SAFER USE OF MEDICATION AND CHRONIC DISEASE

Lisa Demos
Australian Disease Management Association (ADMA)
Overview

- Management Principles of Chronic Disease
- Disease and Medication Interactions
- Rationalisation of Medication
- Encouraging Adherence and Monitoring Medication Usage
- Health Literacy
- Swapping medicine
Chronic Disease Management

- Principles include:
  - care planning
  - evidence based practice
  - patient centred care
  - clinical information systems
  - Teamwork (multidisciplinary)
  - community resources
Chronic Disease

- Projected 3.5 million Australians with chronic disease by 2016
- Common chronic diseases: asthma, arthritis, diabetes, heart failure, COPD, depression
- Major risk factors for chronic disease: unhealthy diet, physical inactivity and tobacco use
- **Evidence**: disease management and self management can improve health and reduce acute healthcare requirements
Integrated Chronic Disease Management

The provision of person centred care in which health services work with each other and the client to ensure coordination, consistency and continuity of care over time and through the different stages of their condition.

Features include:

- planned and proactive care intended to keep people as well as possible
- coordinated care using team based approaches
- evidence based care
- support for self management
- regular review and follow up

Dept of Health Victoria
CHD Models

- Disease specific:
  - CHF, COPD, diabetes
- Non disease specific:
  - DMU, chronic symptom management: self management classes
- Interventions:
  - Self management education, Telephone coaching, Outpatient reviews, Home visit, Home Medication Reviews
Medications & Chronic Disease

- Medications are one of the most commonly used medical interventions, particularly in managing chronic disease.

- ~171 million prescription items claimed per year under the Pharmaceutical Benefit Scheme (PBS) - cost over $7.2 billion.
Medicines use in Australia

- ~70% of Australians have taken at least one prescription medicine or non-prescription medicine in the last two weeks
- This increases to 90% of people over 65 years
- 1.5 million Australians suffer an adverse event from medicines each year resulting in at least 400,000 visits to general practitioners and 140,000 hospital admissions
NPS Review

Adverse drug events and medication errors

- 6% of hospital admissions in Australia associated with ADEs (30% in the elderly)
- 10% of general practice patients report experiencing an ADE (25% of high risk patients)
- Prevalence of medication errors in the community varies according to the stage of the medication process (and method of investigation)
- Consistently high error rates during transfer of care between hospital and community settings
- Documentation during transfer of care associated with consistently high error rates: 52 - 88% of transfer documents contain an error
Adverse Drug Events (ADEs)

- 10% of Australian patients in general practice report ADEs

- Highest risk groups include elderly, those taking multiple medications and those taking "high risk medications"

- >80,000 medication-related hospital admissions a year
  - level of unavoidable risk of harm associated with medication use
  - ~ 50% of drug-related hospitalisations in Australia are potentially preventable
NPS Review

Most at risk of ADEs

- Older people
- Taking multiple medicines
- Serious health conditions
- Taking high risk medicines
- Transferred between community and hospital care
- poor communication - most commonly reported contributing factor
- Patients and health professionals
- GPs and pharmacists
- Health professionals at transfer of care
NPS Review

Interventions

Most common:
- Medication review
- Medication reconciliation
- Patient education
- E-health interventions
  - Complex (multi-faceted) implementation
  - Most had no significant impact on outcomes

Strongest evidence:
- Disease management interventions (e.g. heart failure) which included a medication review (home visits, telephone follow up)
- Limiting focus to particular high risk drugs or drug classes
- Particular settings (e.g. transfer of care)
Guiding principles of Medication Management in the Community

- promote the quality use of medicines and better medication management in the community
- assist service providers in developing or evaluating policies and procedures
- support those involved in assisting consumers
- support consumers in managing their medicine(s)
- guide health care professionals in developing and evaluating professional standards.

APAC, July 2006
Guiding principles of Medication Management in the Community

- Guiding Principle 1 – Information resources
- Guiding Principle 2 – Self-administration
- Guiding Principle 3 – Dose Administration Aids
- Guiding Principle 4 – Administration of medicines in the community
- Guiding Principle 5 – Medication lists
- Guiding Principle 6 – Medication review
- Guiding Principle 7 – Alteration of oral formulations
- Guiding Principle 8 – Storage of medicines
- Guiding Principle 9 – Disposal of medicines
- Guiding Principle 10 – Nurse-initiated non-prescription medicine
- Guiding Principle 11 – Standing orders
- Guiding Principle 12 – Risk management in the administration and use of medicines in the community

