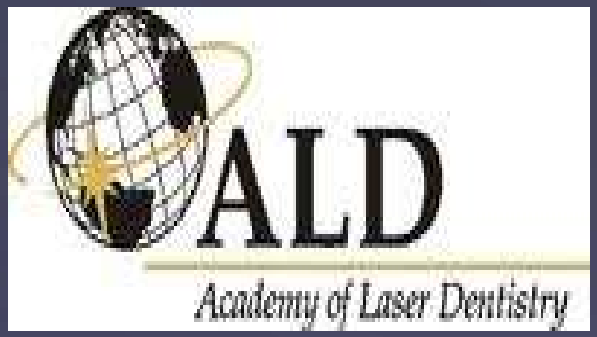
Diode Lasers In the Hygiene Operatory

Heidi Christopher RDH, FWCLI

My Laser Education

- 6 Standard Proficiency Certificates
- Advanced Laser Periodontal Certificate
- Full Fellowship from WCLI



CDA Journal – January 2017

"Benefits of using Lasers in Dental Treatments Validated"

Today's Agenda

- What is laser energy
- What types of lasers are used in dentistry
- Which lasers are best for your practice needs
- When & why would you add laser as an adjunct in hygiene

What is LASER?

Light

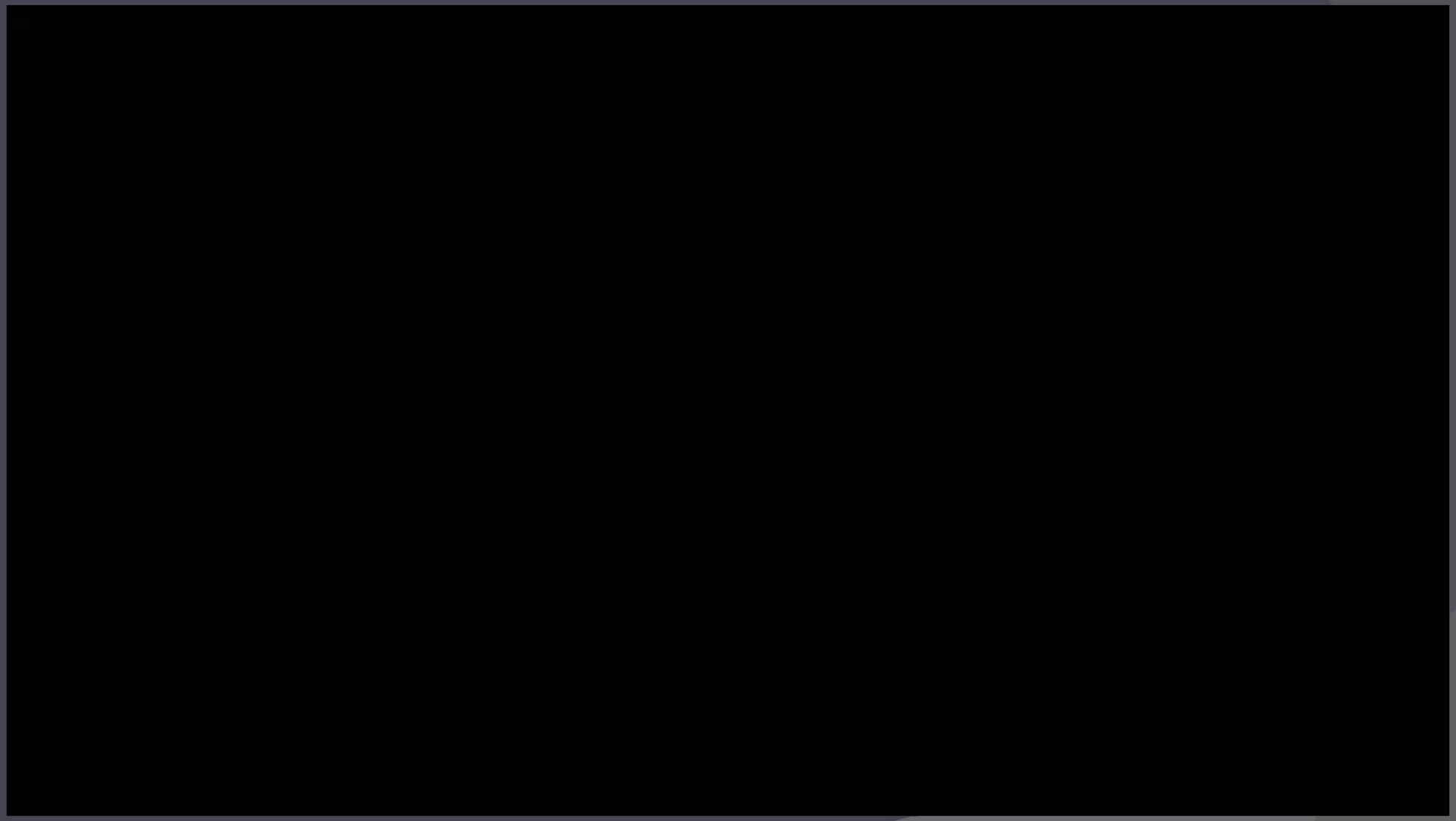
Amplification by

Stimulated

Emission of

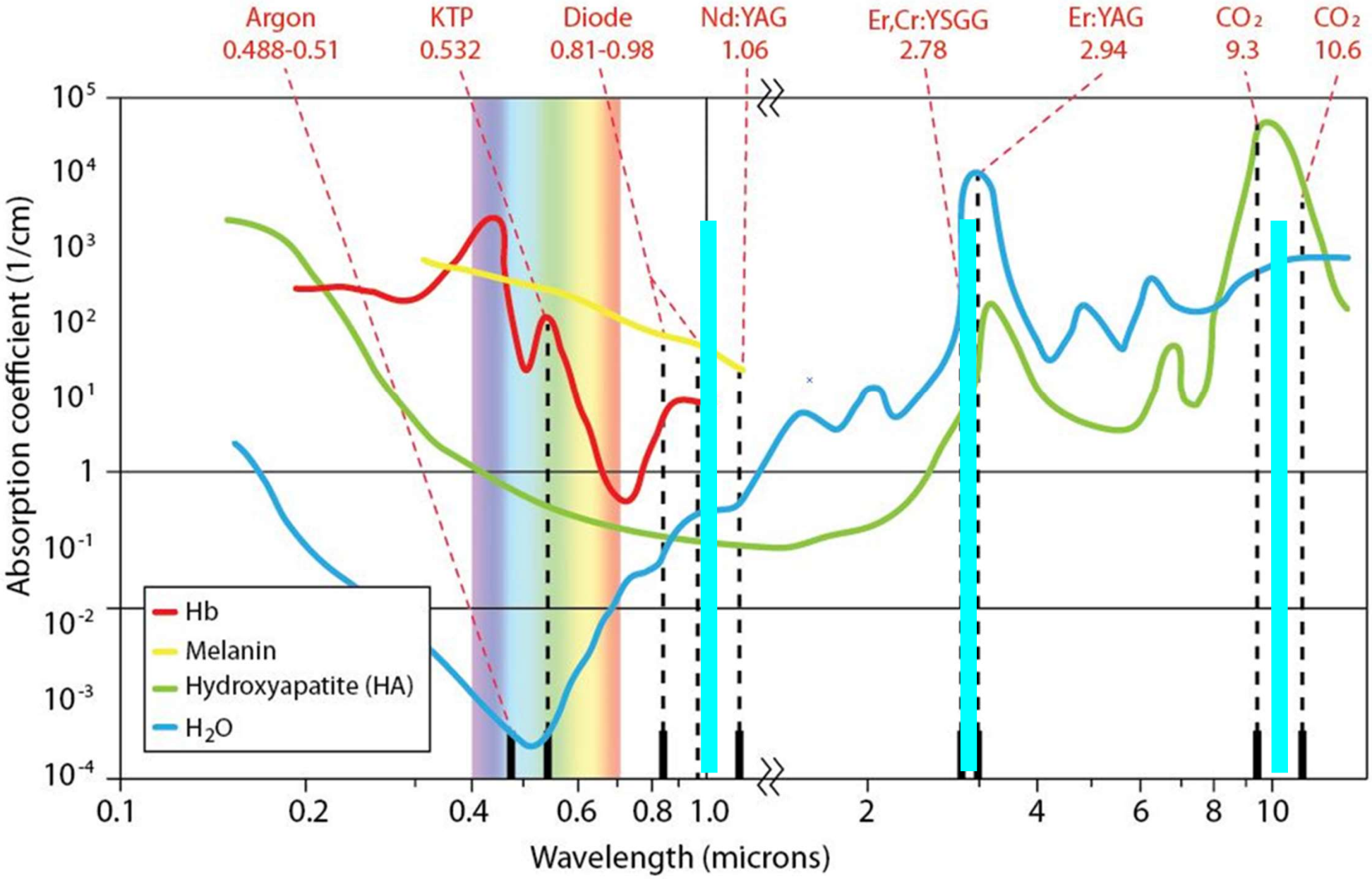
Radiation

Laser Physics



Many Types of Dental Lasers

Absorption curves of various tissue components.



Courtesy of Nick Hartman - Solea Lasers

Approximate Absorption Curves

Medium		Wavelength	Absorbed by
Class 3B lasers		400 – 700 nm	Hgb, Melanin, Resin
Diode	**(Solid)**	**800-1064 nm**	**Melanin, Hgb**
Nd:YAG	**(Solid)**	**1064 nm**	**Melanin, Hgb**
Erbium	(Solid)	2790-2940 nm	Water, Hydroxyapatite
CO	(Gas)	9600-10600 nm	Hydroxyapatite, Water

