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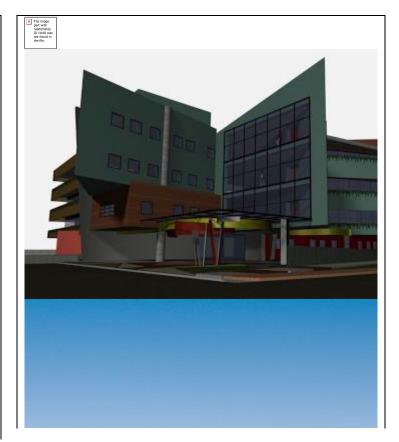


Luigi Cristiano: <u>Infrared rays (IRs) and IRs-based devices: uses in</u> physiotherapy, sports medicine, and physical rehabilitation

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Abstract: Infrared rays (IRs), classified into NIR, MIR and FIR rays, are increasingly used both in medicine, especially in non-invasive aesthetic medicine, and beauty salons, slimming centers and gyms. They are also used in physiotherapy, physio-aesthetic, physical rehabilitation, and sports medicine for enhancing athletic performance and muscle recovery after both the sports activity and as a result of pathologies, traumas, or accidents of various types. IRs are well absorbed by living organisms and are perceived as heat and, although their mechanisms of action are still not-well clear, they develop endogenous heat (i.e. it originates within living tissues) and show many interesting heat-related effects and non-heat-related effects on the human tissues included skeletal muscles, tendons, and ligaments. IRs have shown a positive effect on general disorders of the locomotor system and concur to the improvement of skeletal muscle performance, decrease exercise-induced oxidative stress, delay of muscle fatigue, reduce pain (also chronic pain) and inflammatory responses of muscles, protect against muscle injuries and stimulate general psychophysical well-being.

Infrared-based devices are frequently used as a non-invasive complementary tool and passive modality of enhancing performance or recovery both in sports pre-exercise and after athletic postworkout sessions but also for the neuromuscular recovery in physiotherapy and physical rehabilitation. These devices can be used for whole-body treatments or on single area applications and they include infrared thermal blankets, infrared lipo laser paddles (soft-laser), infrared heat lamps, infrared bands, infrared saunas, infrared pens, far infrared-emitting ceramic or stone beads and far infrared-emitting apparel (technical sportswear).



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