APAC, July 2006
Disease & Medication Interactions

- Can occur in any age group
- Common in older people as have more diseases
  - more susceptible to side effects of drugs than younger people
  - e.g. beta-blockers for heart disease or high BP can worsen asthma and make it hard for people with diabetes to tell when their blood sugar is too low
- More likely in patients with diabetes, high or low BP, an ulcer, glaucoma, enlarged prostate, poor bladder control, and insomnia
Disease & Medication Interactions

Older people more susceptible to side effects:

- Decrease in amount of water in the body with age, and increase in percentage of fat tissue
  - higher concentrations of water soluble drugs, accumulation of fat soluble drugs

- Reduced drug elimination as kidneys less able to excrete drugs into urine, and liver less able to metabolise drugs
  - older people may need smaller doses of certain drugs or fewer daily doses e.g. digoxin

- May be more sensitive to the effects of some drugs
  - e.g. antianxiety or insomnia medications or anticholinergics

Rationalisation of Medication

Beers Criteria for Potentially Inappropriate Medication Use in the Elderly 2012

Based on best practice & systematic review

- Therapeutic category or Drug or Disease
- Rational
- Recommendation
- Quality of Evidence
- Strength of Recommendation

Guideline for identifying medications where risk of use outweigh benefits, prevent ADRs

American Geriatrics Soc JAGS 2012
# Rationalisation of Medication

## Beers Criteria for Potentially Inappropriate Medication Use in the Elderly 2012

<table>
<thead>
<tr>
<th>Drug</th>
<th>Rationale</th>
<th>Recommendation</th>
<th>Quality of Evidence</th>
<th>Strength of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digoxin &gt;0.125mg/day</td>
<td>In heart failure higher doses associated with no additional benefit and may increase risk of toxicity</td>
<td>Avoid</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
</tbody>
</table>

American Geriatrics Soc *JAGS* 2012
## Rationalisation of Medication

### Beers Criteria for Potentially Inappropriate Medication Use in the Elderly 2012

## Drug-Disease Interactions

<table>
<thead>
<tr>
<th>Disease</th>
<th>Drug</th>
<th>Rationale</th>
<th>Recommendation</th>
<th>Quality of Evidence</th>
<th>Strength of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td>NSAIDs, COX-2 inhibitors,</td>
<td>Potential to promote fluid retention and exacerbate HF</td>
<td>Avoid</td>
<td>NSAIDs- moderate</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Thiazolidinediones (rosiglitazone)</td>
<td></td>
<td></td>
<td>Thiazolidinediones - high</td>
<td></td>
</tr>
</tbody>
</table>
Medication Interactions

- Polypharmacy common
  - Elderly take average 4-5 prescription drugs & 2 non-prescription drugs daily
- Increased potential for interactions prescription, over-the-counter and complimentary medicines
Side-effects of Herbal Supplements

- Increased risk of significant bleeding associated with garlic, ginkgo, ginger, saw palmetto supplements
- Decreased blood sugar with chromium, cinnamon, whey protein
- Hormonal effects of dong quai, black cohosh, kudzu, saw palmetto
- Elevated blood pressure caused by bloodroot, green tea, hawthorn, maté
Adherence and Monitoring Medication Usage

Adherence

“the extent to which a person’s behaviour- taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider”

WHO 2003
Adherence

Intentional

Non-intentional

Underdoser, overdoser, random.
Drug holiday taker, time dependent

Rates of non-adherence

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rate of non-adherence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>20</td>
</tr>
<tr>
<td>Arthritis</td>
<td>55-71</td>
</tr>
<tr>
<td>Contraception</td>
<td>8</td>
</tr>
<tr>
<td>Diabetes</td>
<td>40-50</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>30-50</td>
</tr>
<tr>
<td>Hypertension</td>
<td>40</td>
</tr>
</tbody>
</table>
Factors Predicting Non-adherence

- Long duration of treatment
- Large number of medications
- High cost of medications
- Presence of cognitive defects
- Actual or perceived adverse drug effects
- Confidence in the prescribing doctor
- Poor interpersonal skills
- Poor coping strategies
- Rejection of diagnosis
Factors Predicting Non-adherence

- Not knowing how to take the medication
- Not understanding the importance of the medication
- Forgetfulness
- No or mild symptoms of disease
- Prophylactic or maintenance therapy
- Loss of faith in the medication
- Health beliefs and attitudes
- Poor sight or memory
- Literacy / health literacy
Major Predictors of Non-adherence

