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Case Study: Male Hair Removal with the Alpha System Featuring 3rd Generation POWER-MOTION™ LLD Diode Laser

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Background

Redefining Male Grooming with Advanced Laser Hair Removal

In today's image-driven and wellness-conscious culture, laser hair removal has evolved far beyond a female-only solution. Around the world, an increasing number of men are opting for permanent, hygienic, and low-maintenance solutions for managing body hair. Whether they're urban professionals, athletes, or style-conscious individuals, men are increasingly turning to laser hair removal to target areas such as the chest, back, shoulders, beard line, and intimate areas - motivated by personal comfort, aesthetics, and changing grooming standards. With growing awareness, higher disposable incomes, and a heightened focus on skincare and hygiene, the male demographic is now one of the fastest-growing sectors in the aesthetics industry. Clinics globally are witnessing a surge in male clientele, prompting a demand for advanced technologies engineered explicitly for coarser, denser male hair.

A Market on the Rise

The global laser hair removal market is undergoing rapid expansion. In 2024, the market reached a value of USD 1.13 billion, and by 2032, it is projected to grow to USD 5.36 billion, representing a compound annual growth rate (CAGR) of 18.9%. Similarly, Fortune Business Insights estimates a rise from USD 1.05 billion in 2023 to USD 4.61 billion by 2032, with a compound annual growth rate (CAGR) of 18.1%. As a result, the estimated global market value in 2025 is forecasted to fall between USD 1.6 billion and USD 1.7 billion, driven by the popularity of non-invasive treatments, technological advancements, and an increasing recognition of laser hair removal's long-term benefits.

From Legacy Methods to Next-Gen Innovation

Historically, professional hair removal has been led by two dominant modes of laser delivery: 1st Generation – "Single" Mode (Stamping), introduced in the late 1990s to early 2000s, which uses static, high-energy pulses applied shot by shot. 2nd Generation – "Fast" Mode (In-motion): Emerging in the mid-to-late 2000s, this method enables continuous handpiece movement with reduced fluence, resulting in faster coverage. In 2023, Forma-TK Systems Ltd introduced a transformative solution: the 3rd Generation POWER-MOTION™ Mode, integrated into the Alpha system. Utilizing cutting-edge 808nm LLD diode laser technology, these platforms deliver precise energy, rapid coverage, and exceptional patient comfort.

Challenges of Diode 808nm Laser Hair Removal in Men

Laser hair removal in men presents unique clinical challenges that set it apart from female treatments. Male body areas, particularly the chest, back, and beard area, feature significantly higher hair density and thicker, coarser hair shafts with greater melanin concentration. While this makes them ideal chromophores for the 808nm diode laser, it also leads to increased photothermal absorption, raising the risk of epidermal overheating and discomfort. Moreover, men's hair follicles are typically rooted deeper in the dermis, requiring higher energy penetration and advanced cooling technologies to maintain treatment efficacy and patient safety. Despite the common belief that men tolerate pain better, many report higher sensitivity during laser treatments, particularly in hormonally active areas like the beard or genital region. Long-term results also require more persistence, due to hormonal influences, men often need more sessions and ongoing maintenance to control regrowth. Additional factors such as lower adherence to pre- and post-treatment protocols, larger anatomical treatment areas, and more complex body contours further complicate treatment planning. These factors call for a skilled approach, effective technology, and personalized protocols to deliver safe, lasting results in male laser hair removal.

Science Behind Technology

Successful laser hair removal targets two key structures within the follicle: The stem cells located in the bulge area of the outer root sheath (about 1mm beneath the surface), the dermal papilla, positioned at the follicle's base, and varying in depth by growth phase. The most effective treatment

window is during the anagen (active growth) phase, when melanin in the hair shaft absorbs laser energy. This energy converts to heat and diffuses into the dermal papilla and bulge, leading to permanent follicular damage, a principle known as selective photothermolysis. Thermal imaging studies confirm that the 808nm LLD diode in POWER-MOTION™ mode achieves superior heat distribution, supporting fewer sessions, faster results, and enhanced clinical efficacy.

Precision Meets Performance

The Alpha System, powered by the 3rd Generation POWER-MOTION™ LLD Diode Laser, is designed to meet the evolving demands of both male and female clients. It offers personalized treatments for all skin types, delivering unmatched precision, efficiency, and comfort in every session.

