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## What is polypharmacy?

Polypharmacy is the concurrent use of multiple medications. It can be associated with the prescription and use of too many or unnecessary medicines at dosages or frequencies higher than therapeutically essential. However, multiple medications are often necessary and can constitute best care for patients.

The most recent National Health Survey (1995) found that 10.7 million (59.1%) Australians were taking prescribed or over-the-counter medications (excluding complementary medicines). Of these a substantial proportion were using multiple medications (Table 1).

Table 1. Proportion of higher users of medications (as a percentage of those taking at least one medication\*)

Number of medications	Total	under 65 years	65-74 years	75-84 years	over 85 years
4 or more	14.5	10.1	33.2	40.7	38.2
6 or more	4.6	2.6	13.1	17	16.2

\*Excludes complementary medicines (vitamins, herbal preparations, etc).

## Elderly patients at increased risk

Older people have higher rates of chronic illness and are more likely to be taking multiple medications. Polypharmacy increases the risk of adverse drug events such as falls,<sup>1</sup> confusion and functional decline.<sup>2</sup> Changes in physiology and social and physical circumstances contribute to the risk of adverse drug events. Older people are more likely to experience poor vision, hearing and memory loss and have altered metabolic rates, such as declining renal function.

Adverse reactions may go undetected because symptoms may mimic problems associated with older age such as forgetfulness, weakness or tremor. Adverse reactions may also be misinterpreted as a medical condition and lead to the prescription of additional drugs.

## A case in point

This case highlights some of the problems that can arise with polypharmacy. The patient described needed significant changes to her medication. While this is not typical of every medication review, it is taken from an actual case.

Mrs Jones is an 83 year old lady who has recently been admitted to a nursing home close to her daughter but at some distance from her previous home. Her new GP and the community pharmacist providing services to the nursing home undertook a medication review soon after she was admitted. She has non-insulin dependent diabetes mellitus, recurrent urinary tract infections, osteoporosis, osteoarthritis and ischaemic heart disease. She has urinary incontinence and fractured her right femur 12 months ago.

### On review:

Most of Mrs Jones' medications are essential to her care. Her diabetes and cardiovascular disease are well controlled and no changes to these medications are considered necessary. The notes from the referring GP and a discussion with Mrs Jones reveal that since starting sertraline about four months ago, she has felt much 'brighter'. However, the GP and pharmacist identify several medications that should be reviewed.

**Hexamine hippurate - drug interaction and inadequate dose:** Hexamine hippurate is a urinary antibacterial requiring a urinary pH < 5.5 for activity and a dose of 1g twice daily. Concurrent use of the urinary alkaliniser, Ural<sup>®</sup> is senseless. Hexamine hippurate will not be effective where infection is due to *Proteus* and some *Pseudomonas* species, since these also increase urinary pH. The GP decides to cease the hexamine hippurate and trial a prophylactic dose of trimethoprim 150mg at night. The Ural<sup>®</sup> is continued for some weeks but at a later review will be ceased.

### Medications at time of review:

Sertraline (Zoloft<sup>®</sup>) 50mg in the morning  
Gliclazide (Diamicon<sup>®</sup>) 80mg in the morning  
Metformin (Diabex<sup>®</sup>) 500mg three times daily  
Omeprazole (Losec<sup>®</sup>) 20mg in the morning  
Aspirin (Cartia<sup>®</sup>) 100mg in the morning  
Isosorbide mononitrate CR (Imdur Durule<sup>®</sup>) 60mg daily  
Alendronate (Fosamax<sup>®</sup>) 10mg daily  
Propantheline (Pro-Banthine<sup>®</sup>) 15mg daily  
Naproxen (Naprosyn<sup>®</sup>) 500mg suppository at night  
Hexamine hippurate (Hiprex<sup>®</sup>) 1g daily  
Ural<sup>®</sup> one sachet at night  
Oxazepam (Murelax<sup>®</sup>) 15mg at night  
Coloxyl with Senna<sup>®</sup> one at night

*Note: Brands specified are those used in this actual case. Other brands are available for some drugs (refer to list of drugs).*

### Propantheline - appropriateness of therapy:

Propantheline is an anticholinergic agent that relaxes the detrusor muscle to treat urinary urge incontinence. It can cause confusion and constipation in elderly patients. Further investigation finds that Mrs Jones suffers from stress incontinence and so propantheline is ceased and the nursing staff institute alternative toileting techniques. Ongoing need for laxative therapy will be reviewed at the next visit.

### Naproxen - appropriateness of therapy:

Rectal delivery of naproxen does not reduce the risk of gastrointestinal ulceration, although it may reduce the incidence of dyspepsia. The GP decides to trial paracetamol at a dose of 1g four times daily and use naproxen on an intermittent basis when Mrs Jones' osteoarthritis symptoms are worse.