Erbium & CO_2

CO_2 – Cavity Prep

ErCrYSGG: Deep Pocket Therapy

Diodes


SOL


epic

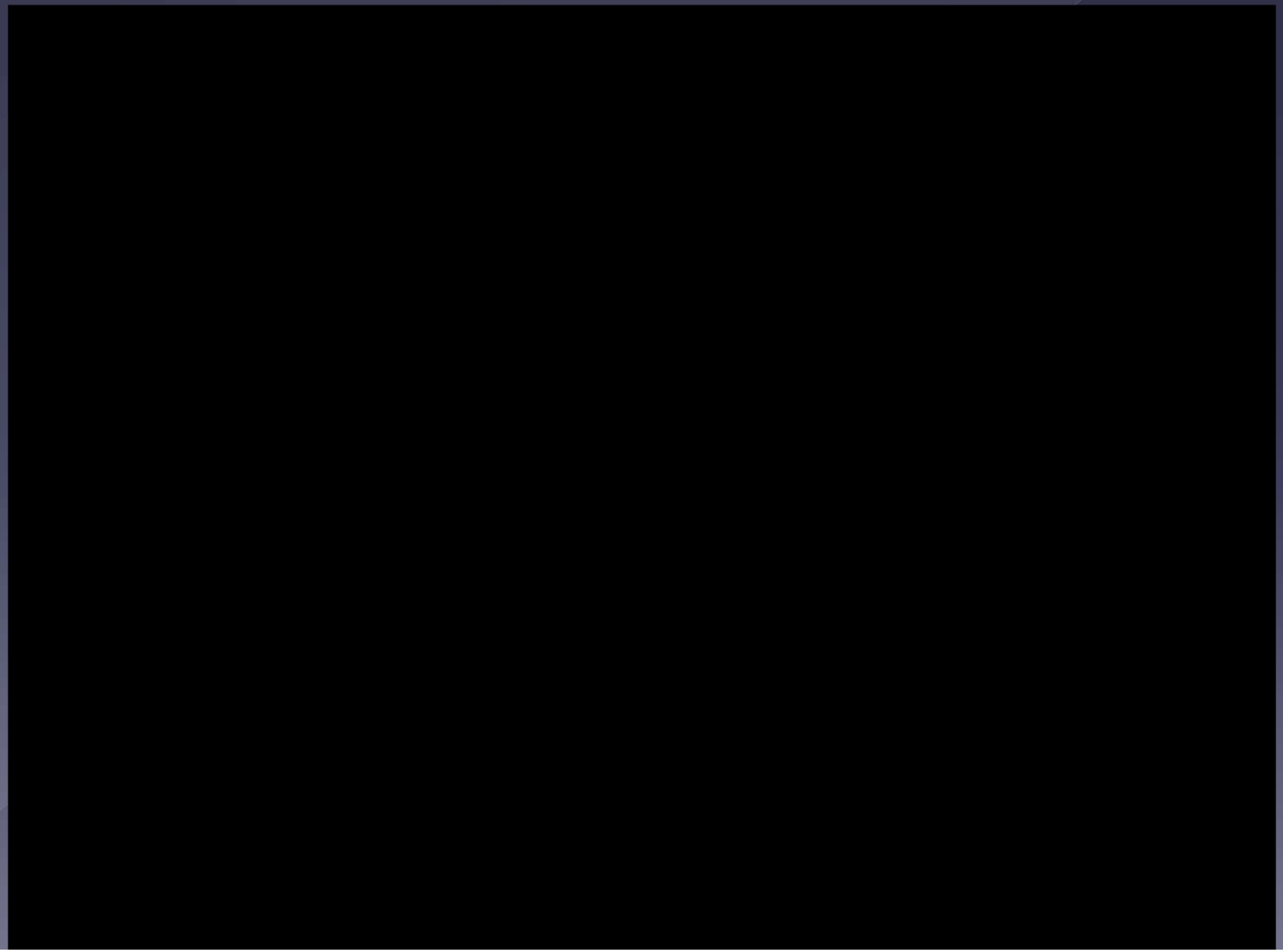

PRECISE
READY


ULTRADENT PRODUCTS INC
810
2.0
980
NON SURGICAL
DECONTAMINATION
DEBRIDEMENT
APHTHOUS ULCER
HEMOSTASIS
SURGICAL
INCISION / EXCISION
IMPLANT RECOVERY
TOOTH EXPOSURE
OPERCULECTOMY
GINGIVOPLASTY
GINGIVECTOMY
FRENECTOMY
PULPOTOMY
PAIN RELIEF
STOP
HOME
PRESET
DUAL
ACTIVE
STANDBY

DDS Procedures

- Gingivectomy
- Frenectomy - Tongue Tie
- Exposure – Ortho & Implant
- Fibroma Removal
- Crown Lengthening
- Troughing
- Esthetic Contouring
- Etcetera…

Implant Exposure



Gingival Contouring

Courtesy of Dr. Binh Dao

Courtesy of Dr. Binh Dao

Courtesy of Dr. Binh Dao

Pigmentation Removal

6 months Post-op

Can Your RDH Use a Laser?

Business and Professions CODE SECTION 1900-1966.6

