

MODULE 12

DRUG THERAPY IN ELDERLY

Learning objectives

On completion of the module, the medical officer will be able to:

1. Decide the best treatment option for an elderly based on the aim of improving broad functional outcome and disease.
2. Have a basic understanding on the judicious use of prescribing drugs in elderly.
3. Use medicines in appropriate doses
4. Identify adverse drug events and drug interactions.
5. Reduce pill burden where possible, and identify risk versus benefits while prescribing an agent.

Introduction

Older patients have a higher prevalence of chronic and multiple illness and physiological changes associated with ageing may mimic as illness. They are hence more likely to be prescribed medication by their doctors and to take multiple agents. This puts them at a higher risk of suffering Adverse Drug Reactions (ADRs) and drug-drug interactions. Pharmacokinetics and pharmacodynamics may be altered by normal ageing or disease, further heightening the risk of ADRs.

Principles of a Geriatric Prescription:

- Comprehensive geriatric assessment is an important tool for the clinician in designing effective, multidisciplinary management plans. Broad functional outcomes and alleviation of specific disease should be the final outcome. This approach also helps in the assessment of the risk and benefit of prescribing a medication for a particular condition in the context of comorbidity and disability, predicts likely changes in pharmacokinetics and pharmacodynamics, and gives information on what assistance the patient may require to adhere to the optimal medication regime.
- Appropriate medical management requires a consideration of all possible treatment options for a patient based on the available evidence including non-pharmacological management options.
- Patient autonomy is an important medical ethical principle often underemphasized in prescribing guidelines. Participation of older patients in treatment decisions including medicines presents challenges, not the least of which may be a divergence between the goals of the patient and the prescriber.
- Pharmacokinetics are impacted by Drug absorption, First-pass metabolism and bioavailability, and Protein binding
- Drug clearance is impacted by renal and hepatic function, which are reduced in the elderly.

Selected pharmacodynamic changes with ageing

↑ = increase; ↓ = decrease; ↔ = no significant change

Drug	Pharmacodynamic effect	Age-related change
Diazepam	Sedation, postural sway	↑
Diphenhydramine	Postural sway	↔
Enalapril	ACE inhibition	↔
Furosemide	Peak diuretic response	↓
Heparin	Anticoagulant effect	↔
Warfarin	Anticoagulant effect	↑

Adverse Drug Reactions

Adverse drug reactions (ADRs), including interactions, are a common cause of admission to hospital in elderly patients, especially frail, are often associated with polypharmacy and inappropriate dosage, and are an important cause of morbidity and death.

80% of ADRs causing admission or occurring in hospital are dose related, and thus predictable and potentially avoidable. Antibiotics, anticoagulants, digoxin, diuretics, hypoglycaemic agents, antineoplastic agents and nonsteroidal anti-inflammatory drugs (NSAIDs) are responsible for 60% of ADRs leading to hospital admission and 70% of ADRs occurring in hospital. Other cardiovascular medicines and analgesics are also important clinically.

These figures highly in lists of medicines most likely to be used in the elderly. The dose of these drugs needs to be decreased, increased or adjusted periodically depending on renal and hepatic function.

Drug/ Class	Common ADRs
ACE Inhibitors (eg: Enalapril)	Renal impairment and hyperkalemia
Anticoagulants (eg: Warfarin)	Bleeding
Antipsychotic (Eg: Haloperidol) and Hypnotic (Diazepam)	Falls and sedation
Asprin	Bleeding and dyspepsia
Beta blockers (Eg: Atenolol)	Bradycardia and cold peripheries
Diuretics (Eg: Furesamide)	Dehydration, Electrolyte imbalance
Insulin and oral hypoglycemics	Hypoglycemia
NSAIDs (Eg: Diclofenac)	Dyspepsia and renal impairment
Bronchodialator (Eg: Theophylline)	Tachycardia and hypotension, falls

Polypharmacy:

The term polypharmacy itself just means “many medications” and has often been defined to be present when a patient takes five or more (although the definition differs with different authors). In elderly, because of multiple comorbidity as well as

certain other factors like use of alternative medicine (ayurvedic, homeopathic or other herbal medications), peer suggestion, patients often ends up with polypharmacy. Therefore utmost care needs to be given while prescribing drugs to the elderly patients to reduce the burden of inappropriate multiple drugs. However use of multiple drugs is not always necessarily strict contraindication. For example, secondary prevention of myocardial infarction often already requires the use of four different classes of drugs (antiplatelets, statins, ACE inhibitor, beta blocker). It is therefore crucial to distinguish appropriate from inappropriate polypharmacy.

Inappropriate polypharmacy is present, when one or more drugs are prescribed that are not or no longer needed, either because: (a) there is no evidence based indication, the indication has expired or the dose is unnecessarily high; (b) one or more medicines fail to achieve the therapeutic objectives they are intended to achieve; (c) one, or the combination of several drugs cause unacceptable adverse drug reactions (ADRs), or put the patient at an unacceptably high risk of such ADRs, or because (d) the patient is not willing or able to take one or more medicines as intended.

