

INVESTMENT IN RESEARCH SAVES LIVES AND MONEY

Paralysis

Paralysis is the complete or partial loss of muscle function in part of the body.¹ It can result from an injury or a disorder that disrupts the normal function of the central nervous system, which is composed of the brain and the spinal cord. When an injury or disorder prevents the communication between the brain and the spinal cord, the brain loses its ability to control muscles via signals through the spinal cord.² Paralysis can occur in many different forms, including paraplegia (paralysis of the lower half of the body, including both legs) and tetraplegia (paralysis of the arms and legs).¹ While there are many potential causes of paralysis, the most common are strokes, injuries to the spinal cord, multiple sclerosis, and cerebral palsy.³

TODAY

72.1%

of Americans living with paralysis are under 65 years of age.⁴

Nearly

5.4 million

Americans were living with paralysis in 2013.⁴

According to a 2013 survey, roughly

42%

of Americans who are paralyzed say they are unable to work.⁴

Research Delivers Solutions

Researchers have discovered that electrical currents can be used to stimulate damaged nerves in the spinal cord through a process called epidural stimulation. In 2011, a paralyzed patient was able to move his legs again after receiving surgically-implanted epidural stimulation. Clinical trials are ongoing to test the safety and efficacy of this kind of intervention for more people.⁶

Other researchers are attempting to regrow nerve cells at the site of a spinal cord injury, which has been difficult because scarring at the injury blocks nerve cells from regrowing. However, researchers were able facilitate robust regrowth at the injury site if they introduced a mixture of proteins and genetic material, which stimulated regrowth of the cells and guided them to recreate the right connections. These new connections between nerve cells were able to conduct electrical signals across the injury, but researchers did not observe improved movement. Researchers believe this is because the newly wired circuits must be retrained to restore movement, so studies are continuing to explore how to regain movement after these connections are recreated.⁷

COST

\$77,701 per year:

Estimated indirect cost of paralysis for a single patient due to loss in wages and productivity.⁵

\$2,494,338:

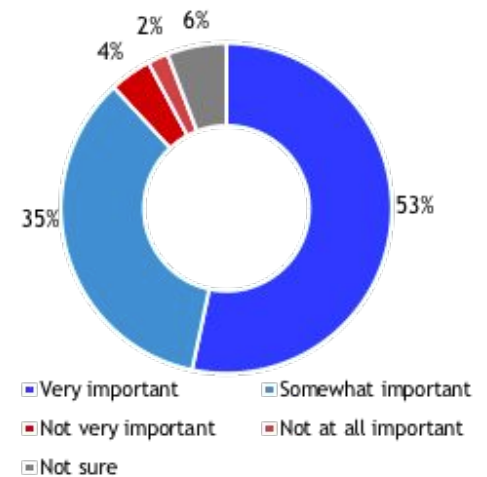
Estimated lifetime cost of paraplegia for a person who sustains a spinal cord injury at the age of 25.⁵

Every year, spinal cord injuries cost the U.S. roughly

\$40.5 billion.³

Strong Majority Support Faster Medical Progress as a Federal Priority

How important is it for the President and Congress to assign a high priority to ensuring faster medical progress?



Source: A Research!America poll of U.S. adults conducted in partnership with Zogby Analytics in January 2020

Paralysis

Then. Now. Imagine.

THEN

As recently as 35 years ago, paralysis from spinal cord injury was considered untreatable.⁸

NOW

Research has shown that the nervous system is not hard wired — it can adapt itself after injury — leading to rehabilitation techniques that have allowed some paralyzed patients to regain limited function and sensation. Additionally, studies on other therapeutic techniques ranging from drugs to regenerating nerve cells are underway.⁸

