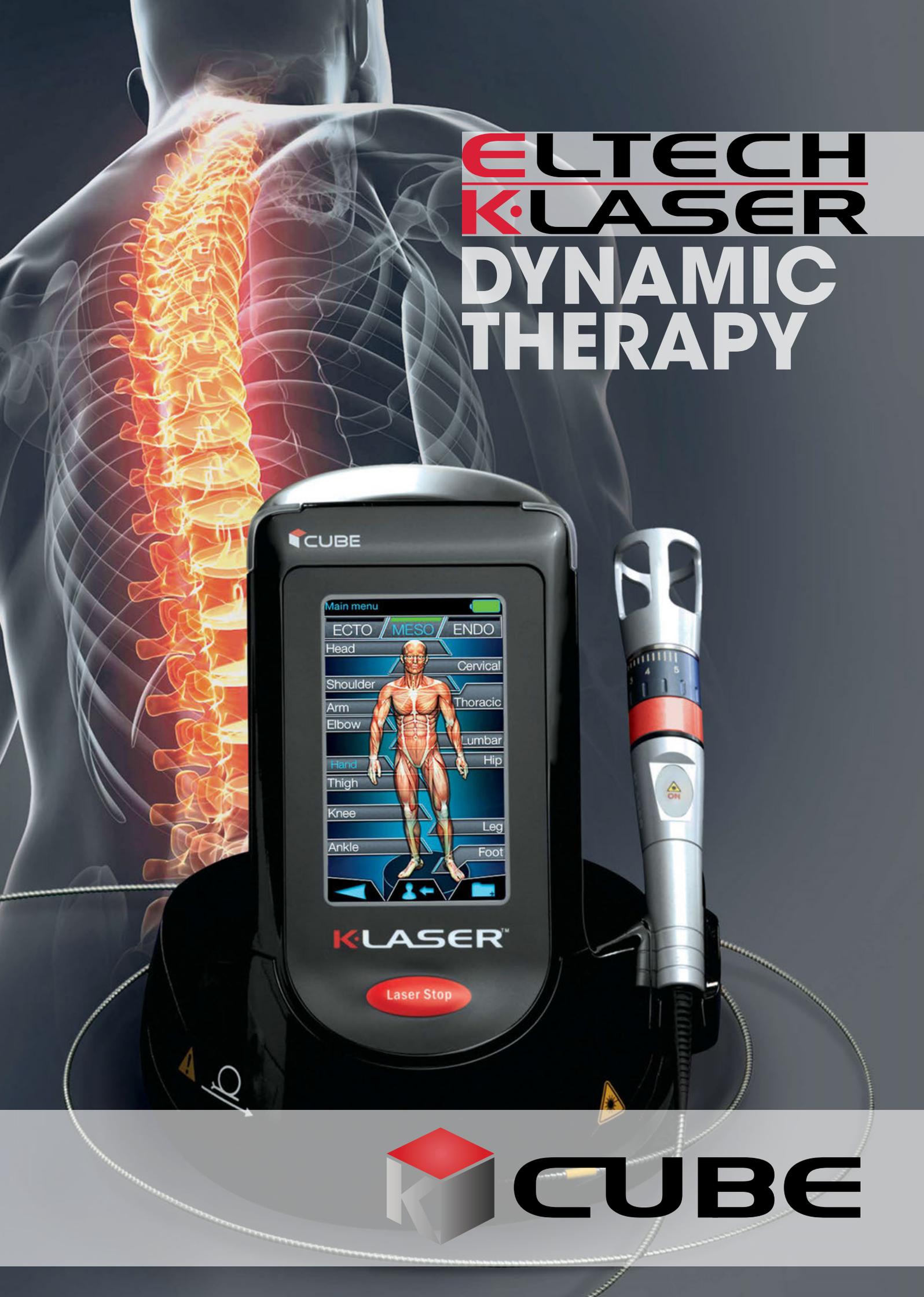


ELTECH K·LASER DYNAMIC THERAPY



CUBE

K-LASER

DYNAMIC THERAPY

K-LASER IN THE WORLD

K-laser company designs, manufactures and markets equipment and professional lasers for the medical/surgical sector all over the world, thus expressing **Made in Italy** at its best. Every day, its qualified staff cooperates with competent professionals and renowned private hospitals, investing its resources in Research and Development in order to deliver the most cutting-edge products on the market: **K-Laser Cube**.



K-LASER THERAPY: SYNONYMOUS WITH DYNAMIC THERAPY

K-Laser intuitive software consists of several **dynamic stages** that characterise the selected treatment. It allows adjusting application parameters, as well as wavelength, time frame, frequencies and power **within a single therapy session**, thus significantly increasing its efficacy and boosting the immune system while repairing tissues.

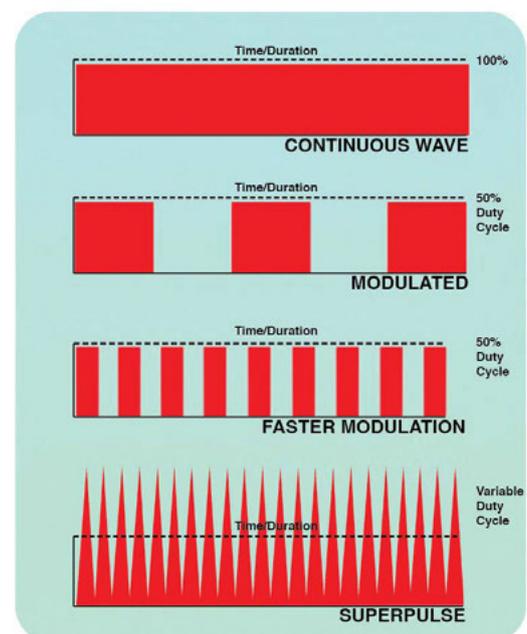
Thanks to an increased ATP production, which reaches its peak after 24 hours from the first laser treatment, the human body is able to transform laser energy into vital energy available to the cells

DIFFERENT TYPES OF TISSUE CORRESPOND TO DIFFERENT MODULATION PARAMETERS

The parameters of the new **K-Laser Cube line** are distinguished according to the type of pulse (**CW** mode, pulse mode with adjustable frequencies, **ISP** super-pulse mode), with diversified tissue response.

