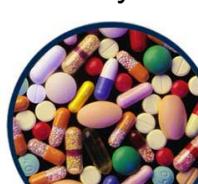


Polypharmacy Seminar



The logo for the National Prescribing Service Limited, featuring the letters N, P, and S in white on blue squares.

National Prescribing Service Limited

Objectives

On completion of this module you should be able to:

- state the major guiding principles in rational prescribing
- recognise, and substantiate, over-prescribing or inappropriate use of multiple drugs
- describe how to perform a full medication review
- identify the important components of hospital discharge prescribing, including the provision of information to patient, carer and health professionals
- state the major factors which create differences in the approach to prescribing in special populations, with particular reference to the elderly

National Prescribing Curriculum Module

N P S

15/03/2009 11:27 PM

Polypharmacy

Before commencing this module, have you read the [Guides to Good Prescribing](#)?
If not click on one of the links at the bottom of the page.

[Introduction](#)

[Polypharmacy](#)

This module invites you to treat an elderly woman presenting with renal failure, vomiting, secondary heart block and a recent history of falls. She is on multiple medications. Your role and the details of the case are outlined below.

Work through the module by starting with the first section which explains the 'Learning objectives' and continue on to each subsequent section until the module is completed. You may then click on the module title (in the blue border above) or press the 'Home' button to return to the introductory screen and select another module.

Author: Dr Peter Pillai
Editor: Clinical Pharmacology
Princess Alexandra Hospital
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Prescribing Guides

[NPS Easy Guide to Good Prescribing](#)
[WHO Guide to Good Prescribing](#)
[AMH 2003 Guide to prescribing](#)

Polypharmacy

Causes of Polypharmacy

Risks of Polypharmacy

- Adverse drug reactions common cause of
 - hospital admission
 - morbidity and mortality
 - Falling, delirium and the other geriatric syndromes may be drug-related
 - Medication errors
- Polypharmacy, per se, appears to be a risk factor for adverse outcomes*

What are the goals of care?

- Often different in frail person
- Risks of polypharmacy higher in frail person with limited homeostatic reserve

Rationalising prescribing

- Disproportionate drug consumption by the elderly
- However evidence base limited
- → extrapolation from younger patients

Weigh risks and benefits



- Efficacy
- Risk of ADR
- Pt wishes

Risk -Benefit

- The concept of absolute risk and NNT
- $NNT = 1/ARR$

Avoid Prescribing Cascade

- Avoid further prescribing to treat ADRs:
- NSAIDs and BP
 - thiazides and gout
 - antiemetics and dopaminergic therapy

ORIGINAL INVESTIGATION

A Prescribing Cascade Involving Cholinesterase Inhibitors and Anticholinergic Drugs

Sudeep S. Gill, MD, MSc, FRCPC; Mohammad Mamsani, PharmD, MA, MPH; Gary Naglie, MD, FRCPC; David L. Streiner, PhD; Susan E. Bronskill, PhD; Alexander Kopp, BSc; Kenneth I. Shulman, MD, SM, FRCPC; Philip E. Lee, MD, FRCPC; Paula A. Rochon, MD, MPH, FRCPC

Background: The prescribing cascade model involves the misinterpretation of an adverse reaction to 1 drug and the subsequent, potentially inappropriate prescription of a second drug. We sought to evaluate the size of the prescribing cascade involving cholinesterase inhibitors and anticholinergic drugs used to manage urinary incontinence.

Methods: A population-based retrospective cohort study was carried out in Ontario, Canada. Participants included 4484 older adults with dementia (20491 were dispensed at least one anticholinergic drug during 24 months) enrolled between June 1, 1999, and March 31, 2002. Subjects received a prescription for an anticholinergic drug despite having an anticholinesterase inhibitor prescribed, or the study period ended (March 31, 2003). The main outcome measure was receipt of an anticholinergic drug to manage urinary incontinence.

