longpulse

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Presentation
LongPulse®

VYDENCE
CONTINUING MEDICAL EDUCATION Program

Prepared by **Clarissa Bravin, Renata Novais**
reviewed and approved by **Antonio Olivatto**

see more at:

vydence LASER ACADEMY tv

ETHEREA-MX® PLATFORM

LEADER IN THE WORLD'S SECOND-LARGEST AESTHETICS MARKET

- Maximum versatility;
- LASER and light technologies;
- 70+ treatment indications;
- LASER for all types of skin;
- Always with new technologies;
- Greater profitability and return;
- Compact design that is easy to transport;
- Reliable: second-generation platforms;
- Powerful and with proven results;
- Easily changeable handpieces, plug-and-play;
- Dual voltage, with no need for a voltage stabilizer;
- International standard, FDA approved;
- Sold in nearly 20 countries.

ProDeep®
Nd:YAP 1340 nm
For deep epidermal nonablative fractional LASER treatments.

GoSmooth®
Er:GLASS 1540 nm
Gold standard technology for non-ablative LASER skin resurfacing.

ACROMA-QS®
Nd:YAG 1064/532 nm
Dual-wavelength Fractional Q-switched LASER with optional fractional spot.

LongPulse®
Nd:YAG 1064 nm
Nd:YAG LASER with variable pulse modes.

DualMode®
Er:YAG 2940 nm
Powerful, dual-effect Er:YAG with improved coagulation effect.

IPL-Sq®
Intense Pulsed Light
Square-Wave Pulse Technology and all-in-one available cut-off filters.

ATHENA®
DualMode® Accessory
intimate LASER treatment for women's health and wellness.

intenseIR®
Infrared Light
Hi-powered IR light for skin tightening of the body and face.

etherea MX | Z Y E

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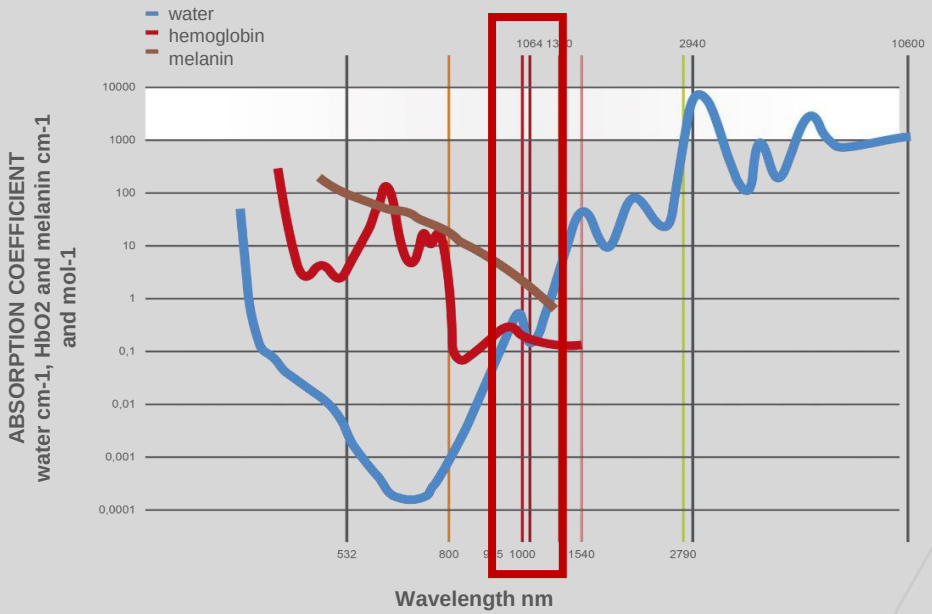
About LASERs and light: **science and technology**

SCIENCE AND TECHNOLOGY

TARGET CHROMOPHORE AND ABSORPTION CURVE



- Relationship of target chromophore and absorption curve as a function of wavelength;
- High affinity for hbo and meta-hb;
- Has an affinity for melanin – even though low;
- Greater penetration, lower affinity for water vs. melanin;

*Manstein et al. FRACTIONAL PHOTTHERMOLYSIS: A NEW CONCEPT FOR CUTANEOUS REMODELING USING MICROSCOPIC PATTERS OF THERMAL INJURY. LASERs Surg Med 2004;34:426-38.

SCIENCE AND TECHNOLOGY

longpulse

WAVELENGTH vs. DEPTH OF PENETRATION

TYPE OF LASER	WAVELENGTH	ABSORPTION COEFFICIENT	DEPTH OF PENETRATION
DIODO	980 nm	0,0448 per mm	3200 µm
Nd:YAG	**1064 nm**	**0,0177 per mm**	**81100 µm**
Nd:YAG	1320 nm	0,2040 per mm	7000 µm
Nd:YAG	1340 nm	1,5900 per mm	3400 µm
DIODO	1450 nm	3,0400 per mm	470 µm
Er:GLASS	1540 nm	1,1800 per mm	1200 µm
Er:YAG	2940 nm	1220,0 per mm	1,20 µm
CO2	10.600 nm	84,400 per mm	17 µm

