

**Safe and Quality
Use of Medicines**
2005–2007 Report

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Executive Summary

Health systems throughout the world are putting considerable resources and effort into strategies for safer medication use and to improve the quality use of medicines.

Medication errors occur in all health care systems only too frequently, and many are preventable. However, preventing medication error is only one part of the quality use of medicines, and this report details what has been achieved since the publication of the Safe and Quality Use of Medicines National Strategy.

Members of the Safe and Quality Use of Medicines (SQM) group have a common interest in improving the safe and quality use of medicines in District Health Boards (DHBs) in New Zealand. Each member is funded by their own DHB, and District Health Boards New Zealand provide funding for the national co-ordinator.¹ Resources for conferences, workshops and specific projects have been provided by the Ministry of Health, ACC and PHARMAC.

The group has sought and developed links with other bodies concerned with the safe and quality use of medicines, such as ACC, the Centre for Adverse Reactions Monitoring (CARM), Medsafe and bpac^{NZ}. People representing these bodies either attend SQM meetings on an invitation basis or are represented on the group.

Following publication of the national strategy, the group's priority has been to improve the safe use of the six high-risk medicines initially identified. This was seen as an area where maximum impact could be made within the minimal resources available. Since the strategy release two alerts have been issued on the medicines originally targeted, and a further three are close to publication. In addition, audit work to further clarify the specific issues and current situation with three other high-risk medicines/situations has been undertaken.

The alert design has evolved and now gives clear recommendations on risk reduction within an organisation. Consultation on the alerts at a national level has always occurred, but this is now wider and attracts considerable feedback. The alerts are distributed to individuals within DHBs – in both primary and secondary care, as appropriate – and are published on the website (www.safeuseofmedicines.co.nz). Whenever possible, examples of incidents that have occurred, along with any sample resources developed by individual DHBs, are published on the website to complement the alert. With the evolution of the alerts to contain more definitive recommendations on risk reduction strategies, evaluation of an alert's impact is easier and can now be planned before publication.

The SQM group were asked to oversee the final stages of the development of a national medicine chart and disseminated a draft that had been developed over the previous three years for a broad national consultation in 2006. Following this, a subcommittee agreed to significant changes to incorporate what were felt to be additional safety features, and a revised chart was sent out for consultation in September 2007.

Knowledge of the SQM group and their work within the sector has grown steadily since publication of the strategy. The group's meeting convened to discuss the barcoding of medicines had 100 percent attendance and led to the development of the 'bedside verification' project by Bruce Anderson at the Ministry of Health. The project incorporated the introduction of a national medicine chart, e-prescribing, the standardisation of hospital medicine

¹ 0.4 full-time equivalents.

information systems and linking these systems to the patient management system, as well as the barcoding of medicines down to patient level. This project was in turn adopted by the Quality Improvement Committee (QIC).

Although the group's initial focus was secondary care, within the past 12 months it has worked hard to increase its profile in primary care, in both general practice and community pharmacy, where the majority of prescribing and dispensing of medicines occurs. The safe use of medicines at the interfaces of health care remains a priority for the group, whether it be between primary providers, between primary and secondary providers, or within different areas of secondary care. The transfer of information on medicines across these interfaces is known to be fragmented and incomplete, and this can often significantly affect patient safety. Medicines reconciliation was therefore a focus for the group in 2007.

There remain major challenges to improving the safe and quality use of medicines in New Zealand. The SQM group have identified some of these challenges in this report.

Chapter 1: Medication Safety

Current situation

Medicine safety is important because medicines are one of the commonest therapeutic interventions used in the health care system. The sheer scale of medicines usage means that any major reduction or prevention of adverse drug events holds the prospect of a substantially safer health system for everyone.²

Medication errors in hospitals or in the community are common.³ Approximately 1.6% of people admitted to hospital experience an adverse medication event, many of which are preventable.⁴ Preventable adverse events have a significant impact on patients: about 3.1% result in death and 8.3% in permanent disability.⁵ Approximately a fifth of all adverse events occur in the primary care setting.

Medication safety is recognised internationally as an ongoing concern in all health care systems, and many countries have established specialist agencies to reduce the risks associated with medication use. Medication safety in New Zealand has been highlighted following publication of reports by the Health and Disability Commissioner on investigations of complaints during 2007, and the release by DHBs of reports on serious and sentinel events in 2008.

Optimising the use of medicines

Medicines New Zealand, the New Zealand Medicines Strategy, was launched by the Hon Peter Dunne in December 2007, almost two years after work first began. *Medicines New Zealand* introduces an overarching framework to support sound decision-making, both over time and across the medicines sector. It is principles-based and aims to deliver a sustainable, equitable and transparent approach to medicines issues in New Zealand. It is also intended to provide a platform for the agencies and stakeholders that make up the medicines system to build relationships and create a cohesive, effective and responsive medicines system that ensures New Zealanders have access to safe and quality medicines that are used in the most effective ways possible.

Medicines New Zealand is supported by an action plan, *Actioning Medicines New Zealand*. This is intended to be a living document that continues to reflect health priorities, needs and emerging issues. The plan is not an exhaustive list of initiatives for the medicines sector, but instead highlights key activities, including optimal use. There is a broad consensus from submitters to the strategy that the optimal use of medicines is an area in which real gains can be made. The SQM group is well positioned to respond to this, and is already contributing significantly in this area.

2 SQM group. 2005. *Safe and Quality Use of Medicines National Strategy*.

3 Davis, P, Lay-Yee R, Briant, R et al. 2001. *Adverse Events in New Zealand Public Hospitals: Principal findings from a national survey*. Occasional paper No. 3. Wellington: Ministry of Health.

4 Briant R, Wasan A, Lay-Yee R, and Davis P 2004. Representative case series from public hospital admissions 1998: drug and related therapeutic adverse events. *New Zealand Medical Journal* 117(1188). URL: <http://www.nzma.org.nz/journal/117-1188/747/>

5 SQM group. 2005. *Safe and Quality Use of Medicines National Strategy*.

CARM

The New Zealand Pharmacovigilance Centre (NZPhvC) approached the SQM group to explore an interest in working collaboratively to improve medicines safety at a national level. The NZPhvC has a number of initiatives under way, including one that aims to identify the characteristics of preventable events being reported through the spontaneous adverse drug reaction reporting programme, known as CARM (Centre for Adverse Reactions Monitoring).

The SQM group have noted the added value that will be derived from the NZPhvC's proposals to include other sources of preventable medication event data in providing a national perspective, and have expressed their support for this broader initiative. Such information is of value to the group in allowing more effective targeting of prevention efforts to locally occurring patterns of events. To maintain the link between the NZPhvC and the SQM group, a representative from the NZPhvC is invited to participate in group meetings on a quarterly basis.

MARC

The Medicines Adverse Reactions Committee (MARC) is a ministerial expert advisory committee on medicines safety in New Zealand. It has a specific role in promulgating advice on the safe use of medicines to health professionals and the wider New Zealand community. The MARC chair, Professor Timothy Maling, is also a member of the SQM group. MARC membership includes an epidemiologist, general practitioners (GPs), physicians, clinical pharmacologists, a psychiatrist, a paediatrician, and representatives of Medsafe and CARM.

MARC conducts quarterly reviews of medicines safety data generated by the medicines industry, health professionals and the community, from the Spontaneous Adverse Drug Reactions Reporting programme and the Intensified Medicines Monitoring programme. Minutes of MARC meetings are available on the Medsafe website. Advice on specific medicines is published in Ministry of Health publications such as the *Prescriber Update*. MARC is in touch, through the Medsafe secretariat, with other pharmacovigilance centres, medicines regulators and pharmaceutical companies around the world. MARC also reviews pharmacovigilance reports reported in the literature.

PHARMAC

PHARMAC and the quality use of medicines

In February 2002 PHARMAC released the *National Hospital Pharmaceutical Strategy*. This strategy focused on nationwide purchasing of pharmaceuticals. One of the key features was the development of a national programme aimed at improving the quality use of medicines by promoting best practice in the use of pharmaceuticals within hospitals and at the primary/secondary care interface. Although many hospitals undertook initiatives to promote quality in the use of medicines, these efforts were not co-ordinated across DHBs. Given overseas developments at the time, in 2002 there existed an opportunity for initiatives to help improve health outcomes and achieve better value for money spent on pharmaceuticals.

