EME® ITALY

# POLYTER **VET**

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# TECARTHERAPY

# WHAT IS IT?

The ENDODIATHERMY is a therapy that would stimulate the body's natural repair processes.

Has as its specific aim of an effective and rapid recovery in the osteo-articular and musculoskeletal, accelerating the body's own anti-inflammatory and reparative processes.

The term T.E.C.A.R. is an acronym for "Resistive Capacitive Energy Transfer." The capacitive / resistive endodiathermy produces a local and uniform increase of temperature, that is controlled directly within the tissues.

The T.E.C.A.R. therapy uses a form of electromagnetic interaction which refers to the physical model of the capacitor, with a single emission frequency biologically tested which is of about 0.5 Mhz.

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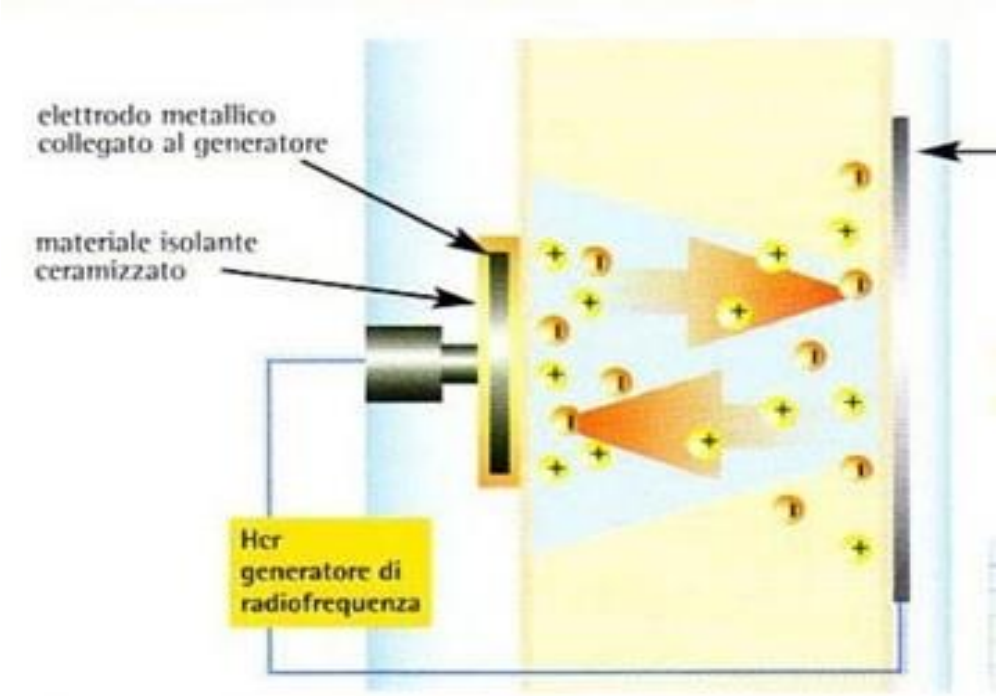
# HOW IT WORKS?

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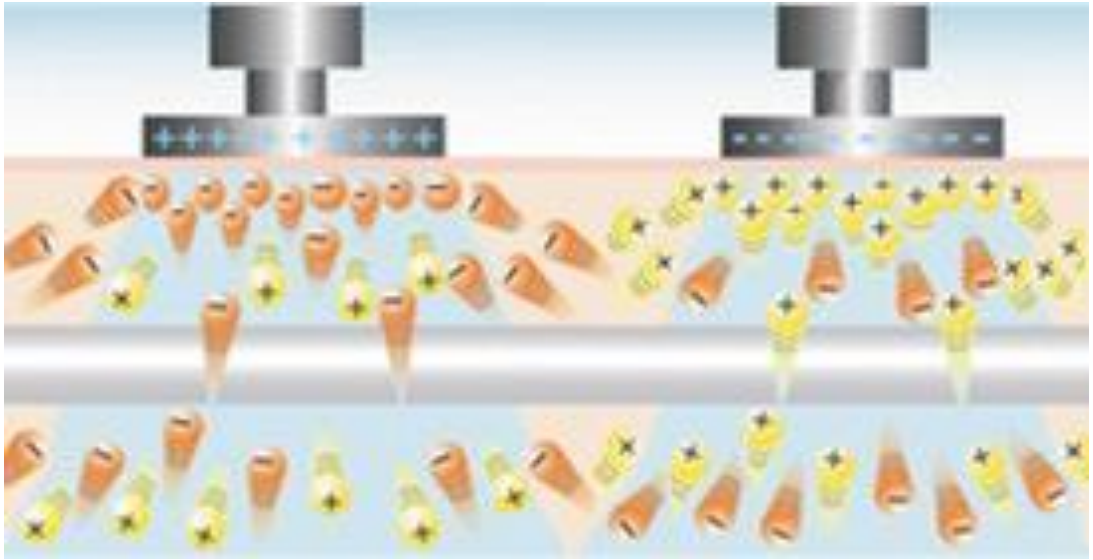
# HOW IT WORKS?



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# THERAPEUTIC EFFECTS

**Biochemical:** Enzyme balances the disorder of adipocytes and accelerates the metabolism of the cells ultrastructural calling oxygen-rich blood, speeding up and facilitating the flow of lymphatic drainage.

**Thermal:** the Joule effect produced by the displacement currents will induce an endothermy deep and spread evenly.

**Mechanical:** increasing the velocity of fluid flow stasis emolinphatic drains, tones the vascular walls.

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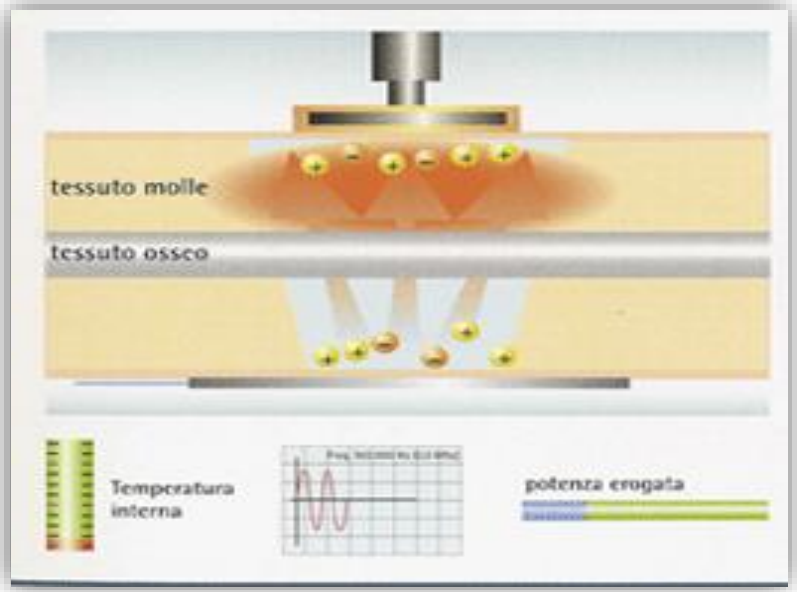
# CAPACITIVE MODE

