



The History of Pain Treatments

Fact Sheet

PAIN TREATMENTS THROUGH THE AGES

Through the ages, the search for pain relief has taken on many variations – some bizarre and some worthy of further investigation. This timeline summarizes how the desire to relieve pain has existed since the time of earliest civilizations, and that the application of electrical stimulation to nerves has evolved into innovations that make living with pain easier.

Thousands of years B.C.	<p>Opium was used by the Sumerian and Assyrian civilizations, and is mentioned in Egyptian medical scrolls dating back to 1500 B.C.</p> <p>Medical practitioners in ancient Greece discovered that electrical impulses emitted from electric eels in clinical foot baths relieved pain and improved blood circulation. Producing up to 600 volts in a single discharge, electric eel therapy was particularly popular for treating arthritis.</p>
500–1500 A.D.	<p>Leeches were a mainstay in conventional treatment of pain and inflammatory diseases in the Middle Ages.</p> <p>Dioscorides reported that the torpedo fish could be applied to the skin to relieve headaches.</p>
1745	<p>The Leyden jar was invented. This was the first device able to store static electricity and was used, among other things, to treat pain.</p>
1750s	<p>Benjamin Franklin and others began to experiment with the earliest creations of batteries. The batteries sent electrical stimulation through the skin to the painful area.</p>
Early 1800s	<p>Morphine was first separated from opium by European chemists, and was found soon after in the United States, where it began to take the place of opium in patented pain medicines.</p>
1831	<p>British scientist Michael Faraday discovered that an electric current can produce a magnetic field and that the reverse was also true. This observation served as the basis for neurostimulation.</p>
1874	<p>The cannabis plant, from which marijuana is made, became a well-regarded headache remedy by prominent physicians.</p>
1882	<p>The “Faradic Electrifier,” an early treatment with electricity, was advertised in the <i>Boston Globe</i> as one of the “Most Marvelous Inventions of the Century! All cases of Rheumatism, Diseases of the Liver, Stomach and Kidneys, Lung Complaints, Paralysis, Lost Vitality, Nervous Disability, Female Complaints are cured with the Electrifier!”</p>

1898	Heroin, the newest opium derivative, was first produced commercially by Germany's Bayer Company. It was widely advertised as being at least 10 times as potent a painkiller as morphine with "none of the addicting properties."
Late 1800s	<p>Hot spring bathhouses were erected in England and the United States to relieve pain, heal injuries and prevent diseases.</p> <p>French scientist G. Gaiffe constructed an electrical nerve stimulating device called the Gaiffe TENS unit, which had all of the basic components of a modern neurostimulation device. However, its low electrical output (estimated to be about 3 milliamperes) made it ineffective for neurostimulation.</p>
1900	More than 200,000 people in the United States were estimated to be addicted to opium, which was used as a main ingredient in patented pain medicines. The U.S. Congress passed a law in 1909 prohibiting the manufacture and sale of opium.
1915–1951	The Violet Ray Generator was introduced and tens of thousands were sold for home use over a 35-year period. Marketing literature claimed the device cured a wide variety of ailments including paralysis, wry neck and writer's cramp. In 1951, the FDA banned the manufacturer from claiming it provided medical cures.
1919	The Electreat, a TENS device, was patented by Charles Willie Kent and manufactured in Peoria, Illinois. An estimated 250,000 Electreats were sold during the following 25 years. The device operated on two "D" cell batteries and a mechanical inductorium. A roller was built in at the top to be applied to the skin, and plug-in sponge pad electrodes were supplied. The Electreat was one of the very first high-output, battery-operated TENS units manufactured.
1939	Methadone was first synthesized in Germany in research efforts aimed at developing a new painkilling medication.
1944–1948	The first clinics devoted to the treatment of pain were established. They were often known as nerve block clinics.
1965	Psychologist Ronald Melzack and physiologist Patrick Wall published a landmark paper on their gate-control theory of pain. They theorized that the body has gating mechanisms within the spinal cord that close in response to normal stimulation and open with intense or painful stimulation, allowing the signal to reach the brain.
1967	Neurosurgeon C. Norman Shealy was the first surgeon to begin implanting neurostimulators in humans for pain relief. By 1970, six patients had undergone this treatment.
1972	Dorsal column neurostimulators were first marketed to neurosurgeons in the United States. These devices were later renamed spinal cord stimulators.
1976	Advances in cardiac pacemaker technology provided the basis for the development of the first totally implantable neurostimulator.
1980s	The use of opioids administered directly to the spinal column via epidurals emerged as a treatment for chronic pain.
1991	The first prototype of a radio-frequency (RF) spinal cord stimulation system is developed by Neuromed (now the neuromodulation division of St. Jude Medical) for the relief of chronic neuropathic pain.
1997	Intradiscal electrothermic therapy (IDET) was introduced as an investigative treatment for chronic low back pain. This procedure involves killing nerve fibers by heating a catheter positioned inside the spinal disc.
2002	The U.S. Department of Health & Human Services reported that narcotic analgesics were involved in 16% of total drug abuse-related emergency room

