BRITISH JOURNAL OF
HOSPITAL MEDICINE

REVIEW

Strategies for Non-Pharmacological Management of Orthostatic Hypotension in Older People: Bridging Pathophysiology and Practice

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Abstract

This review examines the effectiveness of non-pharmacological interventions for managing orthostatic hypotension (OH), a condition prevalent among older adults. Current guidelines prioritise non-pharmacological methods such as physical counter-manoeuvres and compression garments as first-line treatments for OH. Conducting a comprehensive medication review to identify potentially causative agents, along with patient education, is highlighted as essential for optimising the efficacy of non-pharmacological interventions. The review addresses the potential pathophysiological underpinnings of OH, identifying neuro cardiovascular control, vascular insufficiency and the effects of ageing as key treatment considerations. Additionally, it highlights the importance of patient-specific factors, emphasising the strengths of individualised treatment plans. Limitations, including the challenges of heterogeneity in OH, patient adherence and inter-individual variability are discussed, alongside future research needs aimed at optimising these strategies. Effectively managing OH with accessible, cost-effective and low-risk non-pharmacological methods could benefit individuals with OH and help meet the growing healthcare demands of an ageing population.

Key words: blood pressure; cardiovascular therapy; haemodynamics; orthostatic hypotension; postural hypotension; ageing; pathophysiology; non-pharmacological interventions

Submitted: 28 November 2024 Revised: 27 January 2025 Accepted: 27 February 2025

Introduction

Orthostatic hypotension (OH) is prevalent in older adults and those with chronic disease, affecting one in five community-dwelling older individuals (Saedon et al, 2020) and one in three people with Parkinson's disease (Velseboer et al, 2011). Worryingly, a review of UK hospital admissions for OH as the primary diagnosis, revealed a notable 110% increase in cases between 2008 and 2017 (Duggan et al, 2019). With projections from the Office of National Statistics forecasting that over 20% of the UK population will be aged 65 or older within the next decade (Office for National Statistics, 2022), the importance of effectively managing OH becomes clear. Non-pharmacological methods, being accessible and low cost, offer a promising alternative. Additionally, the older population is prone to polypharmacy and a preference for non-pharmacological therapies for OH has been noted due to the burden of already taking numerous medications (Frith et al, 2014). This highlights

How to cite this article:
Owen CM, Frith J. Strategies for Non-Pharmacological Management of Orthostatic Hypotension in Older People: Bridging Pathophysiology and Practice. Br J Hosp Med. 2025. https://doi.org/10.12968/hmed.2024.0956

an opportunity to reduce medication-related side effects while addressing the growing demands of an ageing population on the healthcare system. But the question remains: do non-pharmacological interventions deliver effective results?

Current guidelines for the management of non-acute OH, recommend non-pharmacological approaches as first-line interventions, in all but the most severe cases, regardless of the proposed cause (Juraschek et al, 2024). The latest recommendations from the American Autonomic Society and the National Parkinson's Foundation (Gibbons et al, 2017) advocate a stepwise approach to treating neurogenic OH. The first step is a review of current medications that may impact stable postural blood pressure (BP). Thereafter, non-pharmacological measures are advised. Medication is prescribed only if non-pharmacological methods are considered inappropriate at the initial presentation or prove insufficient in managing symptoms over time. Despite the high prevalence of OH, and patient preference for non-drug interventions, research in this area is limited and clinical practices can vary widely. The solution to these challenges lies in a deeper understanding of the pathophysiology of OH and the role of non-pharmacological interventions in tailoring treatment to the underlying abnormalities.

