Safe Use of Medicines – Home to Hospital and back

Executive Summary

This is a project of DHBNZ, aimed at bringing energy and focus to the safe use of medicines in hospital, primary care and community contexts

It has emerged from a wide range of views, from all parts of the health system, and is aimed at taking a total systems approach for safety.

The key objectives are

- To highlight the issues and risks around the hospital admission and discharge processes in relation to medicines
- To develop the optimum delivery of hospital and community pharmacy services
- To promote effective communication across all people involved at handover / transfer of care and the interface between hospital and primary care

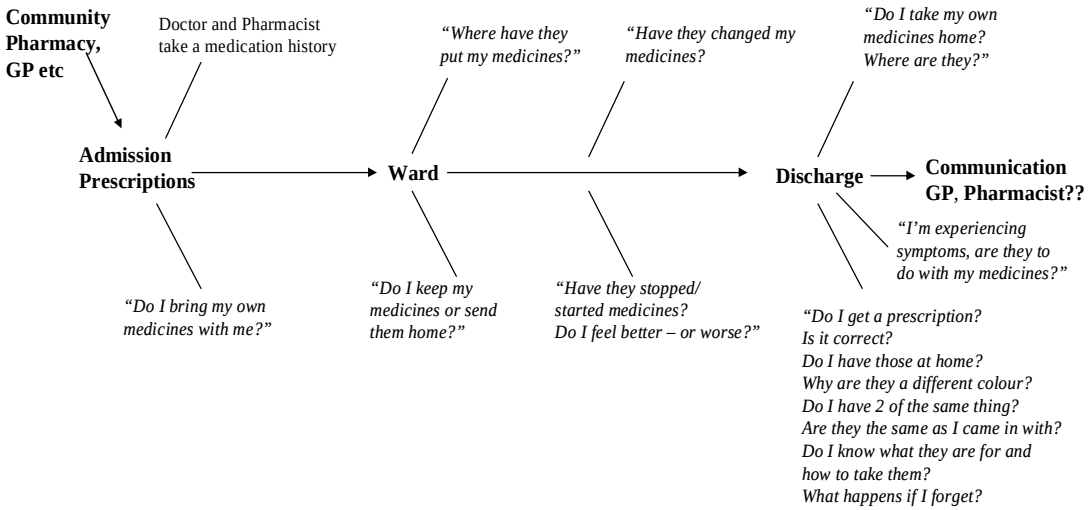
Contents: This is a fully comprehensive technical document, which discusses the principles of care with explanatory notes, the current problems and potential solutions

The pages of most interest to people interested in specifically the admission and discharge process are 1-5, 8-10……..

The pages of most interest to people interested in hospital pharmacy services are…
6-8, 10-12……

The total document will be of interest to those in your organisation taking a systems view of medication related adverse events , risk management and promoting quality and safety.

Prescribing Flow & Safe Use of Medicine
A <u>Patient's</u> Perspective



PRINCIPLE	EXPLANATION	CURRENT PROBLEMS	POSSIBLE SOLUTIONS
<u>Admission Process:</u> On admission to hospital accurate information is available about the patients current medication regime prior to admission Require immediate access to GP/Community Pharmacist full medication history at time of admission (includes alternative therapies OTC medicines etc). (Gold standard to have access to this information electronically at item of admission).	It is essential at admission a full picture of the patients current medication use (including alternative therapies/OTC medicines is obtained). A patient's current medication, including non-prescription items, is an important information source. Incorrect medication could have contributed to the admission. Information is available from a number of sources. This is often conflicting, incomplete or inaccurate	No interface between Hospital/GP and Community Pharmacy systems. § GP records not up to date § Use of multiple GPs § Error in information supplied by GP § Non prescription medicines not included § Use of multiple pharmacies § Current medication not brought in § Old medication not discarded § Identifying medicines brought in § Patients admitted in an emergency	Medication history 'credit card' concept with all medication related details on it and updated at each interaction (event) with a health service. Interfacing developed between Hospital/GP/Community Pharmacies to allow for seamless transfer of information (NB: Privacy and access to information issues to sort in relation to this).
Patients are encouraged to bring medication into hospital with them. This applies to inpatient admissions, preoperative and outpatient clinics. Patients have a record of current medication. (eg update yellow card) NHI numbers used nationally as primary identification source.	A patient's current medication, including non-prescription items, is an important information source. Incorrect medication could have contributed to the admission. Currently information is from multiple sources, each one in itself may be incomplete or inaccurate. As addressed above, should be updated at all health provider interactions. A comprehensive electronic record with multiple access should be the ultimate aim.	• Patients admitted in an emergency without medication • External agencies (St John's, GPs) not aware • Nurses tell patients/carer to take medicines home • Brings to preadmission clinic but not when admitted • Brings sample only, not original container • Rest homes don't send medication with patient • Rest home – often medication record includes non-current medication, held 'just in case' • Patient brings medication organisers (stacker tray) but no other information • Inhalers, eye drops not brought in • Brand of medicine is not stocked in the pharmacy *- Continued next page*	Patients taught that medication must be brought into hospital where possible (ie for all planned admissions). Undertake education programmes nation wide to achieve this. Standardise DHB wide patient medication card which is carried by patient and updated at each health care provision or event ie shared across hospital to GP to Community Pharmacy. (Nationally derived generic yellow card?) Have this 'card' available electronically and ensure health providers can print onto standardised cards.