- Polypharmacy
- Multiple disease states
- Side effects
- Cognitive Defects
- Access to Dr Or Pharmacist
- Cost
- Difficulty Taking meds
- Language Difficulties
- Retention of information
- Memory
- Literacy/Health literacy
Strategies to Improve Adherence

- Informational
- Behavioural
- Social support strategies
- Combination
- Theoretical models explaining non-adherence

- No single strategy is effective
- Limited research on long term impact of strategies
Informational Strategies

- Limited to intensive education
- With written information
- Delivered by physician, nurse, pharmacist, health educator
- Addressing self-care issues, reinforcement, rewards
Behavioural Strategies

- Dosage simplification
- Assessment of medicine use with direct feedback to patient
- Specialised packaging
Adherence - Examples

- Heart Foundation- *Improving cardiovascular adherence* project
- NPS
- Assessed as part of Home Medicine Review
- Electronic medication adherence tools
  - Electronic pill caps which record number of times medications taken each day and provide feedback for health providers
- Telephone-based coaching and follow-up
NPS: iPhone Medicines List App

iPhone Medicines List app

Medicines List version 2 has been released now with scheduling and reminder functions.

To get the most from your Medicines List:

- keep it up to date
- schedule when you should take your medicines
- turn alarms on or off as needed
- take it with you to any medical appointments or print the list from your app
- keep your phone with you in case of emergency — let a relative or friend know your medicine list is stored in your phone.

Remember that information you put in the 'My Details' section will also be included in the in the PDF copy that can be emailed and printed from your Medicines List app.

See now the printable PDF version of a Medicine List looks.

If you give or send this to other people (such as your health professional) they will be able to see your personal information. Check with your health professional that it is appropriate to send a Medicines List before emailing them.

Available now as a free download in the App Store.

http://www.nps.org.au/consumers/tools_and_tips/iphone_medicines_list
Medication Adherence Devices

- Dosette Box (± alarm)
- Webster pack
- Medication Reminder Watch
- Vibrating 12 Alarm Pager
- Automatic Pill dispenser & Organiser
- Smart pill box
  - looks for adverse drug events and provides information
Adherence

- "the focus has been on the personal characteristics of the patient such as knowledge about how the medication works, motivation to take it, depression and other cognitive barriers."

- “We need to give patients practical ways to adhere to their medication regimens, like putting pills next to the coffee maker as a reminder to take them each morning or using technology like cell phones or computers to set reminders to take medications."

Health Literacy

- Term introduced in 1970s
- No consensus on definition
  - Systematic review found 17 definitions
- Concerns knowledge and competencies of person to meet complex demands of health in modern society
- An individual with an adequate level of health literacy has the ability to take responsibility for one’s own health
  - Reading and acting on written health information
  - Communicating needs to health professionals
  - Understanding health instructions
Health Literacy

US studies in 1990s showed association with low literacy and
- decreased medication adherence
- knowledge of disease
- Self-care management

2005 ABS survey showed
- ~ 60% of Australians have less than adequate levels of literacy & health literacy
- Adequate health literacy only in a minority of culturally & linguistically diverse individuals
Health Literacy: UK Study

- 1/3rd adults >65 years in UK have difficulties reading and understanding basic health related written information
- Poorer information associated with higher mortality over 5 years
- Urged healthcare professionals to adopt communication techniques that are effective for patients of low literacy

Bostock S et al. *BMJ* 2012
## Dimensions of Health Literacy

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Access/obtain information</th>
<th>Understand information relevant to health</th>
<th>Process/appraise information relevant to health</th>
<th>Apply/use information relevant to health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>Ability to access information on medical or clinical issues</td>
<td>Ability to understand medical information and derive meaning</td>
<td>Ability to interpret and evaluate medical information</td>
<td>Ability to make informed decisions on medical issues</td>
</tr>
<tr>
<td>Disease Prevention</td>
<td>Ability to access information on risk factors for health</td>
<td>Ability to understand information on risk factors and derive meaning</td>
<td>Ability to interpret and evaluate information on risk factors for health</td>
<td>Ability to make informed decisions on risk factors for health</td>
</tr>
<tr>
<td>Health Promotion</td>
<td>Ability to update oneself on determinants of health in social and physical environment</td>
<td>Ability to understand information on determinants of health in social and physical environment and derive meaning</td>
<td>Ability to interpret and evaluate information on health determinants in social and physical environment</td>
<td>Ability to make informed decisions on health determinants in social and physical environment</td>
</tr>
</tbody>
</table>

Sorensen K et al. *BioMed Central* 2012
Home Medication Reviews (HMR)

