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Laser Tattoo Removal: A Review

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BACKGROUND Tattoos have played an important role in human culture for thousands of years, and they remain popular today. The development of quality-switched (QS) lasers has revolutionized the removal of unwanted tattoos.

OBJECTIVES To thoroughly review the literature on laser tattoo removal pertaining to its history, its theoretical basis, the various devices used, potential adverse effects, and future developments.

MATERIAL AND METHODS An extensive literature review of publications related to tattoo removal was conducted.

RESULTS Reports exist demonstrating the efficacy of laser removal of different tattoo types, including professional, amateur, traumatic, cosmetic, and medical. The literature supports the use of different QS lasers for removal of tattoos. Some colors have a more-complete response using particular wavelengths.

CONCLUSION QS lasers can effectively and safely remove different types of unwanted tattoos.

The authors have indicated no significant interest with commercial supporters.

Humanity's fascination with body art has been with us for millennia. Many examples of tattooing in ancient cultures have been found, the oldest of which dates back to the Bronze Age. In 1991, a 5,300-year-old natural mummy was found in the Ötztal Alps near the border of Austria and Italy. Ötzi the Iceman, as he came to be known, the oldest mummy ever recovered, was found to have 57 tattoos adorning his well-preserved body. Over time, these markings have served to enhance beauty, provide healing, declare belonging, and even shame and punish. Tattoos, or "stigmata" as they were called in ancient Greek and Roman times, functioned to identify criminals and slaves or those belonging to particular religious sects.¹ It is certain that the desire to be rid of such unwanted tattoos prompted early attempts at removal. The earliest documentation of this was by

the Greek physician Aetius, who described a technique incorporating the application of salt and abrasion of the skin.²

For thousands of years, tattooing was a slow and painstaking process in which each puncture of the skin was performed by hand. Then, in the late 1800s, the invention of the electric tattooing machine revolutionized the art form.² Tattoos became accessible and affordable for the average person, and today it is estimated that in the United States up to one-quarter of young to middle-aged adults sport at least one.^{3,4} Although most are pleased with the appearance of their tattoos, patient surveys have shown that these decorative markings are sometimes obtained impulsively, before the age of 18 or while under the influence of alcohol or recreational drugs.³ It is therefore not

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