"CIRCUIT TRAINING" FOR THE BRAIN: UNDERSTANDING NEUROPLASTICITY

BY TZIPORA WOLFF

Few things in life are more frustrating than chronic pain, especially when it feels like the pain is out of our control. However, an increased understanding of how the brain and nervous system produce pain can potentially pave a path towards reducing and ultimately, eliminating it.

When you touch a hot stove, the nerves in your finger will send sensory information to the brain which will interpret the signal as a warning sign. The brain will in turn send a message (via another nerve) to the muscles of your finger, telling it to contract and withdraw from the stove. This is a neural circuit or pathway.

This sort of reaction is automatic, immediate, and occurs without any input from you. In fact, the reaction is so instantaneous that the withdrawal of the finger occurs even before you realize that your finger was in danger of being burned.

There are other types of neural pathways which we create voluntarily. For instance, when my daughter learned to ride a bike, she created a new neural pathway that involves motor skills, balance and coordination. With time and practice, the pathway strengthened and quickened to the point that she could ride her bike effortlessly. Once that neural pathway is established, it remains there forever; even after several years of not riding, my daughter can get on a bike and start riding, without having to relearn the skill which she learned as a child.

Certain nervous pathways can be activated habitually. These are behaviors which are strengthened by repeated use to the point where it may be difficult to NOT activate the pathway. The five year old child who sucks his thumb has "learned" to do this since he was an infant. At some point, his parents decided it was not a good idea for him to continue sucking his thumb. What can the child do to stop? The thumb-sucking behavior is well entrenched in his brain!

While the established neural pathway cannot be erased, it CAN be bypassed. This is the concept of neuroplasticity. In this case, the five year old has capabilities that enable him to create a new pathway, which will circumvent the previously established one. Mom suggests to her preschooler, that every time he feels he wants to suck his thumb, he should think of his favorite superhero, like Superman. "Does HE suck his thumb?" she asks. At first, change is very difficult for the child. Yet, every time the child has an urge to insert his thumb into his mouth and resists that urge, he starts creating a new neural pathway. Initially, this pathway is very thin and delicate. With repetition it becomes stronger, eventially replacing the older thumb sucking pathway as the more dominant one. The original pathway is still present, however. This is evident during times of exhaustion or fear, when the child may revert to thumb sucking. This behavior is now the exception, not the rule.

When it comes to confronting pain, there is yet another type of nerve pathway which we must comprehend. Physical damage to the body (for example, from a fracture, surgery or injury) creates a pathway which senses pain. Once the injury is healed, however, the pain generally abates. The purpose of the pain fibers is to alert us to damage in the body. When this is no longer the case, the pain serves no function. Yet the pathways are still present. Many people will tell you that at times, they feel pain at the site of an old injury or surgery, even when there is no acute damage in the area.

Consider the case of Yossie, the 23 year old male who hobbled into the clinic after a severe attack of right ankle pain. He reported that ever since an ankle injury two years earlier, he would get periodic episodes of pain which crippled him. He had been evaluated by a top orthopedist, and his CT scans and MRIs were all negative. Yossie's doctor gently asked him if he was under any stress lately. While at first he stated that all was well, after some thought he admitted that he had some financial obligations which were stressing him, eventually recognizing a connection between his stressor (in this case, financial worries) and the physical pain. Yossie realized that, in fact, he HAD been worrying about paying the bills when the severe pains came on, an example of activating a latent pathway. This realization enabled Yossie to use the pain as a "red flag", to pay attention to the underlying stress. In doing so, Yossie's ankle pain slowly receded and eventually stopped altogether.

Thousands of patients have been helped using this method of understanding and treating chronic pain, pioneered by Dr. John Sarno. Dr. Sarno elucidated the fact that subconscious stressors can cause physical symptoms. This pain (which is not caused by structural damage to the body) is very real and can cause terrible suffering. Standard approaches to treating pain merely cover it up, without eliminating its underlying cause. Only by acknowledging the mind-body connection and utilizing neuroplasticity to "unlearn" the pain pathway can these challenging syndromes be cured.

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