

## Evidence in Action

# Orthostatic Hypotension: A Management Opportunity

By Robert Vining, DC, and William Alexander, DC

**ACCORDING TO THE CENTERS FOR DISEASE CONTROL AND PREVENTION**, approximately one-third of adults age 65 and older fall each year.<sup>1</sup> Falls are the leading cause of fatal/nonfatal injuries in this age group.<sup>2</sup> The causes vary. Orthostatic hypotension (OH) increases fall risk. OH is defined as, “a sustained reduction of systolic blood pressure of at least 20 mmHg or diastolic blood pressure of 10 mmHg within 3 minutes of standing or head-up tilt to at least 60° on a tilt table.”<sup>3</sup> OH is caused by one or more underlying conditions, meaning the diagnosis is more of a waypoint than a final destination. We looked at the literature to refresh our understanding of its causes and treatment options.

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### An Evidence-based Consideration

We entered “orthostatic hypotension management” into the search engine on the PubMed homepage. We refined the resulting unmanageable list of 600 article titles by selecting the filter “Free full-text availability” to display only articles that can be accessed without a fee or subscription. We checked “5 years” to refine our search to

include recently published articles. Adding these filters reduced the list to fewer than 60 articles, which we scanned. We selected a review entitled, “Preventing and treating orthostatic hypotension: As easy as A, B, C.”<sup>4</sup>

### Pathophysiology

To summarize the article, gravity pulls circulating blood into the lower body when arising from a seated or supine position. Baroreceptors located predominantly in the aortic arch and carotid sinus detect the resulting reduction in blood pressure and signal the central nervous system to induce peripheral vasoconstriction and increase heart rate to compensate for and offset the pooling effect. Without these adaptive mechanisms, the individual risks transient hypoperfusion of the brain leading to OH symptoms, including lightheadedness, dizziness, visual disturbances, weakness, cognitive impairment and pre-syncope. All create an increased risk for falling.

OH can also manifest as headaches and/or neck pain (i.e., coat-hanger pain) with upright postures, caused by ischemia to the muscles of the neck.<sup>5,6</sup> Because these symptoms can be the first noticeable signs of OH, a doctor of chiropractic (DC) could be the initial provider consulted. Occasionally, OH presents as orthostatic dyspnea or angina mimicking potential life-threatening conditions.<sup>6</sup> Symptoms are often exacerbated by situations that trigger a fall in cardiac output. Commonly reported triggers include hot environments, alcohol consumption, inadequate fluid intake, fluid loss (severe burns, diarrhea), prolonged static standing, activities increasing intrathoracic pressure (defecating, coughing) and prescription or illegal drug use.

Common etiologies for OH include cardiovascular diseases, neuro/endocrine imbalances, blood volume depletion and medication side effects. (Table 1 provides a brief summary of some common conditions that can cause OH.) Because so many common health conditions can contribute to OH, you will encounter numerous patients with the potential for developing symptoms. In addition, some medications can cause/enhance OH. (Table 2 provides a useful list.)

**Table 1: Summary of common conditions underlying orthostatic hypotension<sup>6-12</sup>**

Differential DX. Category	Signs/Symptoms	Findings	Possible Etiology
Cardiovascular	Chest pain, palpitations, shortness of breath	Cardiac murmur or gallop	Congestive heart failure, myocardial infarction
	Extremity swelling	Pitting edema	CHF, venous insufficiency
	Abnormal uterine/rectal bleeding, fatigue	Pallor of the conjunctiva, nail beds and palmar creases	Anemia
Blood volume depletion	Chills, fever, nausea, vomiting	Fever and sweating	Gastroenteritis, sepsis
	Confusion/mental fog	Dry mouth, longitudinal tongue furrows, sunken eyes, upper-body weakness	Dehydration
Neuro/endocrine imbalance	Fatigue, reduced strength, weight loss, dry/itchy skin, gastric pain, nausea, vomiting	Low blood pressure, hyperpigmentation of elbow skin, loss of axillary or pubic hair	Adrenal insufficiency
	Insidious onset of urinary or sexual dysfunction, GI issues	Normal cognitive, sensory and motor control	Pure autonomic failure
	Bradykinesia, unilateral resting tremor	Stooped posture, decreased arm swing, rigor, expressionless face	Parkinson's disease
	Visual deficits, eye pain with movement, limb weakness, over-active bladder, symptoms exacerbated by heat	Upper-motor neuron lesion signs, Lhermitte's sign, optic disc swelling	Multiple sclerosis

## Limitations

The article we selected is not based on a systematic review of the literature with well-described and thorough search methods. Therefore, the strength of evidence is considered lower than if the review were performed systematically.

## What This Process Did for Us

For us, the two most relevant aspects of this article are 1) the reminder that OH can present as neck pain radiating to the head and shoulders, and 2) the following statement: “Drug therapy alone is never adequate. Because orthostatic stress varies with circumstances during the day, a patient-oriented approach that emphasizes education and non-pharmacologic strategies is critical.”

Some non-pharmacological management options the authors include are:

- ▶ wearing an abdominal binder when out of bed;
- ▶ sleeping with the head of the bed raised 4 inches;
- ▶ training patients to perform lower-extremity contracting maneuvers;

**Table 2: Common medication classes with possible OH contribution<sup>4,13</sup>**

Medication Class	Prescribed Use	Contribution to OH
Antiparkinsonian Agents	Parkinson's	Decreased sympathetic tone and vasodilation
Narcotics	Analgesic	Vasodilation
Antidepressants (tricyclic, SSRIs, monoamine oxidase inhibitors)	MDD, OCD, SAD, GAD, and PTSD	Vasodilation
Neuroleptics	Schizophrenia, bipolar disorders	Vasodilation
<b>Antihypertensive/Cardiovascular agents</b>		
Nitrates	Angina pectoris	Vasodilation
Calcium channel blockers	Angina pectoris, hypertension	Vasodilation, decreased cardiac output
Diuretics	Edema from congestive heart failure, hypertension	Decreased renal reabsorption of sodium and water
Beta-Blockers	Hypertension, glaucoma, migraine, angina pectoris, cardiac arrhythmia, tachycardia	Decreased cardiac output
<b>Other Vasodilators</b>		
Medication for ED, BPH	Erectile dysfunction, BPH	Vasodilation

SSRIs: specific serotonin reuptake inhibitors; MDD: major depressive disorder; OCD: obsessive compulsive disorder; SAD: social anxiety disorder; GAD: generalized anxiety disorder; PTSD: post-traumatic stress disorder; ED: erectile dysfunction; BPH: benign prostatic hypertrophy.

- ▶ patient education to recognize symptoms of OH and situations that may precede an event; and
- ▶ mild physical exercise in a supine or seated position.

We were reminded of the importance of screening patients for, and diagnosing, OH. Appropriate management may require more than one provider type and represents a potential opportunity to co-manage or collaborate with other health care providers. Several conditions contributing to OH are more common in older adults, a rapidly growing segment in the United States. As conservative providers focusing on prevention, DCs are well-positioned to help patients manage their condition through education and preventive exercise. Lifestyle modification strategies that help patients recognize, prevent and minimize symptoms may also help reduce falling risk and prevent fall-related injuries. ■

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