Cryonic Medical

NeuroCryoStimulation Technology

WHAT IS THIS TECHNOLOGY?

This unique worldwide patented technology treats quickly and efficiently pain and inflammation by creating a thermal shock.

How ? By spraying C02 gas at -78°C and 50 bars.

It's called NeuroCryoStimulation and is proven by tens of medical studies and publications and already used by more than 5.000 customers worldwide

DEFINITION

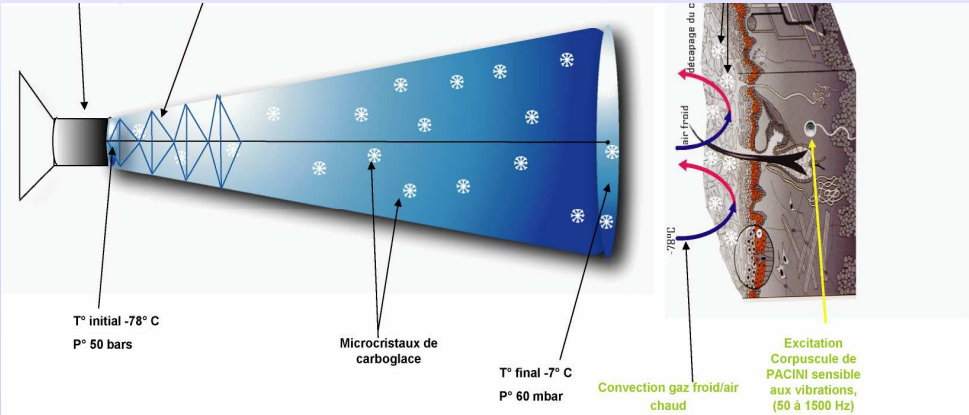
- This technology allows to stimulate the skin neuroreceptors with very low temperatures, high pressure and vibrations, created by the spray of a jet of Carbon Dioxide in liquid phase.
- The reflex response of the NeuroVegetative system following this stimulation will be the basis of the treatment.
- This specific Stimulus will be called the Thermal Shock

Today : 3 types of cold therapies

- Conduction : by contact (ice) : Local action
- (20 minutes to reach external temperature of 0°C)

- Convection : (cold air/spray) : Breath of cold air more rapid than ice
- Source of the cold -30°C reaches the skin at 4°C
- Pressure below 1 bar = no thermal shock

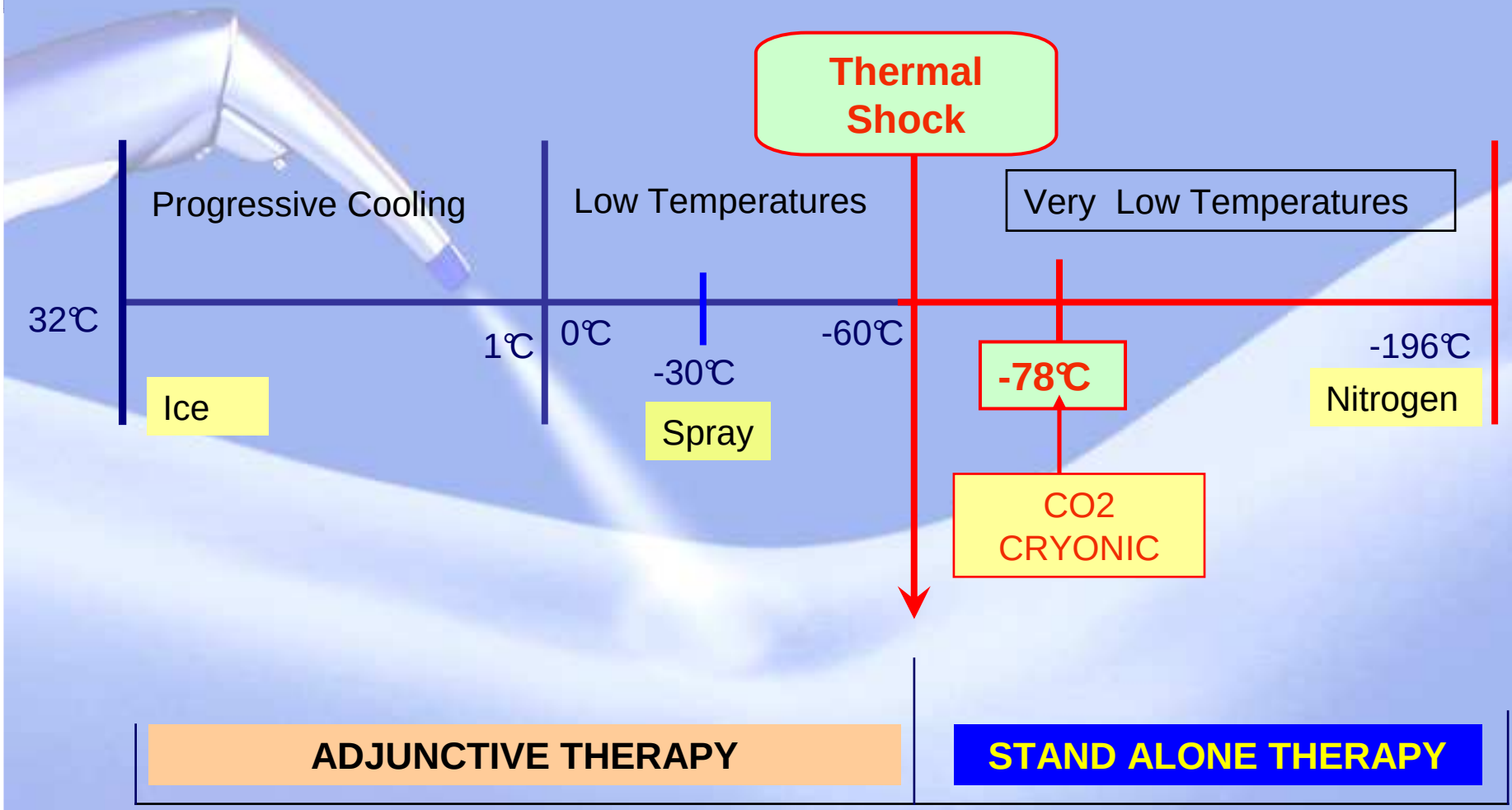
- Sublimation : (NeuroCryoStimulation) :
- Source of the cold -78°C reaches the skin at -10°C : Enough to make the skin temperature reach 0°C within few seconds
- Pressure over 1 bar :



- Production of microcrystals of carbo-ice. They melt when they heat the skin : they change from solid to gas stage = Sublimation.
-There is a shock wave in the jet created by the microcrystals
-Pressure on the skin 2.2 bars

- Allow us to get a calorific stripping (heat fat of the body)= **15KJ/mol/mm²**

Position of the NCS in the SCALE OF COOLING



Real advantage of the NCS: THERMAL SHOCK

PC/ **POWER OF COLD**

+

SC/ **SPEED OF COOLING**

=

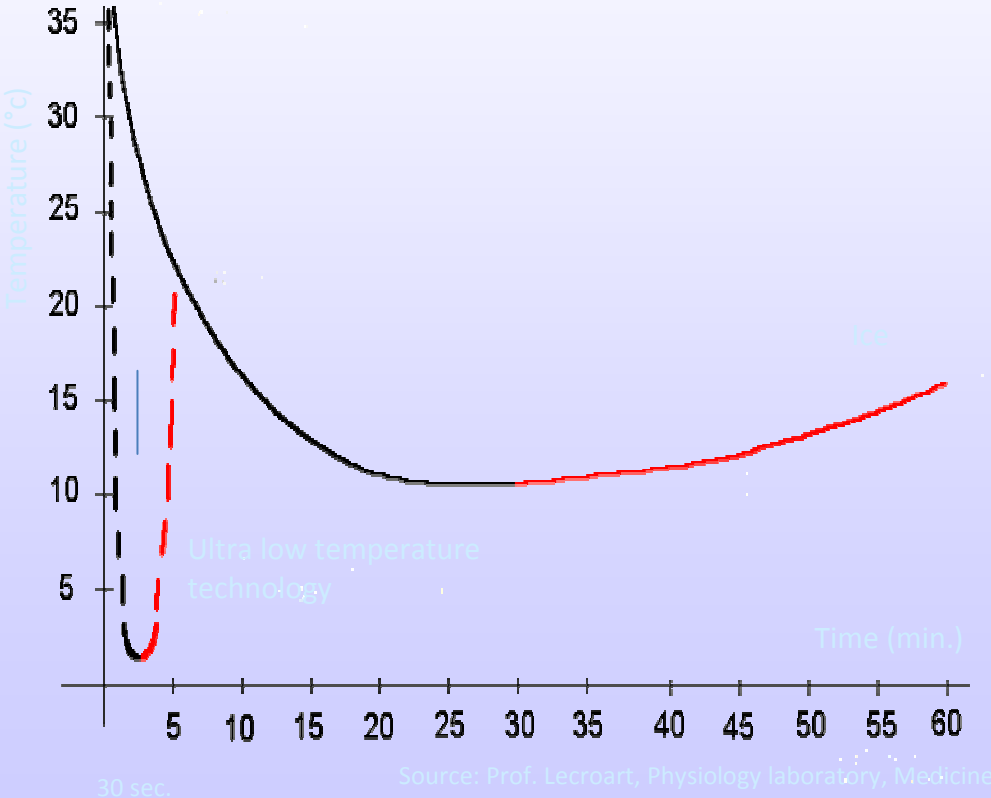
- 78℃ + 50 bars

=

THERMAL SHOCK

WHAT IS NEUROCRYOSTIMULATION?