- 1914. A registered dental hygienist may use any material or device approved for use in the performance of a service or procedure within his or her scope of practice under the appropriate level of supervision, if he or she has the appropriate education, training and experience to use the material or device.

www.dca.ca.gov/dentalhygienecommitteofcalifornia

RDH Procedures

- Laser Periodontal Therapy
  - LBR – Laser Bacterial Reduction
  - LD – Laser Degranulation of diseased epithelium
- Lesion treatments
- Root desensitization

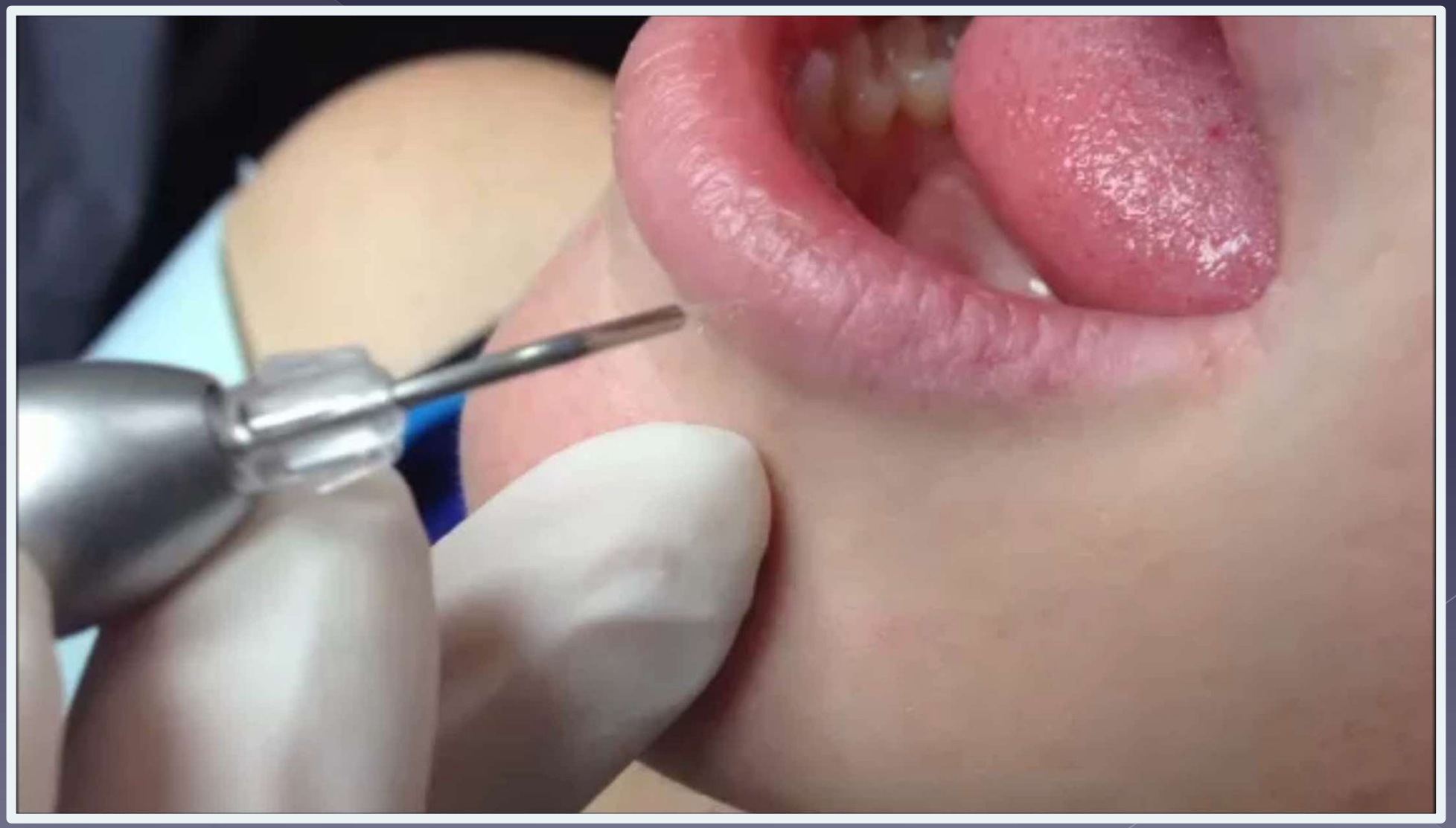
Lesion Treatments RDH

- Aphthous Ulcers
- Herpetic Lesions
- Angular Cheilitis

Lesion Treatments DDS

- Aphthous Ulcers
- Herpetic Lesions
- Angular Cheilitis
- Denture Sores
- Black Hairy Tongue
- Phemphgoid
- Lichen Planis
- Mucoseal
- Chemotherapy Induced Oral Mucositis

