

**frem**Life  
technology for health

## The new generation of FREMS™

**Electroceuticals** for the  
treatment of neurovascular  
diseases



DIABETIC  
NEUROPATHY

DIABETIC  
FOOT

NEUROPATHIC  
PAIN

ARTERIAL  
DISEASE

SKIN SORES

CLAUDICATION



# OUR MISSION:

## **TO GUARANTEE RESULTS TO IMPROVE QUALITY OF LIFE**

Fremslife originates from the innovation of Electroceuticals, also known as Bioelectronic Medicine, which uses electrical stimulation to influence and change bodily functions.

*Fremslife* has developed an innovative and integrated solution for the treatment and reduction of pain in neurovascular diseases, based on Electroceuticals-oriented therapeutic and diagnostic programmes. **The heart of the Fremslife technology is Frems™ (Frequency Rhythmic Electrical Modulation System).**

**Frems™ is a technology covered by more than 10 international patents and is certified by the United States FDA.**

It is the only neurostimulation technology that is scientifically

validated as exerting a neo-angiogenic effect, by promoting the release and synthesis of growth factors. It is effective in reducing pain from the very first session. The system is ideal for treating conditions and injuries during the acute stage; it is perfectly compatible with other therapeutic protocols and delivers outstanding results even in patients who are refractory to other therapies or treatments.

**It is destined to revolutionise the world of medicine.**

## THE EFFICACY OF A THERAPEUTIC SOLUTION CAN ONLY BE ESTABLISHED BY ANALYSING ITS RESULTS

With the scientific evidence provided by over 100 national and international publications, we have demonstrated that the results obtained with our

Frem's™ technology make it an efficacious option for the treatment of many vascular disorders.

Every day, around the world, more than 10,000 patients are treated with our exclusive technology to provide pain relief and manage conditions such as:

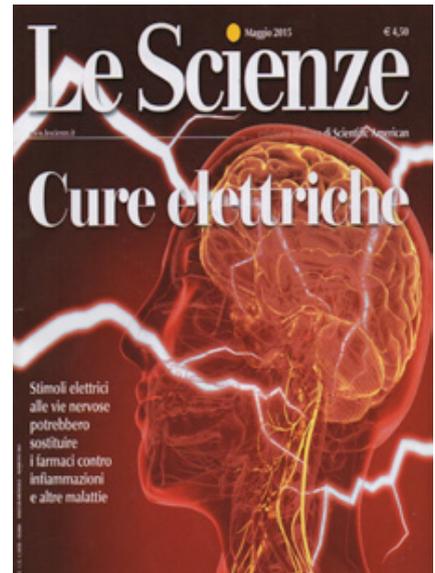
- painful diabetic neuropathy
- diabetic foot
- chronic sores
- claudication



## WHAT IS ELECTROCEUTICALS

It is a new discipline that includes bioelectric medicine, i.e. **the use of electrical stimulation of nerve cells to influence and modify physiological mechanisms.**

The Fremst<sup>TM</sup> technology belongs to this area of medicine as it has been demonstrated, by means of scientific and clinical studies, that it interacts with the human body by influencing certain basic mechanisms such as vasomotion and the H-reflex.



“Le Scienze”, May 2015, n. 561,  
Gruppo Editoriale L'Espresso

## THE SCIENTIFIC BASES OF THE FREMS<sup>TM</sup> TECHNOLOGY

Cells exchange information by means of a complex communication system based on the transduction of electrical signals and biochemical events by the passage of ions through channels in the cell membranes.