THE THERMAL SHOCK INDUCES THE STIMULATION OF CUTANEOUS NEURORECEPTORS GENERATING A NEUROVEGETATIVE REFLEX

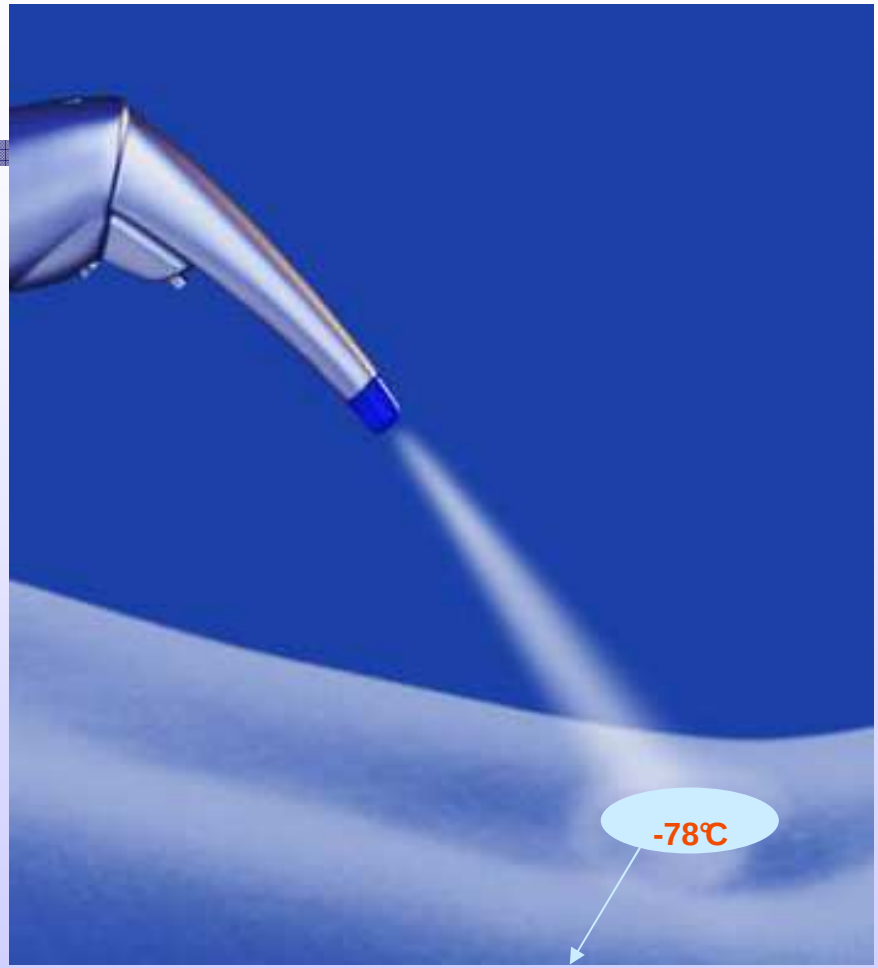


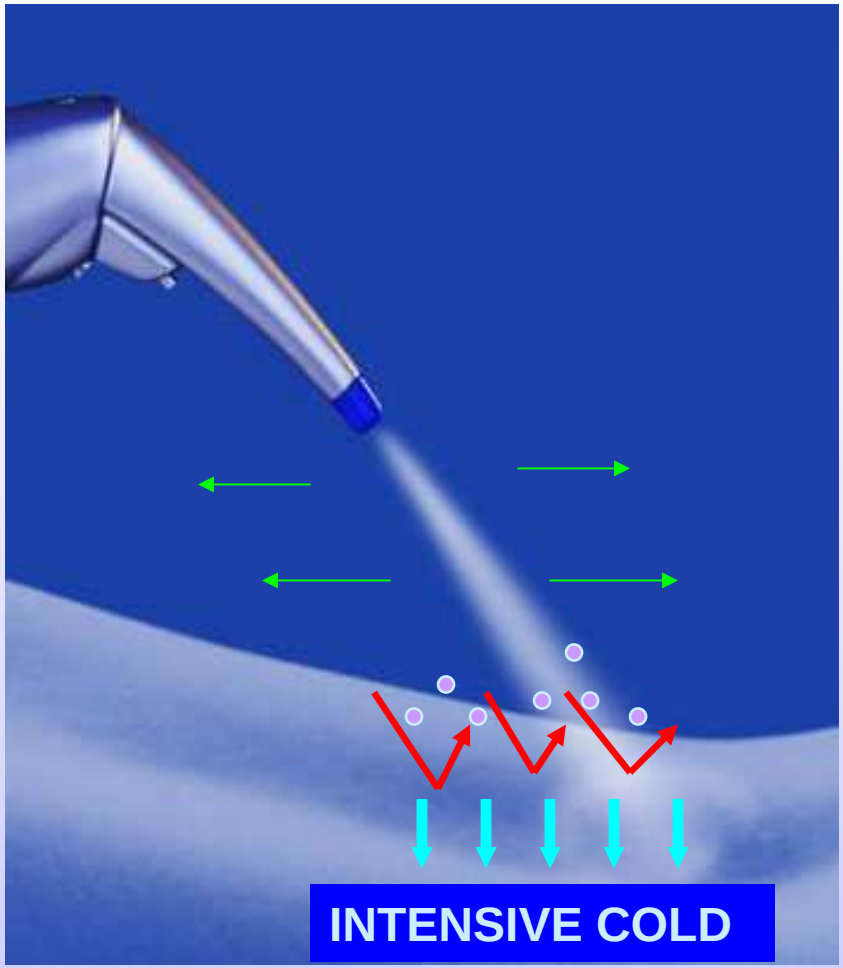
Source: Prof. Lecroart, Physiology laboratory, Medicine faculty, Lille, France

THERMAL SHOCK

SKIN TEMPERATURE DECREASES FROM 32°C TO 2°C WITHIN 30 SEC.