### Alendronate - patient (and carer) education:

The pharmacist and GP remind the patient and nursing home staff about the appropriate

### A case in point (continued)

administration of alendronate, ie with a full glass of water, while sitting in an upright position.

**Omeprazole - ongoing need:** The GP and pharmacist question the indication for omeprazole therapy, which is not clear from the medical history. The question of whether omeprazole was initiated to treat NSAID or alendronate induced gastrointestinal pain/dyspepsia will be investigated by the GP.

**Benzodiazepines - ongoing need:** Regular use of benzodiazepines is reviewed. The GP decides to continue the oxazepam until Mrs Jones becomes more settled in her new environment and will consider a withdrawal regimen at the next visit.

Mrs Jones' new medication regimen remains extensive, however unnecessary and inappropriate medications have been removed. Other medications will be reviewed in follow up visits.

## Steps for managing polypharmacy

- 1. Prevention**

Avoid prescribing for minor, non-specific or self-limiting complaints. Only prescribe when there is good evidence of likely efficacy as well as a strong need for the medication.
- 2. Regular medication review**

An accurate drug history is essential for patients on multiple medicines. This is best achieved when the medication review is done in the patient's home. Alternatively ask the patient to bring in all their medicines (prescribed and non-prescribed). A review includes assessing appropriateness and ongoing need for therapy, adverse effects and interactions, the dosage regime and formulations, and also compliance.
- 3. Non-pharmacological approaches**

Use lifestyle measures whenever possible either as an adjunct or instead of medications.
- 4. Communication**

Talk with the patient about their concerns, expectations, difficulties in using the medications and their ability to follow the medication regimen. Discuss changes to the medication regimen with the patient's other health care providers.
- 5. Simplify**

Reduce the regimen to essential drugs. Consider fewest possible dosage intervals and dose reduction where appropriate. Limit use of optional, trivial and placebo medications.

Table 2. Common examples

Medication	Original indication	Reason for reassessment	Possible action
Digoxin	Heart failure; in sinus rhythm	Heart failure well controlled with ACE inhibitor and diuretic	Consider ceasing digoxin
Nonsteroidal anti-inflammatory drugs (NSAIDs)	Osteoarthritis	Potential to exacerbate co-existing diseases; potential to cause gastrointestinal side effects	Prescribe regular paracetamol and cease or reduce use of the NSAID; intermittent use may be adequate
Low dose tricyclic antidepressants	Insomnia and/or anxiety	Potential to cause adverse effects such as hypotension which may predispose to falls	Withdraw slowly replacing with non-pharmacological measures



## Prescribing pointers - *ceasing medications*

- ▲ Any medication should be started as a trial and discontinued if ineffective or if side effects are unacceptable.
  - ▲ Retain only those medicines for which there is an ongoing need. Decrease the dosing frequency and titrate doses down where appropriate.
  - ▲ The patient needs to be a responsible partner and fully understand the rationale for ceasing medications.
  - ▲ Be aware that discontinuation of drug therapy can be associated with adverse drug withdrawal events in some cases. Medications commonly associated with adverse events unless the dose is tapered include beta-blockers, sedatives, hypnotics, opiates, antidepressants, antipsychotics and corticosteroids.
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### Your questions answered

Following is a question from the nursing staff that arose after Mrs Jones' medication review (see page 2).

#### Question

Could the antibiotic for prevention of urinary tract infection (UTI) be replaced with cranberry juice?

#### Answer

Cranberries, particularly in the form of cranberry juice, have been used widely for several decades for the prevention of urinary tract infections. A Cochrane review,<sup>3</sup> published in 1998, found four trials of reasonable design (three cross-over, one parallel group) to include in the review. Two of the studies of prevention of UTI in elderly patients found that cranberry was more effective than placebo in some patients.<sup>4,5</sup>

However, these studies were small with high withdrawal rates and lack of 'intention to treat' analysis. This may mean that effectiveness of cranberry juice was overestimated. The large number of dropouts from the trials indicates that cranberry juice may not be acceptable to patients over long periods of time. In Mrs Jones' case a trial of cranberry juice would do no harm but her prophylactic antibiotic should probably also be continued.

The NPS Therapeutic Advice and Information Service (TAIS) provides health professionals with information on therapeutics. Telephone TAIS on 1300 138 677 to ask your questions.

## Important notice

From the Therapeutic Goods Administration (TGA)  
and Pharmaceutical Benefits Advisory Committee (PBAC)

Both cisapride (Prepulsid<sup>®</sup>, Prepulsid Forte<sup>®</sup>) and thioridazine (Aldazine<sup>®</sup>, Melleril<sup>®</sup>) can produce prolonged QT intervals with the possibility of rare but serious and sometimes fatal cardiac arrhythmias. The approved indications and the listing of these drugs in the PBS schedule have changed in light of these safety concerns.