Pathophysiology of Orthostatic Hypotension

While OH pathophysiology is relatively straightforward in conditions such as diabetes (post-ganglionic autonomic neuropathy) (Juraschek et al, 2019; Wu et al, 2009) or multiple system atrophy (predominantly pre-ganglionic neuropathy) (Young and Mathias, 2004), it is more complex in older people and in people with essential hypertension. It is believed that age-related alterations at multiple cellular, tissue and physiological levels, combined with the presence of comorbidities and polypharmacy, collectively drive the onset of this condition (Dani et al, 2021; Magkas et al, 2019; Shams and Morley, 2018). Whereas the proposed pathophysiology in those with essential hypertension includes baroreflex dysfunction, endothelial dysfunction, pressure diuresis and medication side effects (Biaggioni, 2017). Herein lies the challenge of treating a heterogenous condition. A logical starting point would be to identify the likely areas of pathophysiology responsible for the characteristic BP drops observed in OH. These would involve the systems that regulate haemodynamic control, as well as the mechanisms involved in standing upright, since this movement precedes OH.

Upon standing, gravitational forces shift blood downwards to the lower torso and extremities, which is promptly detected by the baroreceptors. Vagal withdrawal and increased sympathetic activity ensue until stroke volume and cardiac output return baroreceptor firing rate to set point (Stewart, 2012). An inefficient or dysfunctional autonomic nervous system leaves an individual vulnerable to OH by failing to swiftly restore BP following the transient drops that can occur when standing upright (Shams and Morley, 2018). This initial deficit can be further compounded by underlying disease of structures involved in haemodynamic control such as aortic stenosis and mitral regurgitation, resulting in the more sustained and pronounced BP drops observed in OH (Magkas et al, 2019).

Table 1. Medications associated with the onset or exacerbation of orthostatic hypotension.

Medications for review	Drug class	Examples	Potential mechanisms in OH
Sympatholytics	α-blockers	Doxazosin, alfuzosin	Vasodilation* (Prisant, 2006)
	β-blockers	Propranolol, bisoprolol	Renin inhibitor, reduced total peripheral resistance and impaired compensatory postural heart rate response (Drayer, 1987; Bhanu et al, 2021)
Vasodilators	Nitrates	Glyceryl trinitrate (GTN)	Vasodilation* (Mussi et al, 2009)
	Calcium channel blockers	Verapamil, diltiazem	Vasodilation* and impaired compensatory postural heart rate response (Opie, 1984)
	ACE inhibitors and ARBs	Ramipril, lisinopril, losartan, candesartan	Vasodilation (efferent CNS and PNS suppression) (Dézsi, 2014)
	PDE5	Sildenafil, tadalafil	Vasodilation by amplified effects of nitric oxide (Prisant, 2006)
Diuretics	Loop diuretics	Furosemide, bumetanide	Increased diuresis (Rivasi et al, 2020)
	Potassium-sparing	Spironolactone, eplerenone	Increased (minimally) diuresis, reduced total peripheral resistance (Rivasi et al, 2020)
	Thiazides	Bendroflumethiazide, indapamide	Increased diuresis, reduced total peripheral resistance (Craig, 1994)
Psychotropics	Antipsychotics	Chlorpromazine, quetiapine	Vasodilation* (α1-blocker) (Gugger, 2011)
	Anxiolytics	Diazepam, lorazepam	Reduced total peripheral resistance, muscle relaxant (skeletal muscle pump), reduced inotropy, efferent CNS suppression (Poon and Braun, 2005; Kitajima et al, 2004)
	Antidepressants	Tricyclic: amitriptyline;	Vasodilation* (α1-blocker)
		SSRIs: sertraline	Vasodilation (autonomic dysregulation), bradycardia, hyponatremia (Bhanu et al, 2021)
Antiparkinsonism medication	MAO-B inhibitors	Selegiline, rasagiline	Vasodilation* (increased CNS dopamine) (Bhattacharya et al, 2003)
	Levodopa	Sinemet, madopar	Vasodilation* (CNS and PNS suppression), ECF volume depletion (Craig, 1994)

Medications to review as potential contributors to orthostatic hypotension, largely based on observational evidence.
*, vasodilation as a result of direct effect on vascular smooth muscle.
ACE, angiotensin converting enzyme; ARBs, angiotensin II receptor blocker; CNS, central nervous system; ECF, extracellular fluid; MAO-B, monoamine oxidase B; PDE5, phosphodiesterase-5; PNS, peripheral nervous system; SSRIs, selective serotonin reuptake inhibitors; OH, orthostatic hypotension.

