The Science Behind

TENS Units

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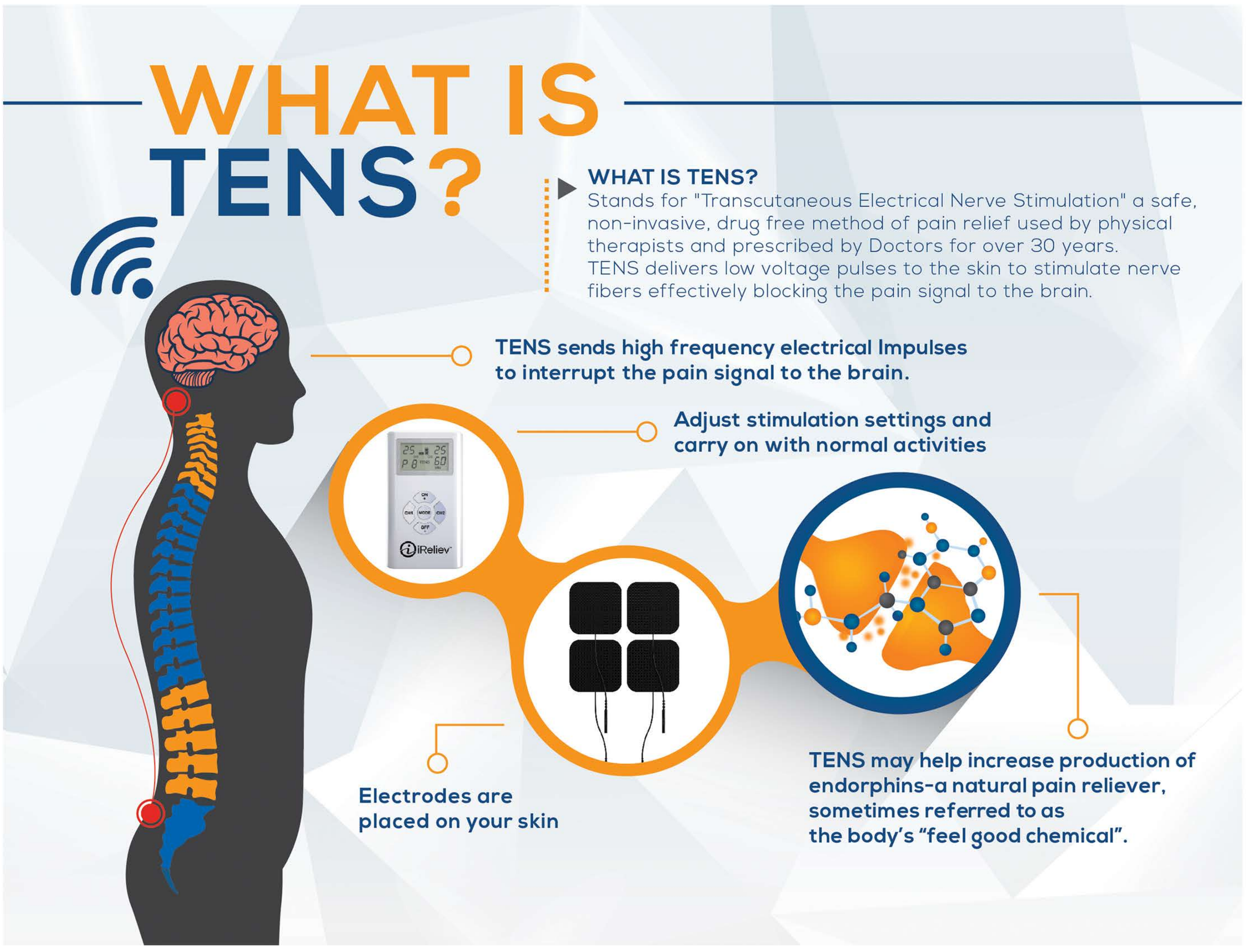
Free eBook

In recent years, electrotherapy has made a big impression. Not only has it become more relevant in medical homecare, but it has also turned into a staple for many athletes. Plus, loads of professionals, such as chiropractors and physical therapists, are using it in their offices or recommending it to their patients for home use. But as this form of therapy excites and intrigues, people want to know:

How does it work? What does it do? Is there a science behind electrotherapy that we can trust? This book is here to answer those questions for you as thoroughly as possible. But before we can get into the technicalities of how electrotherapy works, we need to talk about what it is.



An Introduction to TENS

If you've spent any time looking up information about electrotherapy or its devices on the internet, you've probably seen several different acronyms. Admittedly, these acronyms can be confusing, especially as various retailers use different ones to refer to the same thing, or worse, call something by the wrong name. To keep it simple here, we're going to focus on one of two therapies offered by iReliev: TENS.