The action is concentrated in the area below the movable electrode. It stimulates the soft tissues rich in water content (dermis, lymphatic system, muscles and venous system).

CAPACITIVE stimulation occurs through the use of insulated electrodes and a neutral electrode, called the return plate, which closes the conductive circuit.

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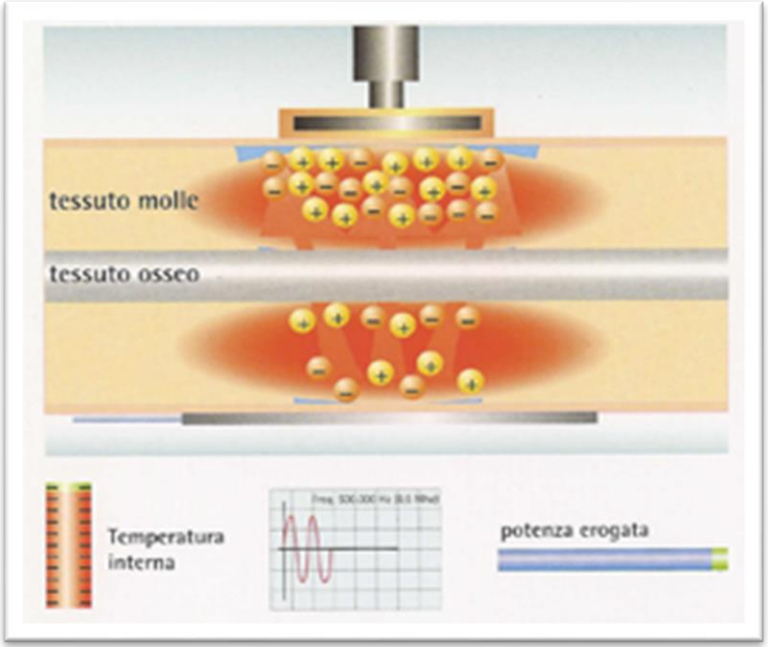
# RESISTIVE MODE

The action takes place on all tissues with the highest resistance and low water content that are interposed between the movable electrode and the return plate (deep muscles, joints, tendons, ligaments, cartilage, bone).

RESISTIVE stimulation occurs through the use of non-insulated electrodes and a neutral electrode, called the return plate, which closes the conductive circuit. In this case there is a crossing of the current in the tissue between the electrodes. The correct positioning is essential in order to achieve beneficial effects on the areas to be treated.

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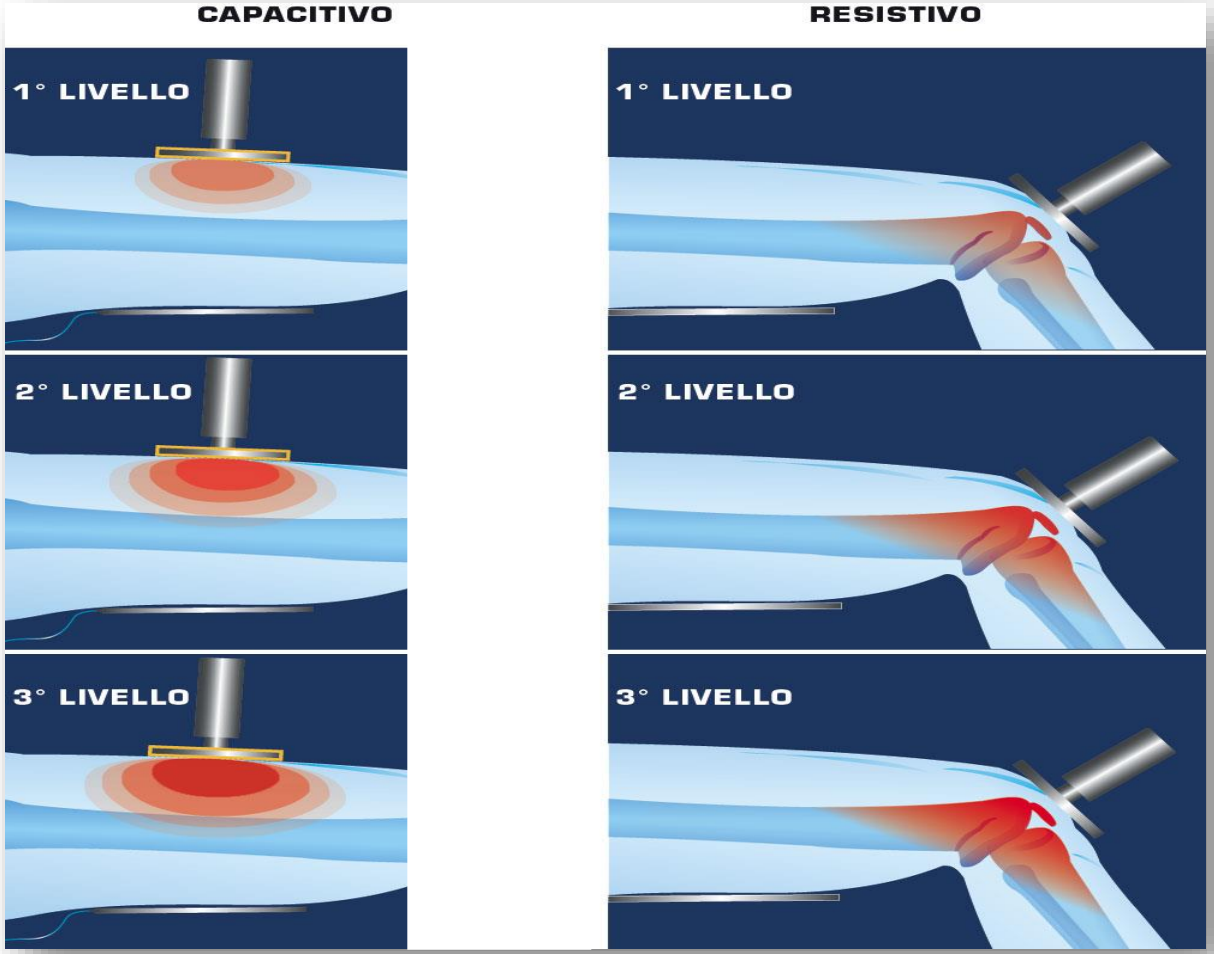
| POWER | BIOLOGICAL EFFECTS | |
|---|---|---|
| | CAPACITIVE TREATMENT | RESISTIVE TREATMENT |
| Low<br>(athermal)<br>50 – 100 W | Cellular biostimolation with increase in the energic transformations cellular (ADP.ATP); increased oxygen consumption in the more superficial tissue layers with indirect actvivation of tissue metabolism and arteriovenous and lymphatic microcirculation | Increased concentration of the charges in the tissue to great resistance (e.g., the bone) with slight increase in the temperature in the area mostly resistive. |
| Medium<br>(moderately thermal)<br>100 – 200 W | Effect biostimulating further to an increase of the inside temperature local in the underlyng area the active electrode. With stimulation of the large vessels and vasodilatation. | Further increase of the charges in the tissue to great resistance (e.g., the bone), great increase in internal temperature. |
| High<br>(frankly thermal)<br>200 – 300 W | Reduces the effect biostimolating, but there is an increase of the temperature, vasodilatation and accordingly increase in blood flow and lympatic, with local redness of the skin to level of the zone of treatment. Action on muscles, cartilage and bone. | Notable increase in concentration of charges in the tissue to great resistance (e.g., the bone), increase temperature in the area mostly resistive, three – dimensional involvement of the bone. Vasodilatation also lavishes some arterial vessels. |


