Electronic medication management (EMM)

A guide for healthcare providers

V1.01 December 2015



Overview

Purpose of this guide

Those viewing this presentation will come away knowing at a high level how electronic medication management (EMM) works and how it can support primary care, including GPs, pharmacies and residential aged care facilities.

Those from the acute care sector will see a brief overview of how EMM systems support key activities and also how hospital systems will interact with primary care.

Who should read this guide?

This guide is intended for healthcare providers. It is not intended to provide detailed technical information.



How to read this guide

This guide can be read in full, or browsed in parts by **clicking the links** to the sections you find most relevant. You'll also find a '<< contents page' link at the top of every slide.

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Introduction to electronic medication management (EMM)

What is electronic medications management and why do we need it?

Introduction to electronic medication management

Electronic medication management (EMM) is a broad term that incorporates any electronic clinical information system, tool or software application that is used to support the medicines management cycle. This includes:

- Prescribing systems; such as GP desktop computers or hospital clinical information systems that have electronic ordering deployed.
- Decision support systems; such as evidence based order-sets, allergy checking, drug interactions.
- Dispensing systems; such as pharmacy software and automated dispensing systems.
- Ordering and supply solutions; such as the electronic transfer of prescriptions (ETP) and hospital messaging solutions.
- Administration records; such as electronic medication administration records.

This guide provides a high level overview of the current systems that are available, or being planned, and how they relate to practice.

Why do we need electronic medication management?

There are a number of drivers that highlight the need to utilise EMM systems. These include:

- Improving the **legibility of prescription orders** to ensure that they are unambiguous and easily understood.
- Supporting clinicians with **choosing appropriate and cost-effective treatments** and helping to reduce clinical variation.
- Improving the **accuracy** and visibility of medication information being communicated between professionals and health care providers.
- Increasing the **quality of information** is available along the medicines management pathway to ensure health providers and consumers have **more complete information**.
- Optimising the medicines supply chain to control costs and drive efficiencies.

Finally, EMM enables the increased sharing of information with consumers, their carers and other providers.

What are the safety benefits of electronic medications management?

EMM implementers cite numerous benefits from EMM systems, however the greatest anticipated benefit of implementing EMM are the reduction of preventable adverse drug events (ADEs) including:

- Fewer prescribing errors as EMM systems provide clinical decision support.
- Lower dispensing errors through closed-loop medication ordering, automation and barcode scanning.
- Reduced administration errors through clearer information on electronic medication administration records, reminders, safety alerts and administration barcode checking.
- Less omission and commission errors at transitions in care through improved transfer of information.
- Improved medication adherence and minimised misuse, over-use and under-use of medicines.

These safety benefits have been described by implementers as reducing the number of medicines related episodes of care, reducing readmissions and length of stay in hospitals.

What does the evidence say?

Electronic medication management is an emerging field and the literature supporting its benefits is still growing. A number of key papers support the anticipated safety benefits of EMM.

Follow the links below to access some more relevant papers on the benefits of EMM.



Effects of two commercial electronic prescribing systems on prescribing error rates





Errors and electronic prescribing: a controlled laboratory study to examine task complexity and interruption effects





Implementing electronic management at an Australian teaching hospital



How does EMM support the medicines management cycle?

How EMM systems can support some of the key flows in medicines management

EMM and the medicines management cycle

- The medications management cycle is a complex, continuous process involving many stakeholders including prescribers, dispensers, administrators and consumers.
- The continuous optimisation of the cycle, combined with the principle of Quality Use of Medicines are common goals of governments and health providers.
- The Commission has modified the cycle diagram from the National Medicines Policy to explain how EMM systems are being implemented to support the various stages in the process.







Medication reconciliation is a formal process of obtaining and verifying a complete and accurate list of each patient's current medicines. Matching the medicines the patient *should* be prescribed to those they are *actually* prescribed.¹

Medicines reconciliation is particularly important when care is transferred - when a patient is admitted to hospital, or transferred from hospital to the home.