CARBON DIOXIDE SUBLIMATION





If we fix the Microcristals (-78℃) = Necrosis

If we keep on spraying the microcristals = CO2 SUBLIMATION

=THE CRYONIC MEDICAL TECHNOLOGY

MEDICAL CARBON DIOXYDE CO_2

SPECIFICATIONS

Colourless gas
Odourless gas
Not inflammable

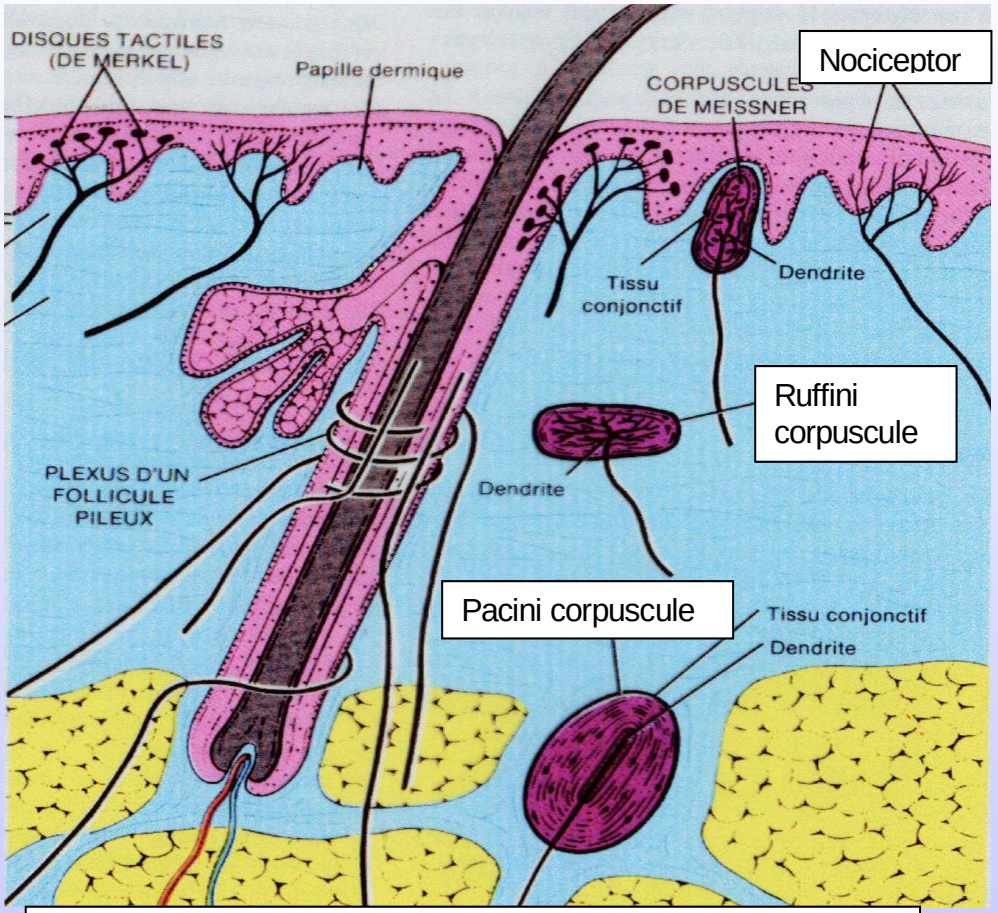
- PURE
- DRY
- BACTERIOSTATIC

Stimulation of THE SENSITIVE RECEPTORS OF THE SKIN

Epidermis
Ectoblast

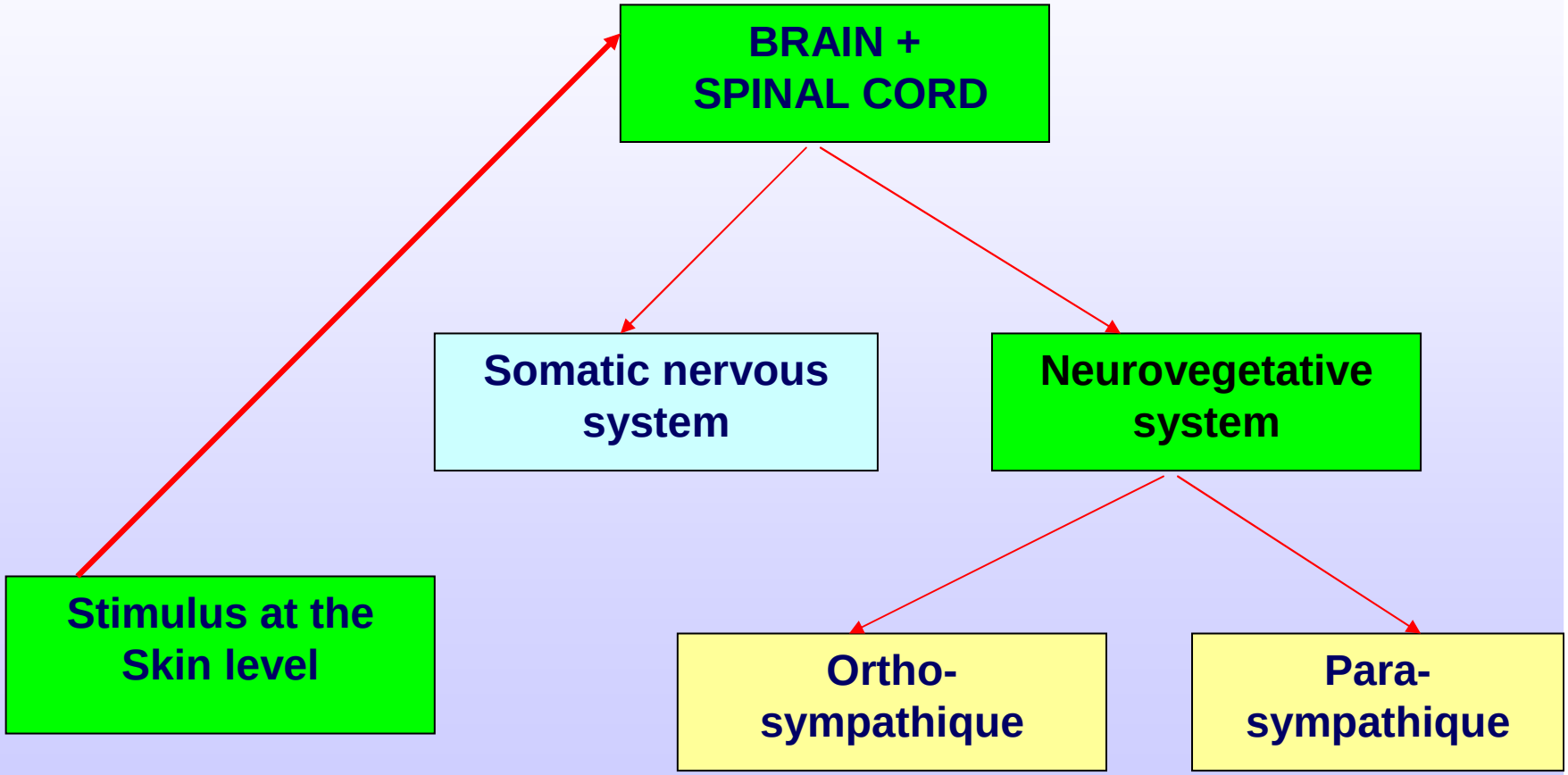
Derm
Mesoblast

Hypodermis
Endoblast



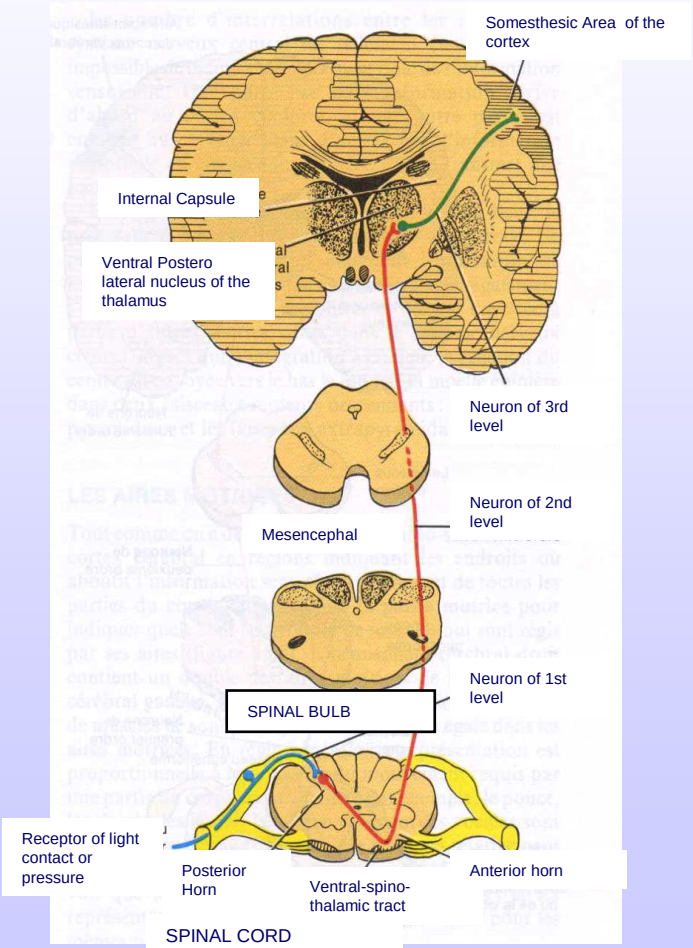
Structures and place of cutaneous receptors

ORGANISATION OF THE CENTRAL NERVOUS SYSTEM

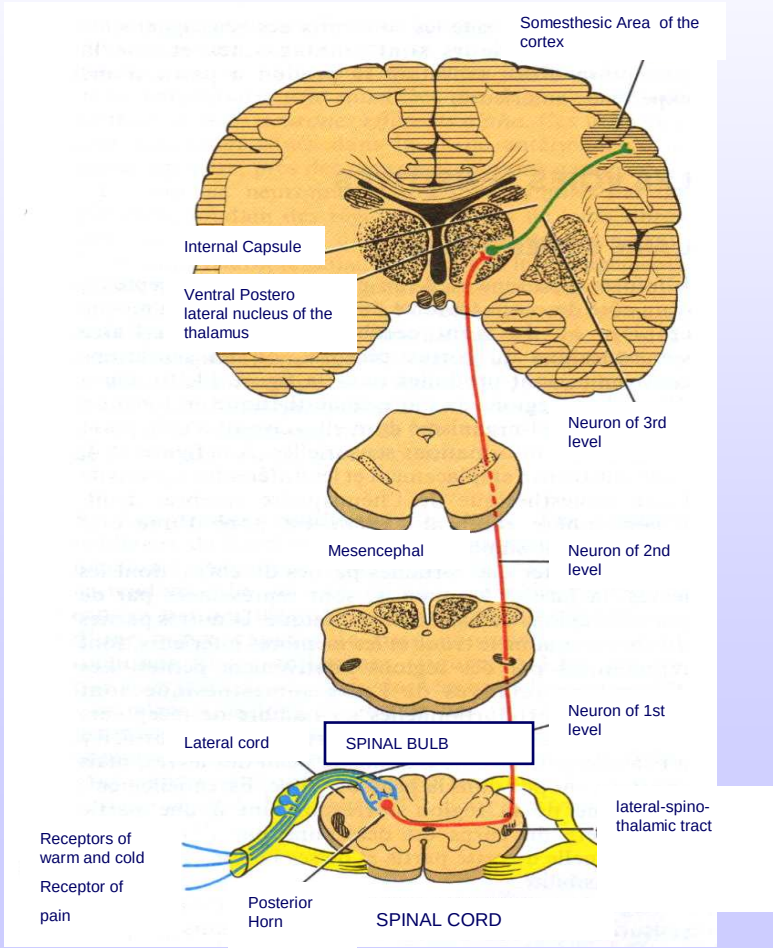


AFFERENTE PATHWAYS

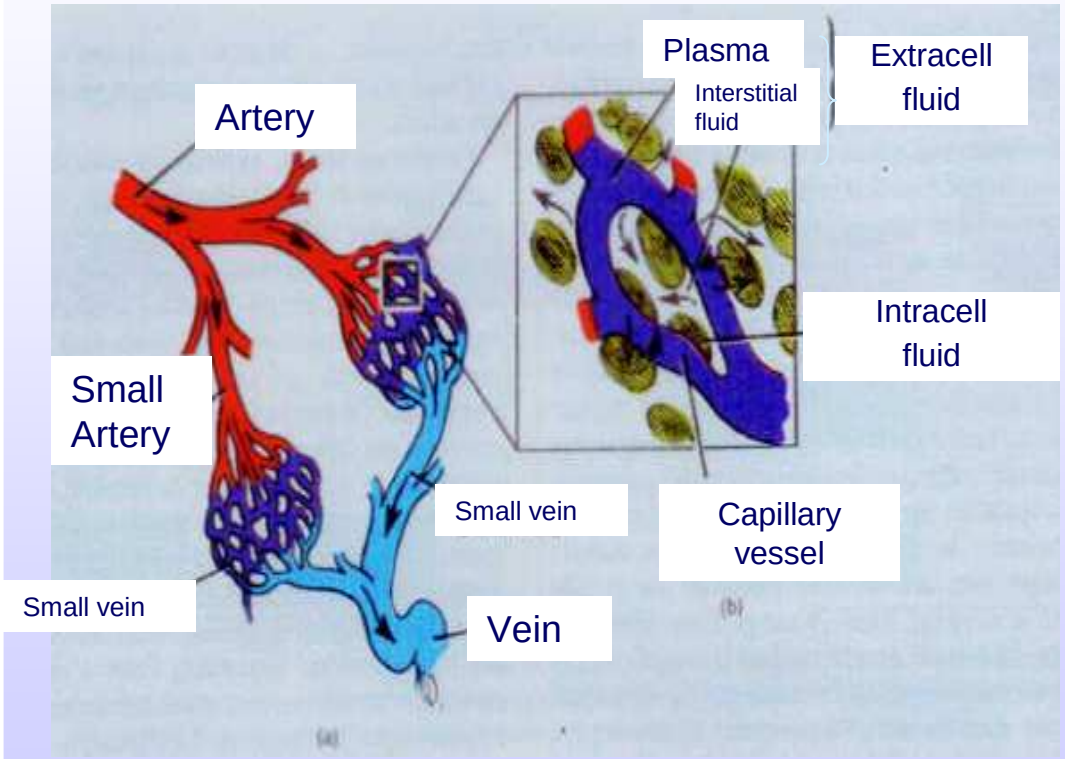
Sensitive Pathways of contact and pressure : ventral-spinothalamic tract