To address this issue, PHARMAC established a Quality Use of Medicines steering committee, comprising a mixture of pharmacists and clinicians with an interest in this area. It was proposed that this group would consider the role of various quality improvement initiatives relating to the safe and quality use of medicines. At the same time, DHBs were also forming a similar committee to examine these issues. Acknowledging that duplication of effort was likely, PHARMAC disbanded its committee and accepted offers to sit on the DHBNZ Safe and Quality Use of Medicines group.

PHARMAC considers that the safe and quality use of medicines is an important role and has supported the SQM group through a number of initiatives. These have included the development, production and distribution of resources for patients on warfarin. A DVD and patient information leaflet were developed to reinforce key messages regarding the safe use of this medication, building on individual projects developed at Waitemata and Capital and Coast DHBs. The project has resulted in these resources being available nationally, with consistent messages.

PHARMAC was also approached by the SQM group with concerns about the safety of heparin and potassium infusions. Concentrated heparin and potassium chloride product on wards poses significant risk to patients if infused undiluted, and the need for mixing the concentrated solution increases the risk of mixing errors at the ward level. After consultation with the group and DHBs, PHARMAC was able to run a national procurement initiative to ensure a nationally consistent range of pre-mixed intravenous (IV) fluids, allowing the removal of concentrated products from hospital wards.

ACC harm notification and medication treatment injury

On 1 July 2005 the provisions for medical error and medical mishap in the ACC legislation were replaced by provisions for treatment injury. The aim of this amendment was to align the treatment injury criteria with the overall no-fault intent of the ACC legislation and to ensure a fairer, faster and simpler service.

The information collected from treatment injury claims represents a unique collection of data on adverse events in New Zealand health care. ACC has recently incorporated the treatment injury data collection into the ACC claim management database. As a result the level of data that can be provided is both broader (it now includes access to demographic data) and more specific (with the collection of targeted medication-related data).

In addition to assessing cover for treatment injury claims, ACC has a mandated role in the assessment and notification of a 'belief of risk of harm' to the public, and a responsibility to share treatment injury-related information with the wider health care sector. ACC's membership of the SQM group provides an opportunity for ACC to share information with the sector, and particularly to support the group's aim of promoting a culture of medication safety. In return, ACC maintains a currency of knowledge regarding key medication issues and provides the SQM group with updates of the medication-related reports they receive.

Chapter 2:

National Safe and Quality Use of Medicines Strategy: Progress against SQM Strategy Goals and Objectives

The SQM group published the Safe and Quality Use of Medicines National Strategy in 2005. The strategy included a number of objectives, and the following chapters report on progress against these objectives up to the end of 2007. The objectives detailed in the national strategy are listed at the beginning of each chapter, and progress on some of these objectives is reported. Future challenges are included at the end of each chapter.

Conferences and workshops

In 2003 the SQM group developed and implemented a workshop with keynote speakers involved in Australian quality and safety initiatives to inform stakeholders about the work SQM was engaged in and to stimulate discussion on how key stakeholders saw the group's future role. This workshop acted as a platform for the development of the national strategy.

In 2007 PHARMAC supported a joint workshop in Wellington. The theme of the workshop was 'Medicines and the Patient Experience – Practical Solutions'. It was opened by the Hon Peter Dunne (Associate Minister of Health), who applauded the efforts in the area of medicines safety. This workshop provided an opportunity for a broad cross-section of the health sector to discuss and debate the quality use of medicines issues. The workshop participants recommended that future work have a stronger engagement and focus on primary care, and that four regional workshops be held specifically aimed at medicine safety issues for primary care.

Newsletter and website

The SQM group newsletter was proposed as a means to inform people working in the field, or with an interest in medicines safety and the quality use of medicines, about current work, both in New Zealand and overseas. The first edition of the newsletter was published and distributed in April 2005. The newsletter provides updates on the SQM group's projects, alerts on 'look-alike sound-alike' naming issues or packaging, information on upcoming conferences, and details of recent publications on medicine safety and quality use of medicines. Newsletters were produced at regular intervals in 2005, 2006 and 2007.

The SQM group developed a website in 2004 to present SQM publications and projects to a wider audience. The website is updated regularly and includes the minutes of the group's meetings. In 2007 the limitations imposed by the current web design were realised and the site is in the process of being upgraded. The upgrade will mean that the site can be more readily accessible through internet search engines.

Chapter 3: Leadership and National Co-ordination

Strategy objectives

1. Extend the SQM group to include consumer and primary health care perspectives.
2. Seek to provide advice and recommendations to the Minister of Health.
3. Show leadership to support the development of a culture in which safe and quality use of medicine activity can thrive.
4. Determine and agree priorities on a regular basis.
5. Develop toolkits of educational material, reference literature, evaluation instruments, organisation of visits from experts, etc for high-priority areas.

Progress on objectives

Group membership

Membership of the SQM group was extended to include a consumer representative in November 2004. However, this position has remained vacant since mid-2007 due to unresolved issues on funding for the group. A practising GP has attended the group meetings since February 2005 and further general practice representation was agreed and appointed in 2007.

Advice to the Minister of Health

The SQM group has sought to provide advice to the Minister of Health through various channels, both formal and informal, and the Minister has attended SQM meetings to facilitate the exchange of information on important matters. In addition, the SQM group have communicated significant concerns to the Director-General of Health.

The group had major input into the development of the National Medicines Strategy, which was published in December 2007. Representatives from the SQM group sit on the Quality Improvement Committee, and the group provided significant input into the Safe Medication Management project plan.

The group has reviewed its priorities annually and whenever new 'risks' have been identified.

Toolkits

The SQM group have continued to gather material to include in a toolkit, based on the safe use of warfarin. Funding the production of the toolkit has been a major issue, but PHARMAC has now agreed to fund this project and work has begun on branding all the material that has been produced at various DHBs and primary health organisations (PHOs) throughout New Zealand.

Future challenges

Future challenges are to:

1. develop and train a network of managers and clinical leaders who will support and promote safety and quality initiatives
2. obtain ongoing funding for consumer and primary care representatives
3. engage with residential care facilities and private hospitals to inform their safety and quality initiatives
4. work together with the Safe Medication Management Programme and other organisations/ project teams involved in areas related to medicines use
5. develop, disseminate and assess toolkits
6. strengthen international links with organisations working on the safe and quality use of medicines worldwide.

Chapter 4: Best Practice Prescribing, Dispensing and Administration

Strategy objectives

1. Identify individuals or groups who can:
 - develop clearly articulated and disseminated national guidance for prescribing, dispensing and administration that can be regularly and formally monitored
 - identify current training programmes around the medication management process and identify areas that are common for all disciplines
 - develop a consistent regional or national multidisciplinary training programme for staff involved in the medication management process at both the undergraduate and postgraduate level
 - deliver appropriate training for all staff involved in the handling of medication linked to the requirements of the Health Practitioner Competence Assurance Act.
2. Share clear treatment plans with all appropriate professionals involved in the patient's care.
3. Involve patients/consumers and their carers in their medication treatment plans.
4. In the future, introduce similar medication management standards for primary health care.
5. Examine how current professional practice standards and expected competencies are working to support the safe and quality use of medicines, and identify any issues.
6. Link any standards related to prescribing, dispensing and administering medicines that are identified with the current New Zealand Healthcare Standards and accreditation processes.

Progress on objectives

Hospital standards for prescribing, dispensing and administering medicines

The medication-related processes used in hospitals, from patient admission to discharge, were examined in May 2003 with a view to developing a 'gold standard best practice' for New Zealand. It was found that there was a high degree of variability in the systems and processes used. There was also a vast variation in resourcing and service delivery. A meeting with the chief pharmacists / pharmacy managers was held, which resulted in a document being developed that highlights the various issues to consider in relation to a hospitalised patient at the stages of prescribing, dispensing and administration of medication. In addition, two pharmacists who worked at the interface between primary and secondary care developed a paper on the standards for medication care at the hospital/community interface. These two papers were combined as a best practice standard document.

