



XXIII CONVEGNO NAZIONALE

DERMATOLOGIA PER IL PEDIATRA

*La terapia...
un dono grande*

26-27 Maggio 2023
Palazzo dei Congressi, Riccione

POSSIBILITA' TERAPEUTICHE E LASER VASCOLARI NEL TRATTAMENTO DELLE MALFORMAZIONI VASCOLARI

DOTT. PROF. E. BERNE'

DOTT.SSA K. ARCIERI - DOTT.SSA A. NASISI - DOTT. F. BALCONI

Centro Malformazioni Vascolari ASM - onlus
Magenta Medical Center
Milano



XXIII CONVEGNO NAZIONALE

DERMATOLOGIA PER IL PEDIATRA

*La terapia...
un dono grande*

26-27 Maggio 2023
Palazzo dei Congressi, Riccione

VASCULAR ANOMALIES

VASCULAR ANOMALIES ARE FEATURED BY DIFFERENT CLINICAL PRESENTATION AND RELATED WITH HEMODINAMIC AND HISTOLOGICAL PATTERN

VASCULAR LESIONS IN BRIEF

With the generic term of Angioma we consider different vascular and lymphatic anomalies.

About 7 % of children born with these malformations and WE KNOW THE DNA MUTATION ONLY IN SINDROMIC PATIENTS and, IN OTHERS only the hypothetical etiology.

While the old classification was considered anatomic pattern(Mulliken) but, actually are more considered both, morpho-functional, histopathological and hemodynamic pattern (ISSVA MELBOURNE, 2014)

VASCULAR ANOMALIES: NATURAL HISTORY

EARLY

(IN FEW DAYS TO THE BIRTH)

INDIFFERENT	20 %
GROW	80 %

LATER

(IN SEVEREAL MONTHS TO THE BIRTH)

NONE REGRESSION	10 %
PARTIAL REGRESSION	20 %
TOTAL REGRESSION	70 %

HEMANGIOMA: WHAT IS IT?



VASCULAR ANOMALIES IN PERCENTAGE

Amburgo - Prof.S.Belov 1998



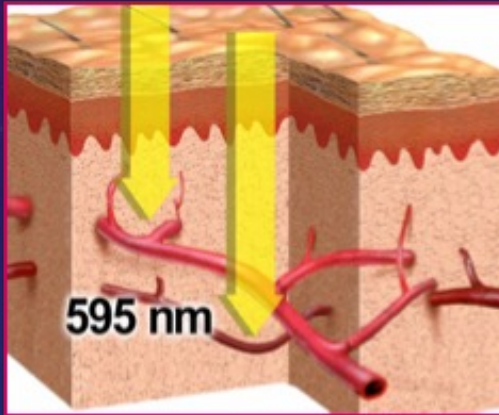
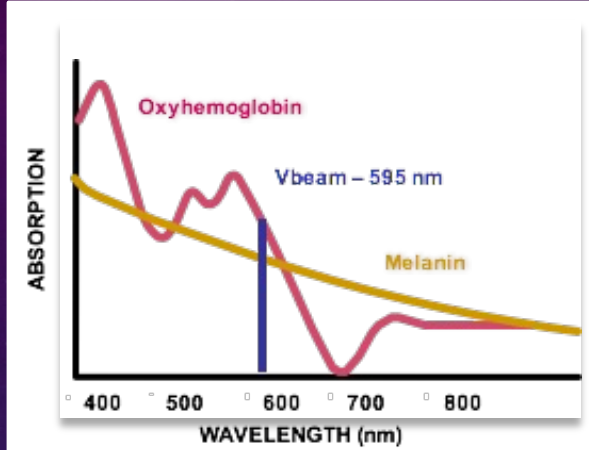
FIRST EVALUATION: FUNCTIONAL AND HEMODINAMIC ASPECTS

- “Which” Vascular Anomaly
- “Where”
- anatomic region and extension
- Age of patients
- Skin or mucosal aspects (normo - hyper or hypotrophic, scars and pluri-treatments)
- Arterious or venous, shunt a-v (Capillaroscopy-Scan Doppler)
- Blood flow and pressure (O. videoscopia)
- Other pathologies

VASCULAR ANOMALIES HOW WE CAN TREAT:

SURGICAL (SURGERY OR LASER-SURGERY)
STERIODS - PROPRANOLOL - RAPAMUNE - ENDOXANE
(*INFANTILE HEMANGIOMAS*)
ENDOVASCULAR APPROACH
(INTERVENTIONAL RADIOLOGIST)
EMBOLIZATION
SCLERO-THERAPY
LASER-THERAPY UNDER U.S. GUIDE
STAY AND SEE

BASIC LASER SYSTEMS



- I.p. 532nm spot 2-10mm

(PWS-Teleangectasia-Hemangioma)

