Vertical Caving and the Curvy Caver

© *Amy Hinkle, MS*

I am a curvy caver. Because of this, I have found SRT to be extremely challenging because of how different my body mechanics are. Although this article focuses on the female form, something largely ignored in vertical caving, I encourage everyone to keep reading as all bodies are unique and it is my goal with this article and the figures within to get you thinking about how your unique body is shaped and the weight within it is distributed, as well as to help you recognize and feel what forces are acting on you while on rope.

In the *NSS News*, August 2012 issue, an article written by John Woods attempted to "typecast" vertical cavers. However, the female used appears to still be what people think of with active outdoors women, the "petite skinny" look. There is nothing bad about this; women, and men, come in a trillion shapes and sizes. The issue is simply that the curvy shape is largely ignored when it comes to physical and outdoor activity.

The problems we face are not the same as a beer-bellied old cave man, nor is it the same as a barrel-chested top heavy man, both of which we are commonly compared to. Even the "typical petite skinny" women does not have the same structure as a "skinny" man.

Women cannot be typecast into a **man's body**, period.

Hopefully, this will help explain our uniqueness. For simplicity, I have used my own body. I started with a digital photograph of my naked form, and traced the edges. All measurements are my own. Even if you are more or less curvy than I am, this still should help get you thinking about how your weight is distributed and the effects that it has.

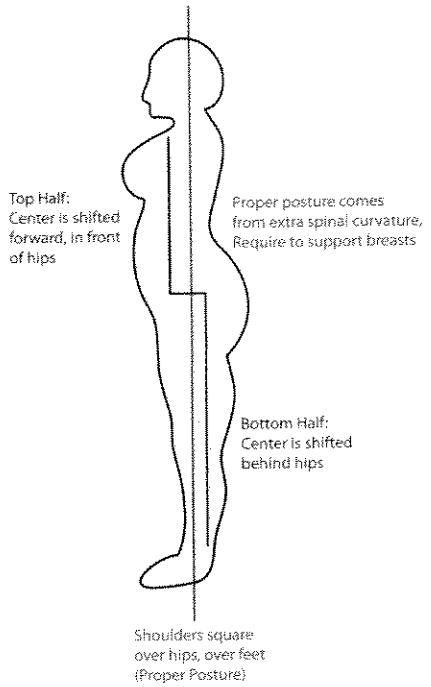


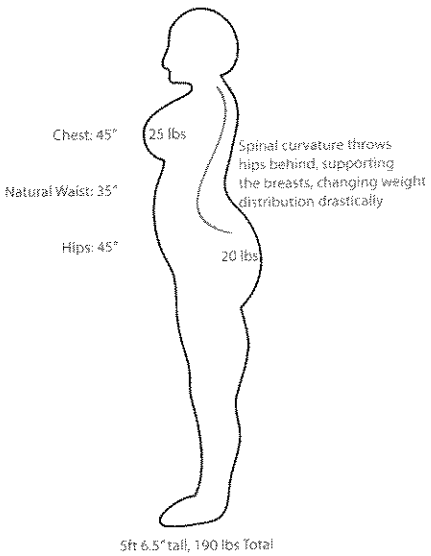
Figure 1: Basic Curvy Body Layout

Extra weight off the top front (breasts) needs extra curvature of the spine to support proper posture (shoulders over hips over feet). This basically separates the body into upper and lower portions, where the upper half has a forward-shifted center of weight, and the lower half has a rear-shifted center of weight.

Figure 2: Weights & Measurements

I typically wear a 36DDD bra (Lane Bryant sizing, note there is no standard bra sizing after a C cup!). My right breast weighs 12 pounds, my left breast weighs 13 pounds (yes, it is common to have different size breasts). This means I have 25 pounds of weight on my chest, that stick out 6 inches in front of me, 3 inches in front of my stomach with relaxed stomach muscles. Remember, the extra curvature is why my stomach sticks out in front, it's not a barrel upper body, or beer belly, it is a curve.

My hips are thrown behind me, because of the extra curvature of my spine. This makes my bum hang out behind my body way behind any center line. Funnily enough, it is rather balanced and hangs behind me by 6 inches, just as the breasts hang in front six inches. There is still symmetry in the curves! It is harder to measure weight of just the portion of my bum that hangs out, but it seems to be about 20 pounds. In addition, from a frontal view we have wide hips!



