 215). A specific DTP exists for rural and isolated practice endorsed RNs. For a RIN to work within a DTP, the employer of the RIN must work within current Health Management Protocols (HMPs) as described in the *Primary Clinical Care Manual* (PCCM) (Queensland Health and Royal Flying Doctor Service 2001). The adoption of these protocols must be approved by a multidisciplinary team with a minimum composition of a medical practitioner, registered nurse and pharmacist and be signed off by the District Manager. If the HMPs have not been signed off by the District Manager, the RIN is unable to work within the DTP and must work as a non-RIN.

The PCCM provides clear instructions concerning all facets of management of patients and administration of specific drugs, including the recommended drug therapy for each clinical presentation. The DTP lists the drugs that an RN is able to administer, the route of administration and any restrictions or conditions placed on the administration. If the drug is not listed on the DTP, but is listed in the PCCM, then the nurse is unable to administer or supply the drug without a verbal or written prescription from a medical practitioner or dentist.

An underlying concern motivating this study is that of medication error. Responsibilities in the management of medications, assessment of risk of medication errors, the detection of factors that increase the risk of medication errors, and the suggestion of ways in which risk may be reduced are considered in this report.

Method

The study involved two phases. Phase 1 entailed purposive sampling of health facilities with the objective of capturing the range of current medication practices existing across rural and remote Queensland. Phase 2 involved random sampling of nurses, seeking a representative description of the current medication practices of rural and remote area nurses in Queensland.

Phase 1 took place in June and July of 2001. Three instruments were involved: (a) an audit of individual patient charts documenting the completeness of these records; (b) an audit of the overall medication practices in the health facility providing the auditor of the individual patient charts an opportunity to expand on the picture captured by the chart audit; and (c) a site booklet designed to profile the demographics of the health facility and its relationship with medication administration and supply within the facility.

Phase 2 took place during August and September of 2002. One instrument was involved – a questionnaire mailed out to randomly-selected nurses. The results of Phase 1 contributed to the content of the questionnaire in Phase 2.

All instruments were developed and assessed by experts, pre-tested and piloted. The survey documents were mailed out to participating facilities or respondents. Twelve facilities selected from a range of government and non-government, rural and remote facilities, and representing a range of types of communities agreed to participate in Phase 1. Eight (67%) returned completed instruments. These instruments included a site booklet, an overall audit form and up to 100 individual chart audit forms from each facility.

Phase 2 employed a non-proportional stratified random sampling. Based on Queensland Nursing Council (QNC) records, the population of rural and remote area nurses were divided into four strata as follows: nurses with a Remote and Isolated Practice Endorsement (RINs) who live in a rural area; non-RINs (both RNs and ENs) who live in a rural area; RINs who live in a remote area; and non-RINs (RNs and ENs) who live in a remote area. This design reflects an interest in discriminating as effectively as possible between the practices of RNs with and without a Remote and Isolated Practice Endorsement and between the practices of rural and remote area nurses. Membership of each stratum strata was reassessed after data collection to accommodate nurses who had recently obtained endorsements. Post-adjusted sample sizes and response rates for each stratum were as follows: RIN-rural 13 (50%); non-RIN-rural 298 (32%); RIN-remote 40 (59%); and non-RIN-remote 300 (32%). The small sample sizes included in the strata containing RINs nurses reflect a census of these two subpopulations. Sufficient numbers of ENs (MED) existed within the non-RIN strata to avoid the need to stratify further. Of the total of 1999 nurses invited to participate, 668 responded (including nurses whose stratum could not be identified) with an overall response rate of 33%. Although comparisons of the respondents with the most recently available work-force figures suggest no significant non-response bias on a demographic basis, the potential for bias on other indicators cannot be discounted.

Major results and conclusions

The major findings of the study are as follows:

1. The majority of nurses believed they had sufficient knowledge to undertake the initiation, administration and supply of medications safely and competently. This knowledge was assisted by ready access to reference materials, the most commonly used being MIMS. In facilities where electronic versions of MIMS only are available, nurses believed that the change to electronic delivery without access to a paper systems version was a retrograde step.
2. Nurses require further education with regard to their scope of medication practice and to the *Regulation*. In particular, nurses need to be aware that:
 - a) The obligation to have medical practitioners confirm in writing, orders for restricted drugs within a 24 hour time period is only required for controlled drugs.
 - b) When a medical practitioner does not confirm the controlled drug order in writing within the statutory time period, a nurse's only responsibility is to notify the DON.
 - c) The need for two nurses to listen to telephone orders is a recommendation for safe practice but is not a requirement of the *Regulation*.
3. Many nurses were not aware that RNs are able to initiate and administer (and in some cases) supply S2 and S3 poisons.
4. RNs continue to initiate, administer and supply medications that were not ordered under a written or verbal prescription or were not on a protocol or standing order. The RNs who undertake this activity were more likely to be RINs than non-RINs, suggesting that the RIN endorsement has not completely stopped this previously reported activity of rural and remote area RNs.
5. ENs were more likely to work outside the *Regulation* than RNs. Areas where ENs are working outside their scope of nursing practice and/or the *Regulation* include:
 - a) The initiation, administration and supply of prn ('as required') medications in the absence of an RN. ENs (MED) are more likely to undertake this role than non-ENs (MED).

- b) The initiation, administration and supply of restricted drugs. Unless they are ENs (MED), ENs administering restricted drugs were working outside the *Regulation*. Similarly, some ENs (regardless of endorsement) were initiating and supplying restricted drugs and this is not within the *Regulation* or their scope of practice.
 - c) Both medication-endorsed and unendorsed ENs initiating, administering and supplying controlled medications.
 - d) The use of the Scope of Nursing Practice Decision Making Framework to delegate to unregulated care providers.
6. Non-RINs in rural nurses and nurses employed in aged care and community health were more likely to use standing orders than RINs, particularly RINs from remote areas. Additionally, ENs from remote areas were more likely to use global standing orders. These findings suggest that the introduction of the PCCM and the RIN endorsement has decreased the necessity for standing orders.
 7. Nurses rarely provided Consumer Medicine Information (CMI) to patients. No difference in this activity appears to exist between RINs and non-RINs suggesting that the need for patient education has not been a major focus in endorsement education programs.
 8. The supply of medications was a frequent activity of many rural and remote area nurses, with at least 50% of the nurses in this study supplying these on a daily basis. This activity is more likely to be carried out by remote area nurses (reflecting the lack of facility or community pharmacists) than rural nurses, and by RINs from both rural and remote areas
 9. The labelling of medications did not often comply with the *Regulation*, particularly with regard to the need to provide warning statements, such as, 'Keep out of reach of children'. Further, less than 50% of nurses are initialling the label prior to supplying it to the patient/client.
 10. The storage of medications generally complied with the *Regulation*. One area which appears to require attention however, is maintaining the storage area at the correct temperature, especially during the summer months.
 11. Both transportation and disposal of medications in rural and remote areas require attention. However, as the study did not ascertain what aspects of transportation and disposal required attention, and there were no qualitative comments invited from respondents, it is difficult to comment on specific aspects of transportation or disposal except to report that follow-up research is needed.
 12. Although not specifically examined in the study, two areas of concern regarding the packaging of medications came to light. First, there was a lack of medication supplied in packaging that the respondents believed was suitable to supply to patients/clients. In particular, this inappropriate packaging took the form of a lack of starter packs which meant that respondents were forced to give large amounts of medication, which they believed was unnecessary (or dangerous). Second, the area of filling dosette packs was also raised with many nurses believing that the transferring of medications from dispensed medication bottles or packs into dosettes increased the risk of medication error.
 13. The introduction of the Rural and Isolated Practice Endorsement for RNs has resulted in a decreased need for RNs to telephone medical practitioners for medication orders.
 14. Medical practitioners often failed to provide a legible prescription although rural nurses were more likely to perceive this as an issue than remote area nurses.

15. There is evidence of a lack of understanding by some medical practitioners sent to work in rural and remote areas of pharmacology and of the role of rural/remote area nurses compared to metropolitan nurses.
16. Members of rural and remote communities, other health professionals and other nurses generally had a poor understanding of both the EN (MED) and the RIN roles.
17. A majority of nurses with a medication-related endorsement believed the endorsement was sufficient for their current practice. Further, they believed that participating in the endorsement course changed their nursing practice for the better.
18. Increased remuneration is the major improvement desired by nurses to improve the endorsed nursing role.
19. The PCCM is used extensively by remote area nurses and there is growing use of the PCCM in rural areas. A large majority of nurses believed that the PCCM supports their nursing practice.
20. The consensus is that preparation for safe medication practice is largely a product of experience, of formal education, such as provided in medication endorsement courses, of in-service training and of access to self-paced, regular updates.
21. Higher rates of medication errors appear to be associated with lower levels of accessibility and adequacy of reference materials and higher expectations of medical practitioners that nurses would violate administration procedures. Also higher workloads, lower staffing levels and lower skills mix were associated with higher levels of medication violations. Further, the higher the workload the more the doctors expect nurses to work outside the *Regulation*, thus increasing the risk of medication errors.

Recommendations

On the basis of the findings of this study, the following recommendations are made.

1. Nurses should have easy access to reference material (e.g., MIMS) that is readily accessible at the patient bedside, as it is apparent that easy access to reference material is associated with the lowering of the potential for medication errors.
2. Since some nurses are unaware of certain aspects of the *Regulation*, further education on the following points is recommended:
 - a) Verbal orders for restricted drugs do not need to be confirmed in writing unless this is a health facility policy.
 - b) Nurses may need to remind medical practitioners to confirm in writing within 24 hours any verbal orders for controlled drugs. However, the ultimate responsible person for the lack of a written prescription is the Chief Executive of Queensland Health, not the nurse.
 - c) RNs have the ability to initiate and administer S2 and S3 poisons and they do not need a prescription (either verbal or written) from a medical practitioner for these drugs.
 - d) The practice of two nurses listening to verbal telephone orders is a recommendation for safe practice but it is not a requirement under the *Regulation*.
 - e) The initiation, administration and supply of S2 and S3, restricted and controlled drugs by ENs, which occurs outside the *Regulation*, cease forthwith until an investigation is held by Queensland Health to ascertain the need for such practices.
3. Queensland Health should ensure that all medical practitioners who are sent to work in rural and remote health facilities are competent in pharmacology.

4. Queensland Health should ensure that all medical practitioners who are sent to a rural or remote health facility have adequate understanding of the differences between metropolitan and rural/remote health service delivery.
5. That RNs and ENs be made aware of the importance of providing CMI and other forms of education about medications to patients/clients.
6. Queensland Nursing Council or Queensland Health should provide education to rural and remote area nurses with regard to their obligations when supplying medications, particularly with regard to correct labelling procedures.
7. That the QNC provide further education concerning the scope of practice of ENs to RNs, ENs (both medication-endorsed and non-endorsed) and members of health facilities.
8. That the QNC continues to provide education to both RNs and ENs on the Scope of Nursing Practice Decision Making Framework within the context of delegation of RNs to ENs and the level of responsibility of the RNs when this occurs.
9. Queensland Health should investigate the supply of starter packs to nurses who are required to supply medications as part of their nursing work.
10. A further study should be instituted with regard to the use of dosettes, particularly in residential aged care. Best practice suggests that it is inappropriate for nurses to be loading dosettes as this increases the risk of medication error.
11. That the QNC deliver a public awareness program to educate the public on the role differences between endorsed and unendorsed nurses. This awareness program could include posters that are placed within workplaces and flyers that nurses provide to individual members of the community.
12. That medical practitioners and allied health professionals be made aware of the difference between a RIN and an RN. This awareness campaign could take the form of information to medical and allied health students, information provided in orientation to Queensland Health, and flyers that are sent to medical and allied health practitioners within Queensland.

1. INTRODUCTION

In a 1996 study of rural nursing in Australia, Hegney stated that the rural and remote area nursing environment was a major determinant of the scope of nursing practice. She argued that factors such as knowing the community, being known within the community, a lack of on-site medical and allied health services, and a lack of professional support networks and poor access to education and training influenced the scope of practice of the rural registered nurse and therefore impacts upon the medication practices of rural and remote area nurses. For example, one of the themes identified in her study was nurses' concern with the high level of telephone orders from medical practitioners for controlled and restricted drugs. Hegney (1996) reported that nurses in her study were concerned about the inability (or unwillingness) of medical practitioners to verify the verbal order in writing within the statutory time period set down in legislation. The study did not, however, include enrolled or remote area nurses nor did it verify, by audit, the reports of the nurses.

Baker and Napthine (1994) stated that nurses in Australia have traditionally been closely associated with the administration and supply of medications and assessment of the patient for their responses to medications. They noted that nurses in the 1990s were required to have knowledge of medications, an understanding of the law regarding the regulation of medications, their storage, administration and documentation, an up-to-date knowledge of the use of medications for each disease state, and knowledge of medication side-effects. Their analysis of the literature for the period 1983 to 1993 identified four domains of concern with regard to medication practice. These were medication error, drugs and the elderly, patient compliance and extended/expanded practice for nurses, including prescribing privileges.

With respect to the medication practices of nurses, whether legal or illegal, Baker and Napthine (1994) raise three important questions: (1) How many nurses are operating in the belief that their practice is condoned by medical officers?; (2) How many nurses have documented standing orders for their practice?; and (3) How many of the medical officers would support the nurse in practical ways should the nurses' actions be questioned? They noted that there was little published data on the use of medications by nurses working in an expanded role.

Nurses employed in rural and remote areas often work in an extended or expanded role. This role difference is due to the lack of generalist and specialist medical practitioners and allied health professionals (Hegney, Pearson and McCarthy 1997). Until the changes to Queensland's *Health (Drugs and Poisons) Regulation* in 1996, many of these nurses were working outside the legislation (Kreger 1991; Hegney et al. 1997). It was not apparent, however, if the changes to the Queensland legislation provided adequate legal protection for the expanded role of rural and remote area nurses.

1.1. Aim of the Study

This study aimed to address the lack of knowledge concerning the medication practices of nurses in Queensland after the introduction of changes to the *Health (Drugs and Poisons) Regulation* (1996). In particular, it gathered data from registered and enrolled nurses employed in rural and remote areas of Queensland in 2001 and 2002.

The study was undertaken in two phases as described in the following chapter.

1.2. Research Questions

The study addressed the following questions.

1. What is the current practice of rural and remote area nurses when administering and supplying medications?
2. To what extent do rural and remote area nurses' medication administration and supply practices comply with current legislation, patient management protocols, health policy, nursing standards, and the Best Practice Information Sheet (BPIS)?
3. What impact do guidelines embodied in current legislation, patient management protocols, Qld Health policies and procedures have on the administration and supply of medications in the everyday practice of rural and remote area registered and enrolled nurses?
4. To what extent can the absence of other health care practitioners, the isolation of the health facility and the demands of rural consumers explain examples of compliance/non-compliance with accepted norms in this area?
5. To what extent do generic policies and guidelines on nursing practice accommodate the health needs of rural and remote populations in Queensland and the contextual needs of rural and remote area nursing practice?

1.3. Expected Outcomes

The expected outcomes of this study were:

1. Documentation of the current practice of rural and remote area registered and enrolled nurses with regard to the administration and supply of medications, in addition to their relationship with other members of the health care team and the rural and remote community (Phases 1 and 2 of the study).
2. Identification of the strengths and weaknesses of current practice (for example, in level of compliance) when compared to the BPIS and Queensland's *Health (Drugs and Poisons) Regulation, 1996* (Phases 1 and 2 of the study).
3. The provision of information of the types of medications frequently administered and supplied by rural and remote area nurses, either with or without a prescription, and the context in which this occurs (Phase 1 of the study).
4. An indication of the parameters which need to be established to ensure best nursing practice with regard to the quality use of medicines in rural and remote areas including collaborative practice with other health professionals (Phases 1 and 2 of the study).
5. Better understanding of the areas which are strengths and weakness with regard to the administration and supply of medications allowing education providers to design courses specifically targeted towards the administration and supply of medication for rural and remote area registered and enrolled nurses in Queensland (Phases 1 and 2 of the study).

1.4. Literature Review

It has been estimated that the administration of medications to clients occupies up to one third of nurses' time (Pepper 1995). The time taken to initiate, administer and supply medications, however, is not a discrete block of time throughout the day. In fact, observation of some nurses who seem to be able to complete a medication round, answer the telephone and help prepare clients for their meals, all at the same time, may lead to the assumption that

the handling of medications is a simple task involving the removal of the medication from its packaging and its delivery to the client. However, a review of the literature reveals that there is much more to this task. In fact, medication administration is probably the task with the highest risk to the client that a nurse can perform (Anderson and Webster 2001). There is no doubt that the initiation, administration and supply of medications is a complex process involving multiple players which include health care professionals, the client and the health care environment (Wakefield et al. 1998).

1.4.1. The Queensland environment

The *Health (Drugs and Poisons) Regulation 1996* and its amendments (hereafter in this report called the *Regulation*) outlines the practice requirements of registered and enrolled nurses in Queensland with regard to S2 and S3 Poisons and controlled (S8) and restricted (S4) drugs.

In Queensland, the *Regulation* authorises nurses who have been endorsed under the *Nursing Act 1992* to practice differently from other nurses (Queensland Government 2000). The endorsements contained in the *Nursing Act 1992*, are rural and isolated practice (RIN), sexual and reproductive health (SRH), immunisation (IPN), mental health nurse (MHN), midwifery (MID), and medication endorsement for enrolled nurses (MED). For the purpose of this study, the major focus has been on RINs and EN (MED). It should be noted that nurses who are RINs describe themselves in this study as RIPERNs (rural and isolated practice endorsed registered nurses). Whilst this was the title used in the early stages of the introduction of the endorsement, in 2003 the Queensland Nursing Council released the official endorsement terminology (i.e., RIN). Similarly, endorsed enrolled nurses are often described as EENs when the correct terminology is EN (MED). In this report the terms RIN and EN (MED) are used unless a direct quote from a nurse is involved.

These changes are unique to Queensland. How registered and enrolled nurses with or without these endorsements can practice with regard to the administration and supply of medications are clearly outlined within the *Regulation*. The relevant sections of this *Regulation* and their relationship to this study are now discussed.

1.4.1.1. Enrolled Nurses (ENs)

Section 162 of the *Regulation* states that enrolled nurses who are endorsed for the administration of restricted drugs are able to possess a restricted drug at their place of work, administer a restricted drug (other than an anaesthetic) on a doctor's instruction and under the supervision of a registered nurse or doctor, and administer a restricted drug to a person for whom it has been dispensed under the supervision of a registered nurse or a doctor (Queensland Nursing Council 2001a).

With regard to S2 and S3 poisons, ENs are authorised in the *Regulation* to administer an S2 or S3 poison under the supervision of a registered nurse or a doctor (Queensland Nursing Council 2001a).

1.4.1.2. Registered Nurses (RNs)

RINs work within a Drug Therapy Protocol (DTP) which is defined as 'a document certified by the Chief Executive and published by the [D]epartment [of Health] stating the circumstances in which, and conditions under which, a person who may act under the protocol may use a stated controlled or restricted drug or poison for stated purposes' (Queensland Government 2003, p. 215).

a) Drug Therapy Protocols (DTP)

For each of the rural and isolated practice, sexual health, and immunisation endorsements for registered nurses, a DTP has been developed (Queensland Health Environmental Health Unit 2002). This section briefly describes the Rural and Isolated Practice Drug Therapy Protocol as it is the main focus of this study. It is the RIN who is able to work within this DTP.

The first requirement for a RIN to work within the DTP is that the employer must have a current Health Management Protocol (HMP). The HMP used in Queensland is the *Primary Clinical Care Manual* (PCCM) (Queensland Health and Royal Flying Doctor Service 2001). Despite the development of a State-wide protocol (the PCCM), each Health District is required to adopt the protocols in whole or in part. This adoption must be first approved by a multidisciplinary team with a minimum composition of a medical practitioner, registered nurse and pharmacist. Their recommendation is signed off by the District Manager. If the HMPs have not been signed off by the District Manager, the RIN is unable to work within the DTP and must work as a non-RIN.

The PCCM clearly outlines the procedures for the clinical assessment, management and follow-up of patients including the recommended drug therapy for each clinical presentation. Each protocol must clearly outline the name, form, and strength of any suggested drug; the recommended dose, the route of administration, the frequency (including the rate where applicable) and duration of administration of the drug; the duration of the drug supply before medical intervention or follow-up is required; and the type of equipment and management procedures required for the management of an emergency associated with the use of the drug (Queensland Health Environmental Health Unit 2002).

The DTP lists the drugs which the nurse is able to administer, the route of administration and any restrictions or conditions placed on the administration. If the drug is not listed on the DTP, but is listed in the PCCM, then the nurse is unable to administer or supply the drug without a verbal or written prescription from a medical practitioner or dentist.

It is clearly stated within the DTP that when consumer product information (now called consumer medicine information) is available for a particular drug, the RIN should provide this information when administering or supplying medications (Queensland Health Environmental Health Unit 2002).

The DTP places specific restrictions on obstetric drugs. All RINs without a midwifery endorsement must consult a medical practitioner prior to the administration of obstetric drugs (Queensland Health Environmental Health Unit 2002). In contrast, endorsed midwives (who are also RINs) can initiate the administration of obstetric drugs as long as they do so within the DTP and the HMP (Queensland Health Environmental Health Unit 2002).

There are specific sections within the *Regulation* which outline the role of RNs (RINs and non-RINs) and midwives and these are discussed below.

b) The Regulation - Registered Nurses and Midwives

Sections 62 and 167 of the *Regulation* state that **midwives** can possess a controlled or restricted drug at the place where they practice midwifery and can administer this drug on a **doctor's** written or oral instruction. They are also able to administer the drug to the person for whom it has been dispensed under the instructions stated by the dispenser. Midwives are

also authorised to administer S2 and S3 poisons, and if they are employed in a hospital in an isolated practice area, they can supply an S2 or S3 poison on a doctor's instruction to a person being discharged from the hospital or to an outpatient of the hospital (Queensland Government 2003).

Sections 67(controlled), 175(restricted) and 263(S2 and S3 poisons) of the *Regulation* outline the authorisations of **RNs**. Specifically they are able to administer controlled and restricted drugs on a doctor's or dentist's oral or written instruction, and administer the drug to the person for whom it has been dispensed under the instructions stated by the dispenser. They are authorised to administer S2 and S3 poisons (Queensland Government 2003).

RINs working in a rural hospital or isolated practice area can obtain a controlled or restricted drug, possess these drugs at their usual place of work, and administer or supply them on a doctor's instruction or under a DTP. A RIN is also able to supply a S2 or S3 poison to or for a person requiring treatment at a rural hospital or isolated practice area (Queensland Government 2003).

Immunisation endorsed nurses (IPN) are able to possess a vaccine or other restricted drug at a place where the nurse practices under the immunisation program and administer the vaccine or other restricted drug under the supervision of a doctor, on the doctor's oral instruction or under a DTP (Queensland Government 2003).

Sexual and Reproductive Health nurses (SRH) are authorised to possess a restricted drug at a place where the program is conducted and administer or supply a restricted drug under the supervision of a doctor, on the doctor's oral instruction, or under a DTP (Queensland Government 2003).

A non-RIN who works within a hospital in an isolated practice area is able to supply controlled and restricted drugs and S2 and S3 poisons, on a doctor's instructions, to a person being discharged from the hospital or to an outpatient of the hospital (Queensland Government 2003).

The *Regulation* also outlines the responsibility of **Directors of Nursing** (DON) of nursing homes and rural hospitals. For example, Sections 63 and 169 state that the DON of a nursing home and the RN in charge of the nursing home can obtain a controlled and/or restricted drug for use at the home, possess a controlled or restricted drug, and issue the controlled or restricted drug to an authorised person who may administer or supply it for the treatment of a resident of the nursing home (Queensland Government 2003).

Sections 68, 176 and 263A of the *Regulation* note that the DON of a rural hospital, or an RN nominated by the DON, can supply a controlled or restricted drug and a S2 and S3 poison on a doctor's or dentist's instruction to a person being discharged from hospital or to an outpatient of that hospital if the hospital does not employ a pharmacist or the pharmacist is absent (Queensland Government 2003).

1.4.1.3. Labelling of medications

The labelling of medications is covered by Sections 85(Controlled Drugs), 198(Restricted Drugs) and 276(S2 and S3 poisons) of the *Regulation*.

The *Regulation* states that a person who supplies a controlled or restricted drug or an S2 or S3 poison on a written instruction must label the container as follows:

- a) All medications should have on the label the instruction to keep it 'out of reach of children'. This warning must be printed in red on a contrasting background and in bold-faced sans serif capital letters with a face depth of at least 1.5mm.
- b) The label of the dispensed or supplied medicine should also have written on it:
 - the name of the person for whom it is intended;
 - the name and address of the person selling the medicine;
 - a description of the name of the medicine;
 - a description of the strength of, and the quantity or volume of, the medicine;
 - directions for use;
 - the date of dispensing;
 - the dispenser's initials;
 - warnings (as appropriate) that the medication may cause drowsiness, that if affected do not drive a vehicle or operate machinery and concerning its interaction with alcohol; and
 - the medicine's expiry date if this is not otherwise visible (Queensland Government 2003).

The only case where a nurse might not need to attach a label is when the medicine is ingested by the person to whom it is supplied in the presence of the person who supplies it (Queensland Government 2003).

1.4.1.4. Verbal medication orders

Section 97 of the *Regulation* states that when a doctor gives an oral instruction to administer or supply a controlled drug, the doctor must put the instruction in writing within 24 hours after giving the instruction (Queensland Government 2003). If the doctor does not put the order in writing within 24 hours, the registered nurse or midwife must report the instruction to the:

- hospital's Director of Nursing; or
- person in charge of the place (Queensland Government 2003).

The responsibility of the hospital's DON is to communicate the report to the hospital's medical superintendent or the Chief Executive within 48 hours of receiving it. In the case of a person in charge, that person must, within 48 hours, communicate the report to the Chief Executive (Queensland Government 2003). This is not the case with restricted drugs or S2 and S3 poisons (Queensland Health Environmental Health Unit 2000). The *Regulation* states that medication practice is a multidisciplinary responsibility and therefore the behaviour of other health professionals (particularly medical practitioners and District Managers) has a direct impact on a nurse's ability to work within the *Regulation*.

1.4.2. Who is Responsible for Medication Practice?

In a practical world, the management of medications is a multidisciplinary responsibility involving doctors, nurses, pharmacists, and managers (Gibson 2001). The complex process of drug preparation and distribution involves the activities of initiation, administration and supply and at any stage along this continuum errors can occur (O'Shea 1999). As in all areas of practice, the registered nurse is accountable for his or her actions. Accountability for correct medication practice includes the activities of 'preparing, checking and administering medications, updating knowledge of medications, monitoring the effectiveness of treatment,

reporting adverse reactions and teaching patients about their drugs' (O'Shea 1999, p. 496). Due diligence in these actions prevents medication errors.

1.4.3. Medication Errors

When considering safety issues for clients in relation to medication practices, it is vital that medication errors and the issues relating to them are considered. However, it must be recognised that a zero medication error rate is not possible given the complexities of initiation, administration and supply of medications (Carthey 2002).

The literature reveals that there is disagreement over what constitutes a medication error. The American Society of Hospital Pharmacists (ASHP 1982, in O'Shea 1999) defines a medication error as a dose of medication that differs from the doctor's order as written in the client's chart or differs from standard hospital policy and procedure. This definition does not include errors of prescribing, and except for the error of omitting a dose of medication, the definition dictates that the medication must actually be given to the client. By definition, if the incorrect dose is detected and corrected before being given to the client, no error has actually occurred. The definition is supported by the identification of nine categories of medication error:

1. Omission error;
2. Unauthorised drug error;
3. Wrong dose rate;
4. Wrong route error;
5. Wrong rate error;
6. Wrong dosage form error;
7. Wrong time error;
8. Wrong preparation of a dose;
9. Incorrect administration technique (O'Shea 1999).

The ASHP definition appears comprehensive but has been expanded and modified by subsequent researchers. Girotti et al. (1987) defined 'wrong time error' as relating to the administration of medications thirty minutes before or after the prescribed time, and the researchers also added a tenth error category of wrong infusion rate. Wolf (1989) summarised medication errors as errors of commission and errors of omission, each of which can be subdivided into intentional and unintentional errors. Regardless, each error involves failure to follow the doctor's prescription.

However, Cox (2000) believes that definitions such as these are too rigid and lack the flexibility required by nurses to accommodate the peaks and troughs of a busy clinical environment. For example, if the ward environment is particularly busy and a client's medication is due, it may be possible for the nurse to justify that even though that client did not receive the medication at the designated time, the medication was still administered. Hence the same outcome was achieved, and no error occurred.

Other authors disagree with Cox (2000) stating that this flexibility around the time the medication is delivered should be reported as a medication error (Carthey 2002). Further, it is suggested that allowing too much flexibility around the time that a medication is administered could lead to poor prioritisation of care needs, thus endangering patient care (Carthey 2002).

How does a nurse avoid medication errors?

1.4.4. Avoiding Medication Errors in Nursing

The majority of nurses will remember the rote learning of the ‘five rights’ which accompanied nursing studies of pharmacology. These were learnt as ‘the right patient, the right drug, the right dose, the right route, and the right time’. In recent literature, these ‘five rights’ were still referred to as a ritual that nurses should use to prevent medication errors in nursing (Wolf 1989; Cheek and Gibson 1996; Cox 2000; Gibson 2001).

Given the unpredictable nature of the clinical environment, some authors believe that rituals and procedures such as the ‘five rights’ give nurses a sense of security, which in turn prevents errors (Keill and Johnson 1993). In contrast, Baker and Naphine (1994) and Wolf (1989) suggest that techniques such as this can actually lead to errors as a result of ritualistic behaviour where staff are not actually thinking about what they are doing. It is argued that despite the ‘magical protection’ (Cheek and Gibson 1996, p. 87) that the ritual gives the operator, medication errors continue to occur. Some authors believe that the medication error rate for nurses could be as high as one in ten (Baker and Naphine 1994).

Several authors voice concern that the ritual of the ‘five rights’ promotes a process ‘where nurses can and do police each other’ (Gibson 2001, p.113). Victimisation where nurses blame nurses encourages a narrow view of the multidisciplinary and multi-causal nature of any ‘error’, particularly medication errors, within the acute care environment (Anderson and Webster 2001). Gibson (2001) argues that whilst nurses focus on a simple explanation (i.e., the nurse is to blame) rather than accepting the multiple factors impacting on medication error, the system will be perpetuated and medication errors will continue to occur.

Another criticism of policies and procedures such as the ‘five rights’ is that they are imposed on nurses by those outside the profession, including lawyers, doctors, pharmacists and managers, and for this reason do not accommodate the complexity of the clinical environment (Gibson 2001). This imposed control over nursing practice is based on power relations. Members of other health professions are seen as the experts in the area of medication management even though nurses spend a large portion of their time in this role.

Walker (1994) suggests that the experience and knowledge of the clinical nurse is discounted because it is mostly a female perspective. Nursing knowledge, he argues, is dismissed as trivial and naïve when compared to the male-dominated rigorous scientific viewpoint of other professionals. In the past, the submissive role of nurses has been reinforced through the willingness of nurses to accept the role of gatekeeper of ‘safe medication practice’ (Gibson 2001, p. 112). They become accountable for their own performance and for the performance of others (Gibson 2001). This responsibility is reflected in the Queensland *Health (Drugs and Poisons) Regulation* where the poor practice of a medical practitioner, who fails to write up a verbal order of a controlled drug within 24 hours, becomes the responsibility of the nurse rather than the medical practitioner.

