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Case Study: Using the Alpha / Spark Pro 808 nm Diode Laser in Single-Stamping Mode

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Background

Facial hair in females is a regular physiological feature that evolves throughout life according to age, hormonal status, and ethnicity. It begins in childhood as fine, light vellus hairs, some of which may gradually transform into terminal hairs during puberty under the influence of androgens, and may increase again after menopause as estrogen levels decline. While most women retain predominantly vellus hair, limited terminal hair growth can occasionally appear on the upper lip, chin, or jawline - changes that are within physiological limits and do not indicate hormonal pathology.

In contrast, hirsutism refers to excessive terminal hair growth in women in a male-pattern distribution, most commonly involving the upper lip, chin, chest, abdomen, or back. It is typically associated with androgen excess, such as in polycystic ovary syndrome (PCOS), adrenal disorders, or other endocrine abnormalities, and may present alongside irregular menstruation, acne, or seborrhea. True hirsutism affects approximately 5–10 % of women (1) and is a medical condition that warrants endocrinological evaluation and treatment of the underlying cause.

However, the majority of women who express aesthetic concern about facial hair do not exhibit signs of hirsutism. Mild or unwanted facial hair - sometimes referred to as non-hirsute facial hair - is a common cosmetic issue, affecting up to 40 % of women (2).

It is considered physiological rather than pathological, often influenced by genetic and ethnic factors, and tends to increase modestly with age, hormonal transitions (e.g., post-menopause), or familial predisposition. Women of Mediterranean, Middle Eastern, South Asian, and Hispanic descent often have denser and darker facial hair. In contrast, women of East Asian and Northern European backgrounds typically exhibit lighter and finer vellus hair.

In this case study, the focus is on non-hirsute, unwanted facial hair - a purely cosmetic concern that does not involve endocrine dysfunction but carries significant psychosocial and aesthetic impact. The rise of high-definition imaging, social media exposure, and beauty-driven self-presentation has heightened awareness of even minimal hair visibility. Many women now pursue hair removal to achieve a smoother complexion, enhanced makeup adherence, and improved self-confidence.

Among current treatment modalities, the 808 nm diode laser has emerged as a leading professional solution for safe and effective facial hair reduction. It functions through selective photothermolysis, where laser energy is absorbed by melanin in the hair follicle, converted into heat, and destroys the follicular growth cells while sparing surrounding tissue. The wavelength's deep dermal penetration, low epidermal absorption, and proven safety across all Fitzpatrick skin types (I–VI) make it particularly suitable for facial indications.

SparkPro's (Alpha) LLD applicator integrates Golden Touch™ Adaptive Contact Cooling Technology featuring a sapphire-glass tip that maintains a stable surface temperature of approximately 5 °C, ensuring continuous contact cooling and uniform thermal regulation. This provides superior epidermal protection, enhanced patient comfort, and consistent energy transmission with every pulse. When used in Single-Stamping Mode, each laser pulse is delivered precisely with controlled overlap and consistent fluence, minimizing cumulative heat and reducing the risk of post-inflammatory hyperpigmentation (PIH) - a crucial consideration for delicate facial areas.

To ensure safety and optimal outcomes, practitioners should perform a patch test, use melanin-meter assessments to personalize fluence settings, apply Parker gel for efficient optical coupling and cooling, and ensure that both patient and operator wear 808 nm-rated protective eyewear, particularly when treating perioral and mandibular zones.

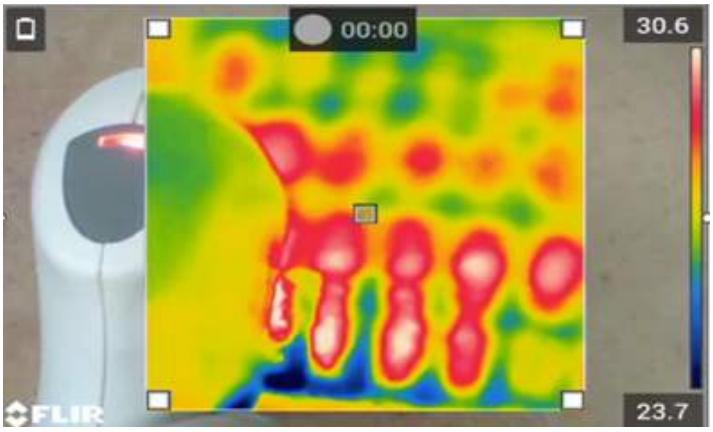

Figure 1 - LLD applicator 1st generation Single-mode ("stamping") hair removal mode 15cmX10cm box thermal photos taken with FLIR N95 camera. Courtesy of Formatk System Ltd.

