

**ORIGINAL CONTRIBUTION**

One-year follow-up results of hair removal using an 810 nm diode laser

David J. Goldberg MD^{1,2}¹Skin Laser & Surgery Specialists of NY and NJ, Hackensack, New Jersey²Icahn School of Medicine at Mount Sinai, New York, New York**Correspondence**David J. Goldberg, Skin Laser & Surgery Specialists of NY and NJ, Hackensack, NJ.
Email: drdavidgoldberg@skinandlasers.com**Funding information**

In Mode Ltd

Summary**Introduction:** Laser hair removal is a common light-based aesthetic procedure. Diode lasers and specifically the long-pulse diode laser 810 nm are the most popular preference for hair removal due to the deep penetration and targeting of the hair follicle. In a recently published article, we presented our hair removal clinical evaluation results using an 810 nm scanning diode laser. Three- and six-month follow-up hair counts demonstrated an average hair reduction of about 70%.**Objective:** In the current article, we demonstrate long-term follow-up hair removal results of 1 year after last treatment.**Methods:** Among 11 out of 14 female patients who received three axillary hair removal treatments, 4-6 weeks apart, returned to the 1-year follow-up visit. Treatment area photographs and hair count of 1-year follow-up visit were compared to baseline.**Results:** The average hair count reduction of about 70% at 1 year after the last treatment was maintained.**Conclusions:** The examined 810 nm diode laser has been proven to be a safe and effective for hair removal. Results sustain not only for 3 or 6 months but also for 1 year after last treatment.**KEYWORDS**

diode laser, hair removal, long-term follow-up

1 | INTRODUCTION

Light-based hair removal is a leading treatment option for long-term hair removal results. The most popular hair removal lasers include long-pulse alexandrite (755 nm), long-pulse diode (810 nm), long-pulse neodymium-doped yttrium aluminum garnet (Nd:YAG; 1064 nm), each has its own specifications and advantages that makes it more suitable for specific skin and hair conditions.¹ The 810 nm long-pulse diode lasers present a good efficacy and safety profile and are commonly used for photoepilation.

A wide variety of studies were conducted and published over the last twenty years, evaluating long-pulse 810 nm diode lasers showing long-term hair removal results with minimal transient side effects. More recent articles focused on studies comparing

adjustable treatment parameters such as fluence, repetition rate, number of passes, movement modes or spot size in order to optimize results and reduce treatment discomfort²⁻⁵ as well as different skin conditions.⁶

In a recently published study, we presented our clinical results in axillary hair removal of 14 patients (28 treatment sites), using 810 nm diode laser (Diolaze, InMode MD Ltd., Lake Forest, CA, USA).⁷ Short- and medium-term follow-up results (3 and 6 months after last treatment) were assessed in comparison with baseline and demonstrated hair reduction by photographs and hair counts.

The objective of the current publication is to demonstrate long-term follow-up results of 1 year post last treatment, of 11 out of the 14 patients who participated in the previous study.

2 | METHODS

As specified in the previous article,⁷ 14 adult female patients, 18–70 years of age and Fitzpatrick skin types I–IV with brown/black terminal hair in the axillae underwent three axillary hair removal treatments, 4–6 weeks apart, with the Diolaze 810 nm diode laser. Treatment parameters were 810 nm, fluences of 30–40 J/cm², 30 ms pulse duration with an 8 mm × 50 mm scanning handpiece and contact cooling. Treatment efficacy was evaluated at 3 and 6 months post last treatment using treatment area photographs and manual hair counts which were conducted on a 2 cm² area, in a reproducible manner. Results of 3- and 6-month follow-up hair counts demonstrated an average of ~70% hair reduction with no significant or unexpected adverse events.

Patients were invited for a 12-month follow-up visit and 11 out of 14 attended this long-term follow-up. Photographs and hair counts of the 22 axillary areas using the same reproducible method as in previous follow-up visits were conducted and compared to baseline.

2.1 | Statistics

Statistical analysis of hair count differences was performed, comparing results before treatment to those at 12 months post last treatment. Paired t-test was used and level of significance was calculated (*P* values). When *p* values <0.05, the average difference between the hair counts in baseline and follow-up visit are regarded statistically significant.

3 | RESULTS

The previously published results demonstrated high safety profile of the Diolaze laser. No burn, localized infection, skin pigmentation and textural alterations were recorded. No unexpected or significant adverse events were recorded in any of the follow-up time points, 3, 6, and 12 months post last treatment.

Eleven subjects completed all study visits, including 12-month follow-up. Table 1 and Figure 1 demonstrate hair counts of 22 treatment areas (left and right axillae of 11 patients who completed the study) at baseline and at follow-up visit 12 months post last treatment. Average hair count was 61.4 hairs at baseline and 15 hairs at 12-month follow-up visit. This statistically significant difference (*P* values < 0.05) indicates an average hair count reduction of 72.9% at 12 months after the last treatment.

Figures 2 and 3 demonstrate sample photographs of left and right axillae of two selected patients at baseline and 12 months post last treatment.

4 | DISCUSSION

Laser hair removal is a widespread technology in the medical aesthetic market; therefore, clinical studies demonstrating safety and efficacy of such lasers are common in the scientific literature.

