

Intense Pulsed Light Therapy for Skin Rejuvenation



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KEYWORDS

- Intense pulsed light (IPL) • Vascular lesion treatment • Pigment treatment • Laser hair removal
- Skin rejuvenation

KEY POINTS

- Intense pulsed light devices are very versatile systems.
- Intense pulsed light devices are often the first devices recommended to purchase.
- Vascular lesion treatment may be performed with intense pulsed light.
- Unwanted pigment may be removed with intense pulsed light devices.
- Hair removal with intense pulsed light works well in light-skinned patients with dark hair.

INTRODUCTION

Data from the American Society for Aesthetic Plastic Surgery in 2014 shows that intense pulsed light (IPL) is the seventh most popular procedure among plastic surgeons and other core specialists (**Box 1**) making this a very common office procedure. IPL devices are not lasers but rather contain a powerful flashlamp that produces noncoherent, polychromatic light that can be tuned to provide a variety of wavelengths, fluences, and pulse durations. This light acts like a laser in causing selective photothermolysis and treatment of vascular and pigmented lesions, photo damage, acne, and unwanted hair. IPL technology delivers noncoherent light from about 420 nm to the midinfrared spectrum (**Fig. 1**). This light is tuned through cutoff filters or separate handpieces that allow light only above a certain wavelength to be emitted. This spectral adjustment is used to tailor the light to skin type and absorbing chromophore. The filter cuts off the emitted light, so that only wavelengths longer than the used filter value pass to the treated area. For example, a 560-nm

filter, allowing emitted wavelengths longer than 560 nm, is used to treat vascular lesions (corresponding to a vascular absorption peak at 585–595 nm) or pigment in darker-skinned individuals, whereas a 515-nm filter allowing wavelengths longer than 515 nm might be used to treat pigment in lighter-skinned people. Some manufacturers have different handpieces with different cutoff filters, whereas others provided one handpiece with interchangeable filters.

Other adjustments include the fluence or energy delivered, the pulse duration, and in some systems a cooling system to protect the skin. Newer systems are significantly improved from earlier systems. The devices calibrate each use and prevent changes with bulb degradation. It was not unusual for older systems to have limited handpiece life, but technological advances have significantly improved bulb life. Current systems are much faster than their predecessors.

The light is usually applied to the skin through a rectangular light guide or crystal. These large rectangular treatment crystals allow treatment of large areas. Step-down adapters for smaller areas are

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Box 1**American Society for Aesthetic Plastic Surgery's top 10 procedures for 2014**

1. Botox
2. Filler: hyaluronic acid
3. Laser hair removal
4. Chemical peel
5. Microdermabrasion
6. Laser resurfacing
7. IPL
8. Nonsurgical tightening
9. Liposuction
10. Sclerotherapy

often used. Gel is usually applied to the skin as an optical and thermal coupler.

IPL devices are effective in the treatment of a variety of vascular conditions, including facial telangiectasia, poikiloderma of Civatte, superficial hemangiomas, and port wine stains.^{1,2} Photodamage including unwanted pigments is a typical use

for these devices both on and off the face.^{3,4} Skin rejuvenation is a very common treatment with improvement in texture, fine lines, and wrinkles along with vascular and pigment eradication.⁵⁻⁹ Hair removal is a very common utilization, although limited to lighter-skinned patients with dark hair because of inadvertent melanin absorption in darker-skinned patients.

IPL systems are similar to lasers in that their use is also based on the principle of selective photothermolysis. The disadvantage relates to the lack of selectivity, possibly leading to inadvertent epidermal melanin absorption and burns.

An IPL device often makes the most sense for an initial device purchase in a plastic surgical practice because of the wide variety of clinical conditions, which may be treated with this device. There are several manufacturers that make excellent IPL devices. As previously mentioned, newer devices have significant advantages over older systems.

PATIENT SELECTION

Patient selection for IPL treatments is critical to successful treatment and is more important than the device and settings used. Patient variables to

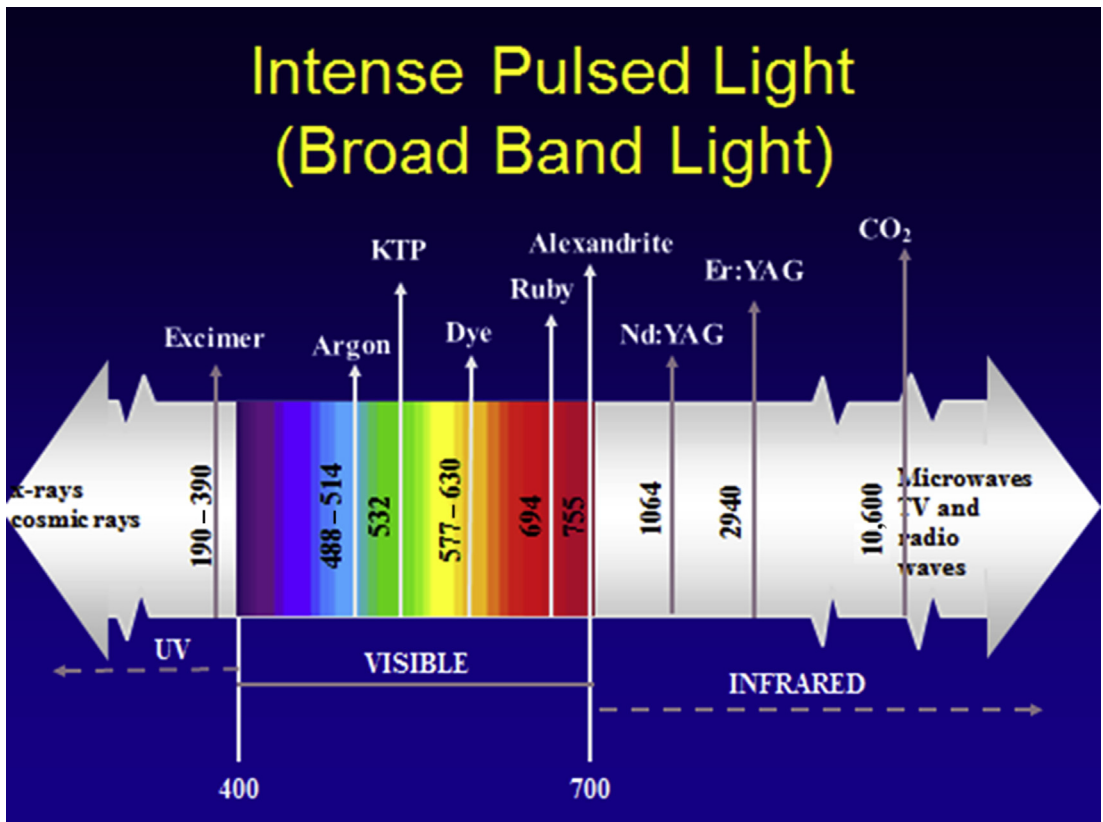


Fig. 1. IPL spectrum. CO₂, carbon dioxide; Er:YAG, erbium:YAG.

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