formatk

Innovating Skin Care:

The Alpha 3D IPL S-430 for Early Acne Intervention and Scar Prevention

Dr. Nadav Pam, Clinical Director at FormaTK | Medical Aesthetic Device R&D | Global Training & Innovation in Energy-Based Systems
Veronika Yehoshua, Clinical Instructor at FormaTK, Certified Cosmetologist, Israel

www.forma-tk.com

Case Study - Innovating Skin Care: The Alpha 3D IPL S-430 for Early Acne Intervention and Scar Prevention

Dr. Nadav Pam MD[1] – Clinical Director | Medical Aesthetic Device R&D | Global Training & Innovation in Energy-Based Systems.

Veronika Yehoshua[2] - Formatk's clinical instructor and certified cosmetologist.[1,2] Clinical Department FormaTK Systems Ltd Yozma St 3, Tirat Carmel, Israel.

[1,2]Forma-TK Systems Ltd, Medical equipment manufacturer in Tirat Carmel - Yozma St 3, Tirat Carmel– Clinical Department.

Background

Acne vulgaris is one of the most common chronic inflammatory skin conditions, affecting up to 85% of adolescents and a considerable proportion of adults, with an estimated 30–40% developing permanent atrophic scars. The disease results from a complex interplay of factors:

- Excess sebum production under androgenic influence.
- Colonization with Cutibacterium acnes (formerly Propionibacterium acnes), a Gram-positive anaerobic bacterium. C. acne contributes to acne by thriving in the lipid-rich, anaerobic environment of sebaceous follicles, where excess sebum and follicular plugging allow its overgrowth. Once dominant, it activates innate immunity through Toll-like receptors (TLR2/4) on keratinocytes, sebocytes, and macrophages, triggering NF-kB signaling and the release of pro-inflammatory cytokines such as IL-1β, IL-8, TNF-α, and IL-6. The bacterium also produces lipases that convert sebum triglycerides into irritating free fatty acids, secretes enzymes that damage the follicular wall, and forms biofilms that enhance persistence. Additionally, its porphyrins (e.g., coproporphyrin III and protoporphyrin IX) generate reactive oxygen species, while activation of the NLRP3 inflammasome amplifies IL-1β release. Together, these processes drive comedone formation, neutrophil recruitment, follicular rupture, and chronic inflammation, ultimately transforming blocked follicles into the papules, pustules, nodules, and cysts characteristic of acne vulgaris.

While acne affects both genders, clinical presentation often differs:

- Males tend to have more severe and persistent forms of inflamed acne due to higher androgen-driven sebum production.
- Females frequently experience cyclic flare-ups linked to hormonal changes (e.g., menstrual cycles, polycystic ovarian syndrome). Adult female acne is increasingly recognized as a distinct clinical entity with psychosocial implications.

Early treatment of inflamed, active acne vulgaris is critical. Persistent inflammation damages the dermal matrix, predisposing patients to permanent sequelae, including atrophic scars, hypertrophic scars, and post-inflammatory hyperpigmentation. Studies consistently show that timely therapeutic intervention reduces both the incidence and severity of scar formation, highlighting the importance of proactive rather than reactive management.

The Alpha System 3D IPL S-430 introduces a safe, evidence-based approach to treating acne vulgaris. Safety is optimized by adjusting parameters according to skin type, measured objectively with a melanin meter, ensuring tailored fluence levels. The system requires only relatively low joules/cm², applied as a single pulse per active inflammatory lesion, with up to 100,000 pulses available per applicator.

This enables precise lesion targeting, weekly intervals, and a high return on investment (ROI) for clinics. Limitations of conventional therapies: oral antibiotics, retinoids, and topical agents sometimes fail to eradicate Cutibacterium acnes, since the bacteria reside within the pilosebaceous unit, protected by a biofilm-like mixture of sebum, keratin, and corneocytes that restricts drug penetration. Long-term drug use may therefore be required, increasing risks of resistance and systemic side effects (Vowels et al., 1995; Bojar & Holland, 2004)- mechanism of 430 nm IPL.

