

- 1. Can you think of some of the other limitations that would make an individual (who is suffering from spinal injury) not opt for this technique?**
- 2. Discuss one new or interesting treatment that can be used in TBI, SCI, or any CNS injury.**

Thank you Arghya for sharing this article. The restoration therapy mentioned in the video, combines electrical spinal cord stimulation and physical therapy. I watched the video and the progress of few patients is indeed remarkable. I would imagine any patient in this condition would like to try the therapy: it is not invasive, and it does not seem to be painful. The constraints have more to do with the intense schedule, the patients have to follow.

You mentioned lack of publications and indeed the researchers in the paper, pointed to the modest improvements of existing similar studies. I would argue we can reach the same conclusion for this study as well: among six volunteers, only two completed the follow-up, the others enrolled in other studies, seeking more treatment.

Also, by reviewing the inclusion and exclusion criterions, it seems that the researchers were looking for very healthy patients. Finally, the small sample size of the experiments limits its impact, and to some extent the level of risk, 0.05, the researchers use for all their test statistics, is on the low-end for clinical research.

One promising treatment for TBI is the drug called integrated stress response inhibitor (ISRIB).

The drug has shown to restore cognition not only in mice with TBI but in healthy older mice. Under stress, cells activate the integrated stress response (ISR) to promote cell survivals. Specific stress stimuli initiate stress kinases to phosphorylate initiation factor 2 (eIF2). Phosphorylated eIF2 then sequesters eIF-specific guanine exchange factor eIF2B to block eIF2 recycling, thus arresting translation and reducing protein synthesis. ISRIB reverses the effect of p-eIF2 and restores translation by targeting eIF2B.

The molecule was discovered by Peter Walter who is a cancer survivor and received the Breakthrough Prize for this work on unfolded proteins. During his long research, he studied how errant proteins can affect the balance between cell death or uncontrolled growth. More recently he is testing the molecule on brain trauma and the long-term use of the molecules with also potential applications to AD and PD (<https://www.statnews.com/2016/09/28/memory-isrib-peter-walter/>).