

**Most Technologically Advanced  
Device for Cryoneurolysis**

# CRYO-S PAINLESS

**Recommended for Pain Management Specialists:**

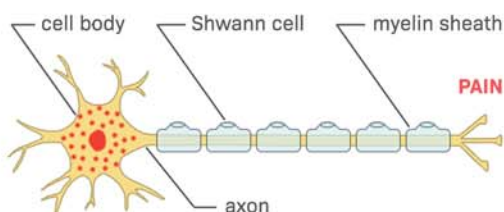
- Anesthesiologists
- Neurosurgeons
- Orthopedists
- Spine Surgeons
- Interventional Radiologist



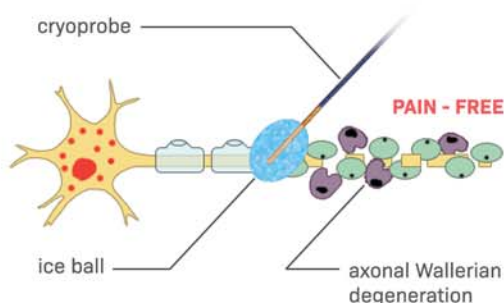
Peripheral nerve structure



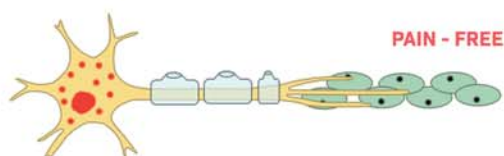
1. Peripheral neuropathy



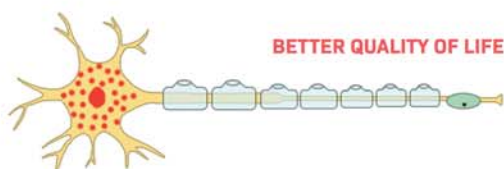
2. Interventional cryoanalgesia



3. Axonal nerve recovery process



4. Complete nerve recovery



## Life Without Pain

**Cryoanalgesia** is a therapeutic method based on the temporary interruption of sensory functions in selected structures of the nervous system by application of low temperature. Cryoanalgesia is gaining more acceptance as an innovative method in pain relief. It uses the process of analgesia, during which the ice crystals created by the cryosurgical system destroy the elements of the nerve tissue carrying pain information. Cryoanalgesia does not damage nerve structures permanently which is why nerve tissues can regenerate slowly with no risk of post-procedural neuroma. Cryoanalgesia is a minimally invasive and safe procedure recommended especially when traditional methods prove to be unsatisfactory.

## Mechanism of Cryoanalgesia

Large myelinated sensory or mixed nerves responsible for peripheral pain. Best patients for cryoanalgesia are those with chronic pain at the level of over 5 in visual analogue scale (VAS).

Axonotmesis - disruption of nerve cell axon with Wallerian degeneration occurring below and slightly proximal to the site of the injury. Axons and their myelin sheath are damaged but Schwann cells, endoneurium, perineurium and epineurium remain intact.

The rate of outgrowth of regenerating nerve fibres is about 1 mm per day, so that the final recovery of conduction to the target structure depends on the quality of freezing. Even if the peripheral nerve structures recover after some weeks, the functionality of the sensory nerve still remains blocked. In mixed nerves, mobility functions recover much faster than in sensory. Cryoanalgesia is also a recommended and safe method for pain of mixed nerves' origin (e.g. 'frozen shoulder').

Complete sensory nerve recovery, including its functionality, takes place within 6-12 months after cryoanalgesia improving patient's quality of life - life without pain.