DEPTH OF PENETRATION AS A FUNCTION OF A LASER WAVELENGTH. Nelson et al. 2002

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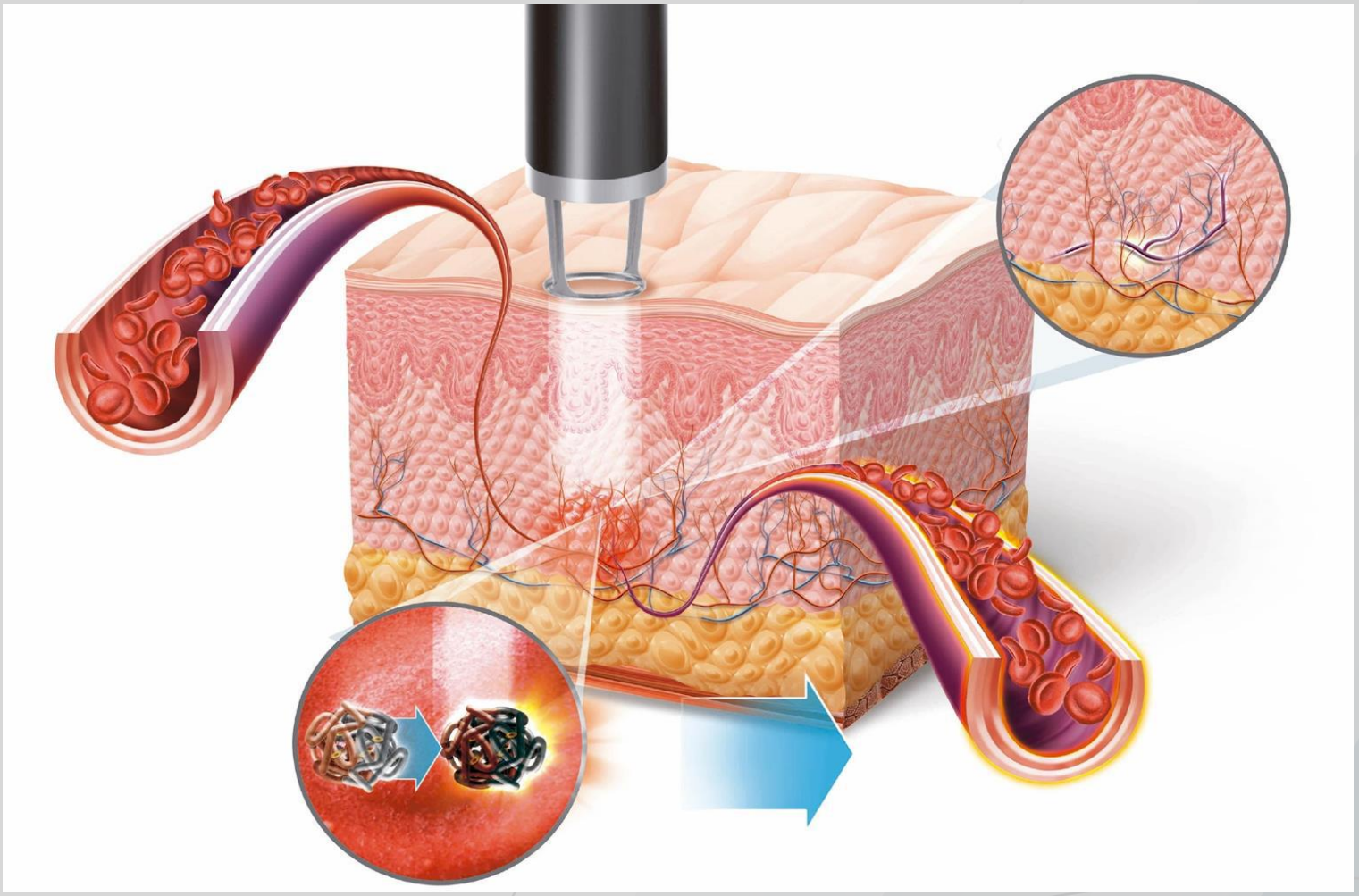
SCIENCE AND TECHNOLOGY

SELECTIVE PHOTOTERMOLYSIS EFFECT



LongPulse®:
features & technology

FEATURES & TECHNOLOGY

TECHNICAL CHARACTERISTICS

	LongPulse®
Wavelength	Nd:YAG 1064 nm
Operating mode	Long Pulse and DYNAMICS®
Maximum energy	500 J/cm2
Pulse time	300 µs to 60 ms
Operating frequency	up to 10 Hz
Spots	2 mm 3 mm 6 mm 9 mm
Additional	Adapter for integrated cooling (Cold-Air Cooling)

FEATURES & TECHNOLOGY

ADVANTAGES LongPulse®

- Gold standard for treating **vascular lesions**;
- Good option for **hair removal**, mainly for darker skin tones;
- Versatility in the **DYNAMICS®** mode and **4 spots**, which ensures greater clinical efficacy and safety, with automatic recognition;
- More practical: **adapter for external cooling.**

FEATURES & TECHNOLOGY

TREATMENT INDICATIONS

SPOT	*LONG PULSE*	*DYNAMICS*
2 mm	• Vascular lesions < 1 mm • Cherry hemangioma	–
3 mm	• Vascular lesions > 1 mm • Cherry hemangioma	• Onychomycosis
6 mm	• Reticular veins • Hair removal • Facial wrinkles	• Facial wrinkles • Rosacea • Poikiloderma of Civatte
9 mm	• Hair removal • Facial wrinkles (Skin Toning)	–

FEATURES & TECHNOLOGY

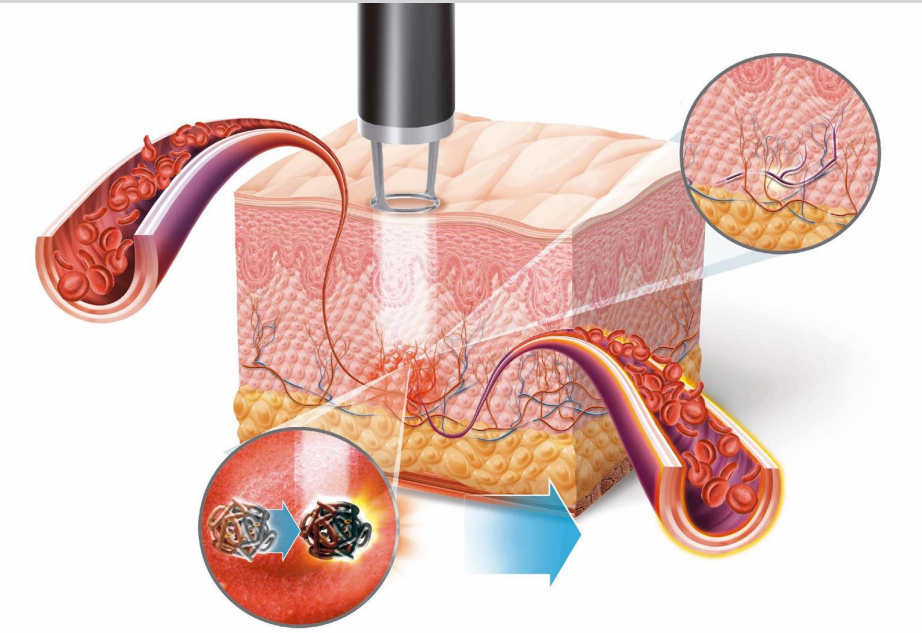
OPERATING MODE

Two operating modes with different pulse times to deliver energy more aggressively in long pulses or more comfortably, accumulating heat in short pulses.

