



**Advanced Dental Hygiene presents:**

# **ROLE OF LASERS IN HYGIENE**

Presented by:

**Joy Raskie, RDH**



# Joy Raskie, RDH

**CEO AT ADVANCED DENTAL HYGIENE |  
DENTAL LASER INSTRUCTOR | SPEAKER | EDUCATOR |  
CONSULTANT | CLINICAL DENTAL HYGIENIST**



Get to know me!

# OBJECTIVES



Gain an understanding of new trends with lasers, how lasers have transitioned over the years and explore current research into lasers in hygiene



Examine how lasers work and what lasers are doing inside the body to help patients achieve their best oral health



Identify ideal patients for laser treatment, what kind of results to expect and how to increase profits utilizing lasers



Master tips to effectively implement lasers into every hygiene schedule and how to elevate your current laser therapy plan by introducing advanced laser modalities

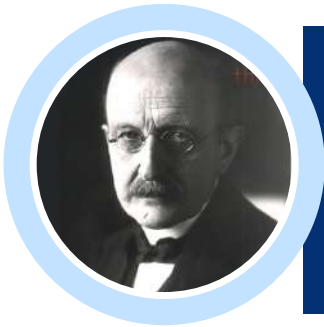
## STATE LAWS ON LASER USAGE BY HYGIENISTS

States not allowing laser currently – Florida, Georgia, Mississippi, Louisiana, Ohio, North Carolina (gray area), New Jersey (gray area), Pennsylvania (gray area).

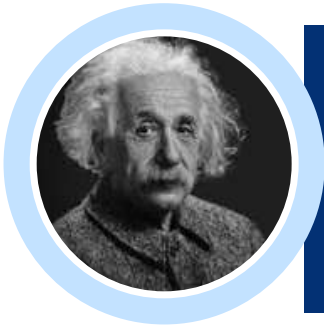


**Step 1:** Scan to find your state rules  
**Step 2:** Top of the page, select your state

## HOW DO DENTAL LASERS WORK?

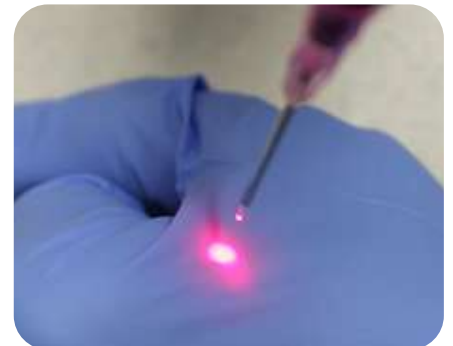
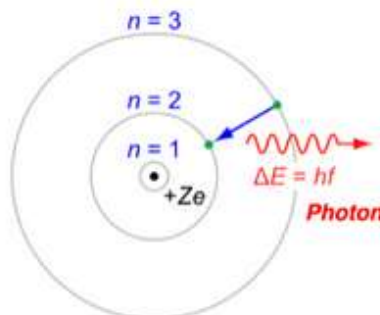
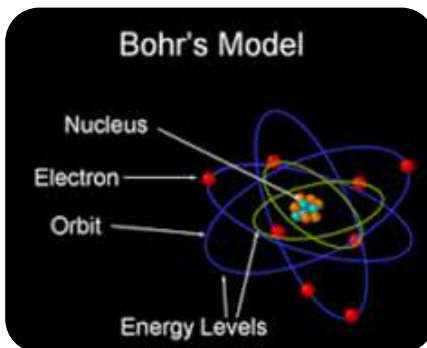


**MAX PLANCK** – German Physicist  
1900–Light consisted of discrete and indivisible packets of radiant energy that he named **quanta**  
Elemental Unit of energy (E)



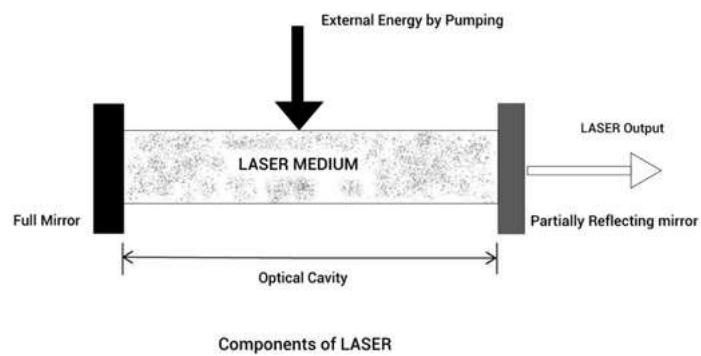
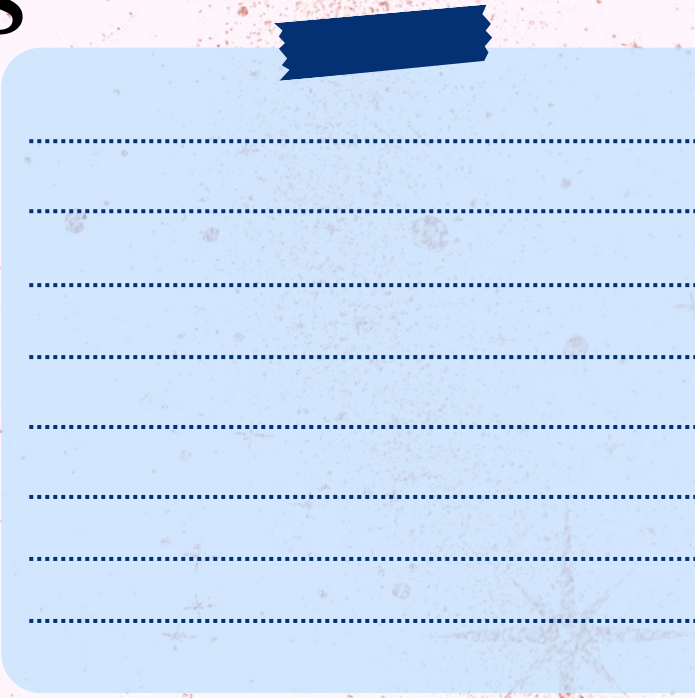
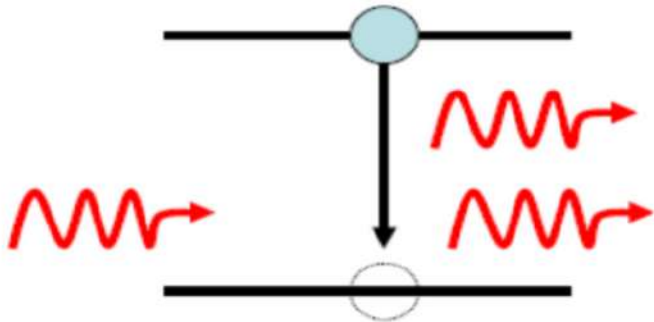
**QUANTUM THEORY**  
In March 1905, Einstein created the quantum theory of light, the idea that light exists as tiny packets, or particles, which he called **photons**

