Dr. Kaplin: “The most important messages for people with spinal cord injuries is that there is hope, there is existing circuitry in the spinal cord waiting to be awakened; and if we can find the right neurotransmitters, the right electrical stimulation to reactivate and awaken that spinal cord, people will begin to regain function that they’ve lost.”

Dale: “Dr. Adam Kaplin is a neuroscientist and neuro-psychiatrist at Johns Hopkins School of Medicine who specializes in how the immune system affects the spinal cord.

Today on Brain Talk: how recent studies are giving hope to many people with paralysis.

A new documentary called ‘Sea of Change’ follows a group of paralyzed war vets on a diving expedition along with spinal cord injury experts Dr. Daniel Becker and Dr. Kaplin."

Dr. Kaplin: “All of the individuals, who went down for the scuba diving research program, were about on average 15 years out from their spinal cord injuries; these were traumatic spinal cord injuries."

Dale: “After 10 dives at about 50-60 feet down, the doctors found that all of the soldiers who had gone SCUBA diving increased sensation to touch about 10-20%. And about half of them had a reawakening of motor activity."

Dr. Kaplin: “The third thing that was very surprising to us was that half of the individuals, who completed their SCUBA certification, regained some motor function, one individual up to 17% improvement in his motor scores."

Dale: “The soldiers lost these gains within the next month. But the doctors believe the raised nitrogen levels, which come with diving, played a role in their increased sensations. Studies by scientists of rats in pressurized air chambers shows why this might be the case."

Dr. Kaplin: “What they saw was, with the nitrogen, they saw a 350% increase in serotonin levels. The reason why this is very interesting is turns out that serotonin is the key stimulator of spinal cord locomotion."

Dale: “Dr. Kaplin says ‘this shows that a key to curing paralysis could be increasing levels of serotonin in spinal cords. But it’s too soon to test injecting serotonin in humans, so that’s why more studies are needed with rats.’"
Dr. Kaplin: “So you can’t take rats scuba diving very easily, but we can do spinal cord injuries and see if just inserting a serotonin pump, or perhaps a type of molecule that becomes serotonin, or something like serotonin that doesn’t break down so easily.”

Dale: “In another promising test, an electrical stimulator was put into the spine of someone injured in an accident. With rehabilitation he was able to walk again in 7 months. Dr. Kaplin points out that ‘serotonin is likely involved here as well, because it’s the key regulator in the spinal cord.’

Injecting stem cells in rats is showing promise too.”

Dr. Kaplin: “Those stem cells that they put in were stem cells that were special only in that they released serotonin and those rats were able to begin to get walking again. There’s a lot of evidence to suggest that this would work, but I think the most important message is there is hope.”

Dale: “Dr. Kaplin thinks it may take five to ten years before experiments like these can be used on humans; which is why it is so critical to fund initial testing now. It’s also important for patients to keep themselves in shape so they are ready to receive such treatments in the future.”

Dr. Kaplin: “And if we can find the right neurotransmitters, the right electrical stimulation to reactivate and awaken that spinal cord, people will begin to regain function that they’ve lost… so don’t give up because it’s coming.”

Dale: “For more information on spinal cord injuries and the brain, log onto brainscienceinstitute.org. I’m Dale Connelly and this is Brain Talk from Johns Hopkins University.”

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Learn more about Dr. Kaplin

Cody Unser First Step Foundation (CUFSF)
CUFSF is a global not-for-profit organization dedicated to raising research funds, public awareness and quality of life for those afflicted with all forms of spinal cord-related paralysis.

Sea of Change
Learn more about the documentary chronicling the SCUBA research led by Dr. Kaplin and Dr. Becker

CBS News Report

Read “Scuba Diving Improves Function of Body, Mind in Vets with Spinal Cord Injury”
A Johns Hopkins Press Release

http://www.brainscienceinstitute.org