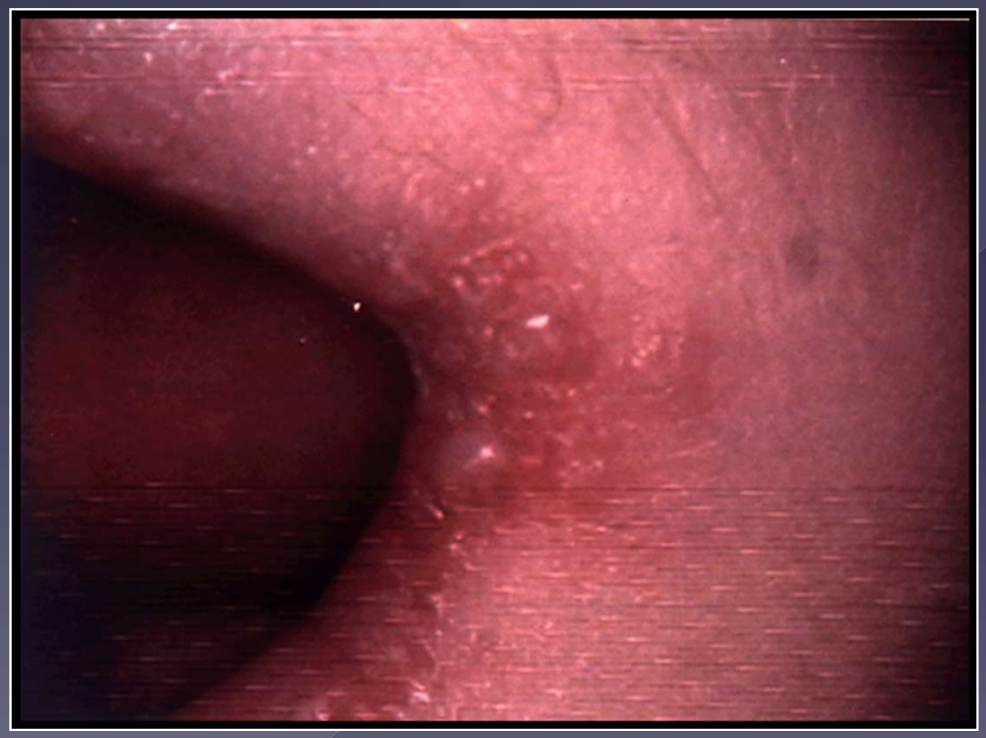
Herpetic Lesion Treatment

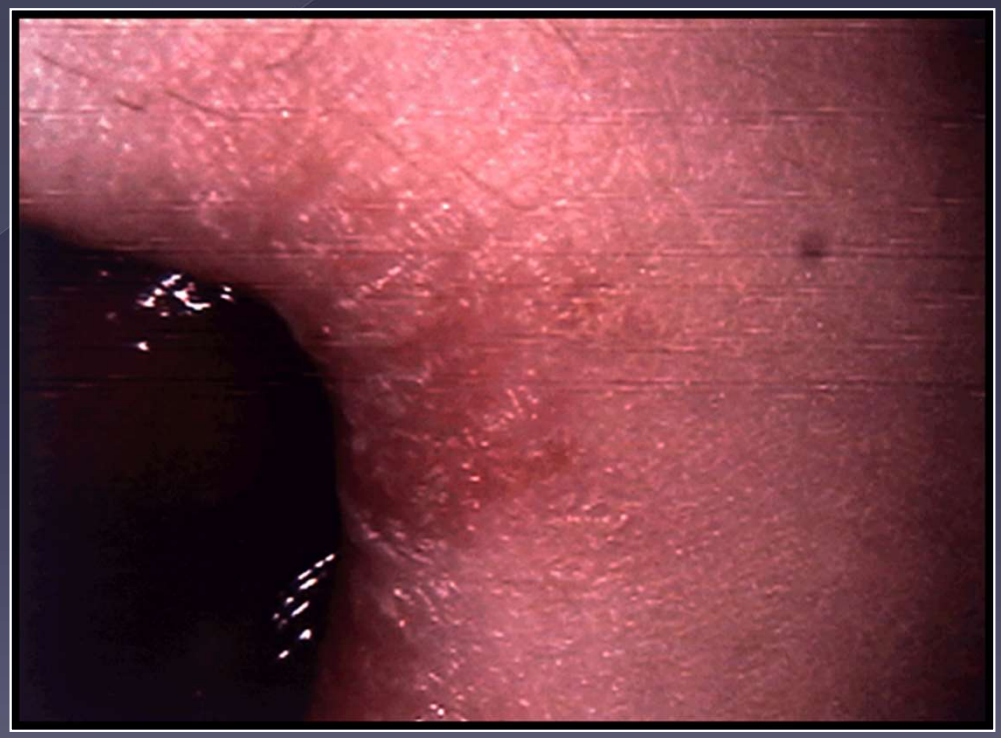


Aphthous Ulcer Treatment

Immediate Post-Op

Herpetic Lesion Treatment





One Day Post-Op

Gr 3 mucositis

Osteosarcoma, MTX 12g/m², L= 417mm³, P= 4.300mm³

After 4 days
Gr 1 mucositis

L=778, P=22.000mm³

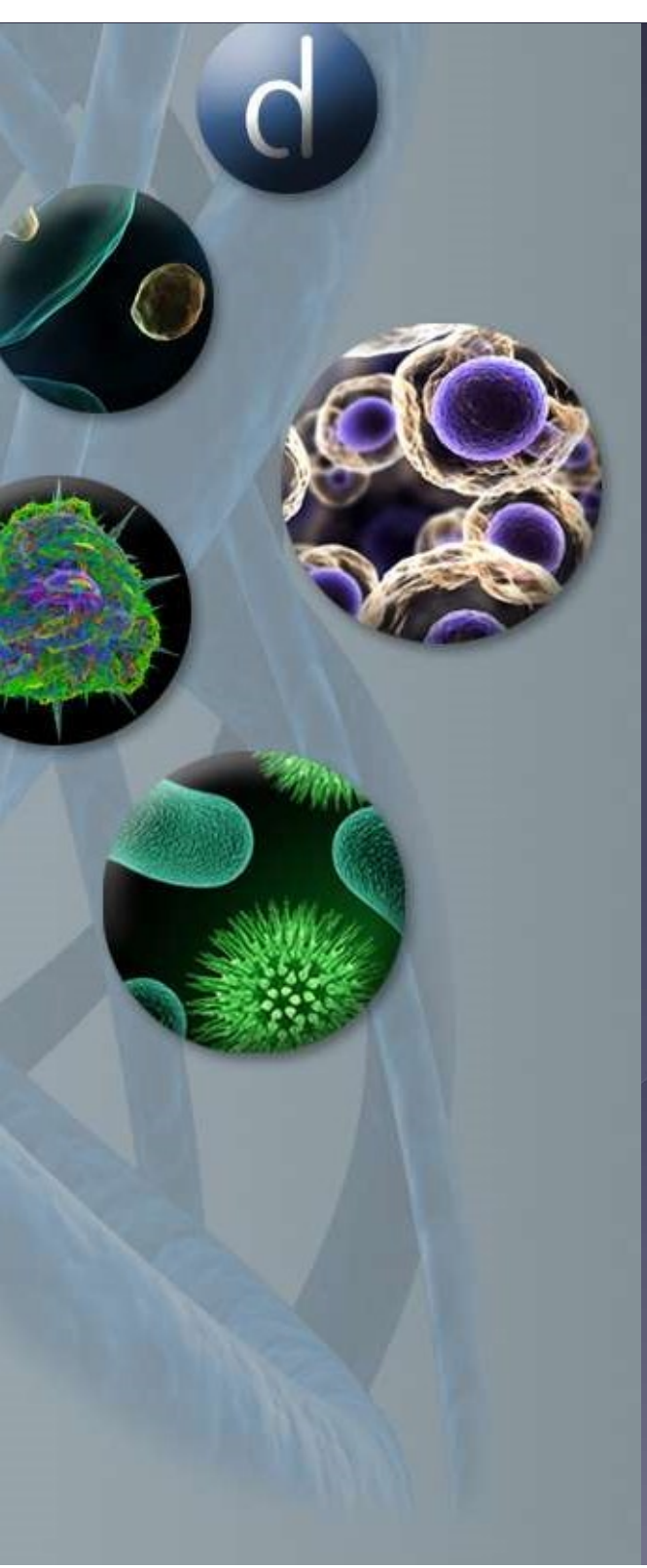