- FPDL 577-600nm spot 2-14mm

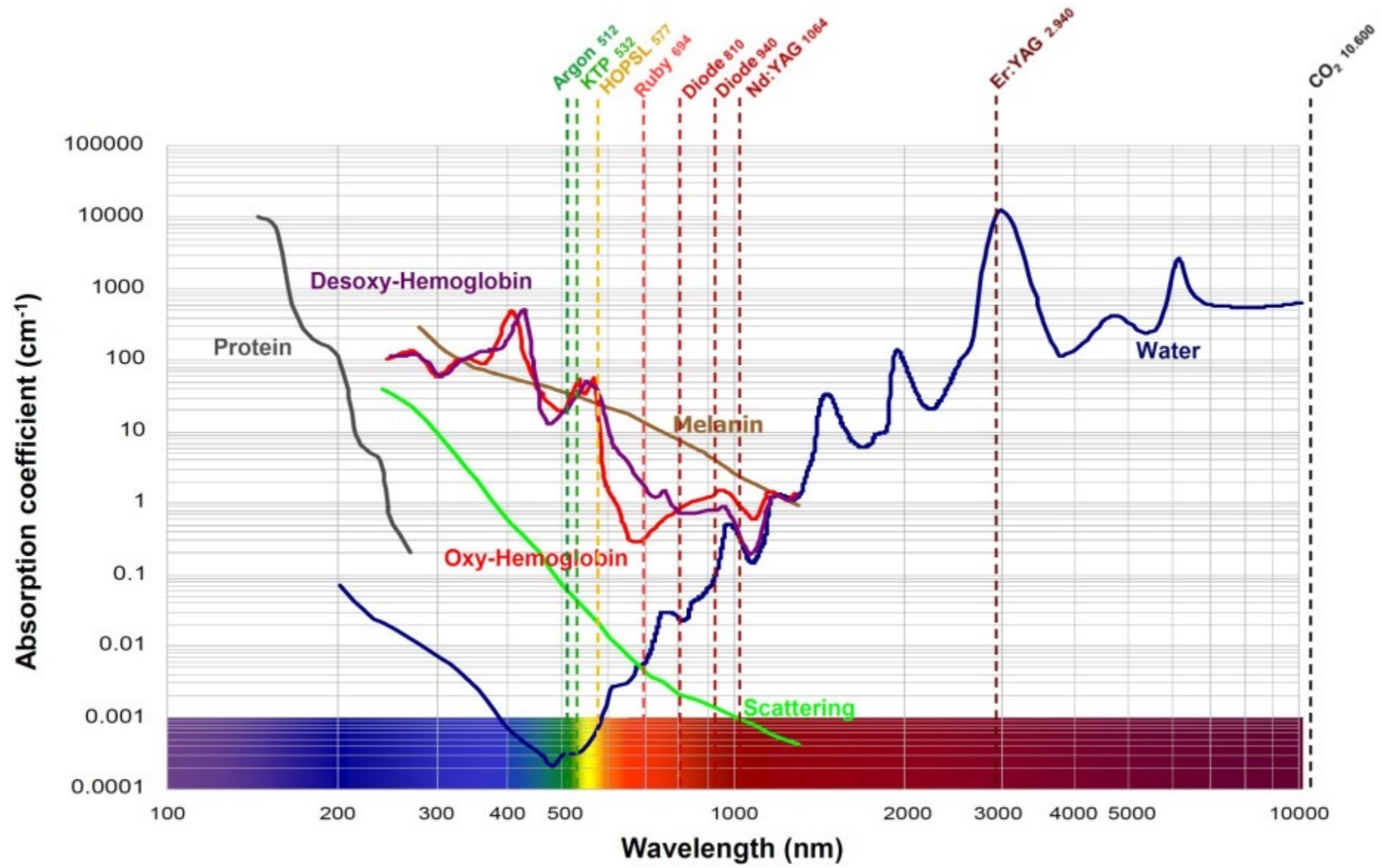
(PWS-Teleangectasia)

- Nd:YAG 1064 nm and Diode 810-1420nm

Transcutaneous or Fiber Optic - H.P.P. Long pulse

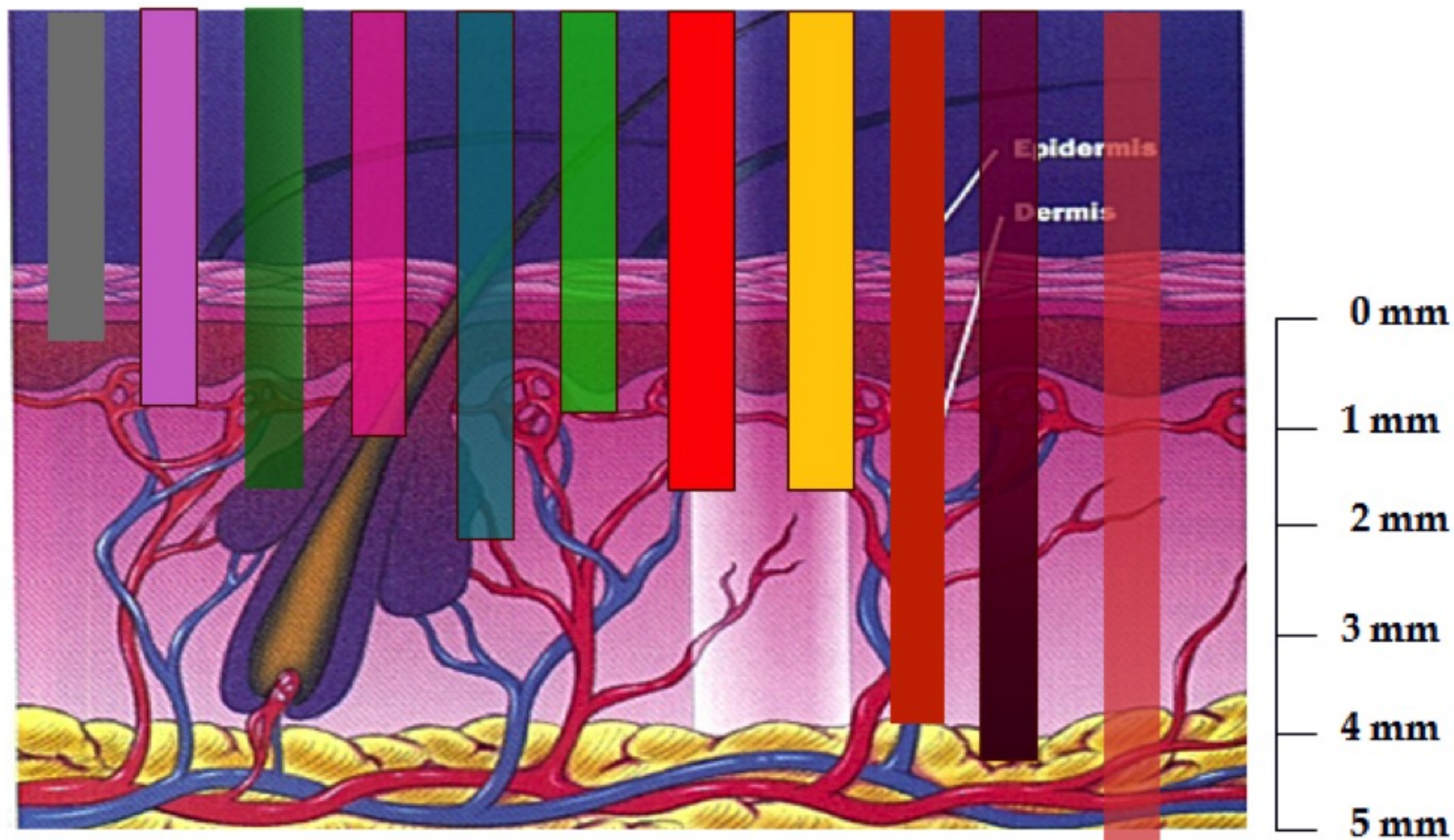
(Cavernous hemangioma-Venous M. large vessels 4mm?)

