



Advanced solutions in cryotherapy for medical applications

PHYSICAL MEDICINE / SPORTS MEDICINE / WELLBEING

ABOUT CRYOTHERAPY

Cryotherapy uses several techniques and procedures that utilize low temperatures to remove heat from a body part in order to decrease pain and promote circulation.

Also known as cryostimulation, cryotherapy session lasts up to 3 minutes in a temperature below -110°C / -166°F and affects the entire surface of the body. Its main purpose is to trigger physiological, systemic and organ reflexes, beneficial for the recovery of homeostasis in the body. There are two main types of cryotherapy: whole-body cryotherapy (WBC) and localized cryotherapy.



Whole Body Cryotherapy - WBC

WBC is very popular in sports medicine in after-season recovery, and in recovering from injuries. Most studies confirm the anti-inflammatory, analgesic, and anti-oxidant effects of this therapy by highlighting the underlying physiological responses. In addition to its therapeutic effects, WBC has been demonstrated to be a preventive strategy against the deleterious effects of exercise-induced inflammation and soreness.

[Lombardi G, Ziemann E, Banfi G. 'Whole-Body Cryotherapy in Athletes: From Therapy to Stimulation. An Updated Review of the Literature'. *Front Physiol*. 2017.]

Localized cryotherapy

Localized cryotherapy focuses on the specific areas of the skin. It is used to target localized areas that are in pain or inflamed applying cold temperatures up to -162°C / -260°F for between 5 - 10 minutes per location. Localized cryotherapy reduces post-traumatic microvascular dysfunction, inflammation, and structural impairment secondary to closed soft tissue injury due to cryotherapy's ability to restore functional capillary density, repair tissue damage, decrease intramuscular pressure, and reduce the number of adhering and invading granulocytes.

[Schaser, David Steier, Lauffen, Ball & Minnemeier, 2007]

CRYOTHERAPY IMPACT

CIRCULATORY SYSTEM



increase in white blood cells → increase in immunity

displacement of blood from superficial to deep structures → better blood supply to deeper tissues

increase venous return and minute capacity → positive effect on heart

THE NERVOUS SYSTEM



functional reduction of receptor reactivity → analgesic effect

slowing down receptor conductivity → decreased muscle tone

ENDOCRINE SYSTEM



increase in noradrenaline concentration → analgesic effect

release of β endorphins → antidepressant effect

release of cortisol and stress hormones → mobilizing effect

MUSCULOSKELETAL SYSTEM



pre-capillary sphincter contraction → reduction of edema

increase venous return and minute capacity → acceleration of microtrauma regeneration

increase in anti-inflammatory interleukin 10 and decrease in prostacyclin, cytokine, interleukin 8 and 2 levels → reduction of inflammatory response



FIELDS OF APPLICATION

PHYSICAL MEDICINE

Treatment of injuries
Immune stimulation
Pain relief

SPORTS MEDICINE

Energy booster
Recovery

WELLBEING

Mood improvement
Rejuvenation



MEDICAL INDICATIONS

Cryotherapy is especially dedicated to patients diagnosed with:

1. Injuries

- > joints – sprains; instability; post-traumatic cartilage, meniscus, internal ligaments lesions
- > muscles – contusions; intracapsular bursts; intramuscular hematomas; avulsion injuries
- > tendons – partial rupture of the Achilles tendon; partial and total rupture of the extensor and flexor tendons of the elbow area; lesions of the quadriceps muscle aponeurosis; degeneration of the plantar aponeurosis; the rotator cuff tears in the shoulder
- > ligaments – damage to the collateral and internal ligaments of the knee, ankle, and elbow

2. Degenerative joint disease:

- > Rheumatoid arthritis
- > Psoriatic arthritis
- > Aseptic necrosis
- > Ankylosing arthritis

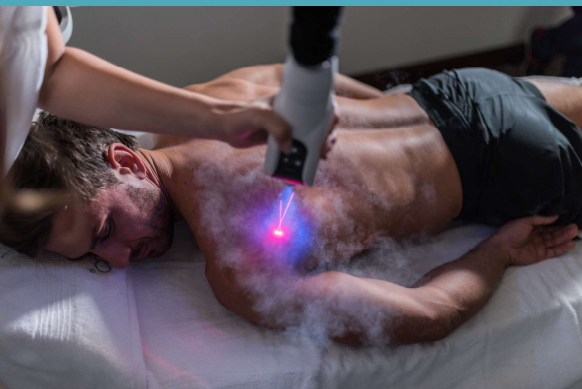
3. Overload syndromes

- > Enthesopathies
- > Tendinopathies
- > Discopathies

4. Metabolic diseases

- > Osteoporosis
- > Obesity

5. Chronic pain syndrome



CRYOTHERAPY DEVICES

°CRYO Arctic Single-person Whole Body Cryotherapy Chamber

The exceptional heat exchange technology ensures that users never come into a direct contact with cryogenic gases, instead they are exposed to safe breathable air. The number of safety features makes the cryochamber exceptionally comfortable for a patient and an operator.

FEATURES

- > 100% breathable air environment
- > Movable window to increase patient's comfort
- > Digital touchscreen to manage treatment protocols
- > Extra-intuitive operator's interface
- > High quality speakers to enable communication between an operator and a patient
- > Additional screen to display remaining treatment time to a patient
- > High quality cryogenic material



°CRYO Penguin Localized cryotherapy machine

Modern mobile device recommended for clinics, hospitals, rehabilitation and physiotherapeutic centers. Equipped with a number of predefined protocols, with well designed ergonomics, it provides exceptional comfort of work.

FEATURES

- > touchscreen display with an intuitive interface for comfort of operations
- > automatic measurement of skin temperature during the treatment
- > several treatment protocols providing accuracy of procedures
- > ergonomic handle with a remote control feature
- > auto-balancer to maximize easy use
- > equipped with a 50-litre bottle for liquid nitrogen