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Laser Hair Removal: A Review

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BACKGROUND Unwanted hair growth is a common aesthetic problem. Laser hair removal has emerged as a leading treatment option for long-term depilation.

OBJECTIVES To extensively review the literature on laser hair removal pertaining to its theoretical basis, current laser and light-based devices, and their complications. Special treatment recommendations for darker skin types were considered.

MATERIALS AND METHODS A comprehensive literature search related to the long-pulse alexandrite (755 nm), long-pulse diode (810 nm), long-pulse neodymium-doped yttrium aluminum garnet (Nd:YAG; 1,064 nm), and intense pulsed light (IPL) system, as well as newer home-use devices, was conducted.

RESULTS The literature supports the use of the alexandrite, diode, Nd:YAG and IPL devices for long-term hair removal. Because of its longer wavelength, the Nd:YAG is the best laser system to use for pigmented skin. Further research is needed regarding the safety and efficacy of home-use devices.

CONCLUSION Current in-office laser hair removal devices effectively provide a durable solution for unwanted hair removal.

The authors have indicated no significant interest with commercial supporters.

Unwanted hair is a common aesthetic problem in many cultures. Hirsutism, excess hair growth in androgen-dependent areas, and hypertrichosis, greater hair density at any body site, may affect psychologic health by causing depression and anxiety. Hair removal through shaving, waxing, plucking, chemical depilatories, and electrolysis can improve one's quality of life,¹ but many of these techniques provide temporary solutions to unwanted hair. Although electrolysis may permanently remove hair, it is a slow and operator-dependent procedure with variable efficacy.^{2,3}

Laser treatment has emerged as the criterion standard in hair depilation. It provides a longer-lasting hair-free period than other methods. In 1996, the 694-nm ruby laser was the first laser device formally studied for hair removal.⁴ Long treatment times,

lasting from a few minutes for the face to several hours for the back, limited its practical use. Shortly thereafter, the quality-switched neodymium-doped yttrium aluminium garnet (Nd:YAG) laser in combination with a carbon-based topical suspension became the first laser hair removal treatment that the Food and Drug Administration (FDA) approved. Upon laser-induced heating, the carbon particles served to selectively damage the hair follicles in contact.⁵ Hair regrowth was delayed by up to 3 months but not permanently.⁶ Today's laser devices provide longer-lasting results due to targeted destruction of the germinative cells in hair follicle bulge.

Anderson and Parrish's principle of selective photothermolysis explains the mechanism behind such light-based therapies.⁷ Lasers emit light onto the

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