TENS is sort of the original form of electrotherapy, but its mechanisms and functionality weren't always as clear as they are today. The very first record of electrotherapy involves ancient Egyptians stepping on electric fish to help relieve headaches. Gradually, over many, many years, scientists and inventors who were interested in exploring the therapeutic benefits of shock continued to play with the idea of what became the TENS Unit.

There were several things that kept people's interest in the development of electrotherapy. For one, it appeared to be a curious solution to many medical woes. Yet at the same time, there was another major appeal. As far as these inventors could tell, and based on their trials and experiments, this electrotherapy was capable of relieving pain without any need of medication. You see, even as far back as the early 19th century, people were taking morphine for pain. At this point there wasn't a drug epidemic like we have today in America, but there were still suspicions that perhaps this drug ought not to be a permanent solution for chronic or even acute pain. In other words, even back then, some people saw a need for an alternative solution.

But, we're not here to discuss the TENS Unit's story—there is a whole different eBook for that. We're here to look at how this device works. The functionality of the TENS Unit is all in the name: Transcutaneous Electrical Nerve Stimulation. A TENS Unit sends electrical impulses through the skin (or "transcutaneously") to stimulate the nerve endings.

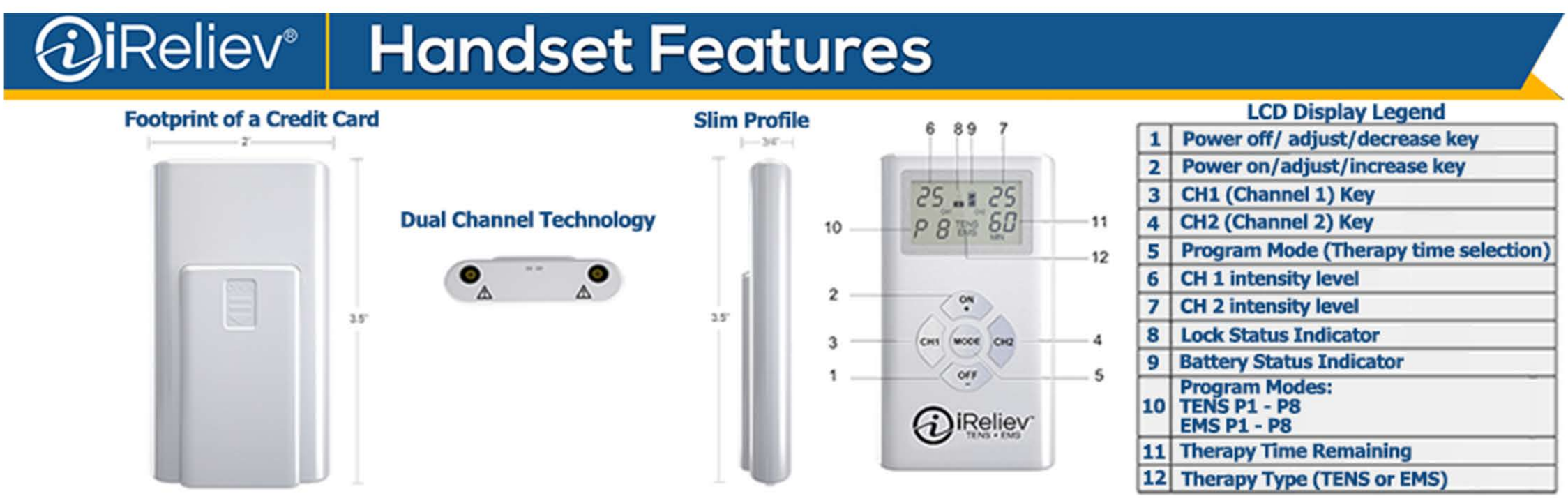
The gentle, electrical impulses can be directed towards nearly any location on the body—wherever there is a need for relief. The impulses create a pleasant tingling sensation that can bring relief from pain almost immediately.

You read that correctly. It doesn't take much time for TENS to provide relief, and we'll explain why shortly. But for now, know that this is just one of the many benefits of TENS that make it so remarkable. There's also the fact that it's completely noninvasive, meaning there's nothing entering the body: no dependency and no addiction. Plus, TENS can be used as often as needed, and with a portable device like iReliev's, you can even take it to work or on the go. But enough praise. Let's get to the science.

The Features of a TENS Unit

Each portable TENS Unit is made up of a couple of key parts. First, there is the device itself. It's small (about the size of a cell phone) and, in this case, battery powered. On the device, you'll notice several buttons. These help the user to adjust settings like the pattern or intensity of the electrical impulses.