It was identified that abbreviations used for prescribing were inconsistent throughout New Zealand and in many cases likely to contribute to medication errors. In response, the SQM group reviewed all current abbreviations and developed a standardised list. A specific alert was developed and circulated highlighting the 'approved prescribing abbreviations'. These guidelines have been developed with a view to applying them at any stage a prescription is generated, and to primary care as well as secondary care (see Appendix 3).

The *Best Practice Standards* document (March 2004) has been displayed on the SQM website⁶ and this is to be used as a reference tool when considering or reviewing medication management systems or processes in secondary care. This document deals with the transition from primary to secondary, during the secondary event, and back to the primary provider. The standards were not developed as a primary sector tool.

Look-alike sound-alike names and packaging

The SQM group have highlighted the risks associated with look-alike sound-alike names and packaging to MedSafe, PHARMAC and the Director-General of Health, using specific examples raised by health professionals nationally. Work has begun on developing a national alert format that can be used as a template for all DHBs to highlight the risks associated with individual products within their organisation. Other factors that can accentuate the risks associated with look-alike sound-alike names and packaging, including eyesight and lighting levels, are being investigated with a view to producing guidelines.

National formulary

After presentations and discussions, the SQM group have supported the development of a national formulary (an official list giving details of prescribable medicines) and have made a recommendation to the DHBNZ Service Improvement Group to this effect.

Medicines safety in renal impairment

Managing drug treatment safely in the context of renal impairment requires a clear understanding of the principles of monitoring renal function and renal drug elimination. Clinical practice is associated with a significant error rate resulting from the prescription of inappropriately high doses and/or lack of awareness of reduced renal function, especially in older persons. Errors result in major drug toxicity, such as an acute deterioration in renal function, deafness, bleeding, and other systemic effects of drug accumulation in renal failure. The purpose of the alert is to highlight the high-risk drugs and provide simple guidelines for safe dosing. This alert is in development and should be distributed to all hospital pharmacists and chief medical officers, and particularly to PHOs for distribution in the wider community.

Future challenges

Future challenges are to:

1. identify current training programmes on the medication management process and areas that are common for all disciplines
2. develop a consistent regional or national multidisciplinary training programme for staff involved in the medication management process, at both the undergraduate and postgraduate level
3. ensure clear treatment plans are shared with all appropriate professionals involved in the patient's care
4. involve patients/consumers and their carers in their medication treatment plans

⁶ URL: <http://www.safeuseofmedicines.co.nz/Portals/0/SQM/Medicines/Medicines%20Management%20across%20the%20primary-secondary%20interface%20&%20within%20secondary%20care.pdf>

5. develop medication management standards for primary health care
6. identify and manage the risks posed by the introduction of new technologies (eg, electronic prescribing)
7. ensure that best practice is incorporated into e-prescribing.

Chapter 5: High-risk Medicines and High-risk Situations

Strategy objectives

1. Assess the following high-risk medicines – potassium, warfarin, heparin, insulin, diltiazem, morphine, cytotoxics and intravenous infusions, make recommendations to improve the safe and quality use of these medicines, and provide alerts or information where appropriate to the health sector.
2. For alerts on high-risk medicines, develop appropriate distribution lists for the alerts, identify individuals responsible for both the dissemination and response to the alerts within a DHB, and establish a time frame for a response to an individual alert.
3. Assess the high-risk areas of paediatrics, theatre and the fragile elderly, in which patients are commonly taking medications, make recommendations to improve the safe and quality use of these medicines, and provide alerts or information where appropriate to the health sector.

All medications contain some degree of risk for the patient, risk that can be mitigated by careful drug selection, dose titration and counselling of the patient. However, there are medications which, due to their potency, narrow therapeutic index, severe side effects or propensity to be confused with drugs with similar names, have been internationally recognised as 'high-risk' medications. The SQM group have now identified 11 high-risk medications. In addition, MARC requested that the group develop an alert on the use of low molecular weight heparin in renal impairment.

Progress on objectives

The high-risk medications are listed in Table 1 below, together with actions the SQM group have undertaken to try to decrease the risk.

Table 1: High-risk medications and the SQM group's response

High-risk medication	Risk	SQM response
Concentrated potassium chloride (KCL)	This is easily confused with ampoules of normal saline or water for injection, but if given as an IV bolus can be fatal.	An alert was sent to all DHBs in 2004 (see Appendix 4) advising of the risk and recommending that all wards remove concentrated KCL from stock; or, if this was not possible, that it be kept in a locked cupboard or container. Work has also been done with industry to provide pre-mixed bags.
Heparin (unfractionated)	This drug has a narrow therapeutic index: if too little is given, the patient can suffer thromboembolic complications, too much and they risk bleeding. There are complicated prescribing and monitoring requirements with multidisciplinary involvement.	An audit of current practice against protocols was carried out in the Auckland region to highlight major issues with prescribing, administration and monitoring. Heparin prescription and the administration chart are being re-designed and protocols standardised within the Auckland region before developing an alert.
Warfarin	This has a narrow therapeutic index: if too little is given the patient can suffer thromboembolic complications, too much and they risk bleeding. There are also multiple drug and dietary interactions.	An alert was sent to DHBs in 2004 (see Appendix 5). SQM worked with PHARMAC to produce a DVD for patient information, and are developing a DHB tool-kit on warfarin safety.
Diltiazem	Multiple preparations of this drug are available and are easily confused, resulting in overdose.	An alert was sent to all DHBs and individual GPs in 2005 (see Appendices 6 and 7). Advice was given to PHARMAC on rationalising the number of preparations available.
Morphine	Overdose can lead to respiratory suppression. Different strengths of the oral preparations of morphine (M-Eslon) look very similar, and there have been cases of 100 mg being given instead of 10 mg.	A sharing-of-packaging alert was developed by Counties Manukau DHB on the M-Eslon issue. A morphine alert is in preparation and being consulted on, advising on the storage of different strengths of the oral preparation. A letter was sent to the Director-General of Health on the risk of 'look-alike' labelling.

High-risk medication	Risk	SQM response
Intrathecal vincristine	This chemotherapeutic agent is supposed to be given intravenously, but there have been 13 cases in the UK over the last 15 years where it has been confused with another chemotherapy (methotrexate) and given in its place, into the intrathecal space. This leads to irreversible nerve damage and is almost uniformly fatal.	Guidelines were prepared in conjunction with the NZ Healthcare Pharmacists Association, consulted on nationally and published on the SQM website. ⁷ It has been suggested that vincristine be made up as a 100 ml bag to decrease the likelihood that it will be confused with intrathecal preparations. Work has been done internationally on making lumbor puncture connectors incompatible with IV connectors.
Methotrexate (oral)	This cytotoxic drug is increasingly prescribed in a non-oncology setting at a lower once-weekly dosage; there is a risk of inadvertent prescribing or dispensing as a once-daily dosage, with resulting toxicity.	An alert is being developed.
Insulin	The risk here relates to high or low blood sugars. There is a risk in prescribing of the abbreviation u being mistaken for an 0 and a 10 times overdose resulting.	A questionnaire was sent to diabetic nurse specialists, GPs, practice nurses and community pharmacists in 2005. This sought to clearly establish the risks surrounding insulin. Work is in progress.
Intravenous infusions	There is a high risk of error because of incorrect pump setting or a wrong concentration of drug being administered.	An audit of current IV infusion practice in all DHBs was undertaken in 2007/08, and the report is awaited. An alert and position statement have been developed and consulted on.
Additional high-risk drugs identified since strategy publication		
Low molecular weight heparin	This can accumulate in patients with renal failure, increasing their risk of bleeding.	An alert was to be sent to all DHBs in early 2008.
Amiodarone	There is a risk of overdose when starting doses are continued in the community setting.	An article was published in bpac ^{NZ} journal 2007 highlighting the risk to GPs. An alert is to be developed.
Colchicine	This gout medication can be fatal if taken in overdose (8 deaths in the Auckland region in the last 10 years).	An alert was sent out for consultation to rheumatologists in 2007 to be issued to all PHOs and DHBs in 2008/09. Discussions are being held with PHARMAC regarding limits on the dose prescribed.