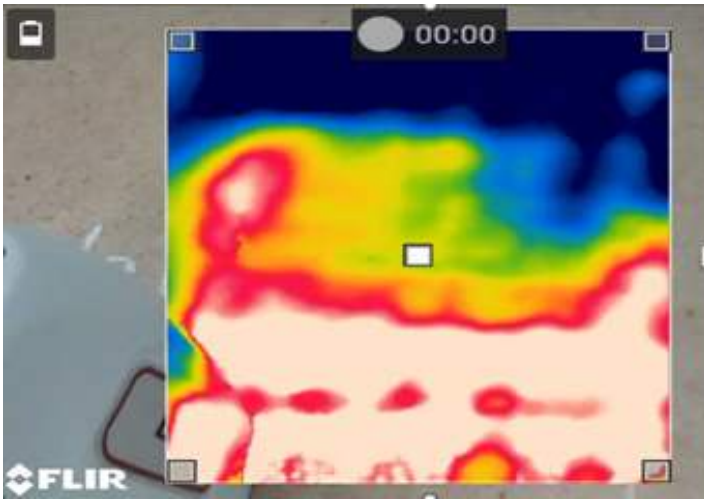


Figure 1 - LLD applicator 3rd generation POWER-MOTION™ hair removal mode 15cmX10cm box thermal photos taken with FLIR N95 camera. Courtesy of Formatk System Ltd.

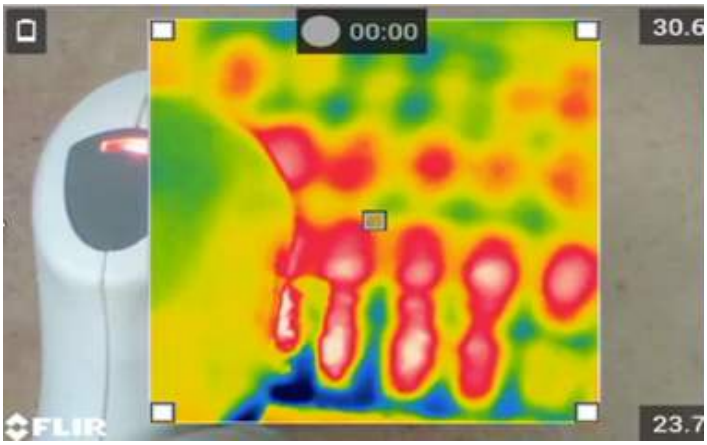


Figure 2 - LLD applicator 1st generation Single-mode ("stamping") hair removal mode 15cmX10cm box thermal photos taken with FLIR N95 camera. Courtesy of Formatk System Ltd.

Aim

This study aimed to evaluate the preliminary safety and clinical effectiveness of male hair removal treatments using the third-generation POWER-MOTION™ 808nm LLD non-invasive diode laser applicator, developed by FormaTK Systems Ltd., following a minimum of five treatment sessions.

Methods

This single-center, prospective observational case study was conducted by Dr. Nadav Pam and Veronika Yehoshua at the Clinical Department of FormaTK Systems Ltd., a medical device manufacturer located at 3 Yozma Street, Tirat Carmel, Israel. The study included four healthy male participants aged 36 to 67 years, all categorized as Fitzpatrick skin types II or III.

Laser hair removal was administered to nine anatomical regions presenting unwanted terminal hair growth using the Alpha System equipped with the LLD (Large Laser Diode) 808 nm applicator. This applicator delivers energy over a 15 mm × 30 mm (4.5 cm^2) treatment area and utilizes third-generation POWER-MOTION mode, enabling continuous and uniform energy application across the skin surface.

Participant eligibility was established through Fitzpatrick skin type classification, with additional verification of epidermal melanin levels conducted via the "Milo" melanin meter to ensure safe and effective energy parameter customization. Each participant underwent a minimum of five treatment sessions per anatomical area, spaced 6 to 8 weeks apart. A follow-up evaluation was conducted one month after the final session.

Before initiating treatment, a diode laser patch test was performed on each subject. The pre-treatment protocol included shaving the target area 24 hours before the session and applying Parker conductive gel immediately before laser exposure. Both patients and operators wore diode-specific protective eyewear throughout each procedure to ensure ocular safety.

Treatment parameters were tailored individually, with fluences ranging from 20 to 22 J/cm^2 and a fixed pulse duration of 40 milliseconds, delivered uniformly using the POWER-MOTION™ mode. Informed written consent was obtained from all participants before initiating any procedures.

Standardized high-resolution digital photographs were taken by trained clinical personnel both before the first session and at the final follow-up. All clinical and photographic data were reviewed and evaluated by Dr. Nadav Pam, Clinical Director at FormaTK Systems Ltd.

Inclusion criteria:

- Healthy adult subjects aged between 18 and 70 have unwanted body hair.
- Fitzpatrick skin types 1-3.
- All participants agree to refrain from exposure to the sun or solarium (solar lamps) during the whole study period.
- All patients will be informed about the study objectives, terms of treatments, eventual benefits, and adverse effects and will express their willingness to participate deliberately in this clinical study.
- All participants signed an appropriate informed consent form.