Photos and Research from Meire Maman Fracher Abramoff

Root Desensitization

Periodontal Therapy

Including Diode Laser Adjunct

- LBR – Laser Bacterial Reduction
- LD – Laser Degranulation of diseased epithelium

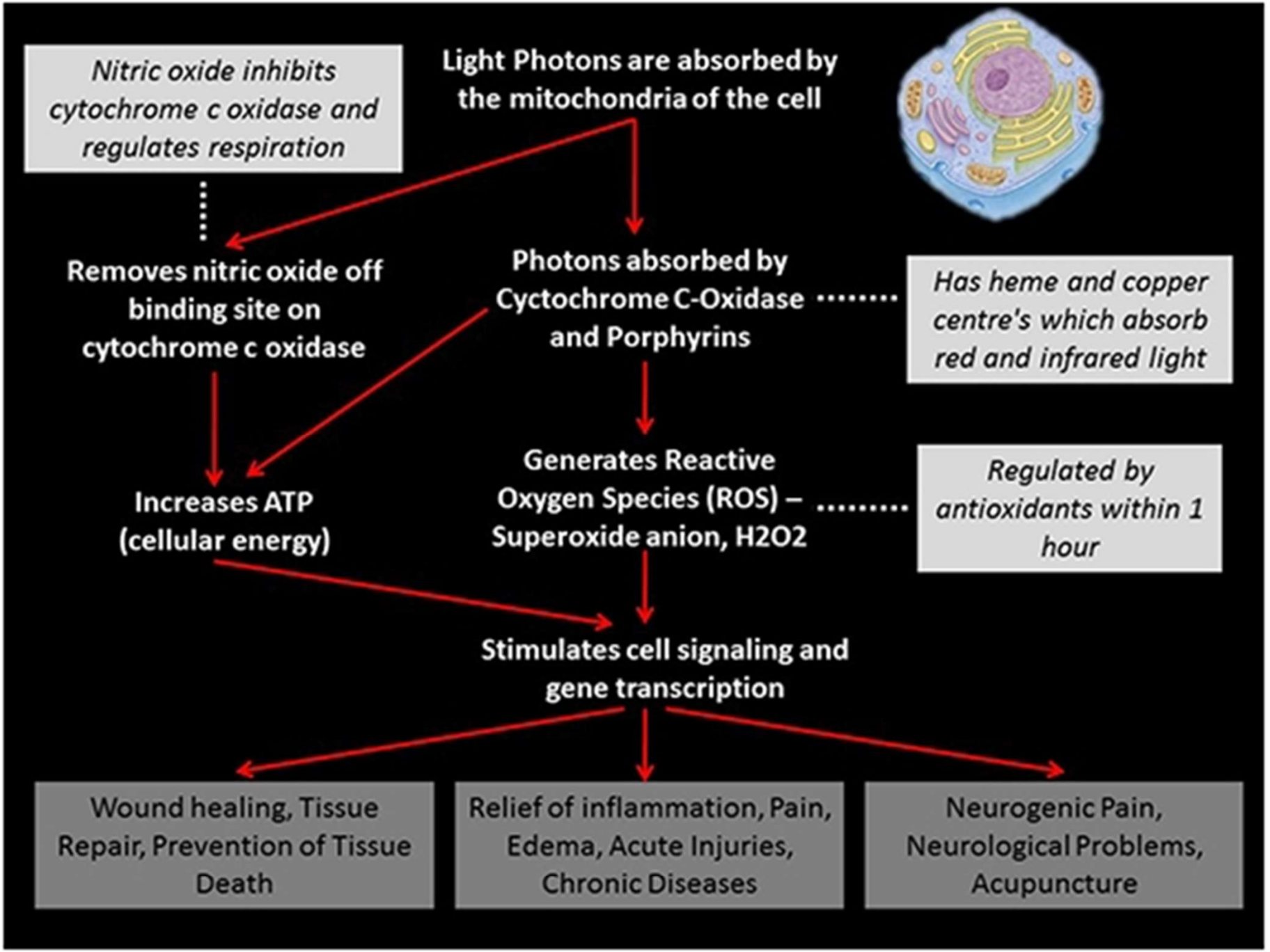


LBR

Laser Bacterial Reduction

AKA:

- Laser Decontamination
- Low Level Laser
- Cool Laser
- Laser Biostimulation
- Photobiomodulation



