



Overview

This data sheet explains a little about Acticare TSE, an electrical therapy for the treatment of chronic pain.

TSE is a drug-free therapy that may be used alone or alongside medication to help reduce pain, increase mobility and aid sleep. In a recent survey of chronic pain patients using TSE (average age 65, average duration of pain 9.5 years) 79% of patients reported better than 50% pain relief.

The beneficial effects of TSE may also lead to reduced visits to the GP or hospital, reduced use of pain relieving drugs, greater independence and improved quality of life. Although TSE may reduce pain, in most cases it does not completely eliminate pain.

Key Features

- ▶ Battery powered portable electrotherapy device with TSE and a wide range of TENS modes
- ▶ More than 10 times the output power of typical handheld TENS and first generation TSE devices
- ▶ Easy to use both in a hospital environment and in the patient's home
- ▶ Rechargeable batteries with 2 hour charging cradle
- ▶ Output frequency up to 20,000 pulses per second
- ▶ Zero distortion of output waveform even under high load
- ▶ Large LCD display with treatment timer
- ▶ Integrated electronic pain diary

Electrotherapy modalities available

- ▶ Transcutaneous Spinal Electroanalgesia (TSE) - high power high voltage pulses (250V) of very short duration (typically 0.5 to 4 microseconds)
- ▶ Transcutaneous Electrical Nerve Stimulation (TENS) Constant, Burst, and Modulated modes
- ▶ High Frequency TENS
- ▶ Acupuncture-like TENS (AL-TENS) down to 1Hz
- ▶ Neuromuscular stimulation (NMES)

The History of TSE and Acticare

Electrical stimulation of the spinal cord for pain relief dates back to 1967, when electrodes were implanted in the spinal cord to block the sensation of pain. This technique is called Spinal Cord Stimulation (SCS). Spinal Cord Stimulation is often effective against longstanding pain, but has the disadvantage that surgery is required to implant the electrodes.

In 1991, inspired by the success of SCS, Drs Alex Macdonald and Tim Coates discovered Transcutaneous Spinal Electroanalgesia (TSE). They were granted patents on the technology in 1995 and 1997.

TSE uses very short electrical pulses applied to the spinal cord via the skin. These pulses are only a few millionths of a second in duration, but of relatively high voltage.

The pulses pass through the skin and tissues to the spinal cord. They are too short to cause any more than a very mild tingling sensation in nerves under the skin, so the therapy is well tolerated by most patients.

TSE has been used as a form of electrical pain relief since its discovery in 1991. No serious side effect or interaction with medication has been reported despite being used in over 100 NHS hospitals and by thousands of patients in their homes.

TSE will work alongside drug therapy without harmful interactions or side effects and is complimentary to physiotherapy, osteopathy and acupuncture. TSE has also been clinically proven to improve mood and aid relaxation.

Easy to use - only two electrode placements to cover the whole body



Acticare TSE may be employed peripherally as a high power, high frequency TENS machine; but the TSE modes are particularly convenient because they work on the central nervous system, only two electrode placements are needed to cover pains anywhere in the body.

← Pains below the shoulders

Place one electrode at the base of the neck at T1 and the second electrode at T12 to relieve pains in the back, hips and knees.

Pains in the head neck and arms →

Place electrodes either side of the neck to relieve headache and pains in the arms.



When should TSE be used?

TSE is an appropriate treatment for the management of many chronic pain conditions. In some cases chronic pain may be a distinct condition in itself, which may or may not be related to some underlying cause. TSE improves quality of life by helping the management of pain but has not been proven to cure any underlying illness. Some conditions that respond well to TSE are:

- ▶ Back pain
- ▶ Arthritis
- ▶ Joint pains
- ▶ Headache
- ▶ Neuralgia
- ▶ Migraine
- ▶ Sciatica
- ▶ Period pain
- ▶ Neck pain
- ▶ Spondylitis
- ▶ Muscle pain
- ▶ Post-operative pain
- ▶ Post-injury pain
- ▶ Stress

When should TSE not be used?

TSE is not suitable for patients with cardiac pacemakers, a history of epilepsy or women who are pregnant. Patients who have a metallic implant in the spine or a tumour should consult a clinician before use. TSE should not be used to treat any pains that have not been diagnosed by a doctor.

How Does TSE differ from TENS?

The primary benefit of TSE is that the electrode locations are standardized. Two surface electrodes are always placed over the spinal cord wherever the painful regions are. Because the spinal cord is the body's conduit for pain signals TSE can relieve multiple pains in different parts of the body at once. Furthermore, the effect of TSE tends to be cumulative over time in about 50% of patients.

In order to penetrate deep tissues, TSE pulses are of higher voltage and higher power than TENS. But because of their very short duration, TSE pulses produce less stimulation of the peripheral nerves and therefore little or no tingling sensations which some patients find uncomfortable.

The Acticare TSE device looks very similar in size and shape to a TENS device, but its size is deceptive: under typical treatment conditions it delivers 5-10 times the power.

Technical Specifications

Feature	Specification
TSE Modes	3 (500, 2500 & 10,000 pulses per second)
TENS Modes	6 continuous, burst and modulated modes
High Frequency TENS	2 (500 pulses per second)
Advanced user programmable modes	Frequency: 1 to 20,000 pulses per second Pulse widths: 0.5 to 200 microseconds Output Voltage: 0 - 250 Volts
Acupuncture-like TENS (AL-TENS)	User programmable waveform down to 1 pulse per second
Neuromuscular stimulation (NMES)	User programmable waveform
Output channels	One
Treatment timer	User adjustable from 10 to 180 minutes
Display	Liquid Crystal Display (LCD)
Real time clock	Time and date display
Pain Diary	Records pain scores and treatment date and time for 250 sessions
Size	100mm high, 72mm deep, 38mm wide
Power source	4 rechargeable AA batteries (2 hour life) with charging cradle.
Weight	235 grams
Approvals	CE marked in accordance with Medical Devices Directive (93/42/EEC) under supervision of Notified Body SGS UK Ltd



Every device is supplied with a charging cradle and rechargeable batteries to minimise the cost of ownership and a high quality carry bag.

TSE: simple, safe and effective

“In monitoring the use of TSE in more than 8000 UK patients, no significant treatment side effects have ever been reported. There is no known interaction with drug therapies, and TSE has been successfully used in conjunction with other therapies, such as physiotherapy, TENS, acupuncture and osteopathic techniques.”

Published: Hospital Medicine, 2001

“Our results show that TSE treatment has significant effects on mood with the subjects being more elated, leisurely and less tensed up.”

Published: Behavioural Neurology, 1997

“The analgesic effects of TSE have been found to be significantly superior to a control in a formal randomised double-blind cross-over study in the relief of chronic musculoskeletal pain.”

Published: Physiotherapy, 1995

“An investigation was carried out in 1999 into the effects of TSE usage on General Practitioner consultation rates; this showed an average consultation rate before acquiring the TSE device of 2.96 visits per patient compared with 1.84 visits during use. This represents a reduction in the consultation rate of 38.7%.”

Presented: Royal Society of Medicine, 2001

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