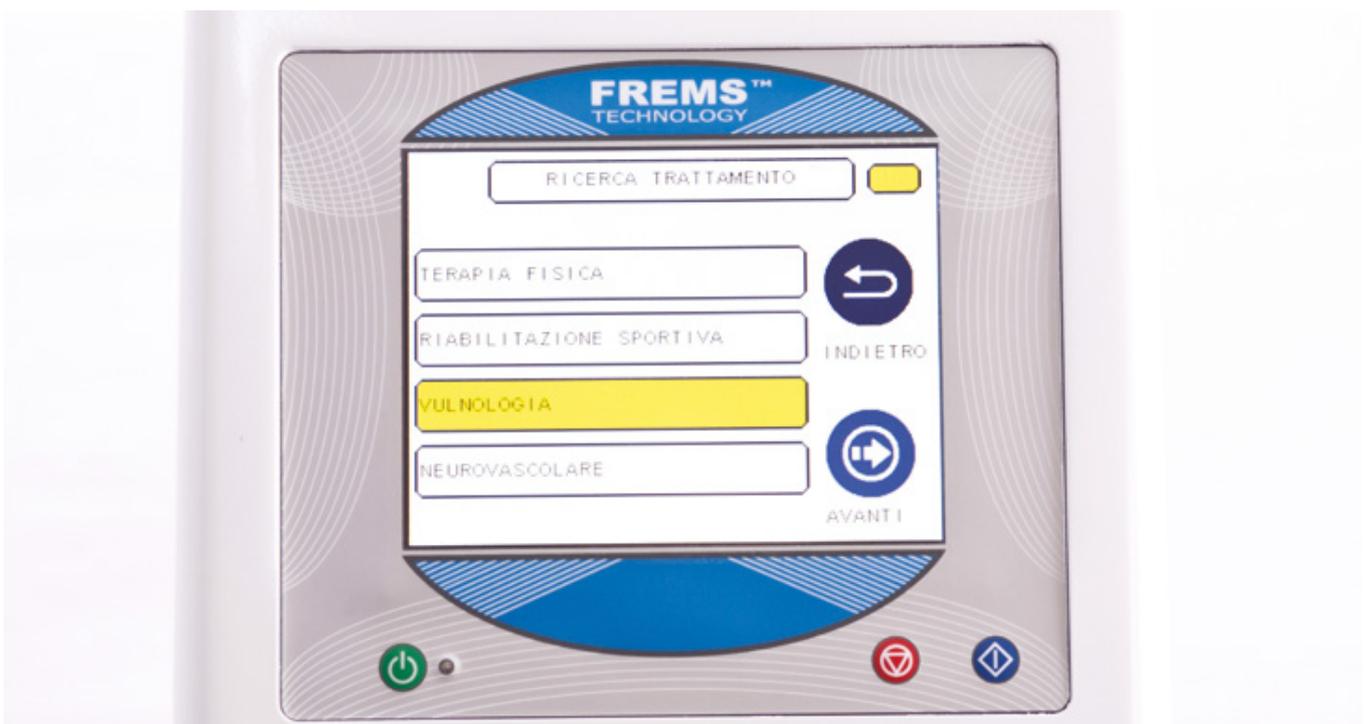
Each cell and/or tissue possesses a certain resting membrane potential.

Excitable cells are able to produce a repetitive

event, known as action potential or “spike”.

Each class of cell or tissue has a characteristic maximum frequency.

For example, smooth muscle is excited by stimuli with frequencies of approximately 10 Hz, striated muscle with frequencies higher than 30 Hz, unmyelinated fibres at frequencies > 150 Hz, etc.



# HOW DOES FREMS™ WORK

**FremS™ (Frequency Rhythmic Electrical Modulation System)**, is constituted by trains of sequences of electric impulses (such as spikes), characterised by a minimal quantity of charge, whose frequency and duration can be varied according to pre-set regimens.

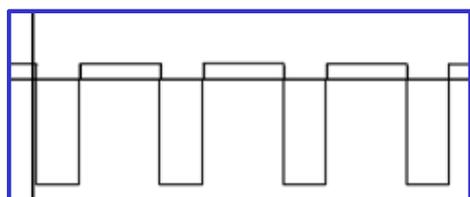
The amplitude of the impulse is set by the operator using a remote control, according to the patient's sensitivity threshold and the tissue stimulated. Subsequently, the system modulates maximum amplitude according to the ion balance of the tissue underneath the electrodes, to keep it constantly balanced (Biofeedback).

Impulses have an active phase and a recovery phase, which guarantees the ion balance in the tissue involved in the process. The impulse sequences are developed to suit the characteristics of the tissues to be involved in the programmed action and they are able to activate a functional "recovery" mechanism in the area involved in the treatment by means of the following actions:

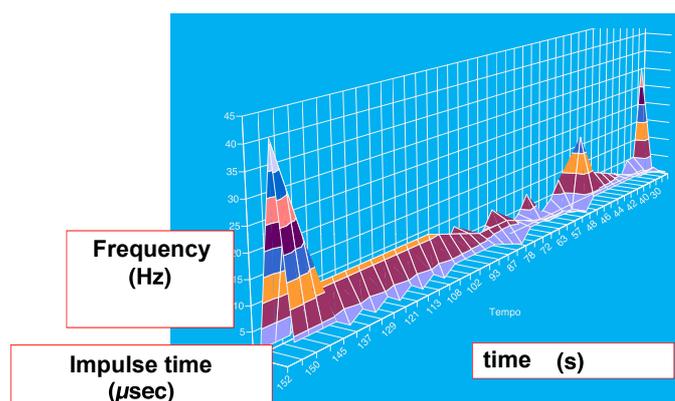
- **FUNCTIONAL REACTIVATION** of biological tissues that have been damaged by metabolic imbalances
- **INHIBITION** of symptomatic neuromuscular feedback processes
- **MOBILISATION** of inflammatory and pro-inflammatory factors
- **ACCELERATION** of damaged tissue repair processes

