

An Explanation of CranioSacral Therapy by Dr. John Upledger, D.O., O.M.M.
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CranioSacral Therapy is a very soft touch, hands-on method of treatment. It deals with what we have named the craniosacral system, which is composed of a membrane that is waterproof that encases the brain and spinal cord and carries within it cerebrospinal fluid. The pressure and volume of the fluid go up and down. That makes it a hydraulic system, which needs to be free to move all the time because the fluid should be moving and bringing nutrients to all the neurons and taking away wastes and so forth. With CranioSacral Therapy, we have several entrees into this system-- most of them through bony attachments or through direction of energy or pulling of fascia--for alleviating any restrictions that might have accumulated due to injuries or illnesses. This therapy improves the health of the brain and spinal cord, which in turn, affects the whole body.

There three layers of cranial membranes. The outer layer is called the dura mater, and it's the waterproof one. It's kind of tough. It has some elasticity, but not a lot. The middle layer is called the arachnoid membrane, and it carries a lot of blood vessels. It interacts between the external dura mater, the outer layer and the internal layer, which is called the pia mater. The pia mater is the one that follows all the little dents and nooks and crannies in the brain.

All three membranes extend from the head down through the spine to the sacrum. Part of what's needed for good health and good movement is the three layers need to be able to move independently of each other. If they were stuck together and couldn't glide, you wouldn't be able to bend side to side or forward and backward because you wouldn't have that play in there. The more you get these membranes mobilized, the healthier you'll be. And of course, that extends through your whole body, ultimately, via the nervous system.

The outermost layer, the dura mater, is sometimes free and sometimes attached to bone. Inside the skull itself, it divides into two layers. One layer becomes the internal lining of the skull wall. Then there are little fibers that attach the second layer to it. The inner layer of it has much more mobility. The fibers are restricted somewhat, but not a lot. It glides back and forth a little bit. It's because of this attachment to the bones that we can actually use skull bones to move the membranes and put forces in there that create release of certain restrictions or adhesions that may have occurred.

When you are an embryo, the surface of the skull itself was all membrane and the bones formed within it. When you are born that is why you have these fontanelles, the soft spots. Those bones haven't grown to fill in the soft spots yet. Actually, at the sutures where bones come together, you might have a gap of an eighth of an inch or even a quarter of an inch wide when you are first born. This is because when you are delivered your head has to deform coming through the birth canal. So one of your skull bones will override the other in order to make the head narrower to get through narrow places.

Heads are supposed to expand and become rounder after you are born. Sometimes they don't. They get stuck, and at a time like that, a good CranioSacral practitioner can release that stuck place between two bones where it didn't fully expand in the space of a few minutes. You can take away a lifetime of trouble for that child right at that point.

When we are adults, it's commonly thought that those different plates of the skull fuse together. This is a myth. First of all I would like to clarify this point. British anatomy taught that the bones were fused, as you became an adult. Italian anatomy did not. I think that is because British anatomy studied embalmed cadavers. They had been sitting in a laboratory, they had been embalmed, and because of post mortem and chemical changes that occurred, these sutures appeared to be calcified. Italian anatomists worked on fresh cadavers, and they could see that there is a lot of elastic tissue, a lot of blood vessels, and a whole lot of things that are there so that the bones can move, one in relationship to the other.

I didn't know about this difference (between the British and Italians) until I was lecturing in Israel and I was making a strong point before a group of doctors about how this systems works and how these bones are not immovable in adults; they are not fused; and nobody really seemed to be really excited about that. Finally after I tried to reiterate it the second time in different terms, because I thought they didn't understand me, one of the doctors said, "Let me show you something." He pulled out an Italian anatomy book published in 1920. He translated it for me from the Italian, "The bones of the skull do not fuse except under diseased conditions throughout life." So we have that myth certain countries because we have studied and drawn our education from British anatomy. We just reinvented the wheel.