Such effects have been thoroughly analysed, paying particular attention to:

- the amount of energy administered depending on the effect obtained;
- the response obtained at different tissue depths;
- the effects of laser light penetration related to the most suitable administration modalities according to the kind of tissue to be treated.

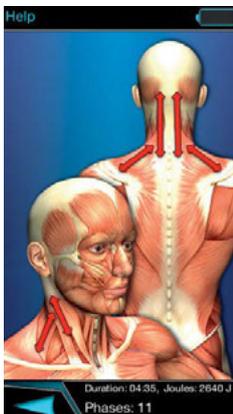




◀ CUBE THERAPY REDEFINED FOR ALL KINDS OF PATIENTS

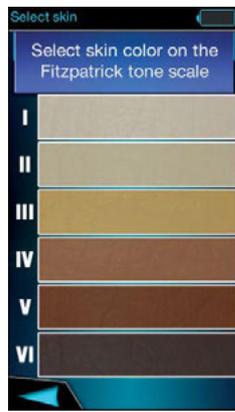
K-Laser Cube allows adjustment of energy delivered depending on the factors involved, thanks to **selected menus that are graphically intuitive**.

Increased power and the wavelengths available play a crucial role in the success of the laser therapy.



◀ TYPE OF PAIN: CHRONIC AND SEVERE

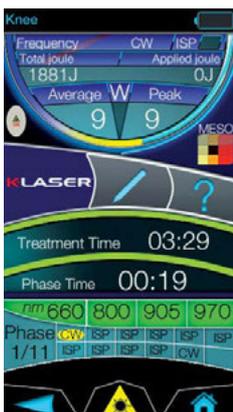
According to the kind of pain experienced by the patient, **K-Laser Cube** makes it possible to select specific treatments.



◀ THE IMPORTANCE OF MELANIN FOR OUR BODY

K-Laser Cube, besides analysing body morphology and the types of tissues, also takes into account another crucial factor for our skin: **melanin**.

Thanks to its innovative parameters, **K-Laser Cube** recognises **the skin's six phototypes**, taking into account every pre-set protocol variant.