The approved indication for cisapride for use in adults has been amended to:

- ▲ *treatment of severe reflux oesophagitis where other available treatment including acid suppression with proton pump inhibitor drugs has failed*
- ▲ *treatment of gastroparesis where the diagnosis has been made or confirmed by a specialist physician.*

The approved indication for cisapride for use in children has been amended to:

- ▲ *severe, proven gastro-oesophageal reflux.*

The PBS listing for cisapride has changed to an authority listing for:

- ▲ *treatment of gastroparesis where the diagnosis has been made or confirmed by a consultant physician.*

In the absence of clinical data in patients who have not responded to the proton pump inhibitors in the treatment of reflux oesophagitis, the PBAC does not support the continued subsidy listing of cisapride for this group of patients.

The approved indication for thioridazine has been amended and it is now restricted to an authority listing on the PBS for:

- ▲ *the management of schizophrenic patients who have failed to respond adequately to treatment with appropriate courses of at least two other antipsychotic drugs, at an adequate dose and for an adequate duration, either because of insufficient effectiveness or the inability to achieve an effective dose due to intolerable adverse effects from those drugs.*

## NPS Pharmacy program

In December, the NPS will be increasing the range of activities available to pharmacists by sending out the first Pharmacy Clinical Audit on over-the-counter NSAIDs. This initiative will be the first of many topic-based activities developed specifically for community pharmacists.

The NSAIDs audit will provide community pharmacists with a tool to check their current practice for supply of these medications. The audit on NSAIDs contains a step-by-step guide for pharmacists and non-pharmacist staff when either a patient requests an over-the-counter NSAID, or presents with symptoms where NSAIDs may be indicated. For more information please contact the NPS on 02 9699 4499.

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**NOTE:** There was a typographical error on page 1 of *NPS News 11* on Depression. The juxtaposition of the text made it appear that moclobemide, nefazodone and venlafaxine are SSRIs. We would like to clarify that this is not the case.

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*The information contained in this material is derived from a critical analysis of a wide range of authoritative evidence. Any treatment decisions based on this information should be made in the context of the individual clinical circumstances of each patient.*



National Prescribing Service Limited

**Our goal** To improve health outcomes for Australians through prescribing that is: ▲ safe ▲ effective ▲ cost-effective  
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You are invited to submit your responses to the following case for collation. We will return a copy of the aggregated responses that will provide a snapshot of how your colleagues responded to the case and comments from an expert in the field. This case study is eligible for inclusion in the Practice Incentives Program (PIP) program for GPs.

**PLEASE COMPLETE CLEARLY IN BALL POINT PEN, BLOCK LETTERS ONLY**

First Name: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Surname: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]  
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 Please tick appropriate box:  Doctor  Pharmacist  Student  Other  
 (GPs only) Provider No: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Prescriber No: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Send completed case study 12 to: National Prescribing Service, 1/31 Buckingham Street, Surry Hills NSW 2010 or fax to 02 9699 5155. Submission date: **12 January 2001.**

David is a 74 year old who lives on his own at home. Lately he has been having difficulty walking to the shops and has to stop frequently to catch his breath. He has suffered from angina for five years. Heart failure of moderate severity was diagnosed in 1997, when enalapril was prescribed. During a hospital admission in 1998, ventricular arrhythmias were noted on ECG, and amiodarone was added to the regimen. His other main complaint is osteoarthritis. He takes piroxicam for the pain in his knees and wrist, which was broken six months ago. He feels depressed and sleeps poorly. His current medications are:

Drug name and dose	Start date	Drug name and dose	Start date
Amiodarone 100mg once daily	1998	Nifedipine slow release 10mg twice daily	1995
Enalapril 5mg once daily	1997	Amitriptyline 25mg at night	1996
Fruzemide 80mg twice daily	1997*	Piroxicam 20mg once daily	1999
Isosorbide dinitrate 10mg twice daily	1995		

\*Dose started at 40mg daily and increased over three years

**1. Do you identify any of the following?**

(please tick and specify drug and problems identified)

- Drug-drug interaction: \_\_\_\_\_
- Drug-disease interaction: \_\_\_\_\_
- Contraindication for one (or more) of the drugs: \_\_\_\_\_
- Evidence of an adverse drug event/side effect of a drug: \_\_\_\_\_
- Need for review of appropriateness of drug selection: \_\_\_\_\_
- Need for review of dose/frequency: \_\_\_\_\_
- Concordance/compliance problem: \_\_\_\_\_
- Need for investigations: \_\_\_\_\_
- Other: \_\_\_\_\_

**2. What action would you take?** (please tick and specify actions)

- None
- Add a medication: \_\_\_\_\_
- Cease a medication: \_\_\_\_\_
- Increase dose of: \_\_\_\_\_
- Reduce dose of: \_\_\_\_\_
- Substitute an alternative medication for: \_\_\_\_\_
- Discuss medication regimen with patient: \_\_\_\_\_
- Discuss side effects with patient: \_\_\_\_\_
- Other: \_\_\_\_\_