There are a couple of very important points: bone motion needs to continue throughout life, and the slight motion that is there is accommodated because the sutures themselves have elastic and collagen fibers in them so that they allow for some movement (on the order of a millimeter or perhaps a millimeter and a half in some cases). If you look at the formation of the sutures, you can see which way the bones move in relationship to each other. It took us a while to make this discovery--or rediscovery I should say.

At first we just studied the cadavers in the anatomy lab, and it looked like the bones were fused together. But I have a friend who is a neurosurgeon--he would take bone samples across sutures from living people that he was operating on. He'd take a very thin slice, quick freeze it, and overnight it to us in Michigan. And we learned to study these things with different kinds of stains. There was no chemical invasion here at all, no phenol or formaldehyde or anything. We saw the structure of the suture was very capable of movement. Then we measured it on monkeys, and it moved very well on monkeys. Then we found out it was a singular hydraulic system. I would put just a little pressure on the tailbone of the monkey and I could stop the motion of the skull bones. I would do this because of the connection and the hydraulic force that I was able to exert, increasing the hydraulic pressure just a little bit.

Because of this sometimes you will work on one area of the body that will actually be treating a problem on another part of the body. That's probably going on at least 75% of the time in good CranioSacral Therapy.

What I like about the sutural movement is that if the suture does not move, we know there is something wrong. Then we do things to make it start moving. In cranial work, you don't have to work hard; you don't do any thrusting or any sudden pushing. You use no more than approximately five grams of pressure. You just resist a movement in the place where it's moving hard, where it has the most motion. Then the hydraulic portion in the inside will open up that stuck suture for you. This is a pumping action. The volume of the fluid is going up and down about ten times a minute inside the skull. Cerebrospinal fluid volume--there's the pressure. In any hydraulic system, if you push in one place, the force you use is being broadcast throughout all of the fluid. You can use the rise and fall of fluid pressure, and I'll get to how that happens. There's the coronal suture that goes across the top of your head. Let's say that it's stuck because your forehead has been compressed backwards because you fell down and you hit your forehead. You jammed that suture together. Now the compensation to allow for the rise and fall of fluid volume inside may be taken up in a suture that runs up along the back of your head from side to side, the occipital suture. Now I examine it and find that the two bones, the frontal and the parietal bone, (where you got compressed) are not moving, and the compensation is happening in the suture which is a couple of inches behind that, the occipital. So if I put my hand on the back suture and hold it together with just a little bit of pressure, and then let that pumping action of fluid on the inside work on the suture that's stuck, it will gradually begin to open that suture.

That's how this works, we are taking the compensation away in one place, reducing it, and that causes the hydraulic force to go to the other place. If you really know how this works and you understand the anatomy, you get so you can direct force all over the body. Now, you want to know what causes the pumping action to occur, am I right?

What we found out first of all is that the sutures spread and close, as I said, in about ten cycles per minute. Now in the sagittal suture, which is the suture that separates the two halves of your skull, there are nerve receptors that stretch and broadcast the stretch. They also have compression receptors so that when the two bones come together another signal is sent. The signals go down a nerve trunk we discovered that runs down through that membrane system, which separates your brain into right and left parts. It goes into the ventricles of the brain and gives a signal there. In the ventricle system of the brain is what is called the choroid plexus, and that plexus extracts fluid from blood. In other words, it uses osmotic pressure and some active extraction. Blood flows through capillaries on one side of this system, and the choroid plexus extracts the fluid and leaves the cells. It is very selective in taking blood plasma out and not allowing all of the ions to pass through. That is the manufacture of cerebrospinal fluid.

Cerebrospinal fluid is made from blood. It is made from the blood at a certain speed. Let's call it "speed 2x." Now there's a constant reabsorption going on of the cerebrospinal fluid back into the bloodstream at the rate of 1x. The reabsorption is occurring in most of

the venous channels in the skull itself. The reabsorption system is called the arachnoid system. The arachnoid reabsorbs the cerebrospinal fluid and puts it back into the blood, as well as into the lymphatic system. Blood comes into the skull, some of the fluid is extracted from it, and it becomes cerebrospinal fluid. At the same time, some of that fluid is being reabsorbed. It's only reabsorbed at "speed 1x," half as fast as it's produced.