	LONGPULSE	DYNAMICS®
Definition	Long pulses, in milliseconds (ms)	Short pulses, in microseconds (µs) to 1 ms
Pulse Time	10 to 60 ms	300 µs to 1 ms
Indication	• Vascular lesions • Cherry hemangioma • Hair removal • Facial Wrinkles (Skin toning)	• Rosacea • Poikiloderma of Civatte • Onychomycosis • Facieal Wrinkles
Action	Selective photothermolysis	Accumulation of heat, heating, collagen stimulation
Characteristics	More aggressive	More comfortable

FEATURES AND TECHNOLOGY

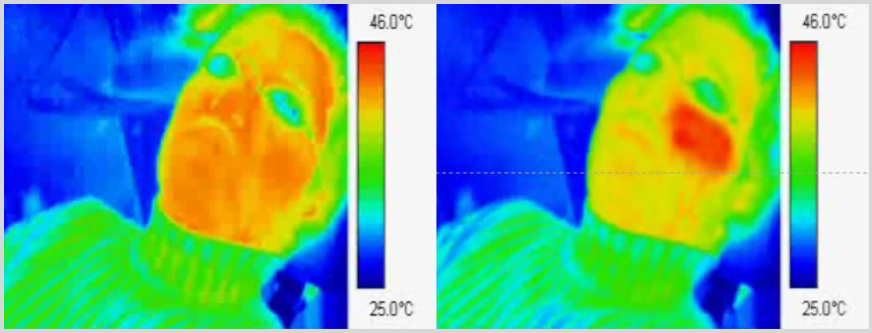
LONGPULSE MODE



Photothermal effects: light absorption leads to the destruction of the target chromophore (selective photothermolysis) by high temperature.

FEATURES & TECHNOLOGY

DYNAMICS MODE



- Thermal peeling: generates homogenous and controlled heat, stimulating collagen and reducing local erythema.

*Manstein et al. FRACTIONAL PHOTTHERMOLYSIS: A NEW CONCEPT FOR CUTANEOUS REMODELING USING MICROSCOPIC PATTERS OF THERMAL INJURY. LASERs Surg Med 2004;34:426-38.

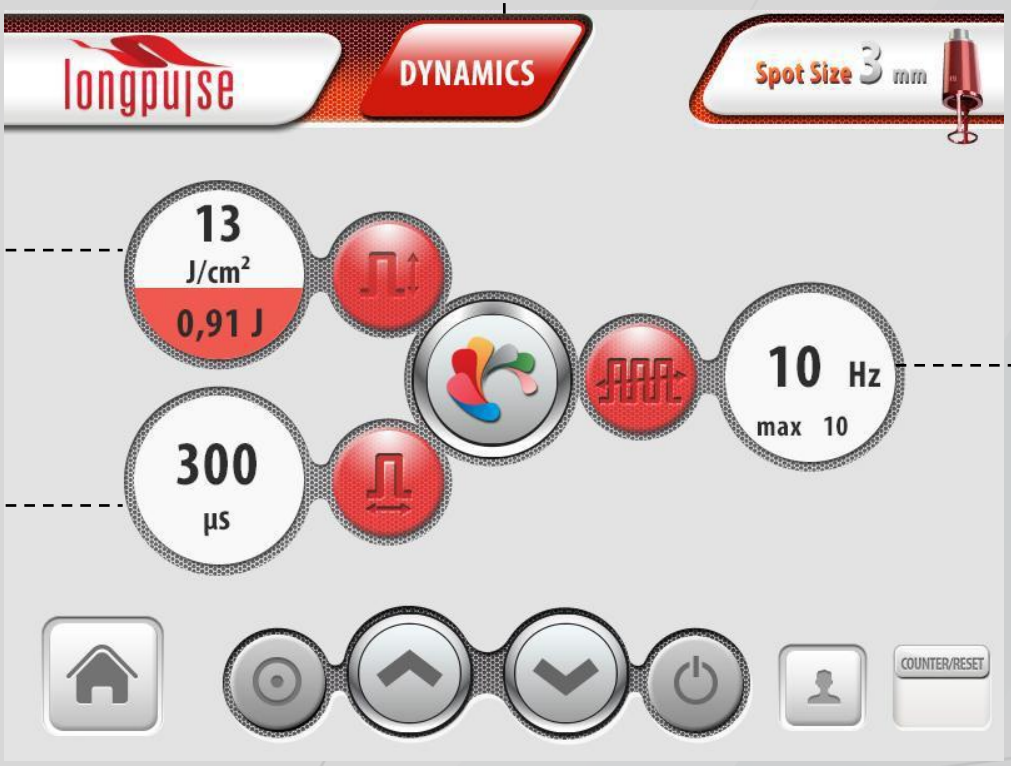
LongPulse®: **interface and parameterization**

INTERFACE AND PARAMETERIZATION

INTERFACE – ETHEREA

selection of **operating mode** – DYNAMICS or LONGPULSE

automatic recognition of the **handpiece and spot**



fluence: energy delivered by area (J/cm2)

pulse time: time for the fluence to be delivered

frequency: or repetition rate between shots

LongPulse®:
practice and training
VASCULAR LESIONS

PRACTICE AND TRAINING

QUICK REFERENCE GUIDE

PRACTICE AND TRAINING

INDICATIONS

- **Vascular lesions** on the legs and chest/face, or in other words, superficial and deep lesions;
- **Hair removal**, especially for darker skin tones (Fitzpatrick scale V-VI);
- DYNAMICS® mode, for **fine lines and wrinkles, poikiloderma of Civatte and onychomycosis.**

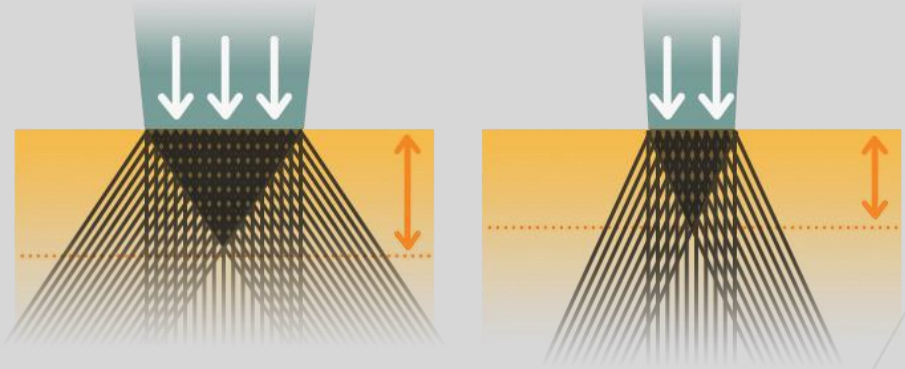
PRACTICE AND TRAINING

CHOOSING THE SPOT: 2, 3 OR 6 MM

Difference between depth of penetration.