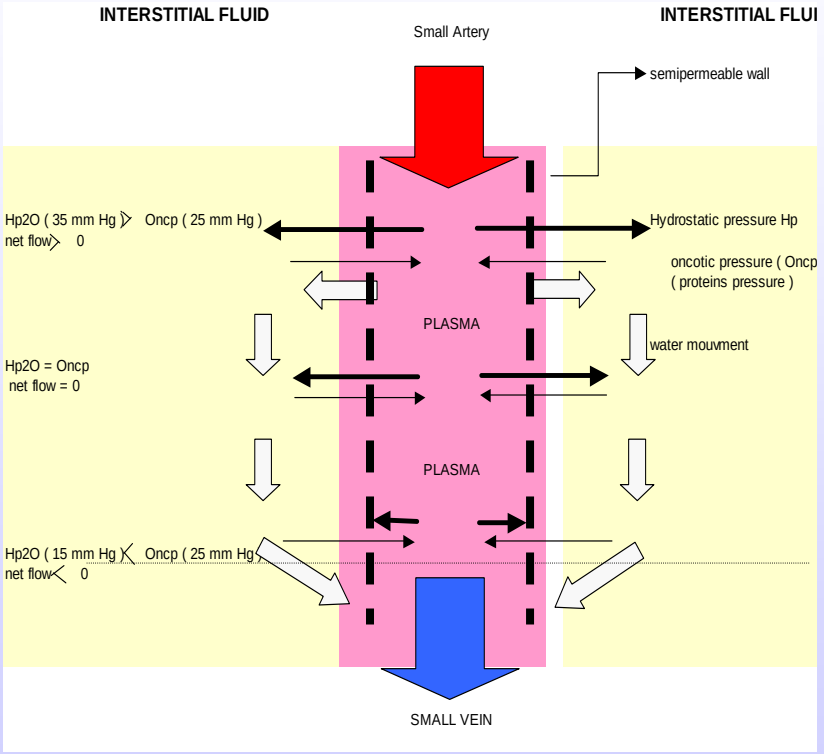


Sensitive Pathways of pain and temperature: lateral-spinothalamic tract



HOMEOSTASIS

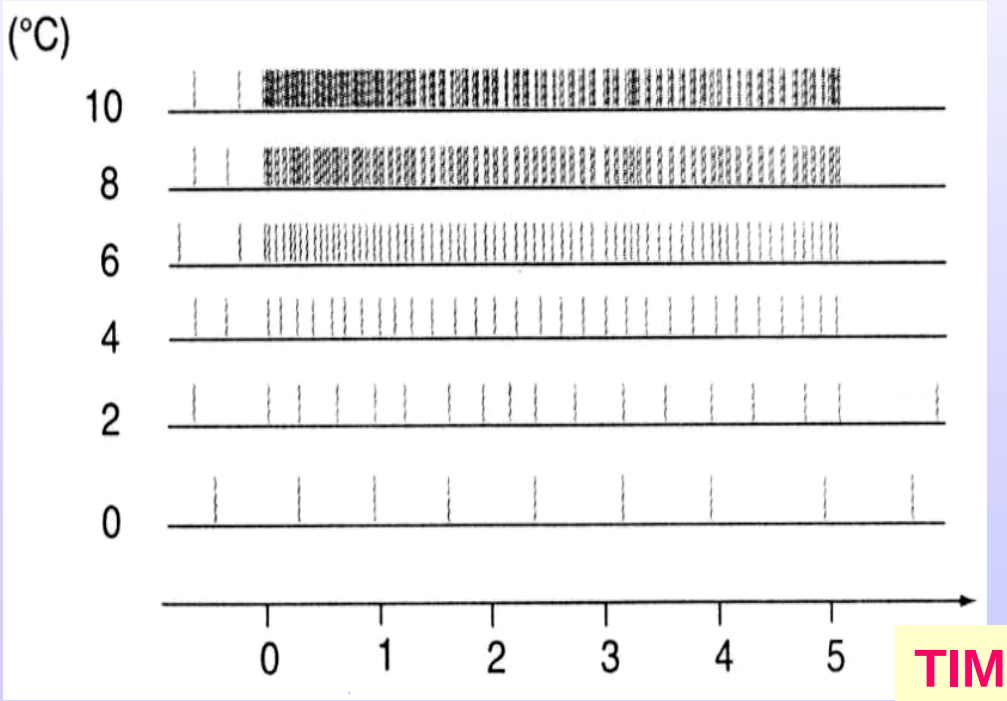




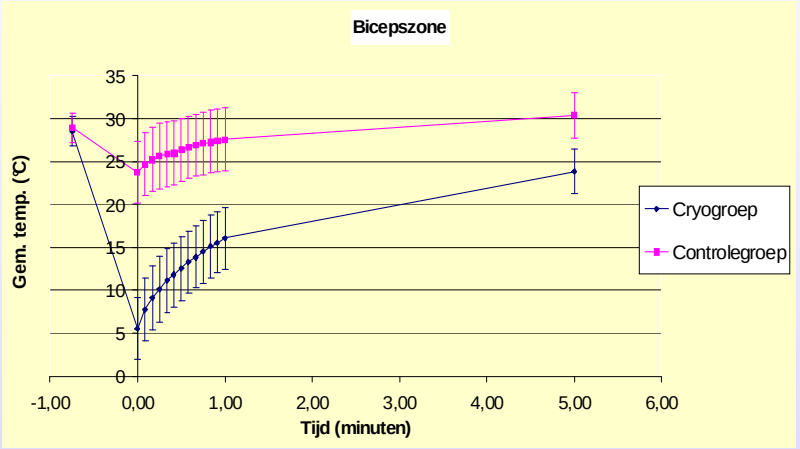
Physiological effects

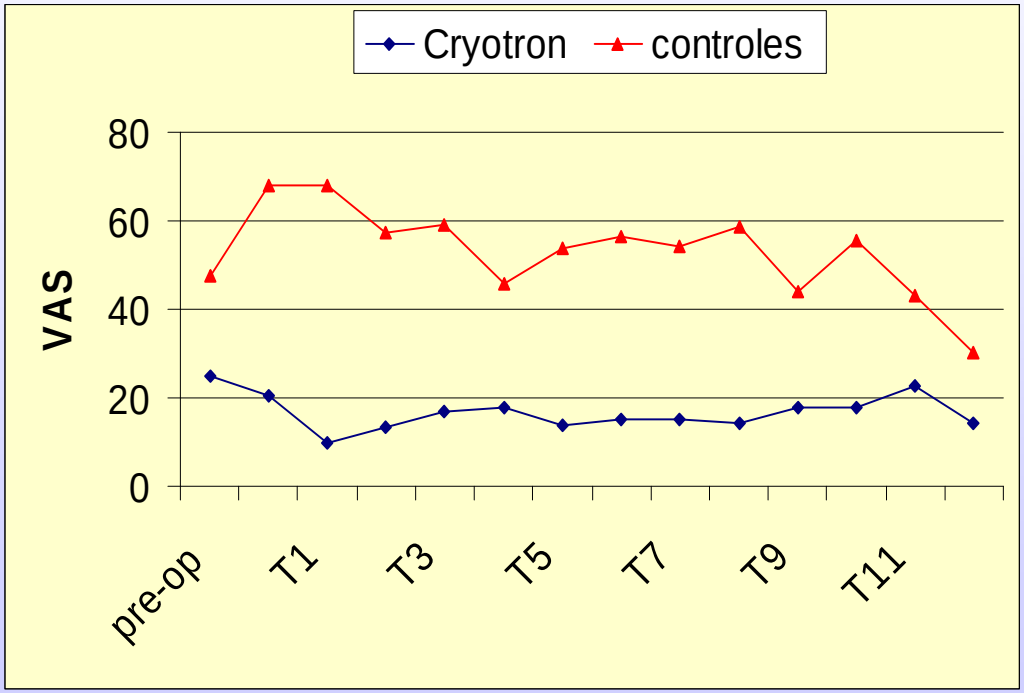
ANALGESIC EFFECT

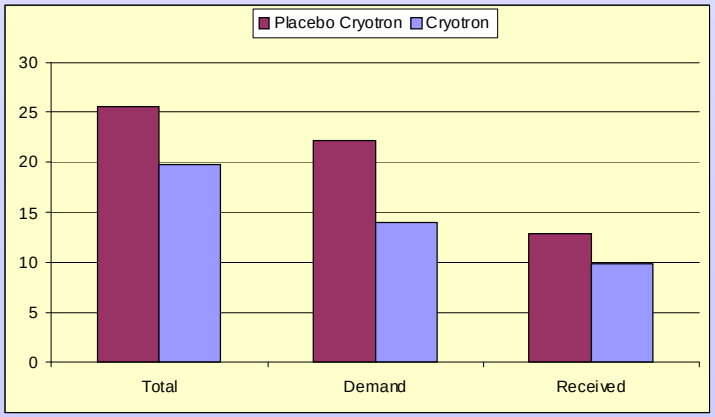
Example of an electrophysiological response of cutaneous receptors



Temperature Measurements, pain, anti-inflammatory medications



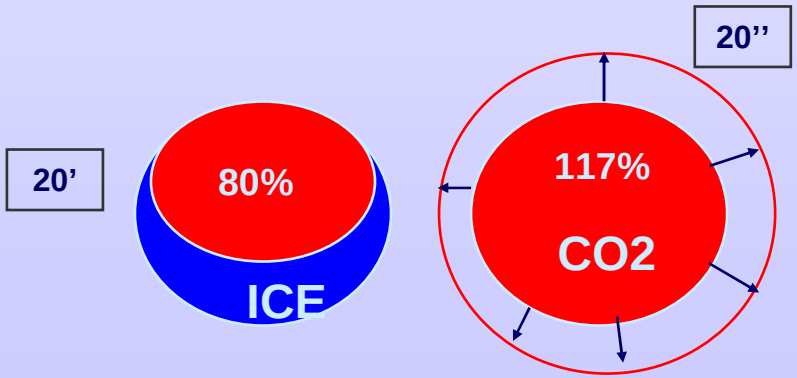


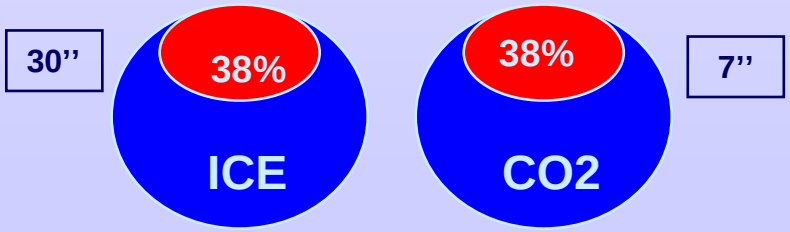


VASOMOTOR EFFECT

Scientifc studies show that it is the importance of the thermic shock and the rapidity of the temperature decrease that influence the quality and the effectivness of the treatment.