		- Continued from previous page • Patients consider they "own" the medicines and hospital must supply while an inpatient • Storage of medicines until discharge – may not be returned to patient • Problems increased by 3 month stat dispensing – more confusion • Yellow medication card is not maintained up to date • Different sizes/format/sources of card exist • Large cards for vision impaired but too big for wallet/handbag • Patients don't carry the card with them • Responsibility for changing the medication card is unclear – doctor, nurse, pharmacist or patient? • Prescriber tells patient to change dose/frequency but the change is not recorded on the label or card • Patient assumes there is a comprehensive medication record at point of contact with health practitioner • Multiple primary care providers	
Provision of information medication summary in patients own language. Admission history recording may also be more accurate if able to ask details in patients own language.	Most/all provision of medication summaries in English with some Maori translation versions.	Resourcing issue to address need for interpreters. What rationalisation should be placed on deciding what alternative languages should be applied,	Consider interpreter/English as second language. Maori/Pacific Island minimum alternative to English.

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Patients allergy/adverse drug reaction status to medication be ascertained by a Clinician at admission and documented into their electronic medication record (into the patient management system).	Currently poorly done with many patients having incorrect allergy status (where actually an adverse drug reaction is <u>not</u> an allergy). Incomplete or inaccurate allergy documentation. Patients may have useful medication denied to them because of a 'perceived' allergy. If Allergy is not identified a preventable reaction may result.	No national standardised means of accessing or categorising allergy status. No updating of existing patient management systems in regards to allergy/adverse drug reaction status. No sharing of information between sectors.	Standardised assessment, categorisation and documentation, and national NHI number as main reference point. System is developed nationally and is then incorporated into the various patient management systems used across the DHBs. (Hospital and Community Sectors)
Standardised admission process to ensure complete capture of patient details.	Currently admission history taking is carried out by tired, distracted House Surgeons/Registrars. Pharmacist involvement in admission histories taking in Emergency Departments have been successful in minimising issues.	Direct to ward admissions as well as via the Emergency. Requires consistent resourcing on a 24 hours 7 day week service (ie 24/7).	Pharmacist involvement in the admission process would be the Gold Standard. However difficult to provide 24/7 service. Studies have shown Pharmacist medication admission history taking reduces errors.
Provision of medication during inpatient stay needs to ensure patient receives their total medication requirements (excluding alternative/complementary/rongoa therapies).	Patient coming in for an event such as an operation where the other conditions they may have requiring medication are not being reviewed or are incidental to their event. Patients need to be provided with all their medication needs during the stay.	WHO restrictions on re-using medication where the storage cannot be guaranteed. If using patient own medications then take liability for the contents so any error made by dispensing in community is carried through inpatient stay Patients feel 'ownership' of medication as had to pay co-payment for it Patients believe in a free supply while in hospital	<u>3 Options:</u> 1. Bring all medication in, use own where possible only provide changes/additions. 2. Bring in and use to obtain full medication history but remove and keep in a safe place and supply all medications required during hospital stay, then at discharge access and return medication patients are still on providing prescription for addition/changes. Encourage patients to allow hospital to discard any no *- Continued on next page* *- Continued from previous page*