LARGE
spot size

SMALL
spot size



LARGER SPOTS	Deep lesions	Reticular veins
SMALLER SPOTS	Superficial lesions	Face and lower member telangiectasia

The effective penetration of the laser beam is directly related to the size of the spot and the fluency used.

PRACTICE AND TRAINING

PARAMETERIZATION VASCULAR LESIONS – SPOT SIZE

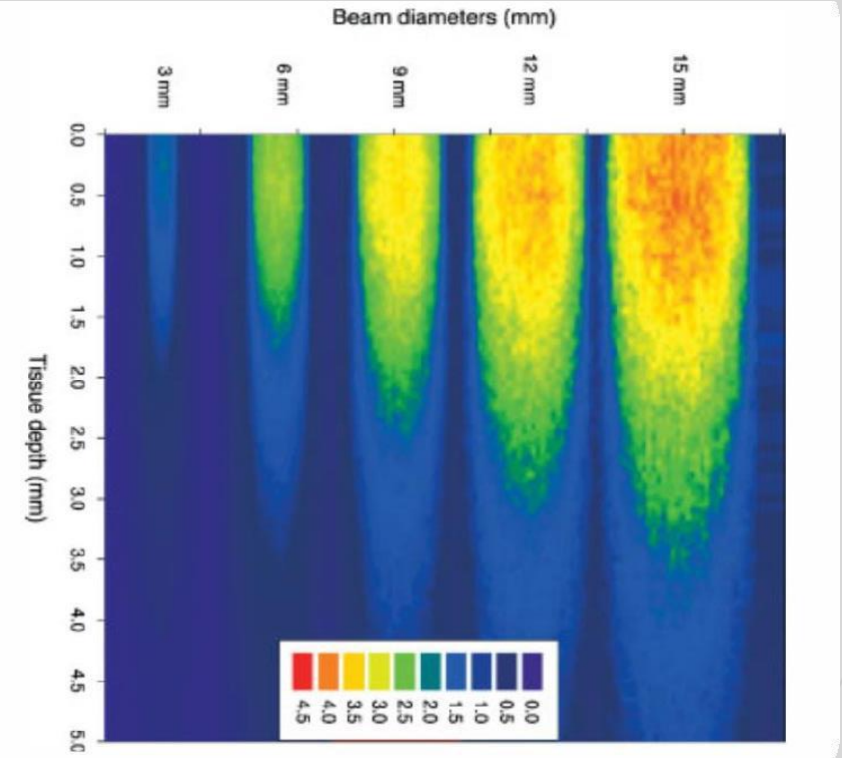


Fig. 4. It shows the distributions of fluence rate in dermis at 1,064-nm laser irradiation for 3-, 6-, 9-, 12-, and 15-mm beam diameters.

LASERs Surg Med. 2005 Feb;36(2):105-16. LASER TREATMENT OF LEG VEINS: PHYSICAL MECHANISMS AND THEORETICAL CONSIDERATIONS. Ross EV1, Domankevitz Y.

SPOT	PENETRATION
1 mm	0,8 mm
3 mm	1,5 mm
7 mm	3 mm
10 mm	4 mm
12 mm	4,5 mm
18 mm	5 mm

PRACTICE AND TRAINING

PARAMETERIZATION VASCULAR LESIONS – SPOT SIZE

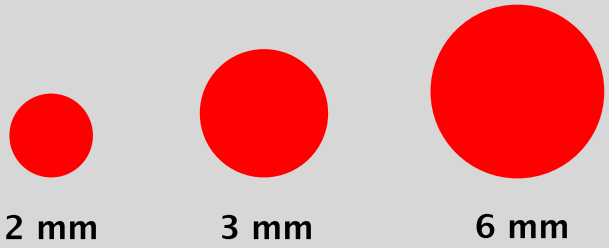
STRUCTURE	THERMAL RELAXATION TIME
TELANGIECTASIA	10 to 20 ms
VENULECTASIS	20 to 30 ms
RETICULAR VEINS	30 to 60 ms

MORE DILATED VEINS	LESS DILATED VEINS
Longer pulse times	Shorter pulse times

PRACTICE AND TRAINING

PARAMETERIZATION VASCULAR LESIONS – FLUENCE

$$\text{Fluence } (J/cm^2) = \frac{\text{Energy } (J)}{\text{Area } (cm^2)}$$



- Larger spots need more energy to have the same fluence as smaller spots.

SPOT	ENERGY	FLUENCE
2 mm	4,7 J	150 J/cm²
3 mm	10,6 J	150 J/cm²
6 mm	42,4 J	150 J/cm²

PRACTICE AND TRAINING

PARAMETERIZATION VASCULAR LESIONS – FLUENCE VS. PULSE TIME

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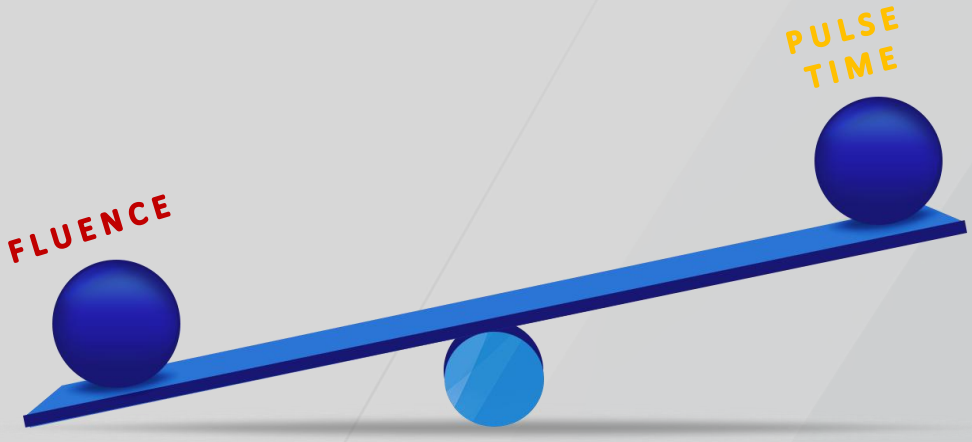
TARGET/CHROMOPHORE