Effective neuro cardiovascular control, with coordinated inotropic and chronotropic adjustments, is not sufficient on its own to maintain stable postural BP. The mitigation of excessive blood pooling due to gravitationally induced volume shifts, also weighs on the vasculature's ability to effectively respond to neural signals, primarily by adjusting total peripheral resistance. The lower body's venous system can accommodate up to 700 mL of translocated blood due to its high distensibility (Biaggioni, 2017). Therefore, factors associated with ageing like vascular insufficiency, increased permeability ('leaky vessels') and reduced skeletal mass can be seen to compromise venous return.

Medication Review

The initial phase of managing a patient with OH involves a comprehensive review of medications that may be exacerbating the condition (see Table 1). This recommendation helps identify any potentially causative drugs, allowing for adjustments that could improve postural BP control (Gibbons et al, 2017). However, although medication is deemed a modifiable risk factor, the literature remains divided on the strength of its causality, as most evidence is observational with little to no studies on the effects of medication withdrawal. However, guidelines and expert opinion remain consistent in their recommendations to reduce or stop nitrates, vasodilators, diuretics, α1-blockers and tricyclic antidepressants or other agents with anticholinergic side effects (see Table 1). There is less agreement on the withdrawal of antihypertensives.

In the Discontinuation of Antihypertensive Treatment in Elderly People (DANTE) Study, withdrawal of antihypertensive medication was associated with lower prevalence of OH in per-protocol analyses; however, this effect was not observed in the more real-world context represented by intention-to-treat analyses (Moonen et al, 2016). While not specifically performed in people with OH, the Stop Vasodepressor Drugs in Reflex Syncope (STOP-VD) trial, which randomized people with vasovagal syncope or carotid sinus syndrome, found that there were significantly fewer syncopal events in those who stopped antihypertensives, but with no increase in adverse events (Solari et al, 2017). While there is a lack of strong evidence to guide decisions around withdrawing antihypertensives in those with OH, there is a growing body of evidence that treating people with hypertension (without OH at baseline) reduces the risk of developing OH at follow-up (Juraschek et al, 2019). For example, the Systolic Blood Pressure Intervention Trial (SPRINT) evaluated outcomes by adjusting BP targets using either intensive or standard treatment. In this trial, investigators observed a significantly higher incidence of OH in their intensive treatment group. However, no change in OH incidence was found in the cohort aged 75 years and older (SPRINT Research Group et al, 2015). It is worth noting that the extensive inclusion and exclusion criteria for SPRINT would exclude the majority of community-dwelling older people (Sexton et al, 2017). To confuse matters further, meta-analyses report conflicting results, with OH prevalence decreasing both after starting antihypertensives and after discontinuation (Klop et al, 2024). Furthermore, the risk of treated hypertensive individuals experiencing falls or syncope was not strongly associated with the presence of OH (Reddin et al, 2023). Despite ongoing debate over which medications are more harmful, drug-induced causes remain the leading contributor to OH presentations in emergency departments (Sarasin et al, 2002). Therefore, conducting a thorough medication review as part of a non-pharmacological intervention strategy is an appropriate action for symptom management and risk stratification (see Table 1).

Patient Education

While patient education may not be an obvious standalone non-pharmacological intervention, it plays a critical role in reducing the impact of OH on an individual's day-to-day life. As many as half of individuals with profound OH, have reported atypical complaints and were not able to recognise the classic signs of their particular presentation (Arbogast et al, 2009). Patient education is a vital component of encouraging adherence to treatment measures, removing barriers to effective non-pharmacological therapy (Robinson et al, 2022).

Considering the heterogeneity of dysregulated postural BP, a patient-oriented approach, including detailed history-taking and relaying of daily activities, helps identify potential adjustments to the environment and activities. There is very little evidence to confirm that trigger avoidance is an effective treatment for OH, but it is unlikely such trials will be funded. However, there is some evidence which suggests that the following factors can trigger or exacerbate OH: heat (Horvath and Botelho, 1949; Wilson et al, 2007), rapid standing (O'Connor et al, 2020), carbohydrate-rich meals (Vloet et al, 2001), alcohol (Tomaszewski et al, 1995) and Valsalva-like manoeuvres (Palma and Kaufmann, 2020).