visits for an estimated 108,320 visits in 2002. The 45 to 54 age group experienced the largest increase (298% since 1995).

2004–2005

The first rechargeable spinal cord stimulation systems became available in the United States. Using rechargeable technology similar to a cell phone, these devices represent the newest advancement in neuromodulation devices for the treatment of pain.

2008

St. Jude Medical introduces the Eon Mini™ neurostimulator, the world's smallest, longest-lasting rechargeable neurostimulator to treat chronic pain of the trunk or limbs and pain from failed back surgery.¹⁻⁴

Indications for Use: Chronic, intractable pain of the trunk and limbs.

Contraindications: Demand-type cardiac pacemakers, patients who are unable to operate the system or who fail to receive effective pain relief during trial stimulation.

Warnings/Precautions: Diathermy therapy, cardioverter defibrillators, magnetic resonance imaging (MRI), explosive or flammable gases, theft detectors and metal screening devices, lead movement, operation of machinery and equipment, postural changes, pediatric use, pregnancy, and case damage. Patients who are poor surgical risks, with multiple illnesses, or with active general infections should not be implanted.

Adverse Events: Painful stimulation, loss of pain relief, surgical risks (e.g., paralysis).

User's guide must be reviewed prior to use for detailed disclosure.

Caution: U.S. federal law restricts this device to sale and use by or on the order of a physician.

Eon and Eon Mini are trademarks of Advanced Neuromodulation Systems, Inc. doing business as St. Jude Medical Neuromodulation Division.

SOURCES FOR STATISTICS AND ADDITIONAL INFORMATION FOR PATIENTS AND JOURNALISTS:

- www.PowerOverYourPain.com
- www.NationalPainFoundation.org
- Part of this timeline comes from the History of Neurostimulation, the Burton Report®

Linked website disclaimer

Some linked websites listed are not managed or monitored by St. Jude Medical, Inc. and are provided and linked only for the convenience of our visitors. St. Jude Medical makes no representation regarding the information presented on any off-site, linked pages or any other sites linked to our site or any such site's compliance with applicable laws and regulations. St. Jude Medical shall not be responsible or liable for any damage or loss caused or alleged to be caused by or in connection with use of or reliance on any such content or goods or services available through any such site.

Sources:

¹ Medtronic. Ultra [brochure]. Minneapolis, Minn.; 2008.

² Boston Scientific. Precision IPG [brochure]. Valencia, Calif.; 2007.

³ Advanced Neuromodulation Systems. Eon Mini™ Neurostimulation System Clinician's Manual. Plano, Tex.; 2008.

⁴ Advanced Neuromodulation Systems. Eon™ Neurostimulation System Clinician's Manual. Plano, Tex.; 2005.