7. URL: <http://www.safeuseofmedicines.co.nz/Portals/0/SQM/Intrathecal/Recommendations%20on%20the%20safe%20admin%20of%20IT%20chemotherapy%20Sept%2007.pdf>

Medicines reconciliation

The aim of medicines reconciliation on hospital admission is to ensure that medicines prescribed on admission correspond to those the patient was taking immediately before admission. The SQM group gathered together groups from around New Zealand who were either providing a partial or full medicines reconciliation service, or who had recently carried out pilot services for a workshop in June 2007. Service providers unable to attend were asked to provide details of the services they provided or had trialled. All participants described the services they operated or had operated, along with the advantages and disadvantages of their service model, and shared any data they had on timing, errors prevented, etc. The workshop participants agreed on a way forward, and this formed the basis for a project plan submitted to the Quality Improvement Committee (QIC).

Some medicines reconciliation work is being done in most DHB hospitals, but it is very limited in primary care, where medicines reconciliation should be done from the reverse perspective, taking into account medicines prescribed in hospital by specialists and by other primary care practitioners (eg, after-hours providers).

Medicines reconciliation has been identified as a deliverable outcome under the Safe Medication Management programme formulated by QIC.

Future challenges

Future challenges are to:

1. respond to the identification of other high-risk medicines or situations with alerts and other appropriate material
2. assess issues specific to high-risk medicines and high-risk situations in primary care, and develop an approach to managing those risks effectively
3. evaluate responses to recommendations made in any alerts
4. encourage patient self-management of their medicines, particularly high-risk medicines.

Chapter 6: Systems, Processes, Technology and Information Systems

Strategy objectives

1. Develop and implement a national medicines chart and other related medicine charts (eg, an insulin chart to ensure consistency in prescribing all medicines).
2. Work towards a common national electronic medication record which captures a full and accurate medication history, including allergies and alternative and 'over the counter' (OTC) therapies.
3. Establish the pharmacy and electronic prescribing systems currently available and in use nationally, and develop standards for what is required of such systems in conjunction with other organisations working in this area.
4. Ensure there is a nationally cohesive approach to the evaluation and possible implementation of electronic prescribing systems. These systems need to be integrated with other systems such as an electronic medication record and other clinical data systems.
5. Work towards all medication being barcoded based on an internationally recognised coding system that would allow tracking of a medication from manufacture, through distribution to actual administration to a patient.
6. Explore whether New Zealand should have a national formulary based on a preferred medicines listing, and how this should incorporate a national evaluation process for new high-cost medicines.
7. Establish the current level of drug information provision and promote the provision of a drug information service that has consistent standards nationally.
8. Improve consumer information so that there is more consistent and easily available material (printed and electronic) in both primary and secondary care, with a priority on high-risk medicines and consumer education on preventing medication mistakes.
9. Extend the availability of unbiased and independent drug information services to all health professionals in New Zealand, especially primary health care practitioners.
10. Promote education on the safe and quality use of medicines.
11. Identify areas in the education of health professionals that are deficient with regard to medication, and work towards improving these.
12. Outline desirable clinical pharmacy service levels for DHBs, with guidance and peer benchmarks for pharmacist staffing and the level of DHB services.
13. Work with all DHBs to make the use of infusion pumps, smart pumps and other forms of prepared IV administration more consistent and standardised.
14. Work with all DHBs to investigate and make use of automated medicine distribution systems, wherever possible.

Progress on objectives

National medication chart project

A draft national medicine chart, initially developed by New Zealand hospital pharmacists, has been championed by the SQM group. The design being worked on resulted from two limited consultations when the group became involved in the project. The design was sent out for national consultation to doctors, nurses and pharmacists in 2006. Following feedback, a radical new design incorporating significant safety features was sent out for a limited consultation in 2007, and the resulting feedback has been collated and discussed at the drug chart subcommittee.

Electronic medication record

Following presentations from HISAC (Health information Strategy Action Committee) and involvement in the various forums held in 2007 relating to e-pharmacy, the SQM group have reconfirmed the significance of electronic systems in delivering the safer use of medicines. The group have endorsed a model whereby the patient forms the focus for e-medication systems, and all interfacing is carried out to access the patient's medication information from a 'patient-owned repository'. This recommendation has been provided to HISAC.

The SQM group have determined that the National Health Index (NHI) system for unique patient identifiers should be linked to a nationally co-ordinated adverse medication recording system, and that parameters such as allergy recording should be able to link back and update the patient's medication record, via the NHI, with the specific information. The SQM group and NZPhvC have discussed the speed at which allergy reports are electronically loaded onto the NHI system, and have also considered how these reports can be made available to primary care prescribers and all secondary care providers.

Pharmacy and electronic prescribing systems currently available

An initial benchmarking exercise was undertaken in 2003 across the DHBs to determine what pharmacy and e-prescribing systems were being used in secondary care. Components of the various systems were studied to see how compatible they would be for future developments. A further benchmarking exercise was undertaken in 2007 to identify pharmacy systems that would not have the functionality required for the "bedside verification project".

Barcoding of medicines

The SQM group convened meetings in November 2005 and April 2006 to bring together interested parties to push for progress towards the barcoding of medicines in New Zealand. These meetings resulted in the completion of a baseline audit measuring the extent of barcoding of pharmaceuticals currently stocked by one pharmaceutical wholesaler. Resulting interest also saw the development of the bedside verification project plan, which was adopted and adapted by QIC. The Minister of Health announced in the May 2007 Budget that funding was to be allocated to this project.

National formulary

Following presentations and discussions, the SQM group have supported the development of a national formulary. A paper for national consideration was developed, and this has been referred to the DHBNZ Service Improvement Group with the recommendation from SQM that a national formulary should be developed.

Infusion pumps, smart pumps and other forms of prepared IV administration

The use of 'smart pump' technology was identified as a relatively simple but extremely useful safety tool. This technology is attached to the infusion pump device and has a series of 'soft' and 'hard' alerts associated with the various drugs given by infusions. Each medication has dose and infusion rate limits assigned to it, and if the operator attempts to give a dose or rate outside of this, then the alert either warns ('soft') or prevents ('hard'). The SQM group made the recommendation that when DHBs were replacing infusion pump devices, the smart pump technology should be built into the replacement systems.

Automated medicine distribution systems

Several DHBs have been using the Pyxis automated medicine distribution system for a number of years. This technology consists of a metal cabinet, to which access is via an inbuilt computer (by entering a user login and ID), through the patient's name to a pre-entered regimen of medication specific to that patient. This helps minimise prescribing errors because the profiling of the patient's medication involves carrying out dose range, interaction and contra-indication checking, in most cases prior to the first dose being administered. Selection error by nursing staff is also reduced, because once the patient's medication is selected, the nurse is led to the location of the specific drawer to retrieve the correct medication. The system also has inventory efficiency gains and has been shown in the two major New Zealand installations to significantly reduce medicine costs through reduced wastage and improved inventory control.

The SQM group recommend that automated medicine distributions systems such as Pyxis should be seriously considered by all DHBs for improving safety and delivering efficiency gains in the administration process within New Zealand secondary hospitals.

Future challenges

Future challenges are to:

1. establish a national drug chart
2. standardise additional medicine charts used in secondary care hospitals (eg, insulin, unfractionated heparin) to ensure consistency in the prescribing of these medicines
3. meet the remaining objectives set out in the Safe and Quality Use of Medicines National Strategy 2005
4. ensure that clinical processes drive information technology initiatives
5. ensure that information technology solutions can deliver what is needed before purchasing and implementation.

Chapter 7:

Primary Care and the Primary/Secondary Interface

The initial focus of the SQM group was on secondary care, particularly the use of high-risk medicines in secondary and tertiary care (see chapter 5), and the systems relating to these. However, parts of these programmes inevitably related to, and were extended to, primary care.

