



Pain affects millions of Americans. It's hard to measure, and there isn't a one-size-fits-all treatment approach. NIH conducts and supports basic, translational, and clinical research on pain, as well as strategies for treating it. Here are just a few recent examples.

### From the lab to the bedside



#### Basic research

Conducted in labs by scientists who study the most fundamental building blocks of life, including genes, proteins, and cells. This kind of research helps us better understand living systems and processes.



#### Translational research

Takes information learned from basic research and studies how it can help improve health and treat diseases.



#### Clinical research

Studies different treatments and interventions to find out whether they are safe and effective in humans.

### Basic pain research



#### Taking a closer look at facial pain

Researchers at the National Institute of Dental and Craniofacial Research (NIDCR) hoped to explore new ways to treat facial pain without unwanted side effects. To discover how nerves in the face send and receive information about pain, researchers used an innovative technique to visualize pain signals in mice's facial nerves in real time. Their findings could lead to safer ways to treat pain in the face, mouth, and jaw. [Read about this research.](#)

#### Learning how sound reduces pain in mice

An international team of researchers, including some from NIDCR, studied mice to understand how sound can blunt pain. They discovered a direct pathway between two areas of the mice's brains: the auditory cortex, which receives and processes information about sound, and the thalamus, which receives and sends information about sensations such as pain. Understanding how processes in the brain regulate pain could help researchers develop new pain therapies in the future. [Find out more.](#)

### Finding how our brains process pain differently

An international group of researchers, including some from the National Center for Complementary and Integrative Health, analyzed data from functional magnetic resonance imaging (fMRI) scans. They found that people’s brains process pain in different ways, with some areas of the brain showing more variation than others. These results could lead to more personalized pain management approaches. [Read more about these findings.](#)



### Translational pain research

#### Building a living pain circuit

Developing new medications is challenging, costly, and time consuming. Researchers must screen large numbers of possible medications if they want to identify even one promising molecule. To address this, scientists funded by the [Helping to End Addiction Long-term® Initiative](#), or the NIH HEAL Initiative®, developed a system to quickly screen medication candidates. This “living pain circuit” is a 3D model of nerve cells that connect to each other the same way they do in the body. This tool can rapidly identify compounds that don’t work in humans. This research is a step toward identifying new and effective pain relief treatments. [Read more about this work.](#)



### Clinical pain research

#### Personalizing pain management after cesarean delivery

Cesarean birth is the most common major surgery done in the United States. The Opioid Prescription After Cesarean Trial (PACT), which is supported by the NIH HEAL Initiative, aims to reduce opioid use in people who had a cesarean delivery. PACT is a randomized clinical study that tests individualized pain management approaches for new mothers who deliver by cesarean. Half of the study participants will receive the current standard treatment (which is a prescription for a fixed number of opioid tablets) when they are discharged from the hospital. The other half will get a new patient-centered approach that allows participants to choose how many opioid tablets they are given and includes pain management and opioid use counseling. [Find out more about PACT.](#)

## Ways to get involved

There are lots of ways you can contribute to pain research. Visit [ClinicalTrials.gov](https://ClinicalTrials.gov) to find out about acute and chronic pain research happening around the world and learn how to participate in clinical studies.

Current trials recruiting participants include research about:

- **Low back pain.** The BEST (Biomarkers for Evaluating Spine Treatments) Trial is part of the BACPAC Research Program. This study, sponsored by the National Institute of Arthritis and Musculoskeletal and Skin Diseases, tests four different evidence-based treatments for low back pain. The goal is to learn which treatments are most effective for people based on their unique traits, such as heart rate and blood pressure. [Learn more and sign up to participate on the BEST website.](#)
- **Pain perception.** NIH researchers are trying to better understand the different factors that affect pain and how people experience it. They also hope to learn more about how people’s relationships with each other affect these experiences. This study is looking for healthy volunteers between the ages of 18 and 60 in the Washington, DC, metro area to participate. [Find out how to participate.](#)

### Using virtual reality to treat real pain

Researchers from the NIH HEAL Initiative’s Back Pain Consortium (BACPAC) are studying ways to use “therapeutic virtual reality” to ease chronic pain. Virtual reality allows people to experience immersive 3D environments—swimming with dolphins, for example—which takes the brain’s attention away from the experience of pain. This three-part research study is testing how effective virtual reality is for improving pain, reducing opioid use, and improving quality of life among people with chronic low back pain. [Learn more about this research.](#) ■