Results: After adjusting for potential confounding factors, we observed that older adults with dementia who were dispensed cholinesterase inhibitors had an increased risk of subsequently receiving an anticholinergic drug (4.3% vs 3.1%; $P < .001$; adjusted hazard ratio, 1.31; 95% CI, 1.09-1.72) relative to those not receiving cholinesterase inhibitors. This finding was consistent in a series of subgroup analyses.

Conclusion: Use of cholinesterase inhibitors is associated with an increased risk of receiving an anticholinergic drug to manage urinary incontinence. The use of an anticholinergic drug in this setting may represent a clinically important prescribing cascade. Clinicians should be particularly concerned regarding the use of cholinesterase inhibitors in new-onset or worsening urinary incontinence and the potential risk of coprescribing cholinesterase inhibitors and anticholinergic drugs to patients with dementia.

Arch Intern Med. 2005;165:808-813

Common Difficult Areas

- Benzodiazepines and psychotropics
- Analgesics
- Hypotensives
- Anticoagulants
- Digoxin

Cockroft- Gault

- Be familiar with use of this equation
- May underestimate renal function in healthy older people

eGFR

Medication Withdrawal Can be Achieved

Campbell AJ, Robertson MC, Gardner MM, Norton RN, Buchner DM.

Psychotropic medication withdrawal and a home-based exercise program to prevent falls: a randomized, controlled trial.

J Am Geriatr Soc. 1999 Jul;47(7):850-3



OBJECTIVE: To assess the effectiveness of psychotropic medication withdrawal and a home-based exercise program in reducing falls in older people.

DESIGN: A randomized controlled trial with a two by two factorial design.

SETTING: Seventeen general practices in Dunedin, New Zealand.

PARTICIPANTS: Women and men aged 65 years registered with a general practitioner and currently taking psychotropic medication ($n = 93$).

INTERVENTIONS: Two interventions:
 (1) gradual withdrawal of psychotropic medication versus continuing to take psychotropic medication (double blind)
 (2) a home-based exercise program versus no exercise program (single blind).

MEASUREMENTS: Number of falls and falls risk during 44 weeks of follow-up. Analysis was on an intent to treat basis.

RESULTS: After 44 weeks, the relative hazard for falls in the medication withdrawal group compared with the group taking their original medication was .34 (95% CI, .16-.74).

The risk of falling for the exercise program group compared with those not receiving the exercise program was not significantly reduced.

CONCLUSIONS: Withdrawal of psychotropic medication significantly reduced the risk of falling, but permanent withdrawal is very difficult to achieve.

NPS NEWS
National Prescribing Service Newsletter

Prescribing benzodiazepines... ongoing dilemma for the GP

Many GPs regard issues related to use of benzodiazepines as some of the most difficult and uncomfortable tasks of their clinical work.^{1,2}

In this issue we present some practical strategies that have been shown to work when deciding whether to prescribe benzodiazepines, especially for older people, or in assisting patients to withdraw. But first, some findings from the Prescribing Practice Review describing the difficult nature of this issue.

GPs in the study were aware that benzodiazepines should be used in the short-term and only for acute situations regardless of whether they were high, moderate or low prescribers.³

24 2002
Inside ►
ISSN 1441-5422 October 2002

- Before prescribing checklist
- '2' Drugs—*are they a better alternative?*
- Evidence supports withdrawal strategies
- Managing Insomnia in older people
- Non-drug treatments
- Complementary update: valerian and melatonin
- Using antipsychotics for behavioural disturbances

No. 4 July 1999
Prescribing Practice Review
Reviewing long term use of benzodiazepines, pp1-4
Managing the new patient with insomnia, pp1-6
Enclosed patient material

Benzodiazepines

Reviewing long term use: a suggested approach

Start with reviewing one or two patients. Continue to review all your patients over the next year.

There are few specific psychiatric conditions where long term use is indicated. Many patients may be using these drugs without any medical indications.

Patients can expect to have a better sleep quality, be more alert and enjoy a better quality of life when they cease taking benzodiazepines. The elderly benefit from a reduced risk of falls and fractures.

The following approach will require you to book several long consultations. Some patients, such as polydrug users, may require specialised services.

Predictors of normotension on withdrawal of antihypertensive drugs in elderly patients: prospective study in second Australian national blood pressure study cohort.