Aims

- The primary aim of this case study is to assess the clinical efficacy and safety of 808 nm diode laser treatments in women with non-hirsute, unwanted facial hair who do not present hormonal imbalance or endocrine disorders. The study further seeks to evaluate the effectiveness of Single-Stamping Mode in achieving consistent hair reduction while minimizing the risk of post-inflammatory hyperpigmentation (PIH) and other thermal side effects, as well as to determine the tolerability and comfort provided by the Golden Touch™ Adaptive Contact Cooling Technology with its 5 °C sapphire tip during facial laser procedures.
- Secondary aims include establishing optimized treatment parameters - such as fluence, pulse width, interval, and cooling conditions - tailored to various Fitzpatrick skin types (I–VI) using melanin-meter guidance; documenting the importance of standardized safety protocols, including patch testing, use of protective eyewear, and coupling gel application; and evaluating patient satisfaction, skin texture improvement, and psychosocial outcomes, thereby contributing to evidence-based best-practice guidelines for diode laser treatments addressing aesthetic, non-medical facial hair concerns in women.

Methods

This single-center, prospective observational case study was conducted by Ms. Beyza Isik, a certified and licensed laser hair-removal specialist with three years of experience in energy-based epilation technologies, at Laser Queen – Premium Aesthetic Laser Clinic, Ettlingerstraße 13, Karlsruhe, Germany. The study was performed and monitored between March 2024 and October 2025.

A total of three healthy adult female participants, aged 18–29 years, were enrolled. All subjects were classified as Fitzpatrick skin types II–III. Treatments were performed on facial regions exhibiting unwanted terminal hair, including the chin, lower jaw, anterior upper neck (above the thyroid and below the jawline), cheeks, perioral area, and sideburns.

Procedures were carried out using the Alpha / Spark Pro System (FormaTK Systems Ltd., Israel), equipped with an 808 nm Large Laser Diode (LLD) applicator featuring a 15 × 30 mm (4.5 cm^2) treatment window. The applicator operated in first-generation Single-Stamping Mode, delivering uniform fluence with approximately 10% overlap to ensure precise coverage and consistent follicular heating.

The treatment principle was based on selective photothermolysis, wherein the 808 nm wavelength selectively targets melanin chromophores within anagen-phase hair follicles. The absorbed optical energy is converted into heat, rapidly elevating follicular temperature to approximately 70 °C for about 1 millisecond - the threshold required to denature the follicular stem cells and germinative matrix within the bulge and bulb regions. The brief pulse duration confines heat to the pigmented follicle, producing selective thermal destruction of the hair-growth structures while preserving surrounding epidermal and dermal integrity.

Following exposure, the treated follicles undergo a predictable biological sequence. Over the following 2–7 days, thermally coagulated follicles experience controlled degeneration and miniaturization. Hair shafts detach and are expelled as keratinized debris, observed clinically as delayed hair "shedding." Histologically, the follicles enter a catagen-like involution phase, marked by bulb shrinkage and cessation of active growth. Within several weeks, many treated follicles fail to re-enter a new anagen cycle, resulting in long-term hair reduction and smoother skin texture.