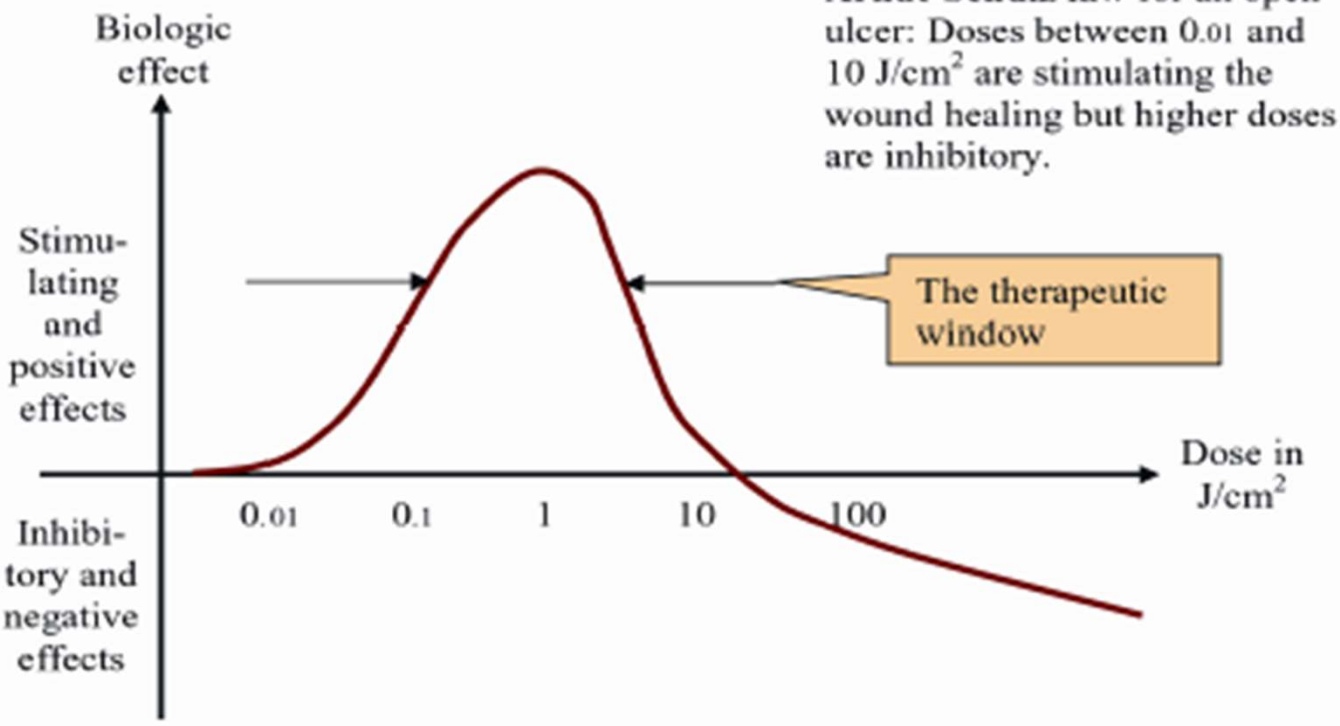
Courtesy of Dr. Gerry Ross

TABLE 1. Secondary Clinical Effects

PBM Result	Clinical Effect
Increased lymphatic flow	Decreased edema (swelling)
Stimulation of β-endorphins (the body's natural pain killers)	Reduction of pain
Reduction in the conduction of c-fibres, which carry pulpal pain	Reduction of pain
Reduction in the release of histamine, bradykinins, and acetylcholine	Reduces the pain associated with inflammation
Stimulation of osteoblasts, odontoblasts and fibroblasts	Stimulate the growth of bone, dentin an soft tissue, respectively
Increased activity of neutrophils and macrophages	Assist in the resolution of inflammation and tissue damage