Some guidelines still recommend raising the head of the bed to a 30-degree angle to minimise nocturnal pressure diuresis and, therefore, volume loss (Gibbons et al, 2017). However, this has been shown to be ineffective in a trial which randomized older people with OH to either sleep with the head up or sleep supine. Symptoms, BP and diuresis were similar in both groups, but with increased pedal oedema in the head-up group (Fan et al, 2011).

Patients hospitalised with syncope or OH are often considered at high risk for falls, leading to restricted mobility and deconditioning, which can trigger or worsen OH (Sexton et al, 2017). Educating patients on this paradox and promoting movement, when possible, should be encouraged. Exercise as part of a non-pharmacological approach would be expected to offer added benefits for individuals with OH. There could be potential for positive adaptation to orthostatic stress by improving core strength and balance, thus reducing the risk of falls. While there is a paucity of evidence on the effects of exercise routines and OH, the general benefits of physical activity on cardiovascular health and quality of life are well-established. Intensive full-body strength training has shown significant improvements in postural BP in older OH participants (Brilla et al, 1998). However, more targeted limb strength training, aimed at assessing the skeletal muscle pump's role in mitigating OH, did not show improvements in BP or calf venous ejection fraction, despite increased lower limb muscle strength (Frith et al, 2024).

Physical Counter-Manoeuvres

As the name suggests, physical counter-manoeuvres work by performing targeted voluntary muscle contractions to induce physiological responses that counter gravity's effects, reducing venous pooling and promoting venous return. An example of this is shown in Fig. 1, where counter-manoeuvres engage muscles surrounding the distensible venous vasculature prone to venous pooling. Veins have limited vasoconstrictive ability; however, the combined action of muscle contraction and relaxation optimises the function of the unique one-way valves in the venous system, aiding venous return.

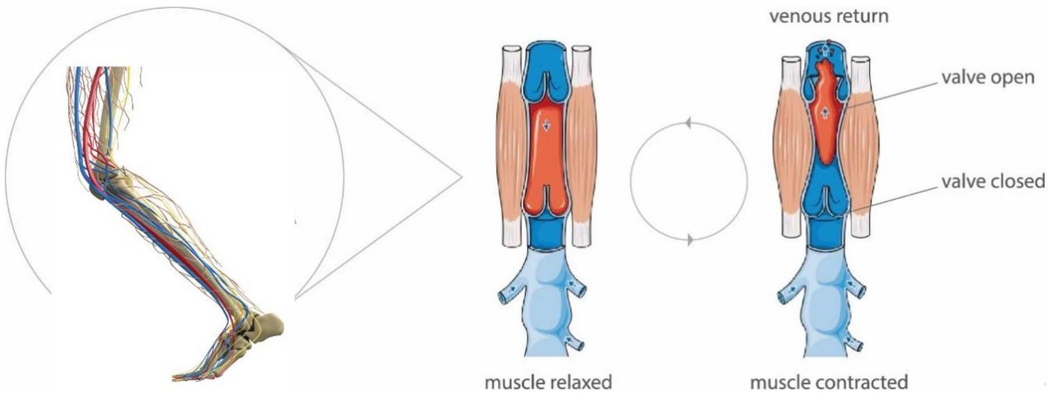

Fig. 1. A mechanism illustrating venous return facilitated by skeletal muscles and venous valves in the lower limb. The circular arrows represent the repetitive cycle of alternating muscle contraction and relaxation during counter-manoeuvres for managing orthostatic hypotension. This process aims to encourage the upward movement of blood through the one-way venous valves, supporting venous return. The figure was designed in Adobe Illustrator version 26.2 (Adobe Inc., San Jose, CA, USA) using elements from Servier Medical Art (https://smart.servier.com/), licensed under CC BY 4.0 (https://creativecommons.org/licenses/by/4.0/).