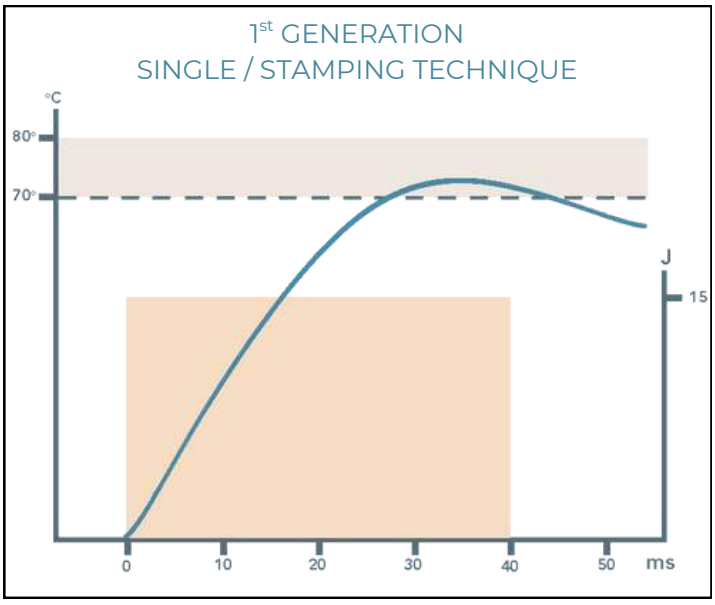

Figure 2 - Treatment technique built on maximizing the amount of energy delivered into a single point.

Participant eligibility was confirmed using Fitzpatrick skin typing and melanin-meter (Milo) readings, allowing individualized adjustment of fluence parameters according to epidermal melanin concentration. Each participant completed a minimum of five treatment sessions per region, following a structured interval protocol:

- Sessions 1–3: every 4–6 weeks
- Sessions 4–6: every 6–8 weeks
- Sessions 7 and beyond: every 8–12 weeks, followed by a one-month post-treatment evaluation.

Pre-treatment preparation included shaving the target area 24–48 hours before each session with a new sterile multi-blade razor, performing a diode laser patch test, and applying Parker conductive gel immediately before exposure to improve optical coupling and cooling efficiency. Both patient and operator wore 808 nm-rated protective eyewear throughout the procedure to ensure ocular safety.

Treatment parameters were individualized, starting with a low fluence of approximately 18 J/cm^2 based on each patient's skin type, and progressively increasing to a maximum of 25 J/cm^2 over successive treatment sessions (rather than within the same session). A fixed pulse duration of 40 ms was applied, consistently delivered in first-generation Single-Stamping Mode at a frequency of 1 Hz. All procedures utilized the Golden Touch™ Adaptive Contact Cooling Technology, equipped with a sapphire-glass tip that maintains a stable surface temperature of approximately 5 °C, ensuring optimal epidermal protection and patient comfort. Written informed consent was obtained from all participants prior to study enrollment.

Immediately after treatment, participants were instructed to avoid direct sun exposure and heat-inducing activities (such as saunas, hot showers, and vigorous exercise) for 48–72 hours to reduce the risk of erythema, edema, or post-inflammatory hyperpigmentation (PIH). Using a soothing, fragrance-free post-laser gel or thermal-water spray was recommended to keep the skin hydrated. Participants were also advised to apply a broad-spectrum SPF 50+ sunscreen daily for at least two weeks, reapplying every 2–3 hours when outdoors.

Between sessions, participants were instructed not to pluck, wax, or epilate treated hairs to preserve follicular integrity; gentle shaving was permitted if needed. Mild perifollicular erythema or edema, when present, typically resolved within 24 hours and was managed with cold compresses as necessary. The use of topical retinoids, exfoliating acids, or chemical peels was discouraged for 5–7 days post-procedure to prevent irritation. In the days following treatment, participants were informed that treated hairs would gradually loosen and shed over 5–14 days, representing normal follicular ejection rather than regrowth. Adherence to these post-care recommendations was emphasized to ensure optimal safety and reproducibility of clinical results.

Standardized high-resolution photographs were obtained before the first session and at the final follow-up by trained clinical personnel. However, due to personal and aesthetic considerations, most female participants declined to be photographed with fully grown or elongated facial hair at baseline. Therefore, all “before” photographs were taken after preliminary shaving, in accordance with participant comfort and ethical consent standards.

All clinical and photographic data were independently reviewed and evaluated by Dr. Nadav Pam, Clinical Director at FormaTK Systems Ltd.

Inclusion criteria

- Healthy females aged between 18 and 70 have unwanted facial hair.
- Fitzpatrick skin types 1-6.
- 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 treatment, potential benefits, and adverse effects, and will deliberately express their willingness to participate in this clinical study.
- All participants signed an appropriate informed consent form.

