EXERCISE: KNOW Your HRV Profile:

The 4 goals of HRV Flexibility®:

1. **AWARENESS** of your patterns and how they feel physically and emotionally
2. **Increase your HRV** while maintaining good breathing (ETCO2 of 35-45 Torr)
3. **QUICK RECOVERY** from stress or exertion
4. **SHIFT** States according to the need: energy up, recovery, Balance, & energy down

**Goal 1. AWARENESS:**

7 tests for awareness. Do these for a minimum of 5 minutes each over a period of time & take Blood Pressure (BP) on occasion:

1. Start recording your HR and just notice it after 5 min of just sitting quietly without watching it or trying to relax or pay attention to your breathing. Store your data.
2. Record another time when you are following the breathing pacer which can turn on by.... It is set at a rate of 6 breaths a minute. If this seems too slow, just adjust your rate to what feels easy to maintain. The key here is to make sure you don't OverBreathe which means you are probably breathing in too deeply and setting off symptoms like feeling light headed or other symptoms listed below under *. If this is the case, try just easing the breath or letting the exhale last longer than the inhale, or shifting attention to pleasant thoughts or memories, or use one of our Optional Tasks below Keep in mind you do not get more oxygen by breathing in more air, but instead by exhaling all the air you inhaled, so if you are taking the conventional advice of taking a deep breath, make sure you let it all back out (as this is when the oxygen is released into the blood stream), and soon you will restore normal breathing which if healthy, involves letting out all that comes in, effortlessly. It turns out we only need to let very little air come in to get all the oxygen we need. Let it be easy breaths.
3. Record your HR another time when you are busy with a mental task like being on the computer or working puzzles or video games
4. Record another time when you are busy with a physical task like walking, or_____. and whether done as Interval Training. Note especially the recovery time of your HR till it stabilizes and note whether that recovery HR and HRV are at or close to your normal HR & HRV.
5. Record another time when you are feeling really stressed and identify whether you are feeling mad, sad, or anxious or other emotion. (Or you start recording and then think of or relive a time you felt really stressed. To be sure you can really feel it, you can relive the event with what you could see, hear, smell, taste, feel or touch---if you use 3 senses your body feels like it is there then).
6. Record another time when you are feeling a heartfelt emotion like appreciation, gratitude, or empathic compassion, and another time when feeling excited. Note what you are feeling for each recording.
7. Record another time when you are feeling or remembering and reliving a time when you felt at your effortless best, feeling the flow of what you are doing that is without that inner chatter or negative thoughts; or a time of special spiritual connection.
Your HRV and Breathing PROFILE: Now that you have several recordings of your HR, HRV, Spectral HRV and breathing rate and chemistry, make note of:

1. Your resting **HRV & ETCO2** under each of these conditions, especially comparing readings during paced breathing with those when you are baseline resting and not focused on breathing. (Make sure readings artifacts & arrhythmias are not averaged in.)

2. Compare those readings with HR & HRV norms for age, sex, health, and height. Consider fitness and health conditions too. See published norm considerations. Note there is not yet an agreed upon standard of norms. With capnometry, see whether your ETCO2 is in the healthy 35-45 Torr range, or above that (so over-oxygenated) or if lower, at what level of severity. See if your HR & HRV time domain readings are on the ideal side of the “norm” or if below, how far below. Low readings of ETCO2 and HRV (for your age) indicate risk.