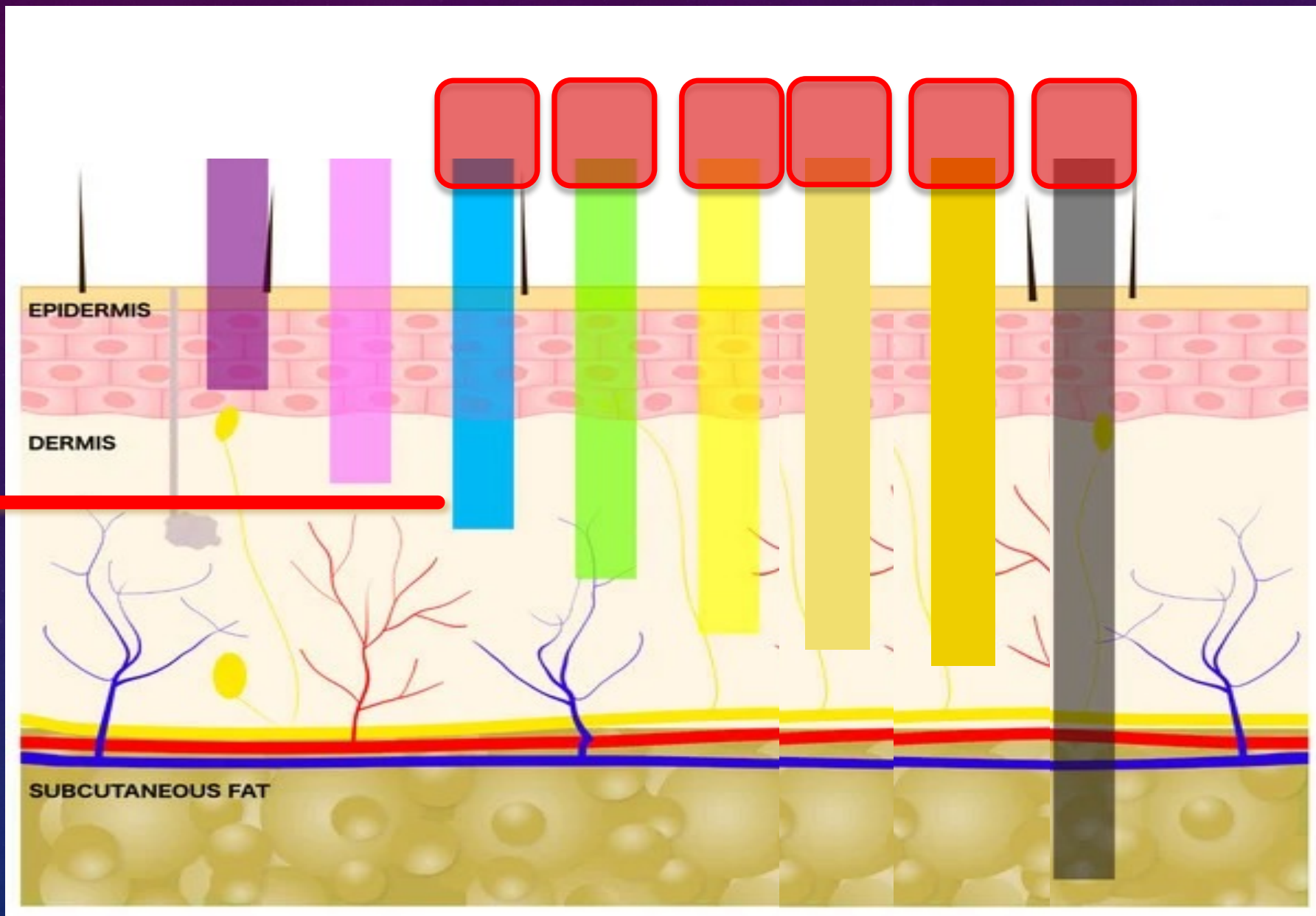
- CO2 and Diode - Ftc - Surgical technique



