

TENS



Drug-Free Pain Management

Impulses in pain management

For many years, transcutaneous electrical nerve stimulation (TENS) has been applied with excellent results in hospitals, medical practices and home use. The extensive appreciation of physiotherapy and non-medication therapy as well as the search for low-cost and easy-to-use therapies with few side effects have all promoted treatment with TENS devices.

Each product is developed by a cross-functional team of physicians and other specialists. schwa medico, a leading supplier of modern TENS devices, has successfully marketed these pain relieving instruments in numerous medical fields such as pain therapy, anaesthetics, neurology, orthopaedics, rehabilitation and internal medicine. Today, schwa-medico is an integral part of modern medicine thanks to the convincing track record of its products.

Pain management has become an important field of modern medicine. With its low level side effects and effective therapy TENS is today a tried and tested component of pain management procedures.

Basic principles of TENS therapy

TENS is a non-medication, non-invasive, highly accepted and widespread therapy highlighted by its very few side effects and outstanding results in the treatment of pain.

Therapeutic electrostimulation leads to the activation of neuro-modulated regulation. The main targets of the therapy are the suppression of pain, the improvement of blood circulation and muscle relaxation. The therapy leads to the activation of main control systems. Peripheral nerves and receptors in the skin, connecting tissues, muscles, tendons and vessels are stimulated by the electrical impulses. If the neural system is mostly intact, the neural reactions which are generated can be used for therapeutic procedures. TENS is classified as a physical therapy and therefore pertains to specific reflexotherapy, stimulation therapy i.e. regulation therapy.

The scientific background of pain suppression is, amongst others, the inhibition of segmental spinal pain according to the modified gate control theory and the inhibition of descending central i.e. supra-spinal pain.

According to scientific research electrostimulation also blocks the afferent pain stimuli in the spinal cord by releasing opioids. Depending on the frequencies used during the stimulation, analgetic effects can be achieved by the release of dynorphin, enkephalin, endomorphin and bendorphin.

- TENS treatment has proved its value over the last 30 years.
- TENS is easy to learn and easy to use.
- It can be used for various indications.
- It is efficient.
- It is cost effective.

Nowadays, TENS are portable, battery operated devices which produce rectangular impulses with a pulse width of 50 μ s to 500 μ s and an adjustable intensity of up to 100 mA. The impulses are transmitted to the human body via electrodes which have been attached to the skin. The frequency of the rectangular impulses varies between 1 Hz and 120 Hz. Pain treatment is the main indication for TENS therapy.

Pain relief with TENS

In principle, all acute and chronic pain can be treated with TENS.

The degree of its effectiveness in terms of pain relief can be primarily judged during practical application. TENS is a flexible treatment which can be matched to the needs of the individual patient.

Indications are essentially:

- Traumatic pain
- Musculo-skeletal pain
- Neural pain
- Pain as a consequence of circulatory disorder

Other indications:

For the improvement of blood supply (e.g. to support wound healing)

TENS for the treatment of ...

- Low back pain
- Cervical pain
- Sciatic pain
- Shoulder pain
- Tension headache
- Migraine
- Epicondylitis radialis
- Epicondylitis ulnaris
- Arthrosis: eg. gonarthrosis, coxarthrosis
- Ankle joint pain
- Pain of the achilles tendon / heel pain
- Carpal tunnel syndrome
- Polyarthritits
- Trigeminal neuralgia
- Polyneuropathy
- Zoster neuralgia
- Phantom limb pain
- Stump pain
- Angina pectoris pain
- Scar pain
- Wound healing
- Dysmenorrhoe

TENS devices

TENStem eco basic



- Digital 2 channel unit
- 12 pre-set programs
- 12 free programs
- HAN stimulation
- Lock key pad
- Belt clip
- Possibility to monitor patient use

Technical data

Art. No.	104041
Output current	100 mA (with 1kΩ load)
Frequency	1-120 Hz
Pulse form	square, positive with negative part
Pulse width	70-350 μs
Power supply	6,0 V (4 x 1,5 V battery AAA type micro e. g. LR03) or 4,8 V (4 x 1,2 V rechargeable battery AAA)
Size	140 x 64 x 28 mm
Weight	approx. 96 g

TENStem eco



- Digital 2 channel unit
- 12 pre-set programs
- 3 free programs
- HAN stimulation
- Lock key pad
- Belt clip
- Possibility to monitor patient use
- High quality skin protection