Courtesy of Dr. Gerry Ross

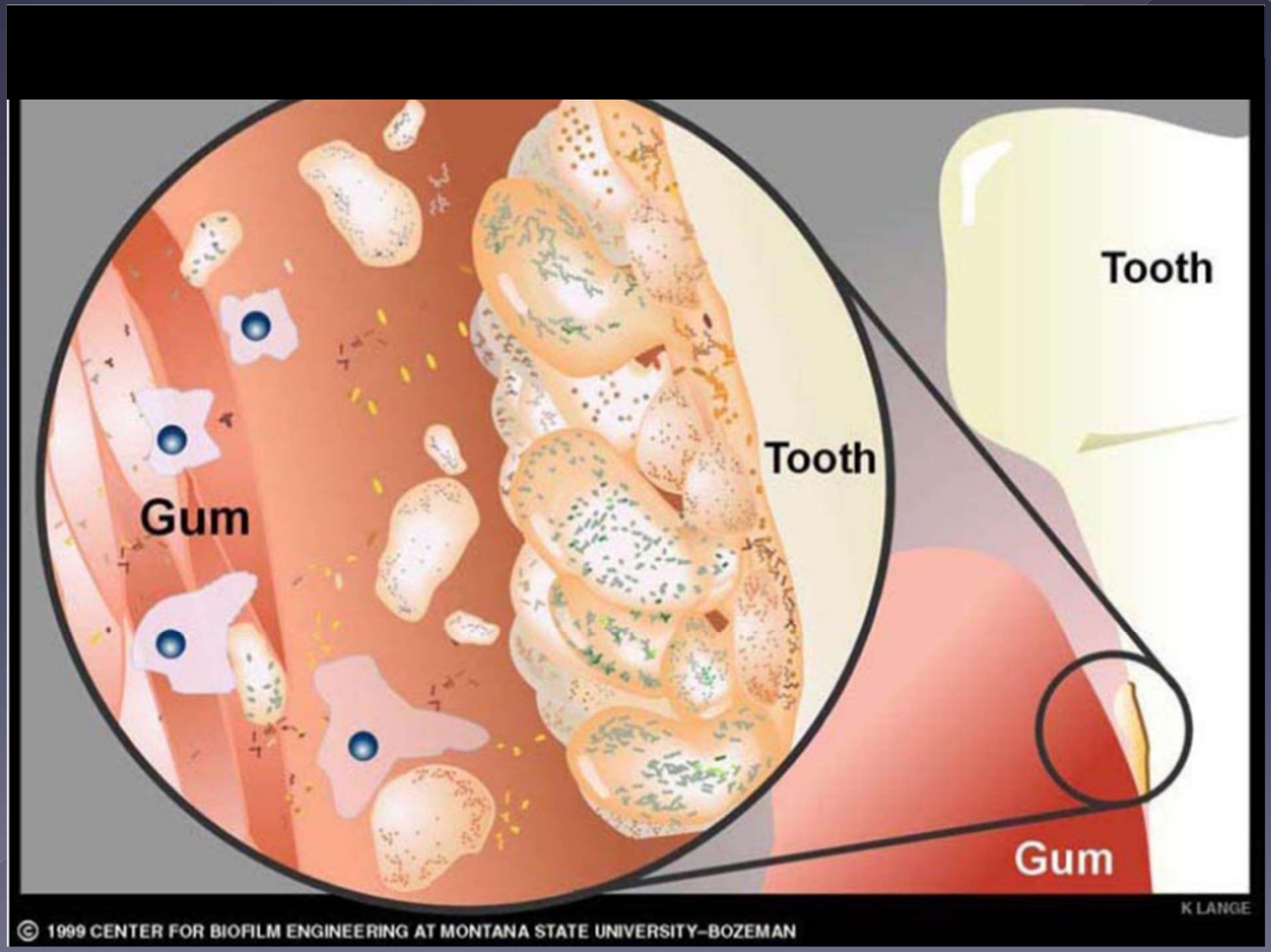
J/cm²



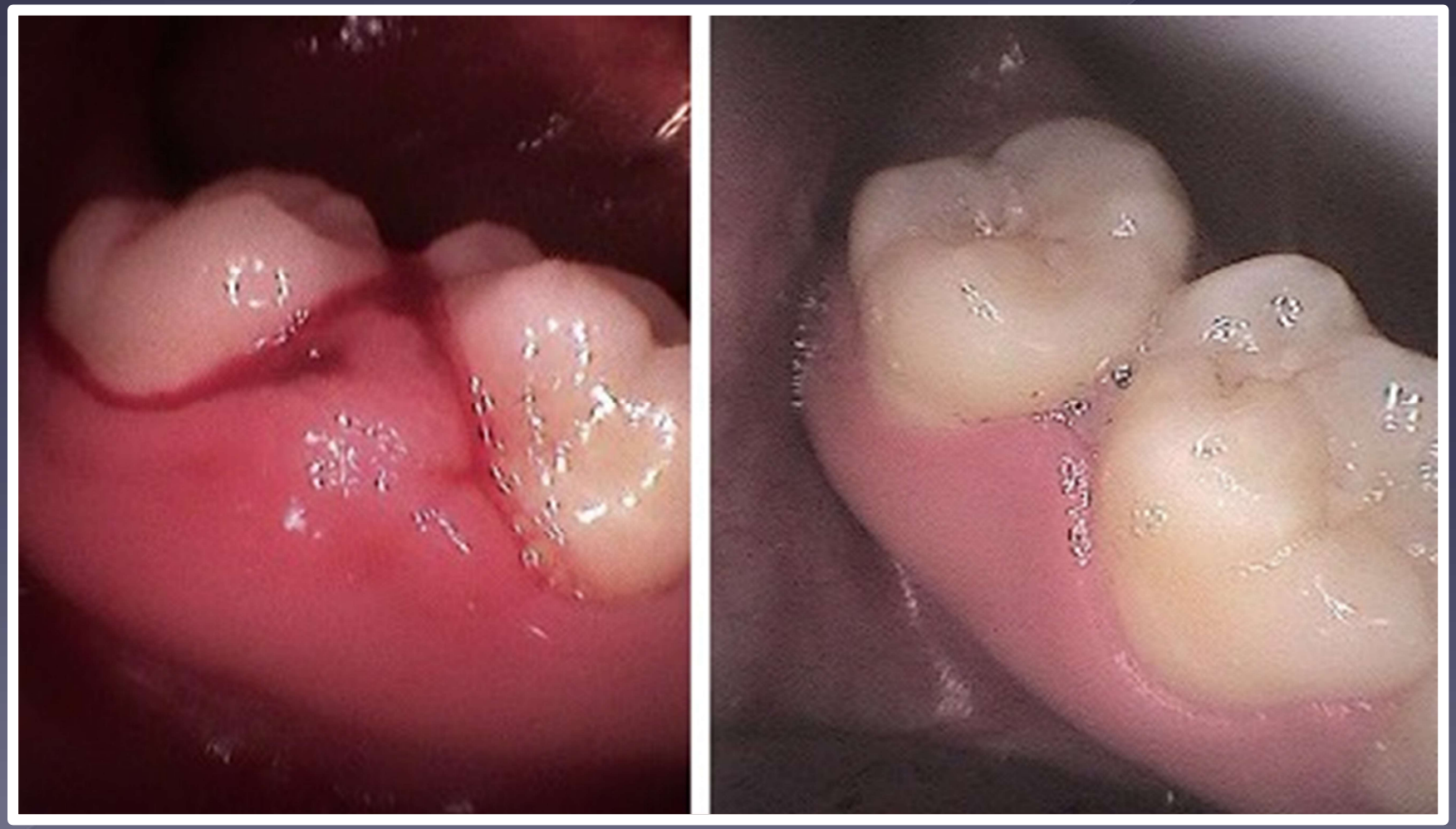
This is a dose (energy density) response curve and there is a similar one for the power density.

