Dear Reader,

Welcome to the November edition of the ***COHERENCE Newsletter***. Last month I shared with you the status of a study that Dee Edmonson and I are conducting where we examine the relationship between heart rate variability (HRV) amplitude and blood pressure. [I'd like to ask you to forgive my fascination with this topic. The reason it's so interesting to me is that I believe that "sympathetic bias", as well as the profound (anti-sympathetic bias) effects of Coherent Breathing are ultimately rooted in autonomic governance of blood flow and pressure.]

Per last month's letter, the study was conducted by measuring the client's blood pressure (79 assessments), then having them breathe coherently for 8-12 minutes with HRV biofeedback. At the end, their blood pressure was again assessed. Their ending average blood pressure, [(systolic +diastolic)]/2, was then compared against their HRV amplitude as demonstrated over the 8-12 minute period. Summarizing that data (Figure 1), 47/79 demonstrated HRV amplitude greater than 13 beats. All of the 47 demonstrated average blood pressure less than or equal to 100mmHg. Thirty-two demonstrated HRV amplitude less than or equal to 13 beats. Of this group, 9/32 (28%) demonstrated average blood pressure greater than 100mmHg. As mentioned last month, the objective of this research is to test the hypothesis that *relatively high blood pressure (>100mmHg) and relatively high HRV amplitude are mutually exclusive*. Please see the October ***COHERENCE Newsletter*** for a more complete discussion.

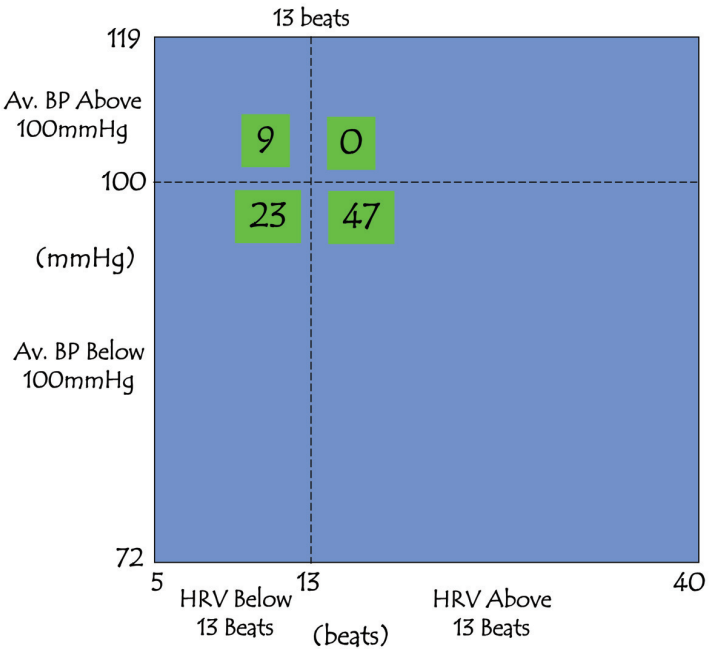

Fig. 1 - Average BP vs. HRV Amplitude (Post Breathing) (28 Subjects, 79 Assessments)

The focus of this month's newsletter is "before and after", i.e. what immediate effect does 8-12 minutes of Coherent Breathing with HRV biofeedback have on a client's blood pressure? The results are presented in Figure 2 on the next page. Please note that this data, while the same set of clients, presents 71 (vs. 79) data instances.

Figure 2 plots average blood pressure "pre-breathing" (yellow curve), average blood pressure "post-breathing" (magenta curve), and the delta (red curve). So as not to lose sight of the matter, the blue curve plots HRV amplitude. However, correlating *change* in blood pressure with *change* in HRV amplitude is beyond the scope of the present study.

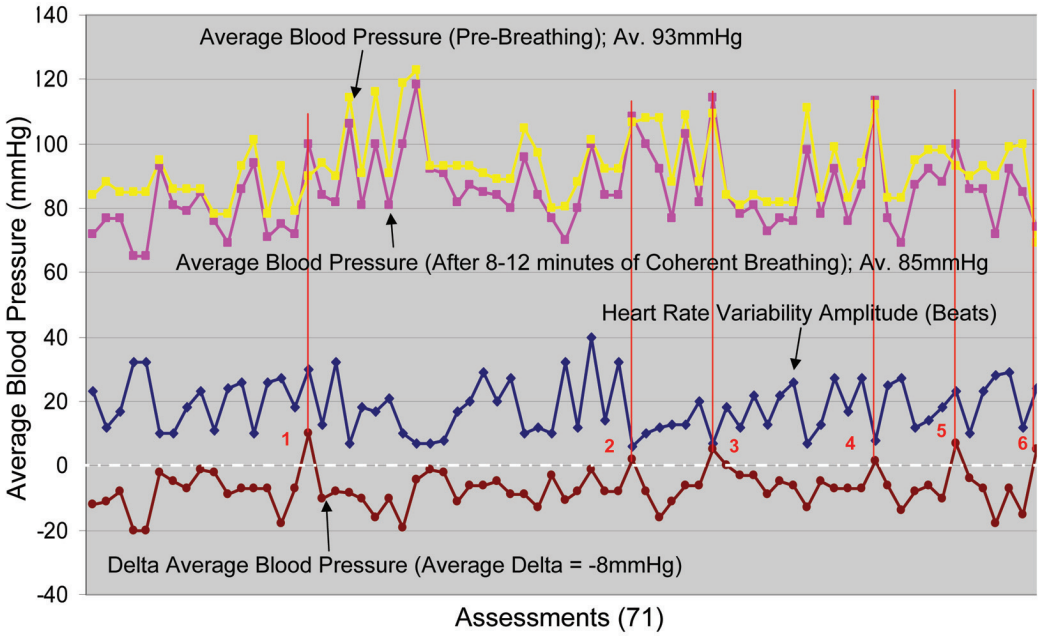

Fig. 2 - Average Blood Pressure Before & After 8-12 Minutes of Coherent Breathing

Averages are 93mmHg, and 85mmHg respectively, a delta of -8 mmHg across the group. Of the 71 instances, 64 (90%) demonstrate lower average blood pressure after than before, where the range is between 1 and 20 mmHg; 6 (~9%) demonstrate higher average blood pressure after than before. Of the 6, 3 demonstrate average blood pressure less than or equal to 100mmHg before and after; 3 demonstrate average blood pressure greater than 100mmHg both before and after, where the range of increase is between 1 and 5 mmHg. One data instance (~1%) remains the same before and after.

The argument in last month's newsletter was that relatively high blood pressure and relatively high HRV amplitude cannot coexist – so far our data supports this hypothesis. In this month's letter, we see that even 8-12 minutes of Coherent Breathing can have a dramatic effect on average arterial pressure. While we did not attempt to assess "pre" HRV amplitude, I believe it is safe to assume that in each instance where average blood pressure demonstrates a decrease, there was an accompanying increase in HRV amplitude during the 8-12 minute period of Coherent Breathing.

I hope you find this month's ***COHERENCE Newsletter*** to be of value. Next month's topic will be **"Why Do We Snore?"** Until then, thank you for your interest and consideration.

Stephen Elliott, COHERENCE