Technical data

Art. No.	104725
Output current	70 mA (with 1kΩ load)
Frequency	0,5-120 Hz
Pulse form	square, positive with negative part
Pulse width	60-300 μs
Power supply	9 V compound battery
Size	114 x 59 x 27 mm
Weight	approx. 170 g

TENS eco 2



- Digital 2 channel unit
- 12 programs
- 12 free programs
- HAN stimulation
- Lock key pad
- High quality skin protection
- Neckband
- Integrated accumulator

Technical data

Art. No.	104062
Output current	100 mA (with 1kΩ load)
Frequency	0,5-120 Hz
Pulse form	square, positive with negative part
Pulse width	50-400 μs
Power supply	integrated rechargeable batteries Ni-mH 4,8 V
Size	114 x 59 x 27 mm
Weight	approx. 300 g incl. batteries

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stim 2 fit



- Digital 2 channel unit
16 pre-set programs for:
- Beauty
 - Wellness
 - Muscle stimulation
 - Pain therapy

Technical data

Art. No.	104039
Output current	100 mA (with 1k Ω load)
Frequency	0,5-120 Hz
Pulse form	square, positive with negative part
Pulse width	60-350 μ s
Power supply	9V compound battery
Size	114 x 59 x 27 mm
Weight	approx. 170 g

EMP 2 pro



- Digital 2 channel unit
21 pre-set programs for:
- Pain therapy
 - Muscle stimulation
 - Incontinence therapy
 - Wellness
 - Sport
- 21 free programs
Battery + connection to main circuit

Technical data

Art. No.	104026
Output current	100 mA (with 1k Ω load)
Frequency	0,5-120 Hz
Pulse form	square, positive with negative part
Pulse width	70-500 μ s
Power supply	3 x 1,5 V compound battery
Size	132 x 83 x 39 mm
Weight	approx. 190 g

Positioning the electrodes

Where to position the electrodes?

The electrodes are to be positioned according to the following procedure:

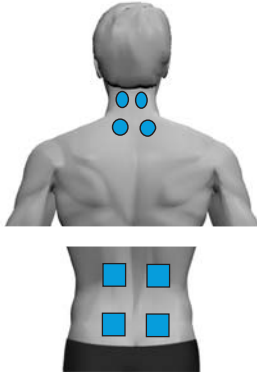
- Local, segmental positioning in the pain area
- Positioning over the peripheral nerve
- Paravertebral positioning on each side of the spinal root

Local positioning is normally the most effective. If this positioning is not possible, the peripheral nerve has to be stimulated ideally where it is located superficially.

Paravertebral stimulation is also possible. Electrodes have to be positioned on both sides of the spinous process of vertebrae. Both spinal roots can be stimulated or only the one causing the pain, the second electrode then remains in the peripheral area.

In case of irradiating pain one electrode has to be positioned over the pain origin and the other at the end of the irradiating area. In case of wide irradiating areas, e.g. sciatic pain, the second channel can be used to treat other painful points within the area. The following pages show examples of common positioning of electrodes.

Examples of electrode positioning



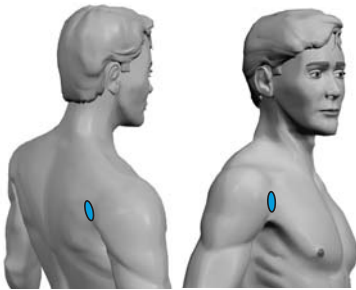
Cervical syndrome / Low back pain

1 channel use

One electrode paravertebral on the main pain spot, the other electrode laterally reversed on the opposite side or alternatively in the irradiating pain area.

2 channel use

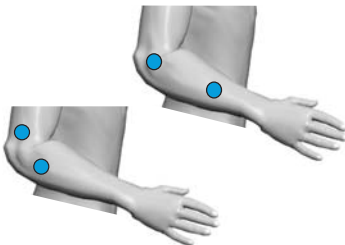
If the pain is diffuse or widespread you may use both channels: e.g. one pair of electrodes to be positioned segmental paravertebral, the other pair in the irradiating pain area.



Shoulder pain

1 channel use

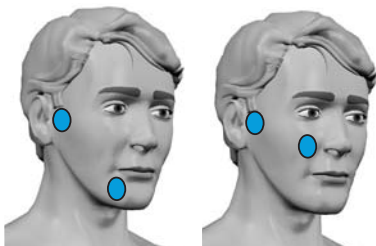
One electrode on the main pain spot, the other one on the opposite side or alternatively in the irradiating pain area.