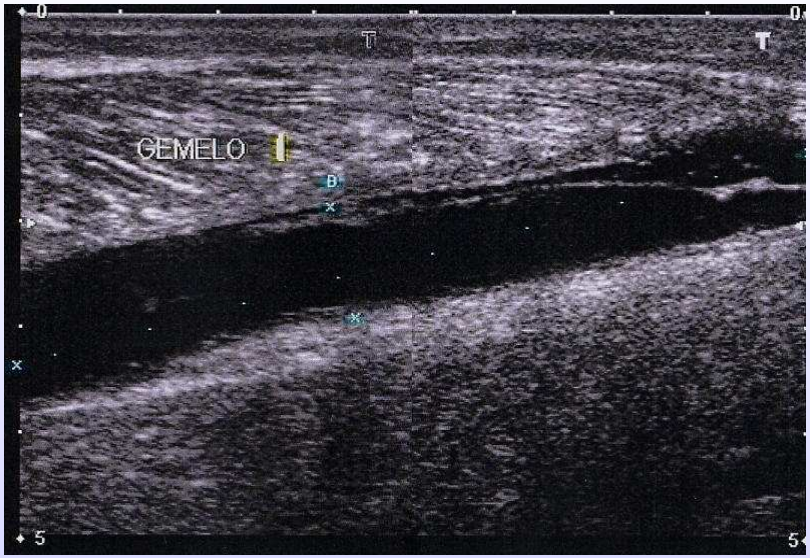
DEEP VASOLDILATATION

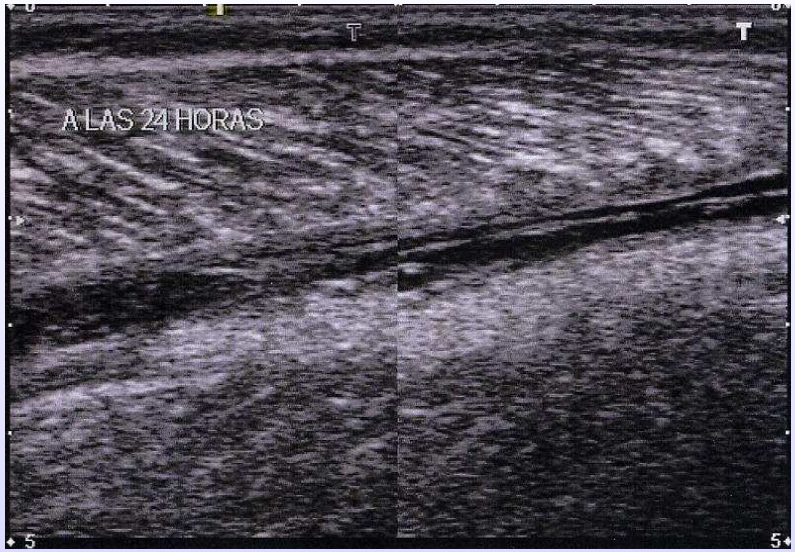




SUPERFICIAL VASOCONSTRICTION

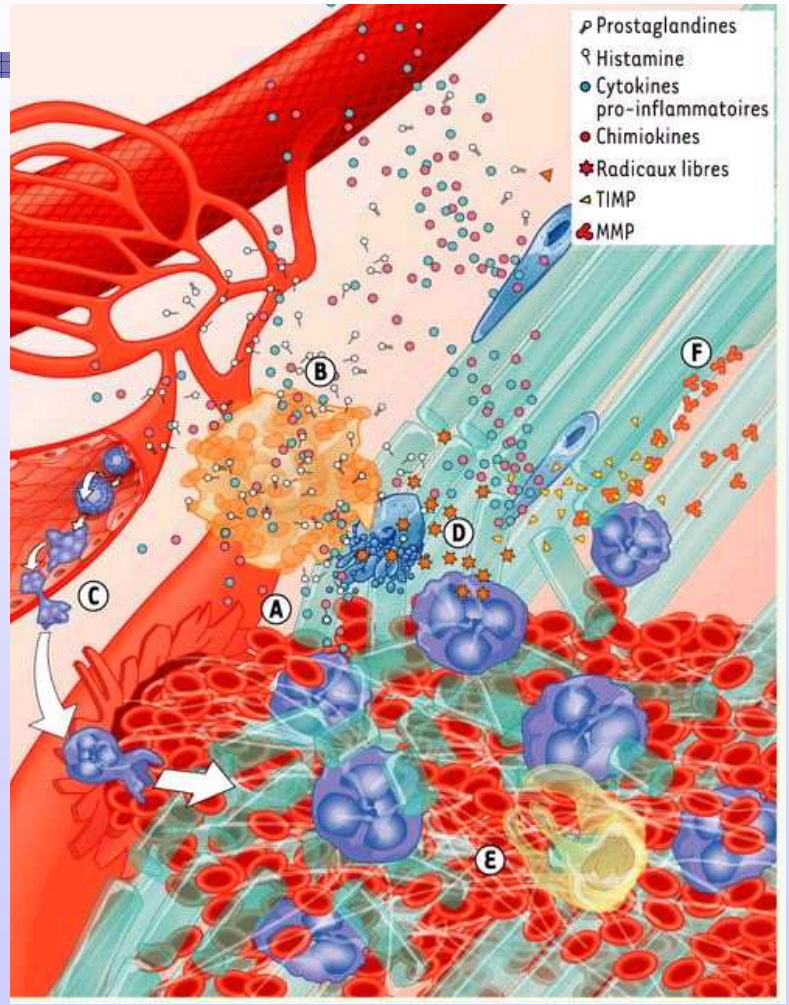
Transverse Plane on the medial gastrocnemius muscle. A clear reduction of the thickness of hematoma is observed intramuscle after 24 hours of 1 session of Cryonic treatment





PRECRYONIC **POSTCRYONIC**

ANTI-INFLAMMATORY EFFECT



Inflammatory crisis =

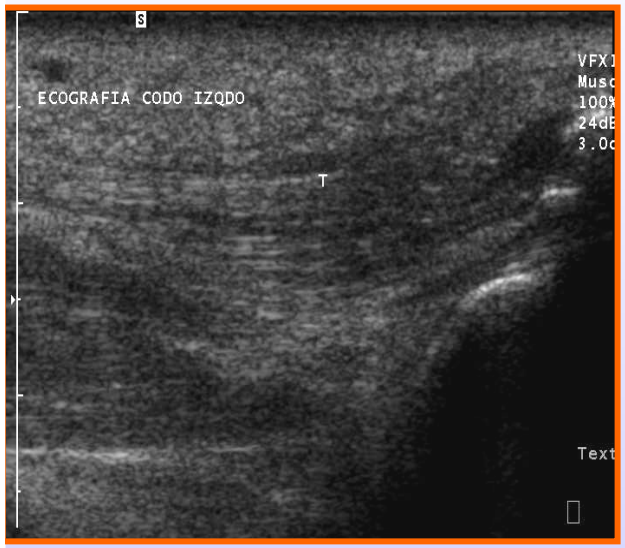
REDNESS
HEAT
PAIN
SWELLING

Vasomotor action : Regulation of the blood flow : decreasing of the edema

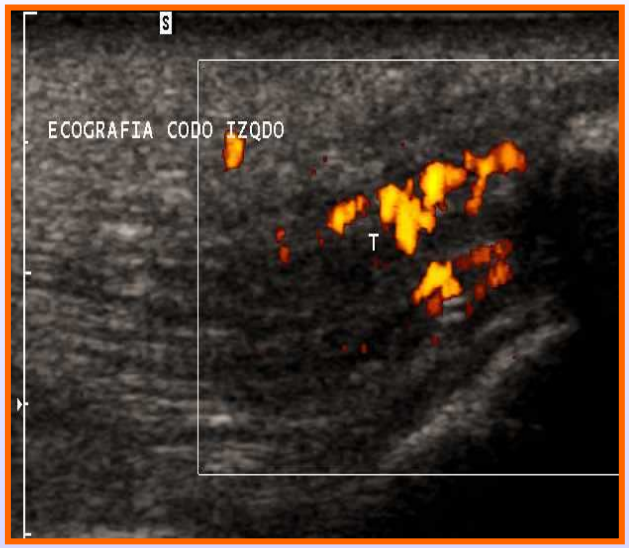
Neurochemical action: Decreasing of the enzymes production which are thermo sensitive. 3 of the metallo- proteases are responsible for the tissue wall

Real alternative to Anti-inflammatory drugs

TENDINOSIS TRICEPS BRAQUIAL: Ultrasound evolution after 8 sessions of Cryonic treatment with reduction of the hipoechoic area and disappearance of vessels seen with Power-Doppler (degenerative angiogenesis).



PRECRYONIC



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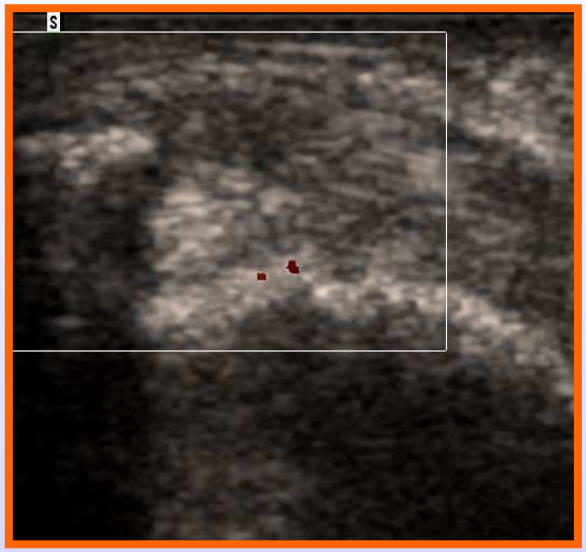


POSTCRYONIC

MYORELAXING EFFECT

		Testing Day O + PAIN										
		Before D1	After	Before D2	After	Before D3	After	Before D4	After	Before D5	After	Conclusion
Patient n°1	Middle buttock Abduction A Distance between the knees in cm	A°25° 20	27° 24	25° 20	28° 28	25° 24	30° 30	30° 25	35° 35	35° 30	45° 38	+
Patient N°2	Deltoid Abduction A	70°	80°	75°	85°	85°	90°	85°	100°	90°	100°	+
Patient N°3	Spinal lumbar DDS	44	39	44	35	39	35	39	32	36	30	+
Patient N°4	Spinal lumbar DDS	40	32	35	32	32	28	32	28 (pain)	32	28	+/-
Patient N°5	Spinal lumbar DDS	40	38	38	35	20	18	20	15	15	10	++
Patient N°6	Middle buttock Distance between the knees in cm	20	24	20	28	36	40	36	45	38	40	+/-
Patient N°7	Spinal lumbar DDS	53	43	45	40	42	35	35	30	30	28	+
Patient N°8	Sus deltoid Angle middle buttock abduction	90°	130°	90°	125°	115°	140°	70°(after treatment with cryo)	80°	100°	125°	+
Patient N°9	Abduction Distance between knees in cm	20°	24°	24°	27°	31°	34°	24°	29°	29°	30°	++
Patient N°10	Internal twin Angle of the plantar foot	10°	15°	15°	20°	34°	25°	25°	30°			+

