



Pandhora REHAB

Infrared Robotic Rehabilitation

increase
your
feedback

ELI-ISOKINETIC®



ISOKINETIC DYNAMOMETER WITH INFRARED PROPRIOCEPTIVE STIMULATION FOR FUNCTIONAL RECOVERY OF THE MUSCULOSKELETAL SYSTEM AND IMPROVEMENT OF SPORTS PERFORMANCE.

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Pandhora, born in 2016, deals with the design, manufacturing and distribution of innovative devices in the field of Rehabilitation. Shareholding company of ENTOPAN (the largest business incubator in Southern Italy), CDP Venture Capital, financed by investment companies belonging to the Giomi Group (among the most important in the hospital sector) and Santo Versace, it is involved at the forefront in research projects in the biomedical and engineering field thanks to its highly specialized team.

The Company has developed an advanced and unique know-how in the field of mechanical design, kinematic simulation and, more generally, in Robotics. Therefore, from this experience the idea of developing devices for Robotic Rehabilitation was born in order to innovate a sector in a very strong technological rise, which clearly shows a strong need for the implementation of therapeutic performance (maximization of therapy efficacy, reduction of times and improvement of comfort of the patient).

Ph.D. Ing. Stefano Troncone
CEO & Founder

LI-ISOKINETIC®

An innovative aspect of Li-Isokinetic® is the combination of Robotic Rehabilitation with infrared rays in order to maximise and accelerate the Rehabilitation process.

Li-Isokinetic® enables the user to rehabilitate from the early stages of post-injury or surgical rehabilitation to full re-athletisation. It sensitively connects the patient with the machine via controlled full spectrum infrared irradiation.

This synchrony between thermal stimuli and the movement cycle amplifies the user's perception of the movement being performed, and therefore speeds up the rehabilitation process, while the mild heat makes the therapy more comfortable. Being capable of measuring muscle strength, endurance, joint mobility,

flexibility and stability, it allows the assessment and mono-articular training of the knee.

The machine is equipped with a dynamometer, which is configured to move a patient's limb and it is controlled by software that allows the angular velocity of the movement performed and thus the force developed by the muscle is kept constant; the software also allows the exercise performed by the patient to be adjusted and monitored at all times, and the data collected during the work sessions to be stored and analysed.

INFRARED SENSORY STIMULATION

It deeply involves the patient, encouraging him to improve.

COMFORTABLE

Deep heat relaxes muscles and the nervous system.

EASY TO USE

It guides the operator during the whole rehabilitation process.



ISOKINETIC TEST

ISOKINETIC EXERCISE:

Movement at a constant speed, regardless of the force applied. The muscles contract and shorten at a constant speed in isokinetic concentration. This allows the muscles to gain strength consistently throughout the movement.

An isokinetic machine optimally stimulates and trains the muscles acting on a joint throughout the entire range of movement.

ROBOTISED NEUROREHABILITATION COMBINED WITH INFRARED RAYS

Full spectrum infrared rays and heat penetrate deep into the skin layer, stimulating blood circulation and promoting vasodilation. Infrared rays combined with robotic rehabilitation stimulate the muscles at the nervous and muscular level.

ISOKINETIC RESISTANCE MODES

With isokinetic equipment, it is possible to assess the strength of a muscle. This is particularly useful in the rehabilitation phase, (e.g. in the case of quadriceps muscle after anterior cruciate ligament reconstruction surgery) since it allows a rehabilitation protocol to be implemented in which isokinetic muscle exercise is combined with traditional physiotherapy from the very early post-surgery stages.

The treatment can be monitored and adapted to the patient's needs, progress can be checked, and an evaluation can be carried out by comparing the injured limb with the healthy contralateral limb.

The patient can work on muscle reinforcement in total safety, since the isokinetic exercise is performed with the operated limb not resting on the ground, and above all, the resistance offered by the machine to the active muscular

effort does not weigh on the operated joint, since it adapts to the same force expressed by the patient, without imposing an overload determined a priori.