			longer required medications to prevent them taking medication that should have been stopped. 3. Use a combination of both methods using those medication only where an OP (original pack) is involved ie insulin pens, inhalers, HRT, oral contraceptives, Nitrolingual sprays etc <u>Recommendation:</u> All discharge prescriptions should be written for 1 month only to avoid compounding 'Stat' issues
Documentation of all medication histories details should be done on a seamless electronic system from prescribing with decision support to dispensing (with decision support) to profiling (if using automative drug distribution systems) to administration (with ultimately bar-coding of drug and patient occurring prior to administration to verify drug/patient/dose is correct)	Errors occur at all stages due to transcribing of information. Doctors should have decision support available at time of prescribing and this would include linked access to laboratory and radiology results.	Variety of computer systems used around the country – some still DOS based. Interfacing is required via patient details to: • Laboratory • Radiology • Electronic Medical Record • Organisations PML (Preferred Medicines List) • Clinical medication related treatment guidelines • Decision support (dose range checking, interaction checking, contraindication and allergy checking) • Pre-set treatment guideline eg pre-operation standard medications • Minis/BNF/Micromedex • All interventions (eg change dose are recorded 'immediate real time' and documented electronically with full audit trial) *- Continued on next page* *- Continued from previous page*	One National Pharmacy Electronic Prescribing System (two maximum) to be used nationwide. Utilise Automative Drug Distribution and Bar-coding technology where appropriate/ available. Ensure before any hospital purchase new software/technology that safety issues are examined and if technology available with safety checks then this use should be encouraged and the extra cost weighed against the safety gains. Access to international organisations such as ECRI (in America) where medical technology is assessed with recommendations made considering functionality, safety features, cost and overall effectiveness. The organisation provides unbiased information and a great deal of work has gone into assessing new technology prior to it arriving in the New Zealand market. ECRI: <u>www.ecri.org</u> Government to be encouraged to invest in

		• No current provider of a seamless electronic prescribing to bar-coding patient systems • Reasonable option available for Pharmacy Automative Drug distribution	technology advances in health to allow consistency across hospitals and wider access to 'safer' technology where it is been proven to improve patient safety. Government to invest in development of a process of electronic prescribing through to bar-coding by providing seeding cash grant as is the case in Britain where $4 billion has been invested to introduce/develop this technology: • Needs to be wireless LAN, fully supported and HTML configurable • Require standardised national drug database and coding • Require standardised national treatment guideline with population/disease variables • Require standardised adverse drug reaction (ADR) status and national database linked to patients NHI number • Require national standardised training programme for prescribing before being allowed to prescribe • Require national standardise validation of prescribing practices <u>NB:</u> Standardisation of drugs, strengths and coding has been identified in America as one of the main inhibitors to utilising 'safer' technology from reaching full potential.

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Clinical Pharmacist should review all patients medication requirement during their hospital stay.	Clinical Pharmacists have been proven to add value/safety if review patient medication requirements during a hospital stay. Verification is require by Pharmacist for: • Dose • Intervention • Route/device/mode/formulation • Frequency • Instruction • C and A (Cautionary and Advisory Labels) • Volumes/diluents/compatibility	Require resourcing 24/7 which is a major barrier. Need to have standardised training, validation programmes to ensure consistency. Distance hospitals can still have clinical review if use 'profiling' via an automative drug distribution system (eg Pyxis)	Every drug chart (prescription) should have clinical pharmacist verification prior to administration, 24/7 services. Automative 'profiling' can assist in achieving this. Issues will arise in these areas: • Stat doses/standing orders/verbal orders • Theatre • X ray • Diagnostics Require national training and validation standards developed to ensure consistency of service. Need national standardised clinical resources such as MIMS, Micromedex, and NOIDS (Notes On Injectable Drugs), All are available in hard and electronic versions, These should be minimum requirements for all hospitals.
Patients are fully informed of changes to medication and the reasons for this while in hospital	This reduces the chance of error through selecting the wrong medication from stock supplies. Systems include individual patient supply, self administration and electronic storage /selection, bar coding and nurse verification systems.	§ Working environment § Nursing systems & practice § Ward medicine storage systems § Prescribing & documentation § Delays in ward - pharmacy communication § Availability of service 24/7	
Systems to promote safe use of medication are employed	The discharge process commences early in the patient's hospital stay. A "first-dose instruction" principle is adopted whereby the patient is given detailed information on receiving the first dose of a new/changed medicine	§ Medicine prescribed away from bedside § Nurse understanding of medicines & reasons	

