

## CARE HOMES – MEDICATION AND FALLS

Falls and fall-related injuries are a common and serious problem for older people. People aged 65 and older have the highest risk of falling, with 30% of people older than 65 and 50% of people older than 80 falling at least once a year.

### THE IMPACT OF FALLS MAY INCLUDE

- Fractures of the hip, femur, humerus, wrist and rib
- Soft tissue injuries
- Haematoma
- Transient confusion
- Social/psychological consequences (loss of independence, loss of confidence, limited social and physical activity)
- Sudden ageing
- Hospitalisation and immobilisation
- Disability
- Death.

This resource has been produced to raise awareness amongst healthcare professionals and care home staff of the medicines that can increase the risk of falls in older people. The aim is that they are taken into consideration when conducting medication reviews and also when deciding whether to initiate medicines if the patient is a known faller or at risk of falls.

- A medicines and falls risk classification is included but this is intended for GPs and senior prescribing healthcare professionals or those visiting to complete a falls review. Care Home staff can use the list of medications as guidance and prompt medication/falls reviews if indicated.

### POINTS TO NOTE

- Falls are multifactorial and a fall should not be looked at in isolation.
- All healthcare professionals dealing with patients known to be at risk of falling should develop and maintain basic professional competence in falls assessment and prevention. This includes care home staff who should attend regular training to maintain knowledge and refer to their falls folder when needed.
- Falls assessment should be performed by a healthcare professional with appropriate skills and experience; this could be CHAT, GP, OPAU, falls clinic.

## HOW MEDICINES CAN CAUSE FALLS

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, vestibular damage (tinnitus, deafness), visual impairment (blurred vision, dry eyes), orthostatic (postural) hypotension and drug induced Parkinsonism.

There are two classes of drugs that have the highest propensity to cause falls, those acting on the brain and those acting on the heart and circulation.

### DRUGS ACTING ON THE BRAIN (PSYCHOTROPIC DRUGS)

There is good evidence that stopping psychotropic drugs can reduce falls.<sup>2</sup>

Taking a psychotropic medicine approximately doubles the risk of falling. There is no data on the effect of taking two or more psychotropic medicines at the same time.<sup>3</sup>

Sedatives, antipsychotics and sedating antidepressants cause drowsiness and slow reaction times. Some antidepressants and antipsychotics also cause orthostatic hypotension.

### DRUGS ACTING ON THE HEART AND CIRCULATION

Maintaining consciousness and an upright posture requires adequate blood flow to the brain. This requires an adequate pulse and blood pressure. In older people a systolic blood pressure of 110mmHg or below is associated with an increased risk of falls. Any drug that reduces the blood pressure or slows the heart can cause falls (or feeling faint or loss of consciousness or “legs giving way”).

In some patients the cause is clear – they may be hypotensive (low blood pressure), or have a systolic drop on standing. Others may have a normal blood pressure lying and standing, but have syncope or pre-syncope (fainting) from carotid sinus hypersensitivity or vasovagal syndrome. Stopping cardiovascular medication reduces syncope and falls by 50%, and reduces the prevalence of these four syndromes.

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. Below is a falls risk classification document which grades psychotropic drugs and drugs acting on the circulation according to their effects on falls risk, it can be used by GPs, prescribing nurses and pharmacists to support medication reviews.

## DRUGS ACTING ON THE BRAIN (PSYCHOTROPIC DRUGS)

### HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

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	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, causes delirium.
Anti-epileptics	Phenytoin	Phenytoin may cause permanent cerebellar damage and unsteadiness in long term use at therapeutic dose.
Parkinson's disease (PD): Dopamine agonists	Ropinirole, pramipexole	May cause delirium and orthostatic hypotension

## HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Parkinson's disease (PD): MAOI-B inhibitors	Selegiline	Causes orthostatic hypotension. 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.

## MEDIUM RISK OF FALLS ESPECIALLY IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Selective serotonin reuptake inhibitor (SSRI) antidepressants	Sertraline, citalopram, paroxetine, fluoxetine	Cause falls as much as other antidepressants in population studies. Several population studies have shown that SSRIs are consistently associated with an increased rate of falls and fractures, but there are no prospective trials.
Muscle relaxants	Baclofen, dantrolene	Sedative. Reduced muscle tone. No falls data on muscle relaxants. Tend to be used in conditions associated with falls.
Anti-epileptics	Sodium valproate, gabapentin	Some data on falls association.

## POSSIBLE RISK OF FALLS PARTICULARLY IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Anti-epileptics	Lamotrigine, pregabalin, levetiracetam, topiramate	Insufficient data to know if these newer agents cause falls.
Vestibular sedatives Phenothiazines	Prochlorperazine	Dopamine antagonist – may cause movement disorder in long term use. Also acts as an alpha receptor blocker and antihistamine.
Vestibular sedatives Antihistamines	Cinnarazine, betahistine	Sedating. No evidence of benefit in long term use.
Sedating antihistamines for allergy	Chlorphenamine, hydroxyzine, promethazine, trimепazine	No data, but sedation likely to contribute to falls. Long half-lives.
Anticholinergics acting on the bladder	Oxybutinin, tolterodine, solifenacin	No data, but have known Central Nervous System (CNS) effects.