Exclusion criteria:

- Fitzpatrick skin type 4-6
- Drug-induced photosensitivity (e.g., Isotretinoin, Retin A)
- Pregnancy and breastfeeding
- Cancer
- Epilepsy
- Severe diseases
- Autoimmune diseases
- Frequent episodes of labial Herpes Simplex in the case of the face
- Immunosuppressive pharmacologic therapy
- Any other medical condition considered contraindicated for the treatment by the investigator. Any other hair removal treatments, such as drugs, topical creams/lotions, or other phototherapy medical devices.

Results

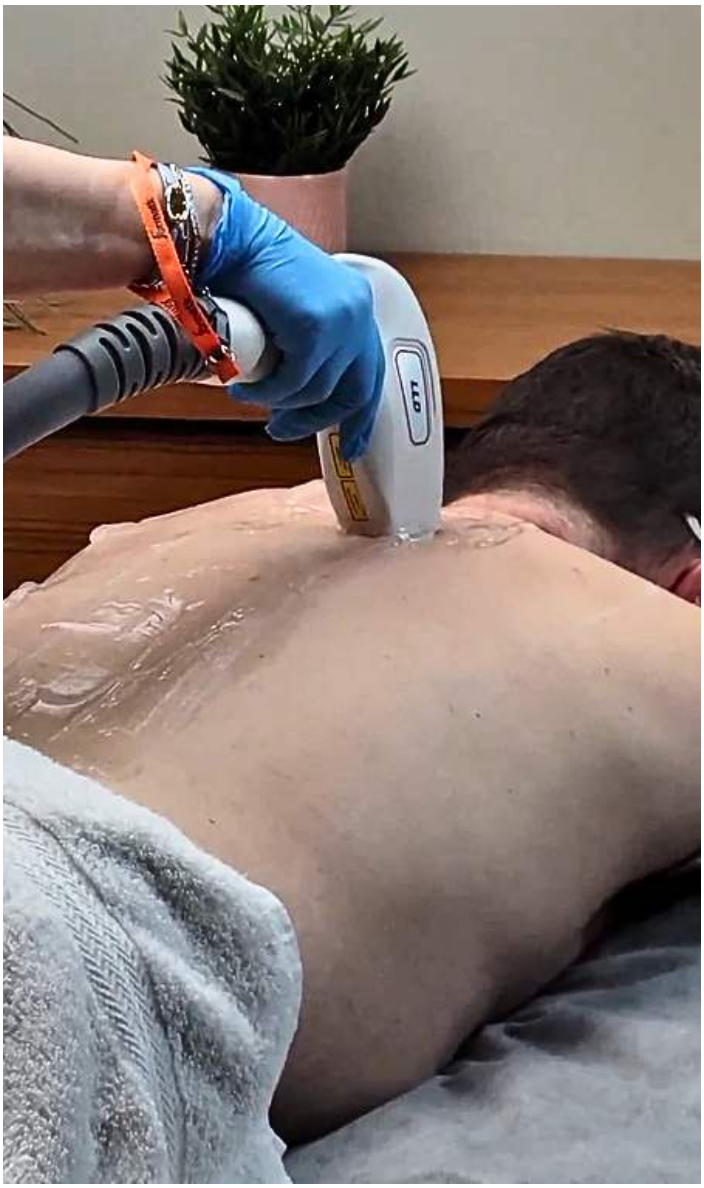
A total of four healthy male subjects were successfully treated for unwanted hair across nine distinct anatomical regions. Participants ranged in age from 36 to 67 years, with a mean age of 46.5 years, and were classified as Fitzpatrick skin types II to III. Each anatomical area received a minimum of five treatment sessions. No adverse events or side effects were reported throughout the study..

Four healthy male participants, aged 36 to 67 years (mean age, 46.5 years), with Fitzpatrick skin types II to III, underwent laser hair removal treatments using the Alpha System, equipped with a third-generation 808 nm diode laser operating in PowerMotion mode.

Treatments were administered across nine distinct anatomical zones, with each site receiving a minimum of five sessions at intervals of 6 to 8 weeks. No adverse events, side effects, or complications were observed throughout the treatment period.

Clinical efficacy was assessed using a standardized 4-point scale for aesthetic improvement. Across the nine treated anatomical regions, the mean improvement rate was 87.3%. Notably, all patients exhibited a hair reduction of greater than 50% by the third session, and no side effects. Treated areas included hormonally responsive zones with high terminal hair density, such as the chest, back, abdomen and axillae.