In case the patient does not have sufficient strength to lift the limb, the movement can be imposed by the isokinetic device, which helps the movement instead of impeding it, allowing the execution of complete and controlled movements even in absence of muscle strength.

There are different types of muscle contraction that can be performed with this type of machine, some of which would not be achievable with common gym equipment and which would in any case be contraindicated in the initial stages of rehabilitation as they would be performed by overloading the joint.

HOW LI-ISOKINETIC® WORKS

WORKING METHODS AND MODES OF MOVEMENT

The isokinetic machine enables an entire training programme to be performed with different types of tests:

- ISOKINETIC
- CONCENTRIC
- ECCENTRIC
- CONCENTRIC/ECCENTRIC
- ISOMETRIC



WARM-UP

The patient's muscles are rapidly pre-heated by infrared rays. This leads to a decrease in pain and stiffness in the muscles and joints.

CONTROLLED IRRADIATION

The emitted heat warms the muscles involved in the movement, allowing the patient to interact with the machine according to the effort being made.

SIGNIFICANT BENEFITS

Infrared rays heat the tissues in depth, quickly loosening any muscle contractions. The affected muscles and nervous system are relaxed, and the patient, being able to interact with the infrared radiation, is deeply involved in the therapy and stimulated to improvement.

THE IMPORTANCE OF INFRARED RAYS

The intensity of the infrared rays is regulated so as to follow the intensity of the muscular effort proportionally.

The heat, increasing proportionally with the effort exerted by the patient, stimulates the thermoreceptors present on the skin, which are heat- and cold-sensitive receptors that differ from the others in that they are always active, thus constantly informing the brain of the temperature change during the cycle imposed by the machine.

The patient, by visually observing and perceiving the changing intensity of the infrared rays as a

function of the effort exerted during movement, will be able to instantly self-assess the success during rehabilitation. This will allow the patient to autonomously control their targeted activity by involving them in the session and motivating them to improve.

In this way, the patient will be able to interact with the intensity of the irradiation depending on the effort exerted by sensorially connecting with the machine, maximising biofeedback, i.e. awareness of the movement being performed.

EASY TO USE

The machine is able to SELF-LEARN and it works with PREDICTIVE EXERCISES.

After a simple test on the patient, the machine adapts automatically calibrating on them.

Through software integrated algorithms, improvement curves of the exercise parameters which are filtered and optimized after every use.

“PREDICTIVE” exercise parameters are suggested by the machine to the therapist during its use and they are also updated thanks to the internet connection.

The process is iterative, exercise parameters are updated after every working cycle, thus improving “SELF-LEARNING” function.

Thanks to this, even less experienced therapists can use easily Li-Isokinetic, making the most of its potential!

BENEFITS

- Increased muscle elasticity
- Injury prevention
- Controlling muscle development
- Shortening recovery time from operations or injuries
- Exercises modulated according to the diagnostic results of previous tests

USES

Isokinetic training equipment is suitable for neurology, neurosurgery, orthopaedics, sports medicine, rehabilitation and other departments. It is applicable for muscle atrophy caused by reduced exercise or other causes. It is also used for muscle atrophy caused by muscle injury, muscle dysfunction caused by neuropathy, muscle weakness caused by joint disease or injury, muscle dysfunction, muscle strength training of healthy individuals or athletes.



TECHNICAL SPECIFICATIONS

TRAINING

Mono-articular: Knee

INFRARED LIGHT

Full spectrum, variable intensity

SPEED

Concentric 40°/s to 400°/s
Eccentric 20°/s to 200°/s
Passive 5°/s to 20°/s

ROTATION ANGLE

0°/105°

HEALTHCARE 4.0

PLC control; Remote interconnection and control;
Simple and intuitive interface;
Electronic medical record

VOLTAGE

CA 220 V 50Hz 4 kW

MOTORISED ADJUSTMENTS

Seat height
Depth
Backrest inclination

WHY CHOOSE LI-ISOKINETIC®

- Ease of use
- Safety and efficiency
- Quality and innovation

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