The nursing profession itself has also used the administration of medications to exert power over others. For example, when nurses take away a patient’s medication on admission to hospital, the person is disempowered from taking an active role in the medication process (Cheek and Gibson 1996). There is the expectation that patients will comply with the hospital/organisational routine (including the ‘five rights’ as the nurse applies it to them).

A common theme in the literature relating to medication procedures such as the ‘five rights’ is that nurses who follow the procedure are ‘good’ nurses and those who do not are ‘bad’ nurses (Cheek and Gibson 1996; Anderson and Webster 2001). If errors occur, and the nurse has not followed the procedure, it simply reinforces the belief that nurses who do not pay attention or take their job seriously cause medication errors and are therefore careless (Wolf 1989).

In reality, the chance of a nurse completing a career without making a medication error is very low. However, the simplistic view that medication errors are caused by careless nurses who are then labelled as ‘bad’ nurses, causes many nurses not to report medication errors (Cheek and Gibson 1996; Meurier 2000; Anderson and Webster 2001). Anderson and Webster (2001) note that an outcome of non-reporting of medication errors is a perpetuation of the system which causes the errors.

The imposition of procedures such as the ‘five rights’, and the investigation of medication errors caused by nurses who breach these procedures, result in an enquiry that is ‘person-centred’ where the blame is directed squarely at the nurse (Anderson and Webster 2001, p.36). The literature suggests that nurses readily discipline each other if an error is detected or admitted, and as a result the offending nurse is ‘objectified’ as a nurse who made an error (Cheek and Gibson 1996, p.87). The distress and shame experienced by the individual is further compounded by the self-punishment that nurses mete out to themselves in such a situation (Cheek and Gibson 1996).

The literature also suggests that ‘person-centred’ management of medication errors are incomplete and designed to lay the blame on one person. The majority of errors cannot be attributed to a single cause but result from the interaction of many factors most of which are unrelated to the individual. It is argued, therefore, that the ‘person-centred’ approach should be replaced by a systems approach to the investigation of such incidents (Anderson and Webster 2001).

A systems approach acknowledges the multidisciplinary and multifactorial nature of the process. For example, a medication error may occur as the result of poor drug container labelling, a disorganised medication cabinet, an incomplete or illegible prescription order, inadequate staffing levels or large workloads (Anderson and Webster 2001). There is room for improvement in each of these components and no one area is specifically related to the behaviour of an individual nurse. Removing the focus from the individual allows all factors in the whole process to be investigated, and in turn leads to system change which has a more permanent effect on error prevention (Anderson and Webster 2001).

1.4.5. Factors Within a System linked to Medication Errors

The literature suggests that a systems approach allows consideration of all the factors that may contribute to a medication error and constructively turns the focus away from the individual. Nurses play a key role in the administration of medications and as such consideration should be given to the issues and practices that may contribute to medication errors, which the nursing profession as a group should address. These include mathematical skills of nurses, nurses’ knowledge of medications, workloads, and the quality of prescriptions (O’Shea 1999).

1.4.5.1. Mathematical skills of nurses

Blinder and Bayne (1991) acknowledge that it is necessary for nurses to possess proficient mathematical skills to perform common nursing functions such as medication calculation. A review of the literature reveals that there is conflicting evidence relating to the mathematical skills of nurses.

A number of studies have concluded that some medication errors are caused by the poor mathematical skills of nurses (Bayne and Blinder 1988; Blais and Bath 1992; Worrell and Hodson 1989). A common mechanism for testing the mathematical skills of nurses is a compulsory medication calculation competency test for nurses involved in medication administration. No other health professionals are included in this compulsory, often annual, ritual. These medication competency tests are usually held during orientation to a new facility and then during in-service sessions (O'Shea 1999). There is conflicting evidence within the literature with regard to the usefulness of these tests. For example, Calliari (1995) states that those who failed a test at orientation are more likely to make errors in the workplace than those who did not. In contrast, Conti and Beare (1988) believe that the tests used at orientation are not reliable in predicting the likelihood of medication errors.

1.4.5.2. The impact of nursing knowledge and experience

Some studies report no relationship between educational background and years of experience with regard to drug knowledge and the likelihood of medication error (Bayne and Blinder 1988; Markowitz et al. 1981; O'Shea 1999). In contrast, Boggs, Brown-Molnar and DeLapp (1988) deduced that there are differences between nurses with different educational backgrounds. In particular, the level of knowledge demonstrated by clinical nurses regarding the medications they administer is lower than that of nurse managers and educators who are more distant from clients.

It has been noted that nurses who continually update their knowledge of medications make fewer medication errors than those who do not (O'Shea 1999). Ways which have been identified as effective methods of remaining up-to-date include the use of reference materials and the use of a network of colleagues (O'Shea 1999).

Research into the relationship between levels of experience and the likelihood of medication error is inconclusive (Perlstein et al. 1979; Bayne and Blinder 1988; Blinder and Bayne 1991; O'Shea 1999). For example, Perlstein et al. (1979) in their study of medication errors in neonatal intensive care units, noted that registered nurses were more likely to calculate drug doses incorrectly compared to doctors and pharmacists. Further, more experienced nurses were more likely to be more certain of their judgement, even if this judgement was incorrect (Perlstein et al. 1979; Koren and Haslem 1994). Other studies suggest that new nurses in a hospital were more likely to make errors than more experienced nurses within the same hospital (O'Shea 1999; Lesar et al. 1990).

1.4.5.3. Workload and its impact on medication error

There are several workload and staffing issues that must be considered in relation to medication errors. Several studies have suggested that a higher medication error rate occurs during day shifts than other shifts in a hospital (Girotti et al. 1987; Raju et al. 1989). The reasons for this are unclear, but it is postulated that as there are more medications given out during the day shift, the potential for errors is higher. There are also a greater number of distractors (such as admissions, discharges and so on) which can combine to increase the

number of errors (Lesar et al. 1990). Additionally, it is suggested that the higher error rate found in the Lesar et al.'s (1990) study between the hours of 1200 and 1559 was the result of the higher number of prescriptions written early in the afternoon shift. The impact of distractions on the incidence of medication errors is highlighted in the literature (O'Shea 1999), and a systems approach might be expected to ensure that these distractions are controlled sufficiently to reduce the error rate.

There is evidence that shift work itself is a factor in medication error with shift-working nurses twice as likely as non-shift nurses to make a medication error (O'Shea 1999). This occurs because of the lack of concentration attributed to the disrupted sleep patterns many nurses experience when working rotating shifts (O'Shea 1999).

Nursing workload has been linked with medication error. For example, Meurier (2000) suggests that shortage of experienced staff and poor skill-mix on a ward can contribute to medication error.

1.4.5.4. Quality of written prescriptions

The final contributing factor to be considered is that of the quality of written prescriptions and the nurse's interpretation of poorly written prescriptions. Illegible prescriptions are illegal in Australia (Cox 2000) and there is no doubt that a medical practitioner who fails to provide a legible medication order can increase a nurse initiated medication error (O'Shea 1999). However, the legal obligation of the nurse is clear in these cases, and nurses who cannot correctly interpret a handwritten medication order should not administer or supply this medication until clarification is sought (O'Shea 1999; Cox 2000).

When considering the quality of written prescriptions, attention must also be paid to the issue of telephone orders for medications.

1.4.6. Telephone Orders

In Queensland, the *Health (Drugs and Poisons) Regulation 1996* does permit doctors to give verbal medication orders. For rural and remote area nurses, the use of telephone orders for medications is common, particularly where there is no agreed protocols or standing orders (Hegney et al. 1997). The protocols and policies for taking of telephone orders suggest that it is safer to have two nurses hear the order, thus providing a witness should there be a dispute over the order (Hegney et al. 1997; Cox 2000; Brown 2001).

In some studies, it has been suggested that nurses can feel uncomfortable about taking telephone orders (Retsas 1993; Hegney et al. 1997). This fear is often based on previous experience with the medical practitioner who may be abusive to the nurse if he/she challenges what is being ordered (Retsas 1993; Hegney et al. 1997). Because of such issues surrounding telephone orders, this study sought to explore if the changes to the *Health (Drugs and Poisons) Regulation*, particularly the endorsement provisions, had overcome the need for nurses to telephone medical practitioners for the initiation, administration and supply of medications. In cases where protocols are not in place, the use of standing orders is a common way of decreasing the need for telephone orders.

1.4.7. Protocols and Standing Orders

Under the *Health (Drugs and Poisons) Regulation*, nurses are permitted to work from protocols (Griffiths, Baker and St Hill 1998). As previously discussed, nurses endorsed for rural and isolated practice, sexual health and immunisation, are permitted, under certain

circumstances, to initiate, administer and supply medications listed in the HMP which are also found in the DTP. This use of protocols rather than standing orders has been recommended, particularly as the protocol contains more detailed information on the management of the client (Joanna Briggs Institute for Evidence Based Practice 2000).

The use of protocols, however, is questioned by some nurses (Nejedly et al. 1999) who believe that, as other health professionals are not required to work from protocols (such as medical practitioners and dentists), the use of protocols restricts the advanced practice role of the nurse. Other authors, however, argue that protocols are beneficial to medication practice as they ensure a multidisciplinary focus to the medication practice of nurses (Hales et al. 1998).

Regardless of the need for standing orders or protocols, it is apparent from previous studies that many rural nurses initiate, administer and supply medications without authority (Hegney et al. 1997). The introduction of the advanced practice role in both Queensland and other Australian States and Territories, has refocused the legislation to ensure that nurses have the ability to provide advanced nursing care within the boundaries of legislation.

1.4.8. Medications and Advanced Nursing Practice

The role of the advanced practice nurse (also known as a nurse practitioner) has been evolving nationally and internationally for at least 30 years (Offredy 2000). In Australia, the role and success of nurse practitioners was explored through the implementation of projects in 1993 at trial sites in New South Wales. Results of the projects demonstrated that the trials had been a success, and that the nurse practitioners had provided safe and effective quality health care (Offredy 2000). Since that time, New South Wales, Victoria, Western Australia and South Australia have all introduced a nurse practitioner model. Queensland has been slower to initiate this model. However, trials were conducted at three sites during 2002/3 (Queensland Health 2003b).

The prescriptive role of nurses working in an advanced practice role varies not only with Australia, but internationally. For example, in New South Wales nurse practitioners have full prescribing rights (Offredy 2000), although they must work from an approved list of drugs. Similarly, nurse practitioners in the USA may have full prescribing rights totally independent of a medical practitioner, whilst others may work from an approved drug formula (Burke, Pohl and Franck 2000).

1.5. Conclusion

It is apparent that the initiation, administration and supply of medications is a complex task. Whilst there is conflicting evidence on specific causes of medication error, there is increasing evidence that the victim blaming model surrounding medication errors is being replaced by a systems approach where multiple human factors are considered (Anderson and Webster 2001; Carthey 2002). There is also acceptance that despite all the system changes put into place, medication errors will continue to occur (Carthey 2002).

The legislation in all Australian States and Territories clearly outlines the legal responsibilities of the nurse with regard to their medication practice. It is expected that nurses will have a good working knowledge of this legislation (and other legislation impacting upon the role of the nurse) and that they will work within it.

Prior to this study, there was no evidence on the impact of the changes of the Queensland *Health (Drugs and Poisons) Regulation 1996* on the individual practice of nurses and health facilities. There was also little or conflicting information on how policies and procedures within organisations complied with best practice. The research team of this study wished to explore if the changes to the *Regulation* had impacted on the medication practice of nurses and health facilities.

The next chapter outlines the design of the study. Chapter Three provides the results and Chapter Four the discussion. The conclusion and recommendations are presented in Chapter Five.

2. METHOD

2.1. Introduction

The main aim of this descriptive project was to document the current practice of registered and enrolled nurses in rural and remote Queensland with regard to the initiation, administration and supply of medications against ‘best practice’ criteria outlined in the *Health (Drugs and Poisons) Regulation 1996*, *The Nursing Act (1992)*, and the *Best Practice Information Sheet (BPIS) on the Administration and Supply of Medications by Rural and Remote Areas Nurses*. In particular, the study examined the practices of Rural and Isolated Practice Endorsed Registered Nurses (RINs) compared with non-RINs;

The study was carried out in two phases, an audit of patient charts as Phase 1 and a mail survey of nurses as Phase 2. The major strength of these methods is that they avoid the problem of interviewer bias (that is, the influence the presence of an interviewer may have on a respondent’s responses to questions). The audit document and questionnaire included both quantitative and qualitative components.

Phase 1 involved purposive sampling of facilities and aimed at capturing the range of current medication practices in health facilities across rural and remote Queensland. The results of Phase 1 were used to inform the questionnaire used in Phase 2. Random sampling was employed in Phase 2 to provide a representative description of the current medication practices of nurses across rural and remote Queensland.

2.2. Phase One: Audit

2.2.1. Booklet Development

Three tools were developed for this phase:

- a) Form A: Audit of Individual Patient Chart,
- b) Form B: Audit of Overall Picture of Medication Practice, and
- c) Site Booklet: The Site Booklet was adapted from the Site Profile document used in the study entitled ‘The Role and Function of the Rural Nurse in Australia’ (Hegney et al. 1997).

Forms A and B were newly developed as outlined below.

2.2.1.1. Item Generation

A pool of potential items for the audit forms was generated in two ways. First, a review of the research literature revealed a number of key issues. For example, ‘documentation of telephone orders’, and ‘encouragement for nurses to work outside their role’ were identified as impacting on rural and remote areas nurses’ administration and supply of medications. Second, the experience of the members of the Project Team, who also qualified as a specialist reference group, suggested additional areas of investigation. Preliminary audit forms were assembled from this pool of items and reviewed several times by the Project Team.

2.2.1.2. Booklets

The Audit of Individual Patient Chart (Form A) requested information as to whether relevant details such as patient demographics, names and signatures of medical practitioners, and names and details of medication(s) administered were documented in the individual charts of recent patients. The Audit of Overall Medication Practice (Form B) requested auditors to provide a summary of similar details based on all the patient charts they had audited and therefore provided an overview of practices within the facility. The Site Booklet requested information about the facility such as bed numbers, staffing, services provided in the facility and catchment area, and the effect these services may have on medication administration and supply.

2.2.2. Target Population

The inclusion criteria for the pilot and main audits were:

- Government and non-government rural and remote facilities with less than 50 acute beds, including community health facilities, as listed in the *Hospital and Health Service Yearbook (2000)*;
- Representation of each of the five major economic bases of rural communities (agriculture, mining, forestry, fishing, and tourism), as well as an Aboriginal and a Torres Strait Islander community;
- Representation of each of five Rural, Remote and Metropolitan Areas Classification (RRMAC); that is, Small Rural Centres, Other Rural Areas, Remote Centres, Other Remote Areas, and Offshore Areas.

2.2.3. Pilot Audit

A pilot study of the audit forms involved four health facilities. These facilities were requested to undertake an audit of five inpatient and five outpatient charts using Forms A and B and then complete the Site Booklet. The total number of completed Audits on Individual Patient Charts (Form A) was 34 from a possible 40 as the most recent outpatients were not issued any medications, while another facility only completed nine Form A Audits.

Respondents were asked to critique the questionnaire as they responded to the questions. They were asked to identify any unclear questions, and to raise issues that had not been addressed in the questionnaire. Using this feedback, any ambiguous, poorly worded, duplicated or inappropriate items were revised or deleted, and additional items added as appropriate. For example, additional questions concerning documentation of verbal orders, and reasons a medication was not given were added to Form A as a result of the written feedback from respondents.

2.2.4. Project Audit

Using the selection criteria outlined above, the Directors of Nursing of 17 facilities were sent a package introducing the project which explained the aims and purpose of the study, and invited them to express an interest in participating. Twelve facilities were selected in this way to participate in the project Audit. The tools used for this study were those developed and modified as a result of the pilot study (see Appendix A).

2.2.4.1. Procedure

Each facility was sent 100 Individual Patient Chart Audits (Form A), to include 50 outpatient and 50 inpatient charts, one only Overall Medication Practice Audit (Form B), and one only Site Booklet. The audit package included a covering letter, the audit forms, a reply paid

envelope, two Plain Language Statements and Consent Forms (one to be returned and one to be retained to allow future respondent contact with the research team), and a teabag as an incentive. The audit forms were coded so as to allow follow-up of non-respondents. To ensure confidentiality of responses, the list of codes and corresponding names, as well as the consent forms, were held separately to the returned forms.

After reminder calls, eight of the 12 facilities returned completed audit forms, a response rate of 67%. The return rate of the Individual Patient Chart Audits (Form A) was 57% (686 from 1200 issued). Two facilities could only complete outpatient charts and therefore only returned 50 of their 100 Audit Forms. Of the eight facilities who returned Form As, only five returned the Overall Medication Practice Audits (Form B) (return rate 63%). All eight facilities returned their Site booklets. However, one facility shared the audit among three sites, therefore, we received three Overall Medication Practice Audits and three Site Booklets from this 'one' facility. This means that nine Overall Medication Practice Audits (Form B) and 10 Site Booklets were received. Table 2.1 outlines the demographic characteristics of the audit facilities based on these 10 Site Booklets.

Table 2.1: Summary of Demographic Characteristics for Audit Facilities (n=10)

Demographic Characteristics	Sub-categories of demographic characteristics	n	Range	Mean
Type of Facility	Multipurpose health facility	1	N/A	N/A
	Hospital only	3	N/A	N/A
	Hospital and community health service	2	N/A	N/A
	Other – Community health service	4	N/A	N/A
Facility Profiles	Government funded	10	N/A	N/A
	Number of high & low care beds	10	0-40	6
	Number of long stay beds	10	0-16	2
	Number of admissions	10	0-250	85
	Number of acute Beds	10	0-61	18
	Number of discharges	10	0-250	84
Population serviced by facility		10	630 to 12000	3793
Nearest tertiary hospital		9	3 to 1000km	377 km
Staff Composition	F/T RNs	-	1-22	6.6
	P/T RNs	-	0-23	4.9
	F/T Ens	-	0-11	4.1
	P/T Ens	-	0-19	4.3
	F/T Assistants in Nursing	-	0-4	1.4
	F/T Assistants in Nursing	-	0-4	1.4
Staff Movement	New Appointments (F/T & P/T)	-	0-14	4.6
	Leavings	-	0-10	4.1
	Replacements	-	0-3	.8

2.3. Phase 2: Mail Survey

2.3.1. Questionnaire Development

The questionnaire was developed concurrently with the audit process. The pool of potential items for the questionnaire were generated in similar ways to those for the audit; that is, by reference to the literature and from the experience of the members of the Project Team who suggested additional areas of investigation. Data analysis of the chart audit also highlighted some further areas to be included in the questionnaire. For example, the reported lack of patient education (including the use of Consumer Medicine Information) and the use of interpreters for people who did not speak English or for whom English was a second language (ESL). The questionnaire was assembled and reviewed several times by the Project

Team, as well as being peer reviewed by the Queensland Nursing Council and selected rural nurses in the Toowoomba Health Service District. This instrument was graphically designed for the pilot study.

2.3.2. Target population

The target population for Phase 2 of the study included all registered and enrolled nurses currently registered with the QNC and working in Queensland rural and remote area facilities. The inclusion criteria were nurses:

- (a) working in government and non-government facilities with less than 50 acute beds, including community health facilities, as obtained from the *Hospital and Health Service Yearbook* (2000); and
- (b) with an address in the postcode areas designated by the five RRMACs: Small Rural Centres, Other Rural Areas, Remote Centres, Other Remote Areas, and Offshore Areas.

2.3.3. Pilot Study

For the Phase 2 pilot study, a random stratified sample totalling 120 nurses was selected from the target population. This sample comprised 24 nurses from each of five strata:

1. Nurses with a Remote and Isolated Practice Endorsement (RIN);
2. Nurses and without a RIN and ENs who live in a Remote Centre;
3. Nurses without a RIN and ENs who live in an Other Remote Area;
4. Nurses without a RIN and ENs who live in a Large Rural Centre; and
5. Nurses without a RIN and ENs who live in an Other Rural Area.

Of the 120 RNs and ENs nurses who were sent the questionnaire, approximately 25% were initially returned. After reminder packages (similar to the initial package) were sent to non-respondents (identified by the code numbers), the response rate rose to 37%. The poor response rate from the pilot study, along with respondent comments and inconsistencies and repetitiveness noted by the project team, indicated that the questionnaire required modification. The questionnaire was therefore reviewed with regard to general format and the wording of each question and how these related to the research questions. As a result of this review, several changes were made and the modified tool was again peer-reviewed by several rural nurses. Minor changes from the peer review were incorporated into the questionnaire, which was then graphically designed for the main study.

The final questionnaire (see Appendix E) consisted of closed and open questions covering the following five sections:

1. Work history and place of work (for example, length of time worked with the current employer);
2. Professional development for medication practice (for example, education, self development);
3. Legal and best practice issues, such as actual practice and compliance with health regulations;
4. Policies and procedures (for example, use of the Primary Clinical Care Manual); and
5. Demographics (for example, age group).

2.4. Main Study

For the main study the target population was divided into four groups as follows (the number in each sub-population according to QNC records is in brackets):

1. Registered Nurses with RIN qualifications in rural areas (8);
2. Registered Nurses without RIN qualifications and all ENs in rural areas (2739);
3. Registered Nurses with RIN qualifications in remote areas (49);
4. Registered Nurses without RIN qualifications and all ENs in remote areas (1372).

For the purposes of this subdivision, rural is defined as Small Rural Centres or Other Rural Area in the RRMAC and remote is defined as Remote Centres, Other Remote Area, or Offshore Areas in the RRMAC.

The non-proportional stratified sampling scheme adopted for the main study included all 57 RINs in strata 1 and 3 and equal numbers (971) of RNs and ENs in strata 2 and 4. This scheme best provided data to enable comparisons to be made between nurses with an RIN qualification and those without RIN qualifications, as well as allowing inferences with approximately equal precision to be made for nurses in rural areas and remote areas.

To ensure anonymity and to protect the privacy of the respondents, the QNC allocated a code to each member of the target population. These codes were used for the sampling processes in both the pilot and main studies. Nurses selected for the pilot study were excluded from the main study. All material sent to respondents was posted by the QNC. The Project Team had no access to the names and addresses of the respondents.

The package sent to respondents contained a covering letter explaining the aims and purpose of the study (Appendix B), a Plain Language Statement (Appendix C), the questionnaire, a reply paid envelope, and a tea bag for 'a cuppa'. Because a code was written on each questionnaire, the research team was able to keep track of non-respondents and send reminder packages (reminder letter – Appendix D) to them three weeks after the initial mail-out.

Of the 1999 questionnaires that were sent, 668 were returned after reminder packages. This was a response rate of 33%, 17 of these were discarded because of missing information. This number includes questionnaires that were returned but were not usable due to incompleteness. Eighty-eight nurses either returned their questionnaires to the research team or declined to participate. Most of those who declined were still registered as nurses but, were not in a clinical position, not working as a nurse, or were not working.

A number of respondents belonging to the non-RIN qualified groups according to QNC records, reported having an RIN. This discrepancy is explained by lack of currency of QNC records and pace of uptake of the RIN endorsement. The response rate of QNC-identified nurses with RIN qualifications was used to adjust subpopulation sizes. Post-survey adjusted population and sample sizes for each stratum are shown in Table 2.2.

Table 2.2. Summary of population and respondent numbers

Stratum	Pop'n N (per QNC)	Invited respondents (per QNC)	Respondents (per QNC)	Est. N (per survey)	Respondents (per survey)
Rural-Nurses without RIN qualifications	2739	971	307	2723	298
Rural-Nurses with RIN qualifications	8	8	4	24	13
Remote-Nurses without RIN qualifications	1372	971	311	1353	300
Remote-Nurses with RIN qualifications	49	49	29	68	40

It is useful to summarise the number of RN(RIN), RN(non RIN), EN(MED) and EN(non MED) surveyed from of the rural and remote areas (See tables 2.3 and 2.4).

Table 2.3 Number of respondent EN's from Rural and Remote Areas.

	Rural	Remote	Total
EN(Med)	52	69	121
EN(non- ED)	12	16	28
Total	64	85	149

Table 2.4 Number of respondent RN's from Rural and Remote Areas.

	Rural	Remote	Total
RN(RIN)	18	44	62
RN(non-RIN)	227	209	436
Total	245	253	498

2.5. Reliability and Validity of the Survey Tool

Validity and reliability in the broadest sense are concerned with 'what the test measures and how well it does so' (Anastasi and Urbina 1997, p.139). According to Anastasi and Urbina (1997) the reliability and validity of any survey is dependent upon the characteristics of the survey items. To this end, qualitative item analysis procedures were utilised during the questionnaire development phase of this project. Specifically, the issues of content validity and effective item writing procedures were addressed. Content validity for the survey instrument was established at the time of its construction by rigorous evaluation of the items by experts and prospective respondents during the pre-test and pilot studies and by using Phase 1 results to inform Phase 2 to ensure an adequate span of the content domain.

At all stages during questionnaire development ambiguous, poorly worded or inappropriate items were either revised or deleted. Face validity of the questionnaire items was also considered during the questionnaire development phase. Face validity refers to whether the survey 'looks valid' to the respondents who complete it (Anastasi and Urbina 1997). Face validity is important because if survey items appear to be irrelevant, inappropriate, or puerile,

respondents may lose concentration, become disinterested, and this may lead to biased responding. The issue of face validity was addressed in the pre-test and pilot where respondents were asked to write comments on the questionnaire and, in the case of the pre-test, were invited to participate in a focus group about the questionnaire.

The term 'validity' in the qualitative paradigm is used to indicate the extent to which the research findings accurately represent reality for the respondents. In qualitative research therefore, validity is achieved by acknowledging a concern with the respondent's perceptions of the issue rather than objective reporting of what may or may not have occurred. In this study, respondents' perceptions of the issue were ascertained during the pilot study when nurses were asked to write their opinions of the questions on the questionnaire thus providing feedback on the questions directly to the research team.

Validity also depends on the way in which the data are entered and analysed. It is desirable to record data line-for-line exactly as it is written or spoken, with radically different versions of the same event considered part of the context and part of the problem under examination. Validity is considered achieved when the researcher's findings are presented back to the respondents and are validated by them as true. Whilst this study did not take transcripts and interpretations back to respondents for validation prior to publication of the results, one indication that validation had occurred was that the qualitative data offered by respondents in the final study was consistent with that offered in the pilot study and, where relevant, there was agreement between the outcomes from Phases 1 and 2 of the study.

Reliability of the responses to the quantitative items in the survey was assessed where possible. In particular, the various scales used in the survey relevant to medication errors were assessed for internal consistency using Cronbach's alpha. The results are reported in a later section.

Unlike quantitative research, qualitative methods seek to understand in detail the phenomena, rather than measuring or testing relationships. The qualitative data in this study were examined to identify common themes and sub-themes that accurately represented respondents' comments. To enhance the reliability of the results, the analysis was independently performed by two researchers and only results in common agreement reported. The qualitative data in this project have increased the richness of the quantitative data and deepened our understanding of the context of rural and remote practice and those issues influencing medication practice.

Construct validity is assessed through triangulation (i.e., the use of multiple methods) in analysing the qualitative and quantitative data. Simultaneous triangulation was used in this study. In this method, both quantitative and qualitative questions were coded and analysed at the same time, with limited interaction between data sets during the process. The findings of the data sets are then compared in order to understand relationships and causal process. That is, once it is established that variables are related to each other, qualitative analysis reveals why they are related to each other. Once the data sets form a coherent and cohesive outcome or theory, validity is considered to be achieved (Morse 1991).

The advantages of triangulation include:

1. Complementarity; that is, the weakness of a single method can be minimized;
2. Enhanced theoretical insights, because alternative methods of interpreting the data reflect different aspects of the one reality; and

3. Enhanced understanding of the meaning of phenomena for respondents, which assists in the clarification of concepts and substantiates the results of quantitative research (Polit and Hungler 1993).

2.6. Ethics

Ethical clearance for this project was obtained through the Ethics Committees at the University of Southern Queensland (USQ) and Toowoomba Health Service District of Queensland Health. The reference number HOOREA121 was assigned to this project by the USQ.

2.7. Limitations of the Research

The small number of facilities and purposive sampling design prevent reliable generalisation of the aggregated results in Phase 1 of the study to all rural and remote health facilities across Queensland. Summary results from each component of Phase 1 can strictly only be interpreted as descriptive of the facilities sampled and, at best, as unreliable indicators of practices across rural and remote Queensland at large.

It should be noted that nurses rather than facilities have been sampled in Phase 2 of this study. Therefore the results describe the medication practices of nurses in remote and rural health facilities across Queensland at the time of the survey (August, 2002). These results do not necessarily coincide with the medication practices of nurses averaged across facilities.

There may be an expectation that some uniformity of practice exists within a particular facility. No account can be taken of this in analysing the data because, within the ethical guidelines of the study, the exact place of work could not be ascertained without threatening to breach the confidentiality of the respondents. Bias may exist in some of the results obtained in Phase 2 of the study for the following reasons:

- a) The sampling frame may have differed from the target population at the time of the study because of the practical necessity of assuming the postcode of a respondent's address coincided with the postcode of the place of work (and therefore the level of rurality of the facility). Relatively few respondents could be expected to not satisfy this assumption and so any bias is expected to be small.
- b) The QNC database on which the sampling frame was based was slightly out of date. In particular, post-survey adjustment was needed for the number of nurses with an RIN qualification in the population. Records in the QNC database were no more than one year old relative to the time of the survey. The shortfall in the number of Rural and Isolated Practice Endorsements can be explained by the rapid uptake of this endorsement by RNs in the year or so before the time of the survey. Since RIN qualified respondents had a significantly higher response rate than non-RIN qualified respondents, the response rate of the RIN qualified respondents was used rather than the overall response rate to estimate the number of RIN qualified nurses in the population. Any bias that exists in these figures will not influence within-stratum results but may influence between-stratum results where the relative sizes of the strata are relevant. The potential size of any such bias is small however, because of the relatively small sizes of the RIN strata compared to the non-RIN strata.
- c) With an overall response rate of 33% only, there is a threat of non-response bias. Where possible, checks have been applied to detect the presence of such bias. These involved a

comparison of the demographics of the respondents in each of the two large samples (rural non-RIN and remote non-RIN) with 1995 nurse force figures (AIHW 1998) according to designation (RN/EN), age, and gender (adjustment, albeit very slight because of the relatively small number of RINs, was made to allow for the existence of RINs in the populations figures but not in the samples). On designation and gender, no statistically significant discrepancies at the 5% level were revealed. However, the RNs and ENs in both rural and remote areas who responded to the survey are older on average by between 3 and 5 years than the 1995 populations ($p < 0.001$ in all cases), which are the latest available population figures that are appropriately subdivided. The discrepancy seems likely to be explained by ageing in the nurse workforce population. The mean age of Australian nurses increased from 39.3 years to 41.6 years between 1995 and 1999 (AIHW 1998; AIHW 2003). However the ageing nurse workforce population suggests the samples of rural RINs and remote RINs are too small to allow meaningful checks of bias. Although comparisons of the respondents with the most recently-available workforce figures suggest no significant non-response bias at the 5% level on a demographic basis, the potential for bias on other indicators cannot be discounted.