Roughead et al. Circ Heart Fail 2009

- Retrospective cohort study of heart failure-related hospitalisation in veterans with CHF
- Veterans who received a HMR had a 45% reduction in hospitalisation rate (HR 0.55, 95% CI 0.39-0.77)
  - 5.5% of the HMR group vs. 12% of the group who did not receive a HMR were hospitalised within 365 days
- No assessment of economic impact
Home Medication Reviews


- Literature Review demonstrated effectiveness of pharmacists’ interventions to reduce morbidity and mortality associated with heart failure

- However only 2 RCTs were included. Both of low quality
Home Medication Reviews

Caughey et al, *Diab Res Clin Pract* 2010

- Prevalence comorbid conditions in elderly diabetics and the prescribing of potentially inappropriate medicines or treatment conflicts
- Cross-sectional study using DVA prescription data
- 18,968 diabetics
  - median of 5 comorbidities
  - 41.9% cardiovascular medicine
  - 46% had gastro-oesophageal reflux disease
  - 25% depression
  - 20% chronic airways disease or chronic pain
  - 15% heart failure or inflammation-pain
  - 16% dispensed a medicine associated with adverse effects in patients with diabetes
  - 22.7% dispensed at least 1 potentially inappropriate medicine (based on 2003 updated Beers criteria)
HMR: Medication Stockpiling
WHO Co-ordinated approach to Chronic Care

**Assess**

- "To ensure we have the same understanding, could you tell me about the Treatment Plan in your own words?"

**To assess adherence:**

- "Many people have trouble taking their medications regularly. What trouble are you having?"
- If adherence problem, what are the reasons and obstacles to adherence (including depression)

*General Principles to Good Chronic Care - WHO 2004*
Queensland Health: Chronic Disease Guidelines-Medication Safety

- Non-inpatient specific resources
  - Non-Inpatient Rural and Remote Medication Administration Record
  - Non-Inpatient Rural and Remote Warfarin Record
- Medication Action Plan (MAP)
- Training and competency assessment modules
  - Medication History Training and Competency Assessment Module
  - Discharge Reconciliation and Preparation of Discharge Medication Records Training and Competency Assessment Module

Chronic Disease Management and Medication Safety in Seniors

- analyses of linked datasets in WA to examine the effects of continuity, regularity, and chronic disease specialisation within general practice on outcomes for a range of chronic conditions.
  - conducted a series of consumer forums, developed a consumer panel and explored key issues through consumer focus groups
- Areas of focus have included use of generic medicines, medicine packaging and labelling and their effects on medication safety.

Home Telemonitoring- ACT

- long distance telemonitoring of patients with a chronic disease
- telemonitoring station in patient’s home for 1 - 3 months
  - to record temperature, BP, heart rate, heart rhythm, weight, O$_2$ saturation, blood glucose & respiratory function
Home Telemonitoring

- Supports clinician’s patient health management plan.
- Helps patients self manage more effectively and increases patient confidence.
- Monitors effect and response of specific therapy and helps stabilise patients’ medical condition.
- Reduces frequency of hospitalisation and ED presentations.
Healthy, Happy and at Home: Broadband Enabled Innovation Project (BEIP)

RDNS project
- Virtual consultations for patients with chronic diseases with dedicated nursing staff.
- The patients would normally have had a nurse visit every day to monitor their medication.

April 2012

RDNS Healthy, Happy and at Home: Broadband Enabled Innovation Project (BEIP)

Royal District Nursing Service (RDNS) is the largest and oldest provider of home nursing and healthcare services in Australia. Every day, RDNS staff provide professional nursing and healthcare to more than 9,500 people throughout Greater Melbourne, some parts of rural Victoria, New South Wales and in Auckland, New Zealand. In any given year, RDNS delivers more than 1.7 million visits to over 33,000 people, mainly in their own homes.

This RDNS video explains how the Royal District Nursing Service has collaborated with the Victorian State Government Department of Business Innovation, Health Tech, Telstra (high speed broadband connectivity) and the Australian Institute for Primary Care Ageing (La Trobe University) to trial a project that utilises videoconferencing technologies.

Broadband Enabled Innovation Project (BEIP) plans to utilise the National Broadband Network to videoconference clients living at home, via a videoconferencing unit to self-administer their medicines from a Pharmacy filled Dosage Administration Aide.