TYPES OF TREATMENTS

ACUTE TREATMENT

THERMIC SCHOCK ON THE PAINFUL AREA DURING 30''

ONCE A DAY

CHRONIC TREATMENT

CORTICALISATION OF THE SENSITIVE RECEPTORS FROM 1 TO 5 MINUTES

ONCE A DAY

A LARGE NUMBER OF INDICATIONS

PAIN MANAGEMENT

- Muscles spasms
- Hematomas
- Edema
- Headaches

SPORT MEDICINE

- Sprains
- Strained or torn muscles
- Post-dislocation discomfort
- Tendonitis
- Epicondylitis (tennis & golf elbows)

RHEUMATOLOGY

- Inflammatory
- Sciatica
- Lumbago
- Bursitis
- Periostitis

A LARGE NUMBER OF APPLICATIONS

MEDICAL REHABILITION

- Mobility enhancement
- Pain relief
- Muscular relaxation
- Treatment of hemophilia

SURGERY (POST OPERATION)

- Microsurgery of the hand
- Maxillofacial and plastic surgery
- Vascular surgery
- Orthopedic surgery

AESTHETICS

- Relaxation
- Massage
- Drainage
- Skin diseases
- Fitness
- Toning

CONTRA-INDICATIONS

- Allergy to cold (extremely rare)
- Raynaud syndrome
- Sensitive skin disorders
- Cryoglobulinemia (extremely rare)

Concrete examples of treatments

THE ANKLE SPRAIN IN ACUTE PHASE

Day 0 : Examination of the patient

Day 1 : AFTER 2 SESSIONS

Day 3 : AFTER 5 SESSIONS

Day 5 : REHABILITATION

can start

All sprains

Ankle Sprain

Feet Sprain

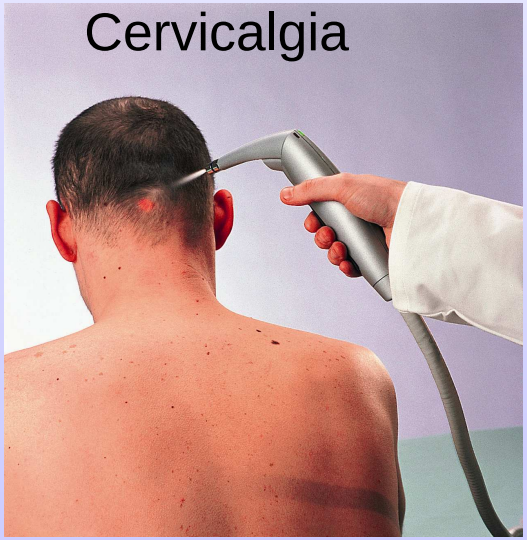
Acromion Sprain

Wrist Sprain

Ligaments of the knee

Lumbago

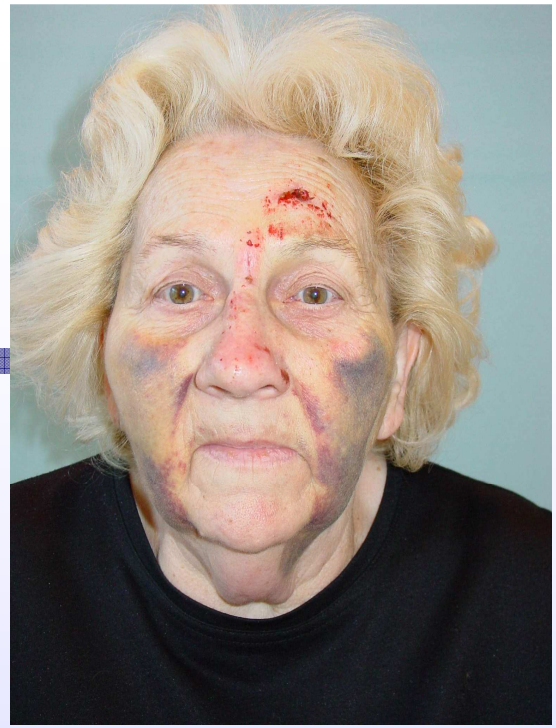
Arthrosis



Tennis Elbow

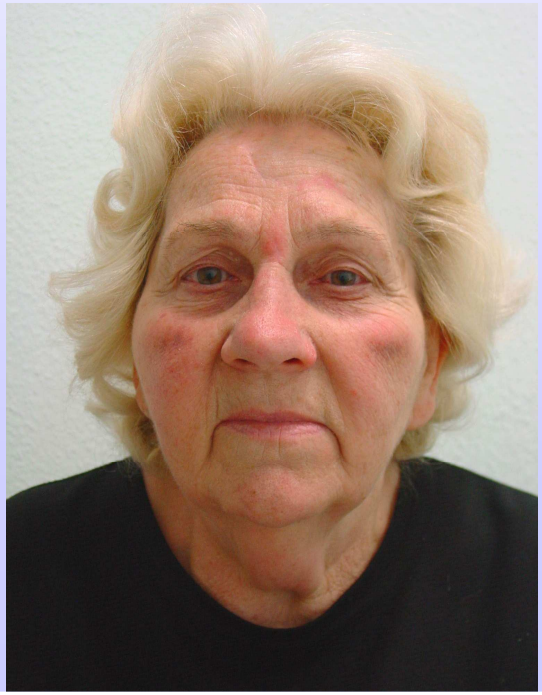
Motorcycle accident (D10)
Drainage of Hematoma

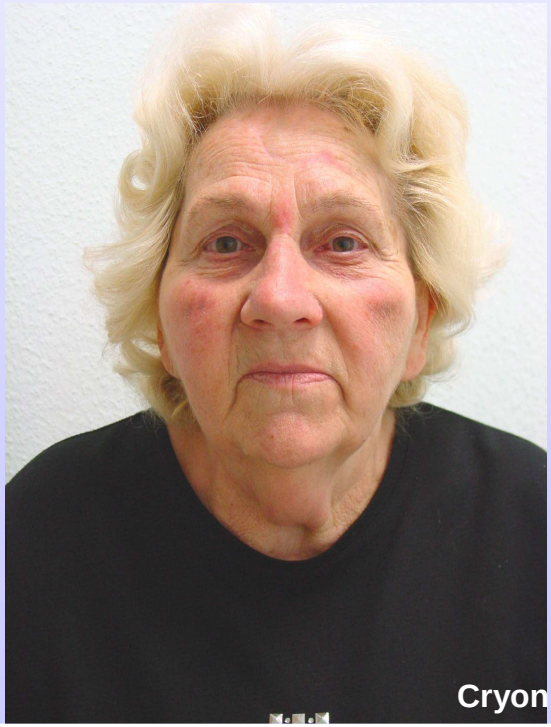
D0



D1

D3





D5

CRYONIC

OEDEMA AND HEMATOMA IN MAXILLO-FACIAL SURGERY

Day 0

Day 1

Maxillo-facial Surgery department CHU Strasbourg

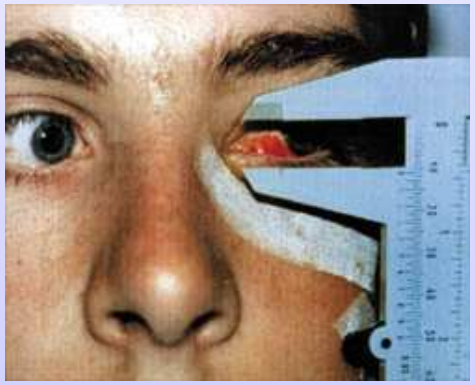
Prof. A. Wilk

CRYONIC

OEDEMA AND HEMATOMA IN MAXILLO-FACIAL SURGERY (2)