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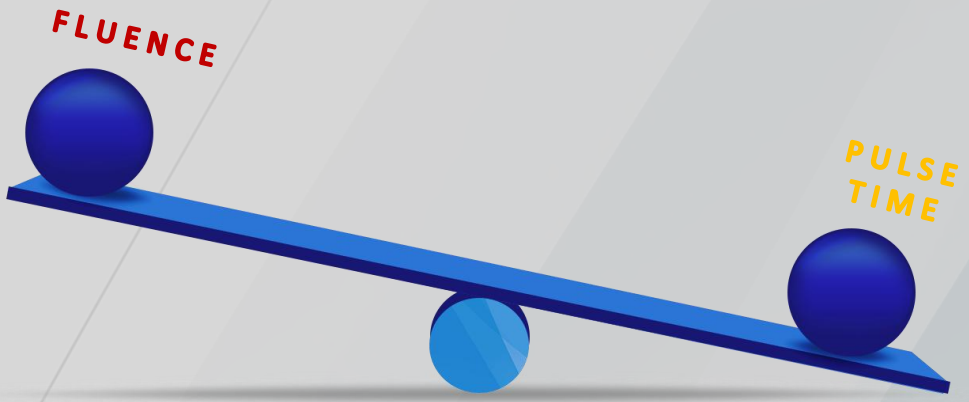
TARGET/CHROMOPHORE



PRACTICE AND TRAINING

PARAMETERIZATION OF VASCULAR LESIONS

CHOICE OF PARAMETERS FOR TREATING VESSELS		
What is the depth?	Superficial vessels Reticular vessels	Smaller spots, 2 or 3 mm Larger spots, 6 mm
What is the dilation of the vessel?	Finer, up to 1 mm More dilated, > 1 mm	Pulse time 10–30 ms Pulse time 30–60 ms
How much chromophore?	Red vessels Purple/blue vessels	Higher fluence Lower fluence

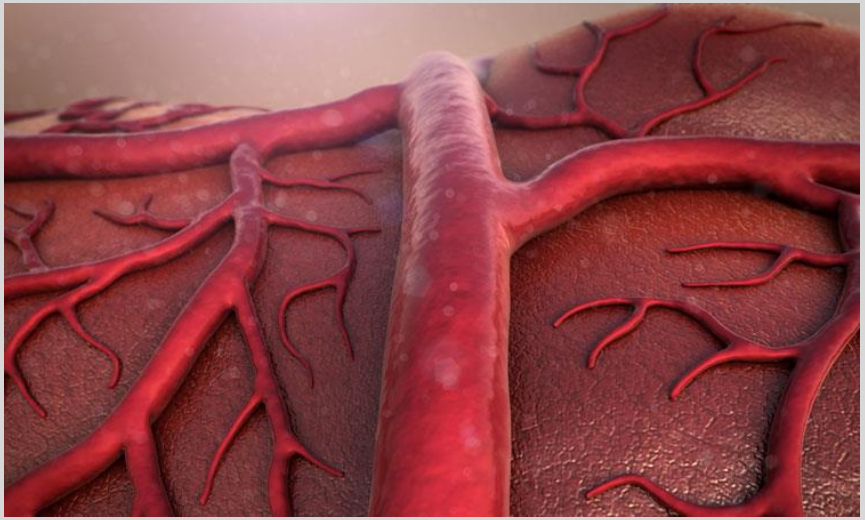
PRACTICE AND TRAINING

PARAMETERIZATION VASCULAR LESIONS

PARAMETER	INCREASE	DECREASE
1st SPOT	Deep vessels Dilated vessels	Superficial vessels Finer vessels
2nd PULSE TIME	Dilated vessels With high blood volume	Finer vessels With low blood volume
3rd FLUENCE	Pink/red vessels Finer vessels Superficial vessels Smaller spots Vessels with higher pressure With high blood volume	Purple/blue vessels Dilated vessels Deep vessels Larger spots Flaccid vessels

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS



A single vessel can have different diameters and depth over the course of its trajectory. It can therefore be necessary to change the spot and adjust parameters several times over the course of a session.

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS

Efficacy related to the type of vessels that will be treated::

COLOR OF THE VESSEL	% OF THE AREA WITH SIGNIFICANT IMPROVEMENT
Blue	100 %
Red	100 %
Blue/red	60 %

SIZE OF THE VESSEL	% OF THE AREA WITH SIGNIFICANT IMPROVEMENT
Reticular veins 2 to 4 mm	100 %
Venulectasis 1 to 2 mm	83 %
Spider veins 0.25 to 1 mm	58 %

Dermatologic Surgery. 2002 Mar;28(3):220–3. 1,064-NM ND:YAG COOLGLIDE® EXCEL LASER IRRADIATION FOR LOWER EXTREMITY TELANGIECTASIAS & SMALL RETICULAR VEINS: EFFICACY AS MEASURED BY VESSEL COLOR AND SIZE. Rogachefsky AS, Silapunt S, Goldberg DJ

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS

PHLEBOSCOPE

<u>Cutaneous transillumination</u>

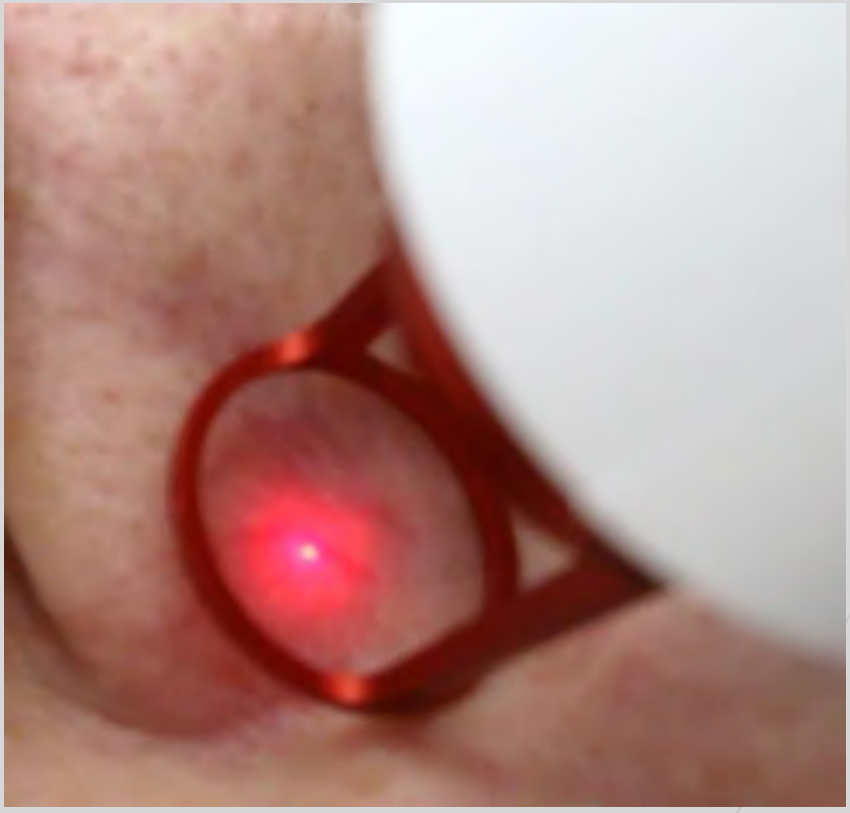
The light issued is absorbed by the vessels, making them darker and allowing their path to be seen.