The body regions recruited for these manoeuvres could be selected based on their contribution to haemodynamic control. A study has shown that active stand tests increase intra-abdominal pressures by as much as 43 ± 22 mmHg, compared to minimal changes in tilt table tests. This suggests that fluctuations in abdominal pressure may aid venous return by rapidly expelling blood from splanchnic capacitance vessels through elastic recoil (Tanaka et al, 1996). In young people with initial OH (a profound transient BP drop within 15 seconds of standing), preactivation of lower body muscles before standing significantly improved mean arterial pressure, cardiac output and symptoms, compared to standing as normal (Sheikh et al, 2022).

Physical counter-manoeuvres are the preferred non-drug therapy amongst older people with OH as they require no equipment, no preparation and are relatively simple (Robinson et al, 2018). Isometric exercises as depicted in Fig. 2 can be performed safely, contracting muscles without the need for assuming the upright stance. The examples given are commonly utilised, but not limited to those prescribed in the management of OH. These include deliberate postures like folding the arms, crossing the legs and tensing the buttocks and abdominal muscles. They reduce postural systolic BP drop by at least 10 mmHg in 44% of older people with OH (Newton and Frith, 2018).

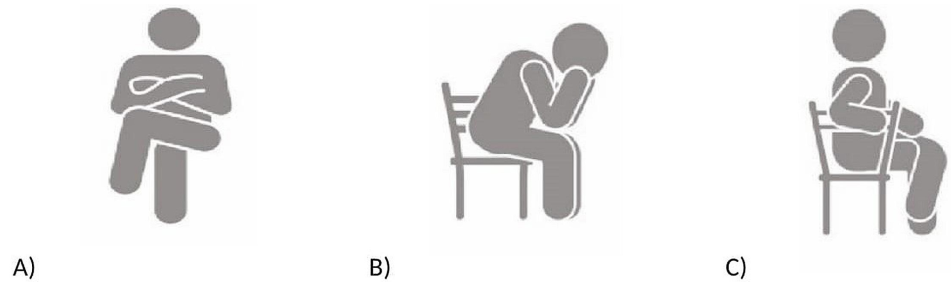

Fig. 2. Examples of seated counter-manoeuvres (A–C) which aim to counteract blood pooling and encourage venous return in the management of orthostatic hypotension. (A) Crossing the limbs—legs and/or arms, (B) compressing the splanchnic-mesenteric region in the brace position, and (C) tensing buttocks and/or abdominal muscles. The figure was designed in Adobe Illustrator version 26.2 (Adobe Inc., San Jose, CA, USA).

Wieling and colleagues caution that increasing intrathoracic pressure too excessively through physical counter-manoeuvres may work counter to their intended purpose by impeding venous return. They also highlight the potential instability of manoeuvres like leg crossing, recommending instead that older individuals use buttock clenching, which has proven effective in their experience, particularly for addressing initial OH (Wieling et al, 2015).

Compression Garments

Compression garments are available in various forms, including knee-high or thigh-high stockings, abdominal binders, and full-body compression suits, and they differ in the amount of pressure they provide. The aim of compression is to reduce the volume of venous blood 'pooling' in the lower limbs and splanchnic-mesenteric region. The volume of blood in a single calf is around 100 mL during standing with an ejection fraction of approximately 40–60% (Kan and Delis, 2001), whereas the splanchnic organs are the body's largest venous reservoir, accommodating approximately a quarter of the total blood volume (Henry and Meehan, 1971). As summarised in Fig. 3 (designed with permissions), the comparison of compression sites by Denq and colleagues (1997) is consistent with this blood volume distribution, showing that compression of the thigh or calf muscles alone provides no significant effect on the standing BP in people with OH. In a study of progressive OH, defined as the gradual deterioration of postural BP during a tilt table test, abdominal compression demonstrated an additive effect to limb compression in maintaining stable BP in an older cohort with mean age of 70 $\pm$ 11 years (Podoleanu et al, 2006). In line with their findings, abdominal compression alone, or in combination with full leg length compression appears to be the most effective strategy for increasing standing BP and improving symptoms (Denq et al, 1997; Frith and Newton, 2020; Okamoto et al, 2016).