CAPACITIVO
RESISTIVO
1° LIVELLO
2° LIVELLO
3° LIVELLO
1° LIVELLO
2° LIVELLO
3° LIVELLO

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# STRENGHTS OF POLYTER EVO TECAR

## INNOVATIVE SOFTWARE

The software allows you to select three types of energy delivery:

- **ATHERMY**
- **ENDODIATHERMY**
- **DIATHERMY**

The great innovation is the provision in athermia, this means that dispensing packages are created and they are repeated through a duty cycle, allowing you to toggle a delivery time and a non-dispensing time.
All this in a few milliseconds.

The Athermia function ultimately allows to work with a high power creating a biological effect without the patient being aware of the heat.

# INDICATIONS BASED ON ENERGETIC LEVEL OF WORK

LOW (athermy): increase the micro-circulation

- Acute traumatic pathology:
  - ✓ Distortions in the acute phase;
  - ✓ Muscle injuries, muscle strains in the acute phase;
  - ✓ Elongations, muscle strain in the acute phase;
  - ✓ Fractures (Treatment indicated for all types of treatment with the exception of ultrasound for which fractures are a contraindication);
  - ✓ Hip dysplasia, elbow in the acute phase;
  - ✓ Shoulder dislocations, acute patella;
  - ✓ ACL rupture in the acute phase;
- Acute inflammatory pathology:
  - ✓ Spine pain, low back pain, neck pain;
  - ✓ Wounds;
  - ✓ Herniated disc in acute phase;
  - ✓ Arthritis;
  - ✓ Osteochondritis;

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# INDICATIONS BASED ON ENERGETIC LEVEL OF WORK

## MEDIUM (endodiathermy) : vasodilation

Sub-acute pathology:

- ✓ Distortions in sub-acute phase;
- ✓ Muscle injuries in the sub-acute phase;
- ✓ Elongations in sub-acute phase;
- ✓ Digestive problems;
- ✓ Fractures (Treatment indicated for all types of treatment with the exception of ultrasound for which fractures are a contraindication);
- ✓ Hip dysplasia, elbow in sub-acute phase;
- ✓ Shoulder dislocations, patella in sub-acute phase;
- ✓ ACL break in sub-acute phase;
- ✓ Spinal pain, low back pain, sub-acute cervicalgia;
- ✓ Herniated disc in sub-acute phase;

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# INDICATIONS BASED ON ENERGETIC LEVEL OF WORK

## HIGH (diathermy) : temperature increase

-Chronic pathology:

- ✓ Osteoarthritis of the joints: gonarthrosis legs, coxarthrosis;
- ✓ Osteoarthritis of the vertebrae: lumbarthrosis, cervicoarthrosis;
- ✓ Joint stiffness in the limbs;
- ✓ Joint calcifications;
- ✓ Fibrosis and muscle calcifications;
- ✓ Chronic phase herniated disc;
- ✓ Chronic dysplasia;
- ✓ Aseptic necrosis of the femoral head;

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# APPLICATION FIELDS

## ELIMINATION OF PAIN AND RECOVERY OF MOBILITY

- Traumatology and general drainage of post-traumatic edema
- Inflammatory joint and tendon
- Musculoskeletal pains
- Treatment of diseases of the joints and peri-articular
- Treatment of consequences of fractures
- Treatment in the post surgery

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# STRENGHTS OF POLYTER EVO TECAR

## CONTROL SENSOR

It allows through an elongated ramp to get a less nervous erogation to avoid the initial shock.

## FEEDBACK SENSOR

It allows you to understand how you are working on a particular patient's area of the body through a combination of current consumption and voltage output.


## SECURITY SYSTEM

The software recognizes the capacitive / resistive probe and in case of a wrong insertion in correspondence of the selected protocol the process can

# STRENGHTS OF POLYTER EVO TECAR

## Ergonomic probes

The new tecar massaging probes are ergonomic and easy to be handled and allow the therapist to combine instrumental and manual therapy.