Very effective in dealing with feeder veins, which often are not visible, but are responsible for the appearance and maintenance of micro-vessels.

proprietary and confidential

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS



- The application must always be **perpendicular** to the skin;
- Always **begin the treatment with the reticular vessels** before the telangiectasias;
- The use of an **external cooler** is always recommended for greater comfort and safety for the patient;
- **You can pass again**;
- **Do not use stacking**.

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS

USAGE PARAMETERS	
Spot:	2, 3 or 6 mm
Operating mode:	LongPulse
Fluence:	60 to 400 J/cm²
Pulse time:	10 to 60 ms
Use of Siberian:	Yes
Sessions:	2 to 4
Interval:	30 days for the same area

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS

Endpoint of the vascular lesions:

Erythema of the lesions;

Collapse of the vessel or

Alteration of its color (gray, blue, purple…)

No visible alteration in the adjacent tissue

PRACTICE AND TRAINING

CLINICAL GUIDE – VASCULAR LESIONS

CONTRAINDICATIONS	PRETREATMENT	PÓS-TRATAMENTO
• Pay attention to skin tone and to patients with an active tan!	• Remove creams and/or lotions before the application; • Remove hair from the region if there is significant hair; • Observe the clinical response and pay attention to patient pain	• Apply local topical corticoid, if necessary; • Avoid exposure to the sun for at least 30 days.

LongPulse®:
practice and treatment
OTHER INDICATIONS

PRACTICE AND TRAINING

CLINICAL GUIDE – HAIR REMOVAL

USAGE PARAMETERS	
Spot:	6 or 9 mm
Operating mode:	LongPulse
Fluence:	30 to 70 J/cm²
Pulse time:	30 to 40 ms
Use of SIBERIAN-FIT®:	Yes
Sessions:	4 to 6
Interval:	30 to 45 days

PRACTICE AND TRAINING

CLINICAL GUIDE – HAIR REMOVAL

Endpoint of the hair:

- Perifollicular erythema or edema in finer hair;
- Carbonization in thicker hair;
- No visible alteration in the adjacent tissues.

PRACTICE AND TRAINING

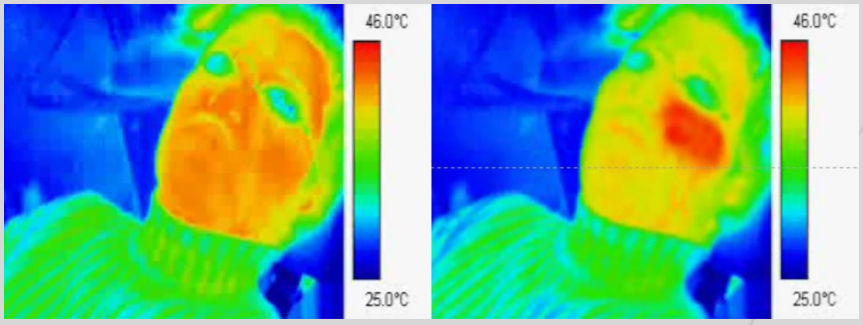
CLINICAL GUIDE – FACIAL WRINKLES

Optionally, it can be done in the DYNAMICS® mode, with the 6 mm spot, pulse time of 650 μs, fluence from 8 to 10 J/cm2 and frequency from 5 to 10 Hz.

USAGE PARAMETERS	
Spot:	6 or 9 mm
Operating mode:	LongPulse
Fluence:	25 to 60 J/cm²
Pulse time:	30 to 60 ms
Frequency:	0.5 to 1 Hz
Passes:	1
Sessions:	3 to 6
Interval:	15 to 30 days