Day 2

Day 3



Day 4

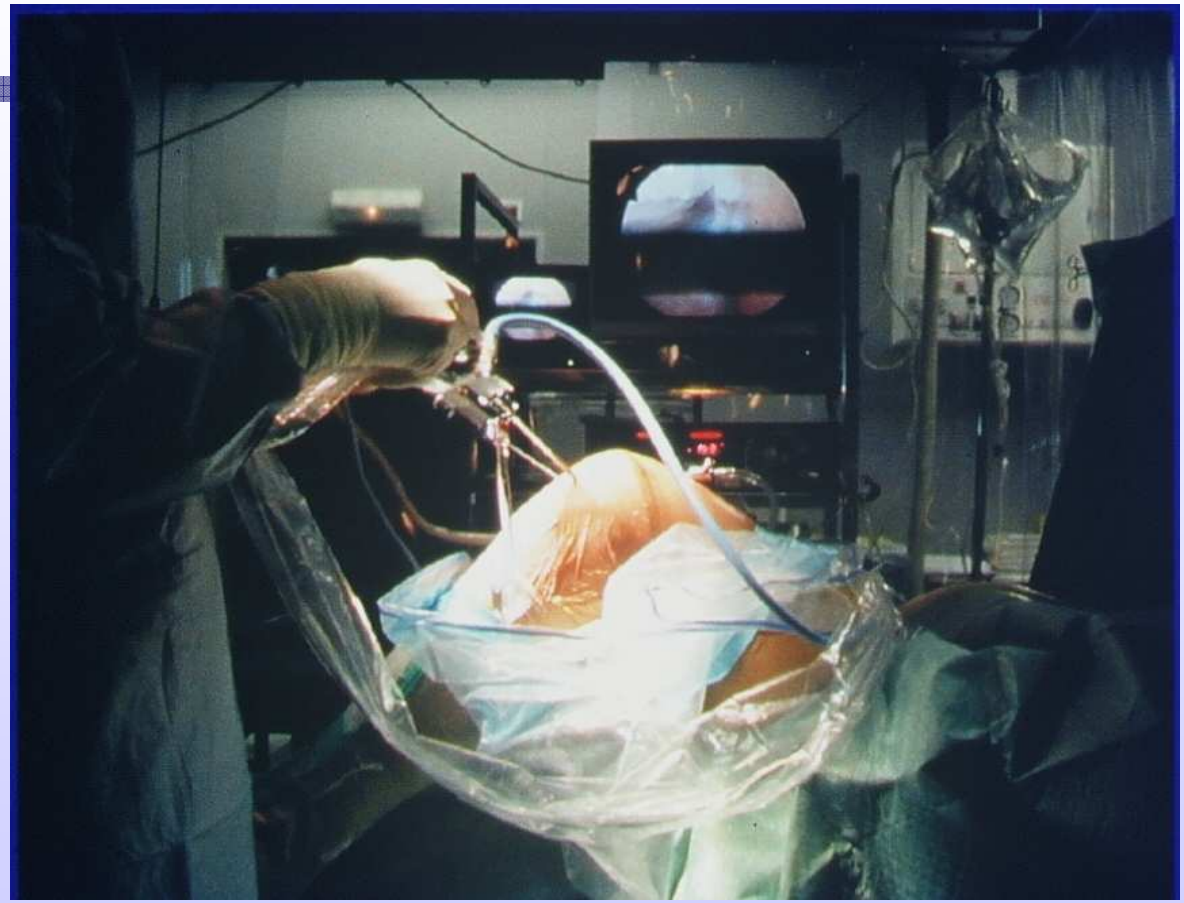
Day 6

Maxillo-facial Surgery department CHU Strasbourg

Prof. A. Wilk

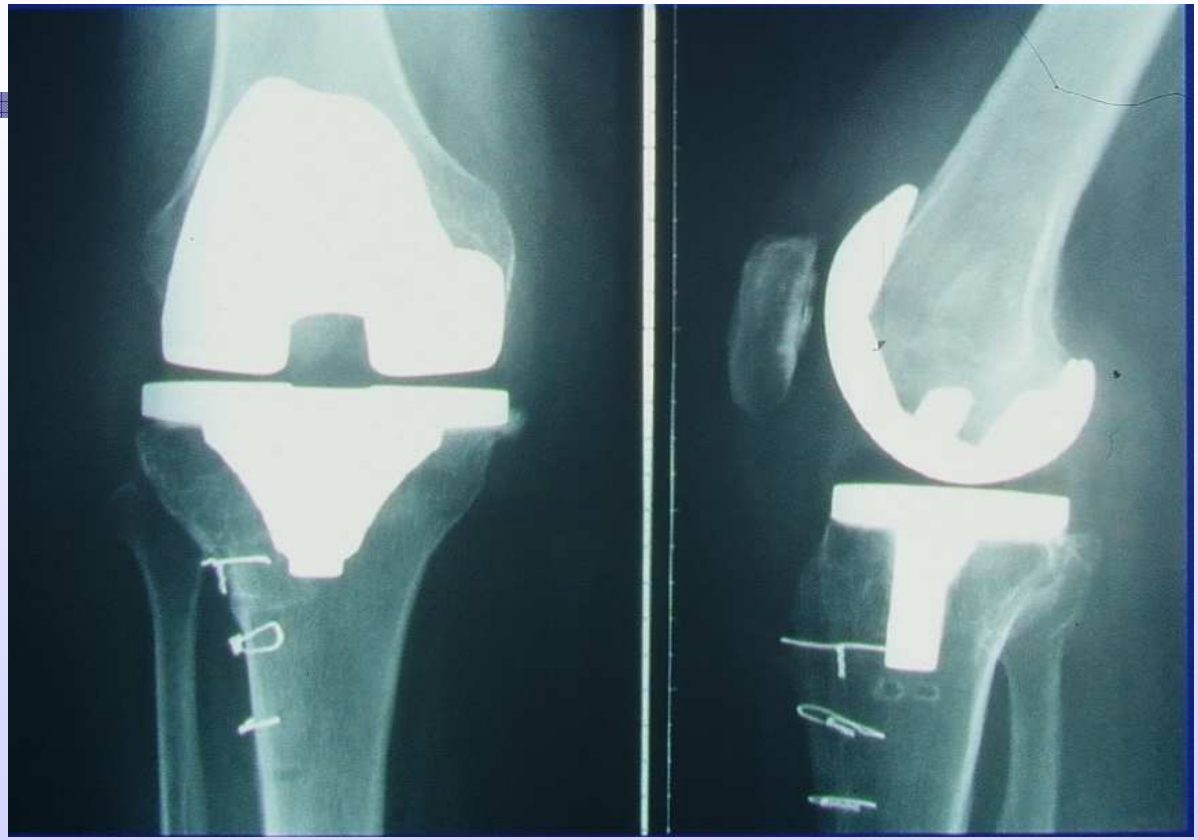
CRYONIC

Gaseous Cryotherapy with high pressure after knee surgery (In 1997)



Team of Doctor BERTIN (BESANCON)

PROTHESIS OF THE KNEE

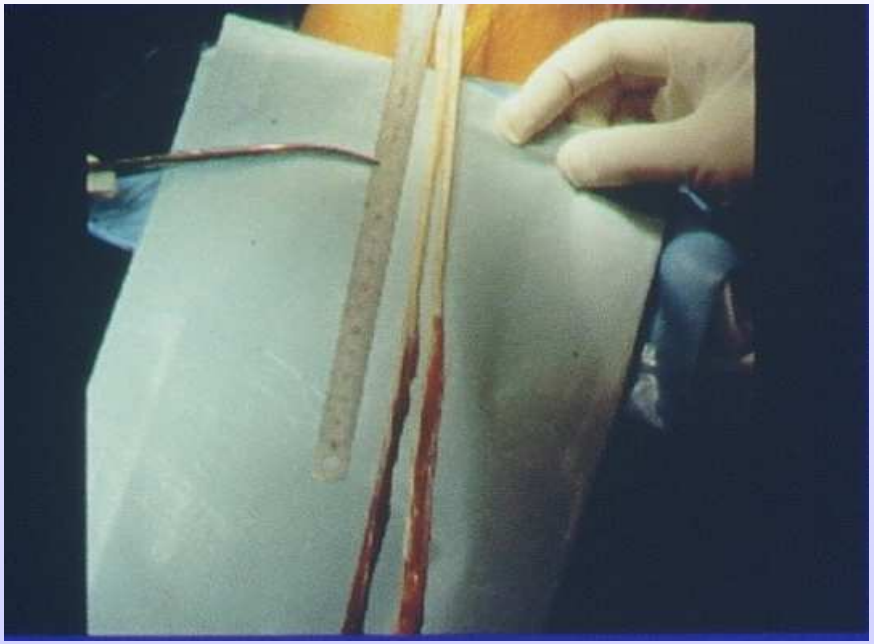


Scorpio / Ostéonics

post cemented stabilised

PLASTICS OF LIGAMENTS

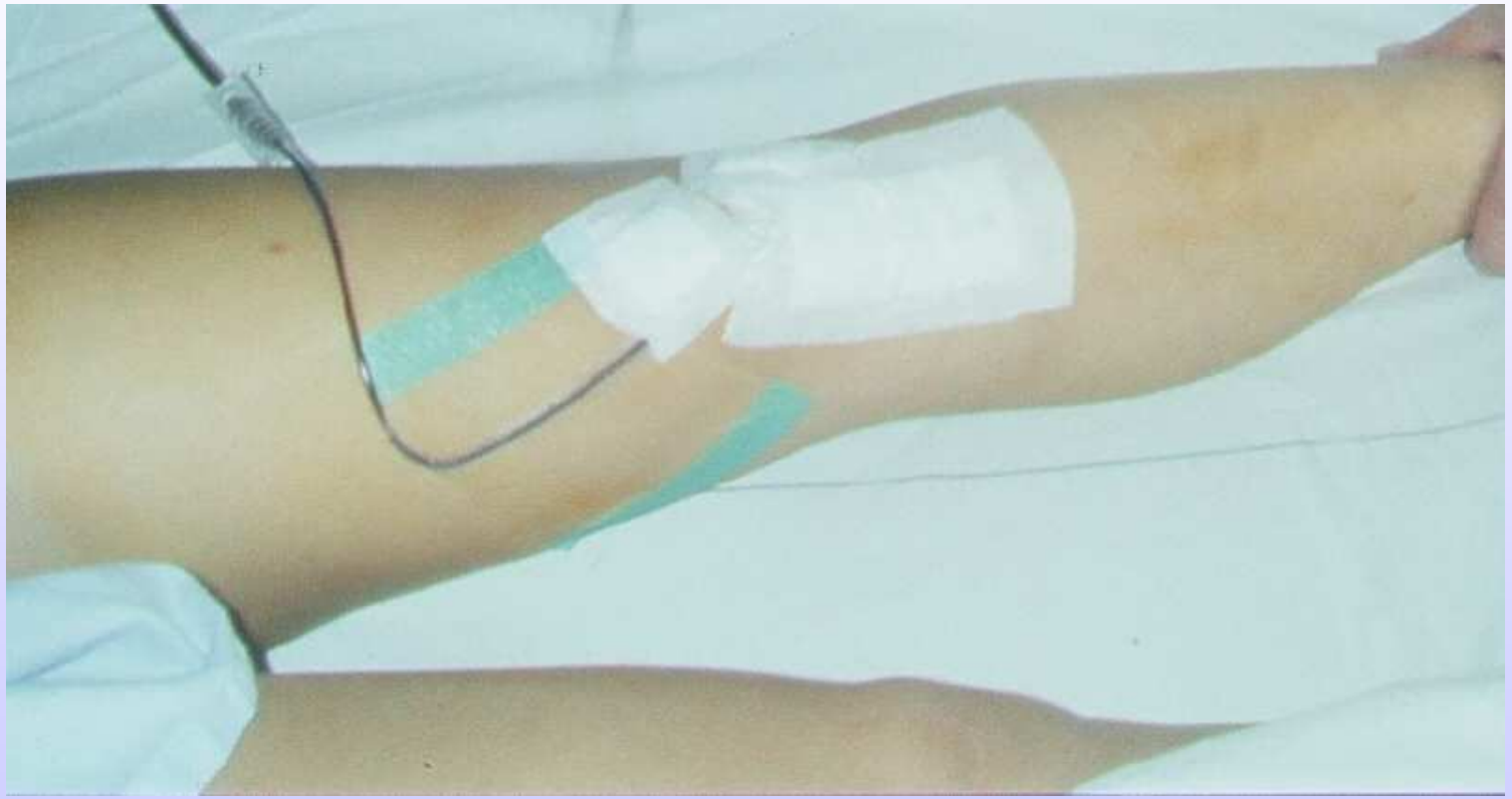
togetherwith or without an extra articular plastics