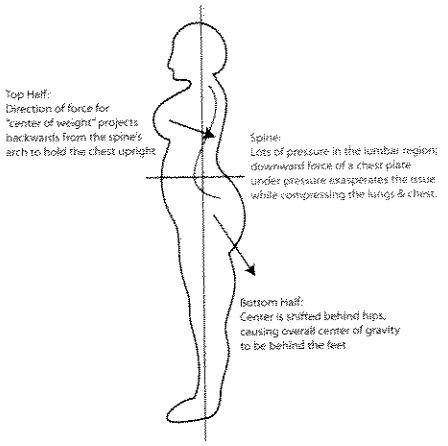


Figure 3: Center of Gravity & Other Forces

The breast weight hangs as a downward force, sitting on top of a spine with extra curve to support it. It adds weight high on the top half, making me in essence top-heavy. When on rope, this translates to falling back from the rope.

In addition, there has to be the extra 6 inches of space between me and the rope for my breasts. A chest roller holds me close as possible, and actually needs to sit on top of the breasts to keep the closeness and efficiency. The large chest plate of a roller is counter-productive. Originally designed to prevent crushing the lungs (On Rope, Bruce Smith & Allen Padgett), it actually has the opposite effect for the well-endowed. The downward force exerted, especially on a double bungee ropewalker, forces the plate over the breasts, pressing all that mass and weight into the chest cavity and compressing it. In simple terms: ***internal organs are engaged as the lungs are compressed/crushed****. Adding a waiststrap from the back of the chest harness to the back of the seat harness can help, but this simply creates a balanced overall downward force, over time having the same effect while hurting the shoulders and lower spine, already under unique strain and angles for supporting the breasts in general. I will discuss ways around this in the climbing system section.*

Although the breasts and spine curvature create a top-heavy effect, when strictly speaking above hips and below hips, more overall body weight is hips and below. Because the hips are shifted to behind the center line, this projects the overall center of weight to behind my body. Ever notice how some people can squat down with their feet flat on the ground, bum way behind them? For my body type, this is impossible as to have all that weight so far behind my heels I would fall. For me to squat, I have to roll up onto the balls of my feet to maintain balance. This sort

of thing is interesting to take note of for froggers in particular.

Curvy Caver Climbing Systems

For vertical work it is imperative to support the upper body close to the rope or the effort to stay upright will be too great. For a curvy caver or anyone who falls back from the rope, typically this rules out climbing systems such as a Frog or Texas. A system with a chest roller to hold the body upright is imperative, however, it is important to not overload the spine, shoulders, and lungs.

As previously mentioned, the large plate of the chest roller tends to engage internal organs particularly on the well-endowed with the downward pull of the bungees. If a ropewalker is desired, instead of placing the bungee through pulleys on the chest roller it may be necessary to try alternate locations. (This also may make things comfortable for those simply annoyed by the bungees pulling downward.) Perhaps this means a single bungee over the shoulder from the knee ascender, and a separate non-bungeed foot ascender strapped to the foot (Single Bungee Ropewalker). Maybe both the knee and foot ascenders are bungeed, but they both go over the shoulders similar to a single bungee system (I call this "Bungee Squared Ropewalker").

Yet another option may be to bungee the knee over the shoulder to the back as with the single bungee system, but the foot ascender gets bungeed to a leg loop or the harness maillon or halfround (My personal preference, see my YouTube video titled "Bungee & Half Ropewalker" by amysrabbitranch at https://www.youtube.com/watch?v=g_QFdZLvnok). Another option altogether is a Mitchell system which has as many permutations as a ropewalker but even in classic form does not require things attached to the chest roller at all.

The key here is letting the chest roller stand alone with nothing additional attached to it other than rope running through it as it was meant for. As for dealing with large chests, I wear a compression bra when caving so that is often what I have on for on rope. This works to help minimize the distance I need between myself and the rope. When pit bouncing, I instead usually opt to wear a "lift and separate" bra and wear the chest roller higher up, but run the rope between "the girls". Anything you pick – do not wear underwires. They poke, break, and stab, generally making the whole experience uncomfortable. Now, a lot of the "lift and separate" bras do have underwires, but with careful snips you can cut a small spot to pull out the wire. Taking out the underwire tends to get rid of the "lift" part so buying a size small gives some compression that is comfortable without that wire. Personally, I find this to be the best of both worlds. If you have sensitive "tips" think about wearing pasties! I hope that further research and development will lead to a more comfortable unisex-wearable chest roller, which would also help solve the issue.