Common problems in medicines reconciliation

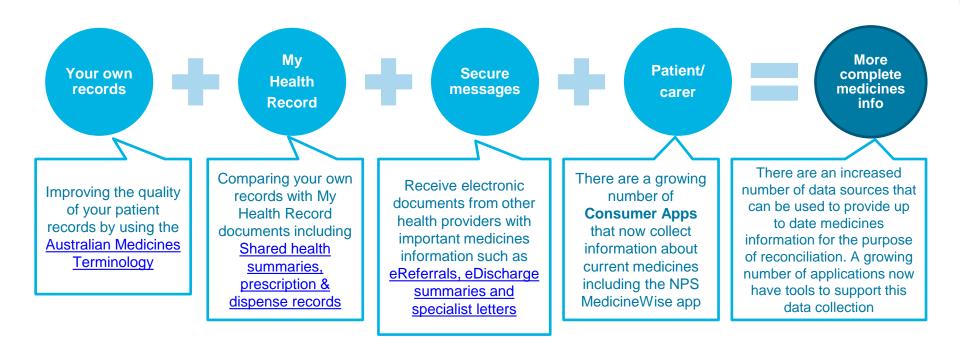
- Between 10%-67% of medication histories have at least one error.
- Up to one third of these errors have the potential to cause patient harm.
- More than 50% of medication errors occur at transitions of care.
- Patients with one or more medicines missing from their discharge information are 2.3 times more likely to be readmitted to hospital than those with correct information on discharge.
- 85% of discrepancies in medication treatment originate from poor medication history taking. These educational materials provide clinicians with information on the four steps of the medication reconciliation process, evidence to support its use and the importance of team work and communication among staff involved in the patient's care.

^{1.} ACSQHC website [http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/] accessed on 18th June 2015



EMM systems can facilitate improved medicines history and medicines reconciliation through:

- Access to more information sources that can help provide a clearer picture of a patient's current medicines, the diagram below describes how;
- Tools and processes to facilitate workflows associated with medicines reconciliation.





EMM in medicines reconciliation

The role of e-Referral

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Medications									
Medication					Directions				
Tritace 10mg capsule: hard, 30 capsules				1 tablet	1 tablet once daily				
Somac 40mg ca	g capsule: hard, 30 capsules			1 tablet	1 tablet once daily				
Astrix 100mg c	trix 100mg capsule: hard, 30 capsules			1 tablet	1 tablet once daily				
Medical Hi	story								
Medical History	- Procedure	15							
Date Time			Procedure			Comments			
01 Jan 1999 16:33+1000		Diabetes insipidus							
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Screenshot of a sample e-Referral

Health Providers can now send **e-Referral** documents via a **secure messaging service** to providers with the appropriate infrastructure and capacity.

e-Referrals are a standard format that may include:

- details about the patient;
- the reason for the referral;
- current medications;
- medical history;
- adverse reactions; and
- diagnostic investigations including pathology test results.

These documents provide very useful information resources that can be validated with patients in the process of medicines reconciliation.

The NEHTA website has more information about e-Referrals

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The prescription of medication is one of the most common healthcare interventions made by health providers in both acute and primary care.

Clinicians make a decision to provide treatment based on the information they have about the patient, their interpretation of the patients presenting compliant and diagnosis. They rely on access to the latest knowledge and guidelines, combined with their assessment of the patients needs in order to select the most appropriate medication.

Common problems in prescribing

- Increasing numbers of patients have co-morbidities and more and more Australians are taking 4 or more medicines.⁽¹⁾
- Medicines knowledge is increasing at a faster rate than it is possible for health providers to continually remain up-to-date.
- Only 57% of patients receive the appropriate treatment as per the relevant guidelines.⁽²⁾

Click here to find out how EMM systems can support prescribing

- 1. Morgan T., Williamson M. et al. A national census of medicines use: a 24-hour snapshot of Australians aged 50 years and older <u>MJA 2012; 196:</u> 50-53
- 2. Runciman W., Hunt T., Hannaford N., et al;, CareTrack: assessing the appropriateness of health care delivery in Australia https://www.mja.com.au/journal/2012/197/2/caretrack-assessing-appropriateness-health-care-delivery-australia



Improved

Exchange of

medicines

information

More complete information, including allergies, previous episodes of care and comorbidities is available through shared records, the My Health Record and improved clinical systems

Through the sharing of prescription and dispense records with the My Health Record, or through secure messages of eDischarge summaries and event summaries

In community, by sending prescriptions electronically through a <u>Prescription Exchange Service</u> or in Hospitals through integrated EMM clinical systems

Clinical decision support

Better prescribing

Closed loop medications ordering Clinical information systems are able to provide support for clinicians in making decisions on treatment choice, medicines selection and use with an increasing number of knowledge driven clinical decision support solutions now available.