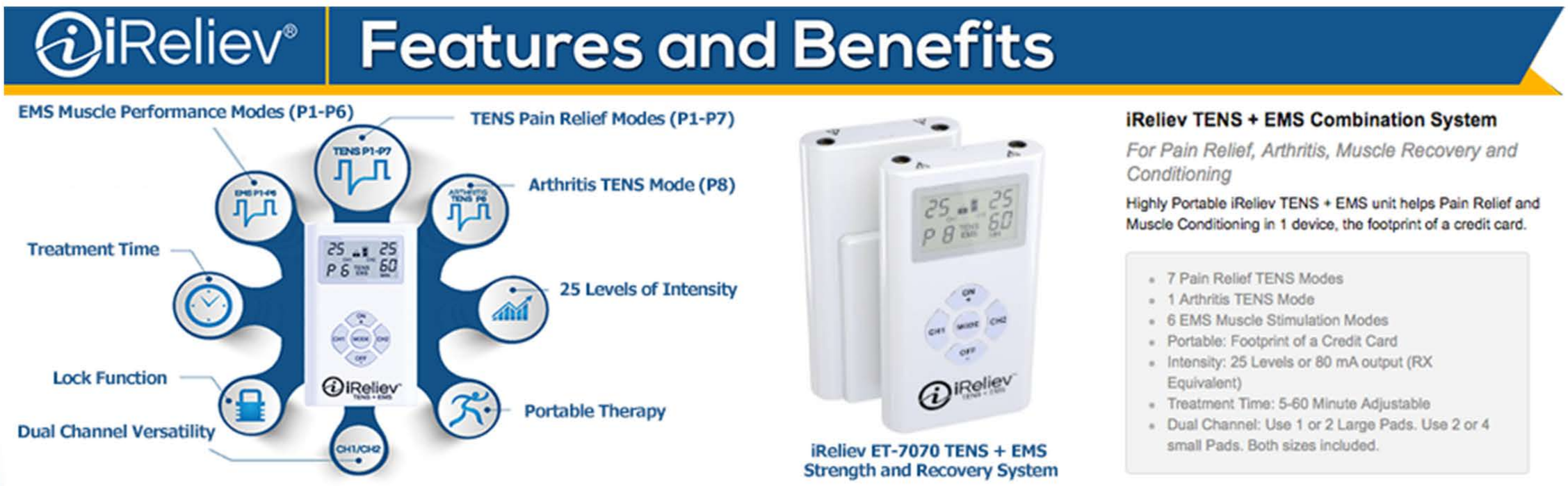
The second key component in the portable TENS system are the electrode pads. These plug into the device similar to how a pair of headphones would plug into an iPod. The electrodes act as the conductors for the electrical impulses that the device kicks out, delivering the impulses through the skin and to your nerve endings.



Thus, when using the TENS Unit, you plug in the electrodes to the device, and then place the electrode pads on your skin near the source of pain. For instance, if a user suffers from lower pack pain, they might place their pads on either side of the spine at the lower back. Some TENS Units offer the choice to use two pads for smaller areas or four pads for larger areas.

Once the pads have been placed around the painful area, the TENS Unit is turned on. Mild electrical currents begin heading to the electrode pads, traveling through the skin and then to the nerve fibers. Instead of feeling pain, the user will experience a warm, tingling sensation.

So what's happening here? How are these electrical impulses capable of relieving the pain? To make a long science lesson short, humans experience physical pain because of the pain signals that are sent to the brain. When the impulses stimulate nerve fibers, it helps to block the pain signal to the brain.



The Science Behind the TENS Unit

There are three primary theories that define why TENS works. The first of which deals with the blocking of the pain signals. This is known as the "gateway control theory," and for fitting reasons. Here's what happens.

The gateway control theory, as briefly mentioned above, says that non-painful nerve signals have the capacity to interrupt painful nerve signals. This is because the non-painful signals essentially get in the way of the pain signals. When they occur, they 'close the gate' and prevent the pain signals from traveling to the brain.

Imagine that these signals are two trains on separate tracks. Each of these two tracks converge into one single track that heads directly to the brain. The train on the right is the pain signal, and it's headed for that track to the brain. But, when the non-painful signal is stimulated—the train on the left, if you will—it heads for that same track to the brain. This signal (or train) gets priority over the nerves' railways, taking over the tracks and preventing the pain signal from getting through.

When TENS stimulates the nerve endings and creates those pleasant, tingling sensations, it's activating the gateway control theory process. Now with these massage-like feelings in place, the pain can't get through to the brain. This is why TENS can provide such instant relief from so many ailments, like lower or upper back pain, shoulder pain, leg or arm pain, and even carpal tunnel. Another way in which the effectiveness of TENS can be explained is through a particular group of hormones that are secreted from within the body.