Depth of Penetration by Wavelength

ErYAG	CO ₂				KTP	Ruby	PDL	Alex	Diode	NdYAG
2940	10,600	1550	1440	1320	532	694	585	755	810	1064





TELEANGECTASIE CAPILLARO-VENOSO SUPERFICIALE

- DYE LASER 595 nm
 - FLUENCE 5-20 J/CM²
 - SPOT 3-15 mm P.D. 0,45 micron-40 Msec.
 - Deep Penetration 0,4-2,8 mm
- 532 nm LONG O INTENSE PULSE
 - FLUENCE 8-15-30 J/CM²
 - SPOT 2-10 mm P.D. 5-40 Msec.
 - Deep Penetration 0,3-3,2 mm
- Nd:Yag 1064 nm Long Pulse
 - FLUENCE 60-380 J/CM²
 - SPOT 1-5 mm P.D. 10-20 Msec.
 - Deep Penetration 0,4-4,8 mm
- DIODO 577 nm
 - FLUENCE 20-50 J/CM²
 - RECTANGULAR SPOT 2X6 mm P.D. 30/60 Msec.
 - Deep Penetration 1,2-3 mm

RETICOLARI VENULARI VENO-LINFATICO

- 532 nm Long o Intense Pulse FLUENCE 20-36 J/CM²
- SPOT 3-6 mm P.D. 20-50 Msec.
- Deep Penetrecion 1,8-2,6 mm
- Nd:Yag 1064 nm FLUENCE 140-280 J/CM²
- SPOT 3-6 mm P.D. 10-30 Msec.
- Deep Penetrecion 2,5-4 mm
- DIODO 980 nm ENDOVASCOLARE FIBRA OTTICA 200-360 Micron
- W 2,5 -6 MODALITA' PULSATO

- Protocolli Laser vascolari Centro Laser Clinico 2022
- Dott. Prof. E. Berne' et al.

PORT-WINE STAINS EVOLUTION IN TIME





FROM “OLD” TO “NEW” DYE LASER LOOKING FOR A *GOLD STANDARD*

HIGHER FLUENCE
LONGER PULSE DURATION
BIGGER SPOTS
MORE EFFICIENT COOLING SYSTEMS
BEST SELECTIVE PHOTOTHERMOLISYS

THE “OLD STYLE ” DYE LASER 585 NM: RETICULAR PATTERN AFTER ONE SESSION



INCREASED SPOT SIZE WITHOUT COMPROMISING FLUENCE

Fluence at 12 mm 10.6 J/cm^2
Fluence at 15 mm 6.8 J/cm^2

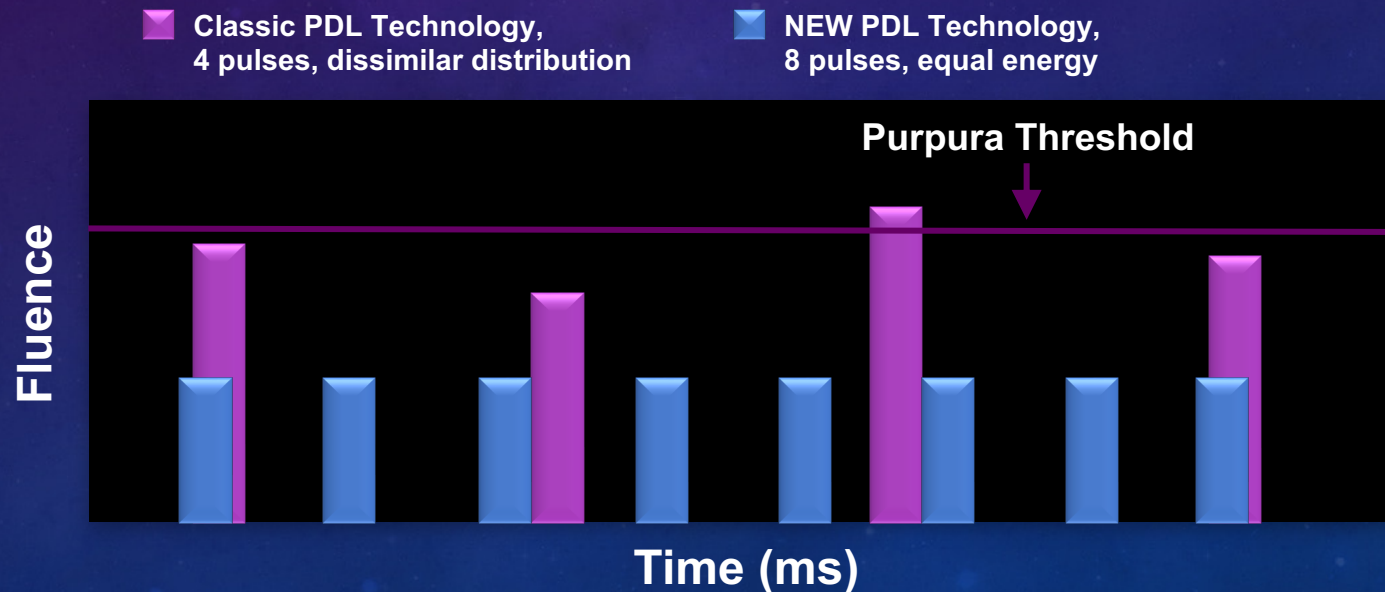
- The new laser system includes increased maximum fluence and spot size from 12mm to 15mm
- Deeper Penetration, Higher Effective Fluence
- 15mm spot allows for a faster treatment than previous machine



A treatment that would take **100 pulses** with a 12mm spot size would only take only **64 pulses** with a 15mm spot size.

