Medication and falls: Key information for care home staff

In patients taking medicines known to contribute to falls, medication review can play an important part in falls prevention. The aim of the review should be to modify or withdraw the drug, if this is not possible close monitoring is required.

The tables below give examples of high risk medicines that can cause falls. Always refer to the Patient Information Leaflet and/or BNF for side –effects of medicines and further information.

Key points

- Residents who have fallen are at high risk for a repeat fall. The mortality risk from a fall at age 85 is about 1% per fall.
- Older people (≥ 65 years of age) may be more "sensitive" to medications.
- Residents taking ≥ 4 prescription drugs, regardless of type of drug, are at an increased risk for falls.
- Falls may be due to recent medication changes, but are usually caused by medicines that have been given for a long time without appropriate review
- Orthostatic hypotension (sudden drop in blood pressure when they move from a lying down or sitting position to sitting or standing) is often caused by medication and leads to falls in older adults.
- Residents at high risk of falling (e.g. with recurrent, unexplained or injurious falls) should be considered for specialist referral and multidisciplinary intervention.

In theory any medicine that causes one of the following effects can increase the risk of falling:

- Sedation, drowsiness
- Impaired postural stability
- Hypoglycaemia
- Hypothermia
- Confusion
- Dehydration
- Visual impairment (blurred vision, dry eyes)
- Vestibular damage (tinnitus, deafness)
- Orthostatic hypotension
- Drug induced Parkinsonism

Key actions

- Prompt medication review for any resident who has an acute fall, to identify and review any medicines that may be contributing to their risk of falls.
- If there are any changes to a resident's mobility, balance, coordination or alertness inform the GP as this increases their risk of falls.
- To avoid orthostatic hypotension encourage the resident to:
    - Avoid sudden postural change, especially when getting up in the morning.
    - Increase their non–caffeinated fluid intake to > 2 litres a day (about 3 litres if they weigh more than 75kg) where appropriate, some residents may be on a fluid restricted diet.
    - Eat several small meals a day.
    - Drink caffeine on rising and after meals.
    - Lie propped up at night with a head up tilt of 15° – 20° (pillow height 20cm - 30cm)

HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

Drugs acting on the brain (psychotropic drugs)

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Sedatives: Benzodiazepines	Temazepam, nitrazepam, diazepam, lormetazepam, chlordiazepoxide, flurazepam, lorazepam, oxazepam, clonazepam	• Drowsiness, slow reactions, impaired balance. • Caution in patients who have been taking them long term.
Sedatives: "Zs"	Zopiclone, zolpidem	• Drowsiness, slow reactions, impaired balance.
Sedating antidepressants (tricyclics and related drugs)	Amitriptyline, dosulepin, imipramine, doxepin, clomipramine, lofepramine, nortriptyline, trimipramine, mirtazapine, mianserin, trazodone	• All have some alpha blocking activity and can cause orthostatic hypotension. • Antidepressants can cause drowsiness, impaired balance and slow reaction times. • Doubles the rate of falling.
Monoamine oxidase inhibitors (MAOIs)	Phenelzine, isocarboxazid, tranylcypromine	• MAOIs are now rarely used; all (except moclobemide) cause severe orthostatic hypotension.
Drugs for psychosis and agitation	Chlorpromazine, haloperidol, fluphenazine, risperidone, quetiapine, olanzapine	• All have some alpha - receptor blocking activity and can cause orthostatic hypotension. • Sedation, slow reflexes, loss of balance.

Serotonin and norepinephrine reuptake inhibitor (SNRI) antidepressants	Venlafaxine, duloxetine	• As for selective serotonin reuptake inhibitor (SSRI) antidepressants (see table on page 5) but also commonly cause orthostatic hypotension (through noradrenaline re-uptake blockade).
Opiate analgesics	All opiate and related analgesics, e.g. codeine, morphine, tramadol	• Sedation, slow reactions, impairs balance, cause delirium.
Anti-epileptics	Phenytoin	• Phenytoin may cause permanent cerebellar damage and unsteadiness in long term use at therapeutic dose. • Excess blood levels cause unsteadiness and ataxia.
	Carbamazepine, Phenobarbitone	• Sedation, slow reactions. Excess blood levels cause unsteadiness and ataxia.
Parkinson's disease (PD): Dopamine agonists	Ropinirole, pramipexole	• May cause delirium and orthostatic hypotension.
MAOI-B inhibitors	Selegiline	• Causes orthostatic hyptotension. The subject of drugs and falls in PD is difficult as falls are so common and orthostatic hypotension is part of the disease. In general only definite drug related orthostatic hypotension would lead to a change in medication.

HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

Drugs acting on the heart and circulation

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Alpha receptor blockers	Doxazosin, indoramin, prazosin, tamsulosin, terazosin, alfluzosin Sedating antidepressants Drugs for psychosis and agitation	• Used for hypertension or for prostatism in men. They commonly cause severe orthostatic hypotension. Stopping them may precipitate urinary retention in men. • See 'sedating antidepressants' in the 'drugs acting on the brain' table (page 4). • See 'drugs for psychosis and agitation' in the 'drugs acting on the brain' table (page 4). • Orthostatic hypotension Orthostatic hypotension
Centrally acting alpha 2 receptor agonists	Clonidine, moxonidine	• May cause severe orthostatic hypotension. • Sedating.
Thiazide diuretics	Bendroflumethiazide, chlorthalidone, metolazone	• Cause orthostatic hypotension, weakness (muscle and general) due to low potassium. • Hyponatraemia.
Angiotensin converting enzyme inhibitors (ACEIs)	Lisinopril, ramipril, enalapril, captopril, perindopril Fosinopril, trandolapril, quinapril	• These drugs rely almost entirely on the kidney for their elimination and can accumulate in dehydration or renal failure. • Excreted by liver and kidney
Beta blockers	Atenolol, sotalol (renally excreted, may accumulate) Bisoprolol, metoprolol, propranolol, carvedilol, timolol eye drops	• Can cause bradycardia, hypotension, carotid sinus hypersensitivity, orthostatic hypotension and vasovagal syndrome • Can cause bradycardia, hypotension, carotid sinus hypersensitivity, orthostatic hypotension and vasovagal syndrome
Antianginals	Glyceryl trinitrate (GTN) Isosorbide mononitrate, nicorandil	• A common cause of syncope due to sudden drop in blood pressure • Cause hypotension and paroxysmal hypotension

Reference: Prescqipp B87: Care Homes – Medication and falls.

Group Name	Name of Drug (common examples)	Effect of Drug
Drugs which cause a decrease in blood pressure (BP)	Lisinopril, Perindopril, Valsartan, Candesartan, Doxazosin, Enalapril, Furosemide, Atenolol, Diltiazem, Amlodipine, Felodipine.	BP control is already impaired in the elderly, so they are more likely to suffer from drug-induced low BP which can lead to dizziness and falls.
Drugs which cause sedation (drowsiness/sleepiness)	Nitrazepam, Diazepam, Temazepam, Amitriptyline, Dosulepin, Chlorpromazine, Phenobarbital,Chlorpheniramine, Hydroxyzine	Sedation is one of the most common causes of drug induced falls. The elderly are more prone to the drug side effects of medicines that work on the central nervous system. This can lead to over sedation and slower reaction time.
Anti-Parkinson's drugs	L-Dopa preparations, Pergolide, Selegilene, Bromocriptine	As above, these drugs affect the central nervous system.
Antidepressants	Sertraline, Paroxetine, Fluoxetine, Citalopram, Cyclizine, Prochlorperazine, Metaclopramide	As above, these drugs affect the central nervous system.
Anticholinergic drugs (to treat tremors and incontinence)	Benzhexol, Procyclidine, Oxybutinin, Tolterodine	These drugs may lead to confusion and 'mental fuzziness' in the elderly.

* If in doubt always check with a reliable reference source.

If it is thought that medication is making a person faint or unsteady, speak with their GP or Pharmacist to ask for a medication review.

If a person is on more than FOUR medications, speak with their GP or Pharmacist to ask for a medication review.

Remember: - The effects of alcohol when taken with some medicines can also increase the risk of falls in the elderly.

Medication that may cause falls (cont.)

Symptom	Drug Group	BNF Chapter	Drug Name
Drowsiness	Hypnotics	4.1.1	Nitrazepam Loprazolam Lormetazepam Temazepam Zaleplon Zolpidem Zopiclone
	Anxiolytics	4.1.2	Diazepam Lorazepam
	Anti-depressants	4.3.1	Amitriptyline Clomipramine Dosulepin Imipramine Hydrochloride Lofepramine Nortriptyline Trazadone
	Antipsychotics	4.2.1	Chlorpromazine Flupentixol Haloperidol Prochlorperazine Promazine Trifluoperazine Amisulpride Aripiprazole Olanzapine Quetiapine Risperisone
	Barbiturates	4.1.3	Phenobarbital
	Sedating antihistamine	3.4.1	Promethazine Chlorphenamine Cyclizine Hydroxyzine

Symptom	Drug Group	BNF Chapter	Drug Name
Hypotension (Low blood pressure)	Diuretics	2.2	Bendroflumethiazide Bumetanide Furosemide
	Beta-blockers	2.4	Propranolol Atenolol Bisoprolol Sotalol Timolol Maleate
	ACEI/ARA	2.5.5	Enalapril Lisinopril Perindopril Ramipril Losartan Candesartan
	Alpha-blockers	2.5.4	Doxazosin Indoramin
	Calcium channel blockers	2.6.2	Amlodipine Diltiazem Felodipine Nifedipine
	Vasodilators	2.5.1	Hydralazine Minoxidil Sildenafil
	Anti-Parkinsonism drugs	4.9.1	Apomorphine Cabergoline Pergolide Levodopa Co-beneldopa Co-careldopa Amantadine
Others	Cause dizziness/drowsiness/confusion For blurred vision		Digoxin Baclofen Dantrolene Carbamazepine Phenytoin Metoclopramide Prochlorperazine Antimuscarinics

Medication to reduce the risk of fragility fracture

Drug Group	*BNF*	*Drug*	*Special instructions*
Bisphosphonates	**6.6.2**	**Alendronate** **Risedronate** **Strontium**	Once weekly dose. Take in the morning 30 mins before food or drink. Sit up right for at least 30 mins after taking. Avoid Calcium supplement for at least 30 mins after taking. Once daily dose. Powder to be mixed in a glass of water. Take at bedtime 2hrs after eating and at least 2hrs before food and drink.
Calcium and Vitamin D	**9.6.4**	**Adcal D3** **Calcichew D3** **Calfovit D3**	Twice daily dose tablet Once daily dose powder.

This is only a selection of the most commonly prescribed medicines.

When a resident is prescribed new medications read the

Patient **I**nformation **L**eaflet or **BNF** for possible side effects and **monitor resident**