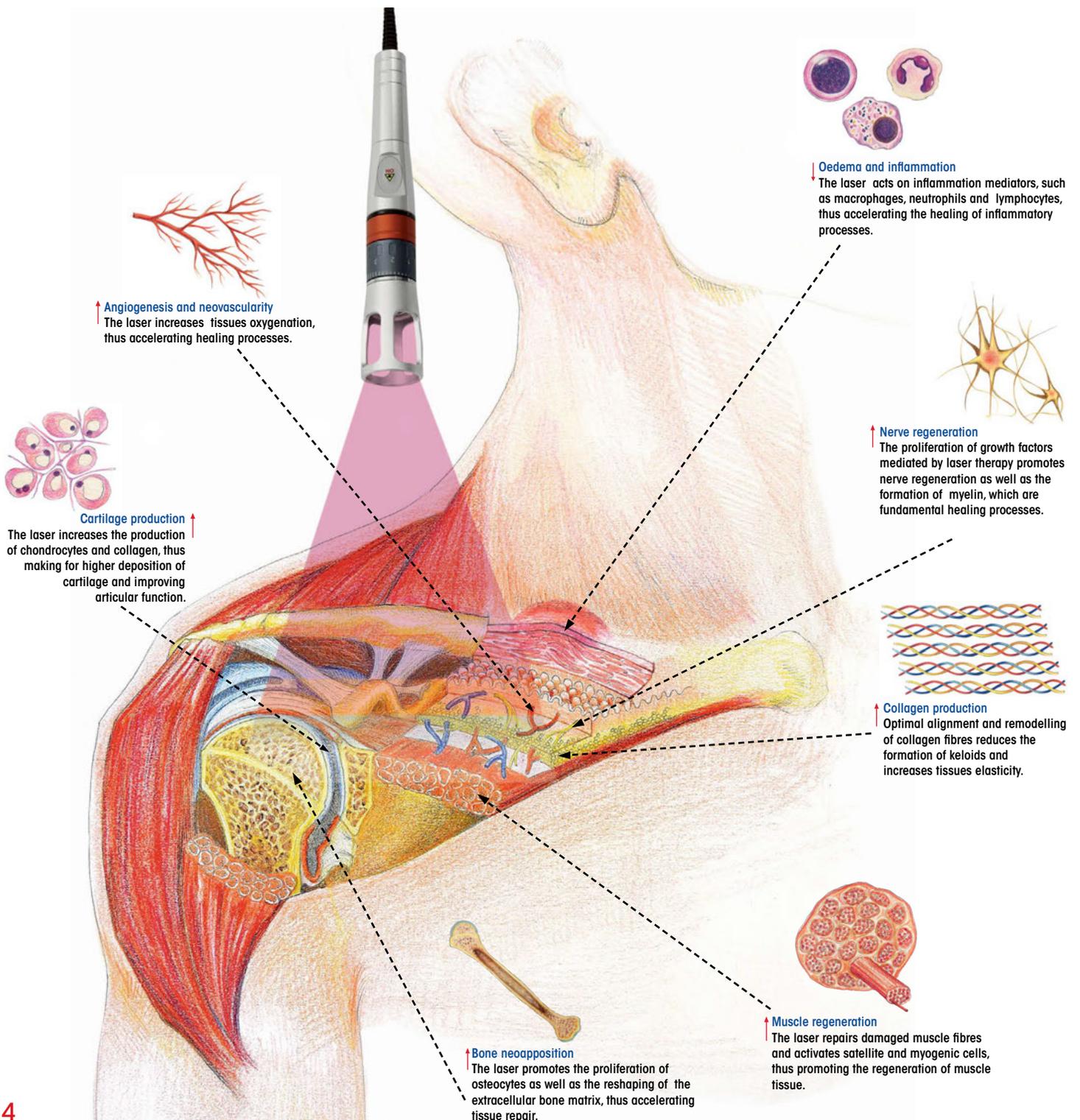


◀ DYNAMIC PROGRAMS

Every **K-Laser Cube** protocol consists of a dynamic parameter setting, to be chosen according to the different types of tissues.

EFFECTIVE IN PHYSIOTHERAPY

Effects on metabolic processes



EFFECTIVENESS AND BENEFITS FOR PAIN THERAPY IN THE MEDICAL FIELD

K-Laser Dynamic Therapy is an excellent multidisciplinary therapy

K-Laser Dynamic therapy uses several pulse frequencies to produce a combination of **analgesia, inflammation reduction, biostimulation and antimicrobial effect**, thus accelerating the regeneration of tissues and increasing cellular energy.

Cells can thus absorb nutrients more quickly as well as eliminate waste substances. As a result of the exposition to laser light, the cells that constitute tendons, ligaments and muscles are repaired more quickly.

K-Laser Dynamic Therapy has anti-oedemic effects since it produces vasodilation while activating the lymphatic drainage system, which results in swelling reduction.



RESEARCH AND DEVELOPMENT

K-Laser has always invested many of its resources in research, a feature that has always characterised the Company. It cooperates with the **Odontoiatric and Stomatologic Clinic** (coordinated by **Prof. Roberto Di Lenarda**) and, in particular, with the **Dentistry and Dental Prosthetics course of study of the University of Trieste** (coordinated by **Prof. Matteo Biasotto**), with the **Dermatologic Clinic** (coordinated by **Prof. Giusto Trevisan**) as well as with the **Cardiovascular Biology laboratory** (coordinated by **Dr. Serena Zacchigna**) at the **l'International Centre for Genetic Engineering and Biotechnology (ICGEB) of Trieste**. **K-Laser** offers its resources to study advanced technologies.



International Centre for Genetic
Engineering and Biotechnology
Developing Knowledge

Such results can be achieved thanks to an intense pre-clinic research that is often carried out at the **ICGEB** of Trieste: **it is an international organisation operating in the field of molecular genetics and biotechnology**. Founded in 1987, since 1994 it has been an Independent Centre of the UN common system. The Centre is supported by over 60 countries and develops innovative researches especially in the biomedical field. Several experiments are carried out in these laboratories in order to thoroughly analyse laser therapy mechanisms and to tailor the therapies according to specific needs.

Thanks to the excellent results obtained in the basic research, a national study has been conducted. The **Children's Hospital Burlo Garofolo of Trieste** participated as the project coordination centre together with other **seven Italian paediatric hospitals (Bologna, Brescia Cagliari, Padova, Parma, Pavia, e Torino)**. **Dr. Giulio Andrea Zanazzo** is the supervisor of this project called **L.A.M.P.O.** (Laser used in Paediatric Mucositis in Onco-Haematology): at present, it is the first and only multicentre trial for the assessment of the laser therapy effectiveness in relation to mucositis treatment in paediatric patients who are undergoing cancer therapies. Some significant results have been obtained: the laser, in fact, led to the reduction of pain in the oral cavity in paediatric patients, thus improving their quality of life and reducing the use of pain-killers. The success of such results is due to the daily research conducted by a multidisciplinary team of physicians and researchers who operate in different medical fields.

Laser therapy proved to be particularly effective on the **following** treatments:

- **oral mucositis** in cancer patients undergoing anti-cancer therapies (in partnership with Haematology, Oncology and Radiotherapy Departments of the Ospedale Maggiore of Trieste);
- **dermatitis caused by radiotherapy** where the laser managed to reduce the number of interruptions due to side effects;
- **several kinds of ulcers**, with excellent results in terms of both healing and analgesia;
- **nervous lesions** either iatrogenic ones or due to external traumas;
- **the biostimulation** of post-surgical sites;
- **disfunctional algic syndromes** of the temporomandibular joint.

SMiLe PROJECT

The study of Laser-Therapy mechanisms



Dr. Giulia Ottaviani works for the Pathology and Oral Medicine Outpatient Clinic (Ospedale Maggiore – Trieste) under the supervision of **Prof. Roberto Di Lenarda** and **Prof. Matteo Biasotto**, where she is completing her residency in Oral Surgery at the University of Trieste. Her tasks include the diagnosis, treatment and follow-up of patients affected by head and neck neoplasm: these patients are followed throughout the treatment, starting from the diagnosis until the complete functional and aesthetic rehabilitation. **Dr. Giulia Ottaviani** closely monitors the management of the side effects caused by cancer therapies through laser therapy sessions. She completed her training at the University of Parma where she attended the master course **EMDOLA** (European Master Degree on Oral Laser's Applications). She focusses on basic research, which she conducts at the **ICGEB** (International Centre for Genetic Engineering and Biotechnology) within the Cardiovascular Biology group coordinated by **Dr. Serena Zacchigna**. Here, from 2012 to 2014, she attended a PhD program in Nanotechnology Research at the University of Trieste where she focussed on laser therapy mechanisms in the field of tumour growth, proliferation of different cell lines as well as on infections treatment both in vitro models and animals.