   **My ETCO2 levels range from ___-___ and are affected by __________________**

   **My ETCO2 levels can be interpreted as:**
   - Very healthy 40-45 Torr
   - Healthy 35-40
   - UnderBreathing (UB): above 50 Torr is hypercapnia
   - OverBreathing (OB): under 35 Torr is hypocapnia
   - 30-35 Torr---Mild-Moderate
   - 25-30 Torr---Serious
   - 20-25 Torr---Severe

   and my first symptoms of OB are __________ & occur __________

   **My Breathing Rate** (Respirations per Min or RR) varies from _____-____ at rest, _____-____ during: stress, exercise, tasks, fun, Other

   (ETCO2 should stay in the healthy range unless when anaerobic) My **HR at rest** is: ___ WNL, ___ high, ___ low & fit, ___ low & unfit, ___ irregular

   **My HRV Time Domain readings at rest** are:
   - Very healthy for my age, sex, height, fitness, and health
   - WNL for my age, sex, and height
   - Low for my age, sex, and height and may be influenced by these health conditions or medicines: ________________________

   **My HRV Waves** (Frequency Domain, by Spectral analysis) are:
   - SNS dominant (ie VLF bandwidth) most of the time, at amplitudes from _____-____ (ie __ low energy, __ medium & __ high) with Peak Frequencies of _____ and typical Power of __________
   - PNS dominant in the HF bandwidth with RPM of ____ and amplitudes from _____-____, with Peak Frequencies of ______ and typical Power of __________
   - SNS & PNS (ie LF bandwidth, aka Coherence) most of the time or when__________________________

   and at amplitudes of _____-____ and typical Power of ____________________

   **My Peak Frequencies are__________________________**

   **My Total Power within sessions are ____________________________**

   **My LF/HF ratio is typically______________________________**

   **My BP is ___ at rest, ___ when stressed, ___ after exercise & ___ when at 0.1 HZ**
Goal 2. My Plan for increasing HRV & ETCO2 if they are not ideal:
The healthiest pattern is to have good HRV as long as it is not accompanied by negative symptoms. The simplest way to think of Good HRV is to see how much your HR goes up ie speeds up with an easy natural inhalation of breath and how much it slows down with an exhale, like in this example (insert graph) If it does not go up and down with your easy relaxed breath, you may either be stressed or have a health challenge or be at risk and may need to consult with your physician. Other reasons for low HRV can be age and fitness level. When we are young and very fit, our HR may vary by 20-40 beats per minute. Average resting HRV goes down with age, health challenges, and stress. If you are over 50 and while breathing slowly and easily, a good HRV may be 5-10. In any case, the goal is to increase your resting HRV without effort. This takes practice of at least 10 minutes once or twice a day for 1-3 months before it begins to change your resting baseline. There are many health, cognitive, emotional, and performance benefits to raising your HRV..., so begin now, so you can work towards better Quality of Life and increased chances of living longer. (Think of this as a daily meditation for life and happiness.)
1. If ETCO2 is chronically or situationally low, work and play with breathing tips until the breathing is easy and ETCO2 is healthy and either remains so or you can recover to healthy in 2 minutes.
2. If HR is too low, explore whatever can bring it up on occasion.
3. If HR is too high, eased breathing and relaxation techniques typically help
4. If BP is too high, practice getting to 0.1 HZ in Spectral HRV (this is a 10 sec cycle, so corresponds with breathing at a rate of 6 breaths per minute.
5. If my time domain HRV readings are typically low for my age, sex, height, health and fitness, to get increased HRV, try watching HRV graphs and slowing your breaths, or use a breathing pacer, or the HeartMath or similar heartfelt emotions techniques then see if HRV has increased and also if HR & BP decreased.
6. If Spectral HRV Waves are too dominant in VLF ie SNS, ease your breathing or use a Breathing Pacer with visual or auditory feedback and set it to what feels slower and easier and triggers no symptoms of OB. You could also test for your Resonant Frequency breathing rate and breathe at that rate. There are many techniques including meditation that can help. The goal here is to increase HRV and get into the LF range at higher amplitudes. Practice at least 10 min. a day preferably more than once a day. Practice with and without monitoring, with and without pacers until your resting and paced HRV are better than your original Baseline. 
In general keep practicing until readings are ideal if possible, and then practice maintenance.
7. An excellent practice to add (especially after getting good HRV) is HeartMath’s Heart Lock-In.