TABLE 1 Hair counts (22 Axillae) and % reduction at 12-mo follow-up visit

Baseline Hair count	12 Mo FU Hair count	% Reduction
61	42	31.15
76	38	50
82	18	78.0
90	20	77.8
30	10	66.7
28	13	53.6
63	23	63.5
60	40	33.3
72	0	100
80	0	100
58	40	31.0
50	24	52
100	0	100
90	0	100
60	0	100
75	0	100
60	18	70
65	14	78.5
34	11	67.6
22	5	77.3
35	5	85.7
60	8	86.7
Average: 61.4	Average: 15.0	Average: 72.9
SD: 21.0	SD: 14.0	SD: 22.8
	<i>P</i> -value: 5E-08	

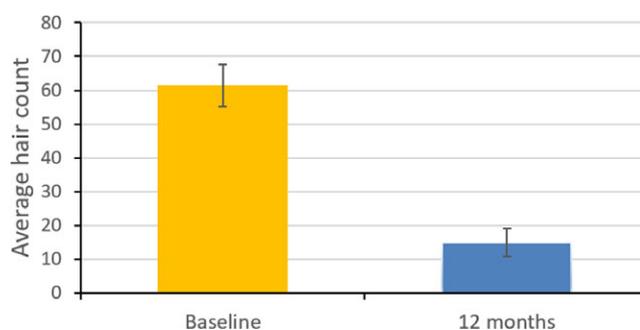


FIGURE 1 Graphic representation of average hair counts at baseline and at follow-up visit 12 mo post last treatment. *Error bars represent standard errors (SE)

Initial studies demonstrated that hair regrowth was delayed by short periods of up to 3 months. Today's laser devices provide longer-lasting results due to targeted destruction of the germinative cells in hair follicle bulge.¹

There are still up to date studies that present results after short periods of 3 months^{3,5} or 6 months⁴ such as studies intended to

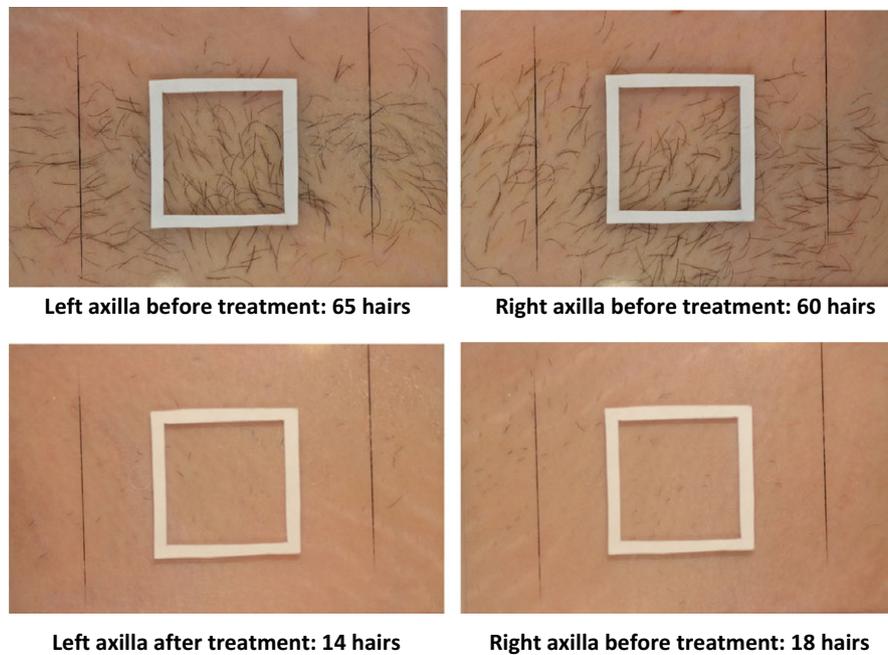


FIGURE 2 A patient example of treated left axilla (Left) and right axilla (Right) Before (Upper photographs) and 12 mo after last treatment (Lower photographs)



FIGURE 3 Another patient example of treated left axilla (Left) and right axilla (Right) Before (Upper photographs) and 12 mo after last treatment (Lower photographs)

compare different treatment conditions and treatment parameters. However, hair removal evidence which includes long-term follow-up period of 12 months^{2,6} is considered more convincing as it indicates long-term results sustainability. Investigators emphasize findings demonstrating that midterm results were maintained at long term, reinforcing study results.²

The currently presented data of long-term follow-up over 12 months indicate that the Diolaze hair removal results are maintained not only for short- or midterm periods (3 and 6 months post last treatment, respectively) but also for long term. These statistically significant findings further establish the long-term safety and efficacy of the Diolaze hair removal treatment.

Current literature states that diode lasers provide a hair count reduction in the range of 25%-91%.² Our results are well within this reported range. The 6-month reduction was well maintained for 12 months.

CONFLICT OF INTEREST

InMode MD Ltd., the manufacturer, has provided the device and funds for the study. Erin Courtney has no conflicts. Dr Goldberg is a consultant and speaker for InMode MD Ltd. Dr Goldberg reports no declaration of interests other than the listed above. The author alone is responsible for the content and writing of the paper.

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