From October 2014 until August 2016, she worked as an advance training and research collaborator for K-Laser - Eltech S.r.l. (Treviso). Since September 2016, she has been working for K-Laser (Sežana, Slovenia) where she researches and prepares case studies destined to both Italian and foreign clients.

K-Laser has established a partnership and research agreement between the **International Centre for Genetic Engineering and Biotechnology (ICGEB)** and the **Department of Medical, Surgical and Health Sciences of the University of Trieste (UNITS)**. This agreement led to the **SMiLe Project** (Study of the laser therapy mechanisms), which took inspiration from the results obtained by the experiments performed in recent years. Such experiments have shown once again that the laser therapy can significantly increase tissue biostimulation, improving the cellular production of ATP, a molecule that temporarily stores the energy obtained from cellular respiration.

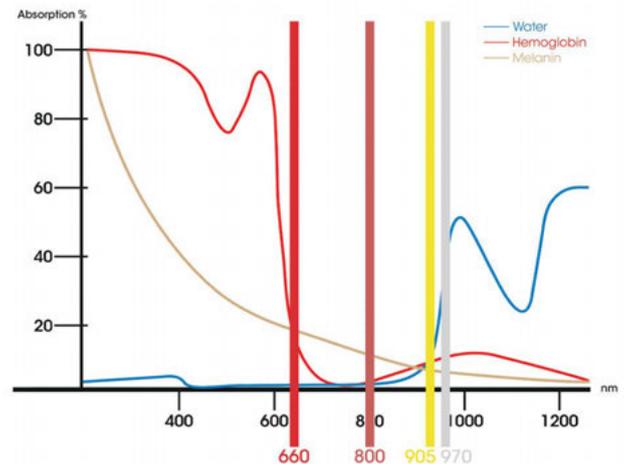
Through such mechanisms, the laser energy stored by the cell permits to accelerate and improving both their proliferation and metabolism in order to heal damaged tissues and lesions in the skin and/or mucous membranes. In addition, laser therapy, and especially the blue light, allow treating several kinds of infections such as fungal, viral or bacterial ones. The laser proved to be effective for the treatment of the acute event and for the reduction of relapses. These results were used in order to study immunity mechanisms. Our immune defences, in fact, represent both the body monitoring system and its emergency department since, thanks to a complex series of biochemical and cellular processes, they allow our organism to stay healthy. Not only does the laser therapy increase the ATP production but it also strengthens and improves our immune defences in case of infections.

The **Research** that **K-Laser** is conducting together with the **ICGEB** and **UNITS** also aims at perfecting a viable support therapy for cancer patients. While undergoing cancer therapies, patients may suffer from skin and/or mucous lesions that drastically lower the quality of life and might undermine the success of cancer therapies.

K-LASER TECHNOLOGY

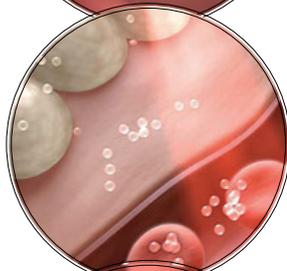
4 WAVELENGTHS

K-Laser Cube is Laser Therapy's world innovation: it completes the wavelengths range, delivering up to 15 different combinations.



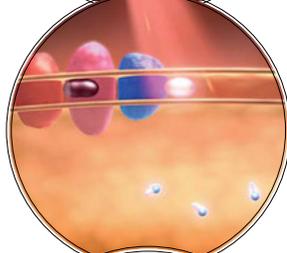
◀ 970 nm

Blood, the main transport system, provides the cells with all the elements which are necessary to their metabolism, such as oxygen and nutritional substances, thus removing catabolic products. This wavelength is able to absorb most of the water contained in our body and a large part of the energy delivered by the therapy is transformed into heat. The deep tissue layers are thus transformed into localised heat points that create temperature gradients at cellular level. They also boost local microcirculation thanks to the increase in oxygen provided to the cells.



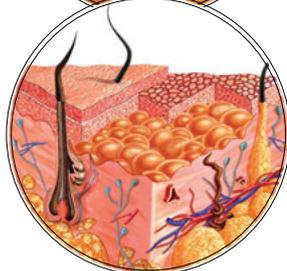
◀ 905 nm

Oxygen is released in variable percentages in the blood: the faster it is released, the more oxygen needs to be transported to the cell in order for the natural healing processes to take place. This wavelength is absorbed by haemoglobin, water, melanin and Cytochrome C oxidase. When it is absorbed, more oxygen is available to the cells.



◀ 800 nm

Cytochrome C oxidase is the terminal enzyme of the respiratory chain that determines the amount of oxygen to be turned into ATP according to cellular efficiency. Enzymes are better absorbed at 800 nm: an ATP molecule is generated for each oxygen-reduction cycle accomplished. The photon absorption accelerates such process while increasing the ATP cellular production.



◀ 660 nm

This wavelength is perfectly absorbed by the melanin contained in the skin, thus guaranteeing energy concentration in the most superficial tissue layers. Laser therapy allows obtaining excellent results in wounds healing as the light both inhibits bacterial proliferation and increases cellular growth.