LBR Technique

LBR


Tooth
Tooth
Gum
Gum
K LANGE
© 1999 CENTER FOR BIOFILM ENGINEERING AT MONTANA STATE UNIVERSITY–BOZEMAN

LBR

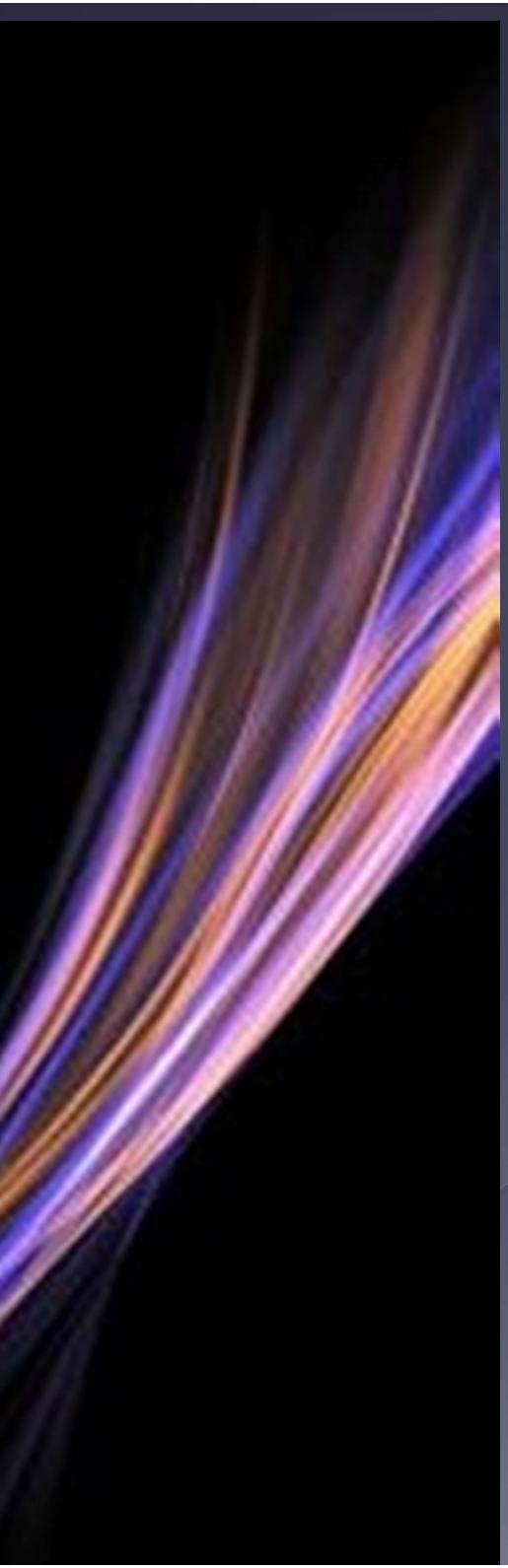


Photos courtesy of Hans Schleicher, DDS

36 hours post-op

When would we provide LBR?

- Perio Therapy?
- Maintenance?
- Perio Abcess?
- Prophy?



LD

- Laser Degranulation
- Laser Curettage
- Laser Sulcular Debridement
- LAPT

LD Technique

Before & After

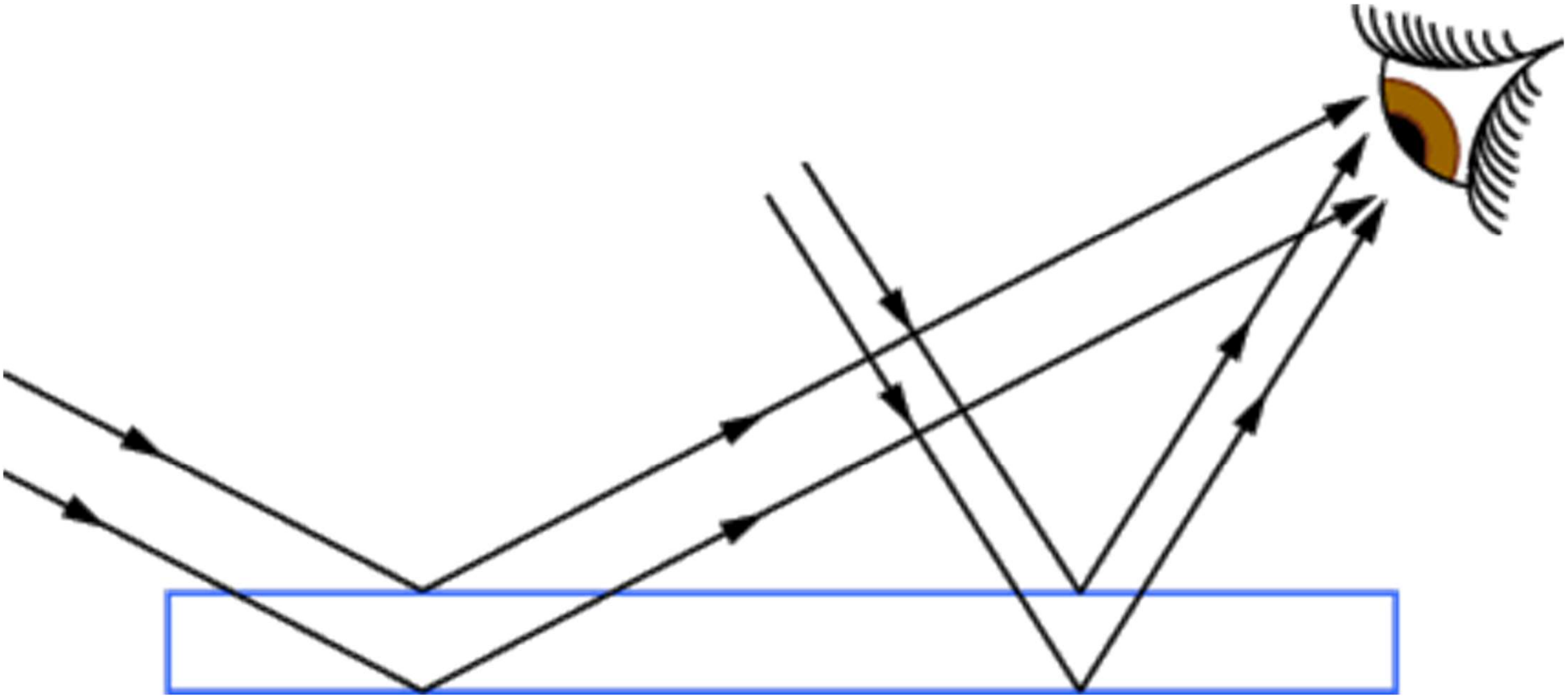
When would we provide LD?

- Perio Therapy?
- Maintenance?
- Perio Abcess?
- Prophy?
- Anytime there is diseased tissue

Laser Safety

- Burn
- Plume
- Sharps
- Eyes
- Flammable

The danger of laser light



Laser Danger


Oxyfine
Pro
PROCEDURES
810
GEMINI
GEMINI

Current Concepts of Laser Therapy

"Incorporating laser therapy on a daily basis offers an endless list of benefits for patients, clinicians and the overall health of the practice

An invaluable and multifaceted tool"

Dr. Gerry Ross

Conclusions

- Diode lasers are a multifaceted tool
- Laser light can be a beneficial adjunct when treating periodontal disease
- Laser can effectively treat many oral lesions
- Treatment protocols are technique sensitive
- Knowledge of treatment parameters and laser-tissue interaction is important
- Understanding Laser Safety Protocols is imperative
- In California, appropriate education and training required for an RDH to use a laser

Resources:

Academy of Laser Dentistry (ALD)
Las Vegas Institute Global
World Clinical Laser Institute (WCLI)
International Center for Laser Education (ICLE)
Loma Linda University School of Dentistry
Ron Kaminer, DDS
Charles M Cobb, DDS, MS, PhD
Glenn van As, DMD, B.Sc.
Philip M. Hudson, DDS
James Jesse, DDS
Gerry Ross DDS

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