Goal 3: QUICK RECOVERY
If your recovery time for good ETCO2, HRV, and HRV Waves from VLF to LF or HF is not good, like greater than 2 minutes, it would be advisable to use:
1. The concept of Interval Training as one approach. In this you use short bursts of increased energy as in a run, or thoughts of a stress, then “cool down” while monitoring your HR, HRV, BP and ETCO2 if you can, to see how long it takes to recover to your pre stress or pre exertional state before going at it again. Here you want to know that you are “cooling down” by both what the instruments show you and by the feeling of it both physically, emotionally, and mentally.
2. Other approaches include specific strategies for a quick recovery, like:
   a.) HeartMath’s 1 minute stress manager Freeze Frame exercise
   b.) Quieting Reflex (QR) by Charles Stroebel, MD, PhD

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**Goal 4: Shift States** according to the need

1. When you able to identify the patterns of your response and what your ETCO2, HR, HRV and Spectral HRV are (ie Your HRV & Breathing Profile), and

2. you have practiced increased HRV and ideal ETCO2 till you have more control over this (usually in month or more to where you get there easily or it is “home base”), then get in this “home base” of Balance (Coherence) (Low Frequency dominance) preferably at RF ie high power at your Resonant Frequency in the Low Frequency) and next:

3. Practice producing dominance of the PNS Rest and Restore HF (High Frequency) energy associated with relaxation and also the ability to ease into sleep, and either staying relaxed, or returning “home” to LF dominance of Balance (Coherence)

4. Explore ways to increase your SNS VLF Spectral energy, at least some ways that are other than through stress, like with joy, or excitement, or imagine doing something exertional, or heroic; or do something active or breathe bigger and faster without OverBreathing; or watch something engrossing like your favorite team...Note your readings, Then purposefully see how quickly you can come back ie Recover to Balance (Coherence)

5. Practice shifting gears (states) from VLF dominance down to LF then on down into HF and back to LF. Mastery is when you can recognize these states by the “feel” of them as well as by the instrument readings. So practice some with looking at the instruments and sometimes when looking away from them followed by looking back to match the readings with your perceptions of the state.

6. Another practice is taking these learned control skills into the future.
   a. One way to do that is to called Visuo-Motor-Behavioral-Rehearsal aka the visualization skills used by athletes, speakers, performers, astronauts, triages, troops, police, firemen, students---any time you have practiced a skill and want to be able to do it whenever needed, ie it is now unconsciously available (the goal of all learning)
   b. Another way is my SQRT technique (see separate instructions)
   c. Another is to practice with Virtual Reality till the skill is mastered

7. Advanced exercise or skill: from a place of Coherence, ie internal centeredness:
   a. access a state of equanimity, then gradually expand that feeling of caring/appreciating/feeling gratitude/loving/compassion to include ultimately all others (an exquisite way to do this is the Dalai Lama’s How to Expand Love
   b. my new exercise to do this is to first recognize that we all come from source and so share that as one form of oneness. Since we are all also filled with that oneness, let’s call it Light (the physics term) or God or the Ground of being, or the Great Unknown or the Void or No-Thingness or the TetraGrammaton or.... Then find a way start with the Intention to see and feel that oneness that we share in all forms, inanimate and animate. I like to think of it as recognizing we come from or are created by the Divine (by whatever name you know) and that we are filled with that in some form (eg approximating the phi ratio in structure and process). Then see the Divine Nature in all, feel the deep Intuitive knowing of that. Then seeing and feeling that, work on learning how to act accordingly. (We may not believe we come from the Divine Light or that that Divine nature shows up in our very structure eg heart and breath and nervous systems, and bones, but if we can come to realize that, then it may be that a purpose in being alive now is to recognize this and learn how to treat one another from that place rather than from judgement.

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**BREATHE WELL, BE HEARTFUL AND HEALTHFUL, ENGAGE and LIVE IN SPIRIT**

Bob Whitehouse

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