2.8. Data Analysis

2.8.1. Quantitative

In Phase 2 of the study, the number in each population stratum at the time of the survey differed from that at the time of establishment of the sampling frames (based on QNC records) from which the respondents were randomly selected because of an increase in the number of nurses with RIN qualifications during this time interval. The number in each population stratum at the time of the survey was estimated post-survey on the basis of the response to question 4.1(a) in the survey and the pooled response rate of endorsed nurses based on the original QNC figures. This response rate was used in preference to the response rate over all strata because the RIN endorsed and non-RIN endorsed response rates differed significantly, endorsed RINs responding at a higher rate (58%) than unendorsed RINs (32%).

Weights based on the post-adjusted figures were incorporated into the analysis and used where appropriate in estimating population parameters within and between groups of respondents aggregated across strata (e.g., groupings by nurse designation or public/private employment). Inferential analyses involving such groups were dealt with using the hierarchical loglinear analysis routine in SPSS (Version 11.0) with stratum incorporated as a factor and by using custom-written routines in R (Version 1.7.1) (Ihaka and Gentleman 1996) and Excel (Version 2000). The relative weightings of the four strata, rural non-RINs, rural RINs, remote non-RINs and remote RINs, as proportions of the total population are 65.3%, 0.6%, 32.5% and 1.6% respectively (as based on the estimated subpopulation sizes in Table 2.2).

Analyses within and comparisons between strata do not need to take account of strata weightings and were performed using SPSS. The chi-square test of independence was used to compare proportions for dichotomous variables and ordinal-scaled variables. Categories were collapsed as appropriate to ensure sufficient numbers to preserve the integrity of this test. Differences in median responses on ordinal-scaled items were assessed using the Mann-Whitney or Kruskal-Wallis tests.

To compare rural and remote area nurses, one randomly chosen respondent from the rural-endorsed stratum and nine randomly-chosen respondents from the remote-endorsed stratum

were added to the rural-unendorsed and remote-unendorsed strata respectively to generate random samples of rural and remote nurses. The numbers of RINs added to each sample were based on the estimated proportions of nurses holding RIN endorsements in each of the rural and remote populations. No bias is introduced using this approach instead of a more rigorous weighted approach, and any loss of precision is small because of the small proportion of RINs in each population. The advantage of this approach is simplification in the analysis.

Except for comparisons involving RINs only, to protect against Type I errors, in view of the considerable number of extant comparisons and sample sizes involved, only results significant at the 1% level (two-sided) are reported unless an otherwise non-significant effect is significant at the 1% level in one of the other strata. In these cases a threshold of 5% is used. Although all known RINs were sampled, the small sample sizes compromised reliable inference. A 10% significance threshold has been used for comparisons involving RINs to provide a reasonable balance between Type I and Type II error rates. The possibility of false positives is relatively high however for these comparisons.

No statistical inferences were made from data in Phase 1 of the study because of the small, non-probability samples involved.

2.8.2. Medication Violations

In addition to the above, a number of scales were developed from questions embedded within the Phase 2 instrument. These scales are described below and were used to measure organisational factors that may be contributing to violation of legal and best practice issues described under Section 3 of the questionnaire. Internal consistency estimates of reliability (Cronbach's alpha) obtained in this study are shown in brackets, where applicable.

1. *Training.* This scale included three items (questions 2.5a, b, and c) asking respondents about the adequacy of their level of knowledge of medications and their ability to explain this information to patients. Scores were reversed so that higher scores indicated a higher level of knowledge ($\alpha = .76$).
2. *Reference Material.* Respondents were asked about the accessibility and adequacy of up-to-date reference material, and the accessibility of the Queensland *Health (Drugs and Poisons) Regulation 1996*. There were three items in this scale (questions 2.5d, e, and f). Scores were reversed so that higher scores indicated a higher level of accessibility and adequacy ($\alpha = .76$).
3. *Workload.* This scale was included to ascertain whether workload issues were impacting on the nurses' ability to comply with the *Regulation*. Issues covered included workload, staffing levels, and skills mix within the facility. There were three items (questions 3.4c, d, and g) and scores were reversed so that higher scores indicated higher workload, lower staffing levels, and lower skills mix ($\alpha = .79$).
4. *Expectation of Doctor.* A single item (question 3.4b) was used to assess nurses' perceptions of the extent to which medical practitioners expected them to work outside the *Regulation*. Scores were reversed so that higher scores represented higher perceived expectation.
5. *Violations.* This scale included a number of statements covering legal and best practice issues and included all items under question 3.1 except 3.1a. Question 3.1d was recoded so that higher scores on the scale represented higher numbers of violations ($\alpha = .77$).

The objectives of this part of the study were to examine organisational factors that were considered likely to impact on medication administration performance; explore the relations among these variables; and develop a model for predicting the work outcome variable, self-reported violations. Structural equation modelling using Amos 4 (Arbuckle, 1999) was applied to analyse these data. It is noted that, because of missing data, 506 respondents were included in this analysis.

2.8.3. *Qualitative*

Qualitative data were transcribed verbatim from the questionnaire. Following this, two researchers analysed the data to identify the themes and sub-themes arising from the data. These emergent themes are discussed and linked to the quantitative data.

2.9. Conclusion

This chapter has outlined the methods undertaken for this research study. The following chapter outlines the results.

3. RESULTS

The study was undertaken in two Phases. Phase 1 involved data gathered by use of a chart audit and Phase 2 involved a questionnaire.

3.1. Phase 1: Audit

3.1.1. Individual Patient Charts – Form A

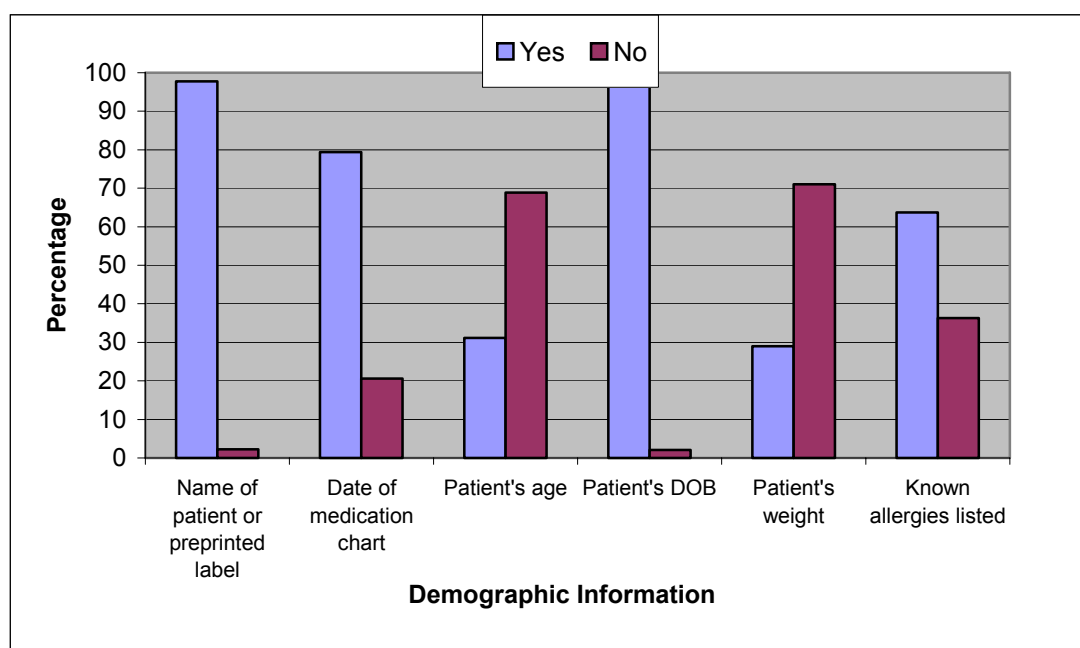
3.1.1.1. Chart security

Just under a quarter (23%) of the charts checked were not kept in an area accessible to authorised staff only.

3.1.2. Demographic Information

As indicated in Figure 3.1, demographic detail appeared to be generally well completed. However, 71% of charts did not record the weight of the patient, 69% did not document the patient's age and over one third (36%) of the charts did not have 'any known allergies' completed.

Figure 3.1. Form A - Demographic Information



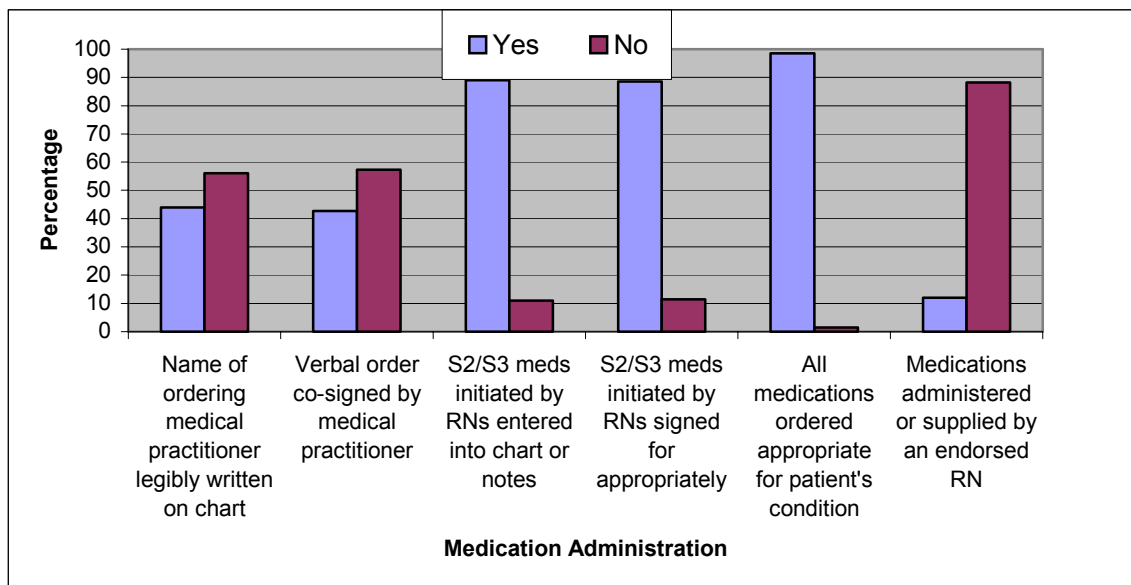
3.1.3. Medication Administration

The way in which medical practitioners completed medication charts appeared to be problematic (see Figure 3.2). For example, in 56% of charts, the medical practitioner's name was not written legibly. Additionally, a large percentage of the medication orders taken by telephone (58%) had not been co-signed by the medical practitioner. As the audit did not ascertain if the medication was a controlled or restricted drug, it is difficult to ascertain what percentage of these orders would fall outside the *Regulation*.

In contrast, it is apparent that nurse initiated medications were normally entered appropriately within the patient's record. Of interest was the high percentage of medications

being administered or supplied by non-RINs. This is a result expected due to the small number of RINs at the time of the audit.

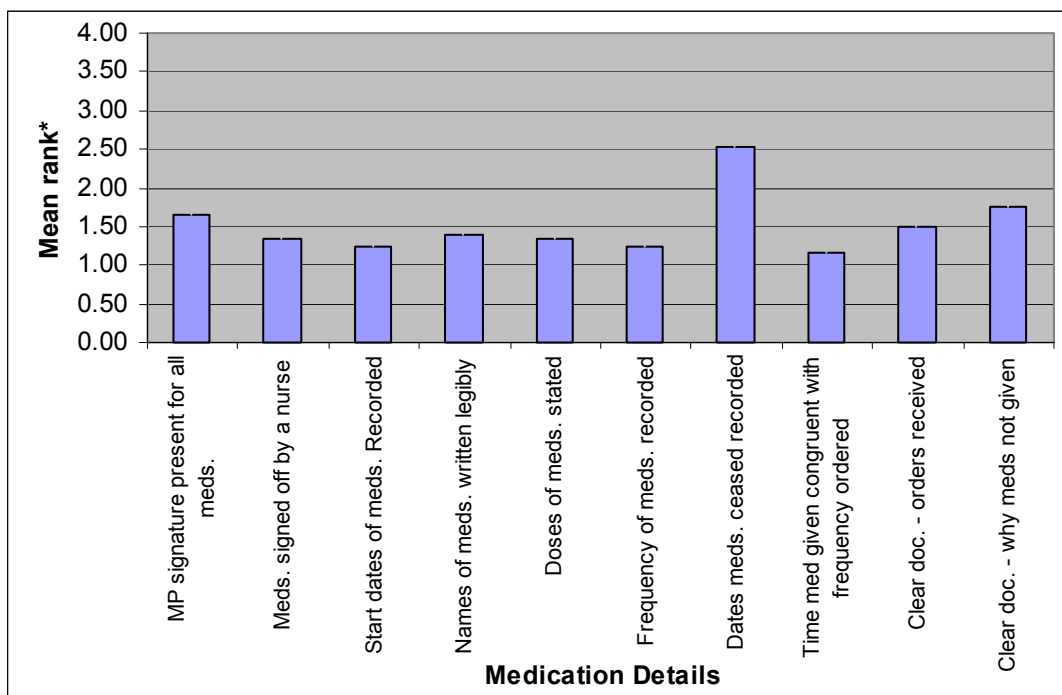
Figure 3.2. Form A - Medication Administration



Medication Details

As can be seen from Figure 3.3, medication details were generally recorded ‘always’ or ‘most of the time’. However, 18% of medication charts had a signature of a medical practitioner on all medications ordered by a doctor recorded only ‘sometimes’ or ‘never’. Additionally, a quarter of the charts did not have clear documentation of the reasons why medications were not given. A major omission appeared to be cease dates of medications, as 52% of charts had these dates recorded only ‘sometimes’ or ‘never’.

Figure 3.3. Form A - Medication Details



* Means based on ranking scale where 1=Always, 2=Most of the Time, 3 = Sometimes, 4 = Never. MP = medical practitioner

3.1.4. Overall Picture of Chart Documentation – Form B

3.1.4.1. Medication administration – documentary evidence

Overall, the Form B responses supported the results from the Form As. As can be seen in Figure 3.4, telephone orders were again not well documented with only two of the seven auditors indicating that correct procedures were followed ‘always’ or ‘most of the time’. It also appears that staff education of patients was only ‘sometimes’ or ‘never’ evident; that Indigenous Health Workers were not involved where applicable; and that follow-up of patients with regard to their medications was not documented (see Figures 3.4 and 3.5).

Figure 3.4. Form B – Overall Documentary Evidence 1

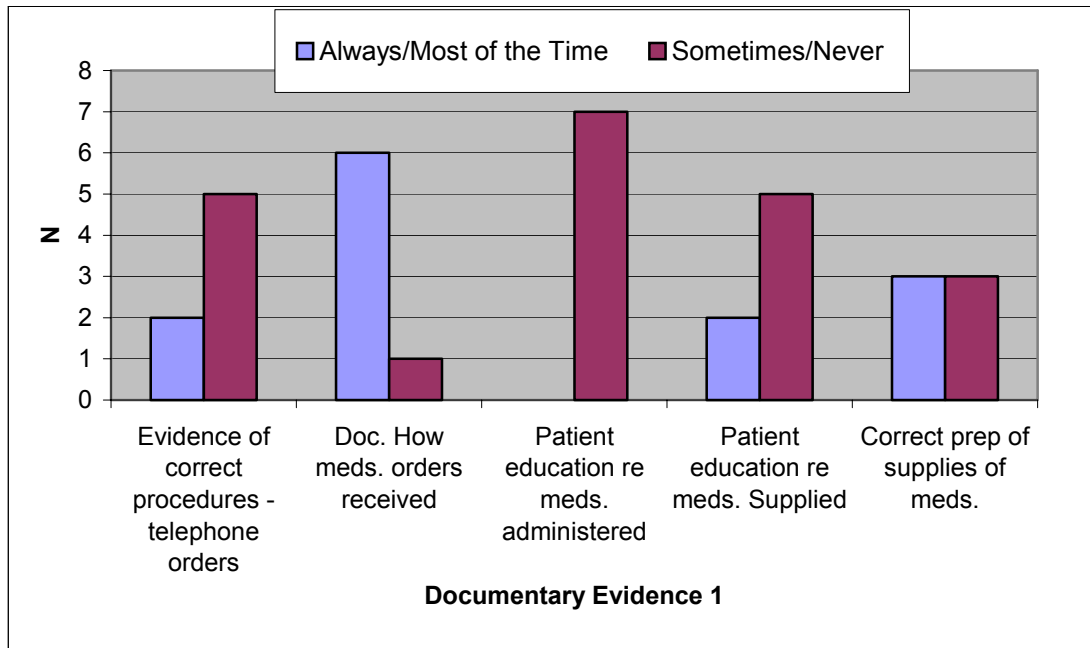
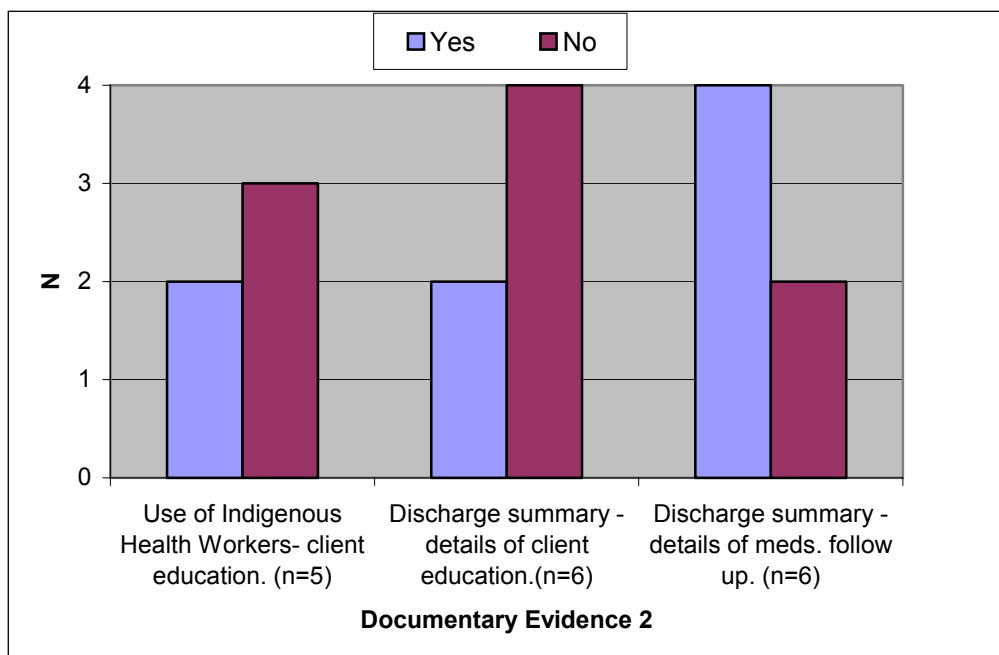


Figure 3.5. Form B – Overall Documentary Evidence 2



3.1.5. Medication Storage

Generally, storage of medications seemed to be well handled by most of the facilities. For example, all the auditors responded that medications were stored at the manufacturer's recommended temperature. However, only three of the eight facilities had a working alarm on the pharmacy refrigerator.

3.1.5.1. Medication labelling

All respondents stated that their facilities labelled medications supplied to patients. Again, respondents generally indicated this was well handled. However, in five of the eight facilities, the doctor's or nurse's name and address were never present on the label. Additionally, five of the nine facilities 'sometimes' or 'never' noted the date of disposal on medications after opening.

3.1.6. Summary

In summary, the audit suggested that documentation regarding medication administration and supply was generally well handled, as were the storage and labelling of medications. There were, however, several aspects that appeared not so well handled:

- Recording of patient age, weight and known allergies;
- Documentation of telephone orders by medical practitioners;
- Recording of cease dates of medications; and
- Patient education regarding medications.

3.2. Phase 2: Questionnaire

3.2.1. Demographics

3.2.1.1. Gender

Ninety-five percent of the respondents were female.

3.2.1.2. Age groups

Thirty-one percent of nurses were under 40 years of age. RINs from remote areas were, on average, older than non-RINs in remote areas ($p=0.04$). There is evidence ($p = 0.04$) that RINs were, on average, older than non-RINs. There is also strong evidence ($p<0.001$) that rural nurses were older, on average, than remote area nurses. For example 24% of remote area nurses were aged less than 35 years compared to 13% of rural nurses and 12% of rural nurses were aged 55-59 years compared with 7% of remote area nurses.

3.2.1.3. Current level of employment

Forty-one percent were level 1 RNs; 21% level 2 RNs, and 15% were Level 3, 4, or 5 RNs. ENs comprised 23% of the total number of respondents.

3.2.2. Work History and Place of Work

3.2.2.1. Type of health facility in which employed

The majority of nurses in the study were employed in hospital-only facilities (52%) with a further 11% employed in hospital and community health facilities and 10% in Multi-Purpose Health Services. Ten percent of the respondents were employed in residential care, seven percent in community health and 10% in 'other' facilities.

3.2.2.2. Sector in which employed

The respondents predominately were employed in the public sector (79%). All but four of the 50 RIN respondents were employed in the public sector.

3.2.2.3. Employment

Eighty-seven percent of the respondents were employed as either permanent full-time (45%) or permanent part-time with less than four percent employed in temporary part-time or full-time positions and 10% employed on a casual basis. Nurses who were employed on a permanent basis within their health facility were more likely to be RINs.

3.2.2.4. Length of time with current employer

Forty-one percent of all nurses in the study had been employed for less than five years; 47% for between 5 to 10 years and 13% for more than 20 years. In both rural ($p=0.01$) and remote ($p=0.04$) areas, RINs had been employed with their current employer significantly longer than non-RINs. In remote areas, ENs were more likely to have been with their current employer longer than RNs ($p<0.001$) with 74% of RNs, and 60% of ENs having worked with the current employer for less than 10 years. Similarly, in rural areas, ENs had been with their current employer longer than RNs ($p<0.05$). For example, 65% of RNs had been with their current employer for less than 10 years compared to 44% of ENs.

3.2.2.5. Length of time in rural and remote area nursing

The majority of nurses in the study had worked in rural and remote area nursing for more than 5 years (78%). There is strong evidence ($p<0.001$) that rural nurses are more likely to have worked in rural and remote area nursing longer than remote area nurses. For example, 52% of remote area nurses had been employed for less than 5 years compared to 36% of rural nurses. Additionally, there is evidence that RIN remote area nurses ($p=0.02$) and RIN rural nurses ($p=0.08$) have been employed in rural and remote area nursing longer than non-RINs.

In the study overall (both rural and remote areas), there is evidence ($p=0.01$) that ENs had worked in rural and remote area nursing longer than RNs. However, after further analysis, it was found that that ENs in rural settings had worked in rural and remote area nursing longer than RNs ($p<0.05$), whereas in the remote setting, there is no evidence of ENs having worked longer than RNs ($p>0.05$).

3.2.2.6. Length of time in nursing

Ninety-three percent of nurses in this study had been employed in nursing for more than 5 years. Of these, 55% had been employed for more than 20 years. There is strong evidence that RINs (combined rural and remote) have been employed in nursing longer than non-RINs ($p=0.001$). There is also evidence that both RIN remote area nurses ($p=0.001$) and rural nurses ($p=0.02$) have been employed in nursing longer than their non-RIN counterparts.

3.2.2.7. Endorsements

In this question, nurses were asked to identify if they had any endorsements, and if so what type. Four percent of registered nurses held a Rural and Isolated Practice Endorsement (RIN); 2% held a sexual health endorsement; 16% an immunisation endorsement; 33% a midwifery endorsement; and 3% a mental health endorsement. Twenty percent of the enrolled nurse respondents indicated that they held a medication endorsement (EN [MED]).

There is evidence ($p<0.05$) that remote area nurses have more endorsements than rural nurses with 68% of remote area nurses compared to 58% of rural nurses holding at least one endorsement.

3.2.2.8. Understanding by the community and other health professionals of the endorsed role

Respondents were asked to indicate on a 4 point Likert scale where 1 was ‘always’ and 4 ‘never’, whether they believed that other health professionals and clients/patients in their community understood the role difference between endorsed and unendorsed nurses.

a) Health Professionals

Fifty-seven percent of all nurses believed that other health care professionals in their community ‘sometimes’ or ‘never’ understood the role difference. There is weak evidence ($p=0.08$) of a difference between the perceptions of rural and remote RINs, with remote RINs more likely to believe that other health professionals understand the role difference compared to rural RINs.

In both rural and remote areas, there is strong evidence of a difference in the perceptions of RNs and ENs ($p<0.001$) with regard to other health care professionals understanding the role. This perception, however, is stronger in rural ($p<0.001$) than remote ($p<0.05$) respondents. Regardless, RNs are more likely than ENs to believe that other health professionals sometimes or never understand the role difference.

b) Patients/Clients

Eighty-nine percent of all respondents believed that patients/clients ‘never’ or ‘sometimes’ understood the role difference between an endorsed and unendorsed nurse. In remote areas, there is strong evidence of a difference between RNs and ENs ($p<0.001$) with 51% of RNs and 32% of ENs stating that patients/clients never understood the role difference. In rural areas, there is weaker evidence of a difference in perceptions between RNs and ENs ($p=0.02$).

3.2.2.9. Issues surrounding lack of understanding of the endorsed role and strategies that could overcome this lack of understanding

This open-ended question gathered qualitative data with the aim of capturing the respondent’s perceptions of whether there was a lack of understanding of the endorsed role. It also asked them to suggest any strategies which could be introduced to overcome the perceived barriers identified. Two hundred and fifty-eight nurses provided an answer to this question.

a) Issues related to a lack of understanding of the role

The major theme arising from this question was that there was a lack of understanding of the endorsed role by the community ($n=108$; 42%), by medical practitioners ($n= 23$; 9%) and by allied health professionals ($n=17$; 7%).

i) Overall comments

The majority of the comments provided about this lack of understanding or confusion are exemplified by the following quotes from the respondents:

Most of my clients would never have heard the terms endorsed and unendorsed.

Community members do not know the difference between registered and enrolled nurses. There would be less understanding between endorsed and unendorsed nurses.

GP and pharmacists are generally not aware of the role difference.

Relieving doctors, usually from large city hospitals, are not aware of the difference.

Allied health personnel have little education about RIPERN [RIN].

Confusion and often conflict i.e., Why can he/she give me medication and you can't??

A very small percentage of respondents believed that patients (n=3), staff (n=3), medical practitioners (n=4) and other nurses (n=5) were not confused about the endorsed role. For example: *'people here have had endorsed nurses for a while now and just take it for granted that everyone is'*.

ii) *Lack of interest in changes in the role*

Seventeen respondents (7%) believed that it was not important for the general public to know if the nurse was endorsed or unendorsed and in most cases, stated the public would not be interested in the changed role. For example, *'in my experience, patients don't really care if we are endorsed or not – as long as they get their treatment'*. A further seven respondents (3%) also commented that other health professionals were not interested in the different roles. For example: *'I believe in my setting, the other health care professionals do not have an interest in understanding any differences'*. Similarly 13 respondents (5%) believed there was no reason for other health professionals to be aware of the role. For example: *'other health professionals aren't interested in nurses other than as workers who are there to do their bidding'*.

iii) *Increased expectations of the role of the nurse who is endorsed*

Twenty-three respondents provided comments that indicated they believed the endorsement would allow nurses to work outside of the extended scope of practice. In the majority of cases these comments were directed at the EN (MED) role rather than the RIN or other RN endorsements. For example, *'some endorsed ENs think they can now be completely in charge of their patients....'*. A further nine respondents commented that there is evidence of RNs not trusting ENs (MED) to undertake their medication role. For example: *'I [RN] don't trust your ability. I will do the meds ...'*.

iv) *Endorsement not utilised or not implemented*

Nine (3%) respondents believed that endorsed nurses were either not used to their capacity or were totally prevented from using their endorsement. For example: *'DON ... refused to allow EN to give medication ...'* or *'RNs and some CNCs also do not foster the adoption of endorsement'*.

Four (2%) of the respondents were concerned that RNs would be accountable for the mistakes that an EN (MED) may make. For example: *'Registered nurses should not be ultimately responsible for endorsed enrolled nurses administrating meds as they do so without direct supervision of registered nurses'*.

v) *The impact of endorsement on relationships within the health care team*

Four (2%) ENs (MED) believed that they were undervalued and their extended role unrecognised. For example: *'at times, most of us ENs feel undervalued...'*. A further 13 (5%) respondents believed that the endorsement had impacted upon their role in a negative way. For example: *'ENs now assume ... that they are as good as an RN... who ... finds this demoralising'*.

Seven (3%) respondents believed that role blurring was occurring especially between EN (MED) and RNs and RINs and RNs. They noted that *'even though the scope of practice is a guide, most organisations develop policies for their environment'* and that these policies are *'very easy to be distorted to suit the situation'*.

vi) *Education and Training*

Thirteen (5%) respondents believed that there should be better access for progression from AIN/EN to RN or that there should be more available courses to become RNs. For example: *'Old Health needs to offer financial incentives/assistance to Enrolled Nurses so that they can become RNs'*.

A further, 10 (4%) respondents believed that the EN endorsement was a way of reducing the number of RNs required at a workplace or that the RIN endorsement was an increase in role responsibilities without appropriate remuneration.

b) *Strategies that could be introduced to overcome the issues raised*

i) *Name badges or different uniforms*

Respondents to this question also gave some suggestions on how these issues could be addressed. The major theme was that there be visible markers which allow people to differentiate between AINs (assistants in nursing), ENs, and RNs. For example, 23 (9%) respondents believed that there should be *'different uniforms'*. A further 46 (18%) respondents believed that name tags should be used which *'stated name [and] designation'*.

ii) *Education about new role*

The second major theme reflected the barriers outlined by respondents in this question and 74 (29%) respondents believed that education should be provided to the public to make them aware of the new roles. Whilst the majority of respondents believed that this education would be *'one to one explanation ...'*, 12 respondents believed that this could take the form of a *'poster or flow chart which could be put up in the workplace'* or *'part of a hospital care package available in the [patient's] locker'*.

Nineteen respondents believed that general practitioners should be educated with regard to nurses' scope of practice including the RIN role. Additionally, 38 (15%) respondents believed that education should also be extended to allied health professionals and other nurses within their districts to make these staff more aware of the role of the EN (MED) and RIN.

A further 19 (7%) respondents stated that *'education is the key'* but they did not specify who was to be educated.

iii) *Alter the current system of endorsement*

Twenty (8%) respondents believed that there should be some changes to the endorsement process. Their comments varied with two nurses stating that ENs should *'be gradually phased out'*; three nurses stating that *'all nurses should become endorsed'*; 13 nurses stating that all nurses should be encouraged to become RINs or ENs (MED) and that incentives should be given for this to happen; and two respondents believing that the word endorsement should be changed to something that the public would understand.

iv) *Team approaches to care*

Finally three respondents believed that the answer was that a team approach to care would mean that people *'work together as a productive and functioning team'*.