Patient #	Age	Gender	Skin Type*	Total number of treatments
1	36	Male	2	6
2	67	Male	3	7
3	38	Male	3	6
4	45	Male	2	5



Number Anatomical areass	Patient number according to anatomical site treated	Anatomical Area for removal	Number of treatments per anatomical zone
1	Patient 1	Chest	6
2	Patient 1	Abdomen	6
3	Patient 1	Back	6
4	Patient 1	Right Armpit	6
5	Patient 1	Left Armpit	6
6	Patient 2	Back	7
7	Patient 3	Chest	6
8	Patient 3	Back	6
9	Patient 4	Back	5

Discussion

The outcomes of this prospective observational case series highlight the safety and efficacy of the 808nm diode laser in male patients, particularly in regions characterized by dense, androgen-dependent hair growth and deeper follicular architecture. These anatomical zones, often challenging to treat due to their robust follicular structure and hormonal responsiveness, demonstrated rapid and consistent clinical improvement following a relatively limited number of treatment sessions.

An average improvement rate of 87.3%, with peak responses reaching 94–95% in Patients 3 and 4, illustrates the Alpha System's capacity to deliver uniform clinical outcomes. The use of PowerMotion™ mode likely enhanced energy homogeneity and epidermal safety, supporting a pain-tolerant experience even in patients with thick, melanin-rich hair shafts. Furthermore, the selected treatment intervals of 6 to 8 weeks effectively corresponded with the male anagen hair growth cycle, maximizing laser-target interaction and therapeutic efficiency. The absence of adverse events, including post-inflammatory hyperpigmentation or thermal injury, reaffirms the Alpha System's high safety profile for Fitzpatrick skin types II–III.

Conclusion

This small-scale prospective study demonstrates the Alpha System's PowerMotion-enabled 808nm LLD diode laser as a clinically effective and well-tolerated modality for hair removal in male patients. High improvement scores were achieved across challenging anatomical sites within a short treatment timeline, with no reported side effects.

These findings indicate that the Alpha System is particularly well-suited for treating male hair due to its ability to target deeper follicles, accommodate high hair density, and maintain epidermal safety. Additional research with larger, more diverse cohorts is warranted to confirm long-term efficacy and refine treatment protocols across broader skin types and anatomical regions.

Before & After Results

Patient #1

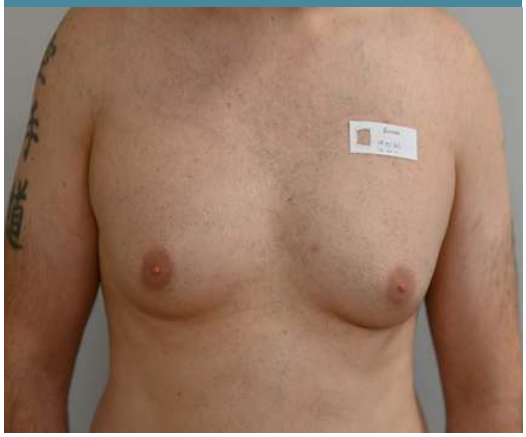
BEFORE

AFTER 6TX

Power Motion | LLD Diode laser |Fluence: 22 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

BEFORE

AFTER 6TX



Power Motion | LLD Diode laser |Fluence: 22 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

BEFORE

AFTER 6TX

Power Motion | LLD Diode laser |Fluence: 22 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

BEFORE

AFTER 6TX

Power Motion | LLD Diode laser |Fluence: 22 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

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AFTER 6TX

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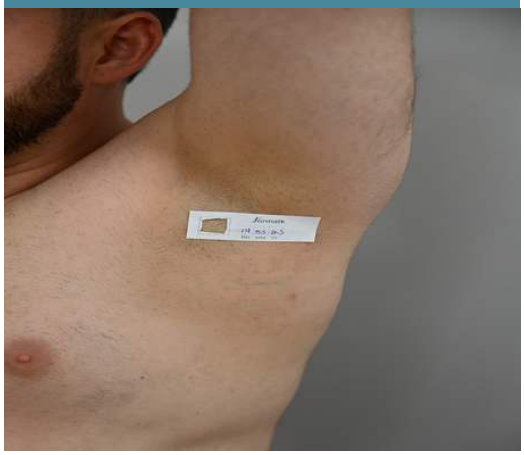
BEFORE

AFTER 6TX



Power Motion | LLD Diode laser |Fluence: 22 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

Patient #2

BEFORE

AFTER 7TX

Power Motion | LLD Diode laser |Fluence: 20 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

Patient #3

BEFORE

AFTER 6TX

Power Motion | LLD Diode laser |Fluence: 20 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

BEFORE

AFTER 6TX

Power Motion | LLD Diode laser |Fluence: 20 J/ cm² |Pulse width: 40ms|Rate: 1 Hz

Patient #4

BEFORE	AFTER 5TX
	

Power Motion | LLD Diode laser |Fluence: 22 J/ cm^2 |Pulse width: 40ms|Rate: 1 Hz

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Source: https://www.skyquestt.com/report/laser-hair-removal-market.
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