VBEAM SYSTEM DIFFERENTIATOR – 8 MICRO-PULSES

- Eight equal energy pulses
- Closely mimics one continuous pulse
- Still Delivers Required Vessel Coagulation Fluence



Cheek and Neck PORT-WINE STAIN

3 SESSIONS – DYE LASER 585 nm
7-9 j/cm² 7 mm spot 400ms pulse duration



“TELANGECTATIC SUPERFICIAL INFANTILE HEMANGIOMA” IN
EVOLUTIVE PHASE AND *EVOLUTION OF TECHNOLOGIES*
DYE 595 NM 1 SESSION (1998)



ULCERATIVE AND BLEEDING COMPLICATION OF INFANTYLE HEMANGIOMA»
RESTORATION OF TISSUE WITH DYE LASER 595 NM -1 SESSION (1999)



INTERAZIONE LASER-TESSUTO

L'elenco di seguito riportato si riferisce e riassume le proprietà del PDL 595nm e del laser CO₂ frazionato

- Up-regulation delle Heat Shock Proteins (HSP72, HSP73, HSP47)
- Up-regulation delle MMP-1 (*metalloproteinasi della matrice*)
- Down-regulation dei livelli TGF- β 2, TGF- β 3 e β FGF immediatamente dopo il trattamento ma aumento di TGF- β 3 2 settimane dopo il laser
- Down-regulation di CTGF (*connective tissue growth factor*)
- Sensibile incremento della espressione di miR-18a e miR-19a

TRATTAMENTO COMBINATO EMANGIOMA VOLTO PROPRANOLOLO-LASER DYE 595NM



“THE DEEP IMPACT OF PRIMA LASER”

DYE 595 NM LARGE SPOT – HIGH FLUENCE



FOCAL RECIDIVA POST-TREATMENT DYE 595 NM – 532 NM I.P.