Appropriate polypharmacy is present, when: (a) all drugs are prescribed for the purpose of achieving specific therapeutic objectives that have been agreed with the patient; (b) therapeutic objectives are actually being achieved or there is a reasonable chance they will be achieved in the future; (c) drug therapy has been optimised to minimise the risk of ADRs and (d) the patient is motivated and able to take all medicines as intended.

The 7 steps approach to medication review:

'THINK BEFORE YOU INK!'

Step 1: Identify aims and objectives of drug therapy.

Step 2: Identify essential drug therapy.

Step 3: Does the patient take unnecessary drug therapy?

Step 4: Are therapeutic objectives being achieved?

Step 5: Is the patient at risk of ADRs or suffers actual ADRs?

Step 6: Is drug therapy cost-effective?

Step 7: Is the patient willing and able to take drug therapy as intended?

Beers Criteria:

The Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, commonly called the Beers List, are guidelines for healthcare professionals to help improve the safety of prescribing medications for older adults. They emphasize deprescribing medications that are unnecessary, which helps to reduce the problems of polypharmacy, drug interactions, and adverse drug reactions, thereby improving the risk–benefit ratio of medication regimens in at-risk people.

The criteria are used in geriatrics clinical care to monitor and improve the quality of care. They are also used in training, research, and healthcare policy to assist in developing performance measures and document outcomes. These criteria include lists of medications in which the potential risks may be greater than the potential benefits for people 65 and older. By considering this information, practitioners may be able to reduce harmful side effects caused by such medications. The Beers Criteria are intended to serve as a guide for clinicians and not as a substitute for

professional judgment in prescribing decisions. The criteria may be used in conjunction with other information to guide clinicians about safe prescribing in older adults.

Key messages

Guidelines for prescribing medication for older patients:

1. Minimize the number of drug prescribe.
2. Ensure that for every drug taken there is an indication.
3. Assess patient's comorbidity and ability to comply with directions.
4. "Old drug for old people" - it is safer to use drugs that have been time tested.
5. "Start low and go slow" (titrate therapy).
6. Use drugs with less frequent dosing (OD or BID dose is preferable).
7. Keep in mind possible drug interactions including over the counter preparations.
8. Check for adverse drug events.
9. Clear instructions about how to administer the drug should be given.
10. Review regularly and evaluate the need for each of the drug that the patient is taking and educate the patient or family to report the medication related problem.
11. Clinicians must be alert to the use of herbal and dietary supplements by older patients, who may not volunteer this information and are prone to drug-drug interactions related to these supplements.

Strategies for Reducing Polypharmacy:

1. Determine the presenting problem "Can This Be Caused by a Drug?"
2. Determine Which Drugs Are Still Providing Benefit
3. Prioritize Drugs for Tapering and Stopping, Develop a Plan, Coordinate and Communicate with Prescriber and Patient
4. Simplify to Reduce Pill Burden

Further reading

1. Davidsons Principles and Practice of Medicine, 22nd Edition
2. Harrisons Principles of Internal Medicine, 19th Edition

Case scenario

CASE 1

- Mr. X is an 83 year old man with a history of benign prostatic hypertrophy (BPH) and hypertension. He recently started taking the antihistamine diphenhydramine (Benadryl) over the counter for a viral respiratory infection and now presents to the ED because he is unable to urinate.
- Mr. X is diagnosed with acute urinary retention due to BPH. A Foley catheter is placed and 1200 cc of urine is drained. The physician prescribes terazosin, a peripherally acting α_1 -adrenergic antagonist, to help with his urinary retention. The catheter is left in place, and he is discharged home with instructions to follow up with his primary care physician later that week.
- Two days later, Mr. X falls while getting out of bed and returns to the ED for evaluation of hip pain. He complains of feeling light-headed when standing up

and is admitted for a syncope work-up.

- Discuss your approach and management of this case.

CASE 2

- Mrs. X, 78 years, has the following problems:
- Recent history of cough with expectoration for 5 days with 1 episode of fever and swelling of lower limbs for last 1 month
- She is a known hypertensive on T. Enalapril 5 mg and T. Amlodipine 5 mg thrice a day. She is a known diabetic and is well controlled on Metformin 1000mg SR BD. She is also on Atorvastatin 40 mg.
- She is a known patient of osteoarthritis of knee joints and takes T. Diclofenac 50 mg three to four times a week in last 2 years.
- She feels very depressed and also complains of insomnia for last 1 month, for which she has been recently prescribed T. Alprazolam 0.5 mg daily night. She lost her husband about 2 years back. She stays mostly at home. Her only daughter visits her once a week. She also has a problem of decreased vision and often forgets to take her medications.
- Comment on the above case in terms of treatment and suitable management.