

Treating Acne: Lasers Technology That Works

Diane Berson, MD

Unique LightPod Neo Design Features

1) Air-cooled Compact Device Platform

- Eliminates bulky, costly repair-prone water circulating systems
- Eliminates costly, repair-prone fiber optic cables
- Easy to move among treatment rooms or clinical locations
- No warmup time; plugs into any standard (115V) receptacle



2) Laser Emitter in Handpiece

- High power up to 255 j/cm² in gentle pulse duration
- Handpiece does not contact skin – hygienic, convenient for operator
- No skin cooling or numbing required – higher safety, no per-treatment cost

LightPod Neo: 1064nm Laser With 650-Microsecond Technology A Completely New Modality

1. Long-Pulsed Nd:YAG 1064nm lasers have been one of the most popular devices, but their uses are limited to dark skin hair removal and leg veins, and discomfort is high
2. Aerolase has transformed this modality by developing a short pulse 650-microsecond 1064nm laser, allowing for:
 - a greater range of highly effective treatments
 - with a significantly greater safety margin
 - No pain compared with traditional long-pulsed YAGs

650-Microsecond Technology: How Does It Work?

- Typical Nd:YAG 1064nm lasers operate with extended pulse durations, i.e. from 3 to 30 milliseconds
- Neo at 650 microsecond delivers fluences equal or higher than traditional long-pulsed YAG (up to 255 j/cm²) but in a 50-times shorter pulse duration
- This allows laser energy to pass through epidermis 50 times faster, thus preventing overheating and burns
- 650 microseconds is also below the skin's TRT or 'Thermal Relaxation Time', so the laser heat accumulated within the target (follicle, vein etc.) stays in the target for higher efficacy

650-Microsecond Technology

Why is efficacy high at this pulse duration?

- The targeted tissue has less time to lose heat to the surrounding skin, therefore the targeted tissue reaches a higher temperature
- The treatment is so gentle that multiple passes or pulse stacking are well tolerated, and more tissue response is created

Why is treatment gentle and safe at this pulse duration?

- Thermal oversteering of epidermal melanin is avoided, thereby reducing risk of burns or pigmentary changes
- Thermal oversteering of nerve endings in the dermis is also avoided, thereby reducing treatment pain dramatically – skin numbing and cooling is not even necessary

Acne

Why We Need An Effective Acne Laser

- Acne is the most common dermatologic condition
- Acne medications don't always work
- Acne medications can have serious side effects
- Patients don't always want to take medications
- Patients build up antibiotic resistance
- Acne clearance from medications can take 90 days

Experts Have Tried Light-based Modalities to Combat Acne...

Novel treatment options for severe inflammatory acne vulgaris

Michael H Gold

Acne vulgaris is one of the most common dermatological disorders encountered in everyday practice. Treatment options for this often psychologically scarring disease are numerous and, for many individuals, provide relief from the disorder. However, factors such as antibiotic resistance and, slow onset of action from many topical therapies has led researchers to seek out alternative therapies, especially for those suffering from moderate to severe inflammatory acne vulgaris.

Source: *Expert Review of Dermatology* 1(1), 13-23 (2006)

...Yet Lasers Have Historically Fallen Short of Expectations

- 1) **Modalities in the Visible Spectrum – 532, 585 and 595nm.** Absorbed superficially, thus the thermo-coagulation of sebaceous glands is limited.
- 2) **Infrared Modalities – 1320, 1450nm.** Penetrate deeper into the dermis, some thermo-coagulation of sebaceous glands but primarily collagenesis.
- 3) **Long-Pulse Nd: YAG 1064nm.** Deep penetrating and powerful, HOWEVER long 1064nm pulse duration greatly increases the risk of pain, scarring and pigmentary issues.

650-Microsecond Laser Technology: Multiple Mechanisms of Action

Phototoxic or bactericidal effect:

Light radiation absorption by endogenous porphyrins
Propionibacterium acne – thermal destruction of bacteria.

Photothermal effect:

Thermocoagulation of collagen and sebaceous glands, reducing sebum output and drying out the skin.

Selective photothermolysis of blood vessels:

Coagulation of blood vessels blocks the inflammatory response, reduces pain and inflammation/erythema.

Clinical Study: Treatment of Moderate and Severe Acne With a 650 Microsecond Nd: YAG 1064nm Laser Using High Energy and Stacked Pulses at Low Repetition Rate

Presented at ASLMS 2014 by Khalil Khatri, MD and Natalja Geraskova, MD

- 100 patients with moderate to severe acne and multiple inflammation elements, ages less than 25 years, skin types II-III
- No topical and systemic drug therapies (antibiotics, antiseptics, hormones and retinoids) were used
- Laser settings: fluence of 28-64 j/cm² on 2mm & 3mm spots, repetition rate 0.65Hz, pulse width 650 microseconds
- No complications including hyperpigmentation, burns, scars or increase in acne
- High patient satisfaction particularly due to rapid and aesthetically pleasing results

Current Treatments of Acne: Medications, Lights, Lasers, and a Novel 650-Microsecond 1064nm Nd:YAG Laser

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REVIEW ARTICLE

WILEY

Current treatments of acne: Medications, lights, lasers, and a novel 650-µs 1064-nm Nd: YAG laser

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Clearance of Acne with 650-Microsecond Laser Technology

SIDE BENEFITS OF TREATMENT

- 1) **Hair removal:** laser destruction of hairs opens up pores which can enable oxygen to enter into the pores, facilitating bactericide.
- 2) **Collagenesis:** a portion of the laser energy superheats the papillary dermis, stimulating the formation of new collagen, which helps to smooth out acne scars which commonly exist in areas affected by active acne.
- 3) **Lack of skin contact:** with 650 microsecond laser energy there is no need for gels, sprays or anesthetics, thus avoiding potential clogging of pores by those substances