The increased quality and completeness of a consumers health information is a key enabler of clinical decision support

Better medicines histories

Consistent medicines terminology

With more information available about current medicines through documents in the My Health Record, such as: shared health summaries, discharge summaries, prescription and dispense records

Consistent, unambiguous terminology and unique identifiers by utilising the <u>Australian</u> <u>Medicines Terminology</u> (AMT) is a key enabler of better data quality, interoperability, clinical decision support and other prescribing tools

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Once a decision is taken to prescribe a medicine, the next step is to make an order. We've already discussed some of the steps taken in this process in the previous section.

In a hospital, this might be the step where a pharmacist reviews and verifies the order before it is sent or on receipt to the pharmacy. In community this might be the receipt of a prescription or electronic prescription.

The dispenser must now review the order, check its appropriateness and make a record against the patients record in their system.

Common problems in order, record & review

- Legibility issues with handwritten orders are still common in acute care.
- Lack of information about the patients condition, co-morbidities or concurrent medicines.
- Communication with prescribers for clarifications.

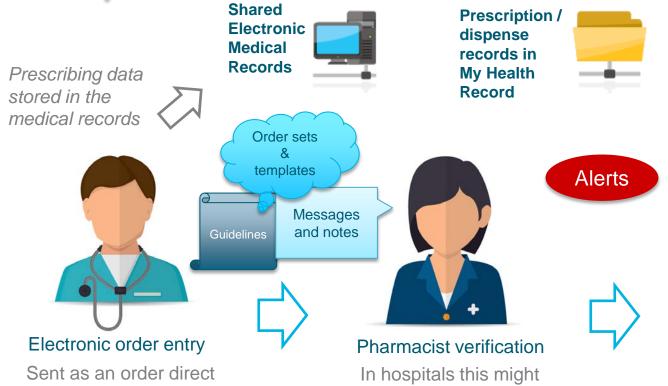


EMM in order, record & review

Initiatives

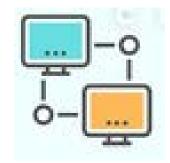
from the clinical

information system





Records can be automatically sent to the My Health Record



Closed-loop dispensing

Automatic matching of orders with products in the dispensary system

Closed-loop ordering, verification and dispensing.
Enabled by standardised medicines terminology & unique identifiers

be in your EMM system



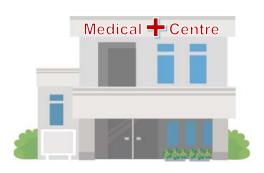
EMM in order, record & review

Electronic transfer of prescriptions (ETP)



Prescription exchange service

eRX or MediSecure allow for prescriptions to be sent securely and electronically between GPs and pharmacies.

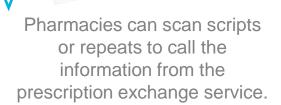


Prescribers sent ePrescriptions directly from their clinical information system.

GPs can also receive alerts when the last repeat has been dispensed and also script requests from pharmacies.



New apps are allowing consumers to order their repeats from their chosen pharmacy using eTP technology.



