

SYMPATHETIC/PARASYMPATHETIC INITIAL ORTHOSTATIC RESPONSE

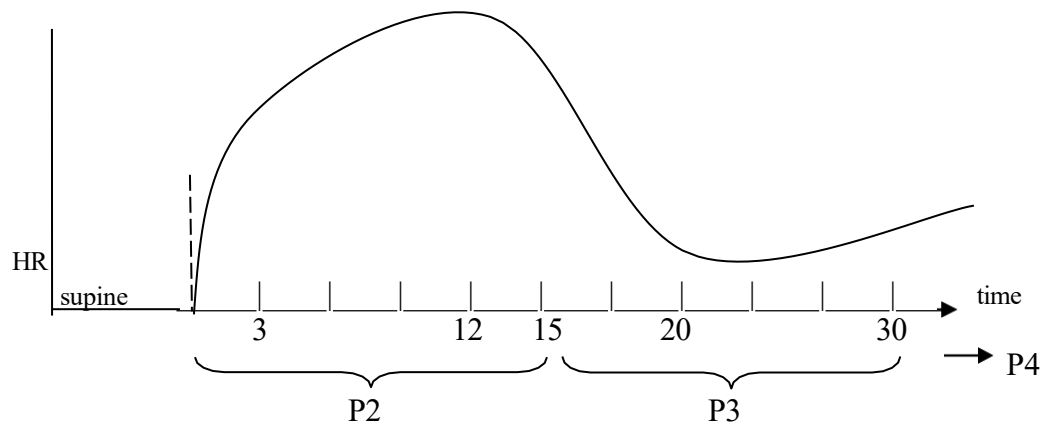
The orthostatic blood pressure response is not a simple matter of a sympathetic mediated increase in blood pressure, moving blood from the pool in the splanchnic vessels up to the brain to keep us from passing out when we stand up. The systolic blood pressure actually changes direction 4 times – going up, then down, then up, then down – in the 30 seconds beginning with initiation of the standing movement. Similarly, the diastolic blood pressure goes through the same 4 changes, but lags the systolic changes by a few seconds.

The orthostatic pulse response is just as complex. It is the initial contraction of the large muscles of the thighs, hips, pelvis, abdomen, and spine that sets off the orthostatic response. In fact, the most significant change in pulse occurs in the first 3 seconds, during most of which the patient is still recumbent.

The initial circulatory response to standing up involves the following changes in heart rate: (Refer to Figure 1, below.) As the patient initiates muscular contractions upon the command to stand up, there is a nearly vertical jump in the pulse that lasts for 3 seconds. This sharp up-move is not due to sympathetic activation, but rather to complete parasympathetic inhibition. By the 4th second, the sympathetic system kicks in, as parasympathetic inhibition is sustained, but to a lesser degree. The heart rate increase continues to a peak at 12 seconds, with a maximum instantaneous pulse count 25 greater than the supine pulse.

At the 13th second, the heart rate begins a decline steeper than the rise from seconds 4 through 12. It bottoms to a trough at about 19-20 seconds, with a minimum instantaneous pulse about 5 to 7 over the supine reading. Beginning in the 20th second, the heart rate begins a low- amplitude roller coaster with a slight upward slant, lasting up to 3 minutes.

Orthostatic Heart Rate Response



Upon orthostatic challenge, the instantaneous pulse relative to the supine pulse looks like this, second by second:

Second:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pulse:	+4	8	12	14	16	18	19	20	21	22	24	25	22	19	16
Second:	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pulse:	13	10	7	6	5	6	6	6	7	7	7	8	8	8	8

These intricacies of the pulse rate response to Orthostatic Challenge are merely for your academic edification. Your Nutri-Spec Orthostatic Challenge by which you pick up the change in pulse rate from supine to the end of 30 seconds after the feet hit the ground is all that is necessary for you to effectively evaluate your autonomic pulse rate response.

In a Sympathetic Imbalance, the orthostatic rise in blood pressure and pulse is exaggerated, and sometimes prolonged, while in a Parasympathetic Imbalance the amplitude of the changes is muted. There is also an interplay between Sympathetic/Parasympathetic balance and Electrolyte Balance in many patients' orthostatic response. All such considerations are programmed into your Nutri-Spec analysis, so you know exactly how to manage patients regardless of what wild gyrations in pulse and blood pressure they show upon orthostatic challenge.