## Bipolar probes

The bipolar applicators are used without the steel plate allowing a greater freedom of movement. The treatment has a localized action, characterized by less dispersion and depth. It's ideal for sports therapy and physio-aesthetics.

## Therapy in movement

The adhesive return plates allow to perform treatments in movement with absolute safety and practicality.

# CONTRAINDICATIONS

Do not perform treatments:

- Out of animales affected by cancer
- On pregnant animal
- On a pacemaker
- On bearers of metal implants in the area of treatment
- In cases of lesions of the skin in the area of application
- Acute inflammatory systemic states

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# SOME ADVICES ON TREATMENT

- Shave and thoroughly clean the area to be treated
- Check that the animal is calm
- The treatment takes place exclusively by applying the electrode to the animal as well as the return plate.
- It is essential always to apply the RF cream on the electrode and on the return plate.
- the preferable area where to apply the neutral return plate is under the belly. Before applying this plate, cover it with the specific conductive cream and then block it with an elastic band
- In case of treatment in resistive mode, we suggest that you end the session with a brief treatment in capacitive mode.
- The endothermic treatment will be even more effective when combined with a manual treatment of type mass– physiotherapy

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# ELECTROTHERAPY


# ELECTROTHERAPY

Takes advantage of the therapeutic effects given by the passage of current in the animal body

The passage of current through the biological tissues generates a series of effects on the body:

- Thermal
- Chemical
- Electromagnetic

which in turn are responsible of the therapeutic actions:

- Motor exciting (muscular hypotrophies, peripheral nerve injuries)
- Vasomotor (vasodilation)
- Analgesic
- Carrier

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# MAIN TYPES OF THERAPEUTIC CURRENTS

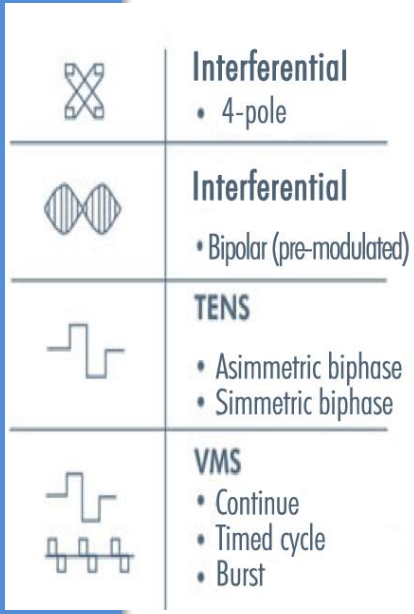
Iontophoresis

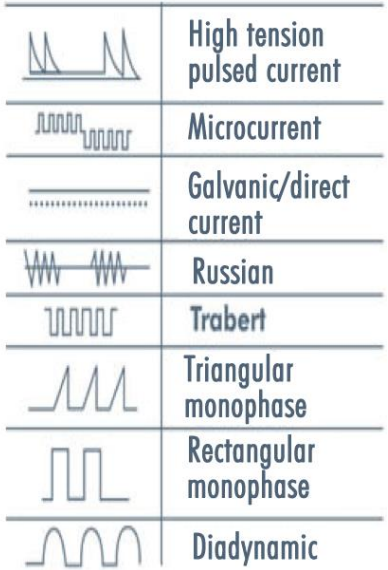
Diadynamic
(Bernard currents)

TENS

Interferential currents

Muscular
electrostimulation

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# IONTOPHORESIS


Unidirectional continuous current which allows to convey active ions of a drug through the skin

The therapeutic ions of the drug are conveyed within the tissues through the hair follicles and the sweat glands

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# TREATMENT SUGGESTIONS

- The skin must be clean and intact
- The sponges on which the drug is placed must be wet
- The duration of the application must not be lower than 20 minutes because in the first 15 minutes there is only the passage of indifferent ions
- Attention to the skin reactions given by the intolerance to that drug or by the continuous current

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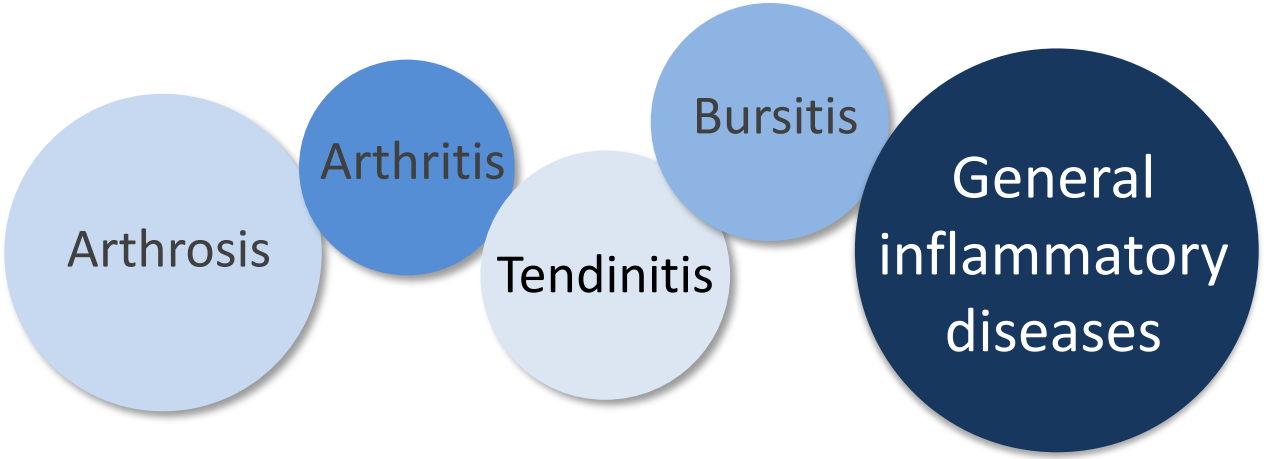
# TREATMENT INDICATIONS

There are several, in relation to the type of drug.