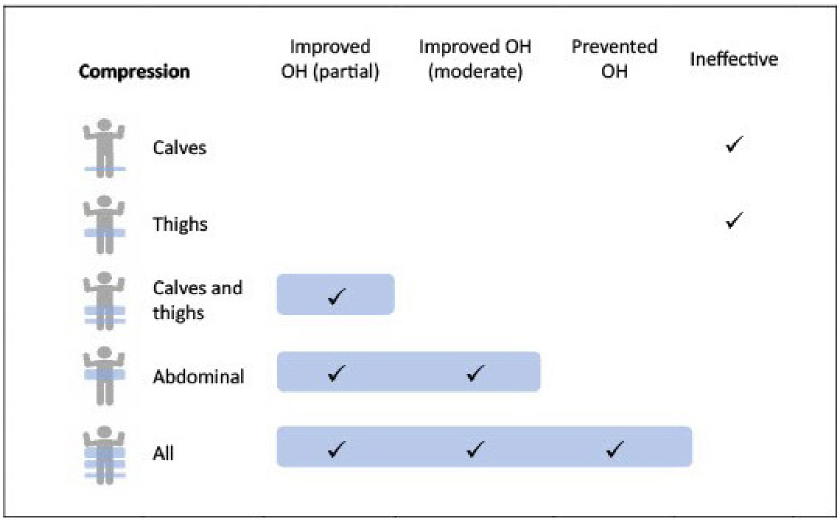

Fig. 3. A comparison of the impact of compression of various anatomical sites, showing the isolated and additive effect of each on standing blood pressure in orthostatic hypotension. The figure was designed in Adobe Illustrator version 26.2 (Adobe Inc., San Jose, CA, USA).

Fluid, Salt and Caffeine Intake

Non-pharmacological dietary strategies for managing OH focus on increasing intravascular volume to support baseline BP and stabilise postural BP fluctuations. This broad approach supports BP maintenance over time, however, for more immediate relief in OH, bolus water ingestion aids in expanding blood volume and acts acutely by inducing a pressor response (Oyewunmi et al, 2023). Rapid ingestion of water reduces the osmolarity of blood in the portal vein which is detected by osmoreceptors in the liver. These receptors are linked to the sympathetic nervous system, and result in increased BP within 5–10 minutes, reaching their peak around 30 minutes and lasting for around 60–90 minutes (Mathias and Young, 2004; Shibao et al, 2013). In a recent meta-analysis, rapid intake of 350–500 mL of water raised mean BP by 24 (95% confidence interval 15–33) mmHg (Oyewunmi et al, 2023) in people with OH, but interestingly there was no effect seen in healthy controls. This establishes bolus water ingestion as a non-pharmacological approach that acts both quickly and offers relatively sustained effects for managing OH. The longer-term benefits of repeated bolus water drinking are not known.

Increasing intravascular volume can also be achieved through higher salt intake, though results are less compelling than with water bolus therapy. Evidence for short-term improvement is low-quality, and there are no trials supporting its long-term efficacy or safety (Loughlin et al, 2020). Consequently, the American Heart Association suggests a daily salt intake of 10 g for OH but stresses the need to balance this with risks like supine hypertension and pressure natriuresis (Juraschek et al, 2024).

Caffeine appears to reduce postprandial BP drops in older individuals (Heseltine et al, 1991), but its overall effectiveness as a supportive agent in OH is inconclusive. A systematic review of five relevant studies on caffeine and OH found inconsistent results when caffeine was used alone (Gibbon and Frith, 2021), but the accessibility of readily available nutritional measures like caffeine makes this approach a practical non-pharmacological strategy for daily management of OH. However, until more evidence is available, a cautious approach should be taken towards the potential effects of increased consumption of this compound, especially on more pronounced BP fluctuations due to fluid shifts in patients with autonomic failure.