Unlike systemic or topical therapies, 430 nm IPL directly targets the endogenous porphyrins produced by C. acnes, primarily coproporphyrin III and, to a lesser extent, protoporphyrin IX.

Coproporphyrin III correlates strongly with acne severity and decreases following effective therapy [Borelli et al., 2006]. These porphyrins absorb light at 430 nm; once photoexcited, they generate reactive oxygen species (ROS) that selectively damage bacterial membranes without harming surrounding tissue.

Clinical impact

This photodynamic-like process is highly localized, overcoming biofilm protection and reducing the inflammatory cascade [Nagy et al., 2005]. Additionally, it enhances local oxygenation and modulates sebaceous gland activity, producing an environment less favorable for acne recurrence. By combining targeted C. acnes eradication, reduced inflammation, and improved follicular balance, the Alpha 3D IPL S-430 offers a safe, non-invasive, and highly efficient solution -especially for patients in whom systemic therapies are ineffective or contraindicated.

Alpha 3D IPL S-430: Safe, Non-Invasive, and High-Value Acne Solution

- Safe across all skin types – Treatment parameters are personalized using a melanin meter, ensuring optimal safety and effectiveness.
- Low energy, high precision – Requires only one pulse per active lesion per week, with fluence tailored to the patient's skin type.
- Exceptional ROI – Each applicator delivers up to 100,000 pulses, maximizing cost-efficiency and service longevity.
- Non-invasive and time-efficient – No downtime; a single session can treat the face, chest, and back in minimal time.
- Target-specific action - 430 nm IPL penetrates directly to the bacteria, reaching the source of inflammation.
- Unique photochemical mechanism – C. acnes porphyrins (mainly coproporphyrin III and protoporphyrin IX) absorb 430 nm light, producing ROS that selectively destroy bacteria while preserving healthy skin.
- Clinically proven results – Decreases inflammation, early IPL treatment of inflamed acne lesions prevents scarring, enhances oxygenation, and reduces sebaceous gland activity, lowering the chance of recurrence.
- Weekly treatment protocol - Provides fast, visible improvements with minimal effort for both practitioner and patient.

Objectives

Primary Objective

To evaluate the safety and clinical efficacy of 430 nm intense pulsed light (IPL) monotherapy for the management of inflammatory acne vulgaris in adolescent patients, with a specific endpoint of determining whether early treatment can prevent the development of new acne scars during the course of therapy.

Secondary Objectives

- To assess patient tolerability of weekly 430 nm IPL treatments, including results of patch testing and adherence to protective safety measures.
- To document treatment response across multiple anatomical regions (face, chest, back) using standardized clinical photography.
- To measure changes in acne severity and lesion clearance through the application of four validated aesthetic evaluation scales at each treatment session.

Methods

This was an observational, single-center, prospective case study conducted to investigate the safety and efficacy of 430 nm IPL monotherapy for treating acne vulgaris in adolescents. The study was performed at the Formatk Clinical Department, Tirat Carmel, Yozma 3, Carmelim Building, Israel.

Study Period

Patient enrollment occurred between January 1, 2024, and August 2025 at the Formatk Clinical Department.

Participants

Five participants were enrolled, comprising two females and three males, aged 16 to 20 years. All participants underwent screening before enrollment and provided written informed consent. For participants under 19 years of age, parental consent was obtained from both parents in accordance with ethical requirements.

Investigators

The study authors performed all treatment sessions: Dr. Nadav Pam[1] – Clinical Director, Medical Aesthetic Device R&D, Global Training & Innovation in Energy-Based Systems; and Veronika Yehoshua[2] – Licensed Cosmetologist, Clinical Instructor, Formatk Systems.

Treatment Protocol

Treatments were administered once weekly, with each session lasting approximately 10–20 minutes.