Curvy Caver Seat Harnesses

The whole "low point of attachment requirement" for your seat harness is a SRT ***myth***. This is NOT required, and in fact for some body types may be detrimental to comfort and ease, and hence safety, on rope. The height of the attachment point in a caving harness is based on what is called the **rise**, the bit of webbing that goes from the leg loops up to the waist belt. A low attachment point is achieved by a lack of a rise, and as you add length to the rise the attachment point gets higher. As the rise increases, the further up the waist belt comes, and more of your center mass is supported. Use this often-overlooked variability to your advantage!

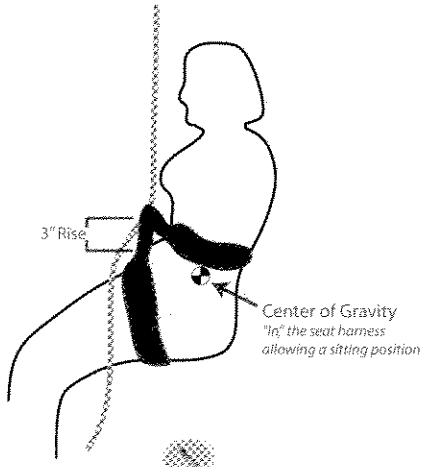
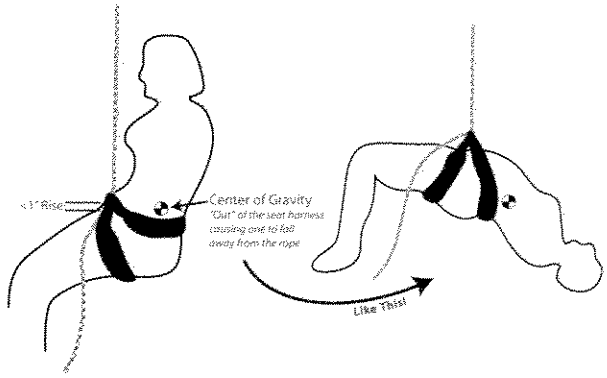


Figure 4 a&b: Seat Harness Rises

Getting a harness with a high rise brings the waist belt of the harness up above the center of gravity of a person who is top-heavy or otherwise falls from the rope. This allows one to sit comfortably in the harness without struggling to stay upright. A proper seat harness for your unique body type is necessary for comfortable rappels and climbs. Additionally, those with well defined hips may find a high rise more comfortable particularly if it feels like low-rise harnesses are just falling off your hips! (I am tempted to insert a pop culture reference of "Don't be lookin' like a fool with your pants harness on the ground!")

Additionally, the distance one rises when frogging is merely a measurement of height and proportions, which varies from person to person. With tuned adjustment of ascender and foot loop lanyards, an entire



full stroke of a sit-stand cycle is typically achieved no matter what the "height" of the attachment point is. Of course all bodies are different and some may be proportioned in a way where a low attachment point is required for an entire Frog stroke. But perhaps it is worth an inch or two loss per stroke if it means less effort. If someone is struggling to stay upright/close to the rope, it may take much less effort to have to perform a few extra cycles than to attempt to work against body mechanics for the entire climb.

I illustrate the difference that the rise makes more visually in this video which you can find online called "Vertical Mythbusters: Seat Harness Attachment Point v2" (http://www.youtube.com/watch?v=yZuM2n_SwTw) in which I compare a low rise and a high rise caving harness. Please note that I'm certainly not suggesting everyone runs out and gets a high rise seat harness, in fact the classic Frogger body type may well benefit from the traditional "low attachment point." My point is simply that each body is unique. Learning what works for YOUR body is important, and the incredible difference that the rise makes is largely ignored due to the current dogma.

Conclusions

You are one-of-a-kind! Learn your body. Think about the different forces you feel on rope, and what feels sore after climbing. Clip on to a rope and sit down, slowly relax and listen where you feel pulls, tugs, pinches, lift, and support. Then try climbing slowly while paying attention to every twinge and try to adjust so it feels right. Listen to how the ascenders are tracking; are they moving smoothly, or are the teeth catching because it is being worked at an angle rather than directly up the rope? Are they squeaking and clanking a lot? How well they track up the rope can tell you a lot about how your system is working. Use ideas here, or invent your own, to fix what you don't like. There are many different tools and techniques and options out there. Don't fall prey to current dogma. Work with your body, not against it, and you'll have a much happier and safer time on rope!