

Hair removal with Low Fluence Hair Removal Mode – LEDA EPI

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Background

It is general knowledge that laser with a wavelength of about 800 nm remove hair well using standard settings for pulse duration and energy density (fluence).

Studies [1] and [2] discuss the use of low fluence in hair removal with an 810-nm diode laser. Several passes are applied to the treated area. With this method, the amount of energy applied to each part of the treatment area cannot be specified and the exact interval between the laser pulses is unclear. However, the treatment with low fluence and several passes is significantly less painful than regular hair removal with high fluence. No significant differences in effectiveness were observed when comparing both methods.

A new diode laser system (LEDA EPI 808, Quantel Derma GmbH, Erlangen, Germany) was recently introduced into the market. It automatically applies multiple low fluence laser pulses (sub-pulses) with defined intervals at the same spot. Also, the number of sub-pulses can be defined. This eliminates the need for multiple passes.

Objective

This case study compares the effectiveness of multiple pulse, low fluence hair removal and standard single-pulse, high fluence hair removal.

Materials and Methods

Treatment of one patient, side by side comparison: right side of the body with high fluence hair removal, left side of the body with low fluence hair removal.

The treatments were done with LEDA EPI 808, Quantel Derma GmbH, using the following parameters:

High Fluence Hair Removal	Low Fluence Hair Removal
Pulses: 1	Pulses: 1 (consisting of 2 sub-pulses)
	Interval: 0.3 s
Fluence: 27-42 J/cm ²	Total Fluence: 24 J/cm ²
Pulse duration: 9-30 msec	Pulse duration: 6 msec

With the low fluence hair removal, the total fluence is not applied in a single pulse, but is divided into multiple separate sub-pulses. These sub-pulses (stacked pulses) are applied at the same spot. The heat accumulates in the hair roots and the surrounding area due to the relatively long thermal relaxation time. The epidermis cools down between the shots, so that the temperature of the epidermis stays below the critical level.

Results

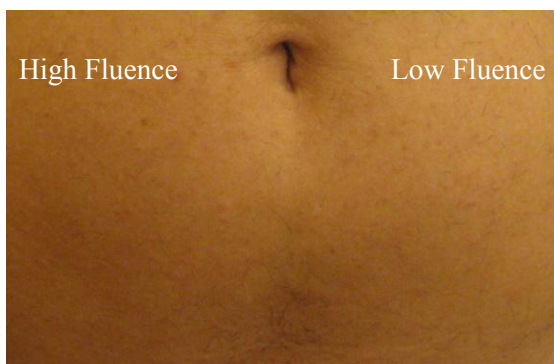
With low fluence hair removal, patient comfort is much higher. The effectiveness is similar to standard high fluence hair removal.

Clinical Images

The images show that the number of hairs is visibly reduced on both sides of the body:



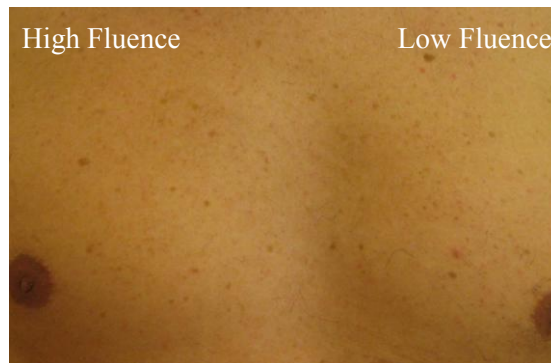
Before treatment



3 months post 4 treatments



Before treatment



3 months post 4 treatments

Conclusion

Hair removal with two low fluence sub-pulses is safe, comfortable for the patient and effective. Further evaluation on more patients and dark skin is necessary.

Note:

This case study is part of an ongoing large multicenter study.

Literature

[1] *Braun M.* Permanent Laser Hair Removal With Low Fluence High Repetition Rate Versus High Fluence Low Repetition Rate 810 nm Diode Laser – A Split Leg Comparison Study. *J Drugs Derm.* 2009 Nov; 8 (11): 14-17.

[2] *Hammes S, Ockenfels HM, Metelmann H-R, Raulin C, Karsai S.* Ein neuer Ansatz in der Laser-Haarreduktion – Diodenlaser mit SHR („Super Hair Removal“) im Vergleich mit dem Alexandritlaser. *Hautarzt* 2010; 61: 880-884.