## Clinical Application

- Craniofacial pain secondary to trigeminal neuralgia, posterior auricular neuralgia, and glossopharyngeal neuralgia
- Chest wall pain with multiple conditions including post-thoracotomy neuromas, persistent pain after rib fractures and post herpetic neuralgia in thoracic distribution
- Abdominal and pelvic pain secondary to ilioinguinal, iliohypogastric, genitofemoral, subgastric neuralgia, pudendal neuralgia
- Low back pain and lower extremity pain secondary to lumbar facet joint pathology, pseudosciatica
- Pain involving intraspinous ligament or supragluteal nerve
- Sacroiliac joint pain, cluneal neuralgia, obturator neuritis
- Knee pain prior or secondary to infrapatellar branch of the saphenous nerve, anterior femoral cutaneous nerve, genicular nerve after total knee arthroplasty
- Various types of peripheral neuropathy
- Trigger points
- Phantom pain
- Upper extremity pain secondary to suprascapular neuritis and other conditions of peripheral neuritis
- Diabetic neuropathy
- Morton's neuroma, heel pain

## The Advantages of Cryoanalgesia

- No neuroma formation - no risk of secondary pain
- High efficiency: pain reduction from 6 months to 2 years
- No scar tissue formation
- Suitable for patients with pacemakers and stimulators
- No risk of vessel proliferation and obliteration
- Can be repeated - nerve grows back
- Simple diagnostics: fluoroscopy or echography
- Percutaneous procedure, microinvasive under local anesthesia
- Fast return to normal activity – no hospitalization
- Can be performed under USG or X-ray
- No more Pain Killers



great occipital nerve  
(headic pain)



suprascapular nerve  
(frozen shoulder)



genicular nerve  
(knee pain)



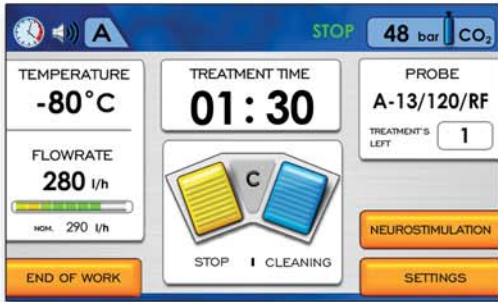
painful  
neuroma



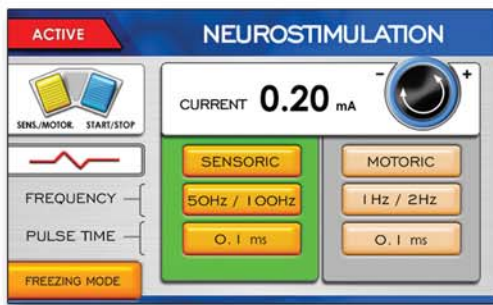
Morton's neuroma (foot pain)



genitofemoral nerve (pelvic pain)



touch screen view during freezing procedure



touch screen view during neurostimulation procedure



grounding pad

## Cooling Source

CRYO-S PAINLESS state-of-the-art cryosurgical device manufactured by METRUM CRYOFLEX is the next generation of apparatus used by many experts in the field since 1992.

The working medium for CRYO-S PAINLESS is carbon dioxide: CO<sub>2</sub> (-78°C) or nitrous oxide: N<sub>2</sub>O (-89°C), very efficient and easy to use gases. A 10 liter cylinder of CO<sub>2</sub>/N<sub>2</sub>O serves for approximately 60 procedures.

CRYO-S PAINLESS is controlled by a microprocessor and all the parameters are displayed and monitored on a LCD screen.

## Neurostimulation

Diagnostic nerve stimulation built in CRYO-S PAINLESS device helps to distinguish between sensory and motor nerves. It prevents from accidental freezing of motor nerves, which is a reversible effect, however the possible discomfort connected with temporary paresis may entirely challenge pain therapy.

Integrated neurostimulator provides two types of stimulation (sensory and motor) and a variety of options for manual settings (without freezing).

Stimulation frequency setting:

- for motor stimulation: 1 and 2 Hz;
- for sensory stimulation: 50, 100, 150, 200 Hz
- impulse width setting: 0.1, 0.2, 0.5, 1.0, 2.0 – 5.0 ms

## Grounding Pad for use with CRYO-S PAINLESS device

Single use grounding pad dedicated for CRYO-S PAINLESS is easy to use and provides more precise neurostimulation than any other grounding pad. Available accessories including connector cables, grounding pads are always available with CRYO-S PAINLESS.