In particular:

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# CONTROINDICATIONS

The contraindications are those of electrotherapy:

1. Dermatitis, wounds, abrasions
2. Hypoaesthesia, vasculopathy, allergy to the active substance
3. Epilepsy
4. Severe heart disorder, pacemaker
5. Presence of intratissue metal
6. Pregnancy

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# DIADYNAMIC


Low-frequency currents with impulses from 50 to 100 Hz always positive

They are combined in various ways giving rise to different types of diadynamic:

- Monophase: only 10 ms 50 Hz impulses and 10 ms pause between one and the other
- Diphase: only same-duration 100Hz impulses with the same duration and pause of the monophase
- Short period: 1 sec of monophase alternates with 1 sec of diphase
- Long period: 5-10 sec of monophase alternate with another ascending or descending waveform

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# TREATMENT SUGGESTIONS

- Use protocols providing for the diadynamic type of variation to avoid addiction
- Place the electrodes in the painful area or along the affected nerve pathways
- Always moisten the sponges
- They can be used also to convey active substances

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# THERAPEUTIC INDICATIONS

## MONOPHASE

Oedema

Stimulation of the connective tissue

## DIPHASE

High analgesic effect

Vascular disorder

## SHORT PERIOD

Tendinitis

Bursitis

Capsulitis

Periarthritis

General traumatisms

## LONG PERIOD

Sciatica

Muscle pain

Myalgia

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# CONTRAINDICATIONS

1. Wounds
2. Some types of dermatitis
3. Pace maker
4. Synthetic methods near the area to be treated

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# TENS
# (Transcutaneous Electrical Nerve Stimulation)


1. They are electrical impulses with well-defined parameters used for analgesic purposes
2. They are based on the theory of the gate and on the stimulation of the production of endogenous opioids
3. The emission can be continuous or pulsed

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# TREATMENT SUGGESTIONS

They can be emitted at:

- High frequency and low intensity (it is perceived as a tingling, quick analgesic effect but short- lasting)
- Low frequency and high intensity (it causes fasciculations, delayed analgesic effect but long-lasting)

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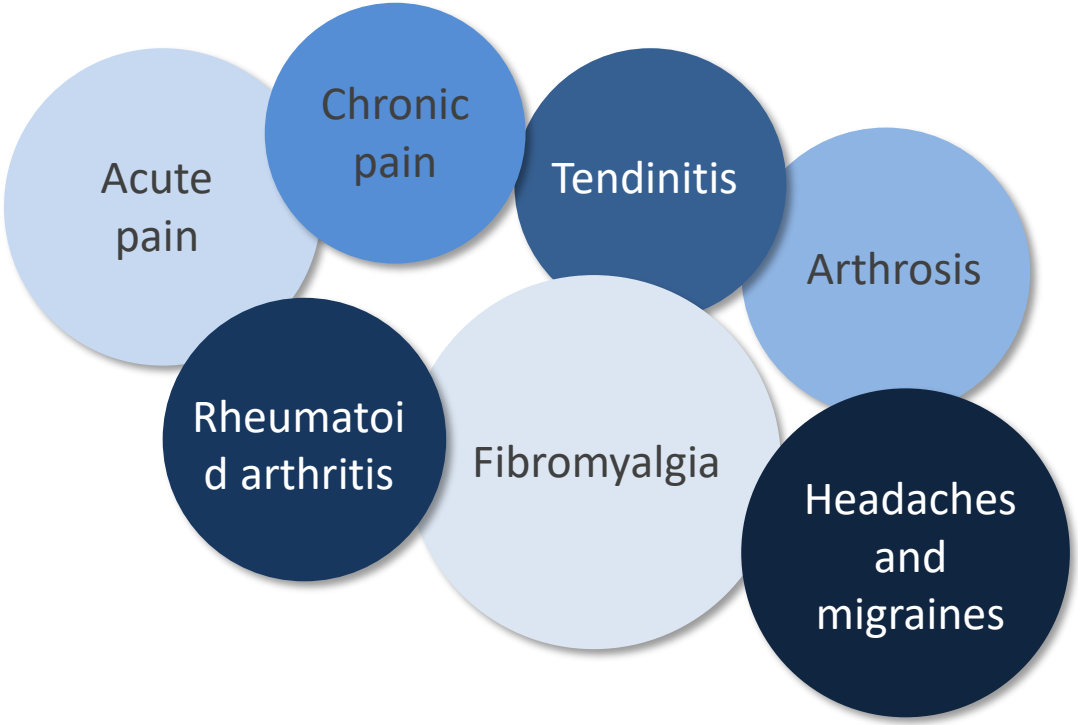
# THERAPEUTIC INDICATIONS

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# CONTRAINDICATIONS

- Wounds and mucous membranes
- Pregnancy
- Heart disease
- Pace maker

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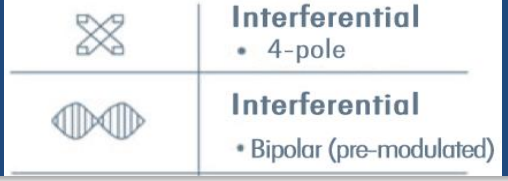
# INTERFERENTIAL CURRENTS




1. They are low-frequency analgesic currents obtained from the interference of two medium-frequency currents

2. To create them, two channels which intersect in one point or in an area are used

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# INDICATIONS AND CONTRAINDICATIONS

1. Used for the analgesic effect especially on the joint
2. The contraindications are the general ones of electrotherapy

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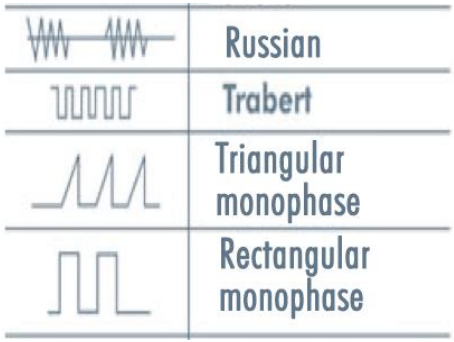
# ELECTRO MUSCLE STIMULATION




## Currents with excito-motor action

They are divided in:

- Currents for the stimulation of the normally innervated muscle (faradic, rectangular, of Kotz)
- Currents for the stimulation of the denervated muscle (exponential, triangular)