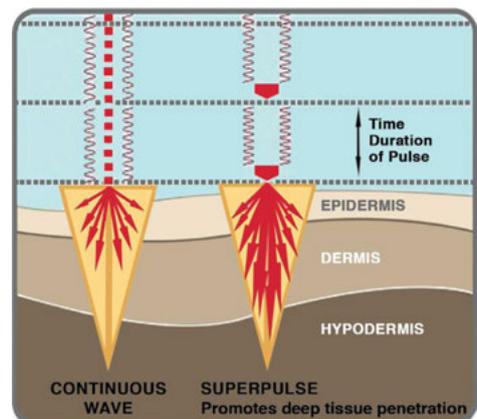
ISP TECHNOLOGY (Intense Super Pulse)

THE NEED FOR INCREASED POWER

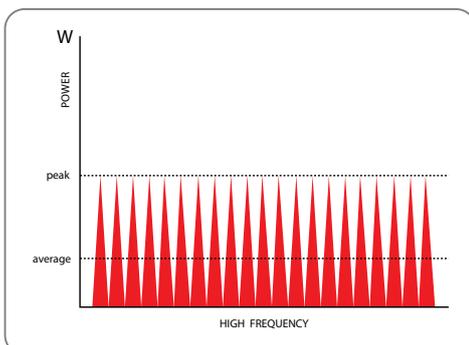
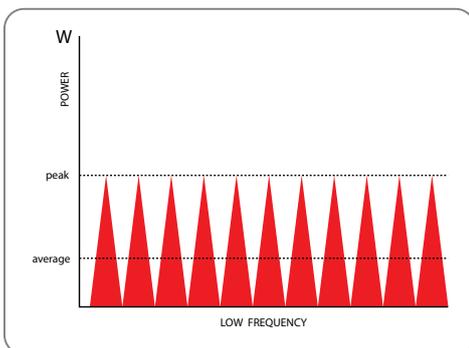
The most recent scientific researches revealed the importance **of average power kept constant in the body**: this feature, in fact, is crucial in order to deliver suitable energy during laser treatments. At present, most super-pulse lasers deliver high-power pulses in a short time frame (millionth or billionth of a second). They can only deliver few milliwatts, thus reaching few watts of average power.

K-Laser Cube is the only laser that, thanks to its exclusive and exceptional **ISP MODE**, allows selecting both the right modulation frequency and average power, also while operating in **super-pulse mode**. Thus, average power is kept constant at all times.

ISP INTENSE SUPER PULSE (da 1 a 20.000 Hz)



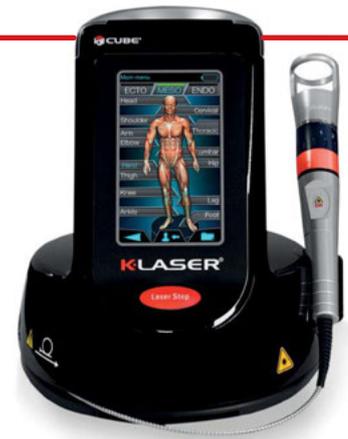
The pulse width is variable and is controlled by K-Laser's powerful software. It is up to 200 times wider than the one in ultra-rapid mode.



The pulse frequency can be chosen starting from the **lowest ones (Low Frequency) for analgesic treatments, to the highest ones (High Frequency) for biostimulation**. Average power is independent and adjustable so as to deliver the right type of energy for the tissue to be treated.

BIOLOGICAL EFFECTS

Clinical results form the basis for K-Laser **Dynamic Therapy** in both physiotherapy and rehabilitation, with **very important protocols**.



anti-inflammatory ➤

Bibliography:

Alves AC et al. Effect of low-level laser therapy on the expression of inflammatory mediators and on neutrophils and macrophages in acute joint inflammation. *Arthritis Res Ther.* 2013;15(5):R116.

Barretto SR et al. Evaluation of anti-nociceptive and anti-inflammatory activity of low-level laser therapy on temporomandibular joint inflammation in rodents. *J Photochem Photobiol B.* 2013 Dec 5;129:135-42.

K-Laser produces an anti-oedema effect: in fact, it both reduces vasodilation and activates the lymphatic drainage system (draining the oedematous areas). Thus, swelling caused by traumas and/or inflammation is reduced.

analgesic ➤

Bibliography:

Chow RT et al. Efficacy of low-level laser therapy in the management of neck pain: a systematic review and meta-analysis of randomised placebo or active-treatment controlled trials. *Lancet.* 2010 Mar 13;375(9718):894.

Gross AR et al. Low Level Laser Therapy (LLLT) for Neck Pain: A Systematic Review and Meta-Regression. *Open Orthop J.* 2013 Sep 20;7:396-419.

Maia ML et al. Effect of low-level laser therapy on pain levels in patients with temporomandibular disorders: a systematic review. *J Appl Oral Sci.* 2012 Nov-Dec;20(6):594-602. Review.

K-Laser therapy positively affects pain receptors: it increases pain threshold while reducing the transmission of pain stimuli to the brain. Pain is also reduced thanks to the anti-inflammatory and anti-oedema effect. **K-Laser** therapy triggers **endorphins production**.

improved vascular activity ➤

Bibliography:

Ottaviani G et al. Effect of Class IV laser therapy on chemotherapy-induced oral mucositis: a clinical and experimental study. *Am J Pathol* 2013; 183: 1747-1757.

Schindl A et al. Systemic effects of low-intensity laser irradiation on skin microcirculation in patients with diabetic microangiopathy. *Microvasc Res* 2002, 64:240e246.