Increasingly we have built up the group's membership with primary care representation, as well as maintaining networks with primary care organisations and providers. Membership has been increased to include a representative from bpac^{nz}, which has the contract with PHARMAC for the provision of medicines, disease and evidence-based information to primary care, and which has worked with the SQM group on some issues in the past.

Primary health care

Strategy objectives

1. Consider whether there should be a sentinel reporting system in primary care.
2. Work towards a common electronic medication record, including all key primary and community care stakeholders.
3. Maximise outcomes, minimise risks and improve safety associated with medication use, minimising misuse, overuse and under-use, and ensuring compliance, initially in secondary care but with later introduction to primary care.

Progress on objectives

Sentinel event reporting in primary care

The management of health care incidents is one of the five national improvement programmes identified by the QIC, and one of the funded national quality improvement programmes. Although this is primarily focused at the secondary care level, this will lay the foundation for a primary care-based nationwide medication error reporting system. The SQM group has been able to highlight medication errors to community pharmacists using the two-monthly communications from the Pharmacy Council, which is circulated to all registered pharmacists in New Zealand. These are also included in the Pharmaceutical Society's newsletters. The new bpac^{nz} journal has also been used to highlight primary care errors. These methods, at a minimum, alert all primary care health care professionals of some reported sentinel events and allow them to review their operational systems to minimise the risk within their own practices.

Common electronic medication record

This has been a major focus of the SQM group (see chapter 6). There has been ongoing liaison with HISAC, the Ministry of Health and, more recently, the QIC regarding the development of an electronic medication record. The use of a central health record ('The One List'), accessed by primary and secondary care providers, including GPs and pharmacists (and preferably patients too), will make huge inroads into the current problems of medication management. Input on primary care, PHOs and information technology (patient management systems) has been – and needs to be – further sought and encouraged.

Safe medication use

The focus of individual medication management has so far mostly been on the high-risk medicines (see chapter 5). The SQM group, individually and collectively, keep informed on current issues in drug safety, including 'top 10' error lists, DHB safety reports, Medsafe/MARC concerns, and serious sentinel events. The development of resources relevant to primary care has mostly consisted of alerts and useful laminated guides, which have been sent to both PHOs and individual providers. Alerts for two of the original high-risk medicines identified have been sent to primary care. These were for:

- diltiazem (primary care-specific)
- warfarin (primary and secondary care, with some primary care-specific resources available).

The work on identifying the risks associated with insulin use included primary care feedback. In addition, the alert on good prescribing practice was sent to primary care for information. Alerts in development that will be sent to primary care are for:

- morphine (one of the original six high-risk medicines)
- low molecular weight heparin
- a colchicine alert, triggered by a death following overdose in primary care
- renal drug dosing.

Primary health care nurses

Nurses are the largest professional group working in primary care and therefore have great potential to make changes to the way people manage their own health and medicines.

With the introduction of the *Primary Health Care Strategy* in 2001,⁸ new opportunities and challenges were created for nurses working in primary care. These included finding new ways to provide best practice to the communities in which they work, and taking a leadership role in helping people to manage their long-term health issues in the community setting, including medication management, which is a vital aspect of patient care.

The role of nurses practising in the community setting is varied and can include patient assessment, compiling a medication history, preparation and administration of medicines, the monitoring of patients, collaboration with doctor and pharmacist, education of the patient, and ensuring continuity of care between health care settings. These roles can contribute to maximising health care outcomes, minimising risk and improving safety associated with medication use.

In order for nurses in primary care make further contributions, it is important that there be extended educational and clinical preparation. It is therefore vital that the goals and objectives of the safe and quality use of medicines be introduced and included in the teaching of nurses in medication management.

Community pharmacy

Community pharmacy provides an important safety measure for primary care, acting as a sorting house for public enquiries, referring patients to a wide array of primary and secondary health care services (eg, general practice, emergency departments, physiotherapists,

⁸ Ministry of Health. 2001. *Primary Health Care Strategy*. Wellington: Ministry of Health.

podiatrists), and picking up errors in prescribing, both clinical and bureaucratic. A significant component of their work is pre-primary care, giving advice to consumers on health care and wellbeing enquiries. The widespread locations and extended opening hours enable easy access for using pharmacists' expertise.

The role of community pharmacists in medicine management has been recognised by DHBNZ in the development of the Medicines Use Review framework. The SQM group have been able to support and influence the development and implementation of this framework, which was finalised in 2007. This is a five-tiered service-level approach for primary care pharmacy practice. The first two levels are concerned with screening and prevention/health promotion strategies. The third level, medicines use review, builds on the strengths of various national pilots, with a focus on medicines use (what patients are actually taking). This service has been systematically implemented by various DHBs through their community pharmacy contracts. High-needs patients (with complex medication regimes) being discharged from hospital can now be referred to an accredited community pharmacist for a medicines use review, thereby reducing the risk of readmission due to medication-related adverse events.

Communication between providers is an integral part of the process. The Royal New Zealand College of General Practitioners support this new initiative to improve patient safety, which is a good example of the potential of teamwork in the primary care setting. One method of evaluation for this service is peer review, and where adopted this will support the development of 'cell groups' of pharmacists for clinical review, and can also be used to support best practice.

Canterbury, Waikato and Waitemata DHBs have funded Dispose of Unwanted Medicines Properly (DUMP) campaigns in 2006/07. These have highlighted not only the fact that people often do not take their medicines as prescribed, but also the public health hazard of disposal and the increased risk of childhood poisoning.

Differential subsidies on prescribed medication

The Government has provided additional funding to reduce co-payments for eligible age groups for subsidised medicines prescribed by any general practice that is a part of a PHO to \$3 per item. However, medicines prescribed by hospital doctors or doctors outside the 'home' PHO are subject to the higher \$15 co-payment. The SQM group have recognised the risk to patient safety resulting from this scenario and have attempted to both quantify the problem and identify actual instances where there was either the potential for harm or actual harm caused by patients not wishing to pay the additional fee, and either not having their prescriptions filled or requesting that their GP transcribe the items on to a new prescription. The SQM group raised this with the Director-General of Health and Primary Health Organisations of New Zealand to highlight the issue and identify the problems created.

Communication

The SQM group recognise the difficulties involved in effectively reaching primary care health professionals and are committed to improving that communication. There is currently no national email system for direct communication with GPs or their surgeries, but it was recognised that a majority of primary care health professionals read the information sent out by bpac^{nz}, which began producing a bimonthly journal in October 2006. The group have contributed articles since December 2006 as a means of communicating with the primary care sector. Safe and quality use of medicines information is also included in pharmacy and nursing journals, and in the *New Zealand Doctor*.

Community/hospital interface

This interface, when entering or leaving secondary care as inpatients or outpatients, is well established as one of the highest risk times for a patient. Errors occur in all types of information exchange at these times, but the most critical are often medication-related. Recent deaths after errors made at patients' admissions highlight this.

Strategy objectives

1. Make a submission to the Ministry of Health on medications in parts B and H of the Pharmaceutical Schedule.
2. Provide input to MedSafe and PHARMAC on safety and quality issues.
3. Identify barriers to co-ordination of care at this interface.
4. Review initiatives that have been used here and elsewhere and pilot similar initiatives.
5. Work towards accurate transmission of admission and discharge information across this interface.
6. Work towards a standardised discharge format, preferably electronic.
7. Explore the use of the latter for other providers (eg, pharmacists).

Progress on objectives

Make a submission to the Ministry of Health (PHARMAC and Medsafe) on quality and safety issues

There has been significant correspondence with MedSafe and PHARMAC about both the registration of drugs, look-alike sound-alike medications, and other aspects of funding that affect safety in use (see chapter 4).

Interface issues

The SQM group identified many interface issues in their hospital service standards *Home to Hospital and Back* document issued in 2004. The group have had ongoing discussions with HISAC and others about electronic methods of improving the issues identified occurring at the interface. In 2007 the SQM group organised a workshop and met with representatives from the majority of DHBs who have either piloted or provide medicines reconciliation services to gather information on service provision and other lessons learnt from pilots and various organisations.