PRACTICE AND TRAINING

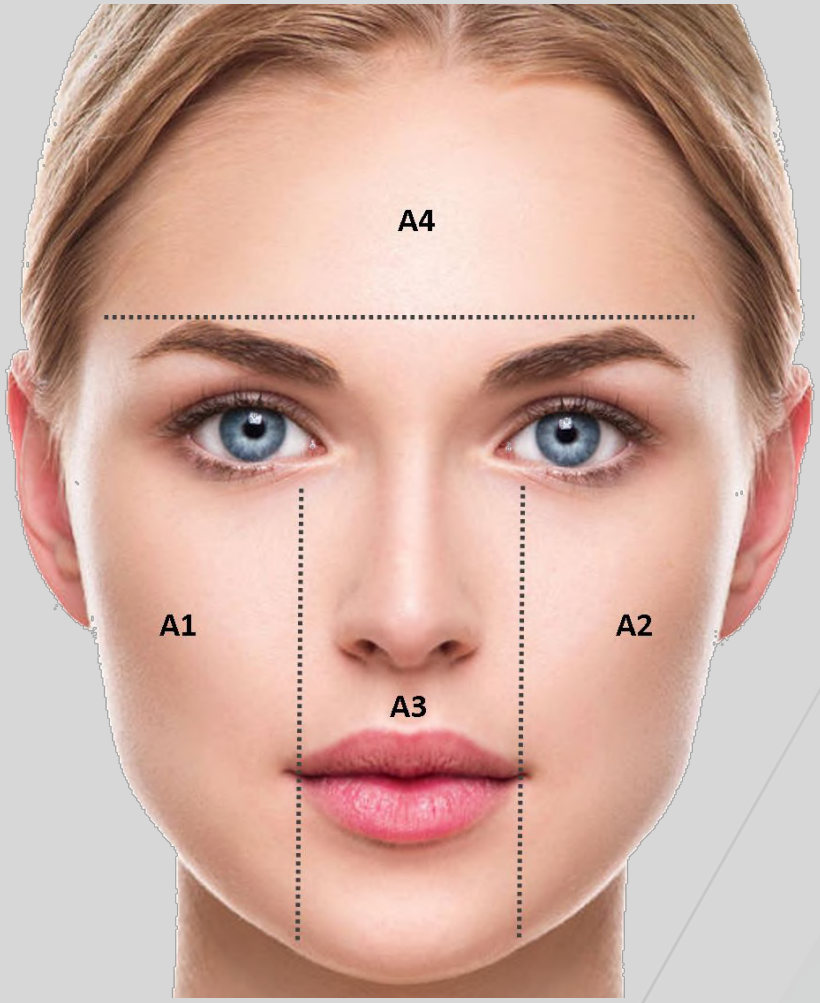
CLINICAL GUIDE – ROSACEA AND POIKILODERMA OF CIVATTE



- **Principle of action**: inducing homogenous and controlled heating, stimulating collagen and reducing local erythematosus;
- Painless treatment;
- No contraindication for skin tone or general tanning condition.

PRACTICE AND TRAINING

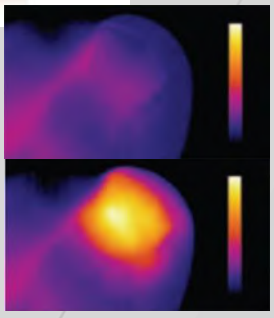
CLINICAL GUIDE – ROSACEA AND POIKILODERMA OF CIVATTE



USAGE PARAMETERS	
Spot:	6 mm
Fluence:	8 to 10 J/cm²
Pulse time:	650 µs
Frequency:	5 to 10 Hz
Shots:	500–1000/ quadr.
Sessions:	1 to 8
Interval:	15 to 30 days

PRACTICE AND TRAINING

CLINICAL GUIDE – ONYCHOMYCOSIS



- Thin nail in advance;
- Do not anesthetize: endpoint is a feeling of pain;
- Objective: heating;
- Principle of action: inducing homogenous and controlled heating of the compromised nail;
- Other factors that can determine the efficacy of the treatment: type of fungus, culture, associations, etc.

PRACTICE AND TRAINING

CLINICAL GUIDE – ONYCHOMYCOSIS

*optionally, you can do intermittent cycles of 100–150 shots on the big toe and 25 to 30 shots on the other compromised toenails (5 passes).

USAGE PARAMETERS	
Mode:	DYNAMICS®
Spot:	3 mm
Fluence:	9 to 13 J/cm²
Pulse time:	300 µs
Frequency:	3 to 5 Hz
Shots:	600 to 800/nail*
Use of SIBERIAN-FIT®:	No
Sessions:	2 to 8
Interval:	15 to 30 days

PRACTICE AND TRAINING

CLINICAL GUIDE – LASER Gemini+®

LASER Gemini+®: a combination of two identical wavelengths and active media, but with different pulse times, for personalized effects;

Nd:YAG q-switched, 1064 nm
for spots and melanosis, cutaneous clearing in general
photomechanical effect only

+

Nd:YAG short pulsed, 1064 nm
for toning, reduction of flushing, closing pores
thermal effect only

- Combination in the same treatment session;
- Sessions monthly or every 15 days;
- From 6 to 8 treatment sessions for broadened results;
- No downtime and no restrictions on skin tone or tan.

PRACTICE AND TRAINING

CLINICAL GUIDE – HAIR REMOVAL

CONTRAINDICATIONS	PRETREATMENT	POSTTREATMENT
• **Pregnant** or **Nursing patients;** **Systemic, autoimmune** or **immunodeficiency illnesses**; • **Acute infections** and/or active **infectious processes**; • **Wounds or malignant lesions** in the treatment area; • Area filled with **nonabsorbable substances**; • Use of **photosensitizing drugs**; • **Skin sensitized** by the sun; • **Change of the sensitivity** of the area to be treated.	• **Remove creams and/or lotions** before the application; • For the treatment of nails, **completely remove polish and creams** and **thin them**; • **Do not use anesthetics**; • For thermal peeling, **cooling the area is not recommended** during or after use of the laser; • Always use the **protective glasses** that accompany the handpiece and place the lead glasses on the patient; • **Herpes prophylaxis**, if necessary.	• **Light to moderate erythema**, which can last for up to three hours, is expected; • **Drug delivery** can be done immediately afterward; • **Avoid using nonsteroidal anti-inflammatories**; • Tell the patient to use **sunscreen** and to **avoid exposure to the sun** during the weeks following the treatment.

PRACTICE AND TRAINING

MY PRACTICE VYDENCE

my practice vydence

The MyPractice is a continued medical education program proposed by VYDENCE® to the doctors that use our products and technologies may share their experiences in a practical and quick way.

» My Practice Online

LongPulse®:
care and preventative maintenance

CARE AND MAINTENANCE

CARE AND PREVENTATIVE MAINTENANCE

- **Cleaning and disinfection of the applicator spots:** use isopropyl alcohol (preferentially) with cotton swabs and/or gauze on the lenses and spacers;
- Spacers can be washed with soap and water and/or enzymatic detergent;
- **Clean after of each application;**
- **Pro rata guarantee** of the handpiece: 200,000 shots in the longpulse mode and 1 million shots in the dynamics mode;
- **Careful during transportation**, misalignment can result in ineffective treatment;
- Send the handpiece to technical support after reaching the recommended number of shots.

CARE AND MAINTENANCE

CARE AND PREVENTATIVE MAINTENANCE

WATCH NOW

Learn more about maintenance procedures on our channel

vydence LASER ACADEMY tv

- Use only deionized water;
- Replace all the water in the reservoir annually;
- Change the deionizing filter annually;
- Annual inspection of the platform and handpieces.

