Electrical Stimulation

History

The application of electricity over painful areas is an ancient concept with new understanding. In Roman times it was thought that electric eels placed in a shallow pool and allowed to 'zap' people could cure their pain. There is even an ancient battery which some archeologists guess might have been used in a similar way.

How it works

In modern times, mild electrical stimulation over painful areas is thought to reduce pain by one of two methods. First, the electrical stimulus itself may fight with space over the wires (nerves) that bring pain signals to the brain. Thus the non-painful electrical sensation overrides the perception of pain in the brain, and thus decreases pain. The second theoretical way that electricity may work is by causing the release of natural painkillers in the body known as endorphins. These are the substances that cause the "runner's high" that long distance runners feel. It is also thought to be the primary mechanism involved in acupuncture. Different frequencies and shapes of the electrical waves are thought to lend themselves more toward one or another of these mechanisms.

What is TENS?

The most common electrical stimulation device used today is known as **TENS** or ***T****ranscutaneous* ***E****lectrical* ***N****erve* ***S****timulation*. This device is a small pager-sized box that can be worn on the belt. It attaches to a wire known as a lead. The lead is the attached to an EKG pad. This pad is usually sticky on one side, so it can stick to the skin. The best pads are reusable, and can last up to a month. The device can be costly, but most insurances including Medicare approve its use for chronic pain. Typically, the pain physician will rent you a device for a month to see if it works for you. If it works, the device can be purchased or continued on a rental basis.

How is it applied for best results?

1. Identify the area where it hurts the most.

2. Put two patches no more than the width of your hand apart over the painful area.
3. If you desire, place two other patches over the painful area, so there is a box around the pain. The patches should form an '**X'** with the current that runs between them.
4. Turn on the box.
5. **Move the intensity dial until either it hurts, or the muscle twitches, then back off slightly**.
6. The stimulation should not hurt, and no muscle should twitch.
7. You may wear it continuously for up to 8 hours a day in that area.
8. You may increase or decrease the level of stimulation as needed throughout the day.
9. You may change the patch location as your pain dictates. Experiment with various patch locations to find what works best for you.
10. Don't use if you are pregnant or have a pacemaker, and never apply to the front of the neck.
11. If you find you need more intensity, check the battery and the patches as they may be wearing out. The patches usually last two weeks to a month, then won't stick to your skin very well.
12. The most common problem is a rash under the patch area. Sometimes a different brand of patch can help; sometimes a skin cream is needed.

Dorsal Column Stimulators

Implanted electrical spinal cord stimulators, also known, as *dorsal column stimulators* can be beneficial in covering up the pain if all other forms of treatment have failed. These are generally placed by a surgeon and/or trained pain physician, and then managed after the placement by the pain specialist. The concept is that a wire (known as a lead) is placed on top of the spinal cord. A very small electric current is passed down the wire, and this electric current blocks the pain. The entire device can be implanted under the skin, including batteries. There is also a type where the batteries are worn outside the skin. Downsides besides the cost include movement of the electrical wires, which can throw off the alignment of the wires and change how well the device works. New techniques and wire types have reduced this problem. Of course any implanted batteries will need to be changed periodically and there is always a risk of infection, scarring around the spinal cord from the wires, and

equipment malfunction. In my experience such devices seldom remove the need for medications, but do reduce the amount required.

Electrical Stimulation techniques are available at **Newport Pain Management**. www.newportpain.com