

Together we are achieving meaningful change!

HEAL Researchers are Investigating Novel Solutions to Address the 36% Spike in Back Pain Expected by 2050

A recent study published in *The Lancet* found that by 2050, a 36% increase in total number of cases of low back pain is expected globally, driven by population growth and aging. (1) In the U.S., where nearly 2 out of 5 adults are already experiencing back pain, the search for novel solutions to address this challenge has taken on new urgency — and researchers from the National Institutes of Health Helping to End Addiction Long-term® Initiative, or NIH HEAL Initiative®, are committed to finding answers. (2)



HEAL researchers are tackling the back pain challenge from a variety of innovative angles, understanding that the contributors to back pain are often complex and multi-faceted. In fact, the HEAL-funded [Back Pain Consortium \(BACPAC\) Research Program](#) is creating a [whole-person model](#) of chronic low back pain that addresses the complexity of the whole person and takes into account the interaction of many of the different systems in the body. Such a model is important because back pain is complicated: it has different causes, from diseases to injury, and many things can affect how we experience the pain. BACPAC's whole-person model addresses this challenge by representing everything that contributes to chronic low back pain or helps treat it, allowing the cause of the pain to be better understood.

BACPAC's leaders believe this model is going to help people think about all the diverse inputs that can influence pain. The ultimate goal is for the model to be turned into a tool that health care practitioners can use to personalize treatment plans. Someday, a person whose back has been hurting for a long time might go to the doctor, fill out a questionnaire, then have a diagnostic test or two. The BACPAC model could take in all the data and then suggest a personalized treatment plan based on the specifics of this person's underlying medical condition, life circumstances, and preferences.

What might this kind of whole-person approach to back pain entail? Read on to learn about three key innovations to watch from HEAL-funded BACPAC studies.

Artificial Muscles

HEAL-funded researcher Conor Walsh, Ph.D., and his team at the Harvard Biodesign Lab specialize in developing soft “exosuits” – wearable devices that help people with muscle weakness (for example, after a stroke) so they can regain movement and muscle strength. Together with physical therapist researcher Diane Dalton, D.P.T., and Lou Awad, Ph.D., D.P.T., from Boston University, Walsh is turning his attention to chronic low back pain. He and his team



designed an exosuit consisting of wide fabric straps that run from the shoulders to the thighs. The straps contain sensors that monitor how a person is moving, as well as a motor that can increase or decrease the amount of tension in the straps.

Because the straps are light and flexible, the wearer can move normally while receiving necessary support for each movement. For example, when a person takes a deep squat to pick up a box or object, the motor automatically tightens the straps to provide strong support. But when a person performs a shallower bend or lifts a lighter object, less tension is applied. The result is that back muscles need to work a lot less. For example, a person wearing the exosuit's back muscle activity level lifting a weight of 13 pounds without the exosuit was the same as when lifting 22 pounds with it on. For people who perform a lot of heavy lifting, this may make a difference in long-term effects on their back muscles. [Read more](#) about this HEAL work. Interested in the science of artificial muscles for back pain? Check out this [recommended reading](#) from the study team.

Virtual Reality

Brennan Spiegel, M.D., and his team are investigating the use of virtual reality (VR) to help ease chronic pain. In this work, VR involves the use of a headset over the eyes to allow people to experience three-dimensional immersive environments. The simulated sights, sounds, and engaging experiences—swimming with dolphins or walking up waterfalls—have the potential to transport users to a different world far from their pain.

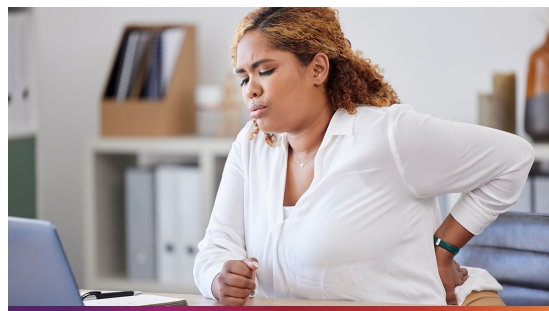


Spiegel and his colleagues hope VR can provide immersive experiences that absorb more of the brain's attention. With fewer mental resources left to process pain signals, people perceive less pain. Usually, he explains, less pain means the potential for less disability, improved quality of life, and reduced need for pain medication.

As part of this effort, Spiegel and his team are engaged in a three-part research study to determine the effectiveness of different VR approaches. The first, educational part of the study examines whether VR can be used to effectively teach techniques such as mental imagery and biofeedback (a therapy to help people control certain involuntary functions, like your heart rate or breathing patterns) to reduce anxiety and manage pain. The second part immerses participants in a virtual world to distract them from real-world sensations. The final part looks at whether the use of VR, regardless of the content being shown, affects the perception of pain. [Read more](#) about this HEAL work. Interested in the science of virtual reality for back pain? Check out this [recommended reading](#) from the study team.