In the future this may become paperless. 21





EMM in order, record & review

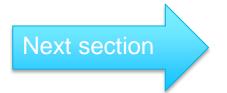
Prescription and dispense records

GPs and pharmacies using a prescription exchange service, and who are also registered for the national eHealth record system, can send prescription and dispense records to a consumer's My Health Record. City Centre Pharmacy Panafcortelone 5mg tablets, 60 tablets Therapeutic Good Strength 5 mg eHealth Record System: Healthcare Provider Portal Therapeutic Good Generic Name Prednisolone Tablets SMITH, JOHN DOB 17-Mar-1963 (50 yrs) SEX Male CLOSE (\$) Review with Dr Black at Bodalla Clinic after four day Showing All Brand Substitution Occurred Health Record Overview Prescription and Dispense View Maximum Number of Reneat Prescription from Mentiller arah74a7-2813-42/6-a743-9a2h51773/8a Dispense Item Identifier f57f1bd6-964e-4x97-x7f2-20d63ed2442 This view should not be wholly relied upon to be a complete record of prescribed and dispensed medicines Administrative Observation Note: Your search could return information created up to 2 hours before the start date and up to 5 hours after the end date you select. This is to c My Health Record Qispense Record Frank HARDING Event date 08-Aug-2011 to 08-Aug-2013 (HPI-I: 8003612039904560) compares 4 Oct 1949 (63y) * Age is calculated Group by Prescription prescriptions to their corresponding Prescribed Medicine Details Screenshot of a sample n and Dispense View dispenses. 16-Nov-2012 APO-Tramadol dispense record Clicking on the entry 16-Nov-2012 Dispensed Tramadol hydrochloride - APO-TRAMADOL - 50 mg - 1 tablet prn - Tablet - Supply 20 - Original dispense 16-Nov-2012 Prescribed Tramadol hydrochloride - APO-TRAMADOL - 50 mg - 1 tablet pm - Tablet - Supply 20 - Dispense origina opens the detailed 31-Oct-2010 Amoxil 250mg records. 13-Feb-2013 Dispensed AMOXIL 250MG - One tablet three times a day- Supply 30 tablets - Repeat 1 13-Jan-2013 Dispensed AMOXIL 250MG - One tablet three times a day- Supply 30 tablets - Original dispense 13-Jan-2013 Prescribed AMOXIL 250MG - One tablet three times a day- Supply 30 tablets - Dispense original and 2 repeats

Copies of prescription and dispense records are now available in a consumer's My Health Record

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Whether in hospital or community pharmacy, the dispensing systems and processes have already benefited from significant technology advances.

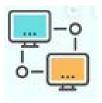
Electronic transfer of prescriptions (eTP), barcode scanning and online claiming have helped drive efficiencies and make pharmacies safer.

Common problems in dispensing

- Polypharmacy; increasing numbers of patients taking increasing numbers of medicines.
- Dispensing errors; including those caused by look-a-like and sound-a-like medicines, transcription errors or prescription legibility.
- Lack of information about patients comorbidities, concurrent medicines and allergies.



There are a number of projects underway to help improve dispensing processes



Closed-loop dispensing

Hospitals are implementing system to enable electronic orders to be sent directly to pharmacy systems



Better quality barcodes

Work is underway to improve the GTIN information (barcodes) that suppliers share with electronic systems



Automated dispensing

Robotic dispensing units are increasingly being installed in both acute and primary care pharmacies



Structured content

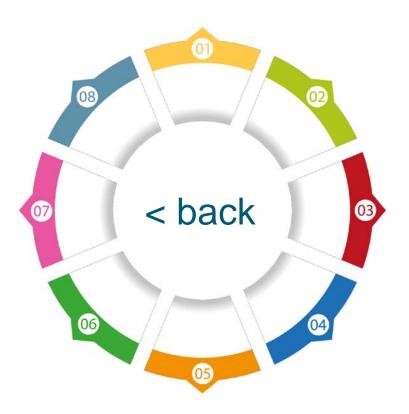
Australian Medicines Terminology enables standard unambiguous medicines naming as well as a unique identifier and machine readable information



My Health Record

Pharmacies can view information and contribute to the My Health Record through event summaries and dispense records

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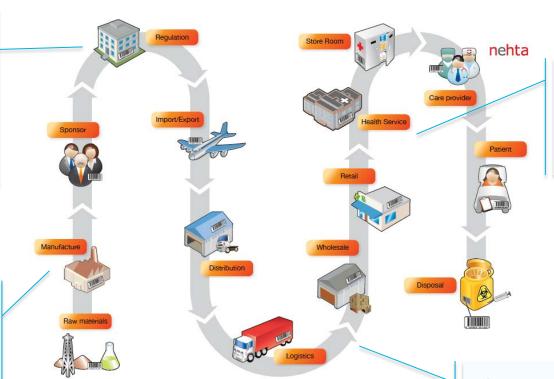




