

# BAROREFLEX FAILURE

## What is Baroreflex Failure?

Baroreflex failure (BF) is a **rare form of autonomic dysfunction** where the baroreflex mechanisms are not working properly.

Baroreflexes are important for the regulation of blood pressure.<sup>1</sup> When activated, the baroreflex sends electrical signals to the brain where it is combined with other input from the body.<sup>2</sup>

When blood pressure is too high, the baroreflex activates the parasympathetic nervous system and inactivates the sympathetic nervous system.<sup>3</sup> The parasympathetic nervous system activation will decrease the heart rate. The sympathetic nervous system inactivation will cause a decrease of the heart rate and stroke volume, and cause vasodilation of blood vessels. The opposite happens when blood pressure is too low.

## Cause

In those with baroreflex failure, there is **damage to the baroreflex structures** responsible for sending information through nerve impulses toward the central nervous system and brain (afferent nerves).<sup>1</sup> In baroreflex failure, the brain is not able to get the signals from the body about blood pressure status and therefore cannot regulate it well.<sup>3</sup>

It is often caused by trauma sustained from extensive neck surgery or radiation of the neck with certain cancer therapies.<sup>1</sup> In some patients, the exact cause cannot be determined.<sup>1,3,4</sup> Onset can be abrupt or more gradual, with abrupt onset more noted with neck surgeries.<sup>1,3</sup>

## Symptoms<sup>2</sup>

- Hypertension
- Hypotension
- Fluctuating blood pressure
- Syncope
- Tachycardia
- Bradycardia
- Headache
- Flushing

Baroreflex failure presents with blood pressure fluctuations throughout the day and may include hypertensive (high blood pressure) episodes and hypotensive (low blood pressure) episodes.<sup>2</sup>

During the hypertensive episodes, patients can experience blood pressure in the range of **170-280/110-135 mmHg, high heart rates, feelings of warmth or flushing, headache, and sweating.**<sup>1</sup>

These episodes are often triggered by psychological stress, emotions, physical exercise, and pain. Hypotensive, or low blood pressure episodes are less common but may involve bradycardia (decreased heart rate) and presyncope symptoms.<sup>1,3,5</sup>

*It is important to note that severe orthostatic hypotension is typically not a symptom of baroreflex failure, but instead may be a sign of pure autonomic failure. Individuals with baroreflex failure can exhibit orthostatic hypotension if they are volume-depleted and treated with sympatholytic medications.<sup>3</sup>*



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## Incidence/Prevalence

Baroreflex failure is a rare form of dysautonomia and impacts fewer than **200,000 people in the USA**.<sup>6</sup>

## Diagnosis

Baroreflex failure is diagnosed through a thorough history, physical examination, ruling out other conditions, assessing heart rate and blood pressure in response to medications, venous plasma norepinephrine testing,<sup>1</sup> and autonomic testing.<sup>7</sup>

Autonomic testing may include:<sup>7</sup>

- Ambulatory blood pressure testing (the only test to assess the absence of the baroreflex function)
- Valsalva maneuver (assessing absence of reciprocal changes in heart rate)
- Cold pressor test (assessing for an exaggerated pressor response)

## Treatment

The **main goal of treatment** for those with BF is preventing extreme high blood pressures.<sup>1</sup>

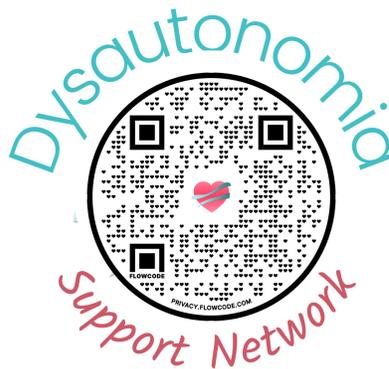
- Medications, such as clonidine, have been used to help reduce blood pressure.<sup>1,3</sup>

A **secondary goal** is to reduce the symptoms of hypotension, or low blood pressure episodes, if necessary.<sup>1,8</sup>

- Fludrocortisone may be helpful in meeting that goal.<sup>1,8</sup>

Some individuals have also needed pacemakers if they experience hypotensive, bradycardic episodes.<sup>8</sup>

Discussions with your provider should occur on how other medications can interact with the body's ability to regulate and control blood pressure with BF.<sup>1,8</sup> *Certain medications are contraindicated, or should not be taken due to potential harm.*<sup>8</sup>



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