Pain and Mood Combination Therapy

People experiencing chronic pain and depression or anxiety tend to experience greater pain and disability than those without these conditions. They also don't respond as well to many pain treatments — including medications, nerve blocks, physical therapy, or surgery — compared to people with chronic pain without depression or anxiety.



HEAL researchers led by Ajay D. Wasan, M.D., M.Sc., from the University of Pittsburgh are testing a combination of antidepressant medications and a type of physical therapy they call enhanced fear avoidance rehabilitation in people with both chronic low back pain and mood disorders, like depression or anxiety. Both treatments have previously been shown to improve outcomes for people experiencing chronic pain but testing them together is new.

Fear-avoidance physical therapy (also called fear-of-movement physical therapy) is based on the observation that some people with chronic low back pain avoid movement because they are afraid of making their pain worse. However, avoiding movement can lead to muscle

tightening and decreased flexibility, causing more pain and a vicious cycle to begin. Fear avoidance physical therapy aims to allay these concerns and get patients active and moving in a slow progressive fashion. Over time, this approach can lead to decreased overall pain.

The study team's approach is "enhanced" because they have added a mobile app that individuals can use in between their physical therapy sessions. This app includes, for example, education about pain and helpful instructional videos.

The participants are randomly split into three groups that receive either antidepressant therapy only, specialized physical therapy only, or both. Through this combination strategy, the researchers are seeking to increase the overall number of patients who show a treatment response and identify factors that predict treatment outcomes.

"We feel that this novel multimodal combination approach of medication and physical therapy can really cause a shift in current treatment strategies," says Wasan.

[Read more](#) about this HEAL work. Interested in the science behind the pain and mood combination therapy study? Check out this [recommended reading](#).

Together, these efforts and [many others](#) provide hope to millions of people living with chronic pain, including back pain. Be on the lookout for published results of these exciting efforts in the coming months!

1. [https://www.thelancet.com/journals/lanrhe/article/PIIS2665-9913\(23\)00133-9/fulltext](https://www.thelancet.com/journals/lanrhe/article/PIIS2665-9913(23)00133-9/fulltext)
2. https://www.cdc.gov/nchs/products/databriefs/db415.htm#Key_finding

HEAL Connections is a center that is jointly run by Duke Clinical Research Institute and George Mason University and funded by the National Institutes of Health (NIH) through the Helping to End Addiction Long-term® Initiative, or NIH HEAL Initiative®. HEAL Connections is aimed at supporting widespread dissemination and implementation of HEAL-funded research. HEAL Connections is funded by the NIH HEAL Initiative under OTA numbers: 1OT20D034479 and 1OT20D034481.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

[CPRA WEBSITE](#) | [DONATE](#) | [CPRA WHITE PAPER](#) | [JOIN THIS MAILING LIST](#)

About the Chronic Pain Research Alliance

The Chronic Pain Research Alliance (CPRA) is the only research-led collaborative advocacy effort dedicated to improving the lives of those affected by multiple pain conditions, termed Chronic Overlapping Pain Conditions (COPCs). These include vulvodynia, temporomandibular disorders, fibromyalgia, irritable bowel syndrome, interstitial cystitis/painful bladder syndrome, migraine and tension-type headache, endometriosis, myalgic encephalomyelitis/chronic fatigue syndrome and chronic low back pain.

The CPRA envisions and is working towards a future where people with COPCs receive a timely diagnosis, followed by comprehensive medical care, including the use of safe and effective approved treatments, informed by the latest and most rigorous scientific evidence.

Your support is vital to the CPRA's existence. Please consider making a [contribution](#) today! One-hundred percent of your tax-deductible gift will be used to further CPRA's mission and will specifically support initiatives to: i) promote a rigorous, standardized and collaborative scientific research effort on COPCs; ii) translate research findings into educational initiatives for clinicians and patients; iii) and advance industry efforts to research and development of safe and effective therapies for COPCs.

The Chronic Pain Research Alliance is an initiative of The TMJ Association, Ltd.
A NON-PROFIT 501(c)(3) Tax Exempt Organization.

Chronic Pain Research Alliance | P.O. Box 26770 | Milwaukee, WI 53226 US

[Unsubscribe](#) | [Update Profile](#) | [Our Privacy Policy](#) | [Constant Contact Data Notice](#)



Try email marketing for free today!