Obviously the volume increases as the cerebrospinal fluid is produced, and when it does the sagittal suture is expanding. It has stretch receptors within the suture. When it stretches to a certain point, it sends a signal down to the ventricles that says stop making fluid and then it stops. Reabsorption still continues. As the reabsorption brings the fluid volume down again, the suture begins to close. When the compression receptors are activated, the message goes down to turn the production back on. What we found is the production is on for about three seconds and off for about three seconds in a normal situation, which gives you about a six-second cycle. These switches that turn on and off control the production and volume of cerebrospinal fluid, and that's what causes the motion of the cranial bones to occur.

The craniosacral system is a system in the body that has always been there but no one was really aware of it, and its importance. Cranial osteopaths knew about skull bones moving, but they didn't understand this system. So what happened was, I took a position they had offered me at Michigan State to do research. I researched Kirlian photography, acupuncture and Cranial Osteopathy. My job was to put a scientific basis to the craniosacral system, and either prove it or disprove it. That's what our dean wanted me to do. I proved it was there, but it was different from what they thought it was. So, we did discover this system as it is, and we called it the craniosacral system.

I then went on to develop CranioSacral Therapy (CST) to treat the craniosacral system. In CranioSacral Therapy, the treatment is all done hands-on, and our evaluation is all done hands-on. For example perhaps you remember an Olympic diver, Mary Ellen Clark. She won the bronze medal on the high platform in the Atlanta Olympics. Mary Ellen was suffering from vertigo (dizziness), which is common to high divers. She had been all over the country. She came to see me in September in hopes that she could make a comeback. She had to lay off diving for about four months prior to that.

I evaluated her, and I'm looking for restricted areas in the craniosacral rhythm or the way it broadcast through the body. Her problem was dizziness. Ear, nose and throat specialists, along with other doctors, had treated her. Nothing helped. What I found out was that a lot of the problem was coming from the lower end down of the sacrum. It went up the dural tube, into the head, and then restricting the right temporal bone. This in turn was causing her to get dizzy, because your balance mechanisms are located in the temporal bone. The normal mobility of the craniosacral system of 10-12 cycles per minute motion was restricted in that temporal bone. Now, it wouldn't do any good to move the temporal bone if you don't understand the reason why it's stuck. For Mary Ellen, the cause came from down in her lower back. Tracing from her lower back what I found was that she had an old injury in her left knee that was creating muscular and fascial restrictions up into her low back and restricting her sacrum. This was

compromising the activity of her craniosacral system, which in turn was restricting her temporal bone and making her dizzy. I began with the restrictions from her knee, and then worked up to the temporal bone. She was back to diving again, and then she won the bronze medal at the Olympics.

When I was at Michigan State I did a lot of work with physicists, and biophysicists particularly. While I was working there, we had Wednesday morning meetings with five clinicians and twenty-two PhD's from a wide variety of scientific backgrounds. We had already proven the suture movement, and we had the hydraulic system pretty well understood. I explained to the group that while working with patients I felt like there was an energy transference between the patient and myself. I had been taking Kirlian pictures of my fingers and my patients' fingers on the same place before and after every session. I did this for a couple of years. What I noticed was, let's say you came in with severe back pain and I worked on you, the first Kirlian picture you would probably have very weak coronas or defective coronas, which is the name for the broadcast of the energy out. I might have strong ones, but at the end of the session maybe you got strong or full corona and I got more defective. It would look like I lost some energy to you. Now the question becomes--and I threw this at the physicists--can we measure that kind of energy transference? For a week or two the physicists ignored this question, and then I kind of insulted them and told them if they knew what they were doing, they would be able to answer this. This guy Carney got real angry with me and said he would come work with me to prove I was an idiot.