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Dispensing/Distribution of drug to patient must be accurate with an electronic record available to track the administration of medication to individual patient level.	There are currently a number of different distribution models provided across the sector. Distribution options: • Pyxis to all patients • I.P.D. to all patients/unit dose dispensing • Imprest/requisition mix • Direct from store to ward • All section 29 medication to Individual patient Dispensing (I.P.D.) (unless urgent) • Full bar coding capability utilised from drug to patient	Individual patients dispensing is labour intense/inefficient but provides safer provision of medicine to patients as it reduces the chance of error through selecting the wrong medication from stock bottle, and allows for tracking dispensing to individual patient level. Automative drug distribution (Pyxis) is an alternative which minimises selection error through 'profiling' and tracks administration of all medications to the individual patient level electronically. It also allows for clinical pharmacist review through the profiling process often prior to the first dose being administered. Self medication models can assist in compliance particularly in AT and R patients and elderly patients on multiple medications.	The internationally accepted Standard is for all medication to have a dose/unit/specific barcode which is checked at time of administration and which verifies the correct patients, drug, dose, time, allergy status etc is to be administered to the patient who is also bar coded and matched to the drug. These systems also have an inbuilt batch/expiry checking/tracking mechanism. Bar coding technology requires standardised national drug names/strengths/formulations/dosage forms. There are two major options deployed in the USA at present: 1. Pyxis Barcode/Nurse Verifier 2. McKesson Administration Systems Individual patient station technology is being developed where each patient has a terminal screen at the bedside where all transactions relating to prescribing, verifying, prescription, administration etc occurs. These also allow for on line requisitioning of Radiology/Laboratory tests and ordering of meals. There are several models currently deployed and although expensive these are being refined all the time and will become cheaper and more affordable over time.

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Intravenous administration of medication employs safe systems of delivery to the patient.	Limited CIVAS (Centralised Intravenous Administration Systems) services are available in New Zealand. CIVAS produces a pre-prepared medication minimising selection error.	CIVAS is very highly resource dependent and must be provided 24/7 to be effective. Current staffing would not be able to provide this level of service.	
	Nationally selected drugs that are very high risk have been identified by "The DHBNZ Safe Use of Medicines Group" developing standardised administration guidelines and formulations.		Development of a standardised list of drugs/strengths and formulations and standardised administration guidelines. All doses for chemotherapy patients should be manufactured on an individual patient basis from validated manufacturing premises (onsite Chemotherapy manufacturing suite or validated manufacturing company).
	Currently no bar coding system exists to check that correct drugs are being administered.	Lack of bar coding systems available in New Zealand.	Utilise bar coding of all products when such technology is available to the New Zealand Market.
	Smart Infusion Pump technology is now available where safety features are inbuilt. At the time of setting the pump the drug, dose and rate is checked against a drug reference library and if out of dose range or not the correct rate for a specific patient then this will 'flag" and require an override to continue administration. .	Smart Infusion Pumps are new technology therefore expensive and currently there is only one supplier with the advanced technology available. National standardisation of drug name, formulations and strengths is important from the outset to maximise on use of this technology in a consistent fashion across the country.	Utilise Smart Infusion Pump technology where possible and recommend that when upgrading systems this new technology replaces the previous Infusion Pumps systems. ECRI in America have endorsed the new Smart Infusion Pumps as the preferred and safer option.
<u>At Discharge:</u> Medication regime is incorporated in the discharge plan. This plan is commenced as soon as possible after admission.	Planning for discharge should start as soon as possible after admission. Management of medicines after discharge should be an integral part of the discharge plan.	§ Changes in medication/condition	Clinical Pharmacists to visit high risk patients as soon as possible into their hospital stay and ensure regular update occurs until discharge.

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The patient holds a medication record (ie yellow card – medication profile with advice and times etc).	All patients should have a medication record but it is essential for those deemed as high risk (complex medication regimes, changed medication, or who are likely to have difficulty in managing medicines).	§ Record is not maintained up to date § Different sizes/format/sources of card § Patients don't carry the card with them § Patient assumes there is a comprehensive medication record at point of contact with health practitioner § Responsibility for changing the medication card is unclear (doctor, nurse, pharmacist or patient?) § Prescriber tells patient to change dose/frequency but the change is not recorded on the label or card § Multiple primary care providers	Refer to recommendations made at beginning in relation to National Standardised Yellow Card System, which is updated at each medication related 'event' and is consistent between hospital and community.
Patients (and/or carers) are instructed on their medication prior to discharge.	All patients should receive instruction on their medication but it is essential for those patients classed as high risk. A nurse, doctor or pharmacist may give the instruction but systems need to be in place to ensure that the right information is available in a suitable form.	§ Time for this if discharge at short notice § Ability/motivation of patient to understand	Reinforcement of consistent key messages occurs at every health professional interface. Use of approved consumer patient information leaflets (eg Med Info).
All patients should be reviewed within a defined time frame at post discharge.	Currently there is no nationally consistent system to ensure review occurs post discharge.		Referral letter and pre-set appointment date should be set at time of discharge.