## FREMS™ IS NOT A CONVENTIONAL TENS

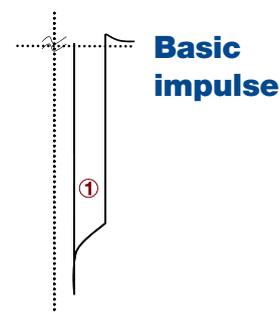
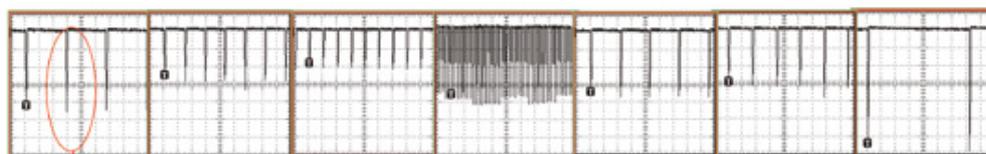
### TENS sequence



### Example of a modulated sequence



### Example of a FREMS™ sequence



Basic impulse

# APTIVA 4

NOW THE BEST IS EVEN BETTER

APTIVA 4

New more powerful hardware

New more user-friendly,  
faster-working software

New user interface

New protocols with automations  
that make application simpler and faster

Continuous treatment efficacy  
monitoring system

Elegant, light and easy  
to transport



# VASCULAR APPLICATIONS

## FREMS™ EXERTS THE FOLLOWING SPECIFIC EFFECTS

### Vasomotor action

*Vasomotion* is the rhythmic pulsing activity of the smooth muscle of the vessels that regulates microcirculation activity. The changes in the microcirculation's perfusion velocity during FremS™, measured by Doppler flow laser, demonstrate the presence of induced vasomotor activity.

### Anti-inflammatory action

Inflammatory response is often a physiological defence response that provides protection against agents that alter the body's biological and biochemical balances. Inflammatory response leads to painful oedematous situations and causes capillary dilation. There is an increase in capillary wall patency, which allows the plasma to penetrate into the intercellular spaces. The fluid accumulates between the cells and causes swelling. FremS™ stimulates vasomotion, thereby favouring, on the one hand, the release of angiogenetic factors, such as VEGF and bFGF and an increase in lymphatic system drainage and, on the other, a reduction in swelling, whilst triggering immune response to reduce the levels of pro-inflammatory cytokines.

At the same time, it favours blood flow and, consequently, the supply of

oxygen and nutritional factors. In the case of diabetic patients with microangiopathies suffering from vessel endothelium inflammation, therefore with high circulating TNF- and IL-2 values, it has been seen to significantly reduce their levels in both the acute and chronic phases.

### Tissue repair

FremS™ favours the proliferation of myocytes and the release of angiogenetic growth factors. In the presence of skin sores, FremS™ can be used to accelerate the repair of damaged tissue, by both the respiration induced by vasomotion and the release of growth factors.

### VEGF and b-FGF release

Experimental studies have shown that it is possible to favour the release and synthesis of VEGF (Vascular Endothelial Growth Factor) and of other angiogenetic growth factors by applying electrostimulation to smooth and striated muscle and epithelial cells, both in vivo and in vitro. The FremS™ system dispenses impulse sequences able to significantly increase the release of plasma growth factors, as demonstrated by the studies conducted.

### Pain relief

FremS™ produces a functional analgesic effect. Applying the electrodes to a certain area of the skin has an anaesthetic - analgesic action that persists for a certain time. In addition, FremS™ also helps to reduce the "peripheral source" of the pain, by means of the mechanisms described previously.

# THE CONDITIONS TREATED WITH FREMS™

## PAINFUL DIABETIC NEUROPATHY

- Increase in sensory and tactile perception
- Increase in motor nerve conduction velocity
- Effects lasting up to 4 months

## CHRONIC SKIN SORES OF VARIOUS ORIGINS

- Early management of pain symptoms
- Recovery of perilesional skin perfusion and promotion of epithelisation

## PERIPHERAL ARTERIAL DISEASE

- Increase in oxymetry values
- Improvement in the parameters that are characteristic of the endothelial system



