

High Blood Pressure

Doug McKee CRNA

According to the *American Heart Association 2009 Fact Sheet*, "An estimated 75 million people in the United States age 20 or older have high blood pressure." That is about one third of our population and the number is rising. There are actually more Americans with hypertension in 2009 than there were in 2004. With all the pharmaceutical advertising on TV one might expect the numbers to be decreasing instead of increasing.

We "Boomers" are very clearly not going gently into our retirement years. We will be dropping like flies unless we do something to drastically change the current trends. It is not really amazing to me that the number is so high. What is amazing is that the cause of 90-95 percent of this debilitating, potential deadly and horribly expensive condition, referred to as "essential hypertension" is still "unknown."

What is known is that stressed, anxious people develop hypertension at a much higher rate than people who are not anxious. Current research supports this but the researchers almost all stop short of saying the root cause of hypertension is stress because the mechanisms in hypertension are obscure and most of the pharmaceutically funded research projects are so tightly focused on specific individual biochemical processes.

What is also known is that relaxation techniques decrease blood pressure. Hmmmmm, let's look at this again. Anxiety and stress raise blood pressure and relaxation lowers blood pressure. It appears the only thing that is really needed here is an explanation of how stress works over a long period of time and how we can change the process.

Studies indicate obese children are at increased risk for, and actually do have, higher incidence of hypertension. Interesting study from University of North Carolina shows obesity is not associated with major cardiovascular risk factors IF the obese children live in a rural setting. Anyone who has raised children in a rural setting knows they have very different coping mechanisms and expectations than their city cousins.

Lots of studies associate the incidence of obesity with hypertension. These studies make it sound like only fat folk get high blood pressure and that the cure is to lose weight. Another study concludes thin people who have high blood pressure are significantly more likely to have a heart attack or stroke than their obese counterparts.

Chronic hypertension begins with breathing changes that start in childhood. Up until we reach five years of age, we belly breathe as a habit unless excited, frightened, mad, or injured. At those times we chest breathe. Children also think in theta rhythm which is less stressful, until they are placed in a formal learning environment designed to develop their ability to think. Actually, the school systems of the industrial age, and they haven't changed a bit in the last hundred years, are designed to teach skills required by factory workers. The three R's, punctuality, and do what you are told without complaint, are still the real endpoint of public education and it is stressful for all concerned.

Schools require our brains to shift to Beta rhythms to store all this new data, which is more or less designed to assure our survival and success, or so we are taught. Beta is not the rhythm of peaceful thoughts. It's the rhythm for sorting our personal experiential database to find meanings for current events. The increase in the incidence of stress, as expressed by an increase of headache and stomach ache as children start school is significant.

So when we get to school we shift to beta waves for processing relative data, and concurrently start chest breathing because of the stress. By age thirteen theta waves are considered borderline pathology. Belly breathing has to be re-taught to students taking voice lessons because children have forgotten how to do it.

The more mental stress, the higher the oxygen consumption. Mental stress increases oxygen consumption more than moderate exercise. Because school age students, teens and adults chest breathe almost all the time, there is not enough oxygen available to combine with arginine to produce sufficient Nitric Oxide, the chemical signal that causes arteries to relax, to maintain arterial plasticity. As with all systems in our bodies, repetition soon creates a new baseline biochemical state and our arteries become less and less able to relax as we age, The same process is happening with our personalities because we habitually repeat the same stress producing thought patterns. It seems plausible that this may well be the mechanism implicating chronic stress as the root cause of hypertension.

Maybe a good metaphor could use the two functions which make up blood pressure; output and resistance. In this day and age we all have to work harder, and we simply don't have the time to relax, never mind that we don't know how to relax even if the opportunity were to arise. As we age, most of us become more and more resistant to change so our frustration levels increase. A new study links COPD and emphysema to repressed hostility. Our levels of anger and frustration have a significant effect on our breathing. It is as though when we are angry we "Can't get it off our chest!"

Many of us simply are overwhelmed by the vast number of choices we must make each day. We have so many choices now that choosing among them is more stressful and frustrating than when we only could choose between one or two options.

Breathing is a signal, just like Nitric Oxide. When we are stressed our breathing is more rapidly, shallow, and uneven. Our rapid breathing, hyperventilation, only raises the oxygen content in our blood for the first couple minutes. After that, the oxygen levels decrease and so does the amount of Carbon Dioxide, CO₂, in our blood. The decrease in carbon dioxide makes us feel anxious and actually interferes with our ability to absorb oxygen. Breathing rapidly actually decreases the oxygen concentration at the level of our cells and increases the number of free radicals being produced.

As teens and adults, since we are never relaxed we never belly breathe except possibly during sleep. Almost all meditative techniques begin with breathing. My opinion is that it is the breathing that produces the mental state by signaling our brain to return to theta rhythm, rather than the meditative state arising de novo in response to cessation of active thinking.

So hypertension begins and may end with changes in our breathing patterns. Teaching critical thinking skills and yoga breathing would probably change the numbers significantly. I know this is a highly simplistic sound bite summary of a very intricate psychoneurobiochemical process, but it is one that scientific studies indicate is accurate and would be usable in developing strategies for educational methods to treat and/or prevent hypertension.