2000

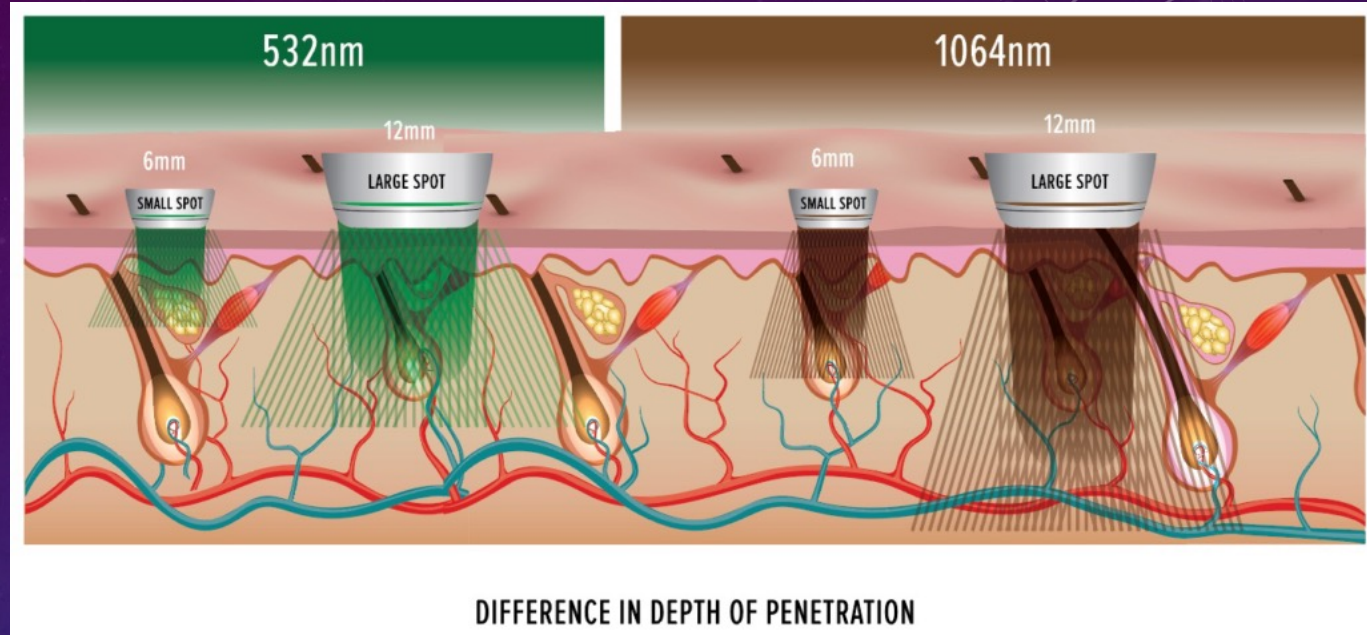


2017

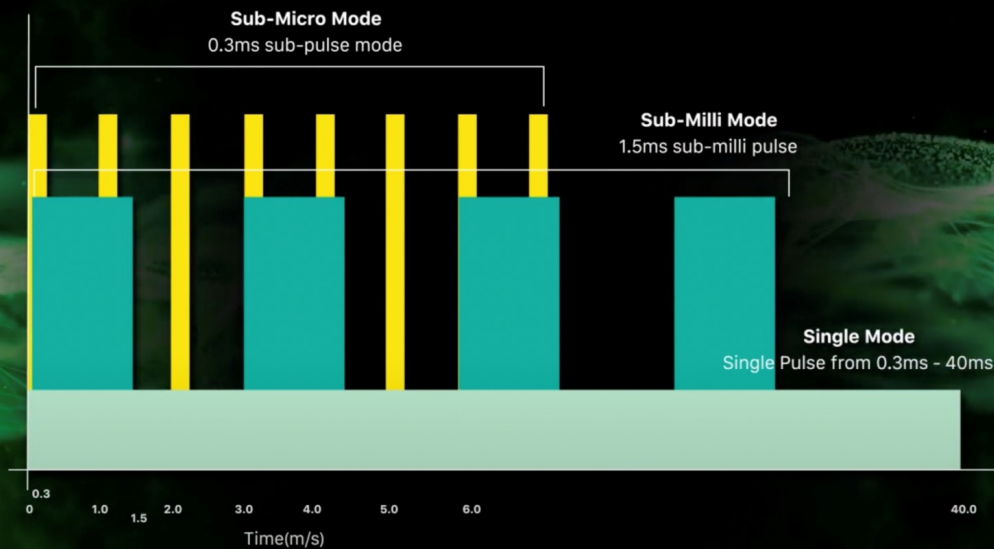


2018

LASER 532 – 1064 NM

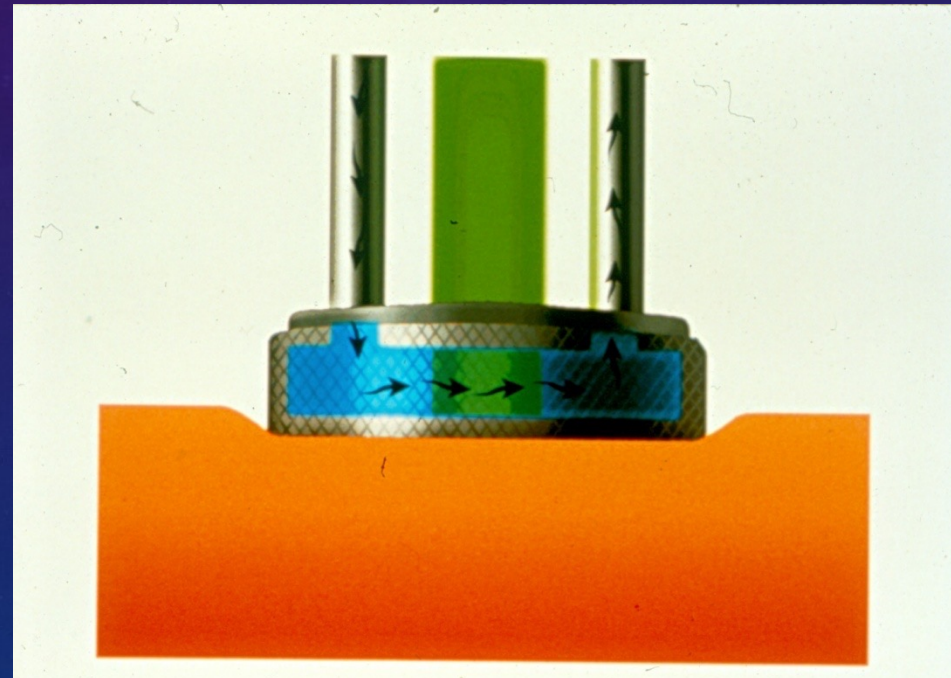
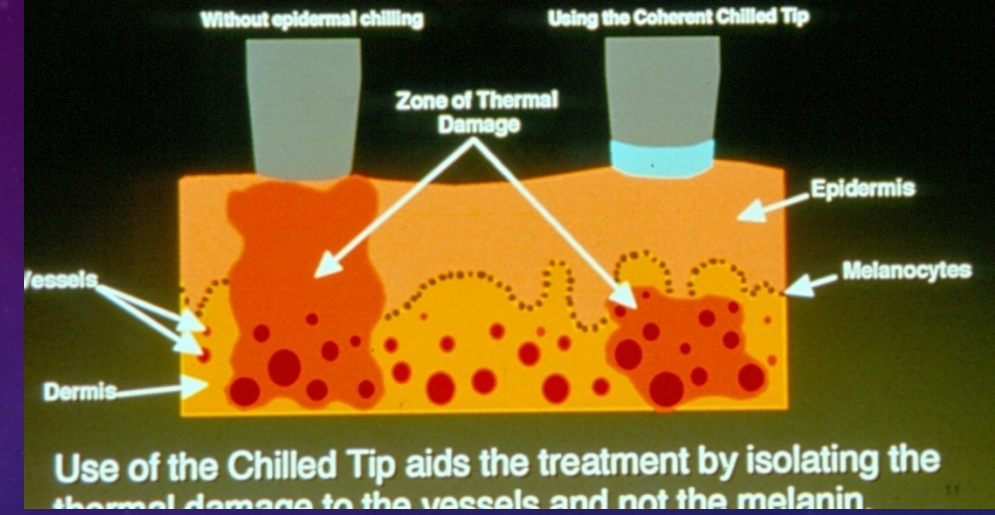


Delivering **safer** and **superior** results in the process.