### CRYO-S PAINLESS device

- Mode selection probe, cleaning and freezing can be performed automatically using footswitch or touch screen which allows to keep the site of a procedure under sterile conditions.
- Electronic communication (chip system) between the connected probe and device allows recognition of optimal operating parameters and auto-configures to cryoprobe characteristics. Pressure and gas flow are set automatically, any manual adjustment is not necessary
- Contains automatic cryoprobe test system and two freezing modes (continuous and sequential). Probe test system includes autocleaning and short freezing test.
- Cryoprobe temperature, cylinder pressure, gas flow inside of cryoprobe and procedure time are displayed during freezing.
- Built-in voice communication
- Built-in neurostimulation (sensory, motor).

operated with  
footswitch or touch screen



TOUCH

electronic communication  
between the probe and device



RFID

two freezing modes



MODE

voice communication



VOICE

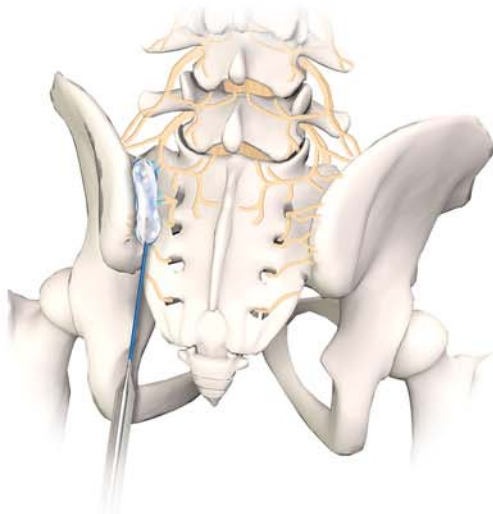
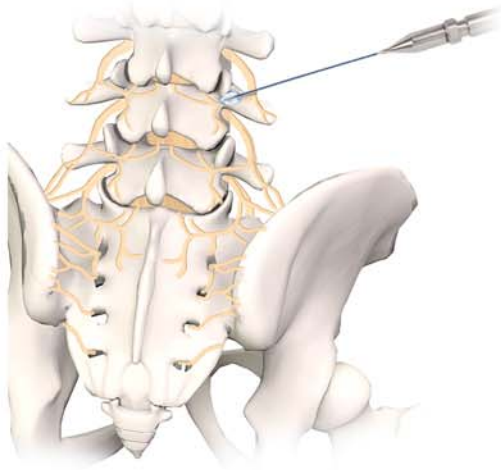
neurostimulation  
(sensory, motor)



STIM



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## Cryoprobes

The largest selection of cryoprobes - the thinnest cryoprobes for cryoanalgesia available on the global pain management market.

We offer both single use and reusable cryoprobes which are easy to sterilize (steam, gas). The special construction enables precise freezing and fast defrosting. The tip of a probe inserted percutaneously is sharp or blunt. Cryoprobes that aim to stick to the nerve more closely are rounded and inserted through disposable or reusable cannulas (e.g. angiocatheters).

Apart from the tip, cryoprobes are covered with medical teflon which allows for stimulation at the probe tip only.

- Gauge from 21 up to 14
- More safety - the operator's hand is not exposed to the harmful X-Ray radiation.
- High echogenicity of cryoprobes enables ultrasound-guided treatments

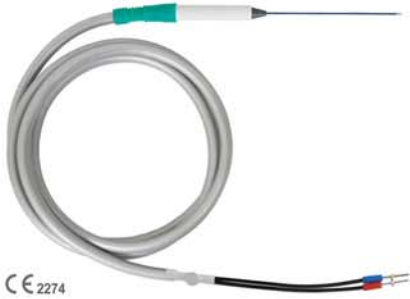
## Sacroiliacjoint Cryoprobe (SIJ)

New SIJ (sacroiliacjoint) cryoprobe represents a new vision of performing cryoanalgesia for chronic lower back pain, including ablation of the sacroiliac region. With independent active areas in a single probe, procedure time is generally reduced.