Feng J et al. Low-power laser irradiation (LPLI) promotes VEGF expression and vascular endothelial cell proliferation through the activation of ERK/Sp1 pathway. *Cell Signal* 2012, 24: 1116e1125.

K-Laser therapy significantly increases the formation of new capillaries, thus accelerating the healing process of damaged tissues, **quickly healing wounds and reducing the damaged area**.

In addition, benefits include increased angiogenesis, which causes vessels to dilate temporarily with the augmentation of the blood vessels diameter. The increased supply of blood in the damaged area facilitates the healing process and reduces pain.



⦿ **Metabolic activity increase**

K-Laser therapy increases the production of specific enzymes for the transport of oxygen, thus facilitating the repair and the regeneration of damaged cells.

K-Laser therapy is used to treat nerve injuries such as traumatic or iatrogenic paresthesias, dysesthesias and anaesthesias using reference protocols.

⦿ **improvement of nerve function**



⦿ **improvement of wounds of soft tissues**

K-Laser therapy allows wounds, ulcers and mucositis to heal faster thanks to tissue biostimulation and consequent better wound healing.

Bibliography:

Chermetz M.; Gobbo M.; Ronfani L.; Ottaviani G.; Zanazzo G.A.; Verzegnassi F.; Treister N.S.; Di Lenarda R.; Biasotto M.; Zacchigna S. Class IV laser therapy as treatment for chemotherapy-induced oral mucositis in onco-haematological paediatric patients: a prospective study. Int J Paediatr Dent. 2013 Dec 25. doi: 10.1111/ipd.12090.



PATIENT SUFFERING FROM RADIODERMATITIS CAUSED BY RADIOTHERAPY TO TREAT BREAST CANCER

⦿ **improvement of skin wounds**

To treat skin wounds such as bedsores and ulcers, **K-Laser "Wounds of soft tissues"** treatment is generally preferred. Twice a day for 2 weeks every other day

K-LASER

› SPORTS INJURY REHABILITATION

› PHYSIOTHERAPY



EFFECTIVENESS IN SPORTS REHABILITATION

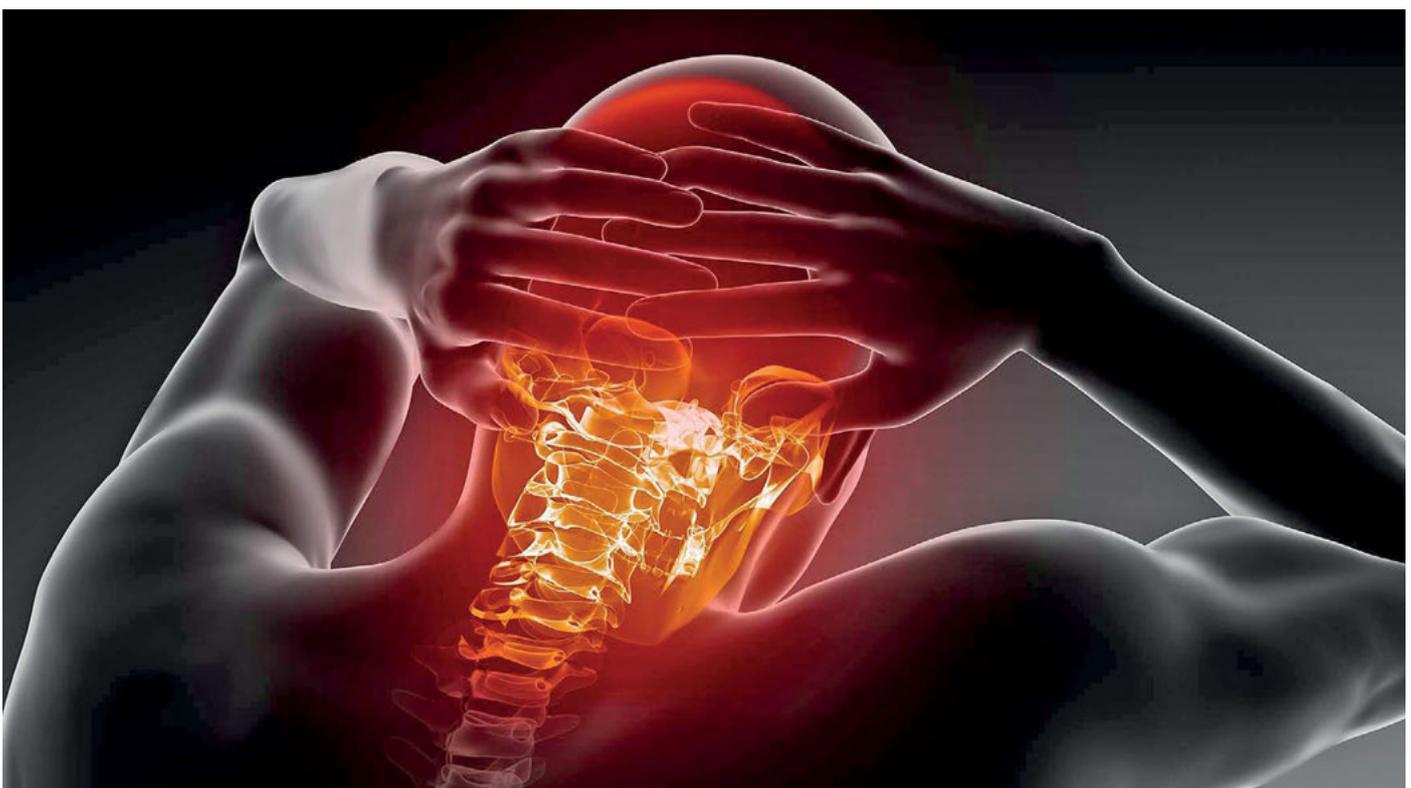
The innovative **K-Laser Dynamic Therapy** has also achieved remarkable results in **Traumatology and Sports Medicine**.