Nelson MR, Reid CM, Krum H, Muir T, Ryan P, McNeil JJ.

BMJ. 2002 Oct 12;325(7368):815

OBJECTIVES: To identify simple long term predictors of maintenance of normotension after withdrawal of antihypertensive drugs in elderly patients in general practice.

DESIGN: Prospective cohort study.

SETTING: 169 general practices in Victoria, Australia.

PARTICIPANTS: 503 patients aged 65-84 with treated hypertension who were withdrawn from all antihypertensive drugs and remained drug free and normotensive for an initial two week period; all were followed for a further 12 months.

MAIN OUTCOME MEASURES: Relative likelihood of maintaining normotension 12 months after drug withdrawal; relative likelihood of early return to hypertension after drug withdrawal.

RESULTS: The likelihood of remaining normotensive at 12 months was greater among younger patients (65-74 years), patients with lower "on-treatment" systolic blood pressure, patients on single agent treatment, and patients with a greater number of comorbidities. The likelihood of return to hypertension after drug withdrawal was greatest for patients with higher "on-treatment" systolic blood pressure.

CONCLUSIONS: Age, blood pressure control, and the number of antihypertensive drugs are important factors in the clinical decision to withdraw drug treatment. Because of consistent rates of return to antihypertensive treatment, all patients from whom such treatment is withdrawn should be monitored indefinitely to detect a recurrence of hypertension.

Is Discontinuation Safe?

- Psychotropic withdrawal reactions
- Anti anginals
- Anticonvulsant medications



Under treatment

- Aspirin and anticoagulation
- Analgesia
 - Paracetamol: Recent PBS changes

Paracetamol		
Sustained release 665 mg tablet: Panadol Extend®	Restricted benefit listing for the relief of persistent pain associated with osteoarthritis	The PBAC recommended listing on a cost minimisation basis at same price per mg of paracetamol as the currently listed immediate release 500 mg tablet formulation. The PBAC considered that any move that would encourage the use of paracetamol at appropriate doses in osteoarthritis should be welcomed.
500 mg tablet: Dymadon P®, Febridiol®, Panamax®, Parahexal®, Paralgin®, Parmol®, Tylenol®	Restricted benefit listing for chronic arthropathies with a maximum quantity of 300 with 4 repeats	The PBAC recommended a differential listing, at the same price per mg as the existing unrestricted benefit listing, to encourage the use of paracetamol at appropriate doses.

Under treatment Continued

- ACE – inhibitors and B-blockers
- Ca and Vit D (v bisphosphonates)



Vitamin D3 and calcium to prevent hip fractures in the elderly women.

Chapuy MC, Arlot ME, Duboeuf F, Brun J, Crouzet B, Arnaud S, Delmas PD, Meunier PJ.

N Engl J Med. 1992 Dec 3;327(23):1637-42.

BACKGROUND. Hypovitaminosis D and a low calcium intake contribute to increased parathyroid function in elderly persons. Calcium and vitamin D supplements reduce this secondary hyperparathyroidism, but whether such supplements reduce the risk of hip fractures among elderly people is not known.

METHODS. We studied the effects of supplementation with vitamin D3 (cholecalciferol) and calcium on the frequency of hip fractures and other nonvertebral fractures, identified radiologically, in 3270 healthy ambulatory women (mean [± SD] age, 84 ± 6 years). Each day for 18 months, 1634 women received triacalcium phosphate (mean, 1.2 g elemental calcium) and 20 micrograms (80 IU) of vitamin D3, and 1636 women received a double placebo. We measured serial serum parathyroid hormone and 25-hydroxyvitamin D ($25(OH)D$) concentrations in 142 women and determined the femoral bone mineral density at base line and after 18 months in 56 women.