Internal right and semi tendineous

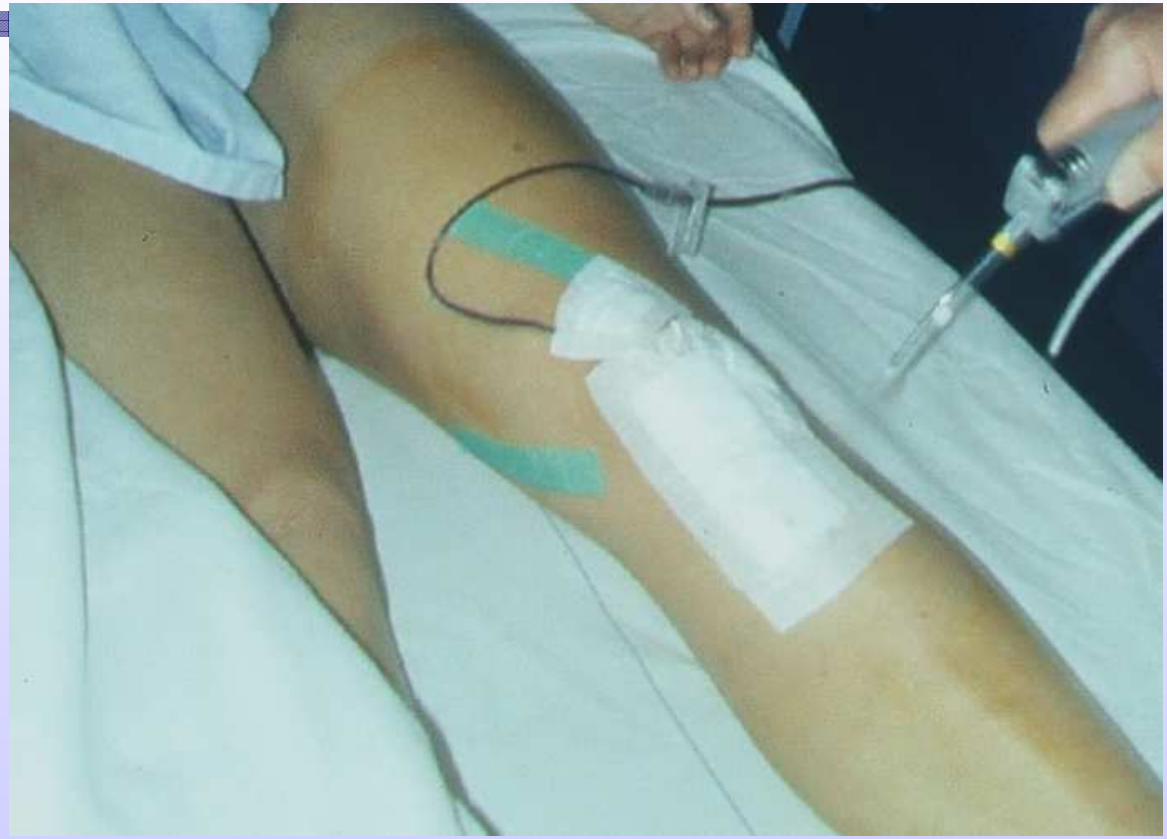
Lig. Patellae

MINIMUM BANDAGE



STIMULATION OF THE LYMPHATIC GANGLIONS

TREATMENT OF THE SCAR



LATERAL SIDE OF THE KNEE

DAY 1 : Flexion at 90°

Range of products

CRYO + : Advanced Cryotherapy device with high pressure (stationary, or mobile with cart) for Hospital, clinic, Doctor office use

CRYO ONE 2 Advanced Cryotherapy device with high pressure (portable) for Sports Medicine, Equine veterinarian, Trainer use or emergency transport use. Uses liquid CO2 or disposable cylinders.

Option : Trolley

Delivered with Protocoles / 1 year Warranty

Medical Grade CO2

C02 GAS CYLINDERS

10 kg =

50 treatments

DISPOSABLE PRODUCTS

Mini cylinder =1 treatment of 1 min

Examples of References

More than 5000 Hospitals, Clinics, Sport clubs, physiotherapists, chiropractors, rheumatologists, physicians and equine vets are currently using the NeuroCryoStimulation over the world

Hospitals and clinics :

Salpétrière –St Maurice in Paris, CHU Strasbourg, Edouard Herriot in Lyon/ France
Lausanne, Zurich and Delémont /Switzerland
Valencia, Madrid, Malaga, Sevilla, Bilbao/ Spain
St Luc –Brussels and Liege /Belgium ……
Baden-Baden, Karlsruhe /Germany
Chronic pain clinics Redondo Beach CA USA
Lewisham Physiotherapy and Sport Medicine –Sydney -Aus

Prestigious customer references: San Francisco Giants, Novak Djokovic, Chelsea, Paris Saint Germain, Monaco and many more …

Rugby World Cup
New Zealand
Semi-final
France vs. Wales

For the PDF version of the presentation, please click here to play video on Youtube

Scientific Studies

A lot of different studies have been done to demonstrate the efficiency of the technology and the innovative and efficient effects of this technology.

Some examples of publications done are

2001 * 'European Journal of Emergency Treatment' /CHU* de la Cavale Blanche, Brest* research hospital
Doctor E.L'Her, intensive care unit and emergency department.
"Initial study of cryotherapy-induced analgaesia during an arterial puncture"

September 1998 * 'THE SCIENCE OF PHYSIOTHERAPY'/University hospitals of Strasbourg.
Professor Astrid Wilk, head of maxillo-facial surgery unit.
"Study of the use of gaseous cryotherapy in maxillo-facial surgery for oedema"

December 2001 * 'SPORTS AND MEDECINE' / Edouard Herriot research hospital, Lyon.
Dr E. Brunet-Guedj, Dr B. Brunet, Dr J. Girardier, Dr E. Renauld, Dr M. Daubard, Dr R. Manigand, Sports Medicine Unit.
"The impact of gaseous cryotherapy in the treatment of tendinopathies."

SPORTS AND MEDECINE' / Dr H. Chick, Dr A.-L. Carayon, Dr J.-C. Rognon, Dr A. Cohpan (sports doctors).
"Gaseous cryotherapy in the treatment of injuries to top athletes."

December 2004 * 'THE SCIENCE OF PHYSIOTHERAPY'/University of Brussels
Doctor Romain Meeusen and Doctor Franck Handelberg
"The influence of cryotherapy (Cryotron®) on pain and inflammation following a shoulder arthroscopy".

- .....

Archive of Physical Medicine and rehabilitation October 2007

Laurent MOUROT (Ph.D), Christian CLUZEAU, Jacques REGNARD (MD, Ph.D)

From the department of Physiology (EA 3920 and IFR133), Franche Comté University, Besançon (Mourot, Cluzeau, Regnard) and Functional Explorations department, University Hospital, Besançon (Regnard), France.

•*Hyperbaric gaseous cryotherapy: effects on skin temperature and systemic vasoconstriction.*

Objective. To compare skin surface cooling caused by application of an ice bag (15 min) and by projection of CO_2 microcrystal (2 min) under high pressure (75 bar) and low temperature (-78°C), a modality called hyperbaric gaseous Cryotherapy (HGC).

Design. Randomized controlled trial with repeated measure.

Setting. Laboratory experiment.

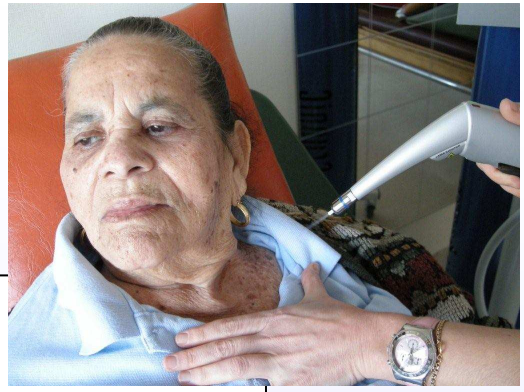
Participants. 12 healthy male subjects (mean ± SD: 22.9 ± 1.8 years)

Interventions. Ice bag and hyperbaric gaseous Cryotherapy were randomly applied on the skin of the non-dominant hand.

Main Outcome Measure. Skin temperature of the cooled (dorsal and palmar sides) and contra-lateral (dorsal side) hands were continuously measured with thermistor surface contact probes before, during and after (30 min) cooling.

Results. HGC projection induced a large decrease (P<.05) of the dorsal skin temperature of the cooled hand (from 32.5 ± 0.5°C to 7.3 ± 0.8°C), and a significant decrease of the skin temperature of the palmar side and of the contra-lateral hand. The skin temperature of the dorsal side of the cooled hand was decreased with an ice bag (from 32.5 ± 0.6°C to 13.9 ± 0.7°C; P<.05). However, the lowest temperature was significantly higher than during HGC, and no significant changes in the other skin temperatures were observed. Rewarming was equal after the two modalities, highlighting a more rapid increase of the skin temperature after HGC.

Conclusion. HGC projection decreased skin temperature of the cooled and contra-lateral hand suggesting a systemic skin vasoconstriction response. On the other hand the vascular responses triggered by ice pack cooling appeared limited and localized to the cooled area.



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"Pain in the older people. A prospective evaluation of treatment by hyperbaric gaseous Cryotherapy (NeuroCryoStimulation)"

OBJECTIVE. To evaluate the effect of hyperbaric gaseous cryotherapy by carbon dioxyd on severity of elderly people's pain.

METHODS. An open prospective study was conducted in patients admitted in a geriatric center, with several types of pain. At entry, the patients recorded a pain score, marked on a 100 mm visual analogic scale. This measure was repeated for comparison at the end of the treatment session.

RESULTS. Between May and June 2005, Fifty-five patients were enrolled. Mean age was 82 years. 41patients (74,5%) had a rheumatic or orthopedic pain, and ten patients (18,1%) presented neurological pain. Four subjects were enrolled for swelling or cutaneous haematoma. After a mean of four sessions of hyperbaric gaseous cryotherapy, pain scores decreased from 47 to 13 mm ($p<0,001$) for the rheumatic or orthopedic pains, and from 51 to 12 mm for the neurological pains.

CONCLUSION. Hyperbaric gaseous Cryotherapy by carbon dioxide is a modern no pharmacological technique to treat pain in elderly people.

Main advantage of this technology

- Innovative
- Non invasive
- Natural
- Effective
- Rapid
- Comfortable

- Replace medication
- Large number of applications
- Few contra-indication
- No direct competitors
- Health Savings

The modern unique natural High technology that you must have to treat your patients

Profitability

- Leasing cost (5 years for a Cryo+) = €/month
- Average of gas consumption : 2 cylinders/month = €
- 2 cylinders = 100 treatments = 5 treatments (average/patients)
  = 20 patients/months

Price of the treatment for patient: € for 5 treatments

Your Profit:

(20 patients x €) = € - (Cost leasing + gas) = €

= **+ € / month**