Results

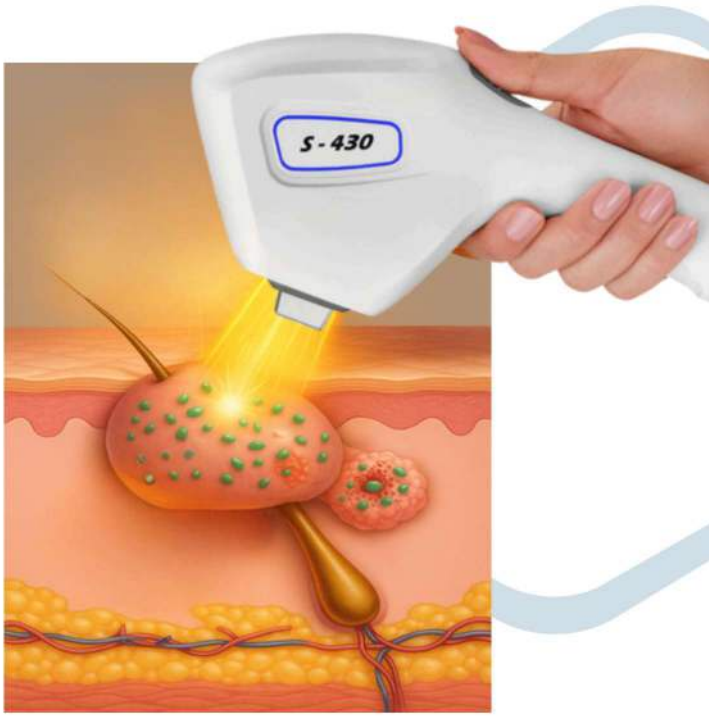
A total of five participants (two females, three males; ages 16–20; Fitzpatrick skin types I–III) completed the study. Treatment areas included the face, chest, back, and shoulders. Each patient received 3–5 weekly treatment sessions with 430 nm IPL monotherapy.

Clinical Outcomes

- Improvement Rates: Clinical evaluation one week after the final session showed 80–82% overall improvement across all patients. Improvement was consistent regardless of treatment area.
- Anatomical Distribution:
  - Face: 3 patients, improvement 80–82%.
  - Chest & back: 2 patients, improvement 80-82%.
  - Shoulders: 1 patient, improvement 80%.
  - Back only: 1 patient, improvement 80%.
- Pre-existing Scarring: 2 of the 5 patients presented with acne scars before enrollment. Both experienced significant improvement in active lesions, though pre-existing scars did not fully resolve. Importantly, no new scarring developed during or after the study, suggesting a preventive effect.
- Pain and Tolerability: Visual Analogue Scale (VAS) during treatment was 0–1, indicating excellent tolerability.
- Side Effects: None were reported. No erythema, blistering, hyperpigmentation, or post-inflammatory sequelae were observed.
- Downtime: Participants reported minimal to no downtime, resuming daily activity immediately after treatment.

Practical Advantages

- Non-invasive: No needles, incisions, or systemic interventions.
- No consumables required: Each session was completed without additional disposables, reducing costs.
- No laboratory monitoring: Unlike systemic therapies (oral retinoids, antibiotics), no blood test monitoring was necessary.
- Short sessions: Each procedure lasted 10–20 minutes.



The effect of 3D IPL S-430 P. Acne

Patient #	Age	Gender	Fitzpatrick skin type	VAS (during treatment)
1	17	Male	2	1
2	18	Female	2	1
3	20	Female	1	0
4	16	Male	3	1
5	17	Male	1	0

Patient #	Area of treatment	Total treatments	Overall, 4 point Scale Improvement	Patient have acne scars prior enrollment
1	Face, chest, and back	5	82%	yes
2	Face	4	81%	No
3	Back	4	80%	No
4	Face, Chest, and Back	3	80%	yes
5	Shoulders, back	3	80%	no

Discussion

This prospective observational case study provides important evidence supporting the clinical benefits of the Alpha 3D IPL S-430 in adolescent acne management. The primary endpoint- evaluating safety and efficacy of 430 nm IPL while preventing new scar formation - was met, as all five patients experienced substantial improvement in inflammatory lesions (80–82% clearance) with no new scars developing during treatment. This outcome strongly reinforces the value of early therapeutic intervention in reducing the risk of long-term sequelae, particularly atrophic scarring, which remains one of the most distressing consequences of adolescent acne.