Treatment is quick with high application comfort. **This is why K-Laser Dynamic Therapy** can be used to treat all pathological conditions that affect sportspeople thanks to the biostimulation of damaged tissues and pain reduction.



Treated Pathologies:

- Outcomes after bone Fracture
- Outcomes after Trauma
- Ligament injuries
- Tendon Luxation
- Tendon Inflammatory Pathologies



K-LASER

IN FOOT PATHOLOGIES



K-LASER THERAPY SUCCESS

K-Laser relies on the super-pulse technology called “**Intense Super Pulse**” (ISP). This technology has immediate effects on tissue healing as it reaches deeper layers and reduces skin heating, thus immediately relieving pain.

A list of foot pathologies treated with laser therapy is shown here. Treatment used the **therapeutic zoom hand-piece, ORL hand-piece and high-energy optics**.

Right after the first session, the patient can notice remarkable improvements in terms of pain relief. This is why **K-Laser** exploits non-invasive treatments.

Metatarsalgia
Hallux valgus-bursitis
Plantar Fasciitis
Tarsal tunnel syndrome
Arthritis-Osteoarthritis
Interdigital neuritis
Heel spur
Achilles tendonitis
Morton’s neuroma
Post-sprain Edema
Diabetic neuropathy
Tibia-tarsal Distortion
Diabetic ulcer
Warts
Mycosis

K-LASER

TESTING AND RESEARCH IN FOOT PATHOLOGIES

Thanks to the active cooperation with “**La Claudiana**”, school of health of Bolzano, **K-Laser** offers its resources to support technological advancement, thus helping research and develop new protocols in foot pathologies.



EXPERIMENTATION AND RESEARCH IN FOOT PATHOLOGIES



CLINICAL CASES TREATED WITH **K-LASER** DYNAMIC THERAPY



Ⓐ plantar warts

To treat warts, **K-Laser** offers a non-invasive treatment consisting of single therapeutic sessions.

Ⓐ onychomycosis

NAIL INFECTION

Mycoses can be limited to the outermost portion of nails or can affect proximal and distal sections.

If left untreated, mycoses can cause onycholysis and nail dystrophy. They can also affect the foot skin both at plantar and at interdigital level, with conditions such as **INTERDIGITAL TINEA PEDIS**, usually known as **ATHLETE'S FOOT**.

Thanks to the advanced **K-Laser Cube** therapy, which consists of a number of hand-pieces, treatment is divided into several stages: from ORL hand-piece therapy to high-energy hand-piece one.

K-Laser pulsed therapy initially guarantees a reduction of the inflammation and, afterwards, the eradication of the fungus infection with complete disinfection of the treated area.





Ⓐ **diabetic ulcer**

Diabetic ulcer affects cutaneous and subcutaneous tissues and is not likely to heal spontaneously. It is among the most difficult foot conditions to treat with non-invasive procedures, with minimum pain and without careful angiologic and istopathologic assessment. **K-Laser** therapy boosts tissue biostimulation, thus helping damaged tissues to heal.

Ⓐ **malleolus venous ulcer**

Venous ulcers are usually more superficial and tend to be localised around the inner malleolus. Oedema is frequently present: **K-Laser** therapy allows obtaining significant results in terms of vascularisation and damaged tissue healing.

K-LASER

**TESTING AND RESEARCH
NEUROPATHIC DIABETIC FOOT**

Thanks to the partnership with the **Italian Institute of Podology** and to the **Italian Association of Podologists**, **K-Laser** allows developing clinical protocols regarding Testing and Research in the field of '**Neuropatic Diabetic Foot**'.





K-LASER CUBE

EXTEND PLUS THERAPY ON EXTENDED AREAS

K-Laser last generation has conceived the “**K-Laser Cube Extend**” new technology, which can be combined with **K-Laser** therapy in order to treat extended areas more easily while obtaining better results than the ones achieved with a laser scanner.

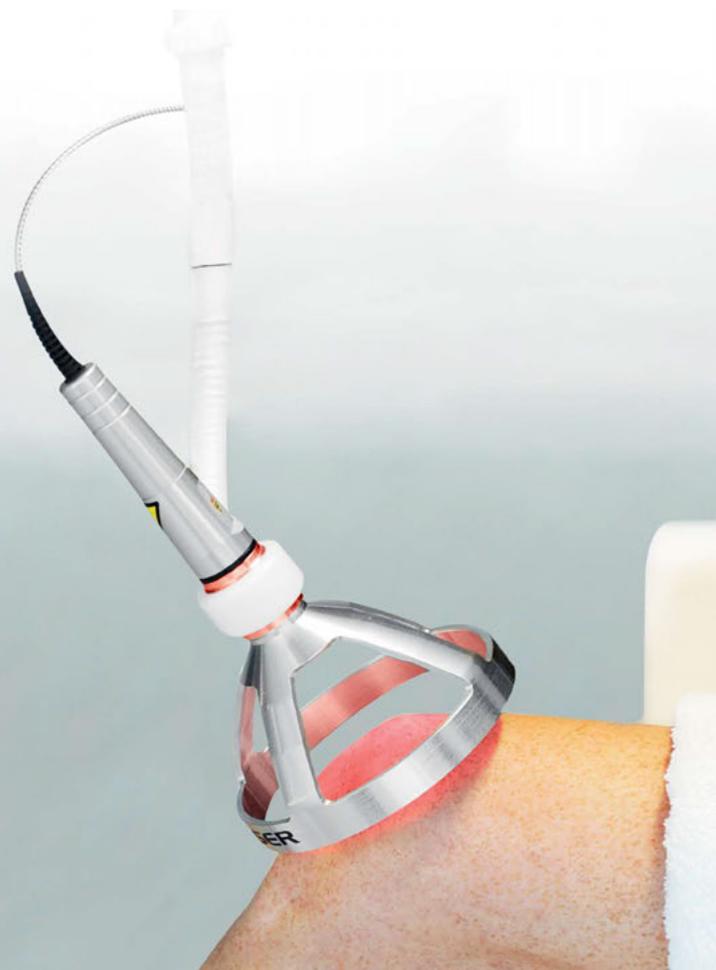
K-Laser Cube Extend Plus is equipped with an articulated swivel arm and with a removable head with housing for the laser beam.