3.2.3. *Professional Development for Medication Practice*

3.2.3.1. *Factors influencing preparation for medication practice*

Nurses were asked to indicate on a five point Likert scale, where 1 was 'extremely valuable' and 5 was 'not valuable', their perceptions of the value of experience, formal education, training, mentor/preceptor and an endorsement course.

a) *Experience*

Ninety-five percent of all nurses believed that experience was extremely or very valuable for medication practice. There is evidence of a difference in this perception between remote RINs and rural RINs ($p=0.03$) with remote RINs more likely to believe that experience is valuable than rural RINs.

b) *Formal education*

Seventy-six percent of nurses believed that formal education was extremely or very valuable with regard to preparation for medication practice. RINs were more likely to believe that formal education was valuable than non-RINs ($p=0.08$). There is evidence of a difference between rural Registered and Enrolled and remote area nurses ($p<0.05$). For example, 19% of rural Registered and Enrolled nurses believed that formal education was somewhat or not valuable for their medication practice compared to 8% of remote area RNs and ENs.

c) *Training (in-service, short courses)*

Sixty-nine percent of all nurses believed that training was extremely or very valuable for preparation for medication practice. There were no differences between any of the groups on this item.

d) *Mentor/Preceptor*

Sixty-one percent of all nurses believed that a mentor/preceptor was extremely or very valuable for preparation for medication practice. There is strong evidence of a difference in the perceptions of ENs and RNs ($p<0.001$) in rural areas. For example, 42% of ENs reported that a mentor/preceptor had been extremely valuable for their preparation for medication practice compared to 18% of RNs. This difference was not seen in remote area nurses. There was no indication that the perceptions of the value of a mentor/preceptor for medication practice was effected by years of experience in nursing or years of experience in rural and remote area nursing regardless if they were an EN or RN.

e) Endorsement course

Seventy-eight percent of all nurses believed that an endorsement course was extremely or very valuable preparation for medication practice. There is weak evidence ($p=0.08$) that rural RINs believe this to be so more than non-RINs in rural areas. Additionally, in rural areas there is a difference in the perceptions of ENs and RNs ($p<0.01$) with ENs finding the endorsement course more valuable than RNs. For example, in rural areas 49% of ENs believed the EN (MED) endorsement course was extremely valuable compared to 31% of RNs. In remote areas, there is no significant difference between the perceptions of RNs and ENs ($p=0.5$). RINs found their endorsement course, on average, more valuable in preparing them for medication practice than those nurses with endorsement courses in other specialities. However, this result is only weakly significant ($p=0.03$), possibly because of the small numbers of RINs involved.

3.2.3.2. Courses undertaken and their usefulness to medication practice

Respondents were asked to nominate any courses or programs they had undertaken in the last three years and to indicate, on a five point Likert scale (where 1 was ‘extremely useful’ and 5 was ‘not at all useful’), its usefulness to their current medication practice. A total of 329 respondents provided an answer to this question.

As Table 3.1 indicates, the most frequently mentioned course was the medication endorsement for enrolled nurses with 90% of nurses stating they found the course extremely or very useful. Nurses who had or were, at the time of the study, undertaking the RIN endorsement found the course extremely or very useful (88%). Similarly nurses who had completed the immunisation (91%) and sexual health (92%) found their course extremely or very useful.

Table 3.1: Course, Provider and Level of Perceived Usefulness (by frequency)

Type of Course - Endorsement	Ex	V	M	S	N
EN (MED) – TAFE	60	21	4	3	2
RIN	30	13	3	1	2
RIN in progress	9	1	2	0	0
Immunisation Endorsement	43	17	3	3	0
Sexual health	4	7	1	0	0

Ex = extremely useful; V = very useful; M = moderately useful; S = somewhat useful; N = not useful

Other training mentioned by the respondents included annual medication tests, in-service programs at the local level or in-service programs held outside of the local facility (see Table 3.2). The most useful accessed training courses were those offered by organisations, such as, St. Luke’s, Blue Care and Mt Olivet Hospital on pain management, palliative care and pharmacology.

Table 3.2: Training (in-service, short courses)

Type of course – CPE	Ex	V	M	S	N
Annual medication endorsement	14	9	5	2	0
In-service at the local level regarding medications	29	18	4	3	0
Courses from outside facilities	37	10	4	0	2

Ex = extremely useful; V = very useful; M = moderately useful; S = somewhat useful; N = not useful

A small number of respondents nominated formal education such as undergraduate Bachelor of Nursing programs or postgraduate programs such as Masters of Emergency Nursing (see Table 3.3).

Table 3.3: Formal Education (undergraduate and postgraduate programs)

Type of Program	Ex	V	M	S	N
Undergraduate program such as BNSc	8	3	1	1	0
Post-graduate program such as Masters emergency nursing	1	2	0	0	0

Ex = extremely useful; V = very useful; M = moderately useful; S = somewhat useful; N = not useful

Overall it can be seen that the majority of nominated education and training programs have been provided by the employer or by industry rather than the tertiary sector. The vast majority of respondents found the courses to be extremely or very useful.

3.2.3.3. *Strengths and Weakness of education and training programs*

An open-ended question asked respondents to comment on the strengths and weakness of the courses they had undertaken (or were in the process of undertaking). A total of 126 respondents provided a response to this question. The major themes are outlined below.

a) **Availability and accessibility**

The first theme that emerged from the data was that of issues of course availability and accessibility. Thirteen respondents noted that few courses were available for medication practice other than the RIN or immunisation endorsement programs. For example, one respondent said: *'I can't remember ever being to a medication course'*. Another asked: *'What medication course? In my situation it is very difficult to do any courses'*. A further six nurses noted that either courses were not provided in their area or that they hadn't found any *'that don't require travel or huge expense'*. In contrast, four nurses spoke positively about the courses they had accessed locally. For example, *'the strength of the in-service ... is that it is accessible for a parent of a small family who cannot 'go away' for 2 to 3 days, plus travel time, to undertake any medication courses'*.

b) **Barriers that inhibit course attendance/completion**

Nine respondents believed that there were factors inhibiting their ability to either attend or complete courses. The major factor was having time to complete the program if they were employed full-time and working on-call. For example, *'I began the remote and isolated course, however, the huge workload, full time work and an extremely stressful work environment caused me to withdraw from the course'*.

c) **Positive aspects of courses**

Twenty-eight respondents provided positive comments on the course they had undertaken, eleven of which were generic comments. For example, one RN taking about the RIN course stated: *'the course is very comprehensive'*. A further 10 respondents believed that annual medication reviews and in-service training were valuable. For example: *'all hospitals should provide annual medication calculation reviews...'*; and *'in-service provides more relevant, user-friendly approaches'*. Seven respondents provided positive comments on specific aspects of the courses in which they had been enrolled. These comments focused specifically on videoconferencing and the self-pacing characteristics of the course. For example, *'I did the course when it was first offered through video conferencing so I did not*

have to leave my rural area very often, and *the course from ... was very informative and self-paced*.

d) Negative aspects of courses

Fourteen respondents provided some negative comments on courses they had undertaken. Two of these respondents stated that the overall program management was deficient. For example: '[I was] *unable to contact course provider to negotiate*'. A further six respondents were unhappy with the mode of delivery. For example: *'it would have been much better if the course was facilitated where I live instead by teleconference/correspondence'*. Finally, six respondents believed that the content of the course was excessive or that the course was too short for the content; for example, *'course too condensed'*.

3.2.3.4. Use of reference materials

a) Use of current MIMS Annual (i.e. 2002)

Seventy-eight percent of all nurses stated that they used a current MIMS Annual. There were no statistically significant differences between RNs, ENs, RINs and non-RINs or between nurses in different geographical locations.

b) Use of MIMS CD-ROM

Sixteen percent of all nurses stated they used a MIMS CD-ROM as a reference for medication practice. There were no significant differences between RNs, ENs, RINs, and non-RINs or between nurses in different geographical locations.

c) Use of MIMS On-line

Thirty-three percent of all nurses used MIMS on-line. There is evidence of a difference between RINs and non-RINs from rural areas ($p=0.03$) with RINs more likely to use on-line MIMS. Additionally, a significantly higher proportion of RINs made use of on-line MIMS than non-RINs ($p=0.003$).

d) Use of a pharmacology textbook published/updated in the last two years

Thirty-five percent of all nurses noted they used a pharmacology textbook that had been published or updated after the year 2000. Whilst there were no differences in the use of a textbook between RINs and non-RINs in rural and remote areas, there is evidence of a difference in use between ENs and RNs in rural ($p<0.01$) and remote ($p<0.05$) areas. For example, in rural areas 39% of RNs stated they used a textbook compared to 19% of ENs. In remote areas, 37% of RNs stated they used a textbook compared to 23% of ENs. Additionally, a significantly higher proportion ($p<0.001$) of RNs than ENs used a recent pharmacology text book regardless of geographical location.

e) Current monthly MIMS

Sixty-six percent of all nurses used a current monthly MIMS. There were no statistically significant differences between RNs, ENs, RINs and non-RINs or nurses in different geographical locations.

3.2.3.5. Medication practice

This question elicited responses, on a five point Likert scale where 1 was 'strongly agree' and 5 was 'strongly disagree', to seven questions about nurses' perceptions of their knowledge of medications; their ability to explain to patients how medications work; accessibility of reference materials, and the impact of their accessibility of reference material

to maintenance of medication competence; accessibility of the *Health (Drugs and Poisons) Regulation*; and perceptions of the usefulness of annual medication calculation tests.

a) Adequacy of knowledge of medication for current level of practice

Eighty-eight percent of all respondents ‘agreed’ or ‘strongly agreed’ that their knowledge of medications was adequate for their current level of practice. There were no statistically significant differences between any of the groups in the study.

b) Ability to explain to patients how medications work

Ninety-one percent of all nurses believed they were able to explain to their patients, in terms the patient understood, how medications work. RINs from remote areas were more likely to believe they were able to do this ($p=0.03$) than non-RINs.

c) Ability to explain to patients the side-effects of medications

Eighty-six percent of all nurses believed they were able to explain the side-effects of medications to patients. There is evidence of a difference in this perceived ability between rural and remote RINs ($p=0.02$). Additionally, overall, RINs believed they were able to explain side-effects better than non-RINs ($p = 0.003$).

d) Access to up-to-date reference material for the administration and supply of medications

Eighty-seven percent of all nurses ‘agreed’ or ‘strongly agreed’ that they had easy access to up-to-date reference material. There were no significant differences between the groups in the study.

e) Adequacy of reference material supplied by health facility

Eighty-three percent of all nurses believed that the reference material supplied by their health facility was adequate to maintain their competence with regard to medication practice. There were no significant differences between the groups in the study.

f) Access to the *Health (Drugs and Poisons) Regulation 1996* and its amendments

Seventy-six percent of all nurses stated they had easy access to the *Regulation* in their workplace. There is evidence of a difference between RINs with remote area RINs more likely to state they have access than rural RINs ($p=0.02$). There is also evidence of a difference between RNs and ENs ($p<0.01$) in rural areas with 41% of ENs strongly agreeing that they have access compared to 25% of RNs. In remote areas, there was only slight evidence of a difference in perceptions of ENs and RNs ($p=0.07$).

g) Usefulness of annual medication calculation tests

Eighty-one percent of all nurses believed that annual medication calculation tests were worthwhile with regard to maintaining their medication competence. There is evidence of a difference in rural areas between RINs and non-RINs ($p=0.06$) with RINs more likely to perceive the tests as worthwhile. In rural areas, there is also strong evidence of a difference between RNs and ENs ($p<0.001$) with ENs more likely to believe that medication calculation tests were worthwhile than RNs. Similarly in remote areas there is evidence of a difference between RNs and ENs ($p<0.01$) with ENs more likely to perceive the tests as worthwhile than RNs.

3.2.3.6. Comments provided on the answers to Question 2.5

One hundred and fifty-two nurses provided an answer to this question, with some providing more than one comment. During thematic analysis of the responses it was evident that nurses had provided comments on the specific questions they had been asked in Q2.5.

a) Adequacy of knowledge of medication for current level of practice

Thirteen respondents detailed how they maintained their knowledge. For the majority, their comments indicated that maintaining knowledge is a personal responsibility for each individual. The nurses noted:

... I know where to look for information.

... experience is a key learning factor – with lack of that, knowledge can become a bit stale (or difficult to recall).

...my workplace did not supply the Drugs and Poisons Regulations or other pieces of legislation – I purchased my own and have made it available at work.

A further 13 respondents discussed aspects related to limitations in their medication knowledge. For example:

... my knowledge of medications and how they work I believe is adequate in some areas, however, when working in such a small hospital compared to a larger hospital, I don't use as many different medications, therefore I find it harder to become familiar with newer medications.

... medication is huge – almost all nurses will admit to their need for ongoing education.

... not having knowledge of how medicines work slows me down in looking it up. I'm a community nurse so have to travel back to my office.

Thirty nurses provided a response which focused on how they kept their knowledge up-to-date. The areas raised were:

i) Need for updates

Regular updates on medications were seen to be very important if nurses were to remain competent in medication practice (n=14). For example: *'yearly in-service on current and new medications would be useful'*. These nurses also noted how difficult it was to keep up with all the new drugs on the market. For example: *'new medications are released every day. Sometimes it is hard to keep up with them in the workplace – especially after leave or a change of employment'*.

ii) Need for short courses as medication updates

The respondents noted that medication courses are very necessary and that there needs to be access to *'short, self-paced annual/biannual pharmacology update course[s]'* (n=16). One nurse noted that these would be more beneficial than *'annual medication calculation tests'*.

b) Ability to explain to patients how medications work and ability to explain to patients the side-effects of medications

Seven respondents provided a response to these questions. Three respondents noted that they worked in an aged care facility where the residents were cognitively impaired. As a result, they note that *'it is not necessary to discuss [side effects] with a 100 year old with Alzheimer's'*. Four respondents were working in the community. They noted that their patients self-administer their medications. However, they do have a role in giving *'information on their medication'*.

c) Access to up-to-date reference material for the administration and supply of medications, and adequacy of reference material supplied by health facility, and access to the *Health (Drugs and Poisons) Regulation 1996* and its amendments.

The 63 respondents to this question, provided a response to the following three statements:

'I have easy access to up-to-date reference material with regard to the administration and supply of medications';

'The reference material supplied in my health facility is adequate to maintain my competence with regard to the administration and supply of medications'; and

'In my workplace, I have easy access to the Queensland Health Drugs and Poison Regulation 1996 and its amendments'.

d) Access to resource material

A total of 32 respondents stated they had access to resource materials. In the majority of cases the material most accessed was MIMS (on-line, CD ROM and manuals). It was noted however, that *'both on-line and CD ROM take time to access. If you are busy the MIMS manuals are easiest'*. Other resources not identified in the questionnaire that the respondents stated they used or had found helpful were pharmacists, the RIN course, colleagues in the workplace and the manufacturer's instructions.

In contrast, 20 respondents stated that resources were not available. For example, there were no copies of the *Queensland Health (Drugs and Poisons) Regulation*, *'MIMS manuals are not in the department'*, or *'sometimes [I] cannot get on computer'*. A common theme in these data was that those who had access to on-line MIMS did not have the time to access it. Further, respondents noted that *'in small remote workplaces computer technology is not always available ... [and the] communication network fails, quite often'*. They commented that MIMS on-line had replaced MIMS manuals and that the paper forms of *'MIMS ... (previously very handy) [are] no longer supplied'*. A further 11 respondents noted that the resource material they had available was out of date. For example: *'We have an out-of-date MIMS 1997 and have regularly asked for an update to no avail'*.

e) Usefulness of annual medication calculation test

A total of 60 respondents made some comment about medication calculation tests. These comments, when analysed, covered four distinct areas.

i) Medication calculation tests are essential

Twenty respondents believed that medication calculation tests carried out in their workplace were *'... essential...'*

ii) Medication calculation tests not carried out in the health facility

Thirteen respondents noted that in their current workplace, medication calculation tests were not carried out.

iii) Medication calculations tests are unnecessary

Eleven respondents believed that medication calculations were unnecessary and noted that a '*medication calculation exam shows nothing*'.

iv) Medication calculation tests can be replaced by self assessed competency

Ten respondents believed that rather than a medication calculation test that they should have '*... annual competency tests on drug info e.g., interactions, side effects*'. Other comments made related to self-assessment '*... ideally as part of a self directed learning package highlighting hospital policies/new or changes in medications*'; and that annual medication calculation tests do not stop mistakes which '*usually relate to the 5 rights or illegible writing*'.

3.2.3.7. Satisfaction with endorsements

This question contained four questions that related to the nurses' perceptions of the suitability of the rural and isolated practice endorsement, the immunisation endorsement, the sexual health endorsement and the enrolled nurse medication endorsement.

a) Rural and Isolated Practice Endorsement

Sixty two nurses provided an answer to this question. Ninety percent of these nurses believed that the rural and isolated practice endorsement was sufficient for their current scope of practice. There is evidence of a difference in the responses between rural and remote area nurses ($p < 0.05$) with 41% of remote area nurses believing it was sufficient compared to 30% of rural nurses.

b) Immunisation Endorsement

A total of 129 nurses provided an answer to this question. Ninety-five percent of these respondents agreed and strongly agreed that the endorsement was sufficient for their current scope of practice. There was no difference between rural and remote area nurses.

c) Sexual Health Endorsement

A total of 23 nurses responded to this question. Eighty-two percent of nurses strongly agreed or agreed that the sexual health endorsement was sufficient for their current scope of practice.

d) Enrolled Nurse Medication Endorsement

One hundred and twenty-one nurses provided an answer to this question. Ninety-three percent of nurses agreed or strongly agreed that the endorsement was sufficient for their current scope of practice.

3.2.3.8. Comments on satisfaction with endorsement

This was an open-ended question where the respondents were asked to comment on their satisfaction (or dissatisfaction) with their endorsement. A total of 63 respondents answered this question. The data revealed that:

- Eleven nurses were currently studying for rural and isolated practice or immunisation endorsements or had completed and were awaiting their results;

- Ten respondents believed that there should be yearly updates for all endorsed nurses. For example: *'annual refreshers or updates would be beneficial'*. A further six nurses discussed the need for education and training. For example: *'as a registered nurse (clinical) in the community ... we still need access to the above nursing courses in order to advise clients in rural communities'*;
- Nine nurses stated that completion of an endorsement course had changed their practice for the better and that the endorsements were sufficient for the scope of nursing practice. For example: *'the endorsement I have attained has totally changed my job for the better'* and *'I agree that my endorsement (as it now stands) is sufficient for my current scope of practice'*;
- Nine nurses believed there was lack of recognition of the endorsement. For example: *'since I have gained my endorsement, I have had a total patient load ... taking the role of a junior RN and saving my hospital board wages'* or *'I do not have formal isolated practice endorsement. As a result I feel that the qualifications I do have ... are not recognised, nor is the experience I have gained throughout my career'*;
- Eight respondents believed that the course could be expanded. For example: *'the endorsement does not take into account sufficiently the need for advanced skills in clinic assessment ...'* and *'working within an MPHS this endorsement does not allow for flexibility in regard to prn orders'*;
- Four nurses believed that an endorsement would not be used in their workplace; and
- Three nurses noted their health facility had not signed off the HMPs or that management decisions prevented them from working with their endorsement.

3.2.4. Legal and Best Practice Issues

3.2.4.1. Frequency of legal and best medication practice aspects

A total of 14 questions relating to legal and best practice issues of medication practice were presented in this question. Nurses were asked to respond on a 4 point Likert scale concerning the frequency of aspects of their practice where 1 was 'always' and 4 was 'never'.

a) Telephone orders

Nurses were asked to identify the frequency with which they took telephone orders from a medical practitioner for controlled and restricted drugs. Twenty percent of all nurses indicated they 'never' undertook this activity. There is strong evidence of a difference between RINs and non-RINs in rural ($p=0.003$) and remote areas ($p<0.001$) with RINs more likely to take telephone orders. There is also strong evidence of a difference in rural ($p<0.001$) and remote ($p<0.001$) areas between RNs and ENs with RNs more likely to take telephone orders than ENs. For example, in rural areas 59% of ENs answered 'never' to this statement compared to 10% of RNs.

b) Telephone orders signed for within 24 hours by medical superintendent or registrar

Ninety-one percent of all nurses noted that the medical superintendent or registrar 'sometimes', 'most of the time' or 'never' signed for the telephone ordered medications within 24 hours. There is evidence of a difference between RINs and non-RINs in remote areas where RINs were more likely to state that this occurred than non-RINs ($p=0.05$).

c) Telephone orders signed for within 24 hours by general practitioners within the town

Ninety-three percent of all nurses noted that general practitioners within the town signed for telephone ordered medications within the 24 hour statutory time period. There is evidence of

a difference between rural and remote area nurses ($p < 0.01$) with 72% of remote area nurses believing this is the case compared to 56% of rural nurses.

d) Administration of controlled and restricted drugs without a protocol or medical practitioner authority

One percent of nurses stated they would ‘always’ or ‘most of the time’ administer or supply a controlled or restricted drug without an order and then obtain the order at a later date. A further eight percent of nurses stated they would do this ‘sometimes’. There is strong evidence of a difference between RINs and non-RINs in remote and rural areas ($p < 0.001$) with RINs more likely to do this than non-RINs. There is also strong evidence of a difference between RNs and ENs ($p < 0.001$) in both rural and remote areas. For example, in remote areas, 10% of RNs compared to 2% of ENs answered ‘always’, ‘most of the time’ or ‘sometimes’ to this question. In rural areas, a similar difference is apparent ($p < 0.05$) with 11% of RNs compared to 3% of ENs answering ‘always’, ‘most of the time’ or ‘sometimes’ to this question.

e) Medical Officer’s names and signatures legible on medication orders

Thirty-six percent of nurses believed that this was the case, ‘always’ or ‘most of the time’. Eight percent stated ‘never’.

f) Medical Officer signs and dates the cessation of medication orders in the medication chart

Ten percent of all nurses stated that the Medical Officer ‘never’ signed and dated the cessation of medication orders in the medication chart/patient’s notes. In rural areas, there is strong evidence of a difference ($p < 0.001$) between RNs and ENs with 14% of RNs stating that the Medical Officer ‘never’ carried out this function compared with 2% of ENs. In remote areas, there is no evidence of a difference between RNs and ENs ($p = 0.97$).

g) Nurse initiated S2 and S3 medications are entered onto the medication chart or in patient notes

Eighty-six percent of nurses stated they did this ‘always’. There is weak evidence ($p = 0.05$) that RINs from remote area are more likely to undertake this than non-RINs. There is no evidence of differences between RNs and ENs.

h) S2 and S3 medications that the nurse initiates are signed for appropriately

Eighty-seven percent of all nurses stated they ‘always’ signed off the S2 and S3 medication they initiated. There was no evidence of differences between RINs and non-RINs regardless of geographical location.

i) Nurses name and signature are legible on the medication chart or in patient’s notes

Eighty-two percent of all nurses believed this was ‘always’ the case. There was no evidence of differences between the groups of nurses in the study.

j) Use of the QNC’s Scope of Nursing Practice when delegating to ENs/carers

Eighty-six percent of all nurses stated that they ‘always’ or ‘most of the time’ used the *QNC’s Scope of Nursing Practice Decision Making Framework* when delegating nursing work. In rural areas there was a strong difference ($p < 0.001$) between ENs and RNs with ENs stating they were more likely to use the Framework than RNs. This difference was not

evident in remote areas. There was no evidence of differences in the use of the Framework between RINs and non-RINs.

k) Patients are given relevant information about the medications administered/supplied to them

Thirty-four percent of nurses answered ‘always’ to this question. In contrast, 47% stated ‘most of the time’ and only 0.5% responded ‘never’. There is strong evidence ($p=0.004$) of a difference between RINs and non-RINs with RINs nurses more likely to believe they did this than non-RINs.

l) Provision of Consumer Medicine Information (CMI) with medications that are administered/supplied

Twenty-two percent of all nurses answered ‘always’ to this question and a further 31% stating they did this ‘most of the time’. A total of 14% stated they ‘never’ undertook this role. There is evidence ($p<0.01$) of a difference between rural and remote area nurses with 61% of remote area nurses likely to supply CMI compared with 46% of rural nurses.

m) Indigenous Health Workers or interpreters are used to explain medication that are administered

Forty-two percent of all nurses stated they used health workers or interpreters ‘always’ or ‘most of the time’.

n) Indigenous Health Workers or interpreters are used to explain medication that are supplied

Similarly 42% of all nurses stated they used health workers or interpreters ‘always’ or ‘most of the time’ when supplying medications.

3.2.4.2. *Initiation, administration and/or supply of medications without a medical practitioner’s authorisation*

Respondents were asked to provide comment on any issues or concerns they may have with regard to the practice of initiating, administering and/or supply medications without a medical practitioner’s authorisation. A total of 60 nurses provided an answer to this open ended question. The major themes from the data were as follows.

a) Standing Orders

Thirty percent ($n=18$) of respondents stated they used standing orders/protocols. In the majority of cases, these were nurses employed in community health, aged care or private hospitals rather than in acute public hospitals. All of these respondents stated they did not initiate medications even if they were S2 and S3 drugs unless there was a protocol or standing order. For example:

If the MO cannot be contacted we have telephone protocols to contact MOs at higher-level facilities, in order to obtain telephone orders.

Some nurses were concerned about the use of standing orders. For example:

[I] have concerns with standing orders – can include S8 drugs or drugs such as [antibiotics]. Often [the] MO does not sign the same despite being his regular, standing treatment, e.g., on a patient with back surgery may have standing treatment

of reducing dexamethasone and one stat dose of [antibiotic] – and not signed within 24 hours, sometimes not at all.

b) Supply without a medical practitioner's order

Thirty-seven percent (n=22) of respondents stated they may occasionally supply a medication without a doctor's order. For example:

[On] occasions this is not done within 24 hours. [I am] concerned re legal aspects. [When I supply] S4 and S8 [it is always] with consultation of DON.

Occasionally apply a S4 cream such as Bactroban (Mupiricin) if not ordered by MO.

Sometimes when patients have IV cannulas in situ. The MO forgets to write up N/Saline flush. Thought I am not fearful to give same (as it has been double checked) I prefer not to have to.

Common practice to initiate, administer and supply meds without MO order (Ventolin, Panadol, Temazepam, pts reg meds, p.forte, valium, etc).

I am an endorsed RIPERN [RIN]– however I am not practicing in a [health service where the PCCM has] not been signed off. Due to MO being on-call and therefore there is a certain response time – as CNC when resus situation and no MO available by phone or in person, I have followed the guidelines of the PCCM – HMPs and got the MO to sign for later.

It was apparent that many of these nurses only provided medications after hours when a medical practitioner was not available, or if they did not want to bother the medical practitioner. For example:

Only done at night when I am reluctant to disturb them [the medical practitioner] and know they will be informed the next morning by myself or the RN on that shift.

Ten percent (n=6) of nurses, none of which were RINs, stated they worked outside the current *Regulation* as it was:

Done as a courtesy – wrong I know, but is a judgment call.

These nurses believed that what they were doing was in the public interest as:

The patient suffers more than if I waited for the MO order.

c) Never supply without a medical practitioner order

Thirty-seven percent (n=22) of respondents stated they always have a MO order. For example:

I'm solely responsible and don't get paid enough to have that responsibility.

Within my workplace, NO medication even OTC [over the counter] are given without a doctor signing the medication chart first. An order must be given.

Eight percent (n=5) of respondents stated that the initiation/administration/supply of medications outside of the *Health (Drugs and Poisons) Regulation* should not happen. For example:

We have lots of doctors in this town, so really there should be someone we can find to get an order.

d) Legal and safe practice issues

Twenty-eight percent (n=17) of respondents raised concerns relating to legal or safe practice issues such as:

Working in a small institution ... [means that] telephone orders are not always repeated to two nurses because there are not two nurses available. This has been an issue which must be addressed.

That legally we as nurses are placing ourselves at risk and open for litigation due to current Regulation. I believe if the medication that was ordered (with medical authority) verbally was inappropriate or incorrect we (nurses) would not be supported by the medical profession despite the Health Management Protocols.

Panadeine Forte. At some institutions it is a DD and needs to be signed by 2 RNs. Some RNs give it out without MO orders. A standard needs to be made to cover RNs put in a position of whether to give this drug or not.

A further ten percent (n=6) of respondents stated they consulted with another RN before initiating or administering medications. For example:

I always consult with RN before initiating or administering medications.

This practice also related to checking telephone orders. For example:

All telephone orders from a MO for medications are heard by a RN as well as another staff member (nurse) before any medications are administered to patient/client.

e) Adverse reactions

Twenty percent (n=12) of respondents were concerned about adverse reactions and their responsibility. For example:

[I need to be confident] that my personal knowledge is adequate and that the patient does not suffer any unwanted side-effects previously unknown.

[I am concerned about] adverse reactions – especially allergic reaction.

3.2.4.3. Enrolled Nurse Practice

This question contained 10 statements that focused specifically on the EN's medication practice. All ENs were asked to respond, on a four point Likert scale where 1 was 'always' and 4 was 'never', to the frequency of each of the described practices.

a) Initiation of prn medications in the absence of a RN

Sixty-four percent of all ENs stated they ‘never’ initiated prn (‘as required’) medications in the absence of a RN. In contrast, eight percent indicated they ‘always’ or ‘most of the time’ undertook this activity.

b) Administration of prn medications in the absence of a RN

Fifty-four percent of all ENs stated they ‘never’ administered medications in the absence of a RN. A further 36% stated they ‘sometimes’ undertook this activity. Only ten percent stated they undertook the administration of prn medications in the absence of a RN ‘most of the time’ or ‘always’.

c) Supply of prn medication in the absence of a RN

Sixty-four percent of all ENs stated they ‘never’ undertook this role, with 4% stating ‘always’, three percent ‘most of the time’ and 28% ‘sometimes’.

d) Initiation of S2 and S3 medications in the absence of a registered nurse

Sixty-seven percent of all ENs stated they ‘never’ undertook this activity.

e) Initiation of S4 drugs in the absence of a registered nurse

Eighty-two percent of ENs stated they ‘never’ initiated S4 medications in the absence of a RN.

f) Administration of S4 drugs in the absence of an RN

Sixty percent of ENs stated they ‘never’ administered this medication in the absence of a RN. This contrasted with four percent stating ‘always’, four percent ‘most of the time’, and 32% stating ‘sometimes’.

g) Supply of S4 drugs in the absence of a RN

Sixty-four percent of ENs stated they ‘never’ undertook this role. In contrast, three percent stated they ‘always’ supplied restricted drugs in the absence of an RN. A further four percent stated they did this ‘most of the time’, with a further 29% ‘sometimes’ undertaking this activity.

h) Initiation of S8 drugs in the absence of a registered nurse

Ninety-eight percent of ENs stated they ‘never’ initiated S8 drugs in the absence of a RN.

i) Administration of S8 drugs in the absence of a RN

Eight-eight percent of ENs answered ‘never’ to this question, with the remainder answering ‘sometimes’ (8%), ‘most of the time’ (1%) and ‘always’ (2%).

j) Supply of S8 drugs in the absence of a RN

Eight-seven percent of respondents stated they ‘never’ supplied S8 medications in the absence of a RN. In contrast, three percent stated they ‘always’ undertook this activity. A further 11% stated they ‘most of the time’ (1%) or ‘sometimes’ (10%) undertook this activity.