EMM in supply of medicines

There are a number of projects underway to improve the quality of data in the medicines supply chain

As medicines are registered, a unique concept identifier, description and supporting information is created in the Australian Medicines Terminology (AMT)



Recallnet allows for suppliers to issue electronic notifications to health providers to recall products that may be defective

The National Product
Catalogue (NPC)
captures detailed
product information
from suppliers to be
shared throughout the
supply chain

Lifecycle of a product NeHTA supply chain

Locatenet is a global location number directory that helps identify where products are from

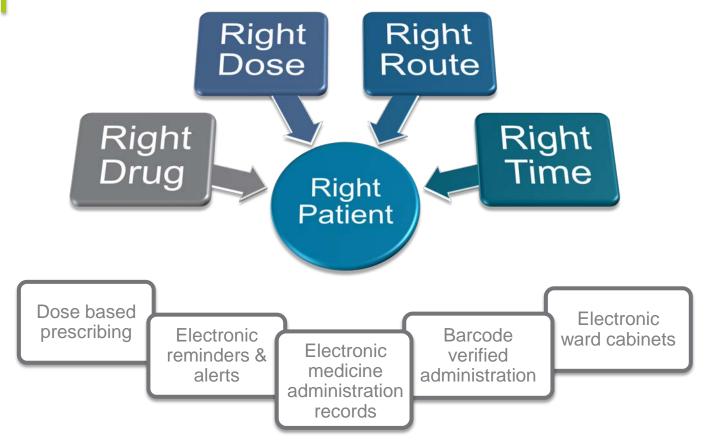
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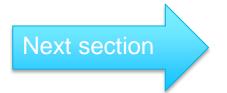
EMM in medicines administration



EMM systems are being introduced in hospitals and aged care facilities to ensure safer, more efficient medicines administration

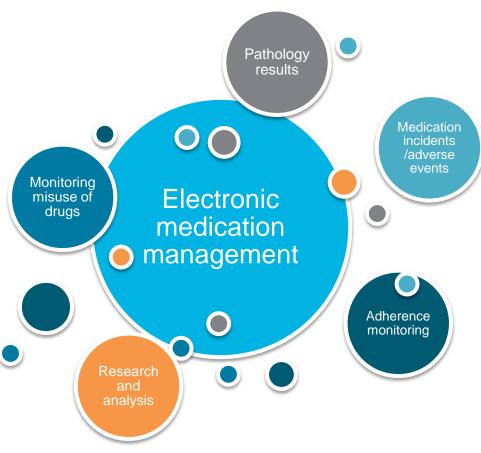
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EMM in 'monitor for effect of medicines'



Monitoring medicines issued to patients to see if they are:

- Effective
- Tolerated
- Used appropriately

is one of the major advantages of EMM systems. New systems are being implemented to facilitate:

- The monitoring of the sale, supply and use of controlled drugs;
- Pathology reports shared in the My Health Record;
- Dispensing records in the My Health Record; and
- Better monitoring of adverse events and allergies.



EMM in 'monitor for effect of medicines'

There are a number exciting initiatives to improve monitoring the effect of medicines – here are a few examples



Integrated vitals monitoring

An increasing number of acute care facilities are integrating their monitoring devices with EMR systems.

This enables clinicians to monitor and record the impact of medicines



Pathology Analytics & Dashboards

Pathology is becoming more integrated in acute and primary care systems. Shared records, including My Health Record, will also contain more results

This enables more sophisticated analysis and reporting to facilitate better monitoring of medicines response



Antimicrobial Stewardship Software

Acute and residential aged care facilities are now introducing software to help support and monitor the appropriate use of antimicrobials.