Thanks to its wider emission cone, it can treat larger areas.

K-Laser Cube Extend Plus, with a 100 mm diameter, has a unique and exclusive design: it is ergonomic and easy to position; it is equipped with special optics that deliver energy uniformly on the whole area to be treated.

K-Laser Cube Extend Plus exploits all wavelengths available. Thanks to the wide range of treatments, it can also be used on serious wounds as well as to treat larger areas.

K-Laser Cube Extend Plus is available for all **K-Laser Cube** models.



K-LASER QRT TECHNOLOGY

QUICK RELEASE TECHNOLOGY (QRT)

HANDPIECE WITH INTERCHANGEABLE OPTICS

This technology springs from the need to perform Dynamic Therapies on different application fields: from Physiotherapy to dermal-foot therapy, from Stomatology to Oral Pathology.



◀ Variable zoom from 1 to 5 cm²

Optional Tips:

K-Laser dynamic principle includes **two optional optics** that can be used according to the physician's needs.

▶ High Energy Optics

▶ ENT Fiber



K-Laser Zoom Plus:

A more performing and uniform therapy thanks to **K-Laser Zoom Plus**.



K-Laser Optics Plus: 12 cm²



With **K-Laser Optics plus** treating extended areas is easier.

IN DETAIL

CUBE SOFTWARE UPDATES

K-Laser technology provides for the periodic update of Cube devices in order to guarantee high-quality performance at all times.

.....

ELECTRONIC THERAPY RECORDS: patients history

The Cube software includes the **Treatment Chronology** of the patients. Patients protocols can also be tailored and exported in various formats through **USB** device.

.....



K-LASER TROLLEY (optional)

Light, transportable and safe, also thanks to the **magnetic plate**, which guarantees the device stability on the trolley.

.....



RECHARGEABLE BATTERY lithium-ion

K-Laser Cube is equipped with **rechargeable battery** with 60 minutes operating time in case of continuous treatments.

.....

REDUCED WEIGHT (about Kg. 1,3)

Thanks to its compactness, **K-Laser** flagship and its transportability, the physiotherapist can **choose where to perform the treatment**. This is why **K-Laser Cube** is an ideal tool in the field of **Sports Medicine, Physiotherapy and Rehabilitation**.



LCD FULL COLOUR GRAPHIC DISPLAY touch screen

Liquid crystal display and high definition full colour graphics make for high visibility even with strong ambient light. The **Touchscreen technology** allows better interaction between **K-Laser Cube** and the user.

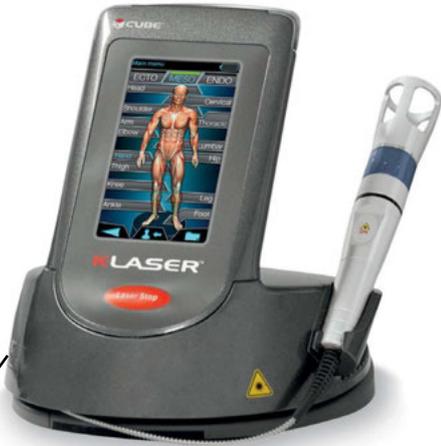


K-LASER CUBE EXTEND & EXTEND PLUS



K-LASER

CUBE



CUBE 2

10W-ISP - 8W-CW
2 wavelengths



CUBE 3

15W-ISP - 12W-CW
3 wavelengths



CUBE 4

20W-ISP - 15W-CW
4 wavelengths

Also available with the
PLUS version



CUBE 4



ON DEMAND

K-LASER HAS CREATED THE BRAND-NEW AND UNIQUE SERVICE:
K-LASER ON DEMAND.



Thanks to its advanced technology, **K-Laser** makes it possible to exploit its therapies through wireless connection.

The Physician can thus access the top range of **K-Laser Cube 4**, provided with four wave lengths and 20W, since it can only invest in performed treatments.

The **ON DEMAND** formula has been designed to contrast the economic crisis: thus, **K-Laser** is the equipment that everybody can afford.

Together with the opening of a **K-Laser specialised centre**, the “on demand” option offers the chance to approach and get to know one of the most widespread therapies in medicine, physiotherapy and podology.



For further information, visit
our website www.klaser.eu
or scan this code to
discover K-Laser technology



K-Laser CUBE Engl. Rev. 4
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**ELTECH
KLASER**

ELTECH K-LASER S.r.l.
Strada Castagnole, 20/H
31100 TREVISO - ITALY
Tel. +39 0422 210 430
Fax +39 0422 297 137
com@klaser.it
www.klaser.eu

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