Epicondylitis radialis / ulnaris

1 channel use

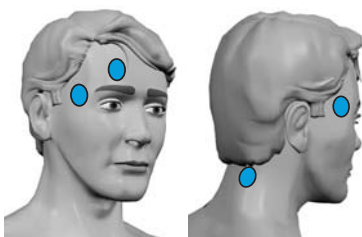
One electrode on the main pain spot, the other one in the irradiating pain area. Alternatively electrodes above and below the pain spot.



Trigeminal neuralgia

1 channel use

One electrode just before the ear, the other one at the end of the respective nerve.



Migraine

1 channel use

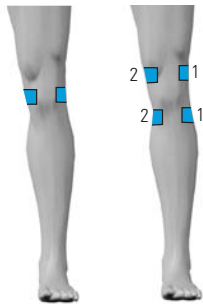
One electrode on the pain spot (e.g. the forehead), the other electrode in the irradiating pain area. Alternatively you may use the Kaada stimulation.

Tension headache

1 channel use

One electrode on the pain spot (e.g. the forehead), the other electrode in the neck. Alternatively you may use the Kaada stimulation.

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Gonarthrosis

1 channel use

Electrodes on both sides of the knee joint.

2 channel use

Four electrodes circling the knee joint.

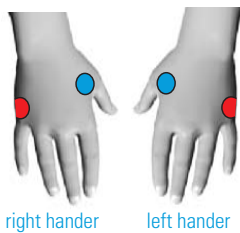


Ankle joint pain

1 channel use

One electrode above the ankle joint, the other one below the ankle joint.

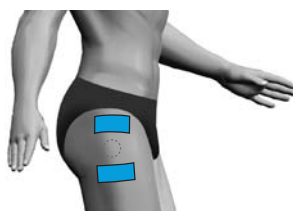
Alternatively one electrode on the pain spot, the other one in the irradiating pain area.



Kaada stimulation

1 channel use

Electrodes should be positioned on the dominant hand.



Arthrosis (hip)

1 channel use

One electrode above the pain spot, the other electrode below the pain spot.

Alternatively one electrode on the pain spot, the other one in the irradiating pain area.



Sciatic pain

1 channel use

One electrode paravertebral on the pain spot, the other one in the irradiating pain area.

2 channel use

Position the second pair of electrodes on pain spots parallel to the first pair of electrodes.

Special accessories



Electrodes

The size of the electrodes employed is dependent on the size of the area affected by pain. Small electrodes have a higher current density. This leads to enhanced stimulation of the nerves on a small area and in the deep tissues.

- **Small electrodes** are preferred for motoric stimulation (muscle twitch) using a low frequency.
- **Larger electrodes** are preferred for high frequency stimulation to amplify the spinal input (gate control theory).

Stimex self-adhesive electrodes

Art. No.	Article	Pieces
281000	Stimex 32 mm round	4
282000	Stimex 50 mm round	4
283400	Stimex 50x50 mm	4
283600	Stimex 50x90 mm	2
281007	Stimex 50x90 mm	4
283000	Stimex 50x130 mm	2
283100	Stimex 80x130 mm	2



Silicone electrodes

(to be used with contact gel)

Art. No.	Article	Pieces
107090	Silicone electrode 20 mm round	2
107060	Silicone electrode 25 mm round	2
107075	Silicone electrode 40x28 mm	2
107035	Silicone electrode 56x28 mm	2
107020	Silicone electrode 75x30 mm	2
107055	Silicone electrode 90x35 mm	2
107011	Silicone electrode 38x45 mm	2
107010	Silicone electrode 48x48 mm	2
107050	Silicone electrode 70x65 mm	2
107070	Silicone electrode 70x140 mm	2



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MedicoBack P-type

Low back support bandage with pelotte and integrated electrodes to be used with all schwa-medico TENS devices

MedicoBack offers patients lumbar vertebrae stabilisation and support as well as easy TENS stimulation thanks to the integrated electrodes. The pelotte with its massage nubs intensifies the pain relieving effect of the MedicoBack. MedicoBack may be used for light or acute pain as well as for chronic pain in the low back area.