A step forward has been made with first one-way then two-way information exchange between primary and secondary care. This has been from primary to secondary care first, with initiatives such as Testsafe, where hospitals can call up the results of tests carried out in the community. This needs to be fully reciprocal so that those in primary care can access tests carried out in secondary care. Privacy and security issues have taken some time to resolve, but this sort of information exchange should remain a priority objective.

Some initial progress has been made towards implementing a common electronic medication record in the Auckland region. This medicines repository work stream is similar to the Laboratory Testsafe system in aiming to have information available from community pharmacies downloaded on a 24-hour basis and available for registered health professionals to share medicine histories. Estimated implementation is scheduled for early 2009.

The multiplicity of practice management systems in primary care is an ongoing problem for DHBs. This may require new software initiatives and is unlikely to change in the short term.

Standardised electronic discharge summaries

Work has been done in various DHBs and groupings of DHBs towards a standardised electronic discharge format for transferring information on medication. This has been used for some time in many parts of the country, but it needs to become universal. This system is based on the discharge summary, including the medicines the patient was taking on admission to hospital and the medicines prescribed on discharge, with documented reasons for any changes. Metropolitan Auckland DHBs have established joint work streams for discharge prescription formatting, and for ensuring contact details for prescribers are clear, so that primary care colleagues can easily contact the prescriber for clarification when necessary.

No progress has been made in providing electronic discharge summaries to pharmacists, although this is the type of information that would be covered by the electronic medical record (see chapter 6).

Future challenges

Future challenges are to:

1. address privacy issues with Testsafe, which are unresolved and will probably have an impact on the medicine repository and electronic health record work
2. consider strategies for enhancing a culture of medicines safety in primary care, including the establishment of an incident reporting and monitoring service for primary care practitioners so that the sector is able to learn from incidents, resulting in changes to practice
3. seek and encourage primary care, PHO and IT (practice management system) input in relation to the common electronic record
4. undertake ongoing work in relation to practice management systems (eg, adjusting the sensitivity of the Monthly Index of Medical Specialities interactions severity in both primary and secondary care to restore its usefulness)
5. focus on quality prescribing as well as safety (ie, increase prescribing where appropriate and reduce unsafe prescribing).
6. make two-way information exchange between primary and secondary care fully reciprocal, so that those in primary care can access tests and records from secondary care
7. have a standardised electronic discharge format in tabular format, which includes medications on admission, medications on discharge, reasons for changes, allergies, and significant adverse drug reactions
8. provide medication discharge summaries electronically to pharmacists
9. develop strategies for accurate and thorough medicines reconciliation and review in primary care and with community pharmacy
10. educate and involve nurses working in primary care to implement safe and quality use of medicines initiatives
11. provide access to information on medications for all the health care team across the interface
12. incorporate the national NHI alerts system into primary care.

Chapter 8: Audit, Evaluation, Monitoring and Research

Strategy objectives

1. Ensure regular clinical audit and monitoring and evaluation activity within all DHBs.
2. Publish and disseminate auditing, evaluation and monitoring through the network.
3. Establish a national register of Drug Utilisation Review projects.
4. Provide sponsorship and support for local drug utilisation evaluation, particularly in smaller centres, through networking and collaboration.
5. Provide co-ordination and communication of existing and ongoing research nationally through a national database.
6. Provide sponsorship and support for research and evaluation of specific medication error reduction initiatives.
7. Provide tool-kits for the evaluation of outcomes from SQM activities so that future investment in these initiatives can be justified in quantitative terms.
8. Undertake focused surveys on a regular basis looking at infrastructure development, service levels and sentinel events.

Intravenous infusion practices

The SQM group sent an audit to all DHBs in November 2007 for completion and return in March 2008. A Position Statement on Intravenous Infusion Practices has been drafted, along with an alert, which will be finalised and sent to DHBs when the information from the audit has been collated and analysed.

Stock-takes of medicines reconciliation and e-pharmacy

Stock-takes of hospital prescribing and pharmacy dispensing and distribution systems were conducted in 2003 as part of a review of standards for hospital pharmacy practice. An updated stock-take of pharmacy dispensing systems was undertaken in 2007, and this identified that many DHBs would not have the functionality to move forward at this stage.

A questionnaire about medicines reconciliation, followed by a workshop and telephone interviews, was carried out in 2007. This gathered baseline information on which DHBs currently provide or have provided medicines reconciliation services. The type of service offered, who provided the service and to which patient populations have all been identified, along with outcomes where these results are available.

Evaluation of potassium chloride concentrated injection alert impact on practice

The first alert issued to secondary care providers by the SQM group was on potassium chloride concentrated injection in April 2004. An evaluation form was sent to DHB chief executives in July 2004. The questionnaire was completed by 19 DHBs, and two additional questionnaires were returned when different hospitals within a DHB had different answers. The evaluation identified individual DHB responses to and compliance with the recommendations in the alert.

Table 2: Summary of responses to and compliance with recommendations contained in the potassium chloride alert

Recommendation	Result		
	Yes	No	Plan to change
Only stock 10 mmol in 10 ml KCl injection	8 (11 only stocked higher strength)	2	2 from higher to lower
Keep concentrated KCl injection in a locked container	16	5	1
Remove concentrated injection from some ward areas	10	11	–
Use pre-diluted solutions when possible	20	1	–
Clear therapeutic guidelines available	7	14	7
Risks taught	4	17	13

Full compliance with the recommendations in the alert depends on the availability of a wider range of pre-mixed potassium-containing infusion fluids, and registration of these products has yet to occur. A further alert and evaluation are planned once a wider range of infusions is available

Future challenges

Future challenges are to:

1. meet the remaining objectives set out in the Safe and Quality Use of Medicines National Strategy 2005
2. ensure funding is available to meet the objectives detailed in the national strategy document.

Chapter 9: Consumer Awareness

Strategy objectives

1. Provide consumer information on the safe use of medicines.
2. Encourage patient self-management of their condition and medicines.

Progress on objectives

The SQM group have been without a consumer representative since May 2007, when the consumer representative resigned. An ongoing problem has been a lack of resources to fund a consumer's travel and expenses. Specific efforts were made in 2007 to address this problem, and it is hoped that funding will be made available in 2008 and that a consumer representative will drive these objectives forward. The SQM group emphasised the need for increased consumer information in their feedback on the National Medicines Strategy.

Future challenges

Future challenges are to:

- engage with consumers and highlight to them specific issues related to the safe use of medicines
- actively promote the consumer's role in the self-management of their own conditions and medicines
- encourage a culture where clinical staff address risk from a consumer perspective.

Chapter 10:

Improving Medication Safety: Quality Improvement Committee – National Quality Improvement Programme

The national Quality Improvement Committee (QIC) was established in 2006 with the aim of leading quality improvement through a number of initiatives. A shortlist of six initiatives was developed, with an organised national effort to improve medication safety near the top of the list. QIC, Ministry of Health officials and SQM group members contributed to the Safe Medication Management Quality Improvement project. The proposal was submitted to the Cabinet, and funding was approved in 2007.

This is a wide-ranging medication safety programme, national in scope, reflecting concerns with medication safety not only in the country's public hospitals but also at the interface with primary care and (eventually) in primary care itself. There have been close links with the SQM group throughout this process, with some aspects of the programme falling under SQM governance.

The programme itself has several interconnected streams, as follows.

- **Development of a national medication chart:** this work has progressed under the SQM group, and QIC intends to support its introduction.
- **Medication reconciliation:** medication reconciliation (MR) is the process whereby a patient's medication history is reviewed with them (primary care and community pharmacist sources may also be included) so that it can be 'reconciled' with the medications charted for the patients on admission to hospital and vice versa. This ensures that the medications they are taking prior to admission are continued in hospital (if appropriate), and that no medications are accidentally left off the chart or incorrectly added. The information collected during the MR process must be able to be accessed by those involved in the patient's care and transferred with the patient when care provider/settings change.

The need for MR was demonstrated by two high-profile Health and Disability Commission cases. In each case the patient was charted with completely the wrong medications (meant for other patients). Surveys done at Auckland City and Middlemore Hospitals showed that medication histories were poorly done at admission, with in excess of 70 percent of cases showing at least one error. The SQM group convened a workshop of those groups already embarked on MR, which involved presentations of each hospital's approach, barriers to effective MR, and what has been learned. The most successful MR programmes were those led and run by clinical pharmacists, although it was acknowledged that this valuable resource varied across hospitals and even the best resourced were generally not available on weekends.