These solutions combine EMM, pathology and decision support to optimise the use of antibiotics

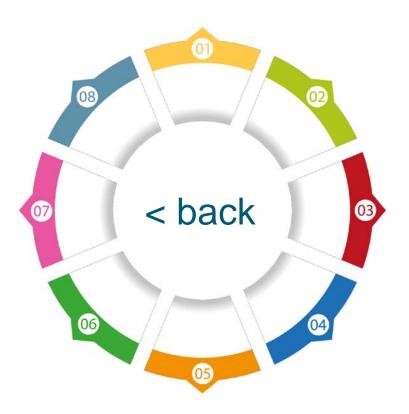


Home Monitoring & Wearables

There are now a growing number of remote monitoring technologies that can help capture patient recorded data This can then be shared electronically or during consults.

Examples include inhaler adherence monitoring, tablet counters through to electronic sphygmomanometers s32

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Transitions of care are known to be a point of vulnerability for medication management. Whether this is a transfer within hospital department, at admission to, or discharge from hospital to home or residential care the presence of a curated medicines list will significantly improve the ability of the new healthcare professionals or teams to deliver safe, high quality care.

Studies show that approximately 20% of patients experienced a significant delay in medicine administration upon arrival at the facility and that 12% of missed doses were considered high risk.

Semple S, Roughead E. Medication safety in acute care in Australia: where are we now? Part 2: a review of strategies and activities for improving medication safety 2002-2008. *Australia and New Zealand Health Policy* 2009;6(1):24.

Intervention at care transitions by family and care givers (facilitated by EMM) has been also been shown to reduce rates of hospital readmission and to improve patient confidence in medication selfmanagement.

Parry C, Min S-J, Chugh A, Chalmers S, Coleman EA. Further application of the care transitions intervention: results of a randomized controlled trial conducted in a fee-for-service setting. *Home Health Care Services Quarterly* 2009;28(2-3):84-99.





Discharge summaries

80% contained one or more discrepancies when compared with the discharge prescription; Only 50% of the changes to regularly scheduled medicines; Only 25% of the changes to medicines scheduled "as required".

Callen J, McIntosh J, Li J. Accuracy of medication documentation in hospital discharge summaries: A retrospective analysis of medication transcription errors in manual and electronic discharge summaries. *International Journal of Medical Informatics* 2010;79(1):58-64.

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EMM in continuity of care

The role of the discharge summary

Healthcare providers can now send **e-Discharge summary** documents via a secure messaging service. Typically this would be from a hospital to a GP. However it is also now possible to send discharge summaries to a consumer's My Health Record.

e-Discharge summaries are based upon a specification and should include:

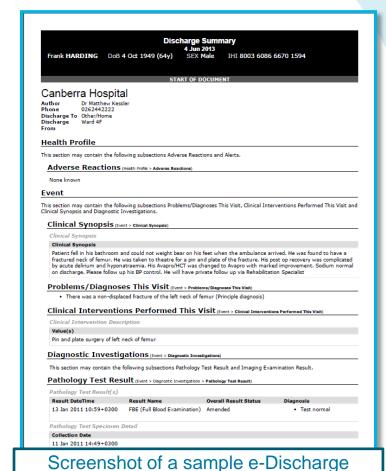
- details about the patient;
- overview of the episode of care or 'event';
- summary of interventions;
- diagnostic investigations including pathology test results.

There should also be detailed information about medicines including:

- current medications on discharge;
- ceased medications on discharge.

Discharge summaries are important documents in handover and care transition. The ability to share these documents electronically and access them via My Health Record should help improve medicines management across care transitions.

The NEHTA website has more information about discharge summaries



summary

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What is happening nationally?

What national work is being done to support implementation of electronic medication management?

What is happening nationally?

There are a number of national initiatives underway to support EMM.

Click the logos below to visit the appropriate website to find out more about that organisations activities in EMM.

nehta

- Australian Medicines Terminology
- SNOMED CT-AU Terminology
- National reference sets including dose based prescribing
- Standards development for recording medicines
- Supply chain enhancements
- ePrescriptions



- My Health Record
- Electronic transfer of prescriptions
- PBS and MBS enhancements

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

- Safe display of medicines onscreen
- Tall Man lettering
- eHealth safety
- EMM implementation guides





What is happening nationally?