Management of Supine Hypertension

In those with autonomic dysfunction or essential hypertension, supine hypertension is common alongside OH. This complicates its management, particularly in the older population, prone to age-associated decline in autonomic function (Shams and Morley, 2018). There is very little evidence to inform management of this challenging scenario. Traditionally the approach follows the guidance of an expert consensus statement, which recommends that 'the potential benefits and risks cannot be reliably quantified, such that management decisions have to be based on clinical judgement'. This involves weighing up the potential cardiovascular risks of supine hypertension against the reduced quality of life with standing hypotension (Jordan et al, 2019). However, as discussed earlier, the landscape may be changing, with emerging evidence suggesting that addressing supine hypertension may reduce pressure diuresis and thereby improve circulating volume and standing BP. This has been demonstrated in a recent small study which used continuous positive airway pressure (CPAP) to treat the supine hypertension associated with OH (Okamoto et al, 2023). Other non-pharmacological strategies include avoiding the supine position during the day, avoiding medications which could increase BP such as noradrenaline reuptake inhibitors and limiting water intake before bedtime. Theoretical strategies have been posited, to include 'therapeutic postprandial hypotension' by ingesting carbohydrates (or even alcohol) before bedtime (Jordan et al, 2019).

Limitations and Overcoming Barriers to Adherence

While non-pharmacological interventions are widely utilised, their application may be limited in higher-risk groups. Here, pharmacological agents such as midodrine and fludrocortisone remain essential for patients with more profound autonomic failure. The latest guidelines from the American Autonomic Society and the National Parkinson Foundation (Gibbons et al, 2017) acknowledge that in high fall-risk cases, non-pharmacological measures may need to be secondary, serving a supportive role alongside pharmacological therapy from the start.

In clinical practice, while it is common to employ multiple non-pharmacological strategies together, the overall benefits may not always justify the effort required for adherence to multiple strategies when a single therapy may be adequate. A study involving participants with OH showed no added benefit to postural BP stabilisation when non-pharmacological interventions were used in combination (Frith and Newton, 2020).

Table 2. Strategies to improve adherence to non-pharmacological treatments for orthostatic hypotension.

Focus	Strategies	Examples in practice
Knowledge	Understanding therapy efficacy	Patient education
	Behavioural experiments to challenge preconceived ideas	Drinking more water to observe the effects on incontinence
Feedback	Self-monitoring by trialling a therapy	Keeping a symptom diary to observe positive treatment effects
	Demonstrating the efficacy of physical counter-manoeuvres	Biofeedback using continuous non-invasive BP measurement
Repetition	Practicing	Performing physical counter-manoeuvres during clinic visits
	Habit forming	Prescribing twice-daily practice to improve familiarity
		Using bolus water drinking with regular medication
Troubleshooting	Identifying solutions to overcome common barriers	Opting for flavoured water to address an aversion to plain water consumption

Potential behavior change strategies in clinical practice to improve uptake and adherence of non-pharmacological therapies in the treatment of orthostatic hypotension. BP, blood pressure.

Despite being preferred by older people with OH (Frith et al, 2014), non-drug therapies are associated with several barriers. For example, incontinence is a frequent barrier to increased fluid intake, while discomfort and aesthetics are barriers to compression hosiery. However, barriers can be overcome, and behaviour change strategies specific to older people with OH are available to increase uptake and adherence to non-drug therapies (Robinson et al, 2022). Examples of these are summarised in Table 2.