## HOW IS FREMS™ APPLIED

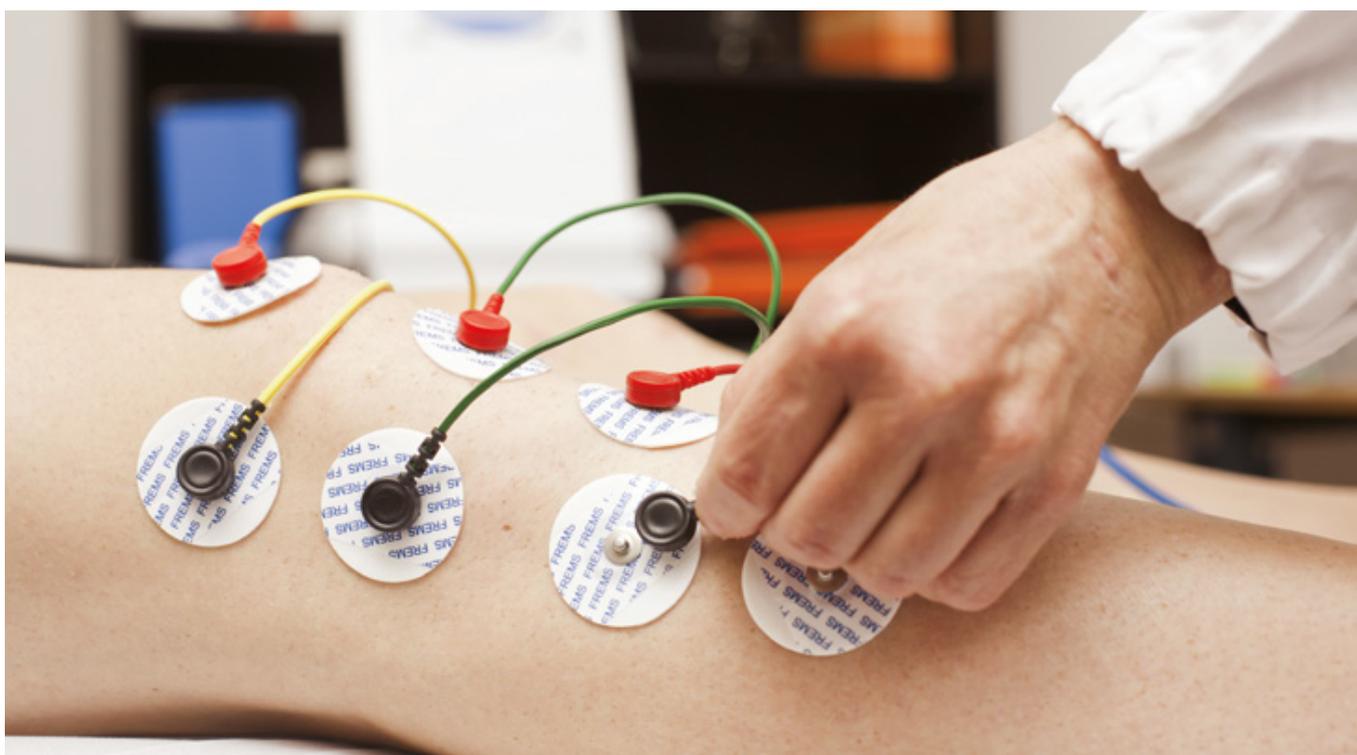
FremS™ consists in applying an electric signal that is transmitted by transcutaneous electrodes. These electrodes are dedicated to and specifically intended for the application of FremS™ and must be positioned according to set rules for each

specific treatment and consolidated protocols for each application. Treatment consists in a cycle of daily sessions lasting approximately 30 minutes, performed either in a medical setting or at the patient's home for a number of weeks.



### Consumable material

The treatment is administered by positioning, in the area to be treated, transcutaneous electrodes with a limited contact surface that have been developed and certified specifically for FremS™ applications.





## APTIVA 4 THE MAIN UNIT

- 4 simultaneously active channels
- 4 cables, each of which has 8 leads for a total of 32 electrodes, allowing a complete, even bilateral, treatment
- Electrode detachment alarm
- Remote control for treatment management at a distance
- User card
- Mains power supply



## FREMS™ ELECTRODES

**The electrodes are an essential component for guaranteeing treatment efficacy.**

The contact impedance between electrode and patient is a potential critical point for energy transfer.

The original FremS™ electrodes have been specifically designed to optimise this energy transfer.

The limited contact surface was chosen because, combined with the biocompatible material the electrodes are made of, it guarantees the best impedance for greater energy transfer.





**Centro Studi Fremslife** is a place dedicated to scientific exchange and training that provides a concrete support to our mission:

**TO GUARANTEE RESULTS TO IMPROVE QUALITY OF LIFE.**

With this initiative, Fremslife intends to provide a service that favours the scientific aspects of the technologies it manufactures, dedicating particular attention to the clinical evidence of the results obtained in the treatment of various conditions.

Directive 93/42/EEC and subsequent amendments.  
 Fremslife is certified according to EN 13485:2012  
 The Aptiva™ system is also FDA510(k)-approved.



**Fremslife s.r.l.**

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