[Click here to watch this video]
COPD

Assessment of inspiratory flow

MEDICATION REMINDERS

- Inhalation before meals will assist in reducing fatigue caused by eating
- Shake the container before using otherwise only the propellant will be delivered
- Exhale fully before inhaling dose
- Fully seal lips around mouthpiece
- Administer medication at start of inhalation
- Inhale dose slowly and deeply
- Hold breath for at least 10 seconds before exhaling
- Withhold further inhalations for at least 1 minute
- Drug delivery from spacers is reduced by multiple actuations of the inhalation device. Optimal delivery is obtained by using one actuation at a time. This allows for the recovery time of the valve mechanism.
- Static electricity charge on the plastic spacer can reduce delivery. This can be reduced by “priming” the spacer or washing it in warm water with kitchen detergent and allowing it to drain dry.
- Rinse mouth after inhalation (rinse, gargle and spit) of preventer medication
- The turbuhaler should be held upright when loading and the lid replaced after use to control exposure to moisture.
- Puncture inhaler once only, don’t hold button in while inhaling, ensure lid is clicked down properly. Clean monthly
Case – Chronic Disease Patient

- 77 year old retired male
- Lives with wife in single storey house

Medical History
- Diabetes
- Hypercholesterolemia
- Hypertension
- CHF
- Osteoarthritis
- Obesity/ ex-smoker
Medication Review

**Medication List**
- Aspirin 100mg m
- Ramipril 10mg m
- Amlodipine 10mg m
- Carvedilol 12.5mg bd
- Frusemide 40mg bd
- Simvastatin 40mg n
- Metformin 1g bd
- Gliclazide 80mg m & n
- Paracetamol 500mg prn

**Actual Medications**
- x Aspirin 100mg m
- ✓ Ramipril 10mg m
- x Amlodipine 5mg m +/-
- x Carvedilol 6.25mg bd
- x Frusemide 40mg m +/-
- ✓ Simvastatin 40mg n
- x Metformin 500mg ½ m
- x Gliclazide 80mg ½ m, 1 n
- ✓ Paracetamol 500mg 6 /day
  + Ibuprofen 200mg prn
Medication Review

- Aspirin restarted
- Amlodipine dose clarified with GP – for review
- Carvedilol dose increased to 12.5mg bd
- Frusemide dose changed to 40mg m – review for urinary frequency
- BSLs recorded tds for 2 weeks then reviewed HbA1c
- Ibuprofen removed/regular paracetamol
- Self filled Dosett box for medication management
- Education - medications and disease
- Liaison with GP, Community Pharmacy
- Advise on medication options
- Medication List provided
Swapping Medicine

- Generic substitution by pharmacist
  - Cost-saving
  - May confuse patient
- Therapeutic substitution to similar drug class
  - Convenience
  - Cost
NPS News 76: Generic medicines - Informing patients about multiple brands

- Ensuring safe switching
- Communication is an essential safeguard
- Are generic medicines as effective and safe as original brands?

Generic medicines are widely used in Australia and account for around 40% of prescriptions filled on the Pharmaceutical Benefits Scheme (PBS).[1] While GPs and pharmacists agree with consumers having a choice of medicine brands,[2-4] many health professionals remain concerned that switching between brands may confuse some patients, particularly if done repeatedly.[3-5] This NPS News highlights ways to minimise confusion and addresses common misconceptions about the safety and effectiveness of generic medicines.

Minimising patient confusion

Patient confusion caused by switching between brands of a medicine is a major concern for health professionals.[6-9] While the extent of confusion is unknown, cases of double dosing, stopping medicines and reduced recognition of dispensing errors have been attributed to brand switching, with some leading to patient harm.[5-9]

Inform patients they may be offered a choice

Although patients are more likely to discuss generic medicines with their pharmacist,[10] they also value their GP telling them that they may be offered a generic medicine.[11-13] Information from both prescribers and pharmacists can help allay patients' concerns about generic medicines and help them feel more confident in their choice (see Box 1).[11-13]

Use the active ingredient name

Educating patients about the active ingredient name (that is, the drug or 'generic name') and using it consistently can help reduce confusion over brand names.[14, 15] This is particularly important for patients discharged from hospital who may receive unfamiliar brands.[14] Encourage patients to use a Medicines List to record the active ingredient name of their medicine, as well as other important information.[15]

Box 1. Discussing medicine brands at the time of prescribing

Use the active ingredient name instead of the brand name when discussing a medicine and what it is for.
Optimising Medication Use in Chronic Disease

- Assess patient/carer understanding of medications
- Assess patient adherence and need for assistance
- Consider patient’s dexterity, eyesight and short-term memory loss
- Comprehensive plan of care including: current medication profile, education on medication and equipment, detailed medical history and allergies/alerts
- Collaboration and liaison between healthcare providers