- **Introduce e-medication chart, or e-prescribing:** the SQM group are working on standardising the medication chart (see above). Building on the SQM group's work will allow this chart to be put into an electronic form. Having such an electronic medication form is a prerequisite for electronic prescribing – the process that will reduce medication errors through eliminating the need to hand-write medications (often illegibly), and also prevent common prescribing errors.

- **Standardise hospital medicine information systems:** emphasis and effort would be primarily directed at implementing a consistent electronic prescribing system and ensuring that all information systems dealing with medicines are using a consistent data set of medicines, such as the Unified Data Model⁹ (UDM) that is being implemented in the Auckland region. Once this occurs, the pharmacy dispensing system can interface with other information systems. Part of this process requires unique electronic identifiers for all medications and for the different preparations of each medication. There is also a body of work required to standardise the messaging system used in the medication process. This work is being lead by HISAC in conjunction with SQM group members.
- **Package pharmaceuticals at unit of dose with barcodes on wrappers or labels:** in the short to medium term this is likely to involve the purchase and operation of unit dose repackaging machines. For the medium to long term, by mandating through rule or regulation, the requirement will be for globally standardised barcodes to be printed on pharmaceutical packaging.
- **Link all information systems connected with medicine management,** including patient management systems, electronic prescribing systems, barcode point-of-care systems, and pharmacy dispensing systems, using a common consistent data set of medicines.
- **Introduce bedside verification using barcode-point-of-care (BPOC) systems to New Zealand public hospitals:** in order for this system to be implemented, many of the other components will need to be finalised. Bedside verification aims to decrease common administration errors of 'wrong patient' or 'wrong dose'.
- **Train and support DHB staff** in the operation of these systems and process change management.

⁹ UDM is repository of information about the medicines including formulary. Links branded medicines to generics versions.

Appendix 1: Terms of Reference

The Terms of Reference were revised in 2007 and the new Terms of Reference were adopted by the Group in December 2007.

DHBNZ SAFE AND QUALITY USE OF MEDICINES GROUP

TERMS OF REFERENCE

1. ACCOUNTABILITY

1.1 The National Safe and Quality Use of Medicines group is established by the District Health Boards of New Zealand and reports to the District Health Board chief executives.

2. PURPOSE OF THE COMMITTEE

2.1 The role of the Safe and Quality Use of Medicines (SQM) group is to provide independent advice to the District Health Board chief executives on any strategy, best practice or model to promote the safe and quality use of medicines.

2.2 The SQM group will work across the health and disability sector as both an advisor and a facilitator. In providing its advice it must:

- ensure that programmes directed at health and disability service providers have the capacity to improve health outcomes
- apply a broad definition of 'safety and quality' that is focused on people-centred care, best practice, evidence, innovation and value for money
- review the worldwide literature to identify current knowledge on effective practice to reduce medication error and associated adverse events
- seek to develop a shared learning environment in the health sector
- ensure appropriate consultation has occurred.

2.3 Key tasks:

- to analyse information and evidence on systemic quality and safety medicine issues from a national perspective, including sponsoring, monitoring and evaluating programmes within a quality improvement framework
- to promote best-practice prescribing, dispensing and administration to improve, promote and protect the health of people and communities, improve safety and thereby minimise risk
- to design a systematic approach to improving the safe and quality use of medicines – this should specifically include the reduction of medication error and adverse events across the interface between primary and secondary care
- to recommend priorities for implementation of system improvements (incorporating any cost–benefit information)
- to be active in building collaboration with national organisations to facilitate an integrated approach to safe and quality use of medicines
- to organise and facilitate opportunities for the discussion and understanding of proven examples of innovation and best practice.

3. COMPOSITION OF THE COMMITTEE

- 3.1 The Committee will have a maximum of 14 members and the chair.
- 3.2 The membership may include representatives of :
 - i. District Health Board chief executives
 - ii. consumers
 - iii. pharmacists
 - iv. primary care
 - v. secondary care
 - vi. senior nursing and medical staff
 - vii. government-funded agencies (eg, Accident Compensation Corporation, Ministry of Health, Medsafe, PHARMAC, bpac).
- 3.3 The chair will be a nominee of the District Health Board chief executives.
- 3.4 Members will have the ability to work strategically and co-operatively, and will have credibility in relevant communities.
- 3.5 Collectively the Committee will reflect the following:
 - expertise in quality improvement and clinical risk management in the health and disability sector
 - knowledge of best practice and/or implementation of innovation in the health and disability sector
 - knowledge of health services research and measurement
 - knowledge of clinical pharmacology
 - knowledge of regulation of pharmaceuticals
 - knowledge of national policy development, funding and service delivery
 - experience of District Health Board service provision and management at a senior level
 - health professionals with extensive and recent clinical experience in primary and secondary care
 - knowledge of consumer participation and representation.

4. TERM AND CONDITIONS OF APPOINTMENT

- 4.1 Members will be appointed following a 'call for applicants' and review of credentials by the group; the chair will make the final decision.
- 4.2 The terms of office of members will be staggered to ensure continuity of membership. No member may hold office for more than six consecutive years. Members will be eligible for reappointment
- 4.3 Any member of the SQM group may at any time resign as a member by advising the secretariat in writing.

5. REPORTING REQUIREMENTS

5.1 The SQM group is required to:

- report as necessary, but at least once a year, to the District Health Board chief executives
- keep a record of all Committee meetings, which outlines the matters discussed and includes a clear note of all decisions taken or recommendations made.

6. FREQUENCY OF MEETINGS

6.1 The timing and frequency of meetings will be determined by the tasks the group is required to fulfil.

7. MEETINGS OF THE COMMITTEE

7.1 Meetings will be held in Auckland and Wellington unless the chair decides otherwise.

7.2 At any meeting, a quorum shall consist of eight members.

7.3 All meetings of the group will be convened by the chair (or their nominee).

7.4 Every question before any meeting shall generally be determined by consensus decision-making. Where a consensus cannot be reached, a majority vote will apply. Any individual can absent themselves from the group decision-making process.

8. DUTIES AND RESPONSIBILITIES OF MEMBERS

8.1 The SQM group has an obligation to conduct its activities in an open and ethical manner.

8.2 Committee members are expected to:

- have a commitment to work for the greater good of the group
- attend meetings and undertake activities as independent persons responsible to the group as a whole
- make every effort to attend all meetings and devote sufficient time to become familiar with the affairs of the group and the wider environment within which it operates
- sign a conflict of interest register when joining the group
- when members identify that they have a conflict of interest on a subject that will prevent them from reaching an impartial decision or undertaking an activity consistent with the group functions, declare that conflict of interest prior to a meeting and withdraw themselves from the discussion and/or activity
- challenge other members if they consider there is a potential conflict of interest
- refer requests for media comments to the chair.

9. ATTENDANCE FEES

9.1 Members of the SQM group are not entitled to be paid fees for attendance at meetings.

10. PERFORMANCE MEASURES

- 1.1 The SQM group will be effectively meeting its tasks when it provides relevant and timely advice to the District Health Board chief executives based on research, analysis and consultation with appropriate groups and organisations.

11. THE SECRETARIAT

- 1.1 The SQM group will have a secretariat to provide an administrative and analytical support.
- 11.2 The secretariat will be responsive to requests from Group members, members of the public and other stakeholders.

Appendix 2: Membership

Chai Chuah	Chief Executive, Hutt Valley District Health Board
Beth Loe	National Co-ordinator, DHBNZ SQM Group
Anecita Lim	School of Nursing, University of Auckland
Mary Seddon	Counties Manukau District Health Board
Tim Maling	Capital and Coast District Health Board
Avril Lee	Waitemata District Health Board
Marilyn Crawley	Waitemata District Health Board
Elizabeth Plant	Taranaki District Health Board
Debi Lawry	Central Otago Health Services
Nigel Miller	Canterbury District Health Board
Peter Black	Auckland District Health Board
Gillian Bohm	Ministry of Health
Peter Moodie	PHARMAC
Adam McRae	PHARMAC
Frances McClure	General practitioner
Dwayne Crombie	Chief Executive, Guardian Healthcare
Roy Morris	Otago District Health Board
Consumer representative	Currently vacant

Appendix 3: Good Prescribing Practice Alert



Medication Alert

Abbreviations when Prescribing Medicines!