Endorphins are the body's natural painkiller. The name comes from a combination of the words endogenous (meaning originating from within the body) and morphine (as in the analgesic drug).

Endorphins are produced naturally by our bodies in certain situations, particularly when we've injured ourselves. For instance, if a person breaks a bone, their body might release endorphins to help them deal with the pain. The production of endorphins can also be triggered by things like working out. This explains why lots of people turn to exercise for its mood-boosting effects.

When endorphins are released, they create a relaxed, pain-free state, similar to the painkilling qualities of morphine, also producing a similar, blissful high. Studies have shown that regular TENS therapy can trigger the release of endorphins as well. Thus, not only would TENS be working thanks to the gateway control theory, but also by releasing the body's natural painkiller. Plus, endorphins, along with the stimulated nerve endings, have been shown to help prevent the pain signals from travelling to the brain. The final theory that explains why TENS works is the central inhibitory effect. In short, this would mean that TENS changes the way our bodies transmit different signals which could ultimately mean that TENS changes the way that we feel pain.

How TENS Can Benefit You

Now that you know the science behind how TENS works, you may be curious about its potential effectiveness in your life. If you're wondering whether your pain symptoms are treatable with TENS, the answer is almost always yes. Whether you've been suffering from the same pain for years or whether you just recently developed an acute pain as a result of an injury or otherwise, TENS therapy can help you. It's been known to help with migraines, carpal tunnel, back pain, joint pain, and more. In most cases, TENS works effectively and quickly to provide natural and drug-free relief.

There are four factors that demonstrate how TENS can work for you and your specific needs: functionality, portability, usability, and safety and effectiveness. The presence of these factors in a TENS machine will determine not only how well it will treat your pain, but also how well it will fit into your lifestyle.

First, take a look at functionality. Will the machine be strong enough to provide relief from your pain? The answer to this question lies in the output level on any given TENS machine. The output, measured in mA, will determine the available intensity of the machine. Lower numbers may not cut it for more intense pain, but anything from 80-100 mA should be enough to effectively block the pain signal.

In addition to the output number, you'll want to look for a machine's number of intensity levels. These levels let you set how strong the electrical pulses are for each treatment. For instance, iReliev's TENS Unit offers an output of 80 mA and 25 intensity levels. Because of the potential versatility in an electrotherapy unit, TENS can work for many different people and many different conditions.

Beyond looking at just the output of a machine, you should confirm that the TENS or EMS unit is functional as a machine. Do the mechanics work well? Is the unit battery-powered or rechargeable? Oftentimes rechargeable units are weaker and require charging every few hours. Battery-powered TENS Units will last longer, which is good news for those who seek regular treatment throughout the day or on the go. And speaking of on-the-go, portability is another feature in some TENS units that allow the therapy to work for you, adjusting to you and your lifestyle. iReliev's TENS Unit is portable, battery-operated and small enough to carry in a pocket or purse. Unlike prescription and over-the-counter painkillers, TENS therapy can help with pain as soon as it begins. Having a portable TENS unit with you on the go allows you to find relief the moment you need it.

Even if a TENS unit is powerful and portable, it will be of no use to you if you can't figure out how to use it. Picking a unit that's over-the-counter is one way to ensure usability. One of the qualifications a TENS unit must meet to be considered over-the-counter is an easy-to-use design that the average person can figure out without the guidance of a professional. But even some of these over-the-counter units aren't straightforward, or don't offer satisfactory information in the manual. iReliev is one company that's enthusiastic about educating consumers on how to make TENS work for them. The provision of eBooks, instructional videos, newsletters and quick-start guides grant you access to resources that will help you discover how TENS will be most effective to you.

Over-the-counter units also guarantee a product's safety. To become over-the-counter, a product must be FDA approved, and FDA approval is one thing that undoubtedly verifies the legitimacy of TENS. The FDA acts as a sort of middleman between the consumer and health products, screening devices before they hit the market to check for safety and efficiency. The FDA has cleared certain TENS devices such as those by iReliev as safe and effective.

Overall, the medical community as a whole is warming up to electrotherapy more and more as time goes on. It's not uncommon to find electrotherapy devices in the offices of natural health practitioners. And today, even regular physicians are beginning to recommend electrotherapy as an alternative pain treatment. That is, in part, thanks to the large number of clinical studies that now exist, proving the effectiveness of TENS. With all of this in mind and more studies and developments occurring regularly, it would be nearly impossible to argue that TENS is not a viable solution to pain. As more people try it, more testimonies come out in the open, touting TENS as their go-to pain relief. With no dangerous side effects, nothing to lose and so much to gain, why not conduct your own experiment and give TENS a go at your pain today?

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