

Infra-red radiation - Types and Effects

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Infra-Red Radiation: The infrared rays are electromagnetic waves with the wavelengths of 750 to 400000 nm and frequency 4×10^{14} Hz and 7.5×10^{11} Hz. It lies beyond boundary of visible light.

Any hot body can produce infrared rays like the sun, electric bulb, coal fire, gas fire, etc.

Physiotherapy departments infrared rays are produced by two types of generators: Nonluminous generators, Luminous generators.

Types:

IR-A, with wavelengths of 770 to 1400 nm;

IR-B, with wavelengths of 1400 to 3000 nm;

IR-C, with wavelengths of 3000 to 10^6 nm.

Effects:

Physiological effects

Infrared treatment produces heating effect in the superficial epidermis and dermis, leads to vasodilatation which increases blood circulation in that area.

The sedative effects on nerve endings lead to reduction in the muscle spasm.

Therapeutic Effects

Pain: Infrared radiations are effective in relieving pain. Mild heating on the superficial tissues by infrared radiations causes sedative effects on the superficial sensory nerve endings. Pain may be due to accumulation of waste products of metabolism, an increased flow of blood through the part removes these substances and thus relieves the pain.

The pain due to acute inflammation or recent injury is relieved most effectively by mild heating. When pain is due to chronic injury or inflammation, stronger heating is required. The treatment may last up to 30 minutes.

Muscle relaxation: Relaxation of muscles is achieved by heating the tissues. Mild heating by infrared causes relaxation of muscles and thus relieves spasm. Relief of pain also induces relaxation in muscles and helps relieving muscle spasm associated with injury or inflammation. Relaxation of muscles provides greater range of motion to the exercising part as it relieves muscular spasm.

Blood supply: Infrared radiations increase the temperature in the superficial tissues, causing vasodilatation in the superficial tissues. It provides more white blood cells and fresh nutrients to the area being treated. It also accelerates removal of waste products and helps bring about resolution of inflammation.

Cases of post immobilization stiffness, open wound and infections can also be effectively treated. Fresh supply of blood rejuvenates the tissues, removes waste products of metabolism and also relieves muscular spasm.