Personalised Treatment Strategies

Instead of a 'one size fits all' approach for OH, incorporating the pattern of postural BP changes into treatment strategies may provide better outcomes. For example, interpreting the underlying mechanisms, a transient BP drop upon standing that quickly recovers may be non-pathological and more suited to non-pharmacological interventions, while more pronounced and sustained drops may require pharmacological intervention (Owen et al, 2022). Additionally, a more personalised approach to OH management, focused on detailed evaluation of postural BP patterns, could reveal conditions beyond the typical drops seen in OH. An example is orthostatic hypertension, characterised by increases, rather than drops in postural BP. Emerging evidence links this condition to elevated risks of cardiovascular disease (Juraschek et al, 2023), frailty (Choi et al, 2024; Owen et al, 2025) and all-cause mortality (Kostis et al, 2019). Currently, the challenge to evaluating subtle changes in postural BP lies in the availability of technology and poor reproducibility. In clinical practice, assessments are limited to a few readings and they do not account for variations in circulating blood volume (Kario, 2009). The ideal approach would involve consistently tracking BP readings over time, on a beat-to-beat level. However, current technologies for home monitoring fail to meet the quality standards necessary for inclusion in clinical guidelines for diagnosing postural BP conditions (Gibbons et al, 2017).

To optimise and accurately gauge the efficacy of non-pharmacological interventions, the choice of intervention should encompass a comprehensive health assessment and be tailored to the individual's preferences, lifestyle and severity of symptoms. For instance, physical counter-manoeuvres may be inaccessible to frail individuals with reduced muscle strength. In such cases, compression garments may offer a more practical solution, with particular clinician attention to balancing the discomfort of abdominal binders, which encourage usability, against limb compression stockings, which are less effective and can be more challenging to don. Expanding such considerations to individuals with severely limited mobility, fluid and salt supplementation could be a more appropriate alternative. Non-pharmacological interventions can interact uniquely with different underlying pathophysiologies. For instance, individuals with autonomic failure may exhibit an exaggerated pressor response to bolus water drinking. Similarly, an awareness of the side effects of treatments for comorbidities, such as in the case of Parkinson's disease, may guide Parkinson's management decisions to address OH. Importantly, non-pharmacological interventions can be adjusted based on the person's day-to-day fluctuations in symptoms, allowing for a more dynamic approach to managing OH.

Conclusion

In conclusion, non-pharmacological interventions show promise as first-line treatments for OH, particularly in older adults for whom pharmacological options may pose risks. Currently, the most frequently prescribed strategies include physical counter-manoeuvres, compression garments, and increased intake of fluids, salt and caffeine. However, the heterogeneous nature of OH, along with variability in patient adherence and response, underscores the importance of a comprehensive medication review and opens the possibility for tailored treatment strategies. Personalising intervention plans could be optimised by targeting the potential pathophysiological drivers of OH, specifically neuro cardiovascular control, vascular function and the mechanistic systems recruited in the act of standing upright itself.

Future research should aim to develop prospective clinical trials to address the lack of long-term analysis on the efficacy of non-pharmacological interventions, especially in older populations, focussing on their limitations to improve adherence and integrate them with pharmacological options when necessary. This would cater to the diverse needs of older adults with OH, providing a balance of efficacy, convenience and patient-centred care.

Key Points

- The high prevalence of orthostatic hypotension warrants a focus on accessible treatment strategies. This is achievable through the current approach of employing non-pharmacological interventions as first-line treatment.
- Frequently used non-pharmacological methods include culprit medication withdrawal, trigger avoidance, physical counter-manoeuvres, compression garments and bolus water consumption.
- A comprehensive medication review is critical to identify and adjust or withdraw drugs contributing to OH while balancing their therapeutic benefits.
- There is a growing evidence-base which suggests that treating hypertension may not worsen OH. However, both essential hypertension, and concomitant supine hypertension in OH require more conclusive evidence.
- Given that counter-manoeuvres can be performed as and when needed, and without any specific equipment, they are generally well tolerated with good adherence in older persons, making them a principal consideration for the non-pharmacological treatment of OH in this cohort.
- Validated behaviour change techniques personalised to individuals, may improve uptake, adherence and the efficacy of non-pharmacological interventions.

Availability of Data and Materials

All the data of this study are included in this article.

Author Contributions

Initial draft: CMO; First draft validation: JF. Critical revisions and edits were collaboratively made by CMO and JF. Both authors have approved the final manuscript version. Both authors made substantial contributions to design. Both authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethics Approval and Consent to Participate

Not applicable.

Acknowledgement

Not applicable.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

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