

## INTRODUCTION

The words elderly and polypharmacy go quite abreast nowadays. When elderly patients come to us with a prescription list as long as one’s arm, we do have a typical frown in our face; but at many a time, owing to obligatory circumstances, nothing much can be done. However, concerns always remain, ranging from quality of life issues to adverse drug reactions, drug interactions and prescription cascades.

## DEFINITION

Prescription cascade may be described as the process, whereby the drug related side effects are mistakenly attributed as symptoms of another disease, resulting in prescription of a new medicine. This may bring forth

further side effects and unanticipated drug interactions leading to further misdiagnoses and further symptoms.<sup>1</sup> Elderly people with chronic ailments, frailty and multiple drug therapies are particularly at risk for prescribing cascades.

## DISCUSSION

Over the recent years there has been a substantial rise in the incidence of chronic conditions including diabetes and hypertension; and hence the increase in use of numerous medications by the older population. As a result, correlating side-effect of each drug comes into play. If a physician ignores the detailed drug history of all the drugs that a patient is taking, there is every possibility that an adverse drug reaction (ADR) may be viewed as a new medical entity. Consequently, another drug would be prescribed to treat the new condition, which might exhibit further new side effects that could be again mistakenly diagnosed as another new medical condition. Thus the patient is put to an unnecessary risk of a bunch of unpropitious health effects.<sup>2</sup> An example of this pharmacological feedback loop has been shown in Fig 1. Elderly people are at higher risk of prescribing cascades than young because the usual adverse drug reaction is more likely to be misinterpreted as the onset of a new

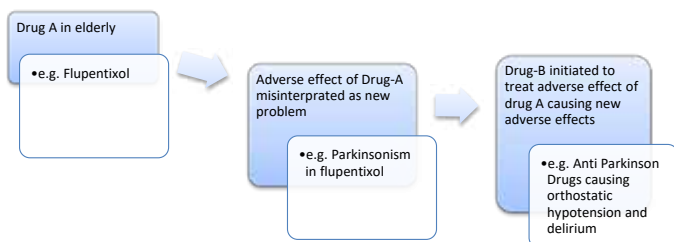
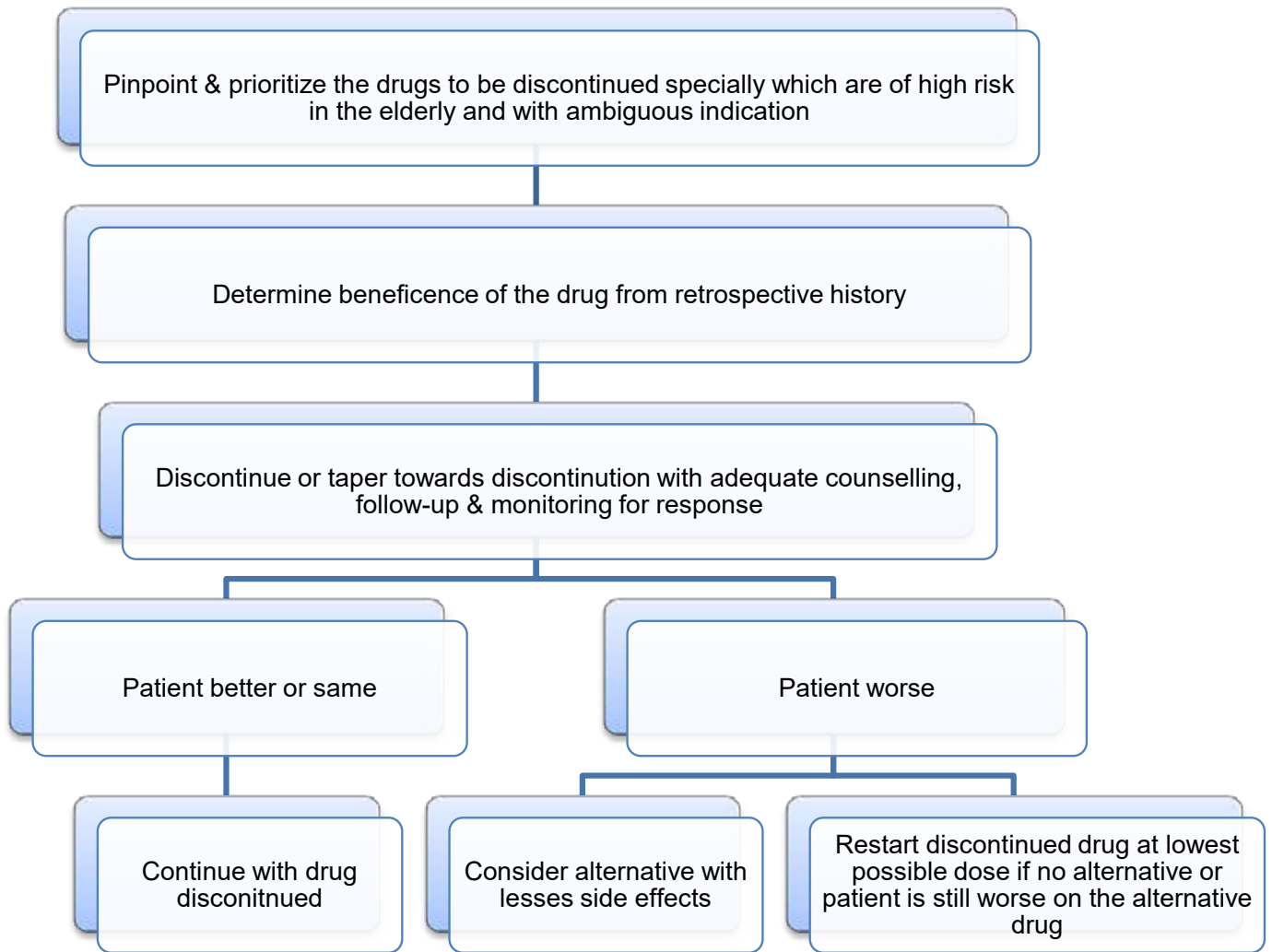