- Design is intended to create a continuous cryoablation with no gaps (similar to RF palisade method)
- A single insertion point reduces time of procedure
- Designed to lesion the peripheral nerves at S1-S3
- Ergonomic handle enhances maneuverability
- Dedicated single-use introducer needle

### Single-use cryoprobe

recommended for USG, CT, X-ray scan



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<b>CO<sub>2</sub></b> <b>N<sub>2</sub>O</b>	<b>STERILE</b> <b>EO</b>	<b>2</b>	<b>DOUBLE</b> <b>PACKAGING</b>	<b>STIM</b>	<b>MICRO</b> <b>CHIP</b>	<b>3</b> <b>YEARS</b>
GAS TYPE	READY TO USE	SINGLE USE	DOUBLE PACKAGING	STIM	MICRO CHIP	STORAGE TIME

- REF. SN06080920** Needle tip\*\*\*,  $\varnothing$  0.8 mm (21Ga), length 90 mm
- REF. SN06131200** Triangular tip\*,  $\varnothing$  1.3 mm (18Ga), length 120 mm
- REF. SN06131210** Round tip\*\*,  $\varnothing$  1.3 mm (18Ga), length 120 mm
- REF. SN06300200** Triangular tip\*,  $\varnothing$  2.0 mm (14Ga), length 120 mm
- REF. SJA** Multi-use adapter for single-use cryoprobe

### Reusable straight cryoprobe

recommended for USG, or X-ray scan



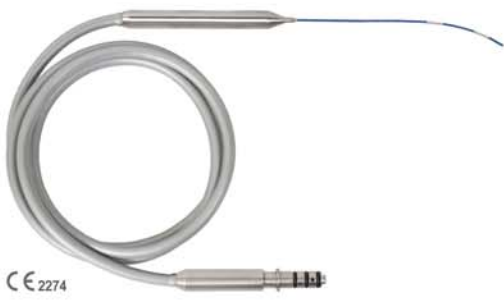
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<b>CO<sub>2</sub></b> <b>N<sub>2</sub>O</b>	<b>AUTO</b> <b>CLAVE</b>	<b>ETO</b> <b>GAS</b>	<b>50</b>	<b>STIM</b>	<b>MICRO</b> <b>CHIP</b>	<b>2</b> <b>YEARS</b>
GAS TYPE	STERILISATION METHOD	NUMBER OF STERILISATIONS	STIM	MICRO CHIP	WORKING LIFE	

- REF. N06130811** Round tip\*\*,  $\varnothing$  1.3 mm (18Ga), length 80 mm
- REF. N06130801** Triangular tip\*,  $\varnothing$  1.3 mm (18Ga), length 80 mm
- REF. N06080921** Needle tip\*\*\*,  $\varnothing$  0.8 mm (21Ga), length 90 mm
- REF. N06131201** Triangular tip\*,  $\varnothing$  1.3 mm (18Ga), length 120 mm
- REF. N06131211** Round tip\*\*,  $\varnothing$  1.3 mm (18Ga), length 120 mm
- REF. N06300201** Triangular tip\*,  $\varnothing$  2.0 mm (14Ga), length 150 mm

### Reusable SIJ cryoprobe

recommended for X-ray, USG or CT scan



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<b>CO<sub>2</sub></b>	<b>AUTO</b> <b>CLAVE</b>	<b>ETO</b> <b>GAS</b>	<b>25</b>	<b>STIM</b>	<b>MICRO</b> <b>CHIP</b>	<b>2</b> <b>YEARS</b>
GAS TYPE	STERILISATION METHOD	NUMBER OF STERILISATIONS	STIM	MICRO CHIP	WORKING LIFE	

- REF. N06302201** Triangular tip\*,  $\varnothing$  2.0 mm (14Ga), length 150 mm
- REF. 4206487** Introducer needle

<b>*</b> triangular tip	<b>**</b> round tip	<b>***</b> needle tip