

# Trunk hair removal treatment with diode laser 810 nm in men population

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## Abstract

In the last years, hair removal has been one of the most common treatments performed for aesthetic purposes, especially in women. Nevertheless, even if it is less popular, the demand within men population has risen. The study aimed to assess the acceptability of the diode 810 nm treatment for hair removal on the back and chest area in men thanks to the speed of treatment and the absence of undesirable effects. For this study, 20 patients were treated for hair removal. They were men with a mean age of 30.5 ( $\pm 7.3$ ). They underwent 4 treatment sessions at 40-day intervals on

the trunk (chest and back area). Patients ranged between a Fitzpatrick phototype I (20%, 4/20) to IV (15%, 3/20) (40% were type II and 25% type III). Moreover, patients were asked to report pain intensity sensation with a visual analogue scale. Overall, in the study population, a hair reduction of 80.6% ( $\pm 2.8$ ) was registered in the treated areas. The device described in this study was demonstrated to be highly efficient in extended body areas and on difficult-to-treat hair follicles like on the back and chest in the men population.

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## Introduction

In the last years, hair removal has been one of the most common treatments performed for aesthetic purposes, especially in women. Indeed, most of the research studies in the literature concern female patients. Nevertheless, even if it is less popular, the demand within men population has risen to adapt to the change in aesthetic and social trends, starting to involve different and even more extended body areas during the treatments. One of the most popular non-surgical aesthetic procedures is laser hair removal (LHR).<sup>1</sup> The effectiveness and safety of LHR technology have been well studied and are widely recognized.<sup>2,3</sup> The technical basis of LHR is supported by the fundamental theory known as “selective photothermolysis”, which is defined as laser damage that is limited to a specific tissue by a specific laser parameter.

In general, LHR functions within milliseconds by inflicting photothermal death to follicular stem cells on the hair follicle by targeting the melanin of the hair shaft and matrix with laser/light pulses in the 600-1100 nm wavelength range.<sup>4</sup> Indeed, thermal damage affects the surrounding stem cells in the hair bulge and stops further hair growth as the melanin absorbs light within wavelengths of 600 to 1100 nm and transforms it to heat locally.<sup>5</sup> Although several lasers have all the technical characteristics to be selective and effective on follicular destruction, the treatment of some patients is still problematic for example dark phototypes or when wide areas with thick hair are to be treated.<sup>6,7</sup> Laser system wavelengths for hair removal range from 694 nm (ruby laser) to 755 nm (Alexandrite laser), to 800-810 nm (diode laser), and to 1064 nm (Nd: YAG laser) offering several levels of absorption and variability in the depth of penetration.<sup>8,9</sup>

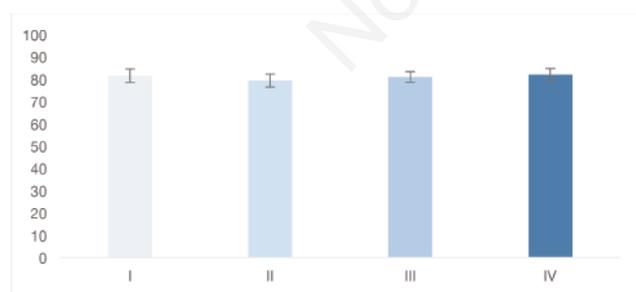
Recent research studies have also included male subjects evaluating body regions such as the pubic, axillary, and extremities. Only Ross *et al.* (2018) additionally treated the chest region but without a particular focus on this area. For these reasons, with this research, we emphasized the treatment of extended areas with respect to those more frequently involved (armpits/pubis/extremities) especially because these body areas are of great interest to the male population only. Indeed, the study aimed to assess the acceptability of the diode 810 nm treatment for hair removal on the back and chest area in men thanks to the speed of treatment and the absence of undesirable effects.

## Case Report

The Subject Device (Vivid, Luxea, Deka M.E.L.A., Calenzano, Italy) is equipped with a diode laser handpiece with a wavelength emission of 810nm. Due to its high melanin absorption, it is an efficient laser for hair removal. Two different techniques (stationary and motion) can be developed for hair removal treatment from any part of the human body including extended areas such as the chest, back, abdomen, and thighs: stationary (single pass) traditional hair removal technique with a fluence of 20-35 J/cm<sup>2</sup>; motion technique that uses a minimal energy emission (6-10 J/cm<sup>2</sup>) to reduce the pain sensation. In this second technique, the user must continuously move the handpiece in a slow linear/circular motion, creating an area of 10'15 cm (150 cm<sup>2</sup>) and executing multi back-and-forth passes up to a defined accumulated energy (7000-10000 J). In both cases, the clinical endpoint will be perifollicular erythema: medium reddening around the hair follicle, sometimes with a slight smell of burnt hair, associated with a slight heat sensation that should disappear within a few minutes. The motion technique allows to induce a progressive increase of the target temperature, monitoring the cutaneous reactions and being able to interrupt or modify the treatment at any time, thus minimizing the side effects typical of the traditional method.

The use of a thin layer of aqueous and transparent gel between the skin and the handpiece was used.

For this study, 20 patients were treated for hair removal. They were men with a mean age of 30.5 ( $\pm$ 7.3). They underwent 4 treatment sessions at 40-day intervals on the trunk (chest and back area). The first three treatments were performed with the moving technique to quickly cover large areas. The fourth treatment, on the other hand, was performed with a stamping technique to treat more specifically the last remaining hair. An integrated skin cooling system (15°C) was necessary to reduce any possible side effects. Patients were ranged between a Fitzpatrick phototype I (20%, 4/20) to IV (15%, 3/20) (40% were type II and 25% type III) (Figure 1). Moreover, patients were asked to report pain intensity sensation with a visual analogue scale. The scores ranged from 0 (no pain) to 9 (very painful, not bearable). In general, the



**Figure 1.** Graphical representation of general hair reduction (%) in patients with different Fitzpatrick phototypes (I-IV).

treatment was well tolerated with a mean value of 4.1 ( $\pm$ 0.8). For the study duration, treatment side effects such as erythema and perifollicular edema, the sensation of heat, and pain in the treatment area were monitored. Just a slight redness was observed for 24 hours after the treatment session but no mild to serious side effect was registered. Overall, in the study population, a hair reduction of 80.6% ( $\pm$ 2.8) was registered in the treated areas.

## Discussion

In summary, with this research, we obtained further evidence of the efficacy of the diode 810nm laser for hair removal treatment. In this regard, there were no previous studies concerning men population exclusively. Thanks to the specific characteristics of the handpiece such as the motion mode, it was possible to perform a well-tolerated treatment, pain-free and with no side effects.

## Conclusions

The device described in this study was demonstrated to be highly efficient in extended body areas and on difficult-to-treat hair follicles like on the back and chest in the men population.

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