3.2.4.4. Ability to comply with the Queensland Health (Drugs and Poisons) Regulation 1996 and its amendments

Respondents to this question were asked to indicate their agreement (on a five point Likert scale where 1 was 'strongly agree' and 5 was 'strongly disagree') with seven statements that might affect their ability to comply with the *Regulation*.

a) Adoption of the PCCM by the health facility

Fourteen percent of all nurses believed that the lack of adoption of the PCCM by the health facility in which they were employed had affected their ability to comply with the *Regulation*. There is very strong evidence ($p < 0.001$) that a higher proportion of RINs than non-RINs believe that the health facility has adopted the PCCM. There is weak evidence that rural RINs are more likely to believe that the health facility has not adopted the PCCM than remote RINs ($p = 0.08$).

b) Medical Practitioners in the health facility/town expectations for the nurse to work outside the role

Twenty-two percent of all nurses 'strongly agreed' or 'agreed' that medical practitioners expected them to work outside the *Regulation* in their health facility. In rural areas, there is evidence of a difference ($p < 0.01$) between the perceptions of RNs and ENs with 49% of ENs strongly disagreeing with this statement compared to 27% of RNs. In contrast, in remote areas, there was no significant evidence of a difference between RNs and ENs ($p = 0.06$) with 36% of ENs strongly disagreeing with this statement compared to 32% of RNs.

c) Workload

Forty-five percent of all respondents either 'agreed' or 'strongly agreed' that the workload in their facility influenced their ability to comply with the *Regulation*. There is strong evidence of a difference in the perceptions of remote area nurses and rural nurses ($p < 0.001$) with 52% of rural nurses strongly agreeing or agreeing compared to 33% of remote area nurses.

d) Adequacy of staffing levels

Forty-three percent of all nurses 'agreed' or 'strongly agreed' that the inadequacy of staffing levels in their facility impacted upon their ability to work within the *Regulation*. There is strong evidence of a difference in this belief between rural and remote area nurses ($p < 0.001$) with 59% of rural compared to 43% of remote area nurses strongly agreeing or agreeing with this statement.

e) Knowledge of endorsed role

Eleven percent of all nurses 'agreed' or 'strongly agreed' that an inadequacy of knowledge of their endorsed role affected their ability to comply with the *Regulation*. There is very strong evidence ($p < 0.001$) that RINs in remote areas are more likely to agree that their knowledge is adequate compared to non-RINs in remote areas.

f) Ability to access education and training programs

Twenty-seven percent of all nurses believed that their ability to access education and training programs affected their ability to comply with the *Regulation*. There is evidence ($p = 0.04$) that rural non-RINs are more likely to be affected by this difficulty than rurally located RINs. There is weak evidence ($p = 0.10$) that remote area RINs have higher agreement on this statement than rural RINs.

g) Adequacy of skill mix

Thirty-three percent of all respondents ‘strongly agreed’ or ‘agreed’ that the inadequacy of skill mix in their facility adversely affected their ability to comply with the *Regulation*. There were no significant differences in the perceptions of RINs and non-RINs, ENs and RNs or rural and remote area nurses.

3.2.4.5. Comments on nurse’s ability to comply with the Regulation

This was an opened ended question which gave the opportunity to the respondents to make qualitative comments on their ability to comply with the *Regulation*. A total of 113 respondents answered this question. The responses to this question mirrored the seven previous questions, and therefore the results are discussed under each of these headings.

a) The PCCM

Thirty respondents provided comments on the PCCM. The themes apparent in the analysis were:

i) PCCM not signed off by health facility

Nine respondents commented that the PCCM had not been signed off as the HMP. For example: *‘The PCCM is not signed off at our hospital’*.

ii) PCCM only used as a guide

Six respondents commented that the PCCM is only used as a guide at present. It appears that there are different reasons for this. For example: *‘The facility I work with uses PCCM as a guide only. It is strongly recommended but we have to get doctor to order drugs’* and *‘We use it only as a guide at this stage’*.

iii) PCCM not used at the facility

Five respondents noted that the PCCM was not used at their facility. These comments came from respondents who were employed in community (including Mines) and aged care facilities.

iv) Not familiar with the PCCM

Five respondents were unfamiliar with the PCCM. For example: *‘PCCM is virtually unknown to the MO, DON and pharmacist at my district’*.

b) Treatment protocols not compatible with practice of medical practitioner

Three respondents noted that the treatment protocols in the PCCM were not compatible with what the medical practitioner in their town believed was appropriate treatment. For example: *‘Doctor ... disagrees with many HMPs when discussed’*.

c) Medical Practitioners expectations of nurses to work outside the Regulation

i) After-hours expectations of medical practitioners

Twenty-nine respondents discussed how issues relating to medical practitioner expectations impact upon their scope of nursing practice. In particular, it was in the after-hour period where medical practitioners were less available that the respondents believed they were expected to work outside of the *Regulation*. For example:

They do expect us to take the initiative in providing S4 drugs and pain relief without an order at night.

At times when ring[ing] these people out of hours, they tend to get angry and annoyed.

ii) Lack of experience of medical practitioners

Seven respondents noted that medical practitioners are often *'only 2 years post-training'* and that they are *'poorly trained in medications'*. Further, *'MO's working between remote [and] rural settings have difficulty in accepting differences'*.

iii) Telephone orders

Six respondents believed that there was difficulty obtaining medical practitioner signatures on telephone orders. For example: *'They do not remember to sign these orders without prompting'*.

iv) Access to medical practitioners

Six respondents believed that access to medical staff was problematic. For example: *'workloads and slow medical officer response to phone calls and impatient client can get tricky to manage'* or *'we don't always have med. staff on site'*.

d) Staffing, workload and skill mix

Seventy-one respondents provided some comments on the staffing levels, skill-mix and workload and how these variables were affecting their ability to work within the *Regulation*. Sub-themes evident within this theme were:

i) Lack of staffing

Twenty-seven nurses commented that the levels of nursing staff were inadequate. For example: *'the staffing levels at times can be inadequate'* and *'staffing regardless of skills-mix is inadequate'*.

ii) Workload

Twenty-one respondents believed that the workload was excessive or that *'workloads and staffing levels change greatly from day to day'*. For example: *'mistakes often happen because time frames to complete tasks safely become ridiculous'*.

iii) Skills mix

Nineteen respondents provided comments relating to skills mix. These varied from *'the skills mix is based on necessity and is sometimes dangerous and other times outstanding'* to *'it is impossible to have the correct skills mix and staffing levels at all times due to unpredictable workload'* and *'current skills mix [means that] staff often work above and beyond expected roles'*.

Additionally, six respondents noted that agency or inexperienced staff also contributed to a poor skills mix and workloads. For example: *'Increased agency staff versus long-term staff, from other states/overseas misinterpreting or under false impression can administer and prescribe'*; and *'the lack of RNs in the facility (permanent) makes continuity difficult. There are many agency staff which puts extra load on the permanent staff'*.

e) Medical Officer workload

Five respondents noted that medical officer workload impacted on nurse initiation, administration and supply of medications. For example: *'they have too many demands made on them'*.

f) Adequacy of knowledge of the endorsed role

The comments provided about the endorsed role were provided by 11 respondents. They noted that *'at present no rural and isolated prac[tice] endorsed RNs in facility. PCCM will be adopted when 1 staff member (at least) endorsed'*. And, *'at our facility there are 2 RNs who are waiting for endorsement and 3 RNs who are presently doing the course'*.

g) Education and training programs

Thirty-nine respondents made some comment in relation to education issues. For example:

- Eleven respondents noted that issues such as the cost, time, and distance all impacted upon access. For example: *'Access restricted by isolation'* or *'distance, family and cost of transport/course cost inhibit my ability to attend education and not enough in-services in [name of town]'*;
- Ten respondents stated that *'funding, staffing and skills mix in rural areas impacts on the number of staff taking up the RIN training'*. Or that *'staffing levels do not permit time for in-service'*;
- Eight respondents believed that lack of support from the employer was impacting on their ability to access education and training. For example: *'RIPERN [RIN] assistance \$ declined by district'* or *'Funding ... is restricted. Therefore my ability to access education programs is restricted, however, not totally inaccessible'*;
- Seven respondents provided varied responses with two noting that *'a visiting consultant pharmacist has recently commenced.... He presents case conferences with the GPs and staff to recommend changes when they are required'*. And *'documentation is our least compliant area. This has been highlighted since involvement with Rural and Isolated Practice training'* and *'there is probably more education available at present particularly to rural and remote nurses than I have ever seen'*; and
- Four respondents believed that there were no appropriate courses. For example, one respondent noted that *'For Indigenous staff to gain [medication] endorsement the courses need to be structured with clear non-technical English (literacy is a problem). The course for endorsement needs to be held locally'*.

3.2.4.6. Controlled and Restricted Medications which should be added to the Drug Therapy Protocol

This question aimed to ascertain if the current medications on the Drug Therapy Protocol (DTP) were adequate for medication practice. A total of 76 respondents list one or more controlled or restricted drug they would like added to the DTP.

Table 0-1 List of S4 and S8 drugs initiated or supplied regularly that nurses feel should be on the Drug Therapy Protocol.

Drug	n	%	Reason for Use
Narcotic Anaesthetics			
Morphine Sulphate/ Hydrochloride	13		Palliation (severe respiratory distress and pain relief) mostly in community settings – i.e. as MS Contin, as Mist Morphine, subcutaneous morphine syringe drivers
Morphine Sulphate	3		Chest pain
Morphine Sulphate	6		Severe pain or just stated as morphine (one said for arthritis)
Pethidine Hydrochloride	1		Headaches/migraines
Pethidine Hydrochloride	3		Renal colic
Pethidine Hydrochloride	5		Pain or no comment
Pethidine Hydrochloride	6		Midwifery patients
Oxycodone Hydrochloride (Endone)	1		Strong pain relief
Fentanyl Citrate (Fentanyl)	2		Pain relief in palliation
Ropivacaine hydrochloride, fentanyl citrate (Naropin with Fentanyl)	1		Epidural use
Pentazocine (Fortral)	1		
Codeine Phosphate	4		Pain relief – varies to musculo-skeletal
Methadone Hydrochloride	3		Program
Paracetamol 500 mg and codeine 30 mg (Panadeine Forte)	12		Stat dose and pain relief
Oxycodone (Proladone)	1		Pain relief (as suppository)
Tramadol hydrochloride (Tramal)	1		Pain
Simple Analgesics and antipyretics			
Paracetamol (Panadol)	10		Temperature or pain relief – seems to be a lot of requests from aged care facilities. Not sure why nurses cannot do this anyway. Including one elixir
Aspirin	3		
Combination simple anaesthetics			
Aspirin (Aspalgin)	1		
Paracetamol 500 mg, codeine phosphate 8 mg (Panadeine)	2		Pain relief
Paracetamol 120mg, codeine phosphate 5 mg (Liquigesic- Co Analgesic Syrup)	1		Children particularly with earache

Drug	n	%	Reason for Use
Anaesthetics – local and general			
Propofol	1		Short sedation used cardioversion
Antibiotics	4		4 just said antibiotics for infections
Sofradex ear drops	2		
Chloromycetin ointment/drops	3		Facial burns and gravel rash/ for elderly people with eye infections
Amoxycillin	2		Dental abscess in absence of dentist, mild pneumonia
Penicillin	1		Infection/post operative prevention
Flucloxacillin	3		Infection – multiple organisms/ only penicillin allowed at present and most infections are resistant to penicillin
LA Bicillin with lignocaine IM	1		Increase compliance in rheumatic patients
Augmentin Duo Forte	1		Frequently used antibiotics
Dicloxacillin	1		Frequently used antibiotics
Cephalexin	2		As most infections resistant to penicillin
Other Antibiotics and anti-infectives			
Trimethoprim (Bactrim)	1		UTIs
Antiemetics/Antinauseants			
Metoclopramide hydrochloride (maxalon)	7		Childbirth used with pethidine (3), for nausea and vomiting (4)
Prochlorperazine maleate (Stemetil)	2		Obstetrics (1), nausea (1)
Non-steroidal anti-inflammatories	2		Mentioned as NSAI
Ibuprofen (Brufen)	7		Obstetrics (2), pain relief (2), toothache (1), sports injuries (1)
Indomethacin (Indocid)	5		Acute gout (2), pain relief (1), obstetrics (2)
Ketoralac trometamol (Toradol)	2		Analgnesia
Antihistamine	1		Just said antihistamine
Promethazine hydrochloride	1		Allergic reactions
Pseudoephedrine sulfate	1		URTI with congestion
Sedatives/hypnotics			
Temazepam	3		Sleep problems
Midazolam (Hypnovel)	2		Sedation in ventilation (1), psych disorders
Anti-anxiety agents			
Diazepam	3		Sedation, anticonvulsant, detox
Antipsychotic agents			
Haloperidol (Serenace)	3		Palliation, psych related issues (1)
Chlorpromazine hydrochloride (largactil)	3		Itchy rash (this is not an indication), psych related issues (1), migraine (1)
Risperidone (Risperdal)	1		Psych related issues
Olanzapine (Zyprexa)	1		Psych related issues

Drug	n	%	Reason for Use
Clopixol-acuphase: zuclopenthixol acetate (Clopixol)	1		Psych related issues
Adrenal steroid hormones			
Dexamethasone	1		Control of nausea, anti-convulsant
Diuretics			
Frusemide	1		Increase dose to 40mg instead of 20mg for LUF/CCF IV (PCCM)
Adrenergic stimulants, vasopressor agents			
Metaraminol tartrate (Aramine)	1		Maintain systolic blood pressure
Adrenaline hydrochloride	1		
Other Central nervous system agents			
Methylphenidate hydrochloride (Ritalin)	1		
Anitdepressants	1		Just named as antidepressants
Sertraline (Zoloft)	1		
Citalopram hydrobromide	1		Antidepressant
Movement disorders			
Madopar	1		Parkinson's disease
Benztropine mesylate (Cogentin)	1		Psych related issues
Antimigraine preparations			
Clonidine hydrochloride (Catapres)	1		Detox
Antispasmodics			
Hyoscine hydrobromide (Buscopan)	2		Detox (1), colic pain (2)
Insulin			
Insulin	1		
Hyperacidity, reflux and ulcers			
Ranitidine hydrochloride	1		Gastritis symptoms when cardiac
Mylanta	2		Emergency
Bronchodilator aerosols and inhalations			
Salbutamol	5		Nebs and puffers
Ipratropium bromide	2		In aged care facility
Vaccines and ADT	2		
Laxatives			
Coloxyl with Senna	1		In aged care facility
Durolax	1		In aged care facility
Antiangina Agents			
Anginine	1		In aged care facility
Nitrolingual pumpspray	1		

Drug	n	%	Reason for Use
Expectorants, antitussives, mucolytics, decongestants			
Pholcodine	1		In aged care facility
Agents acting on the uterus			
Ergometrine maleate (Syntometrine)	1		Obstetrics

Others:

Chronic medications from a MO order such as Atovastatin, Metformin

Nitrous Oxide for analgesia

As Table 3.4 indicates, the most common class of drugs mentioned were narcotic anaesthetics such as Morphine Sulphate/Hydrochloride for use in the management of palliative care patients/clients. Community nurses were more likely to indicate the need for this compared to other nurses.

Analysis of the medications listed in this Table suggest that some nurses are asking for S3 medications (such as Paracetamol) to be added to the DTP. It is apparent that they are unaware of their ability to provide these as nurse initiated medications. It is also apparent that there is a very wide range of medications requested with only small numbers of nurses requesting them.

3.2.4.7. Supply of medications in the absence of a hospital pharmacist

Forty-one percent of all respondents stated they supplied medications in the absence of a hospital pharmacist. There is very strong evidence ($p=0.001$) that rural RINs were more likely to undertake this role than non-RINs. There is also very strong evidence ($p<0.001$) of a difference between rural and remote area nurses with 51% of remote area nurses stating they do so compared with 36% of rural nurses. In remote areas, there was a very significant difference between RNs and ENs ($p<0.001$) with 64% of RNs and 13% of ENs stating they undertook this role. This difference was also evident in rural areas ($p<0.001$) with 43% of RNs and 10% of ENs stating they supplied medications in the absence of a hospital pharmacist.

3.2.4.8. Confidence in supply of medications

Those nurses who had answered that they did supply medications were then asked if they felt confident in doing so. Eighty-seven percent of nurses stated they did. There is strong evidence ($p<0.001$) that remote area RINs were more confident in this role than remote area non-RINs.

3.2.4.9. Frequency of supply medications in the absence of a hospital pharmacist

Fifty percent of the nurses who stated they did supply medications in the absence of a hospital pharmacist, stated that they did so every day. The next most frequent supply was weekly (29%). In remote areas, there is strong evidence that RINs supply medications more often than non-RINs ($p=0.001$). Overall, it was apparent that regardless of geographical locations, RINs were more likely to supply medications than non-RINs.

3.2.4.10. Labelling of medications

Forty-eight percent of all nurses stated they labelled medications (n=330). In remote areas, RINs were more likely to label medications than non-RINs ($p<0.001$). Additionally, rurally located RINs were more likely to label medications than non-RINs ($p=0.003$). There is also evidence of a difference between rural and remote area nurses ($p<0.001$) with 59% of remote area nurses reporting labelling medications compared to 42% of rural nurses. There were strong differences between RNs and ENs in the labelling of medications ($p<0.001$). In remote areas, 71% of RNs and 22% of ENs label medications. In rural areas, nurses were less likely to label medications, but again RNs (49%) were more likely to undertake this role than ENs (14%).

3.2.4.11. Medication labelling

The nurses who indicated they labelled medications were asked to indicate the frequency (on a four point Likert Scale where 1 was 'always' and 4 'never') of recording each of the following: the name of the patient; the date dispensed; the directions for use; warning statements; the initial of the RN dispensing the medication; the words 'keep out of reach of children'; the doctor's, nurse's or health facility's name and address; and a description of the content on the label. A total of 346 nurses provided an answer to this question.

a) Name of patient

Ninety-five percent of respondents stated they 'always' recorded the name of the patient on the label. In remote areas, there is evidence ($p<0.01$) of a difference between RNs and ENs, with 100% of ENs stating they 'always' recorded the patient's name on the label compared to 94% of RNs. In rural areas, there was also a difference between RNs and ENs ($p<0.001$), but the findings were reversed, with 70% of ENs stated they 'always' recorded the patient's name on the label compared to 88% of RNs.

b) Date dispensed

Eighty-seven percent of all nurses stated they 'always' recorded the date dispensed on the label. In remote areas there is evidence of a difference between RNs and ENs ($p<0.01$) with 95% of ENs stating they 'always' recorded the date compared to 87% of RNs. In rural areas, there is also evidence of a difference ($p<0.05$) between RNs and ENs. However, the findings were reversed with RNs (88%) more likely to record the date on the label than ENs (70%).

c) The directions for use (e.g. take before or after food, take until completed)

Eighty-two percent of all nurses stated they 'always' recorded the directions for use on the label. There is no evidence of differences between the groups in the study.

d) Warning statements such as 'may cause drowsiness'

Fifty percent of nurses noted they 'always' put warning statements on the label. Additionally, a further 21% stated 'most of the time' and 17% 'sometimes'. Twelve percent of nurses stated they 'never' so labelled the medications. There is evidence that RINs from rural areas were more likely to do this than non-RINs from rural areas ($p=0.05$).

e) Initialling the label by the dispenser

Fifty-eight percent of nurses stated they 'always' initialled the label following dispensing. There is evidence that RINs in remote areas were more likely to do this than non-RINs ($p=0.02$).

f) Recording ‘keep out of reach of children’ on the label

The *Regulation* is very specific about the recording of ‘keep out of reach of children’ on the label stating that it should be printed on red on a background of contrasting colour and in bold face Sans Serif Capital letters with a height of at least 1.5mm. Fifty-four percent of all nurses stated that they complied with this standard. A total of 27% stated they ‘never’ undertook this labelling. Rural RINs were more likely to record this than non-RINs from rural areas ($p < 0.001$).

g) The name and address of the doctor, nurse or health facility

Seventy-one percent of all nurses stated this was ‘always’ on the label. In contrast, 15% stated it was ‘never’ on the label. There is no significant evidence of differences in responses between the groups in this study.

h) Description of the contents

Ninety-four percent of all nurses stated that this was ‘always’ recorded on the label. In remote areas, there is strong evidence of a difference between ENs and RNs ($p < 0.001$) with 100% of ENs answering ‘yes’ to this question compared to 92% of RNs. In rural areas, there is strong evidence of a difference between RNs and ENs ($p < 0.001$). However, the finding is reversed with 67% of ENs answering ‘yes’ to this question compared to 97% of RNs.

3.2.4.12. Handling of medications by the health facility

This question aimed to gather information about the frequency of how medication handling within the health facility complied with the *Regulation*. A total of five questions asked respondents to provide an answer on a four point Likert scale where 1 was ‘always’ and 4 ‘never’.

a) Ordering of medications

Sixty-four percent of all nurses believed that the ordering of medications complied with the *Regulation*. Whilst 15% did not know, only 2% believed that the health facility ‘sometimes’ or ‘never’ complied with the *Regulation*.

b) Storage of medications

Sixty-six percent of all nurses believed that medications in their facility were ‘always’ stored correctly. A further 23% stated ‘most of the time’ and two percent ‘sometimes’. Ten percent of nurses did not know. In remote areas, there is evidence of a difference between RINs and non-RINs, with RINs believing this occurred more than non-RINs ($p = 0.04$). Additionally, there is evidence that remote RINs were more likely to believe their facility complies than rural RINs ($p = 0.04$).

c) Transportation of medications

Fifty-six percent of all nurses believed that the transportation of medications to their health facility and within their health facility complied with the *Regulation*. A further 18% did not know. There is evidence that remote area RINs were more likely to believe that the transportation complied with the *Regulation* than non-RINs ($p = 0.003$), but this was not evident in rural areas.

d) Dispensing and compliance with the Regulation

Fifty-four percent of all nurses believed their facility complied with the *Regulation* with regard to the dispensing of medications. Whilst 14% stated they did not know, a further 26%

stated ‘most of the time’, and a further five percent stating ‘sometimes’. There is no evidence of a difference between any of the groups in the study.

e) Disposal of medications

Fifty-seven percent of all nurses believed that the disposal of medications within their health facility complied with the *Regulation*. Eighteen percent stated they did not know. There was no evidence of differences between the groups in the study.

3.2.4.13. Issues regarding the facility’s management of medications

This question was open ended and gave the respondents the opportunity to provide a qualitative response to the preceding questions. A total of 82 responded. It should be noted that some responses did not relate to the previous question and therefore were not incorporated into the data analysis. The major themes arising from the analysis were:

a) Comply with the Regulation

The health facility in which the respondent was employed and the respondent themselves complied with the *Regulation* (n= 16). Several of these respondents noted they had just been audited by Queensland Health and the audit had resulted in a ‘*clean bill of health*’.

b) Do not comply with the Regulation

Eleven respondents believed they did not comply with the *Regulation*. The non-compliance varied from incorrect labelling to medication cupboards and/or trolleys left unlocked. For example: ‘*unlocked medication cupboards because something else is also stored there that requires constant access*’.

c) Do not initiate, administer or supply medications

Twelve respondents stated they did not initiate, administer or supply medications. In the majority of cases they were employed in community health. However, one respondent noted that it was unrealistic that nurses working in the community would not either administer or assist with the administration of medications even if it was ‘*... just taking the cap off and allowing the client to take the pill out*’.

d) Changing system to comply with Regulation

Nine respondents noted that they had or were in the process of changing their current systems to comply with the *Regulation*. For example: ‘*[We are] in the process of introducing new systems and new protocols*’.

e) Inadequacy of the ordering and storage of medications

Nine nurses believed that the ordering and storage of medications was inadequate in the facility in which they were employed. In particular, two nurses noted that temperatures in store rooms were impossible to regulate in summer. Other nurses commented that workloads would interfere with the storage of medications as ‘*pharmacists leaves [the medication] on nurses’ desk for nurses to put away when they have time. [The] nurses [are] not always told they are there*’.

f) Need for education

Five respondents believed that more education on the ordering and supply of medications was necessary, particularly for new and relieving staff. For example: ‘*... agency nurses. Some can’t even use the computer*’.

g) Not aware of the Regulation

Three nurses stated they were unaware of the *Health (Drugs and Poisons) Regulation*.

3.2.5. Policies and Procedures

3.2.5.1. Type of policies and procedures regarding medication practice in the health facility

Nurses were asked to respond to policy and procedure issues regarding medication practice in their health facility.

a) Standing orders that are specific to a patient/client

Fifty-three percent of all nurses stated they used standing orders specific to a patient/client. There is evidence of a difference between rural and remote area nurses ($p < 0.01$). Rural nurses (56%) were more likely to have standing orders in place than remote area nurses (44%).

b) Global standing orders signed by the medical superintendent

Twenty-seven percent of all nurses stated global standing orders were present in their health facility. There is evidence of a difference between ENs and RNs in remote areas ($p < 0.01$) with 20% of RNs and 37% of ENs stating that these were present in their health facility. This difference is not evident in rural areas where 29% of both ENs and RNs answered positively to this question.

c) Health Management Protocols such as the PCCM

Forty-four percent of all nurses stated that protocols such as the PCCM were in place. In remote areas, RINs were more likely to state that the PCCM was in use in their facility than non-RINs ($p < 0.001$). This is also evident but less significant in rural areas ($p = 0.08$). Additionally, remote RINs were more likely to state that the PCCM was used in the health facility than rural RINs ($p = 0.06$).

3.2.5.2. Use of the PCCM in nursing practice

Respondents were asked if they used the PCCM in their practice. Forty-four percent stated they did so. In remote areas there is strong evidence ($p < 0.001$) that RINs made more use of the PCCM than non-RINs. There is also evidence ($p = 0.02$) that rural RINs were more likely to make use of the PCCM than non-RINs in rural areas. Additionally, there is evidence that remote RINs used the PCCM more in their practice than rural RINs ($p = 0.03$). There is also a significant difference between rural and remote area nurses ($p < 0.01$) with 52% of remote area nurses using the PCCM compared to 39% of rural nurses.

3.2.5.3. Perceptions of the usefulness of the PCCM to practice

Respondents were asked to rate their agreement, on a five point Likert scale where 1 was 'strongly agree' and 5 was 'strongly disagree', with seven statements regarding the usefulness of the PCCM to their practice.

a) The PCCM supports practice as a rural and isolated practice nurse

All remote area and rural RINs strongly agreed or agreed that the PCCM supported their practice. There is strong evidence that remote area RINs believed this more strongly than remote area non-RINs ($p < 0.001$).

b) Accessibility of the PCCM within the health facility

Ninety-four percent of all respondents ‘strongly agreed’ or ‘agreed’ that the PCCM was readily accessible within their health facility. RINs from remote area were more likely to believe this than non-RINs working in remote areas (p=0.003).

c) The PCCM clearly outlines the referral processes

Overall 86% of all nurses believed that the PCCM clearly outlines the referral process for all patients/clients that they care for. There is strong evidence amongst remote area nurses that RINs believed this more than non-RINs (p<0.001). Further, remote area RINs were more likely to believe this was the case than rural RINs (p=0.007).

d) The PCCM clearly outlines the minimum requirements for documentation of medication practices within the patient/client’s notes

Eighty percent of all nurses believed that the PCCM clearly outlines the minimum requirements for the documentation of medication practice in patient/client notes.

e) Endorsement of the PCCM by the health facility

Seventy-eight percent of all nurses stated that the PCCM had been endorsed by the Facility or Health District in which they were employed.

f) The PCCM contains material that is up-to-date

Eighty-four percent of all nurses believed that the PCCM contained up-to-date information. There is evidence (p = 0.02) that RINs in remote areas believe this more than non-RINs in remote areas.

g) The PCCM is an easily useable resource

Eighty-eight percent of all nurses believed that the PCCM is an easily useable resource. There was no evidence of significant differences in the perceptions of the nurses in the groups in the study.

3.2.5.4. Issues on the PCCM

This was an open-ended question where the respondents were asked to provide any further comments they may wish on the PCCM and its usefulness for medication practice within their health facility. There were a total of 101 respondents to this question. The themes arising from the analysis of these data were as follows.

a) District to sign off the PCCM

Nineteen respondents stated they were waiting for the Health District to sign off the manual. For example:

As the PCCM has not been adopted I use it as far as I can, then must contact the MO for medications.

[It] has not been signed off by the medical super[intendant]. [I am] unsure at times as to [the] legal use of PCCM if MO’s are available.

b) Layout or content errors within the PCCM

Nineteen nurses believed there were problems with the content or the layout or the content. For example:

The PCCM covers many illnesses but not simple ailments like viral coughs and colds, fevers, headache etc., that would benefit from simple Panadol. Panadol tablets and

Baby Panadol, suppositories would be beneficial in the PCCM for these illnesses. It would save a phone call to the doctor when they are going to agree to this medication anyway.

I find the index very difficult to locate due to References at the back of book – please put clearly and easily read index in front of book.

[The] current paperback version is not user friendly as it won't lie flat'. [It] 'does not always allow alternatives e.g. Aspalgin for Panadeine. Timeframes for consulting MO would be useful e.g., immediately or within 24 hours. Inclusion of orders for more ailments e.g. migraine (recurrent); and 'I think some material may be out of date eg treatment for UTI's.

As the PCCM is only reviewed two yearly there are bound to be some materials that will need updating during this time.

c) Unaware of the PCCM

Sixteen respondents had never heard about the PCCM and some stated 'How do we get one?'

d) Usefulness of the PCCM

Eleven respondents commented on the usefulness of the PCCM. For example:

Very clear guidelines – gives good direction and gives legality to practices which have been common in rural and isolated facilities for as long as I have been nursing.

The PCCM is used extensively in our hospital. It is the best manual I have encountered for novice to experienced health professional.

e) PCCM not used

Eleven nurses commented that they did not use it or did not have access to it. For example:

As a private facility we sit outside Qld Health protocols and established practices.

I work in the community. My office does not store any medication[s].

We are a MPHS facility not a Primary Care facility. While we are encouraged to use the manual as a resource, we are not legally able to use it in place of medical advice.

3.2.6. Further Comments

The respondents were asked if they wished to make any further comments regarding their medication practices. A total of 143 provided a response to this question. The major themes which arose out of the analysis were:

a) Negative comments regarding endorsement

Forty nurses provided what could be considered to be negative comments regarding the endorsed role. One EN (MED) stated that a similar manual for ENs would be useful.

Thirteen nurses believed that there were disadvantages to working in an endorsed role. For example:

... once you've done the [RIN] course, you've got twice as much responsibility with no extra pay – so it's just not worth it!

... the role of dispensing medications falls onto staff ... [we have] only one RN and EN on duty for most shifts and this leads to new grad RNs being put in a position of supplying medications with little pharmacological experience and sometimes without a DON or RN around to ask/advise.