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# TREATMENT SUGGESTION

- Place the electrodes along the muscle pathways, trying to avoid the tendon

- Produce a visible muscular contraction without discomfort

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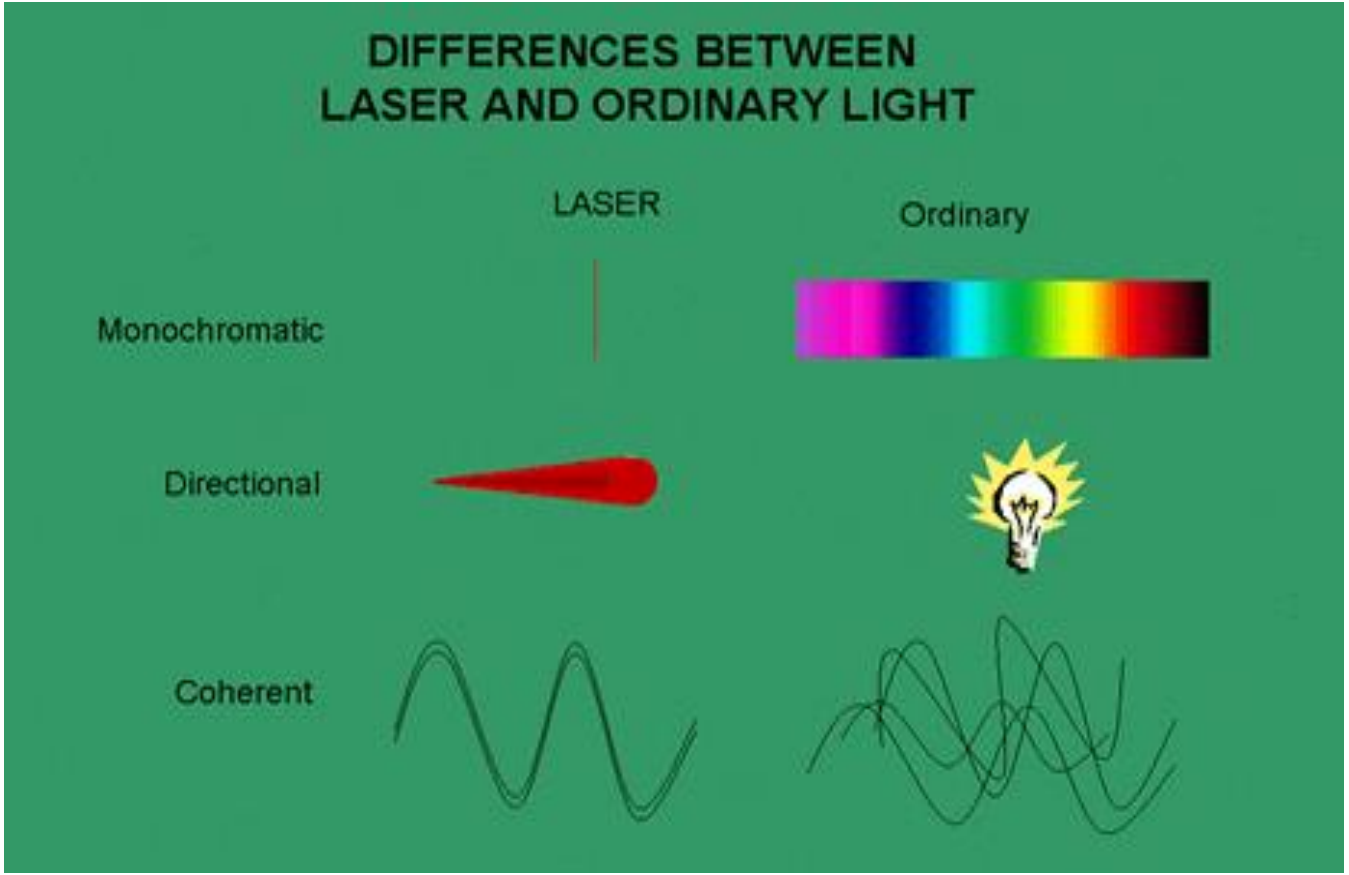
# LASER THERAPY


# LASER

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# How does the high-power laser therapy work?

In the body the light is absorbed by chromophores. The stimulation of chromophores on mitochondrial membranes stimulates the production of ATP which leads to a cascade of events:

1. response of more growth factors inside the cells and tissues as a result of increased ATP and protein synthesis.

2. Accelerated growth with cell division that leads to a more rapid repair of damaged tissues (inflammation, tissue damage).

3. greater metabolic activity through an increase of the synthesis of enzymes, availability of oxygen and nutrients.

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# BENEFITS

- Vasodilatation: is an increase in blood supply, increase in the local heat of the requests cellular metabolic and neuro-vegetative stimulation.
- Increased lymphatic drainage: Greater absorption of excess interstitial fluids with edema reduction.
- Metabolic stimulation: acceleration of the process of transformation of ADP to ATP and electronic parts between the intra-and extra-cellular environments: an increase in the concentration of nucleic acids and amino acids.
- Increase in the threshold of pain and endorphins
- Stimulation of polymorphonuclear leukocytes and macrophages, reduced secretion of prostaglandins, prostacyclins increase
- Increased production of collagen and thus acceleration of the repair of wounds
- Reduced formation of fibrous tissue and scar adherences