## DRUGS ACTING ON THE HEART AND CIRCULATION

### HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Alpha receptor blockers	Doxazosin, indoramin, prazosin, tamsulosin, terazosin, alfuzosin	Used for hypertension or for prostatism in men. They commonly cause severe orthostatic hypotension. Stopping them may precipitate urinary retention in men.
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, Quinapril, trandolapril,	These drugs rely almost entirely on the kidney for elimination and can accumulate in dehydration or renal failure. Excreted by liver and kidney

## HIGH RISK OF FALLS EITHER ALONE OR IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Beta blockers	Atenolol, sotalol (renally excreted, may accumulate)	Can cause bradycardia, hypotension, carotid sinus hypersensitivity, orthostatic hypotension and vasovagal syndrome.
	Bisoprolol, metoprolol, propranolol, carvedilol, timolol eye drops	Can cause bradycardia, hypoten carotid sinus hypersensitivity, orthostatic hypotension and vasc syndrome.
Antianginals	Glyceryl trinitrate (GTN)	A common cause of syncope due to sudden drop in blood pressure.
	Isosorbide mononitrate, nicorandil	Cause hypotension and paroxysmal hypotension.

## MEDIUM RISK OF FALLS ESPECIALLY IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Loop diuretics	Furosemide, bumetanide	Dehydration causes hypotension. Low potassium (which can cause fainting and general weakness) and low sodium (which can cause sluggishness and confusion).
Angiotensin receptor blockers (ARBs)	Losartan, candesartan, valsartan, irbesartan, olmesartan, telmisartan, eprosartan	May cause less orthostatic hypotension than ACEIs. Excreted by liver and kidney.
Calcium channel blockers that only reduce blood pressure	Amlodipine, felodipine, nifedipine, lercanidipine	Cause hypotension and paroxysmal hypotension.
Calcium channel blockers which slow the pulse and reduce blood pressure	Diltiazem, verapamil	May cause hypotension or bradycardia.

## POSSIBLE RISK OF FALLS PARTICULARLY IN COMBINATION

MEDICATION GROUP	COMMONLY USED MEDICATIONS WITHIN THE GROUP	EFFECTS ON FALLS RISK
Acetylcholinesterase inhibitors (for dementia)	Donepezil, rivastigmine, galantamine	Cause symptomatic bradycardia and syncope.

### Note

The list is not meant to be fully comprehensive but intended to raise awareness of the types of drugs that can contribute to falls. There may be other drugs that increase the risk of falls in certain patients.

## MEDICATION REVIEW: REDUCING THE RISK OF FALLS

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.

### KEY POINTS

- Patients 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 ( $\geq 65$  years of age) have altered pharmacokinetics and may be more “sensitive” to medications.
- Renal function impairment may result in accumulation of medication and increased risk of adverse reactions.
- Patients taking  $\geq 4$  prescription drugs, regardless of pharmacologic classification, are at an increased risk for falls.
- There are two classes of drugs that have the highest propensity to cause falls, those acting on the brain and those acting on the heart and circulation. See attachment 1 for more information on individual drugs.
- Orthostatic hypotension is often caused by medication and leads to falls in older adults.
- Theoretically ANY drug that causes the following effects can increase the risk of a serious outcome if an individual falls:
  - Osteoporosis or reduced bone mineral density, e.g. long term use of steroids: Increased risk of fracture if a fall occurs.
  - Bleeding risk e.g. anticoagulants: Increased risk of a cerebral haemorrhage if a fall occurs.



## SYMPTOMATIC HYPOTENSION IN SYSTOLIC CARDIAC FAILURE.

- Liaise with the consultant for patients with symptomatic hypotension in systolic cardiac failure and review all medicines the patient is taking.
- ACEIs and beta blocker have a survival benefit in systolic cardiac failure and should be maintained whenever possible.
- Most cardiac failure in older people is diastolic (preserved left ventricular function). ACEIs and beta blockers have little survival benefit in diastolic failure.

### KEY ACTIONS

- Consider intervention, especially if you have assessed the patient as high risk:
  - Consider risk/benefit ratio: Does the benefit of the drug outweigh a possible risk of falling?
  - Is there a safer drug or non-drug alternative?
  - Is it possible to minimize the dose without losing the benefit of the drug?
- To screen for postural hypotension lying and standing blood pressures should be performed.

(Remember to keep the instrument at the level of the patient's heart both when they are lying and when they are standing). Orthostatic hypotension is defined as a drop in BP (usually >20/10 mm Hg) within three minutes of standing.

Symptomatic orthostatic hypotension can be reversed by non-pharmacological interventions.

These include advice on avoiding:

- Sudden head-up postural change (especially first thing in the morning), hunger, dehydration, excessive heat. large meals especially with alcohol, straining (when passing stool)

The use of compression hosiery to increase venous return is an option for low blood pressure (in the absence of any signs of arterial disease, e.g. intermittent claudication).

If non-pharmacological interventions fail, pharmacological interventions may be required. These include use of blood pressure elevating drugs such as fludrocortisone, corrective measures such as use of slow sodium 2g-10g/day or laxatives to prevent straining.

REMEMBER - medicines are just one of many factors that can increase the risk of falling. Others include:

Motor problems, physical problems, environmental problems, cognitive problems, behavioural problems, cardiovascular problems and neurological problems.

**If in any doubt, or you have concerns about a resident and their falls or falls risk please contact your Community Matron or the CHAT rapid response line on 02087026333**