Seven of these nurses provided comments on shortfalls in the PCCM or the DTPs. For example one nurse provided extensive comments:

- *Crotamiton cream for infants under two months, and advises that it should be applied all over the body. MIMS Aug 2002, states that Crotamiton is never to be applied all over the body of an infant.*
- *Angina. If chest pain of cardiac origin, MO would order Morphine and often Metoclopramide. Why is there no DTP for this?*
- *Renal Colic. Often requires narcotic analgesia and Metoclopramide. Why is there no DTP for this?*
- *Asthma. RIPERN should give continuous nebulised Salbutamol for severe Asthma and this should be in the DTP.*
- *Traumatic ruptured eardrum. Treatment could be same as Acute Otitis Media DTP, and follow up the same.*
- *Sinusitis. RIPERN should be able to treat on a DTP*
- *Bullrout sting RIPERN should be able to give narcotic analgesia and Metoclopramide if warranted, by DTP.*
- *Acute LVF. Amount of Frusemide given initially should be 40mgs. DTP states 20 mgs.*
- *Urticarial rash. This is a common presentation. For a mild allergic reaction – rash and mild periorbital swelling, RIPERN should be able to give by DTP, Promethazine, age and size appropriate, observe for a reasonable time, and discharge. Substance to which person was allergic should be documented if known.*
- *Why are headaches and/or migraines not in the PCCM? We cannot pretend that people do not often present to Outpatients Department with these conditions.*
- *I would like to see the day when the RNs endorsement allows her/him to choose the appropriate treatment and follow up herself/himself. The PCCM sets out excellent assessment, treatment, and follow-up guidelines which if followed would allow the RN to use a medication currently in the facility*

There was also concern expressed by non-Queensland Health facilities that guidelines similar to the PCCM and the DTP would be useful in community nursing practice. Additionally, 11 ENs (MED) and four RINs commented that although completing their endorsement, they were unable to use it. For example:

I find it hard when a hospital in rural areas hasn't changed their protocols to permit EENs to administer medications ... It's like a slap in the face for an achievement and a lot of study.

One issue is if and when the PCCM will be signed off by the Medical Superintendent. He is a GP in this town and feels threatened by RNs becoming more autonomous.

b) Packaging medications

Seventeen respondents stated that they had difficulties with the packaging of medications. Whilst some nurses raised this as an issue in the other qualitative questions, it was apparent that more nurses believed this to be an issue not fully explored in the survey. There were two areas of concern. First, seven nurses commented that they required more starter packs or that they were concerned that they were unable to split larger packs. For example:

We are unable to split packs. This can be dangerous if e.g., a client (elderly) is ordered Prednisone for 3 days [and given] a bottle which has 25-50 tabs in it.

Second, 10 nurses were concerned about the use of Webster Packs and Nomad Boxes. For example:

The use of dosette boxes by clients. ... [and there is] no chemist in the town. If RN fills the box it is regarded as dispensing. The client/family are not capable, so what do we do?

c) Education of general practitioners of the role of endorsed nurses

Sixteen nurses believed that GPs required more education with regard to the RIN role or still did not comply with their obligations under the *Health (Drug and Poisons) Regulation* either due to overwork or refusal to comply. For example:

The main problem affecting staff and patients ... is that the doctors (both GPs and hospital MOs) are all overworked and stretched to their limits ... telephone ordered medications ... do not get signed within the 24 hour timeframe.

I feel although MOs are wishing not to be disturbed after hours for patients they are very reluctant to sign off HMPs and allow RIPERNs [RINs] to have greater control over the amount of call outs they are getting.

d) The need for more education and training in pharmacology

Thirteen respondents requested that more in-service education and training be available about pharmacology. Some suggested that this could also be delivered through video-conferencing or a satellite broadcast. For example:

Working as a casual ... access to course, computers – education not offered.

Training needs to be offered to non-endorsed RNs. As the course has a fee now and a workload which may be quite heavy for RNs who have not studied recently, there is little encouragement for RNs to undertake course. There is a need for training which could be done through videoconference/satellite/TV/video just as an overview of some of these issues.

e) Lack of knowledge of the Regulation and the role of the endorsed nurse

Eleven nurses stated they require education and information about the new RIN role, particularly those who are new to rural/remote area practice. Additionally some nurses noted (as in a previous question) that they had inadequate knowledge of the *Health (Drugs and Poisons) Regulation*.

f) Positive comments on the RIN role

Eight nurses provided positive comments on the RIN role. For example:

All RNs should be given the opportunity to do the RIPERN course.

Any RN working in a position where he/she is required to supply medications in a rural or isolated practice area should have RIPERN endorsement.

g) Pharmacy availability

Four nurses stated that the lack of availability of pharmacists meant that RNs were used more to label and supply medications. For example:

Limited availability of pharmacists ... this workload then impacts on current nursing staff with limited expansion to additional resources.

h) Lack of knowledge of the nurse's role within the Regulation

In these data there were also some comments which indicated a lack of knowledge of the scope of practice of the RNs. For example:

I would like a universal order for someone who presents with audible wheeze (known asthmatic) to be given Ventolin Nebbs and then if necessary phone the MO.

This request is covered by the PCCM and the DTP with regard to the management of asthma patients for RINs. Additionally, it was apparent that some nurses were unaware that they could provide S2 and S3 medications without a medical practitioner order, particularly their ability to initiate, administer and supply medications, such as paracetamol.

3.2.7. Results of Analysis for Medication Violations

The descriptive statistics and correlations aggregated across the four stratas in the study are presented in Table 3.4 below. No significant differences existed amongst the four groups.

Table 3.4. Correlation Matrix for all Variables (N = 506)

Variable	Mean	SD	2	3	4	5
1. Training	4.07	0.52	.38*	-.04	-.07	-.28*
2. Reference Material	4.06	0.70	-	-.18*	-.25*	-.29*
3. Workload	2.86	1.08		-	.35*	.26*
4. Expectation of Dr	2.21	1.17			-	.34*
5. Violations	1.90	0.42				-

*p < .01.

Mean responses to the Training and Reference Material scales were high suggesting that most nurses perceived few problems in these areas. Workload was rated as average but the variance was larger for this variable. The response for Expectation of Doctor was low which suggests that most nurses disagreed that their ability to comply with the *Regulation* was adversely affected by doctors' expectations. However, the variance was high for this variable. For example, although 354 disagreed or strongly disagreed that they perceived doctors expected them to work outside the *Regulation*, 47 were unsure and 105 agreed or

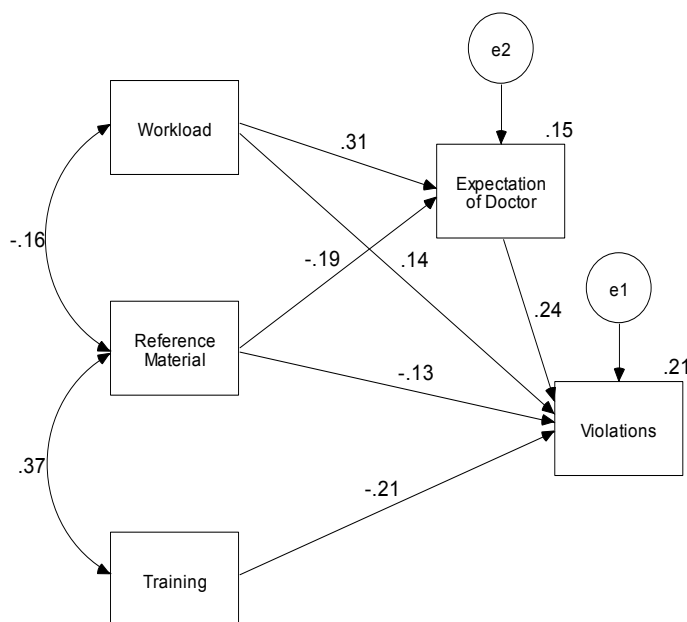
strongly agreed that this was the case. The Violations scale was measured using a 4-point scale with the response indicating that most nurses followed procedures or best practice most of the time.

Amos 4 (Arbuckle, 1999) was used to test the fit of an *a priori* path model to the covariance matrix generated from the set of five variables. Initial fit statistics for this model were unsatisfactory: $\chi^2 (3, N = 506) = 21.5, p = .00; TLI = .79; RMSEA = .22$. On the basis of modification indices and theoretical considerations, this model was modified to show Expectation of Doctor acting as a mediating variable between adequacy and accessibility of Reference Materials and number of Violations. The resulting model is shown in Figure 3.6.

All pathways for this model were significant and fit statistics were excellent: $\chi^2 (2, N = 506) = 0.94, p = .63; CFI = 1.00; TLI = 1.02; RMSEA = .00$. The model accounted for 21% of the variance in Violations, and 15% of the variance in the mediating variable, Expectation of Doctor. The relationship described appears to be homogeneous across the four strata, there being no significant differences amongst the groups. It should be noted however that the small size of the two RIN groups precludes effective discrimination on the basis of those groups.

In interpreting this model, the double-headed curved arrows represent correlations and the single-headed straight arrows represent causal influences. The numbers shown along the pathways in the model indicate the strength of the relationships between each variable. The higher the number, the stronger the relationship and the greater the benefit there is to be gained by manipulating the factor at the start of the causal chain. A negative value indicates an inverse influence on the outcome variable, that is, higher scores on one variable are associated with lower scores on the other.

Figure 3.6. Structural model of relationships between organisational factors and violations.



3.3. Conclusion

This chapter has presented the results of the analysis of the data in this study. The next chapter will provide a discussion of the significance of these results.

4. DISCUSSION

This chapter discusses the results of the study in line with the *Regulation* and previously published national and international literature. It begins with an overview of the demographic profile of the respondents, and discussion of the results in relationship to the research questions of this study will be presented. The research questions were:

1. What is the current practice of rural and remote area nurses when administering and supplying medications?
2. To what extent do rural and remote area nurses' medication administration and supply practices comply with current legislation, patient management protocols, health policy, nursing standards and the BPIS?
3. What impact do guidelines embodied in current legislation, patient management protocols, Qld Health policies and procedures have on the administration and supply of medications in the everyday practice of rural and remote area registered and enrolled nurses?
4. To what extent can the absence of other health care practitioners, the isolation of the health facility and the demands of rural consumers explain examples of compliance/non-compliance with accepted norms in this area?
5. To what extent do generic policies and guidelines on nursing practice accommodate the health needs of rural and remote populations in Queensland and the contextual needs of rural and remote area nursing practice?

From these five research questions it was expected that there would be five outcomes. These were:

1. Documentation of the current practice of rural and remote area registered and enrolled nurses with regard to the administration and supply of medications, in addition to their relationship with other members of the health care team and the rural and remote community.
2. Identification of the strengths (how they have applied legislation and so on) and weakness of current practice (how they have not applied legislation etc.) when compared to the BPIS and Queensland's *Health (Drugs and Poisons) Regulation, 1996*.
3. The provision of information of the types of medications frequently administered and supplied by rural and remote area nurses - either with or without a prescription, and the context in which this occurs.
4. An indication of the parameters which need to be established to ensure best nursing practice with regard to the quality use of medicines in rural and remote areas (this should incorporate collaborative practice with other health professionals).
5. Better understanding of the areas which are strengths and weakness with regard to the administration and supply of medications which will allow education providers to design courses specifically targeted towards the administration and supply of medication for rural and remote area registered and enrolled nurses in Queensland

To decrease repetition in this chapter of the report, the five research questions and outcomes have been condensed into three sections:

- **Section 1:** The current medication practice of rural and remote area nurses and their compliance with legislation, policy and protocols and the impact of rurality on

this current practice. This section provides answers to research questions 1 and 2 and outcomes 1, 2 and 3.

- **Section 2:** The impact of the medication endorsements on practice of nurses and consumers of health care in rural and remote communities. This section answers research questions 4 and 5 and outcome number 4.
- **Section 3:** Education and training for medication practice. This section provides information for outcome number 5.

Before beginning this discussion, it is relevant to briefly revisit the demographics of the population of the study.

4.1. Demographics

4.1.1. Gender

In 1999, the percentage of males in the Queensland nursing workforce was 8.5% which was slightly higher than the Australian nursing workforce percentage of 7.9% (Australian Institute of Health and Welfare [AIHW] 2003). The five percent of males in this study therefore suggest some under-representation of male nurses.

4.1.2. Age Groups

The data from this study were consistent overall with national trends in that nurses from rural locations were older than nurses from remote areas (AIHW 2003). In 1999, the mean age of nurses in Queensland was 41.3 years (AIHW 2003). This compares to the estimated mean age of nurses in this study of 44.8 years.

A new finding from this study indicated that nurses who hold a RIN, are older on average than non-RINs both for nurses in rural areas and nurses in remote areas.

4.1.3. Level of Nurse, Type of Nursing Work and Sector of Employment

Queensland Health is the major provider of rural and remote health services in Queensland, and as expected, the majority of respondents in this study worked in the public sector and in hospital only facilities (51%). The percentages of respondents employed in community health (7%) and aged care (10%) in this study are similar to national percentages (AIHW 2003).

4.1.4. Current Level of Employment

The majority of nurses in this study were Level 1 Registered nurses (41%) who were employed in the acute hospital setting (AIHW 2003). ENs comprised almost one-quarter (23%) of the nurses in this study, possibly an under-representation of the percentage of ENs employed in rural areas (AIHW 2003).

4.1.5. Hours of Employment

Fifty-five percent of the nurses in this study were employed on a part-time basis. This proportion reflects the national trends where 53.8% of nurses were employed part-time in 1999 (AIHW 2003). Additionally, the AIHW suggest that there has been an increase of 7% in the number of nurses working part-time from 1993 to 1999, with a decrease in average hours worked from 32.2 hours in 1993 to 30.3 hours in 1999 (AIHW 2003). This casualisation of the workforce has implications, especially for nurses who seek to have employer sponsored education. Several studies indicate that casually employed nurses are

less likely to attend in-service education or have employer sponsored education (Hegney et al. 1997).

4.1.6. Length of Time in Nursing, in Rural and Remote Area Nursing and with Current Employer

It appears that the respondents in this study are nurses who have been with their current employer, in rural and remote area nursing and in nursing overall, longer than nurses who have participated in other studies. For example, Hegney et al. (2001) in their study of Queensland nurses who had left Queensland Health found that 32% of the respondents had been with their immediately previous employer for more than five years and 50% had worked in rural and remote area nursing overall for more than five years. The respondents in this study provided a different profile with 36% of respondents being with their current employer for more than five years and 78% of respondents having worked in rural and remote area nursing for more than five years.

It is possible that this difference has been brought about by the sampling design of the study which attempted to include all RINs.

4.1.7. Endorsements

The respondents were asked to identify if they had any endorsements, and if so, which type.

Amongst the remote area nurses, 62% of RNs had at least one endorsement and 82% of ENs held a medication endorsement. The corresponding figures for rural area nurses were 51% and 85% respectively.

As would be expected, the most common endorsement held was midwifery with 53% of remote area RNs and 39% of rural area RNs holding this endorsement. The impact of these (latter) endorsements will be discussed in 4.3.

SECTION 1

4.2. The Current Medication Practice of Rural and Remote Area Nurses and their Compliance with Legislation, Policy and Protocols and the Impact of Rurality on this Current Practice

Eighty-eight percent of the nurses in this study believed that their knowledge was sufficient for medication practice. This belief did not differ between RNs and ENs, RIN and non-RIN in rural and remote areas. A small percentage of nurses did note however, that there was a major difference in medication practice when moving from smaller to larger hospitals. That is, the breadth of medication knowledge required increased as the size of the hospital increased. Further, the majority of nurses noted that there was a need for life-long learning to be able to keep up-to-date in a market place where new drugs were frequently being released onto the market (O'Shea 1999).

There were several questions which aimed to gather specific information relating to the nurses' knowledge of medications. These are now discussed.

4.2.1. Use of Reference Materials to Support Medication Practice

4.2.1.1. MIMS

Respondents were asked to indicate the type of reference material they used to support their medication practice. It was apparent that the most commonly used reference material was the 2002 MIMS Annual. The next most commonly used was a current monthly MIMS. Nurses were less likely to use either MIMS On-line or MIMS on CD-ROM. These findings suggest that the majority of nurses (i.e., 78% for MIMS Annual and 66% for monthly MIMS) use up-to-date reference materials. With the exception of MIMS on-line, where RINs were more likely to use this than other nurses, there was no significant difference between RNs and ENs and between RIN and non-RINs in the use of MIMS.

In a further question, the respondents provided comments on the use of different types of MIMS, noting that MIMS on-line and MIMS CD-ROM took time to access and that in a busy environment the monthly MIMS was a better option as it could be taken with them during their medication round. Additionally, several nurses noted that in their workplace they did not have easy access to a computer, and for those who did, communication networks can fail and therefore it was not sufficient to rely on on-line MIMS.

Other nurses noted that MIMS on-line had replaced the MIMS manual and that the paper MIMS were no longer supplied. This, they believed, was a retrograde step. Some nurses noted that they had out-of-date resource manuals – for example a 1997 MIMS, which the management had not replaced despite requests to do so.

4.2.1.2. Pharmacology text book

The RN respondents in this study were more likely to use a pharmacology text book. However, the use of a text book was less than the use of MIMS Annual and monthly MIMS.

It is apparent from these results, that the majority of respondents in this study were using up-to-date reference materials. The next questions sought to explore if they believed that the access they had was adequate to sustain their practice.

4.2.1.3. Access to and the adequacy of up-to-date reference materials for medication practice

Over eighty percent of nurses believed that they had adequate access to reference materials. There was no significant difference in this belief between RNs and ENs and between RINs and non-RINs. When the data relating to the type of reference materials used and nurses' belief about access is taken into consideration, it is apparent that the majority of nurses use portable medication reference materials as portability is important when reference needs to be made at the patient's bedside. Another interpretation of the value of portable medication reference materials is that rural and remote area nurses, unlike those who are employed in metropolitan areas where resources are more accessible, have to be more independent in decision making.

The lower use of electronic types of reference material could be explained in two ways. First, it is very difficult without Palm Computers or Wireless systems to use on-line reference material at the bedside. Therefore, nurses still require a paper-based medication reference to take away from the nurse's station when administering medications. Second, there is poor access to electronic resources within rural and remote health facilities.

The findings of this study indicate that higher levels of accessibility and adequacy of reference materials are associated with lower levels of medication error, confirming the results of a previous study (O'Shea 1999). A new finding of this study is that lower levels of accessibility and adequacy of reference materials were associated with a perception by nurses of higher expectations by doctors that nurses would violate medication administration procedures, resulting in more medication violations by nurses. The recommendation that nurses have reasonable access to reference materials within the *Administration and Supply of Medications by Registered Nurses in Rural and Remote Areas* (Joanna Briggs Institute for Evidence Based Practice 2000) is therefore reinforced by these findings.

4.2.2. Telephone Orders

In Phase 1 of the study, the data suggested that the documentation of telephone orders was problematic. Therefore, three questions were included in Phase 2 of the study which aimed to elicit the medication practice of nurses and telephone orders. Additionally, nurses made some comments about telephone orders in Question 3.2. It is apparent that taking telephone orders is still a major activity of rural nurses (Hegney et al. 1997; Blue and Fitzgerald 2002) and that many respondents in this study still expressed difficulty in having these orders confirmed in writing within 24 hours (Griffiths and Baker 1999). However, it should be noted that within the *Regulation*, it is only controlled drugs which require the medical officer to confirm in writing, not restricted drugs or S2 and S3 poisons (Queensland Health Environmental Health Unit 2000). It is apparent that some nurses are unaware that the Regulation no longer expects them to confirm in writing telephone orders for restricted drugs and/or S2 and S3 poisons.

As would be expected, RNs were more likely to take these orders than ENs. A new finding of this study is that RINs are more likely to take telephone orders than non-RINs, possibly reflecting the experience of the RIN. In contrast to previous studies (Retsas 1993; Hegney et al. 1997) few nurses in this study reported feeling uncomfortable with challenging incorrect medication orders, possibility reflecting the greater number of RINs taking telephone orders.

It is also apparent that using two nurses to listen to telephone orders (Hegney 1996; Hegney et al. 1997; Cox 2000; Brown 2001) is difficult in rural and remote facilities where there may not be two nurses available. While this is not a requirement of the *Regulation*, it is a recommendation for safe practice (QNC 2001a). Several of the nurses in this study noted that this was an issue which needed to be addressed.

4.2.3. Administration and Supply of Medications Without Authorisation

Whilst the majority of nurses stated they did not work outside the *Regulation* with regard to the administration and supply of medications, some nurses stated they did. The major reason for this practice was that a medical practitioner was difficult to contact, particularly out of hours. For RINs this meant contacting medical practitioners for a telephone order for drugs that might not be on a protocol. For non-RINs, the need to work outside the *Regulation* was brought about by their lack of endorsement. In these cases, the nurses were practising the way all rural and remote area nurses practiced prior to the introduction of the *Regulation* (Kreger 1991; Hegney et. al. 1997). Many nurses noted that the reason they worked outside the *Regulation* was the need to provide a medication in the absence of the availability of a medical officer to ensure good patient outcomes. These are arguments evident in previous research on medication practices of rural nurses (Hegney 1998).

In contrast, the findings of this study also indicate that the majority of nurses worked within the *Regulation*. In a small number of cases (9%), nurses stated they would administer and/or supply a controlled or restricted drug without a medical officer authorisation or without a protocol. It appeared that RINs were more likely to undertake this practice than non-RINs, and that RNs were more likely to undertake this practice than ENs. Whilst this is a very small percent of nurses working outside the *Regulation*, it is apparent that the introduction of the RIN role has not completely ceased this activity (Hegney et al. 1997).

4.2.4. The Role of the Medical Officer

4.2.4.1. Legible prescriptions and ceasing of prescriptions

Poor quality prescriptions have been linked to increased risk of medication errors (O'Shea 1999; Cox 2000). Illegible prescriptions (in whole or in part) are illegal in Australia (Cox 2000; Queensland Government 2003) as they are a major factor in medication error (O'Shea 1999).

In this study, the majority of nurses believed that the written prescriptions from which they administered and/or supplied medications were legible, thus reducing the risk of medication error. There were, however, some differences amongst groups with RNs in rural areas most likely to perceive that a prescription was not clearly written.

4.2.4.2. Expectations of medical practitioners

Hegney (1998), Ross (1999) and Blue and Fitzgerald (2001) have noted that the relationships between the rural nurse and the general practitioner are quite different to those found in metropolitan areas. One of the major differences is that a considerable amount of communication occurs by telephone (Blue and Fitzgerald 2002) due to the absence of permanent medical staff within the facility. Hegney (1998) and Blue and Fitzgerald (2001) note that the foundation of this relationship is trust between the nurse and the medical practitioner. Where this trust is not present, it is argued that the resulting poor interpersonal relationships between the doctor and the rural nurse can result in higher outcomes of medication error and other adverse outcomes (Blue and Fitzgerald 2002). This trust, it is argued, takes time to develop and is not always achieved between rural nurses and general practitioners (Hegney 1998; Blue and Fitzgerald 2002).

The findings of this study reflect those of previous studies of rural nurses (Hegney 1996; Hegney 1998) where a considerable proportion of nurses believed that medical practitioners expected them to work outside the *Regulation*. A new finding of this study is that rural RNs, more than ENs were more likely to perceive this was the case. Another major finding of this study is that the higher the expectation of medical practitioners that nurses work outside the *Regulation*, the higher the probability of a violation occurring.

Similar to the findings of earlier studies (Hegney et al. 1997), nurses in this study reported that medical practitioners could become abusive if they were disturbed for problems they believed were not important, particularly after hours. In such cases nurses were intimidated by the bullying behaviour of the medical practitioner (Blue and Fitzgerald 2002).

Another important finding of this study, not previously reported, is the comment by some nurses that medical staff who come to rural areas with only two years graduate experience have a poor understanding of pharmacology. Other issues, which could be seen to be specifically related to rural areas, were a reported lack of understanding by medical practitioners, who have only worked in larger centres, of the limitations of smaller facilities

which are remote from specialist advice and the fact that off-site medical personnel are as accessible as on-site personnel.

4.2.5. Nurse Initiated Medications – S2 and S3 Poisons

There were three questions that aimed to gather data on nurse initiated medications. Over eighty percent of the nurses in this study stated they initiated S2 and S3 poisons, documented this in the medication chart or in the patient notes, signed for these appropriately and provided a legible name and signature that these medications were given. The *Regulation* clearly states that RNs are able to administer S2 and S3 poisons, and that ENs can do so under the supervision of a RN (Queensland Government 2003). With the exception of nurse initiated S2 and S3 poisons being entered into the patient chart/notes where RIN remote area nurses were more likely to undertake this role than non-RINs in rural areas, there was no difference in this activity between RNs and ENs or between RINs and non-RINs.

Sixty-seven percent of ENs stated they ‘never’ undertook the initiation of S2 and S3 poisons in the absence of a RN. It appears therefore that thirty-three percent of ENs are in breach of the *Regulation* which permits all enrolled nurses to administer a S2 or S3 poison only under the supervision of a RN or medical practitioner (QNC 2001a; Queensland Health 2003a).

4.2.6. Use of the Queensland Nursing Council’s Scope of Nursing Practice Decision Making Framework for Delegation Decisions

The Queensland Nursing Council’s (QNC) *Scope of Nursing Practice Decision Making Framework* clearly describes the responsibilities of a RN who delegates nursing work to either ENs or to unregulated care providers (QNC 2001b). Delegation is defined as ‘the conferring of authority to perform activities on a person whose role does not normally encompass them’ (QNC 2001b: p.5). Further, it is noted that when delegation is made ‘a comprehensive evaluation of changes resulting from the delegation, in terms of improved health outcomes or other (unanticipated desirable or undesirable) effects, should occur’ (QNC 2001b: p.5).

Eighty-six percent of the nurses in this study noted they used the QNC’s *Scope of Nursing Practice Decision Making Framework* when delegating to ENs or carers. This finding was particularly evident in rural areas where RNs were more likely than ENs to use the Decision Making Framework to delegate work to ENs and carers. However, there was some confusion with ENs answering this question and stating they delegated to ENs and carers. Under the *Regulation*, ENs do not have the ability to delegate their authority to administer a S2 or S3 poison or a restricted drug (QNC 2001a).

4.2.7. Access to the Health (Drugs and Poisons) Regulation

Twenty-four percent of nurses stated they did not have easy access to the *Regulation* within their workplace. Remote area RINs were more likely to have easy access within their workplace than rural RINs. In rural areas, ENs were more likely to have easy access to the *Regulation* than RNs.

4.2.8. Use of Standing Orders and Health Management Protocols

4.2.8.1. Standing Orders

There is some suggestion in the literature that the majority of nurse prescribing is accompanied by the use of standing orders or protocols (Nejedly et al. 1999). It is argued that these standing orders or protocols increase the multidisciplinary team for prescribing purposes and therefore improve the prescriptive ability of nurses (Hales et al. 1998).

However, it is also noted that if standing orders are used, they should contain the same information as protocols (Joanna Briggs Institute of Evidence Based Practice 2000).

Whilst the Regulation is silent on the use of Standing Orders, Queensland Health notes that a standing order can provide ‘a legal written instruction for the administration of medication for patients in situations where a prompt response using a standard procedure will improve patient care ...’ (Queensland Health 2003a: p1). In particular, standing orders can be either global (for an organisation) or can be used for individual medical practitioner’s patients (Queensland Health 2003a). There are several restrictions on the use of standing orders which apply to this study:

- An individual patient assessment must be carried out to allow the standing order to be applied to the individual patient and their circumstance;
- ENs (MED) can administer standing order drugs as long as they comply with the QNC’s Scope of Nursing Practice;
- The use of Standing Orders must be documented in the clinical record of the patient;
- Standing Orders can only be issued after endorsement by the Medical Superintendent of the hospital who will issue a reference number to this Order, a copy of which must be kept with the Medical Superintendent;
- Standing Orders must comply with the set proforma;
- Standing Orders are reviewed each twelve months and this review recorded in a central register.

In this study, approximately 53% of nurses were using Standing Orders to increase their independent ability to administer medications. Rural nurses were more likely to use these than remote area nurses suggesting that the introduction of the PCCM and the RIN endorsement had overcome the need for Standing Orders. This result is verified by the finding that approximately equal proportions of ENs and RNs in rural areas (where only a few RNs have a RIN) use Standing Orders. Additionally, that the PCCM has replaced Standing Orders is suggested by the higher use of global standing orders by ENs in remote areas where they are unable to work from the PCCM.

Again, supporting the use of the PCCM, it appears that Standing Orders were used more by nurses from the aged care sector or nurses working in community health. In some cases, it appears that RNs were unaware of their ability to initiate and administer S2 and S3 poisons as they were using global standing orders.

4.2.9. Education of Patients about their Medication and Supply of Consumer Medicine Information (CMI)

4.2.9.1. Patient education

Many studies have been undertaken that have focused on how best to provide information to patients (Hallstrom and Elander 2001; Moumjid, Carrere, Bachelot, Mignotte and Bremond 2003). In all cases these studies suggested that nurses must not only ascertain the need from the patient’s perspective, but also have the ability to be able to provide the education to the patient in a way they understand (Hallstrom and Elander 2001; Moumjid 2003). Only when nurses ensure that patients are free to ask questions and ensure they understand what message is being given, can the knowledge gap between the patient and the nurse as well as the power imbalance be addressed (Rycroft-Malone et al. 2001).

It is also suggested that patients who understand the medications they are taking are capable of making informed choices about this medication, thus increasing feelings of control, self-

determination and autonomy, and increasing the likelihood of compliance with the medication regime (Edwards 1995; Rycroft-Malone et al. 2001). It is suggested that compliance with medications has economic benefits to the health system as it is estimated that re-admissions can be a result of non-compliance to the prescription (Merkatz and Conig 1992). Understanding of medications is particularly important in patients who have English as a second language (Merkatz and Conig 1992).

In contrast to a previous study (Rycroft-Malone et al. 2001), over 80% of nurses in this study believed they had sufficient knowledge of medications and how they worked to explain to patients in terms the patient understood, how the medications worked; the side effects of the medications. RINs were more likely to believe they could explain to patients the side effects than other non-endorsed nurses. The differences in the findings of this study may be explained by the nature of nursing practice in rural and remote areas. For example, nurses in rural and remote areas are more likely to know the people in their community (Hegney et al. 1997) and therefore are more likely to have frequent on-going contact with these people. In these instances it is suggested, relationship-based partnerships between the nurse and the client are more likely to develop and therefore the client's knowledge of their disease state and medication need is enhanced (Rycroft-Malone et al. 2001).

4.2.9.2. Provision of educational material including Consumer Medicine Information (CMI)

Consumer Medicine Information (formally called Consumer Product Information) sheets are provided by pharmaceutical companies with the aim of supporting information exchange between the health professional supplying or dispensing the medication and the patient/client (Communication Research Institute of Australia 2001). Despite the fact that the Queensland Health's Environmental Health Unit (2002) states that it is a responsibility of nurses to provide CMI to patients (if it is available), only 22% of nurses in this study stated they always provided this information if it was available. Remote area nurses were more likely than rural nurses to provide CMI. It should be noted that there was no difference between RINs and non-RINs and the provision of CMI, suggesting that the need for patient education has not been a major focus of the endorsement programs.

4.2.10. Use of Interpreters or Indigenous Health Workers for the Administration and Supply of Medications

In Phase 1 of this study, the data indicated that nurses were unlikely to routinely provide patient education, and in particular the use of interpreters and Indigenous Health Workers was poor. As a result, questions were added to the questionnaire which aimed to gather further information on these practices from the broader rural and remote area nursing community.

There is little information developed nationally which provides consumer information to those who do not speak English or for whom English is a second language. For example, even the Consumer Medicine Information Sheets are not available in any language other than English (Communication Research Institute of Australia 2001). Therefore, in the absence of any national material, the importance of developing some form of communication (either verbal or written) to those patients who do not understand English is even more vital. In this study, it was apparent that the majority of nurses were not using interpreters or Indigenous Health Workers to explain to patients their medications. A lack of understanding or comprehension by patients is expected to increase the rate of medication error and non-compliance (O'Shea 1999).