Cooling the skin limits the zone of thermal damage



LASER 532 NM
INTENSE PULSE
17 J/CM2 - 15 MS
SPOT 4 MM
COOLING SYSTEM



EYELID HEMANGIOMA

LASER 532 NM

CRYOGENIC COOLING SYSTEM

12 J/CM2 15 MS 3MM SPOT SUB-MILLI MODE

1 SESSION

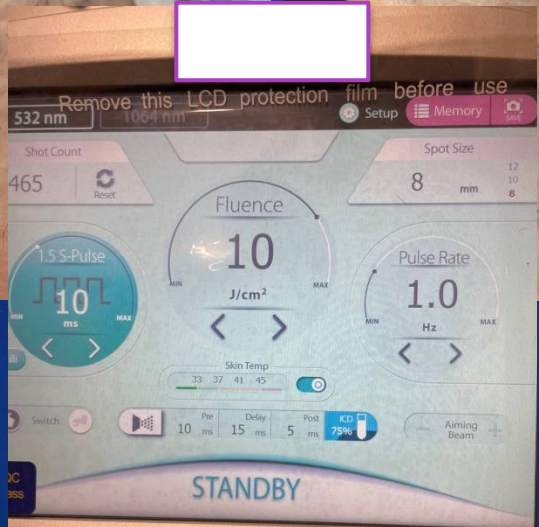






LASER 532 NM (L. P. RAFFREDDAMENTO CRIOGENICO)





PORT-WINE STAIN
532 NM INTENSE
PULSE
4 SESSIONS





DYE LASER 595 NM (VBEAM)

2 SESSION (13 MM SPOT -9 J-1,5 E 3 MS)

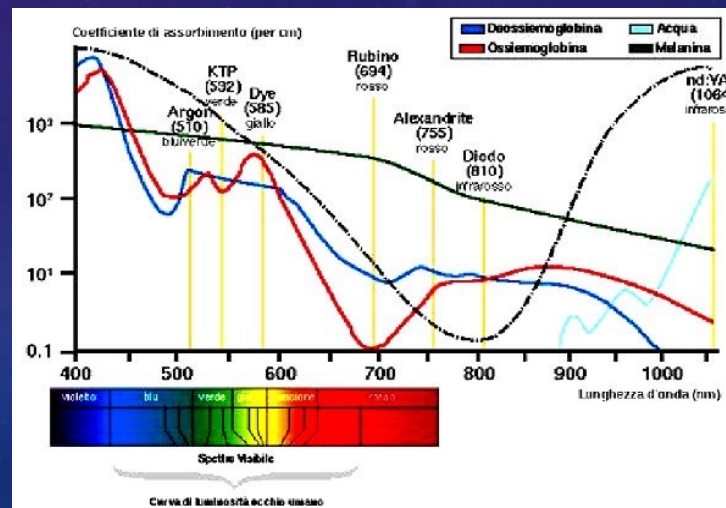
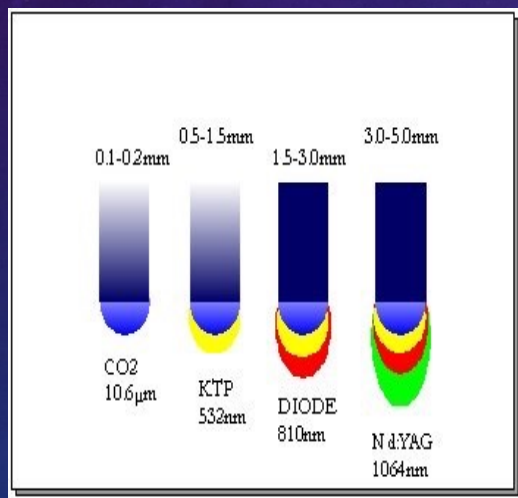
AFTER MULTI-TREATMENTS LASER 595 ,OLD
GENERATION.

“

Laser 1064 nm

- Absorbtion not elective (Hb-Melanin-water)
- Higher absorbtion by the water
- Deep penetration (4-7nsec>300 j>5-8mm)
- Thermal effect no selective photothermolysis
- Control of thermal effects in photocoagulation ????

”



Very attention in pediatric treatment

VENOUS MALFORMATION

LASER 1064 NM L.P. E 532 NM I.P.



VENOUS LOW-FLOW ANOMALY: 1064 NM CRYOGENIC COOLING SYSTEM

160 J/CM² -- 20 MS - SPOT 7 MM



THE DEEP IMPACT OF “1064 NM” LASER VENOUS MALFORMATION

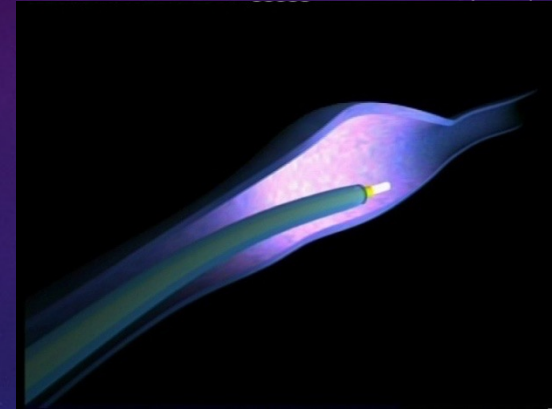


THE DEEP IMPACT OF “1064 NM” LASER



CONSIDERATION ABOUT EVLT ND:YAG>>DIODE

- ❑ Surgical technique echoassisted
- ❑ Transdermal - Transmucosal.
- ❑ Treatment of deep lesions
- ❑ Advantage in use of optical fiber
- ❑ High coagulative ability but
- ❑ High hemorrhagic risk
- ❑ Accuracy in evaluation of thermal risk