Exclusion criteria

- 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 is 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 three healthy adult female participants were successfully treated for unwanted facial hair across nine distinct anatomical regions. Participants were 18–29 years old and classified as Fitzpatrick skin types II–III. Each treatment area received eight laser sessions, and no adverse events or side effects were observed or reported throughout the study period.

Patient #	Age	Gender	Fitzpatrick skin type	Total number of treatments	4-point scale improvement after the last treatment
1	18	Female	2	8	85%
2	29	Female	3	8	90%
3	22	Female	3	8	87%

Discussion

The present case study evaluated the clinical efficacy, safety, and patient comfort of the Alpha / Spark Pro 808 nm Diode Laser operated in Single-Stamping Mode for the treatment of non-hirsute, unwanted facial hair in healthy adult females. All participants achieved significant hair reduction (85%–90%) without any adverse events, pigmentary changes, or post-treatment irritation.

These outcomes confirm the fundamental mechanism of selective photothermolysis, in which the 808 nm wavelength selectively targets melanin within anagen-phase follicles while sparing surrounding tissue. The Golden Touch™ Adaptive Contact Cooling Technology, featuring a sapphire tip stabilized at approximately 5 °C, maintained continuous epidermal protection and comfort throughout treatment.

The Single-Stamping Mode ensured precise fluence delivery with about 10 % overlap, providing consistent follicular heating while minimizing cumulative thermal load and the risk of post-inflammatory hyperpigmentation (PIH). This precision proved especially beneficial for delicate, photo-exposed facial areas such as the chin, submental (upper neck), perioral region, cheeks, and sideburns.

No erythema, edema, or burns were observed, underscoring the procedure's safety when pre-treatment assessment, melanin-meter calibration, and standardized protective measures are followed. The gradual fluence escalation protocol (18 → 25 J/cm²), combined with a fixed 40 ms pulse duration, allowed for controlled energy deposition tailored to each skin type.

These findings align with previous literature supporting the diode laser as the gold-standard technology for long-term hair reduction and demonstrate the clinical advantages of FormaTK's precision-engineered system.
Participants reported excellent comfort during sessions, aided by auxiliary cold-air flow and the contact-cooling interface. As practitioner Beyza Isik noted:
The Alpha/Spark Pro system has genuinely helped me make my clients happy! It has taken my business to the next level – everything has become much more professional since I started using it in my clinic. The entire team is also highly supportive – they are always available and ready to help."

Her testimony highlights the combination of technical precision and patient experience that defines the Alpha/Spark Pro platform—bridging advanced science with real-world satisfaction and practice growth.

Although limited by its sample size, the study provides strong evidence that this technology ensures both clinical predictability and a superior user–patient experience. Future multicenter studies including broader Fitzpatrick ranges and long-term follow-up are warranted to consolidate these promising findings.

Conclusion

This case study confirms that the Alpha / Spark Pro 808 nm Diode Laser, operated in Single-Stamping Mode with Golden Touch™ sapphire contact cooling, is a safe, effective, and patient-friendly system for aesthetic facial hair reduction in women.
The protocol achieved up to 90 % reduction in unwanted facial hair after eight sessions, with no adverse events, minimal discomfort, and consistent improvement in skin smoothness and tone.

Individualized parameter adjustment guided by melanin-meter readings, coupled with strict adherence to post-care recommendations, resulted in reproducible, complication-free outcomes.
These results position the Alpha/Spark Pro as a reliable and advanced professional solution for precise, delicate facial treatments—combining scientific rigor, patient safety, and operational efficiency.

The Alpha / Spark Pro 808 nm Diode Laser by FormaTK Systems Ltd. redefines precision in facial hair removal through its intelligent Single-Stamping energy delivery and Golden Touch™ 5 °C sapphire cooling technology.

Practitioners and patients alike experience an unmatched blend of comfort, control, and confidence with every pulse.

- Up to 90 % reduction in unwanted facial hair.
- No adverse events or PIH reported.
- True precision delivery (10 % overlap, 40 ms pulse).
- Superior comfort via 5 °C sapphire contact cooling.
- Minimal downtime and rapid return to routine.

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Before & After Results

Patient #1

BEFORE

AFTER 8TX

Patient #2

BEFORE

AFTER 8TX

Patient #3

BEFORE

AFTER 8TX

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