In relation to the secondary endpoints, the treatment demonstrated excellent tolerability and safety. Pain scores remained minimal (VAS 0–1), and no side effects such as erythema, blistering, hyperpigmentation, or post-inflammatory complications were observed. Standardized photography across multiple anatomical regions (face, chest, back, and shoulders) confirmed that efficacy was consistent regardless of treatment site, supporting the broad applicability of this wavelength in sebaceous-rich and truncal acne.

The use of validated aesthetic scales further verified objective and reproducible improvements in acne severity.

The therapeutic mechanism of 430 nm IPL provides a unique advantage compared to conventional therapies. By directly targeting Cutibacterium acnes porphyrins (coproporphyrin III and protoporphyrin IX), light activation generates reactive oxygen species that disrupt bacterial membranes, degrade biofilms, and reduce inflammation without damaging surrounding tissue.

This not only clears active lesions but also modulates sebaceous activity and improves follicular oxygenation, creating an environment less favorable for recurrence. In contrast, systemic and topical medications are limited by poor follicular penetration, side effects, and risks of antimicrobial resistance.

Equally important are the practical benefits: treatments are non-invasive, short in duration, require no consumables, and do not necessitate blood test monitoring - factors that improve compliance and lower the clinical and economic burden. For adolescents, who may be reluctant or unable to adhere to long-term systemic therapies, these advantages are highly significant.

Taken together, the study outcomes demonstrate that the Alpha 3D IPL S-430 is not only effective in clearing acne lesions but also addresses the crucial endpoint of preventing new scar formation through timely intervention, while maintaining high levels of safety and tolerability.

Conclusion

The Alpha 3D IPL S-430 proved to be a safe, effective, and well-tolerated modality for the treatment of adolescent acne vulgaris. The study achieved its primary endpoint, showing that early treatment with 430 nm IPL prevented the formation of new scars while significantly improving active inflammatory lesions. The secondary endpoints were also fulfilled, with consistent lesion clearance documented across multiple anatomical areas, minimal discomfort, excellent safety, and high patient tolerability.

With no reported side effects, no downtime, and no need for systemic monitoring, this approach offers both patients and clinicians a practical, high-value solution. By combining lesion clearance with scar prevention, the Alpha 3D IPL S-430 positions itself as an evidence-based first-line or adjunctive therapy, particularly in populations where systemic drugs are unsuitable, contraindicated, or poorly tolerated. Early introduction of 430 nm IPL treatment thus provides not only immediate cosmetic benefit but also long-term protection against the psychosocial and physical burden of acne scarring.

Reference

1. Vowels BR, Yang S, Leyden JJ. Induction of proinflammatory cytokines by a soluble factor of Propionibacterium acnes: implications for chronic inflammatory acne. Infect Immun. 1995;63:3158–3165.
2. Bojar RA, Holland KT. Acne and Propionibacterium acnes. Clin Dermatol. 2004;22:375–379.
3. Farrar MD, Ingham E. Acne: inflammation. Clin Dermatol. 2004;22:380–384.
4. Graham GM, Farrar MD, Cruse-Sawyer JE, Holland KT, Ingham E. Proinflammatory cytokine production by human keratinocytes stimulated with Propionibacterium acnes and P. acnes GroEL. Br J Dermatol. 2004;150:421–428.
5. Nagy I, Pivarcsi A, Koreck A, Szell M, Urban E, Kemeny L. Distinct strains of Propionibacterium acnes induce selective human beta-defensin-2 and interleukin-8 expression in human keratinocytes through toll-like receptors. J Invest Dermatol. 2005;124:931–938.
6. Borelli C, Merk K, Schaller M, Jacob K, Vogeser M, Weindl G, Berger U, Plewig G. In vivo porphyrin production by P. acnes in untreated acne patients and its modulation by acne treatment. Acta Derm Venereol. 2006;86(4):316–319.
7. Piccolo, Domenico & Kostaki, Dimitra & Dianzani, Caterina & Crisman, Giuliana & Conforti, Claudio. (2022). Effective Intense Pulsed Light Protocol in the Treatment of Moderate to Severe Acne Vulgaris of the Chest and Back. The Journal of clinical and aesthetic dermatology. 15. 22-25.

Before & After Results

Patient #1

Patient #2

Patient #3

Patient #4

Patient #5

formatk

Taking care of you