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Patients are assured of medicines on discharge and these reflect the discharge medication regime.	This ensures the patients have an immediate supply and instruction can take place with the medicines prior to or immediately on discharge.	§ May not have a designated regular pharmacy § Discharge at out of normal service hours. § Matching discharge medication with medicines at home - duplication & changes § Repeat prescription held at local pharmacy may differ	Provision of minimum of seven days medication made available at discharge. Re-introduce provision of discharge medication for all patient (issues; relating to resources/co-payments etc).
Community practitioners are informed of the discharge, medication changes and follow up requirements	Through discharge letter, medication record or ability to access hospital data directly	§ Sending information to the correct person § Integration of IT systems § Volume of data	Seamless transfer of information between health providers. Until electronic interfaces are in place faxing of the discharge medication details and discharge prescription details to the Community Pharmacies and GP should occur.
High risk patients are followed up after discharge	To ensure medication regime is followed.	§ Identification of high risk § Tracking	P.R.S. applied to these patients
Procurement of pharmaceuticals must be regarded as a clinical decision as well as an economic one.	National Procurement via PHARMAC has maximised on purchasing at best price whilst ensuring clinical considerations are addressed. Some hospitals have outsourced the procurement of pharmaceuticals. Most hospitals use a PML type system which is derived by a multi disciplinary team of Clinicians, Pharmacists and Nursing Staff, ensuring appropriate clinical input.	Outsourcing the supply function of pharmacy has occurred in some situations around the country for perceived economic reasons.	Assess National Procurement process and modify via HPAC if necessary. Where the PHARMAC process doesn't apply then procurement of Pharmaceuticals should be continued to be co-ordinated through the Pharmacy Departments with clinical decision making from Clinicians occurring as part of the process.

PRINCIPLE	EXPLANATION	CURRENT PROBLEMS	POSSIBLE SOLUTIONS
Need to receive Electronic confirmation of order and utilise automatic inventory control/re-order.	Most pharmacy computer systems deploy a degree of automatic inventory control/re-order and electronic confirmation of order, but to limited degrees. Batch expiry checking is currently difficult and expensive to achieve.	Technology varies dramatically across hospitals and there is no consistent standard. Bar coding from order to patient administration will allow for full inventory control/batch/expiry tracking but this technology is expensive.	National strategy for development of technology and resources to address this issue.

Other principles requiring consideration:
Patient outcome should be measured in relation to their medication at all stages of care.

National ADR monitoring – currently exists as CARM – needs to be integrated electronically into systems so immediate adverse event reporting can occur at time of the event. This needs to be linked to the patient's NHI number.

National Standardised Guidelines from training/competency and validation measurement methods and level of qualifications need to be developed for:

- Prescribing guidelines with standardised abbreviations and basic calculations for medical staff
- District Nurse/Community Nursing administration
- Nurse I.V, IM, and PCA administration
- Chemotherapy administration guidelines
- Self administration and assessment guidelines
- Clinical ward pharmacy guidelines
- Discharge medication related counselling guidelines
- Standardised manufacturing for sterile/non sterile (ie CGMP revisited)

Other Issues:
Co-ordinated registration of products:

- Section 29/25/consent issues\paediatric availability of medications
- MedSafe/PHARMAC

Consumer Information leaflets available to consumers

Drug Information available to consumers.

National Standardised Storage Guidelines need to be developed addressing legislative requirements:

- Address need to store below 25°C
- Security issues
- Fridge Issues
- Time to get to patient issues
- If stored in bedside locker security issues

THIS DOCUMENT HAS BEEN COMPILED BY ELIZABETH PLANT (TARANAKI) MERGING THE GOLD STANDARD SERVICE DELIVERY FOR HOSPITAL PHARMACY AS DEFINED BY WORKING PARTY AT 2003 HOSPITAL PHARMACISTS MANAGEMENT SPECIAL INTEREST GROUP MEETING, AND THE STANDARDS FOR MEDICATION CARE BETWEEN HOSPITAL/COMMUNITY INTERFACE AS COMPILED BY BRIAN ELLIS (OTAGO) AND AVRIL LEE (WAITEMATA).