4.2.11. Supply of Medications

In rural and remote areas, registered nurses are permitted to supply medications in the absence of a hospital pharmacist (Queensland Health 2003a). In rural areas, RINs were more likely to undertake this role than non-RINs. Additionally, reflecting the fact that there are unlikely to be many hospital pharmacists employed in remote areas, remote area nurses were more likely to supply medications than rural nurses. Contrary to the *Regulation*, about 10% of ENs were also supplying medications (Queensland Health 2003a).

The nurses who indicated they did supply medications, were asked how confident they felt when doing so. The large majority (88%) stated they felt confident. However, in remote areas it was apparent that RINs were more likely to feel confident than non-RINs. This finding suggests that the endorsement process assists nurses with their extended role.

The frequency of supply of medications also reflected the lack of pharmacists with approximately 50% of respondents stating they supplied medications every working day. Again, remote area RINs were more likely to undertake this task daily (83%) compared to remote area non-RINs (58%). In rural areas, the difference in the supply of medications between RINs (53%) and non-RINs (41%) was also apparent, but not statistically significant.

4.2.12. Labelling of Medications

Nurses who supply medications often do so for more than one dose. In these cases, nurses are required to provide a label to the medication. Forty-eight percent of the respondents in this study stated they labelled medications. It is apparent that RINs are more likely to carry out this function than non-RINs, again reflecting the expanded role. Similarly, reflecting the lack of pharmacists in remote areas, remote area nurses (both RNs and ENs) were more likely to label medications than rural nurses. Consistent with the responses to supply of medications, ENs were labelling medications – again a role not outlined in the *Regulation* (Queensland Government 2003).

The *Regulation* in Sections 85, 198, and 276, clearly states what is required on a medication label (Queensland Government 2003). Question 3.11 in the survey, outlined these requirements and ascertained if nurses complied with the *Regulation* with regard to labelling. The most common information recorded on labels was a description of the contents (94%), the name of the patient (95%), the date dispensed (87%), the directions for use (82%), and the name and address of the doctor, nurse or health facility (71%). The least common information always placed on a label included: warning statements such as ‘may cause drowsiness’ (50%), ‘keep out of reach of children’ (54%), and the initial of the nurse labelling the medication (58%).

There were some differences between the practices of RNs and ENs and between RINs and non-RINs on their labelling practices. There were some interesting reversals on practice depending upon geographical location. For example in remote areas, ENs (100%) always put the name of the patient on a label compared to 94% of RNs. In contrast for rural areas, only 70% of ENs put the name, compared to 97% of RNs. When recording the date dispensed, 88% of RNs in rural areas always recorded the date dispensed on the label, whereas only 70% of ENs recorded same. In contrast, 87% of RNs in remote areas always recorded this date, compared to 95% of ENs. With regard to the description of the contents (e.g., medication name and dose), 100% of ENs in remote areas always recorded the

descriptions of contents, whereas 92% of RNs recorded same. In contrast in rural areas, only 67% of ENs recorded the description, compared to 97% of RNs.

With regard to affixing warning statements such as ‘may cause drowsiness’ or ‘keep out of reach of children’, RINs in rural areas were more likely to do this than non-RINs in rural areas.

4.2.13. Handling of Medications by the Health Facility

In line with information gathered from Phase 1 of this project, which suggested that medications were handled very well (with the exception of a working alarm on the pharmacy refrigerator), five questions were included in the questionnaire which examined the practices within the health facility with regard to the ordering, storage, transportation, supply (called dispensing in the questionnaire) and disposal of medications in accordance with the *Regulation*. It should be noted that several respondents noted in the qualitative responses that their facility had been recently audited and was in the process of changing practices to ensure compliance with the *Regulation*.

4.2.13.1. Ordering

Some nurses (15%) did not know if the ordering of medications in their facility complied with the *Regulation*, suggesting that they did not carry out ordering or were unaware of their obligations under the *Regulation*. Eighty-five percent of those who did know stated that they believed that the facility complied always, or most of the time.

4.2.13.2. Storage

Incorrect or poor storage of medications is not only a breach of the *Regulation* (Queensland Government 2003), but also can lead to increased medication errors (Anderson and Webster 2001). Sixty-four percent of the respondents in this study believed that storage of medications complied with the *Regulation* all of the time. The storage of controlled and restricted medications is clearly outlined in the *Regulation* (Queensland Government 2003). In remote areas, where nurses would be more likely to order, store, administer and dispense drugs, RINs were more likely to believe that there was compliance than non-RINs. Additionally, possibly due to the fact that remote area nurses often work in isolation from other nurses and are unlikely to have pharmacists in their facility, remote RINs were more likely to believe that the storage complied with the *Regulation* compared to rural RINs.

4.2.13.3. Transportation

Whilst only 56% of nurses noted that their facility complied all of the time with the *Regulation*, there were differences between RINs and non-RINs. For example, RINs in rural and remote areas were more likely to report that the facility complied with the *Regulation* with regard to transportation.

4.2.13.4. Dispensing

Nurses are not allowed to dispense medications. Dispensing under the *Regulation* is defined as selling on prescription (Queensland Government 2003). Nurses should only supply medications. As a result of the use of the word ‘dispensing’ instead of supplying (which nurses are able to do), no interpretation can be made on the results which would reflect nursing work.

4.2.13.5. Disposal

Fifty-four percent of nurses believed that their facility disposed of medications correctly.

4.2.14. Packaging of Medications

Concerns about packaging of medications arose as a major theme within the last question of the study. It should be noted that there were no questions of packaging included in the questionnaire and that further studies into the medication practice of nurses should include this.

There were two themes which arose from the data analysis. First, the inability of nurses who were supplying medications to supply only what was required for the immediate management of the patient. In these instances nurses were concerned that medications were being supplied to clients superfluous to their needs. Nurses in the study therefore expressed the wish to be able to split packs (if no starter packs were available) rather than oversupply medication to the patient.

The second issue related to the use of dosette boxes by clients. In some cases nurses were filling the dosette boxes for clients and were concerned this would be regarded as dispensing. However, on consultation with the Environment Health Unit of Queensland Health (personal communication, 15th September 2003) it appears that filling a dosette box would be seen as administering the medication rather than supplying or dispensing. An additional concern regarding the use of dosette boxes was that errors occurred when medications were transferred from dispensed containers to the dosette. This practice had previously been identified as causing errors, some of which could severely compromise patient safety (Levings et al. 1999).

4.2.15. Enrolled Nurse Practice

Question 3.3 was specifically designed to gather information from enrolled nurses. There were 10 questions which examined the initiation, supply and administration practices of ENs. These were related to the initiation, supply and administration of prn, S2 and S3 poisons, controlled and restricted drugs.

4.2.15.1. Initiation, supply and administration of prn medications

Prn (or 'as required') medications are usually delivered to a patient after an assessment (either by a registered nurse or a patient) has been carried out indicating that the medication is required. ENs, who are not independently able to interpret patient assessment data, develop a nursing plan, or evaluate a patient's response to the prn medication (QNC 2001a) are not able to initiate prn medications.

In this study ENs were asked if they had initiated prn medications in the absence of a RN. One-third of the EN respondents indicated they initiated prn medications in the absence of a RN. Eight percent of EN (MED) respondents stated they always or most of the time carried out this activity compared to nil percent of non-ENs (MED). It is apparent that, as ENs are not allowed to initiate a prn medication, approximately one-third of ENs were working outside of their accepted scope of nursing practice and that ENs (MED) were more likely to say they do this than non-ENs (MED).

With regard to the administration of prn medications, ENs (MED) are able to administer a prn S2, S3, or S4 medication as long as the medication is administered to a patient who is able to assess their own need for the medication, and/or the indications for the prn medication have been written onto the care plan by the RN (QNC 2001a). Non-ENs (MED) are not able to administer prn medications unless the need has been assessed by a RN or

medical practitioner. This assessment could occur by telephone (QNC 2001a). It should be noted that all ENs are unable to administer a prn medication if it is a controlled drug (QNC 2001a). The data indicate that there was no significant difference between EN (MED) and non-ENs (MED), with approximately fifty percent in each category stating they would carry out this activity. It is apparent, therefore, that a large proportion of non-endorsed ENs were working as if they were endorsed.

Under the *Regulation* ENs are not able to supply medications (Queensland Government 2003). Despite this, at least 36% of the respondents in this study did supply medications at some stage. Of this 36%, six percent of ENs (MED) and none of the non-ENs (MED) stated they always or most of the time supplied medications, indicating that ENs (MED) were more likely to be undertaking a supply role than non-ENs (MED).

4.2.15.2. Initiation of S2 and S3 poisons

Whilst ENs are not able to initiate or supply S2 and S3 poisons, they are able to administer these drugs under the supervision of a RN or medical practitioner. Despite this, approximately one-third of the ENs in this study stated they initiated and/or supplied S2 or S3 poisons some of the time. Of those nurses who were initiating S2 and S3 poisons, non-ENs (MED) (14%) were more likely to always or most of the time carry out this activity than ENs (MED) (4%).

4.2.15.3. Initiation, administration and supply of restricted drugs (S4)

The majority of ENs (83%) stated they never initiated restricted drugs in the absence of an RN. Again, non-endorsed ENs (14%) were more likely to state they always or most of the time initiated S4 medications than ENs (MED) (4%).

With regard to administration of restricted drugs, 59% of respondents stated they never undertook this activity. There was no significant difference between ENs (MED) and non-ENs (MED). It is apparent that there was again no real difference in the activities of ENs (MED) and non-ENs (MED), despite the fact that the *Regulation* only allows for EN (MED) to possess and administer a restricted drug which has been ordered by a medical practitioner or supplied by a RN under a DTP (QNC 2001a). According to the *Regulation*, the administration of medications must be under the supervision of a RN.

Thirty-eight percent of ENs in this study stated they always, most of the time or sometimes supplied a restricted drug. Non-ENs (MED) (16%) were more likely to state that they always or most of the time carried out this activity than ENs (MED) (7%). However, 31% of ENs (MED) stated they carried out this activity sometimes, compared with 15% of non-ENs (MED). This is not an activity that ENs are permitted to undertake and this is a clear breach of the *Regulation*.

4.2.15.4. Initiation, supply and administration of controlled medications

ENs are not normally allowed to initiate, administer or supply a controlled substance (QNC 2001a). They are able, however, to assist a person take a controlled substance if they are working as a carer. Whilst only a very small percentage of nurses in this study stated they initiated (2%), administered (12%) or supplied (14%) a controlled drug in the absence of a registered nurse, it is apparent that some ENs are working outside of the *Regulation*.

When the data were examined further, there were some observed, but not statistically significant differences between non-ENs (MED) and ENs (MED). For example:

- Fourteen percent of non-ENs (MED) stated they sometimes initiated a controlled drug compared to 0% ENs (MED);
- One percent of ENs (MED) stated they always initiated a controlled drug compared to 0% of non-ENs (MED);
- Fourteen percent of non-ENs (MED) stated they always, most of the time or sometimes administered a controlled drug compared to 12% of ENs (MED);
- Fourteen percent of non-ENs (MED) stated they always or most of the time supplied a controlled drug compared to 2% of ENs (MED);
- Twelve percent of ENs (MED) stated they sometimes supplied a controlled drug compared to 0% of non-ENs (MED).

4.2.16. Effects of Workload including Staffing Levels and Skills Mix

Internationally, registered and enrolled nurses are faced with managing the impact of decreasing numbers of experienced nurses and increasing numbers of unregulated and untrained care providers (AIHW 2003). It has been reported internationally that as hospital activity and patient acuity rates have increased and patient length of stays have decreased, there has not been a linked growth in the nursing workforce (Buchan et al. 1997).

The major cause of the high workload of nurses is cost containment. A direct outcome of cost containment has been growing numbers of acutely ill patients per bed per nurse, the increased use of unqualified workers and a reduction of the number of qualified nurses employed in the work unit (Buchan 2000; Senate Community Affairs References Committee 2002). In the last two decades there has been an increase in hospital activity rates, a decrease in patient length of stay and an increase in patient acuity rates. There has not been a commensurate growth in the size of the nursing workforce which accommodates these changes (Buchan et al. 1997; AIHW 2003; Tummers et al. 2002).

Evidence from previous studies indicates that appropriate skills-mix, including higher levels of qualified staff, particularly registered nurses, is related to improved quality of care and patient safety and outcomes (Idvall and Rooke 1998; Fagerstrom and Rainio 1999; Spilsbury and Meyer 2001; Needleman et al. 2002). In this study, 45% of nurses believed that current workloads ensured they could not comply with the *Regulation*. Similar to findings of other studies, 43% of nurses in this study noted that inadequate staffing levels and skills mix impacted on their ability to comply with the *Regulation* and therefore avoid medication errors (Meurier 2000). This was more the case in rural than remote areas. In the qualitative data, nurses commented that '*mistakes often happen because time frames to complete tasks safely become ridiculous*'.

The findings of this study confirm that higher workload, lower staffing levels and lower skills mix were associated with higher levels of medication violations (Meurier 2000). A new finding of this study showed that the higher the workload for doctors, the more nurses perceived doctors expected them to work outside the *Regulation*, leading to a higher level of medication violations and therefore an increased risk of errors.

SECTION 2

4.3. The Impact of the Medication Endorsements on Practice of Nurses and Consumers of Health Care in Rural and Remote Communities

One of the major impacts on the role of the rural and remote area nurse has been the introduction of the RIN and EN (MED). The research team, therefore, was particularly interested in determining if the respondents believed that other health professionals and the community understood this role.

4.3.1. Understanding of the Endorsed Role

There were three questions relating to whether the respondents in this study believed that other health professionals and the community understood the endorsed role. These questions included two Likert scale questions and one open-ended question. The questions related to all endorsements. However, in the majority of cases, particularly in the qualitative data, nurses referred to the EN medication endorsement and RNs to the RIN.

4.3.1.1. Other health professions

It is apparent from the findings that a majority (57%) of respondents believed that other health professionals did not understand the role difference between an endorsed and unendorsed nurse. In fact, some nurses noted that other health professionals did not have any motivation to understand role differences in nursing.

Within the qualitative data there were also comments about the EN medication endorsement, with many negative comments arising from both ENs and RNs. The major issues seemed to be that the EN medication endorsement allowed the EN to work within, what the RNs considered to be, the RN's role. Comments were made by several respondents that there was role blurring with ENs (MED) now able to undertake most of the RN's role. Some RNs were resentful that while the EN had now taken on what was considered to be RN work, it was the RN who remained accountable for the ENs practice, as the RN must always supervise the work of the EN (QNC 2001a). Some RNs believed that the EN medication endorsement was one way to decrease the number of RNs working and thus was being used as a cost-saving exercise by health care agencies.

Confirming this, the ENs (MED) noted that there was a lack of trust by some RNs who would not allow ENs to give medications. Other ENs noted that they were not allowed to work with their medication endorsement, although they had completed a qualification. Similar to other studies, some ENs (MED) noted that while they had increased responsibilities they were not being remunerated for the medication endorsement (Hegney et al. 2003).

In the United Kingdom, the removal of professional boundaries or 'role blurring' is seen to be the 'key to modernising the NHS' (Masterson 2002, p.337). In fact, role blurring and the erosion of traditional professional boundaries, with its link to cost savings and benefits to health care delivery, has been the focus of previous studies (Brown et al. 2000). Consistent with the findings of these previous studies, some of the RN respondents in this study strongly expressed the view that the expansion of the EN role was an intrusion into the role of the RN (Brown et al. 2000). These RNs would be seen to be attempting to maintain their professional boundaries in an attempt to stop the widespread adoption of the EN (MED) role

(Gerrish 1999). For many of these RNs, the current role boundaries allow them to feel secure in their work and good about their achievements (Hirschhorn 1988; Brown et al. 2000). Thus, the removal of these boundaries were seen by RNs in this study as an erosion of their role.

The concerns of these RNs are even more justified when one considers that whilst the EN (MED) is accountable for her/his practice, it is the delegating RN who is equally responsible should the EN not work within the legislation. One could argue that in these cases, there had not been a clear boundary set about how expanded the role of the EN could be (Brown et al. 2000). It is therefore up to the profession to decide if it supports the practice of ENs to supply and label medications, and if so, what legislation will be required to reflect this expanded role. Until that time, it is apparent that ENs in this study are working outside the *Regulation* and exceeding the boundaries of what is legally acceptable practice.

With regard to the RIN, remote area nurses were more likely to believe that other health professionals understood this role than rural nurses. This finding could be explained by the fact that the RIN was first introduced in remote areas and has only recently been expanded to rural areas. This confusion, or lack of understanding of a new role, is also reported in the international literature, particularly linked to the introduction of a nurse practitioner role (Daly and Carnwell 2003). In the case of RINs, it is apparent that, like the nurse practitioner role, the need for a RIN has been brought about by perceived shortcomings in the quality of patient care and health care resources (particularly shortages of medical practitioners) (Daly and Carnwell 2003). However, similar to the nurse practitioner role, there appears to be confusion on behalf of other health care practitioners about the role differences between RINs and non-RINs (Albarran and Fulbrook 1998; Wilson-Barnett et al. 2000). Whilst there appears to be no easy solution to the confusion about the role of nurse practitioners at the national and international level, there are some steps which could be taken to lessen the public's confusion about the role differences between RINs and non-RINs. In particular, Queensland could ensure that all rural and remote area nurses are RINs, therefore removing any confusion about the role (Daly and Carnwell 2003).

One finding, not previously reported, was that relieving medical officers were unaware of the role differences between RINs and non-RINs. A recommendation therefore, would be to include this information at the undergraduate level for all medical students as well as in orientation sessions with new medical practitioners before they are sent out to relieve in rural or remote areas.

4.3.1.2. Patients/clients

In contrast to the findings above, it was apparent that a large majority (89%) of the respondents in this study believed that patients/clients did not understand the role difference between a RIN and non-RIN. Some nurses noted that while patients/clients would not think in terms of whether a nurse was endorsed, they would be confused about why one nurse was able to work in an extended practice role and another was not. However, some nurses did note that in communities where the RIN role had been in place for some time that the community fully understood this nursing role.

The confusion about differences between nurses and therefore what they are legally permitted to undertake, has been reported previously. However, it was related more to confusion about differences in levels of nurse practitioners (Daly and Carnwell 2003). Again, several respondents in this study believed that role confusion would be overcome if there were no differences in the levels of nurses (e.g., RNs and ENs) or between endorsed

and unendorsed nurses (RIN vs non-RIN and EN (MED) vs EN). This finding is supported by one previous study (Daly and Carnwell 2003). This would mean that the EN model would be phased out. The risk of removing the EN model of care is that the EN would soon be replaced by another level of nurse whose care might not be regulated.

If it is not feasible to have all ENs with a medication endorsement and all rural and remote area RNs with a RIN endorsement, the data from this study support the need for a strong public awareness campaign that clearly outlines the role differences between nurses. Further, it is also apparent that despite the extensive workshops held by the Queensland Nursing Council to inform nurses of their obligations, some of the education may be needed to be addressed to the nursing profession itself.

4.3.1.3. Endorsed nurses knowledge of role

Forty-eight percent of nurses believed that their knowledge of their endorsed role was adequate. Many of the comments provided that related to a lack of understanding of the endorsed role were from rural nurses who were undergoing an endorsement course or who noted that there were currently no RINs in their facility.

4.3.1.4. Nurses' satisfaction with the endorsed role

Endorsed RNs and ENs were asked to comment if they believed the endorsement was sufficient for their current scope of nursing practice. Four endorsements were listed. These were rural and isolated practice (RIN), immunisation (IPN), sexual and reproductive health (SRH), and medication endorsement for enrolled nurses (MED). Ninety-two percent of nurses believed that the RIN was sufficient for their scope of practice; 95% believed that the immunisation endorsement was sufficient for their scope of practice; 82% of nurses believed that the sexual and reproductive health endorsement was sufficient for their scope of practice and 93% agreed the medication endorsement for ENs was sufficient for their scope of practice.

Nurses also provided qualitative responses to the questions surrounding the perception of the endorsed role by themselves, other health professionals, other nurses and the public. Many of the positive comments confirmed previously stated views such as the endorsement course had changed their practice for the better.

Negative comments included issues such as the lack of extra remuneration for both the ENs (MED) and RIN endorsements as respondents believed they should be remunerated at a higher rate for their expanded practice role. Eight respondents wished for the RIN (and therefore the DTP and HMP) to be expanded as they believed it did not allow for sufficient flexibility, particularly for prn medications. Again, there were nurses who listed medications which were S2 or S3 poisons which RNs can administer without a medical practitioner's order.

4.3.1.5. Strategies to overcome lack of understanding of the endorsed nurse's role

The respondents were asked to provide some guidance on what strategies could be used to overcome the lack of understanding of the endorsed nurses' role. It was apparent that education was seen to be the major way. This could take the form of:

- Posters at work explaining the role difference;
- One to one sessions with patients/clients or other health professionals;
- A flyer included in patient information given to them prior to or on admission; or
- Educating GPs about the endorsed role.

The other most commonly suggested strategy was for visible markers on a nurse's uniform which allowed people to differentiate between AINs, ENs and RNs. Some believed this could be achieved by different uniforms, whilst others believed this could be achieved on the nurse's name badge. The latter suggestion has been introduced since the completion of this study, with the Queensland Nursing Council in 2003 releasing the endorsements which can be used on name badges.

4.3.2. Medication Calculation Tests

There is considerable literature on a link between medication errors and the poor mathematical skills of nurses (Bayne and Blinder 1988; Blais and Bath 1992; Worrell and Hodson 1989). A common mechanism for testing these skills has been the annual medication calculation tests (O'Shea 1999), which have been recommended as one way of ensuring competence in medication administration (Joanna Briggs Institute for Evidence Based Practice 2000).

Despite the conflicting opinion of the literature on the usefulness of these tests (Conti and Beare 1998; Calliari 1995), the majority (81%) of nurses in this study believed that annual medication calculation tests were worthwhile with regard to maintaining competence. In this study, however, it was apparent that ENs were more likely to see these as useful than RNs. Additionally, RINs in rural areas were more likely to believe that medication calculation tests were worthwhile than non-RINs.

4.3.3. Factors Affecting the Endorsed Nurses' Ability to Comply with the Regulation

4.3.3.1. Adoption of the Primary Clinical Care Manual (PCCM) by the facility or Health District

For RINs to work within the *Regulation*, the Health District must sign off on protocols (Queensland Health Environmental Health Unit 2000). In Queensland, the protocols which have been accepted for signature at each individual Health District are those within the PCCM. Without signoff, a RIN cannot initiate, administer or supply any drugs on the DTP. In this study, whilst 78% of nurses said they used the PCCM in their practice and that it had been endorsed by their health facility, a further 14% of the respondents noted that the PCCM had not been signed off. As would be expected, it was the RINs who were more likely to report this lack of sign off. Additionally, it was in rural areas that these nurses were more likely to state that signoff had not occurred. This could reflect the fact that rural areas are still in the process of implementing the RIN role, whereas remote areas have had this role for some time.

The qualitative comments provided by the respondents reflected the quantitative results. For example, some nurses noted that the PCCM was not signed off, while other nurses noted that the medical practitioner did not agree with the treatment protocols within the PCCM, and therefore the multidisciplinary agreement needed for implementation of the protocols was not possible (Queensland Health Environmental Health Unit 2000).

4.3.3.2. Use of PCCM

Whilst 44% of all nurses stated that protocols such as the PCCM were being used, RIN remote area nurses were more likely to state this than rural nurses. Similarly, RINs in both rural and remote areas were more likely to be using the PCCM than non-endorsed nurses.

Other nurses who were not employed in Queensland Health facilities noted that the PCCM was not used as their focus was primary community nursing. Finally, some respondents

noted that the manual was used as a guide only, but they were still required to have the medical practitioner order all controlled and restricted drugs.

4.3.3.3. Usefulness of the PCCM

Nurses who had stated they used the PCCM in their practice were then asked to provide some comments on the usefulness of the PCCM to their practice and their perceptions of its credibility as a resource. All RINs strongly agreed or agreed that the PCCM supported their practice and 86% believed that it clearly outlined the referral processes. A further 80% of nurses believed that the PCCM clearly outlined the minimum requirements for documents. Eighty-four percent of nurses believed that the material in the PCCM was up-to-date and 86% believed that it was an easily useable resource. Additionally, 94% of nurses stated that the PCCM was readily accessible within their health facility.

Several nurses made comments regarding the PCCM. Nineteen nurses provided comments which would improve the useability of the manual. In particular, it was noted that the layout was not as user friendly as it could be (that is, it does not lie flat). A few nurses expressed concern that as it was reviewed every two years, there was the potential for material to become out of date.

Whilst 16 respondents had never heard about the PCCM, many others provided positive comments on the clarity of the guidelines and its usefulness to all practitioners from novice to expert.

4.3.4. Controlled and Restricted Drugs to be added to the DTP

Reflecting the changing role of nurses, where there has been an expansion into what would have been the role of other health professionals (Masterson 2002; Daly and Carnwell 2003), the drugs which the majority of nurses wished added to the DTP were narcotic anaesthetics. In the most part, the nurses wished to administer and supply these drugs to palliative care patients being managed in the home.

Many of the other drugs which were listed as necessary were S2 and S3 poisons such as Salbutamol and Paracetamol which RNs are able to administer without a medical practitioner order. Similarly, RINs are allowed to supply a S2 or S3 poison. These results suggest that some RNs are not aware that they now have the ability to administer a S2 or S3 poison.

SECTION 3

4.4. Education and Training for Medication Practice

There were several questions within the questionnaire which focused on the nurses' preparation for the endorsed role.

4.4.1. Factors Influencing Educational Preparation for Medication Practice

4.4.1.1. Perceptions of education and experience and their impact on medication preparation

Whilst the literature has conflicting views on the link between educational preparation and the likelihood of medication error (Bayne and Blinder 1988; Boggs et al. 1988; O'Shea 1999), it is apparent that the nurses in this study were more likely to believe that experience was more valuable for medication training than formal education. However, nurses were less likely to believe that in-service or short courses were as valuable as formal education.

With regard to experience, remote RINs were more likely to indicate its value than rural RINs. Confirming this difference, rural nurses were more likely to believe that formal education was more valuable than remote area nurses.

The use of a preceptor was also seen to be valuable by 61% of the nurses in this study. In particular, rural ENs found a preceptor more valuable than rural RNs. The perception of the usefulness of a preceptor for medication practice was not influenced by the nurse's years of experience in nursing.

The majority of nurses (78%) in this study also believed that an endorsement course was valuable in their preparation for medication practice. Again there were differences between rural RNs and ENs, with ENs finding the course more valuable than RNs. There were no differences between remote area RNs and ENs. RINs were more likely to believe that their endorsement course was very valuable compared to nurses who held other endorsements.

4.4.1.2. Types of medication courses and their usefulness

Confirming the results above, it is apparent that all endorsed nurses found the course they had undertaken to be extremely or very useful regardless of whether it was undertaken at a TAFE, university, or through Queensland Health. Additionally, at the in-service or short course level, the majority of nurses were very satisfied with the usefulness of these courses.

4.4.1.3. Strengths and weaknesses of education and training programs

Several nurses in the study believed that other than formal endorsement programs, there were few medication courses available to them which were accessible.

There were many nurses who provided positive comments about their educational experiences, especially with regard to the RIN course where some nurses provided positive comments on the self-pacing characteristics of the course and links by videoconference. They noted that the course was very 'comprehensive'. Similarly, other nurses believed that in-service in the form of medication calculation tests or in-service training was very useful.

Other nurses raised negative aspects of the courses they had undertaken. For example, some nurses believed that the mode of delivery should have been face-to-face rather than distance, and others noted that the course was too condensed and therefore the workload was excessively high.

Other comments which were made in the questionnaire about continuing professional education included the need for regular updates to ensure that nurses remained competent following completion of the course. These would best be provided as self-paced programs.

4.4.1.4. Barriers to education programs

The barriers mentioned by the 25% of nurses in this study such as inability to access education programs have been raised in previous studies (Hegney et al. 1997; Spencer 1997; Hegney and McCarthy 2000; Hegney et al. 2001). Similar to the findings of these other studies, remote area RINs were more likely to believe that access was difficult than rural RINs. Additionally, non-RINs were more likely to perceive lack of access than RINs.

Additionally, the findings that respondents were restricted by the cost of travel to attend distant courses; their current workload which meant that time was not available to undertake

these courses; and the cost of the course itself were findings expressed in previous studies (Hegney et al. 1997; Spencer 1997; Hegney and McCarthy 2000; Hegney et al. 2001).

4.5. Conclusion

This chapter has discussed the results of the study and compared them to previously undertaken research as well as the BPIS and the *Regulation*. The next chapter provides a summary of the findings of this study and makes recommendations on how medication practice can be improved.

5. CONCLUSION AND RECOMMENDATIONS

This chapter provides a summary of the major findings of the study. It begins by describing the findings with regard to the respondent's current medication practice. The chapter will then discuss issues which are linked to nurse's endorsement and education for medication practice. The findings relating to medication error will then be discussed. The chapter will conclude by making several recommendations for improving the safety of medication practice in rural and remote area nurses.

5.1. Current Medication Practice of Rural and Remote Area Nurses

To practice in a competent and safe manner, nurses require good knowledge of pharmacology, pharmokinetics, and pharmacodynamics.

5.1.1. Medication Knowledge and Reference Materials Which Allow Nurses to Keep Up-To-Date

It is apparent that the majority of nurses in this study believed they had sufficient knowledge to undertake the initiation, administration and supply of medications safely and competently.

This knowledge was assisted by ready access to reference material, of which the most commonly used was the MIMS. In the majority of cases, the nurses used paper versions of MIMS as they believed that electronic versions (CD-ROM and On-line) were not sufficiently portable. In facilities where electronic versions were the only version supplied, nurses believed that the change to electronic systems without access to these systems at the bedside, was a retrograde step.

In addition to knowledge of medications, nurses also require good knowledge of the legislation and to the policies and protocols within their workplace. In Queensland, nurses are also required to understand the Scope of Nursing Practice Decision Making Framework which allows the nurse to ascertain if they are working safely within their scope of practice.

5.1.2. Nurse's Understanding of their Scope of Practice and the Regulation

The data suggest that nurses require further education with regard to the scope of practice and the *Regulation*. Specific areas requiring attention are:

a) Confirmation of telephone orders within 24 hours

The data from this study suggested that many nurses were unaware that they did not have an obligation to have medical practitioners confirm in writing, orders for restricted drugs within a 24 hour time period. Rather, the confirmation is only required for controlled drugs. Further, it was apparent that nurses were not aware that their only responsibility when a medical practitioner does not confirm the controlled drug order in writing within the statutory time period was to notify the DON.

b) Two nurses listening to verbal medication orders

Whilst it is considered to be safe practice, the need for two nurses to listen to telephone orders is not always practical in rural and remote areas. Nurses need to know that this is a recommendation for safe practice and not a requirement of the *Regulation*.

c) Initiation of S2 and S3 Poisons

The data suggested that many nurses in this study were not aware that RNs were able to initiate and administer and, in some cases, supply S2 and S3 poisons.