Fig. 1: Prescribing cascade in elderly<sup>1</sup>

Table 1: Some common examples of prescription cascades <sup>4</sup>			
Drug A	Adverse Drug Reaction caused by initially prescribed drug	Second drug to treat side effects of initial drug assuming a new symptom related or unrelated	Adverse Drug Reaction secondary to second drug added to combat the new symptoms
ACE inhibitors	Dry cough	Anti histamines	Sedation Increase fall
Anti-Cholinesterase	Urinary Incontinence	Oxybutynin	Urinary retention, constipation
NSAIDs	Raised blood pressure	Anti hypertensive	Dizziness
Thiazide	Hyperuricaemia	Xanthine oxidase inhibitor (e.g. febuxostat)	GI upset Acute kidney injury
Anti hypertensives	Dizziness	Prochlorperazine	Parkinsonism
Statin	Muscle pain	Baclofen	Sedation
Haloperidol	Parkinsonism	Procyclidine	Dry mouth, Glucoma Retention of urine
Amitryptiline	Prolonged QT	Antiarrhythmics	Further arrhythmia
Tamsulosin	Postural dizziness	Vestibular sedatives	Sedation Increased frequency of falls

NSAIDs: Non-steroidal anti-inflammatory drugs



**Fig. 2: Algorithm for a trial of discontinuation<sup>5</sup>**

medical condition for the old.<sup>1</sup> For example, a movement disorder induced by flupentixol may mimic Parkinson's disease, but this misinterpretation would be unlikely in a young person as this disease is uncommon in young.

### EXAMPLES OF PRESCRIBING CASCADES

Among elderly people, common drug classes like anticholinergics (oxybutynin for overactive bladder in benign prostate enlargement), psychoactives (flupentixol-melitracen combinations for post menopausal symptoms), benzodiazepines as anxiolytic or sedative – increase the risk of ADRs. In a case control study of 3512 patients (age 65 to 99 years), patients who had received an antipsychotic medication in the preceding 90 days were 5.4 times more likely to be prescribed anti Parkinson therapy than patients who had not received an antipsychotic (95% CI 4.8-6.1).<sup>3</sup> Drugs like cholinesterase inhibitors (e.g., donepezil, rivastigmine, and galantamine), used for the management of dementia in older adults may cause diarrhoea and urinary incontinence. A prescribing cascade may occur when these symptoms are followed by a prescription of an anticholinergic (e.g. oxybutynin) to treat incontinence. Table 1 shows some common examples of prescription cascades.<sup>4</sup>

### CONSEQUENCE

There are several implications of prescribing cascades in practice. The ADRs associated with this phenomenon might create a significant negative health outcome. Addition of a new drug always adds to the financial burden for the old age. In the subcontinent, the communication between a physician and a patient is not always an ideal one due to various practical reasons. As a result patient may not tell their physician when they experience seemingly trivial ADRs which may lead to poor quality of life. Moreover, patients may stop a medication by guessing on their own without consulting their physician ignorant of what impact it might create on their disease course or management.<sup>4</sup>

### PREVENTION

The main precipitating factor for prescribing cascades is ADRs. So avoidance and/or early detection are essential to prevent this. In the elderly, drugs should be initiated at low doses with gradual titration towards desired effect. Physicians should enquire thoroughly about the drug history and particularly search for a temporal relationship between a newly occurring symptom and a recently prescribed drug. Patients should be empowered with

446 appropriate knowledge and skill regarding the ADRs of a prescribed drug and to identify them when occurring.

The following strategies may be used once the new symptoms can be attributed as ADRs:

1. Dose reduction of the likely drug if the reaction is dose related
2. Choosing an alternative drug with a similar effect but with a reduced risk of ADR
3. De-prescribing: reassessment for the absolute necessity for the medicine causing the ADR and discontinuation if possible (Figure 2)
4. Application of safer prescribing strategies like FORTA (Fit fOR The Aged)<sup>6</sup>: FORTA is an evidence based age appropriate drug listing approach introduced by Wehling (2009) that label drugs both positively or negatively by categorizing them into 04 groups, ranging from category A (indispensable), B (beneficial), C (questionable) to D (avoid), on the basis of identifying overtreatment, undertreatment or mistreatment of a disease. Initial studies have showed significant improvement of over and under treatment by applying it.<sup>6</sup> However, this promising utility is complex and yet to be proven in practice and hence require clinical validation.

## CONCLUSION

Prescribing cascades bear the potential to cause serious malfeasance to patients. Prescriber discretion, particularly in the elderly, is essential in this regard.

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