ALERT 4 April 2007

- For the attention of: DHB CEOs, PHO CEOs, DHB Chief Medical Officers, DHB Directors of Nursing, DHB Quality Managers
- For action by: Medicines Advisory Committees, Pharmacy and Therapeutic Committees, Clinical Boards, PHO Clinical Leaders
- For information to: Schools of Medicine, Midwifery, Nursing and Pharmacy, Medical Colleges, Pharmacy Council, Pharmacy Facilitators

Purpose of this alert

To highlight the safety issues surrounding the use of abbreviations when prescribing medicines.

Background to this Safe Use of Medicines alert

It is expected that all hospitals would have standard operating procedures or guidelines about the use of abbreviations when prescribing medicines within their organisations. This alert is to highlight the need for such guidelines and identify some abbreviations, acronyms and symbols that can be dangerous and when used can lead to serious adverse incidents¹. There is also the risk that health professionals who have worked in other parts of the world might use or interpret abbreviations in a different way to their host nation.⁵ These abbreviations should be included in a “do not use” list.

Recommended action

Secondary Care

- All hospitals should review the guidelines/standard operating procedures within their organisation regarding the use of abbreviations when prescribing medicines
- Abbreviations included in the “do not use” list should not be allowed
- Include education for prescribers on the use of abbreviations in induction training and RMO handbooks

Primary Care

- Primary care practitioners should review their prescribing practice and not use the abbreviations included in the “do not use list”

References

1. Cohen, Michael R. Medication Errors, American Pharmaceutical Association 1999, sections 5.9, 8.4
2. Institute for Safe Medication Practices – Preventing Medication Errors available from URL: <http://www.ismp.org/msarticles/specialissuetable.html>
3. Joint Commission on Accreditation of Healthcare Organisations (JACHO) – 2004 National Patient Safety Goals “Do not use” list. available from URL: <http://www.jointcommission.org/PatientSafety/DoNotUseList/>
4. Health and Disability Commissioner from URL: <http://www.hdc.org.nz/complaints/opinions?98HDC14229>
5. Adcock, Harriet, Learning from Medication Errors The Pharmaceutical Journal: 267, 1; Sept 2001, 287-289

“Do Not Use” Abbreviations and Symbols

“Do not use” Abbreviation / Symbol	Intended Meaning	Potential Problem	Preferred Term
Do not abbreviate the name of any medicine ¹		May be incorrectly mistaken for something else e.g. MTX has been used for both methotrexate and mitozantrone e.g. HCT has been used for both hydrocortisone and hydrochlorothiazide e.g. HCT has been used for both hydrocortisone and hydrochlorothiazide e.g. ISMN has been used for isosorbide mononitrate and may be confused with ISMO®	Always write names of medicines in full.
Do not abbreviate the names of any chemical ^{2,3} e.g. MgSO ₄ HCl KCl	Magnesium sulphate, Hydrochloric acid, Potassium Chloride	May be incorrectly mistaken for something else. MgSO ₄ has been mistaken for morphine sulphate HCl has been mistaken for potassium chloride	Always write chemical formulas in full e.g. magnesium sulphate hydrogen chloride potassium chloride
U ^{1,2,3} or IU ^{1,2,3}	Unit International Unit	Mistaken as zero, four or cc Mistaken as IV (intravenous) or as 10 (ten): or as a trailing 1 (one)	Write unit or international unit
OD, od or O.D. ^{1,4}	Once daily	Mistaken as QID or BD	Write daily
Q.D. or q.d. ^{1,2,3}	Every day	Mistaken as QID	Write daily
SC2	Subcutaneous	Mistaken for SL (sublingual)	Write subcutaneous or subcut
SL	Sublingual	Mistaken for SC (subcutaneous)	Write sublingual or subling
Trailing zero ^{2,3} Incorrect use: 1.0mg	1 mg	Decimal point is missed leading to a tenfold error –read as ten mg rather than one mg	Never write a zero by itself after a decimal point Correct use: 1 mg
Lack of a leading zero ³ Incorrect use: .5mg	0.5 mg g	i.e Decimal point missed leading to a tenfold error - read as five mg rather than half a milligram	Always use a zero before a decimal point Correct use: 0.5 mg
µg ³	microgram	Mistaken for mg (milligrams) resulting in one thousand-fold dosing overdose	Write microgram or mcg
ng	nanogram	Mistaken for mg	Write nanogram
mEq or milliequivalent		Confusion between milliequivalent and millimole. Only SI units should be used.	Always use millimole or mmol

If you require any further information or wish to provide feedback on this alert, please go to www.safeuseofmedicines.co.nz

Appendix 4: Concentrated Potassium Chloride Injection Alert



MedicationAlert

Potassium Chloride Concentrate Injection can be FATAL!

ALERT 1 Monday 5 April 2004

For the attention of: Chief Executives of District Health Boards

For action by: Chief Pharmacists in DHB Hospital

For information to: Medical Directors, Directors of Nursing, Chair's of Pharmacology and Therapeutics Committees, DHB Quality Managers

Background of the Safe Use of Medicines alert

- Potassium chloride concentrations can be fatal if given inappropriately.
- Potassium chloride is widely used and administered intravenously in diluted solutions to treat low potassium levels in patients who are often seriously ill.
- Potassium chloride concentrate ampoules can look very similar to a number of other injectable medicines including sodium chloride and water for injections. There have been a number of incidents both within New Zealand and overseas where concentrated potassium chloride solutions have been accidentally administered to patients with fatal results. Common causes include staff mistaking potassium chloride solution for sodium chloride when reconstituting a drug for injection and not calculating the correct dilution when preparing diluted solutions for infusion.
- Free flow bags containing potassium chloride have caused the death of patients.

Purpose of alert

To highlight and reduce the risk of accidental overdose of intravenous potassium resulting from the use of concentrated potassium chloride solutions.

Definition

Concentrated potassium chloride solutions are defined as the following concentrations:

- 10mmol in 10 ml (750mg of potassium chloride in 10ml)
- 20mmol in 10 ml (1.5 g potassium in 10ml)

Recommended action – until a range of premixed potassium chloride dilutions are available

1. Storage and handling of potassium chloride concentrate

- Removal of potassium 20mmol in 10ml concentrate solutions from all hospitals.
- Potassium chloride concentrate should be stored in a separate locked cupboard/container away from common diluting solutions such as sodium chloride solution.
- Potassium chloride concentrate solutions should be restricted to pharmacy departments and those critical care areas where the concentrated solutions are needed for urgent use such as ICU, CCU and other nominated specialist areas.

- Once premixed solutions are in place then consultants only, should be able to authorise distribution to other areas within the hospital on a one off named patient basis.
2. Prescribing of solutions containing potassium
 - Commercially prepared ready to use diluted solutions containing potassium must be prescribed where available.
 3. Checking preparation and use of concentrated potassium solutions in clinical areas
 - Where there is a requirement for an alternative potassium chloride dilution a second practitioner (nurse, pharmacist or doctor) must always check for correct product, dosage, dilution, mixing and labelling during preparation and again prior to intravenous administration.

Additional suggested action

- Risks associated with the storage, prescribing, preparation and administration of potassium chloride concentrate should be highlighted in patient safety induction training and IV training for all staff involved in the medication process.
- Clear therapeutic guidelines for the use of potassium chloride should be developed within each DHB /healthcare provider.

For further action by Safe Use of Medicines Project Team

The Safe Use of Medicines Project Team that contains PHARMAC representatives, will work with PHARMAC to consult on, and put in place hospital contracts for a specific range of dilutions of potassium chloride infusions so as to minimise the need for staff to use potassium chloride ampoules.

If you require any further information or wish to provide feedback on this alert, please go to www.safeuseofmedicines.co.nz