LongPulse®:
cases and results

CASES AND RESULTS

VASCULAR LESIONS

Photo courtesy of Dr. Rodrigo Kikushi
São Paulo, SP

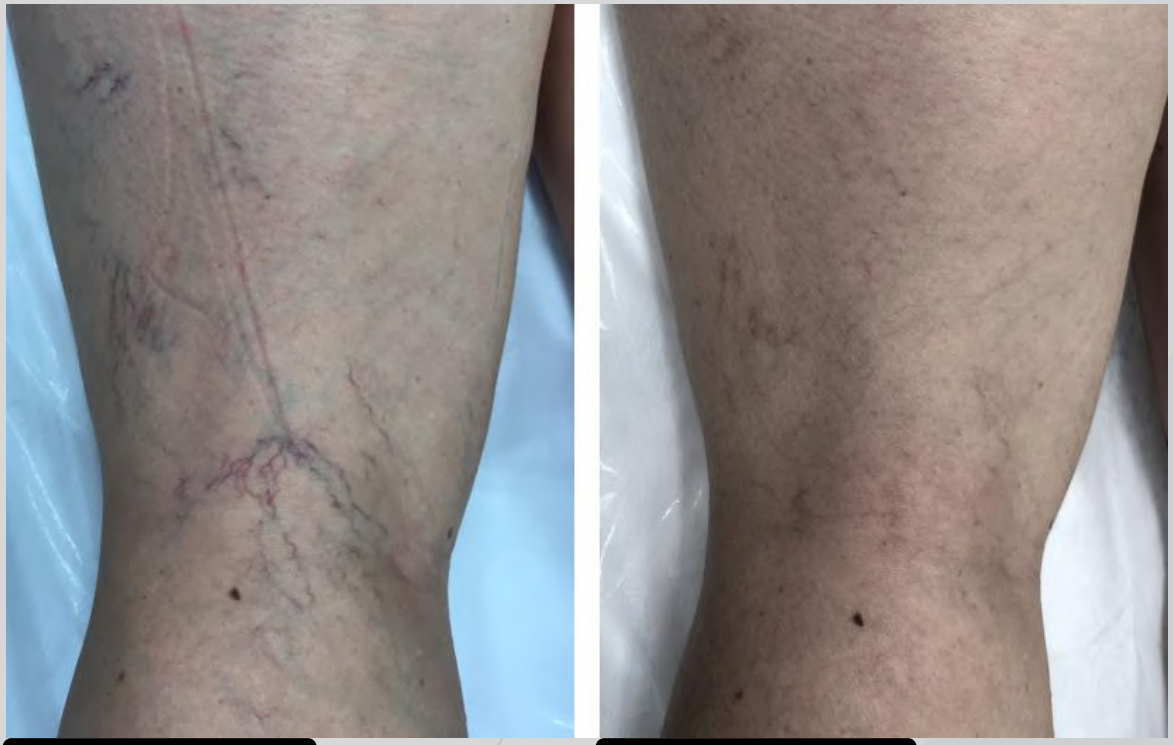
BEFORE

AFTER

CASES AND RESULTS

VASCULAR LESIONS

Photo courtesy of Dr. Rodrigo Kikushi
São Paulo, SP



BEFORE

AFTER

CASES AND RESULTS

VASCULAR LESIONS

Photo courtesy of Dr. Rodrigo Kikushi
São Paulo, SP

BEFORE

AFTER

CASES AND RESULTS

VASCULAR LESIONS

Photo courtesy of Dr. Rodrigo Kikushi
São Paulo, SP

BEFORE

AFTER

CASES AND RESULTS

HAIR REMOVAL

VYDENCE Training Center
São Paulo, SP

BEFORE

AFTER

longpulse

clinical library

vydence medical

CLINICAL LIBRARY

CO2 vs. ER:YAG

Results obtained with Nd:YAG LASER in the treatment of varicosities of the legs proved comparable to sclerotherapy

DISCUSSION

The results of this study show that a Long Pulsed Nd:YAG 1,064-nm high energy laser can provide a safe and acceptable treatment of 1–3-mm leg veins that is comparable to sotradecol sclerotherapy. The 1,064-nm wave-

Comparative Pilot Study Evaluating the Treatment of Leg Veins With A Long Pulse ND:YAG Laser and Sclerotherapy

Charlotte M. Coles, CRC, Richard S. Werner, MD, and Brian D. Zelickson, MD*
Abbott Northwestern Hospital, Center for Cosmetic Care, Edina, Minnesota

Considered the most acclaimed technology for darker skin tones V–VI. Safe and effective treatment even for tanned patients.

Two prospective, controlled studies were conducted to determine the safety and efficacy of the Cutera CoolGlide aesthetic laser for the removal of unwanted hair in tanned patients of skin type I – IV with brown or black hair. Enrollment for the initial study was 20 tanned subjects. Each subject received a single treatment on three test areas, and an untreated control site, of 3 cm by 5 cm each and was followed at 1, 3 and 6 months to evaluate epidermal response and hair counts. These safety results were further confirmed in the second study in which larger areas, up to 15 cm by 15 cm, were treated on 38 tanned subjects and followed for 1 month. Treatments were performed on arms, legs, backs, shoulders, abdomens and bikini lines. The actual enrollment in the two studies consisted of skin type II (31%), skin type III (24%) and skin type IV (45%) patients. Immediate post-treatment reaction included erythema and edema. No blistering or purpura were seen. The treatments for the first study were performed at 15, 20, and 30 ms pulse widths using the 10 mm spot size and pre-cooling handpiece of the CoolGlide system. The fluence was determined by the investigator for each patient with an average fluence of 63 J/cm^2 (range of 50 to 70 J/cm^2).

CLINICAL LIBRARY

CO2 vs. ER:YAG

TABLE 1. Vessel Parameters for This Model Are Seen

	Diameter (μm)	Depth in tissue (μm)
Vessels	20–150	800–1,200
	150–400	1,150–1,660
	400–1,000	1,380–3,840
Posterior intercostal vessels	≤600	1,800
Lateral thoracic vessels	≤800	3,200
Deep circumflex vessels	≤1000	3,840

TABLE 2. Ideal PW and MED Values for Certain Diameter Vessels Are Seen

Vessel diameter (mm)	Pulse width (millisecond)	Fluence (J/cm^2)
0.2	15	80
0.3	20	90
0.4	20	90
0.5	25–30	100
0.6	30	100
0.7	35	100
0.8	35–40	100
0.9	45–50	110
1	60	110

OBJECTIVE

- Combination of parameters that seek to cause precise and exact damage to the vessel or venule, avoiding or minimizing all adjacent damage;
- Prolonged pulse time results in high temperature, which is necessary to close the vessel, increasing the efficacy of the treatment.

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Thank you