IMAGINE

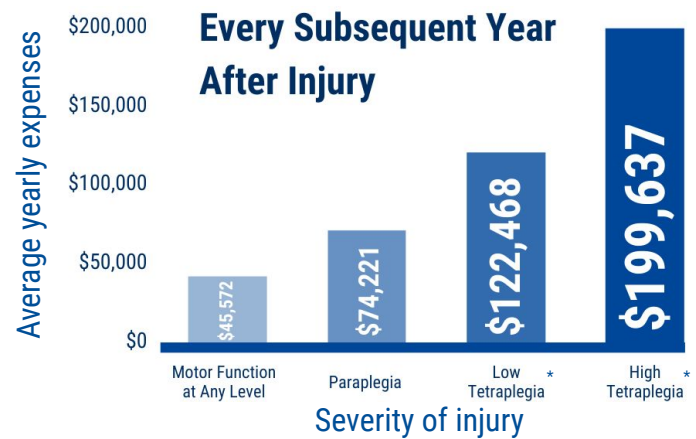
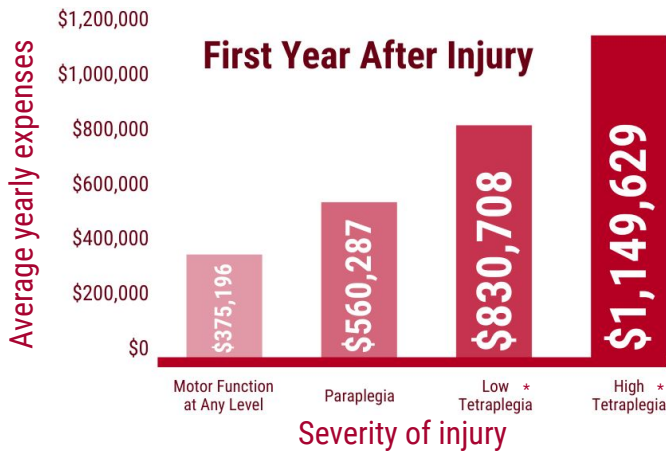
A cure.

Autonomic Dysreflexia (AD)

AD is a potentially life threatening condition that can occur in individuals with spinal cord injuries. Once AD is triggered, a slow medical response can lead to serious consequences. AD is triggered by an irritant below the level of the spinal cord injury, which an individual may not feel due to paralysis. This can include a pressure sore, bladder irritation, tight or restrictive clothing, or a variety of other sources. The irritated area sends signals to the brain via neurons, but the signals are blocked at the site of the spinal cord injury. This confuses the body, leading to over-activity of the autonomic nervous system, which controls functions like heart rate, breathing, and digestion. Symptoms of AD include high blood pressure, headache, flushed face, sweating, slow pulse, and others, depending on the individual. By recognizing these symptoms of AD, the patient's source of irritation can be addressed and, if necessary, medication can be used to aid recovery.⁹

Average Yearly Expenses for Individuals with Paralysis due to Spinal Cord Injury

Expenses include health care costs and living expenses.



* High and low tetraplegia refer to the level of the spinal cord injury, though both are in the cervical (neck) region. High tetraplegia is classified as having a spinal cord injury between the C1 – C4 spinal cord segments, which is at the top of the spinal cord, so individuals generally have greater loss of function than those with low tetraplegia, who have an injury farther down the spinal cord in the C5 – C8 range.

Source: National Spinal Cord Injury Statistical Center, Spinal Cord Injury Facts and Figures at a Glance⁵

1. Paralysis” medlineplus.gov. 2019.
2. “How the spinal cord works” Christopher and Dana Reeve Foundation. 2020.
3. “Stats about paralysis” Christopher and Dana Reeve Foundation. 2020.
4. Armour et al. “Prevalence and Causes of Paralysis—United States, 2013.” *AJPH* 2016;106(10);1855-1857.
5. “Spinal Cord Injury: Facts and Figures at a Glance” NSCSC. 2020.
6. Smith et al. “Spinal cord epidural stimulation for voluntary movement after spinal cord injury: current state of the research.” *Journal of Neurologic Physical Therapy* 2019; 1-4.
7. Anderson et al. “Required growth facilitators propel axon regeneration across complete spinal cord injury.” *Nature* 2018;561(7723); 396-400.
8. “Spinal cord research” Christopher and Dana Reeve Foundation. 2020.
9. “Autonomic dysreflexia” Christopher and Dana Reeve Foundation. 2020.

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