Anyhow, he started watching me with all of the patients. He was there all the time. "What did you do that for, why'd you do this, why'd you do that?" Ultimately, we wound up studying and making recordings of full body electrical potential, tuning out such things as electro-myographic noise. What we were looking for was the body potential of fluctuations, considering that the body has a bag full of electrolyte conductors and the skin is the insulator that keeps it inside. When I do certain things, just by positional changes or modifying the cranial rhythm by compressing one area that's moving too much, it would change the electrical potential of the total body as we were measuring way down in the lower limbs. What he taught me to realize was when I found the right position with a patient to reduce the pain or to take that pain away, the electrical potential that he was measuring would drop when I got in exactly the right place. If I kept it there long enough the electrical potential would start to come up a little bit.

He said, "How did you know how to find that place?" It took a lot of introspection, but finally I discovered that when I found exactly the place that took the pain away, the craniosacral rhythm stopped. It stopped at the same time that the body electrical potential would drop. What we discovered here was that there is a change in electrical potential when I find exactly the right position. Now how did I find the position? Well, my answer to that was that I just followed the body's tendency. What we found out over a lot of arduous work was that if I was very skillful and very sensitive, I could find the position. I would go with the body to a position that alleviated the pain. It was the body that was taking me there. Then we found out those were the positions that the injury had occurred in initially. It happened over and over again.

These were mostly Worker's Compensation patients, and they were mostly work injuries that I was working with at the time. The patient would say, "That's exactly the same position I was in when I fell down and hurt my back!" I didn't know that. Carney didn't know that. The patient didn't even know it until he got into the position. So we called that "tissue memory" because the muscles are taking us exactly where we need to go. When we get there, the path of injury is a straight line. In other words, if I fall down on my tailbone on a step, the force of me hitting the step goes into my body in a straight line. But when my body is straight, that line is bent. The energy can't come back out again around a curve or around a 90-degree angle.

When I get the body in exactly the right position that straight line is once again reestablished, and now the energy can come back out the straight line. We found out when we measured it with thermography that we would get one or two degrees centigrade increase in heat while the body was releasing, and at the same time during that period of heat release, the millivoltage was down and flat, and I had a stop in the craniosacral rhythm. When the heat started diminishing, the cranio-rhythm started again, and the electrical potential came back up--not usually as high as it was before, but back up to maybe halfway to where it was before. We got a correlation between all three of those things. So I learned a lot of physics then. Carney started bringing books home from the library and said, "You learn this, and THEN I can talk to you." I really appreciated it. He was a good teacher.

We decided that what's probably going on here is we have a chaotic energy that comes into the body from the accident; it's disorganizing energy. Your body may dissipate it and then you don't have an ongoing injury. If the body can dissipate that foreign energy when it comes in, fine, you'll be all well and the tissues heal in maybe a week or two. It's those injuries that last that are the problem. You fall on your tailbone and you never get better. In this case the injury happened at such a time or such a way that your body was unable to dissipate that foreign energy--so it concentrates it into the smallest possible ball. When we find the pathway that the ball will exit, then the pain is gone. We call the compression into the ball an "energy cyst." Actually, Elmer Green from the Metiger Foundation called it that. I was describing it as "entropy" and he said, "You are describing an energy cyst," and that's more correct. The tissues remember how to take you there, and when you get to the right place, it's like the body tissues are saying, "If you'll do this with me, I know how I can get this thing out of here." If you follow the body and do it very sensitively, it will take you to exactly the right position, the energy cyst comes out, and that thing that's been giving you trouble for the last five years is gone.

To measure this with Carney we used a polygraph reading. It was before big computerized equipment was available. We used a cardiac monitor and a breathing monitor, and then a total body electrical potential monitor in both limbs. We had electrodes. I decided arbitrarily to put them about three inches above the kneecaps on each side and then ground each one on the same side at the top of the foot. That way we were as far away from brain electricity and heart electricity as we could get. Carney made a special instrument that would add the negative and positive fluctuations. He tuned out

what most electromyographers would term "noise." Carney edited in such a way with his instrument that it turned into a pattern we could read. Then we decided we would study the heat output when we saw this energy was coming out, and the Kirlian photography gave us a general idea of whether the coronas improved or not. Basically whether or not the patient got better. The more you understand the body, and the more you work with it, the more you find out that you can facilitate bodily self-healing.