The NT has been working with EMM systems for a number of years in its hospitals and clinics. These solutions are now being expanded and enhanced

WA has been developing its EMM capabilities for some time, including automated dispensing, electronic recording and supply chain optimisations. There are a number of new systems planned for the near future.

Several large eHealth programs in South Austrlia are implementing EMM solutions, including automated dispensing and electronic ordering, supply and administration Queensland Health are beginning to roll-out a full integrated EMM systems across a number of its public hospitals as part of its iEMR program

NSW Health EMM program are working with Local Health Districts to introduce EMM, improved supply chain and AMS systems into hospitals

ACT will be dramatically expanding the EMM systems in hospitals over the next 2 years; including new reconciliation, ordering, supply and discharge solutions

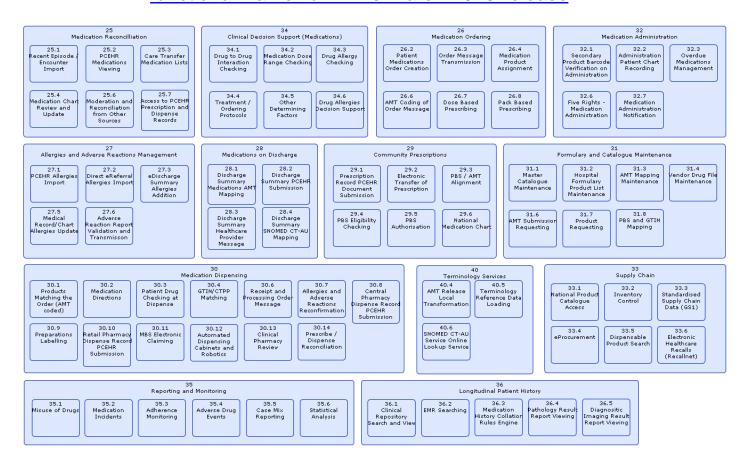
Victorians have been benefiting from EMM systems for a number of years, these systems are now being refined and expanded

Tasmanian hospitals have been working towards integrated EMM for a number of years. There are now apps for discharge, reconciliation and decision support with full administration being rolled out over time

EMM, a guide for healthcare providers

National EMM functional framework

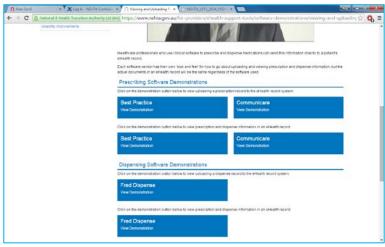
NEHTA has released a detailed functional framework that summarises all of the activities underway with EMM in detail. Visit the NEHTA website for more information http://www.nehta.gov.au/news-and-events/news/815-emedications-management-functional-framework-v1-0-march-2015-release



EMM demonstrations for community prescribers and pharmacy practice

There are a number of national initiatives underway to support EMM click the logos to visit the appropriate website to find out more about that organisations activities in EMM





Glossary

Term	Acronym	Description
Australian Medicines Terminology	AMT	The national terminology standard for the electronic description of medicines. The AMT provides an unambiguous description, unique identifier and important related attributes of medicines that can be understood by both humans and machines.
Systematized Nomenclature of MedicineClinical Terms	SNOMED CT-AU	SNOMED CT-AU is a subset of the international SNOMED CT terminology. It aims to provide an unambiguous description and unique identifier for medical terms, such as diagnosis, treatment and outcomes.
My Health Record	My Health Record	Developed and operated by the Australian Government Department of Health, My Health Record is a shared electronic health record available for any Australian. Participating Health Providers can send and view a range of documents via the Record, either in their Clinical Information System, or via the portal at ehealth.gov.au .
Prescription exchange service	PES	These services enable prescriptions to be securely transmitted from GPs (or other prescribers) to participating Pharmacies.
Electronic transfer of prescriptions	eTP	A mechanism to electronically send prescription documents to pharmacies via a Prescription Exchange Service.
Clinical information system	CIS	The computer system or application used by clinicians as part of day to day practice to record information about patients and carry out activities related to the provision of healthcare.