Benefits:

- Drug-free pain relief
- Low back support
- No side effects
- Quick and easy handling
- To be used in resting position or exercise

Indications

- Spondylarthrosis of the lumbar vertebrae
- Instability resulting from degenerative lumbar vertebrae
- Low back pain with muscular insufficiency
- Lumbago with nerve root syndrome
- Slipped inter-vertebral disk, herniated disk
- All other kinds of low back pain



MedicoBack P-type

Art. No.	Article	Size	Length
107034	MedicoBack P-type	S	85 cm
107036	MedicoBack P-type	M	93 cm
107037	MedicoBack P-type	L	102 cm
107038	MedicoBack P-type	XL	104 cm
107039	MedicoBack P-type	XXL	121 cm

MedicoBack P-type including:

Pieces	Article
1	low back support bandage
1	pelotte
1	cover for the pelotte with integrated electrodes
1	cover pelotte without integrated electrodes
8	gel pads



Stimex garment electrodes: gloves and socks

The Stimex electrode gloves and socks used in combination with a schwa-medico electrotherapy device are ideal for home treatment. They provide stimulation of the entire hand and/or foot and ankle and avoid the sometimes tiresome attachment of self-adhesive electrodes on the hand or the foot.

Field of application:

- Pain in the area of hands or feet
- Reduction of swelling and oedema (not with infection)
- Paraesthesia, e. g. caused by polyneuropathy
- Maintenance of muscles

Indications:

- Arthritis, joint afflictions, rheumatic syndrome
- Arthrosis
- Polyneuropathy
- Stump pain
- Phantom limb pain
- Scar pain
- Postoperative pain
- Sport injuries
- Sprains and other ailments
- Dupuytren's contracture, tendovaginitis stenosans
- Carpal tunnel syndrome

Gloves

Art. No.	Article	Size	Pieces
107014	Stimulation gloves	S	1 pair
107021	Stimulation gloves	M	1 pair
107022	Stimulation gloves	L	1 pair

Socks

Art. No.	Article	Size	Pieces
107023	Stimulation socks	M	1 pair
107024	Stimulation socks	L	1 pair

List of TENS-Studies

1. Ainsworth L, Budelier K, Clinesmith M, Fiedler A, Landstrom R, Leeper BJ, Moeller L, Mutch S, O'Dell K, Ross J, Radhakrishnan R, Sluka K A (2006) Transcutaneous electrical nerve stimulation (TENS) reduces chronic hyperalgesia induced by muscle inflammation. *Pain* 120:182-187
2. Barker R, Lang T, Steinlechner B, Mora B, Heigel P, Gauss N, Zimpfer M, Kober A (2006) Transcutaneous electrical nerve stimulation as pre-hospital emergency interventional care: treating acute pelvic pain in young women. *Neuro-modulation* 9,2:136-142
3. Bertalanffy A, Kober A, Bertalanffy P, Gustorff B, Gore O, Adel S, Hoerauf K (2005) Transcutaneous electrical nerve stimulation reduces acute low back pain during emergency transport. *Acad Emerg Med* 12, 7
4. Bjordal J M, Johnson M I, Ljunggreen A E (2002) Transcutaneous electrical nerve stimulation (TENS) can reduce post-operative analgesic consumption. A meta-analysis with assessment of optimal treatment parameters for post-operative pain. *European Journal of Pain* 2/7:181-188
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11. Hsieh R-L, Lee W-C (2002) One-shot percutaneous electrical nerve stimulation vs. transcutaneous electrical nerve stimulation for low back pain. *Am J Phys Med Rehabil* 81:838-843
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13. Lang T, Barker R, Steinlechner B, Gustorff B, Puskas T, Gore O, Kober A (2007) TENS relieves acute post-traumatic hip pain during emergency transport. *J Trauma* 62:184-188
14. Mora B, Giorni E, Dobrovits M, Barker R, Lang T, Gore C, Kober A (2006) Transcutaneous electrical nerve stimulation: an effective treatment for pain caused by renal colic in emergency care. *J Urol* 175,5:1737-41
15. Osiri M, Welch V, Brosseau L, Shea B, McGowan J, Tugwell P, Wells G (2001) Transcutaneous electrical nerve stimulation for knee osteoarthritis. *The Cochrane Library Issue* 4
16. Proctor M L, Smith C A , Farquhar C M, Stones R W (2006) Transcutaneous electrical nerve stimulation and acupuncture for primary dysmenorrhea (Cochrane Review). *The Cochrane Library, Issue* 1
17. Forst T, Nguyen M, Forst S, Disselhoff B, Pohlmann T, Pfützner A (2004) Impact of low frequency transcutaneous symptomatic diabetic neuropathy using the new Salutaris device. *Diab. nutr. metab.*, Vol. 17 No. 3: 163-168



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