RESULTS. Among the women who completed the 18-month study, the number of hip fractures was 43 percent lower ($P = 0.043$) and the total number of nonvertebral fractures was 32 percent fewer ($P = 0.015$) among the women receiving calcium and calcium and vitamin D compared with those receiving placebo. The responses to active treatment and according to intention to treat were similar. In the vitamin D3-calcium group, the mean serum parathyroid hormone concentration had decreased by 44 percent from the base-line value at 18 months ($P < 0.001$), and the mean serum concentration of 25(OH)D had increased by 182 percent over the base-line value ($P < 0.001$). The bone density of the proximal femur increased 2.7 percent in the vitamin D3-calcium group and decreased 4.6 percent in the placebo group ($P < 0.001$).

CONCLUSIONS. Supplementation with vitamin D3 and calcium reduces the risk of hip fractures and other nonvertebral fractures among elderly women.

Oral vitamin D3 and calcium for secondary prevention of low-trauma fractures in elderly people (Randomised Evaluation of Calcium Or vitamin D, RECORD): a randomised placebo-controlled trial

The RECORD Trial Group*

Summary

Background Elderly people who have a fracture are at high risk of another. Vitamin D and calcium supplements are often recommended for fracture prevention. We aimed to assess whether vitamin D3 and calcium, either alone or in combination, were effective in prevention of secondary fractures.

Methods In a randomised-design trial, 5292 people aged 70 years or older (4481 [85%] of whom were women) who were mobile and fracture-free at baseline were assigned to receive oral calcium (1000 mg per day), or calcium and vitamin D3 (10 µg per day) combined with calcium, or placebo. Participants who were recruited in 21 UK hospitals were followed up for between 24 months and 62 months. Analysis was by intention-to-treat and the primary outcome was new low-energy fractures.

Findings 608 (11%) of 5292 participants had a new low-trauma fracture; 183 (26%) of which were of the hip. The incidence of new low-trauma fractures did not differ significantly between participants allocated calcium and those who were not (331 [12.6%] of 2617 vs 367 [13.7%] of 2675; hazard ratio [HR] 0.94 [95% CI 0.81–1.09]; between participants allocated calcium and D3 and those who were not (353 [13.3%] of 2649 vs 345 [13.1%] of 2643; 1.02 [0.9–1.13]; HR 1.01 [95% CI 0.9–1.12]; P=0.91). There was no significant difference in the number of fractures in the calcium and calcium plus D3 groups compared with the placebo group (179 [13.4%] of 1332; HR for interaction term 1.01 [0.75–1.36]). The groups did not differ in the incidence of all-new fractures, fractures confirmed by radiography, hip fractures, death, number of falls, or quality of life. By 24 months, 2886 (64.5%) of 5292 were still taking tablets, 451 (8.5%) had died, 58 (1.1%) had withdrawn, and 1897 (35.9%) had stopped taking them but were still providing data for analysis of fractures. Compliance with tablets containing calcium was significantly lower (difference, 3.4%; [95% CI 6.6–12.3]), partly because of gastrointestinal symptoms. However, potentially serious adverse events were rare and did not differ between groups.

Interpretation The findings do not support routine oral supplementation with calcium and vitamin D3, either alone or in combination, for the prevention of further fractures in previously mobile elderly people.

Reviewing Medications

- Have patient bring in all medications, including OTC's, herbs, dietary supplements
- Ask about other prescribers
- POMB
- Consider home visit if high risk
- Cautious medication withdrawal where indicated

- Medical mx cycle
- Reconciliation – add slides

Communicate with patients, carers other prescribers



Use aids

- Simplify regimens
- Medication cards
- Dosette Boxes
- 'Webster Pack'
- visiting nurses
- involving caregiver



Aim for concordance



Cases

Acrobat Document

Case 1

Acrobat Document

Case 2

Acrobat Document

Case 3

Conclusions

- Avoid polypharmacy
- Weigh risks and benefits
- Scrutinise all medication prescriptions critically
- Monitor therapy carefully in elderly patients

Acknowledgements

- NPS Site
- Le Couteur DG, Hilmer SN , Glasgow N, Naganathan V, Cumming RG. Prescribing in older people. Australian Family Physician 2004; 33(10): 777-781.
Available from:
<http://www.racgp.org.au/afp/downloads/pdf/october2004/20040930lecouteur.pdf>

- Add something on TALLman