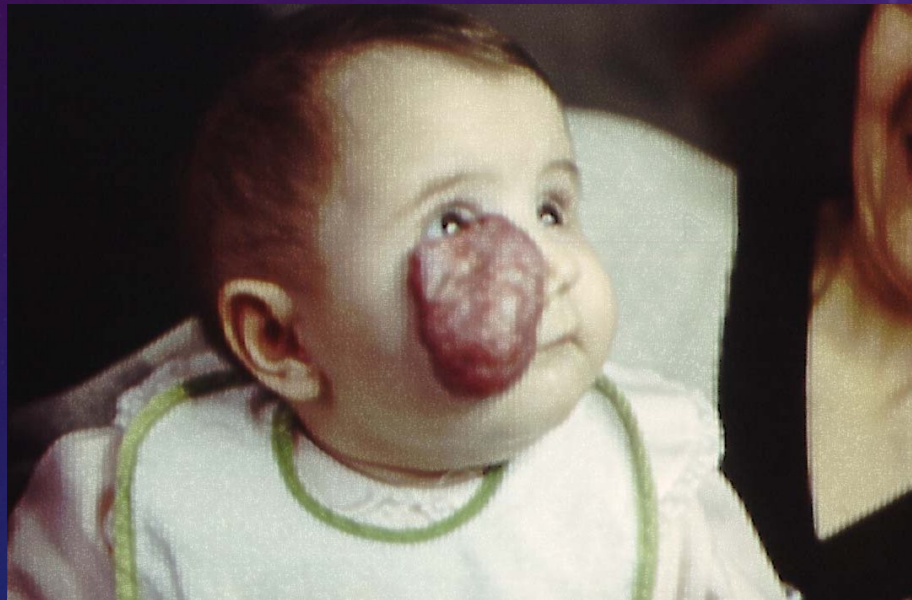
EMANGIOMA
LASER 1064 _{NM}
FIBRA OTTICA 600 MICRON

1992



EVOLUTION OF IMMATURE CAPILLARY ND:YAG LASER 1064 NM OPTICAL FIBER INTRALESIONAL 1990

Before



After

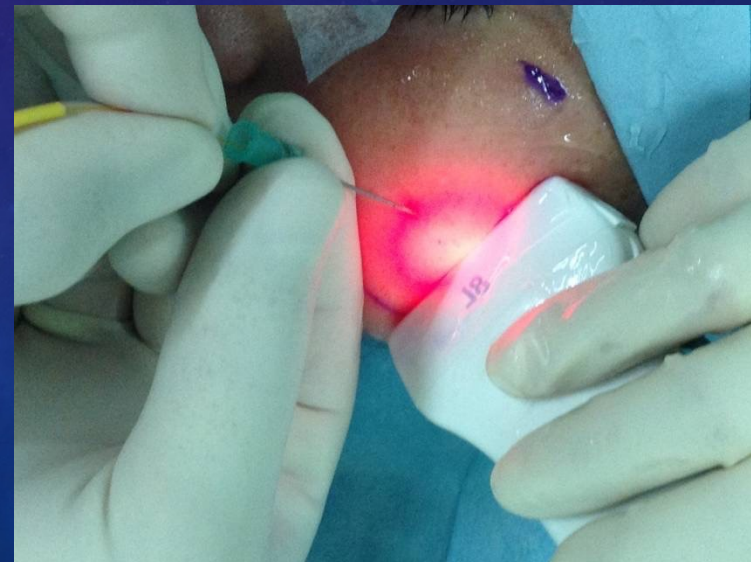


Lip Haemangioma:
Endolesional – transmucosal treatment
Laser Nd:YAG 1064 nm - optical fiber 600 micron



LYMPHATIC MALFORMATION

DIODO 1470 NM - OPTICAL FIBER 600 MICRON



CHEEK'S HEMANGIOMA

DIODE LASER 980NM OPTICAL FIBRE 600MICRON



VENOUS MALFORMATION

DIODE 980 NM ENDOLESIONAL OPTIC FIBER



VENOUS MALFORMATION

DIODE 980 NM OPTICAL FIBER 200 MICRON



VENOUS MALFORMATION WITH A-V FISTULAE

DIODO 980 NM
4-6 W CONTINUOUS MODE CHILLED –TIP COOLING S.





Photocoagulation - 2 sessions
Diode 980 - Fiber 200

ALVEOLAR AND GINGIVAL HYPERPLASIA
PYOGENIC GRANULOMA LIKE
532NM OPTICAL FIBER-HANDPIECE SPOT 2MM





UPPER LIMB HEMANGIOMA
PARTIAL INVOLUTION
DIODE 980 NM
OPTICAL FIBER 400MICRON





COMBINED TREATMENTS
DYE LASER 595 nm
CO2 (ABLATIVE)/FRACTIONAL
ERBIUM-YAG
ENDOLESIONAL OF/980-1470 nm
10.600/1540 nm:THE NEW
FRONTEER

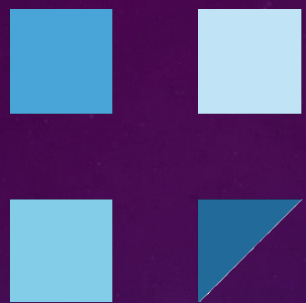


HYPERTOPHIC SCARS DUE AT INADEQUATE WAVELENGTHS









Centro Laser Clinico



Grazie per l'attenzione



Magenta Medical Center

MILANO - C.So Magenta 46

Centro Clinico via Milano

Centro Laser Rho

Ambulatori Specialistici - Estetica - Laser - Odontoiatria

RHO - Via Milano 8