Whether by ignorance or intent, some of the nurses in this study were clearly working outside the *Regulation* and therefore the scope of nursing practice.

5.1.3. Nurses Working Outside the Regulation

a) RNs

The data from this study suggested that RNs continued to initiate, administer and supply medications which were not ordered under a written or verbal prescription or were not on a protocol or standing order. The RNs who undertook this activity were more likely to be RINs, therefore suggesting that the RIN endorsement has not completely stopped this previously reported activity of rural and remote area RNs.

b) ENs

The data suggested that ENs were more likely to work outside the *Regulation* than RNs. Areas where ENs were working outside their scope of nursing practice and/or the *Regulation* included:

- The initiation, administration and supply of prn medications in the absence of an RN. It should be noted that ENs (MED) were more likely to undertake this role than non-ENs (MED);
- The initiation, administration and supply of restricted drugs. In this case non-ENs (MED) were administering restricted drugs when, unless they are EN (MED), they are working outside the *Regulation*. Similarly, ENs (regardless of endorsement) reported initiating and supplying restricted drugs and this is not within the *Regulation* or their scope of practice;
- Both ENs and ENs (MED) reported initiating, administering and supplying controlled medications; and
- The use of the Scope of Nursing Practice Decision Making Framework to delegate to unregulated care providers.

There are two methods where RNs can initiate, administer and supply medications without obtaining a medical practitioner's order for each activity. These are the use of Standing Orders and protocols.

5.1.4. Use of Standing Orders by RNs and ENs

a) Standing Orders

Analysis of the data suggested that non-RINs in rural nurses and nurses employed in aged care and community health were more likely to use Standing Orders than RINs (particularly RINs from remote areas). Additionally, ENs from remote areas were more likely to use global Standing Orders. These findings suggest that the introduction of the PCCM and the RIN endorsement has decreased the necessity for Standing Orders.

b) Protocols (PCCM)

As the protocols used in Queensland are the PCCM, the findings will be discussed in 5.2.4.

An important part of the role of the nurse is to educate the patient/client about the medications they are taking. This education is a requirement for RINs who must supply, where available, CMI to patient/clients.

5.1.5. Patient Education

In both Phases 1 and 2 of this study, the data suggested that nurses rarely provided CMI to patients. Additionally, respondents in this study noted they rarely used interpreters or Indigenous Health Workers. There was no difference in this activity between RINs and non-RINs suggesting that the need for patient education has not been a major focus in endorsement education programs.

In rural and remote areas, there are often no hospital-based or community pharmacists. In the absence of pharmacists, rural and remote area registered nurses (both RINs and non-RINs) are able, under the *Regulation*, to supply medications.

5.1.6. Supplying and Labelling Medications

a) Supplying

The data suggested that the supply of medications was a frequent activity of many rural and remote area nurses, with at least 50% of the nurses in this study supplying these on a daily basis. This activity was more likely to be carried out by remote area nurses (reflecting the lack of facility or community pharmacists), and by RINs from both rural and remote areas.

b) Labelling

When undertaking the supply of medications, unless the drug is for a single dose, nurses are required to label the medication container. The data suggested that the labelling of medications often does not comply with the *Regulation*, particularly with regard to the need to provide warning statements, particularly, 'keep out of reach of children'. Further, less than 50% of nurses were initialling the label prior to supplying it to the patient/client.

In remote areas, nurses in sole practices will be responsible for the storage of medications. In rural areas, storage may be the responsibility of a hospital pharmacist or in the absence of a hospital pharmacist will be the responsibility of the DON.

5.1.7. Transportation, Storage and Disposal of Medications

The data from this study suggested that the storage of medications complied with the *Regulation*. One area which appeared to require attention was maintaining the storage area at the correct temperature, especially during the summer months.

The data suggested that both transportation and disposal of medications in rural and remote areas requires attention. As these questions did not ascertain what aspects of transportation and disposal required attention, and there were no qualitative comments from respondents, it is difficult to comment on any aspects of transportation or disposal.

5.1.8. Packaging of Medications

The packaging of medication was not included in this study. The results suggested that there were two areas of concern regarding the packaging of medications. First, there was a lack of medication supplied in packaging that the respondents believed was suitable to supply to patients/clients. In particular, this inappropriate packaging took the form of a lack of starter packs which meant that respondents were forced to give large amounts of medication, which they believed was unnecessary (or dangerous).

Second, the area of filling dosette packs was also raised with many nurses believing that the transferring of medications from dispensed medication bottles or packs into dosettes increased the risk of medication error.

Another area which impacts upon the medication practices of nurses is their communication and working relationships with medication practitioners. The respondents in this study provided information on several aspects specifically relating to their communication with medical practitioners. In many instances the issues raised by the respondents in this study are caused by the very nature of rural and remote area practice where nurses work with off-site medical practitioners or have poor after-hours access to medical practitioners.

5.1.9. Medical Practitioners and their Impact on Nurses' Medication Practice

a) Telephone Orders for controlled and restricted drugs

The very nature of rural and remote nursing practice means that in the absence of protocols or legislation that allows nurses to administer and supply any medication without a medical practitioner's prescription, nurses take medication orders from off-site medical practitioners. The data in this study suggested that nurses reported that they were only sometimes taking telephone orders for medications, but those who often did were more likely to be RINs. These RINs were also more likely to state they did not have any difficulty challenging the telephone orders of a medical practitioner if they believed they were inappropriate for the patient's condition. These findings suggest that the introduction of the Rural and Isolated Practice Endorsement for RNs has resulted in decreased need for RNs to telephone medical practitioners for medication orders and that when they do so, they are more confident in their knowledge.

b) Communication between nurses and medical practitioners

Similar to previous findings, nurses in this study experienced workplace violence from medical practitioners (Hegney et al. 1997). The main source of workplace violence in this study was abuse from medical practitioners who were telephone contacted by nurses after-hours. In these cases, the respondents in this study believed that the abuse was unnecessary and not conducive to good working relationships.

c) Provision of a legible prescription

The respondents in this study indicated that medical practitioners often failed to provide a legible prescription. The data suggested that rural nurses were more likely to perceive this as an issue than remote area nurses.

d) Medical Practitioners lack of understanding of the role of the rural nurse

The respondents in this study noted that the medical practitioners sent to work in rural and remote areas, or who provide locum relief, often had a poor understanding of pharmacology. This was particularly evident in medical practitioners undertaking a rural rotation in their second year of residency with Queensland Health. Additionally, it was noted that these medical practitioners had a poor understanding of the differences of rural practice as their major training had been spent in metropolitan locations.

5.2. Endorsements and their Impact on the Initiation, Administration and Supply of Medications

5.2.1. Understanding of the Endorsed Role

The respondents in this study noted that members of rural and remote communities, other health professionals and other nurses had a poor understanding of the endorsed role.

a) Other health professionals

The respondents in this study noted that the majority of medical and allied health practitioners were unaware of the difference between a RIN and a non-RIN.

b) Other nurses

Many respondents in this study believed that there was a lack of understanding of the endorsed nurse's medication role. For example, with regard to the EN (MED) role, some ENs believed that RNs were not aware of the expanded scope of practice of the EN. Similarly, nurses, particularly those in rural areas, were unaware of the RIN role. In the latter case, it is possible that as the number of nurses with the RIN endorsement increases, confusion in other nurses of the RIN role will diminish or disappear.

c) Community

The data suggested there was a perceived lack of understanding by the community about the endorsed role – particularly that of the RIN. Statements made by respondents indicated that members of the community did not understand why one nurse could provide medications without a medical practitioner's order and another could not. This lack of understanding was less in remote areas where the RIN role had been in place longer. Additionally, the smaller populations in remote areas are likely to mean that nurses can explain role differences more easily to the community than nurses working in larger centres.

The respondents in this study suggested several strategies that could be used to educate the public. These included posters at the workplace, flyers that would be handed out to all in-patient's on admission and identification by way of name badge or different uniforms.

5.2.2. Satisfaction with Endorsement

With regard to all medication endorsements (immunisation, sexual and reproductive health, rural and isolated practice and enrolled nurse), it was apparent that the majority of nurses in this study believed that it was sufficient for their current practice. Additionally, many respondents stated that the endorsement course had changed their nursing practice for the better.

5.2.3. Improvements to the Endorsed Role

a) Remuneration

The major improvement respondents stated that was desired for the endorsed role was increased remuneration. With the introduction of changes in the latest Queensland Health's Enterprise Bargaining Agreement, those nurses working with the clinical qualification will be remunerated for this qualification.

b) Expansion of the DTP

There were few medications that were needed to be added to the DTP. The major medications requested were narcotic analgesics for pain relief for palliative care patients.

5.2.4. The PCCM

It was apparent that these protocols were used extensively by remote area nurses. Additionally, while there were some rural nurses who were waiting for the Health Service District to sign off on the PCCM, there was growing use of the PCCM in rural areas. Minor criticisms of the PCCM included: the need for the manual to lay flat, concerns about it being kept up-to-date, and the need for medical practitioners to agree with the treatment regimes outlined in the PCCM. However, the overwhelming majority of nurses believed that the PCCM supported their nursing practice.

The data suggested that the RIN endorsement had improved the practice of rural and remote area nurses with few nurses finding the need to work outside of the *Regulation*. In contrast, the data discussed in section 5.2 of this chapter, suggest that some attention is required to the safe and competent practice of medication endorsed ENs who, in addition to non-ENs (MED), appear to be working outside of the *Regulation*.

5.3. Preparation for Medication Practice

There were several questions which aimed to ascertain what factors were considered to influence preparation for medication practice and how valuable or useful the respondent's found these factors.

a) Experience

The majority of nurses believed that a major factor which influenced safe medication practice was experience in the clinical area.

b) Formal programs

Formal programs for medication endorsement were also highly valued by the respondents in this study, but less than experience. One finding of this study was that regardless of where the endorsement program had been offered (Queensland Health, universities, TAFE), RINs found the endorsement program very valuable.

c) In-service preparation

There were many forms of in-service courses available to the respondents in this study. The major form of in-service preparation was the medication calculation test, which was seen to be highly appropriate by the majority of nurses in this study. In contrast, the use of a preceptor to assist with medication competence was more highly valued by ENs than RNs, with only 61% overall believing that this was a valuable contribution to medication competence.

d) Regular Updates

Respondents noted that to remain competent regular updates must be provided by health facilities. These updates were most accessible if they were self-paced and flexible.

The barriers to accessing education and training raised by the respondents in this study have previously been raised. These included issues such as the time to undertake the program (particularly when employed on a full-time basis) and the cost of the program to the participant.

5.4. Medication Error

The findings of this study suggest that there are several factors which are increasing the risk of medication error. First, it is apparent that higher levels of accessibility and adequacy of reference materials were associated with lower levels of medication error. Additionally, lower levels of accessibility and adequacy of reference materials was associated with higher expectations of medical practitioners that nurses would violate medication administration procedures, resulting in more medication violations by nurses.

Second, higher workloads, lower staffing levels and lower skills mix were also associated with higher levels of medication violations. Third, the higher the workload the more the doctors expect nurses to work outside the *Regulation*, thus increasing the risk of medication errors.

5.5. RECOMMENDATIONS

Several recommendations can be made from this study.

Recommendation: That nurses have easy access to reference material which is readily accessible at the bedside, as it is apparent that easy access to reference material is associated with the lowering of the potential for medication errors.

Recommendation: It is apparent that nurses are still unaware of certain aspects of the *Regulation*. In particular, areas for which further education is recommended are:

- Verbal orders for restricted drugs do not need to be confirmed in writing unless this is a health facility policy;
- Nurses may need to remind medical practitioners to confirm in writing within 24 hours any verbal orders for controlled drugs. However, the ultimate responsible person for the lack of a written prescription is the Chief Executive of Queensland Health, not the nurse;
- RNs have the ability to initiate and administer S2 and S3 poisons and that they do not need a prescription (either verbal or written) from a medical practitioner for these drugs;
- The practice of two nurses listening to verbal telephone orders is a recommendation for safe practice and is not a requirement under the *Regulation*; and
- The initiation, administration and supply of S2 and S3, restricted and controlled drugs by ENs which occurs outside the *Regulation* cease forthwith until an investigation be held by Queensland Health to ascertain the need for such practices.

Recommendation: That Queensland Health ensures that all medical practitioners who are sent to work in rural and remote health facilities are competent in pharmacology.

Recommendation: That Queensland Health ensures that all medical practitioners who are sent to a rural or remote health facility have sufficient understanding of the differences between rural and remote health service delivery.

Recommendation: That RNs and ENs be made aware of the importance of providing CMI and other forms of education about medications to patients/clients.

Recommendation: That the Queensland Nursing Council or Queensland Health provides education to rural and remote area nurses with regard to their obligations when supplying medications, particularly with regard to correct labelling procedures.

Recommendation: That the QNC provide further education to ENs (both medication endorsed and non-endorsed), RNs and health facilities with regard to the scope-of-practice of ENs.

Recommendation: That the QNC continues to provide education to both RNs and ENs on the Scope of Nursing Practice Decision Making Framework within the context of delegation of RNs to ENs and the level of responsibility of the RNs when this occurs.

Recommendation: Queensland Health should investigate the supply of starter packs to nurses who are required to supply medications as part of their nursing work.

Recommendation: Further studies be carried out with regard to the use of dosettes, particularly in residential aged care. Best practice suggests that it is inappropriate for nurses to be loading dosettes as this increases the risk of medication error.

Recommendation: That the QNC deliver a public awareness program to educate the public on the role differences between endorsed and unendorsed nurses. This awareness program could include posters that could be placed within workplaces and flyers that nurses could provide to individual members of the community.

Recommendation: That medical practitioners and allied health professionals be made aware of the difference between a RIN and a non-RIN. This awareness campaign could take the form of information to medical and allied health students, information provided in orientation to Queensland Health, and flyers that could be sent to medical and allied health practitioners within Queensland.

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APPENDIX A – FORM A, FORM B AND SITE BOOKLET

INSTRUCTIONS FOR USE OF THE AUDIT TOOLS

The following forms aim to gather data about two aspects of medication administration and supply in your health facility.

Please complete one Form A per admission of each patient. You will therefore need to consider ALL the medication charts per admission. You should complete 10 Form As in total. Five of these forms should be used for the 5 most recent in-patients and 5 forms should be used for the 5 most recent out-patients.

You will only need to complete one (1) Form B.

To ensure confidentiality please do not name any of the patients or clients at any time.

FORM A: AUDIT OF INDIVIDUAL PATIENT CHART.

For each chart, please complete the following.

- 1. Was this medication chart kept in an area accessible only to authorized staff members?**

Yes 1

No 2

- 2. For each medication chart, is the following demographic information evident? (Please circle all that apply).**

Name of patient or label with name and Unit record/patient identification number 1

Age of patient 2

Date of birth of patient 3

Date of the medication chart..... 4

Any known allergies 5

The weight of the patient 6

- 3. Is the name of the medical practitioner who has ordered the medication legibly written on the chart?**

Yes 1

No 2

- 4. Have any S2 and S 3 medications initiated by registered nurses been entered onto this medication chart appropriately?**

Yes 1

No 2

Not Applicable 3

- 5. Have any S2 and S 3 medications initiated by registered nurses been signed for appropriately?**

Yes 1

No 2

Not Applicable 3

6. In your professional opinion as a nurse, are all the medications ordered for the patient or client appropriate for their medical condition?

Yes 1

No 2

7. Please estimate the amount of time the following factors occur:

Factor	Always	Most of the time	Sometimes	Never
The medication chart has a signature of a medical practitioner on all medications ordered by a doctor	1	2	3	4
The medications have been signed off correctly by a nurse following administration	1	2	3	4
The start dates of the medications are recorded	1	2	3	4
The names of the medications are written legibly	1	2	3	4
The doses of the medications are stated	1	2	3	4
The medication frequency is recorded (i.e. tds, bd)	1	2	3	4
The dates the medications were ceased by a medical practitioner are clearly recorded.	1	2	3	4
The time the medications were given are congruent with the frequency ordered (i.e. a bd drug was given twice that day)	1	2	3	4
There is clear documentation regarding how medication orders were received (by telephone, verbal)	1	2	3	4

8. Have any of the medications on this chart been administered or supplied under a Health Management Protocol by an endorsed isolated practice, immunization or sexual health nurse?

Yes..... 1

No..... 2

9. If yes, in the Table below please record the name of the drug, its route, the dosage and the amount supplied.

Name of Medication	Route	Dosage	Amount supplied (i.e. one pack, one IM injection)

FORM B

This form (B) is to be completed once you have audited the most recent 5 inpatient and 5 outpatient medication charts. The information you supply will only relate to the most recent admission or outpatient visit you have audited. We do not ask you to supply information about every admission or visit.

The purpose of this form is to gain an overall picture of medication practice in your facility now that you have examined it in some detail. **You will, therefore, only need to complete one form.** We would like to know your general impressions of the procedures used in your facility relating to the supply of medications, such as the storage, labeling and dispensing of medications, in addition to the quality of documentation related to these activities. For each statement, please circle the most appropriate response unless otherwise instructed. '

1. Is there any evidence in the charts that administration of medications is based upon standing orders?

Yes.....1
 No.....2

2. Please indicate the absence or presence of the following factors in the patient or client charts your have audited.

Factor	Always	Most of the time	Sometimes	Never
Evidence of correct procedures being followed when medication orders are taken by telephone orders (for example, signature and date of verification is evident; countersigning by another nurse)	1	2	3	3
Documentation of how medication orders were received (verbally, telephone and so on).	1	2	3	3
Evidence of staff education of the patient/client regarding the medication administered.	1	2	3	3
Evidence of staff education of the patient/client regarding the medication supplied.	1	2	3	3
Evidence of the correct preparation of dosettes, starter packs and other forms of supply of medications?	1	2	3	3

3. Is there evidence, if relevant, of the use of Indigenous Health Workers or Interpreters for client education?

Yes.....1
 No.....2
 Not Applicable.....3

4. Has a discharge summary been attached to the charts which contain details of client education with regard to medications?

Yes.....1
 No.....2
 NotApplicable.....3

5. Is there documented follow-up of medication orders on the discharge summary?

- Yes.....1
 No.....2
 Not Applicable.....3

6. With regard to storage of medications in the health facility, please indicate the presence/absence of the following factors.

Factor	Always	Most of the time	Sometimes	Never	Not Applicable
Keys to the pharmacy are kept with the RN in charge of the shift	1	2	3	4	5
Keys to the imprest cupboard/room are kept with the RN in charge of the shift	1	2	3	4	5
The medication trolley is locked	1	2	3	4	5
The pharmacy room is locked	1	2	3	4	5
The imprest cupboard/room is locked	1	2	3	4	5
The temperature of the refrigerator is kept at 2-8 degrees Celsius	1	2	3	4	5
All medications are stored at the manufacture's recommended temperature	1	2	3	4	5
The controlled drugs ¹ are checked at least once a week by the pharmacists in charge of the dispensary or the DON	1	2	3	4	5
There is a working alarm on the pharmacy refrigerator	1	2	3	4	5
The Director of Nursing has keys to the pharmacy in a secure locked place	1	2	3	4	5
The expiry date of drugs in the pharmacy are checked daily	1	2	3	4	5
Imprest drugs are reordered on at least a weekly basis	1	2	3	4	5
There is a record of ordered controlled drugs	1	2	3	4	5

¹ Controlled drugs were previously called dangerous drugs and are schedule 8 (S8) drugs. Restricted drugs are schedule 4 (S4) drugs.

7. With regard to supply of medications in the health facility, please indicate the presence/absence of the following factors.

Factor	Always	Most of the time	Sometimes	Never
Patients are given between 24-48 hours of medications supply as starter packs until a community pharmacy can be accessed	1	2	3	4
Patients are given a 5 day supply of medications on discharge	1	2	3	4
Starter packs are made up on-site by a RN and checked by another RN or EN	1	2	3	4

8. Where do you most often obtain supplies of S2, S3, restricted and controlled drugs?

From a Queensland Health source.....1
 From a community pharmacy in the town.....2
 Other (please specify) _____...3

9. Does your health facility label medications which are supplied to patients or clients?

Yes (go to Q 10).....1
 No (go to Q 11).....2

10. With regard to labelling of medications in the health facility, please indicate the presence/absence of the following factors.

Factor	Always	Most of the time	Sometimes	Never
Batch Number	1	2	3	4
Expiry Date	1	2	3	4
Name of Patient	1	2	3	4
Date Dispensed	1	2	3	4
Directions for use - for example take before or after food, take until completed	1	2	3	4
Warning statements such as causing drowsiness.	1	2	3	4
Date of disposal after opening	1	2	3	4
Script number	1	2	3	4
The initial of the RN dispensing the medication	1	2	3	4
The words 'keep out of reach of children' are printed in red on a background of contrasting colour and in bold face sans serif capital letters with a height of at least 1.5mm	1	2	3	4
The doctor or nurse's name and address	1	2	3	4
A description of the contents	1	2	3	4
The generic or trade name of the medication	1	2	3	4
A description of the strength and quantity of volume	1	2	3	4

11. In the space below could you please make some comments about your general opinion of the professional quality of the documentation of medication administration and supply within this health facility.

- 1. This health facility is a (please circle one only)**
- Multipurpose health service 1
- Hospital only 2
- Hospital and community health service 3
- Other (please specify) _____..... 4
- 2. The major source of funding for this facility is (please circle one only)**
- State government 1
- Non-government organisation (Blue Care, Bush Nursing) 2
- Other (please specify) _____..... 3
- 3. Which of the following services does the facility provide? (please circle all that apply)**
- Emergency department 1
- Midwifery/Obstetrics 2
- Paediatrics 3
- Operating Theatre 4
- High Dependency Unit 5
- Medical 6
- Surgical 7
- Outpatients 8
- Day only surgery 9
- Child Health Clinic 10
- Immunisation 11
- Domiciliary Nursing 12
- Hostel beds (low care) 13
- Nursing home beds (high care) 14
- Long stay (or nursing home type patients) 15
- Dementia only beds 16
- Respite beds 17
- Palliative care beds 18
- Others (please specify) 19
-
-

4. Please provide the following details about the health facility.

- Number of acute beds _____
- Number of high and low care beds _____
- Number of long stay (nursing home type patient) beds _____
- Average number of admissions per month _____
- Average number of discharges per month _____

5. What is the approximate population serviced by your health facility?

6. What medical services are available in the health facility and catchment area?

(please circle all that apply)

- Medical Superintendent only 1
 - Medical Superintendent with right of private practice..... 2
 - General Practitioners 3
 - Surgeons 4
 - Physicians 5
 - Others (please specify) 6
-
-

7. What visiting services are available to the health facility? (please circle all that apply)

- Visiting surgeons 1
 - Visiting obstetricians and gynaecologists 2
 - Visiting mental health clinics 3
 - Royal Flying Doctor Service (RFDS) clinics 4
 - Women's health nurse 5
 - Aged Care Assessment Team (ACAT) 6
 - Others (please specify) 7
-
-

- 8. Do these visiting services affect the supply of medications?**
- Greatly (go to Q 9) 1
- Somewhat (go to Q9) 2
- Not at all (go to Q11) 3
- 9. Do these visiting services affect the administration of medications?**
- Greatly (go to Q 10) 1
- Somewhat (go to Q10) 2
- Not at all (go to Q11) 3
- 10. In what way do these visiting services affect the supply and administration of medications?**
- _____
- _____
- _____
- _____
- 11. How far away in kilometres is the nearest tertiary hospital? _____**
- 12. Do you have? (please circle all that apply)**
- A pharmacist employed full-time in the health facility 1
- A pharmacist employed part-time in the health facility 2
- A community pharmacist in the catchment area 3
- No community pharmacist in the catchment area 4
- 13. Do registered nurses in your health facility routinely provide a pharmacy service to clients/patients of the facility?**
- Yes 1
- No 2
- 14. How many registered nurses are employed full-time in the health facility? _____**

15. How many registered nurses are employed part-time in the health facility?

16. How many enrolled nurses are employed full-time in the health facility?

17. How many enrolled nurses are employed part-time in the health facility?

18. How many assistants in nursing (or unregulated care providers) are employed full-time in the health facility? ...

19. How many assistants in nursing (or unregulated care providers) are employed part-time in the health facility?

20. Do you have a 'casual bank' or use agency staff for replacement/relief?
Yes (go to Q 21) 1
No (go to Q 23) 2

21. If yes, is it adequate for your needs?
Yes (go to Q 23) 1
No (go to Q 22) 2

22. If no, please comment on why it is not adequate.
.....
.....
.....
.....
.....
.....
.....

APPENDIX B – LETTER TO PARTICIPANTS

Dear Participant

Thanks for taking the time to read this letter. We hope that you will be able to help us with our research into the practice of rural and remote nurses with regard to medication administration and supply.

“What do I get out of it?” you ask.

- Firstly, a free cuppa using the enclosed teabag!
- Secondly, your input may change medication policies making them more relevant to your work context, and ensuring the safety of yourself and your patients.

What do we get out of it?

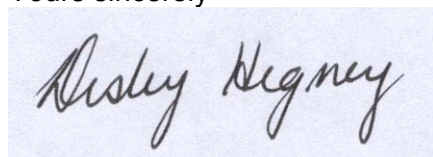
- A correct picture of what rural and remote area nurses are actually doing with regard to medication practice.
- ‘True’ data, including your practical suggestions to guide amendments to the Health (Drugs & Poisons) Regulation 1996.

If you would like to assist us with this research we ask that you follow the instructions below, using the enclosed materials:

- Step 1** Please take the time to read the **Plain Language Statement** before deciding whether to participate. Keep this Statement as a record of how to contact us in future.
- Step 2** Make a ‘cuppa’ with the **teabag** provided and take a ‘breather’ while completing the enclosed **questionnaire**. It should take you approximately 20-30 minutes to complete. Please remember that the aim of the study is to find out what your current medication practices are, not what you understand the correct practice should be. However, there are no right or wrong answers. As the Plain Language Statement says, all your responses will be kept confidential. If you need more space to answer a question, please feel free to attach additional pages with the extra information.
- Step 3** Once you have completed the questionnaire, please return it in the **reply paid envelope** within **two (2) weeks**.

If you have any queries, please don’t hesitate to contact us using the details below. We look forward to your response, and thank you for your assistance with this study.

Yours sincerely



Desley Hegney RN PhD

Contacts

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APPENDIX C – PLAIN LANGUAGE STATEMENT

The University of Southern Queensland (USQ) has been successful in obtaining funding from the Queensland Nursing Council (QNC) for a research project that will investigate the administration and supply of controlled and restricted medications by rural and remote nurses. Our aim is to provide a benchmark with which to measure practice at a later date, which will indicate the impact of amendments to the Queensland Health (Drugs & Poisons) Regulation 1996, such as the EN Medication Endorsement and the Rural and Isolated Practice Endorsement for RNs. All enrolled and registered nurses from rural and remote areas will be eligible to participate.

We ask you to participate in this important study so that Queensland will have the information on which to base future policy. It is therefore important that your responses are based on your **current** medications practice, rather than what you understand the correct practice should be. Your participation will involve the completion of the enclosed questionnaire.

To ensure absolute confidentiality, each questionnaire has been coded. These coded questionnaires have been sent by USQ to the QNC who have agreed to post the questionnaire to you by matching each code with a name. Only the QNC will hold the names, addresses and their codes - USQ does not have access to your name or address details. Three weeks after the first mail-out of the questionnaire, USQ will notify the QNC of the code numbers of the questionnaires not returned to us. The QNC will then post a reminder package to these people. If you do not wish to participate in the study, then please ignore this reminder notice.

Should you wish to withdraw from the study at any time, USQ will notify the QNC of your name and they can advise us of your code. We can then remove your questionnaire from the study.

When the questionnaires are returned to USQ, the data will be analysed by the Project Team. Your comments will be kept completely confidential, with no identifying information appearing with them. At no time will the QNC have access to any information that could identify your survey responses. We guarantee that any comment made about Queensland Health will not be passed onto Queensland Health in a way that could identify the nurse or the facility making the statement. All of the questionnaires will be kept in a locked filing cabinet at USQ for a period of five years, after which they will be shredded and disposed of as confidential waste.

The research team, led by Professor Desley Hegney, Chair of Rural Nursing, comprises a range of professionals, including Dr Jennifer Watson, Dr Ashley Plank (Senior Lecturer in Statistics – USQ), and Ms Christine McKeon and Ms Lisa Raith (Psychologists/Research Assistants).

If you have any questions with regard to this project please feel free to contact Professor Desley Hegney on the number listed below. Participation is completely voluntary. You should understand that your decision to participate in this study will not affect your future prospects of employment in any way. If you wish to participate could you please return the enclosed questionnaire in the reply-paid envelope provided in this package. Return of the completed questionnaire provides your consent to participate in this study. Please retain this Plain Language Statement for future reference.

Any questions with regard to this project may be directed to:

Professor Desley Hegney, Chair of Rural Nursing, University of Southern Queensland, Department of Nursing, Toowoomba QLD 4350. Telephone: 4631 5456; Fax: 4631 5452; Email: hegney@usq.edu.au

Ms Christine McKeon or Ms Lisa Raith, Research Assistants, Centre for Rural and Remote Area Health, University of Southern Queensland, Toowoomba QLD 4350. Telephone: 4631 5458 (Monday only); Fax: 4631 5452; Email: mckeon@usq.edu.au or raith@usq.edu.au

Any concerns regarding the project implementation may be directed to:

The Secretary, Human Research Ethics Committee USQ or telephone (07) 4631 2956.

APPENDIX D - REMINDER LETTER

“Oh no, not **more stuff** from **them** again?” you groan.

Hi, yes, it is **us** again, chasing up the medications survey that you should have received recently. The package would have asked you to help us with our research into the practice of rural and remote nurses with regard to medication administration and supply. If you **did not** receive the first package, we have enclosed fresh items for you to use. If you did receive it and decided not to participate in the study, or have returned the questionnaire, please disregard this letter.

Your thoughts on this topic are valuable and we would appreciate having them. It is not too late to send us your input. And we have provided a free teabag to help you! We realise that completing the questionnaire requires the use of some of your precious time that could be used elsewhere, and thank you for taking the time to be involved.

If you would like to assist us with this research we ask that you follow the instructions below, using the enclosed materials:

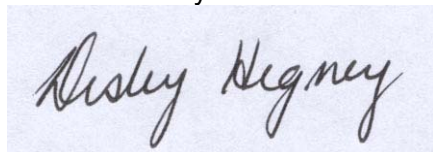
Step 4 Please take the time to read the **Plain Language Statement** before deciding whether to participate. Keep this Statement as a record of how to contact us in future.

Step 5 Make a ‘cuppa’ with the **teabag** provided and take a ‘breather’ while completing the enclosed **questionnaire**. It should take you approximately 20-30 minutes to complete. Please remember that the aim of the study is to find out what your current medication practices are, not what you understand the correct practice should be. However, there are no right or wrong answers. As the Plain Language Statement says, all your responses will be kept confidential. If you need more space to answer a question, please feel free to attach additional pages with the extra information.

Step 6 Once you have completed the questionnaire, please return it in the **reply paid envelope** within **two (2) weeks**.

If you have any queries, please don’t hesitate to contact us using the details below. We look forward to your response, and thank you for your assistance with this study.

Yours sincerely



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APPENDIX E – MEDICATIONS QUESTIONNAIRE

QUESTIONNAIRE