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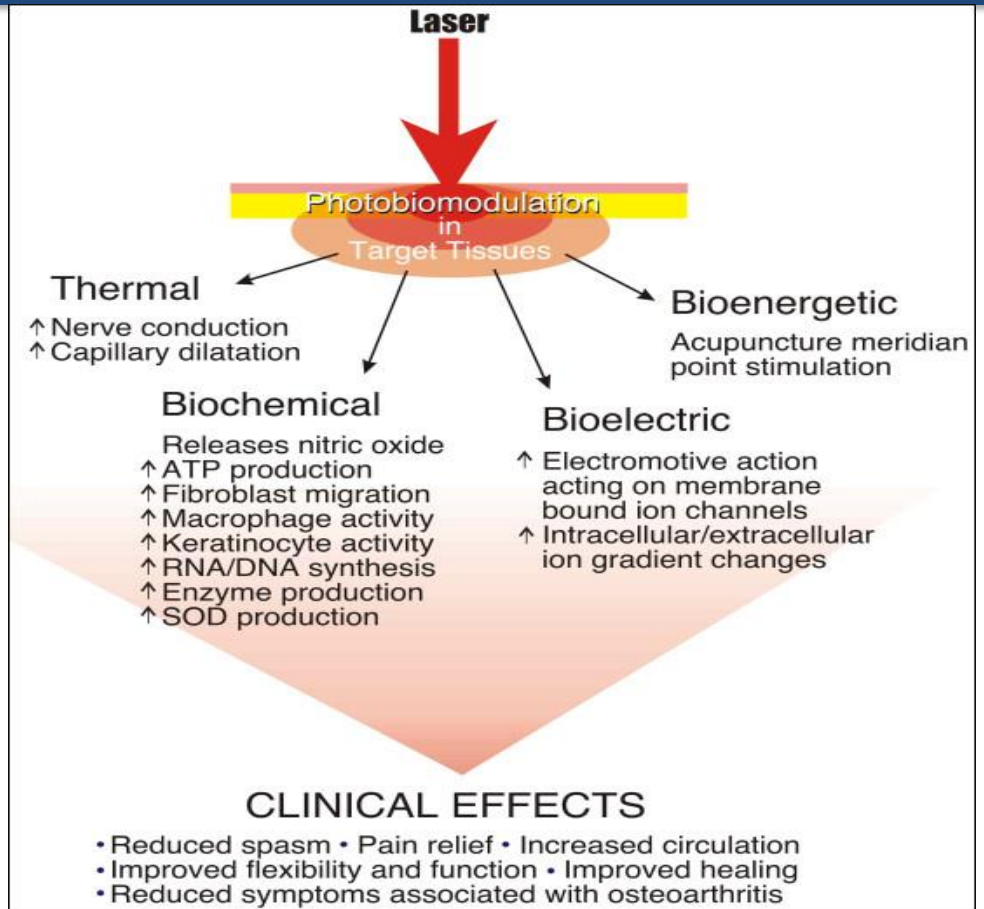
# BENEFITS

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# Emission mode

① CONTINUOUS: in this case the use of the laser is done with the handprobe by scanning or grilling the area to be treated. It is used to treat big areas or tissues that needs a biostimulation

② PULSED: used to treat spots, trigger points or inflamed tissues

| **FREQUENCY PULSED** | **INDICATIONS** |
|---|---|
| 2-50 Hz - 10-20% pulse | PAIN |
| 500-700 Hz - 30-60% pulse | INFLAMMATION |
| > 800 Hz 70-100% pulse | BIOSTIMULATION |
| > 5000 Hz 100% pulse | ANTIMICROBIAL |

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# Characteristics of Class IV Laser

1.Higher dosage of therapeutic energy, more than the Class III and therefore reduce the time of treatment.

2 . Deep tissue penetration

3 . Treatment of increased tissue surface.

4 . Higher power density. Power density indicates the degree of concentration of power . This property has been shown to play an important role in the therapeutic results.

5 . Uninterruptible power supply. In laser class III , the power is only pulsed or modulated, approximately 50% of the time.

6 . Class IV lasers provide a substantial amount of energy in a given time. Their power can be adjusted for acute and chronic conditions .

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# Contraindications

- ✓ Carcinoma: the fotobiostimulation effect of laser therapy can accelerate carcinogenesis.
- ✓ The direct radiation on the uterus gravidarum
- ✓ Above the region of the heart and the vagus nerve
- ✓ Growth cartilages in younger animals
- ✓ Over and around the thyroid and endocrine glands
- ✓ Hemorrhagic areas: they represent an absolute contraindication to laser therapy as a possible photo-induced vasodilation may be an aggravating factor.
- ✓ Applications on the eyes

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# Treatment technique: application rules

- Clean the area before treatment
- Prevent the animal from looking directly at the laser;
- the operator must wear specific protective glasses
- keep the handpiece perpendicular to the area to be treated
- do not use on colored markers and / or tattoos

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# Treatment technique: application rules

- Always use for the duration of the treatment the appropriate eye protection filter.
- It is important the brushing technique or treatment points
- The technique of radiation treatment typically involves more points per lesion.
- Sessions must be daily and last for a few days depending on the outcome sought.

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# ULTRASOUNDS


# U S

Application for therapeutic purposes of sound energy above the frequencies perceivable by the human ear (> 20000 KHz).
In the medical field, ultrasonic vibrations are obtained through handpieces that exploit the mutual piezoelectric effect of quartz to expand and compress if subjected to the action of an alternating current electric field.

The output power is measured in W / cm2.
Delivery can be continuous or pulsed.
The maximum power that can be supplied is 3 W / cm2 with continuous emission and 5 W / cm2 with pulsed emission.
US therapy frequencies are 1 MHz (greater penetration) or 3 MHz (less penetration)

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# Effects on tissues

•**Mechanical Effect:** develops through rhythmic compression and tissue decompression. Increases diffusion processes through cell membranes, cleavage of complex molecules; micro; fibrinolytic;

•**Diathermic effect:** begins to be possible at energies of 1 watt / cm2. It is given by the vibration, impact and friction of the intra and extra cellular structures. As the sound propagates through the tissues it is absorbed and converted into heat. Generates increased cellular metabolism and vasodilation; decontracting and muscle relaxant;

•**Neural effect:** linked to the influence of ultrasound on the neurovegetative system

•**Chemical effect**: linked to a characteristic phenomenon induced by ultrasound, the "cavitation"

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# Indications

- Tendinitis
- Capsules
- Bursitis
- Fibrosis
- Analgesic muscle contractures
- Osteoarthritis
- Organized hematomas and scar tissue

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# Contraindications

- Tumors
- Pacemaker wearers
- Osteoporosis
- Hematoma
- Joints with epiphysis during bone growth
- Venous vascular diseases
- Near glands and the heart area
- On or near the eye
- Abdominal or lumbar during pregnancy
- In case of skin lesions

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# Application techniques

- **Direct and mobile contact treatment:** the most used. The emitting head is moved in a circular motion.

- **Direct and fixed contact treatment:** the head can also be kept fixed for the duration of the session on the part to be treated.

- **Underwater indirect contact treatment:** it is carried out by immersing the part to be treated in a tank containing water

- **Combined treatment:** the device simultaneously delivers low and medium frequency antalgic impulsive currents with ultrasound

- **Sonophoresis**: consists of the localized administration of active pharmacological substances applied in the form of a product for local use, replacing them with gel**.**

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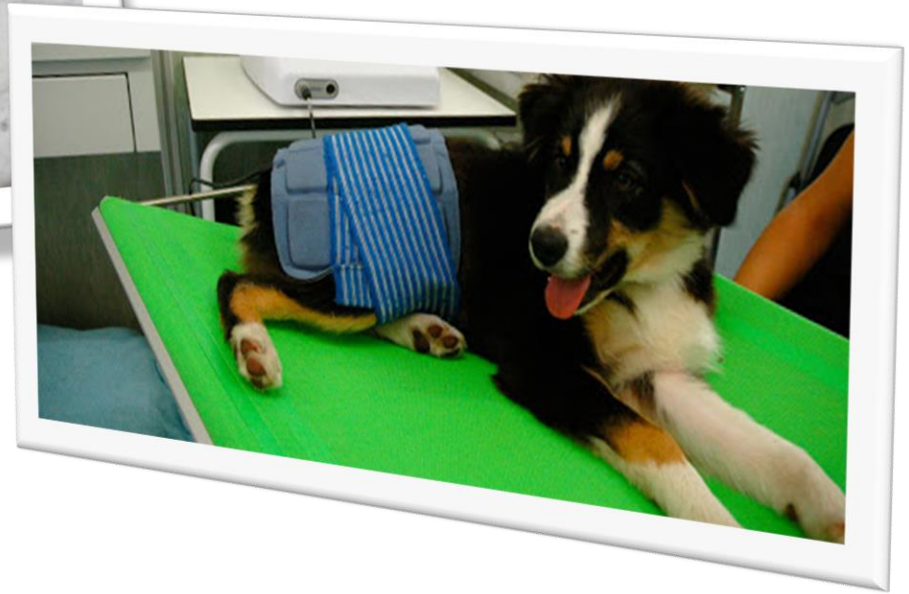
# MAGNETOTHERAPY

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# Effects on tissues

Magnetic fields causes numerous bio-physical effects in the body at different organizational levels of the living matter (cellular, tissular, organ-related and system-related), dependent on primary interactions of a magneto-mechanical and magneto-electrical nature. These fields act primarily:

- **on the plasmatic membrane**
- **on the blood**: a positive effect on the calibre of the vessels and on the viscosity of the blood with improvements in local circulatory conditions and oxygen pressure (hypervascularization) which would also explain the acceleration of the healing processes of soft tissue and bone lesions, and trophic lesions of peripheral circulatory origin, as well as the beneficial effect on biological structures conditioned by the diffusion of oxygen such as, for example, cartilage;
- **on the immune system**: an increase of immunoglobulin-G and circulatingleukocytes reinforcing the immune system; in the regulation of the production of steroid substances and endogenous oppioides (and therefore modulating on the algic system);

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# Effects on tissues

- **on the endocrine system**: inhibition of some hormonal functions (parathyroid) and stimulation of others;
- **on the central and peripheral nervous system**: **on the metabolism;**
- **on cellular reproduction** *;*
- **on tissue regeneration**: genesis of collagen on the part of fibroblasts and on angiopoiesis with vascular neo-formation (which would explain the favorable effects of magnetic fields on the healing processes of injuries, ulcers and torpid sores);
- **on bones**: the start of the osteogenesis is stimulated, where this does not happen naturally (pseudo-arthrosis, delayed consolidation), providing opportune signals of cell reactivation (mesenchimal of the periostosis, monocytes, fibroblasts, osteoblasts that act on the formation of the internal callus), improving the hematic supply, inhibiting the parathormone and therefore favouring the activity of the osteoblasts.

On the basis of these admissible effects the **biological action** of magnetic fields can be summarized principally in:

- **an anti-inflammatory and anti-edemigene action:**
- **anti-inflammatory effect:** able to alleviate pain in the treatment area

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**on the metabolism;**

- **on cellular reproduction** *;*
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On the basis of these admissible effects the **biological action** of magnetic fields can be summarized principally in:

- **an anti-inflammatory and anti-edemigene action:** with a decrease in VES, an increase in gamma globulins and a decrease in alpha globulins as part of a generic anti-inflammatory action of the magnetic fields used;
- **anti-inflammatory effect:** able to alleviate pain in the treatment area

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# APPLICATION RULES

- keep the animal being treated away from humans
- the treatment sessions are relatively long so make sure that the animal is calm and relaxed

# GENERAL INDICATION OF USE

All the therapies available in the POLYTER VET device can be used to treat the following diseases:

- Acute traumatic pathology:
  - ✓ Distortions in the acute phase;
  - ✓ Muscle injuries, muscle strains in the acute phase;
  - ✓ Elongations, muscle strain in the acute phase;
  - ✓ Fractures (Treatment indicated for all types of treatment with the exception of ultrasound for which fractures are a contraindication);
  - ✓ Hip dysplasia, elbow in the acute phase;
  - ✓ Shoulder dislocations, acute patella;
  - ✓ ACL rupture in the acute phase;
- Acute inflammatory pathology:
  - ✓ Spine pain, low back pain, neck pain;
  - ✓ Wounds;
  - ✓ Herniated disc in acute phase;
  - ✓ Arthritis;
  - ✓ Osteochondritis;

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# INDICATIONS OF USE

Sub-acute pathology:

- o Distortions in sub-acute phase;
- o Muscle injuries in the sub-acute phase;
- o Elongations in sub-acute phase;
- o Digestive problems;
- o Fractures (Treatment indicated for all types of treatment with the exception of ultrasound for which fractures are a contraindication);
- o Hip dysplasia, elbow in sub-acute phase;
- o Shoulder dislocations, patella in sub-acute phase;
- o ACL break in sub-acute phase;
- o Spinal pain, low back pain, sub-acute cervicalgia;
- o Herniated disc in sub-acute phase;

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# INDICATIONS OF USE

- Chronic pathology:

  o Osteoarthritis of the joints: gonarthrosis legs, coxarthrosis;
  o Osteoarthritis of the vertebrae: lumbarthrosis, cervicoarthrosis;
  o Joint stiffness in the limbs;
  o Joint calcifications;
  o Fibrosis and muscle calcifications;
  o Chronic phase herniated disc;
  o Chronic dysplasia;
  o Aseptic necrosis of the femoral head;

EME ITALY