## HOW IS LIGHT PRODUCED



# FATHER OF LASERS

Stipulated emission



Periodic Table of the Elements

1	2	3-10																18	19	20																																																																	
H	He																	Ne	Ar	Kr	Xe	Rn																																																															
Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	Fr	Ra	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og
		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu																																																																					
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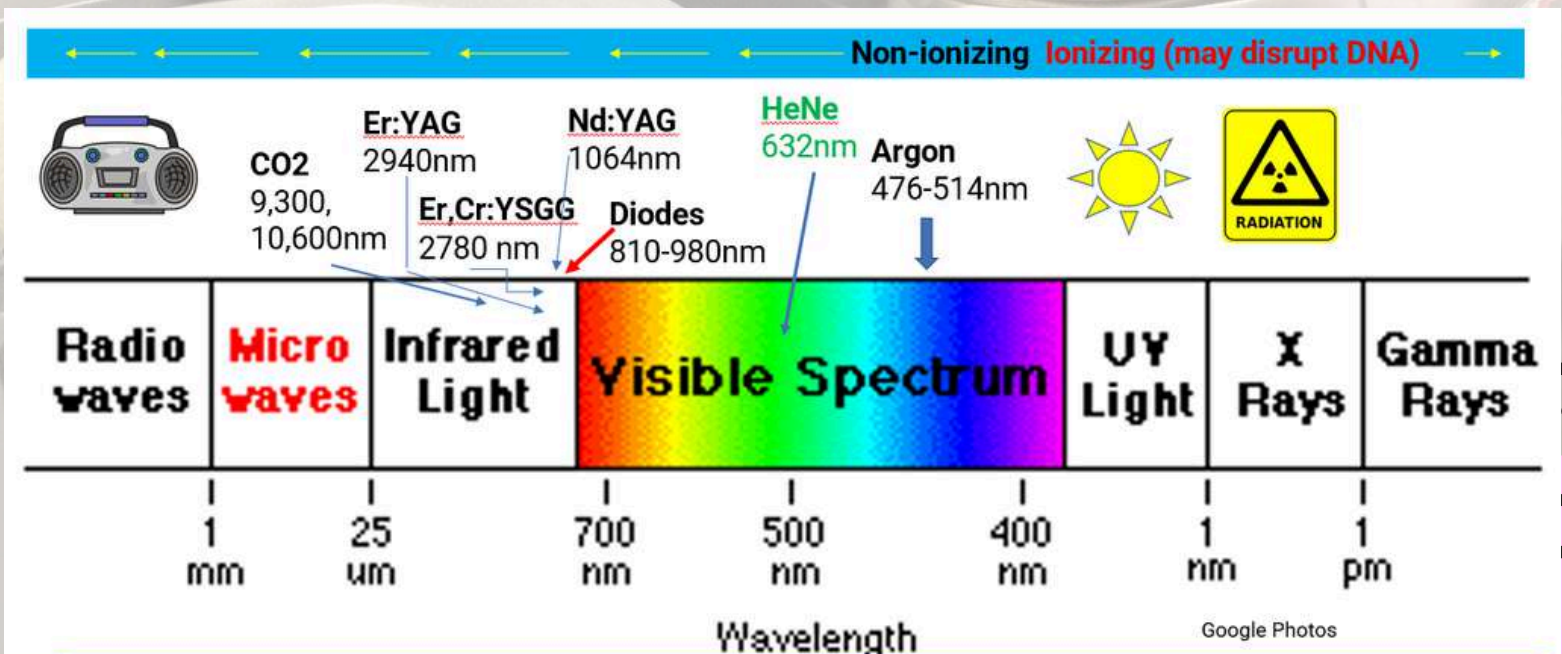
**L**ight

**A**mplication by

**S**timulated

**E**mission of

**R**adiation



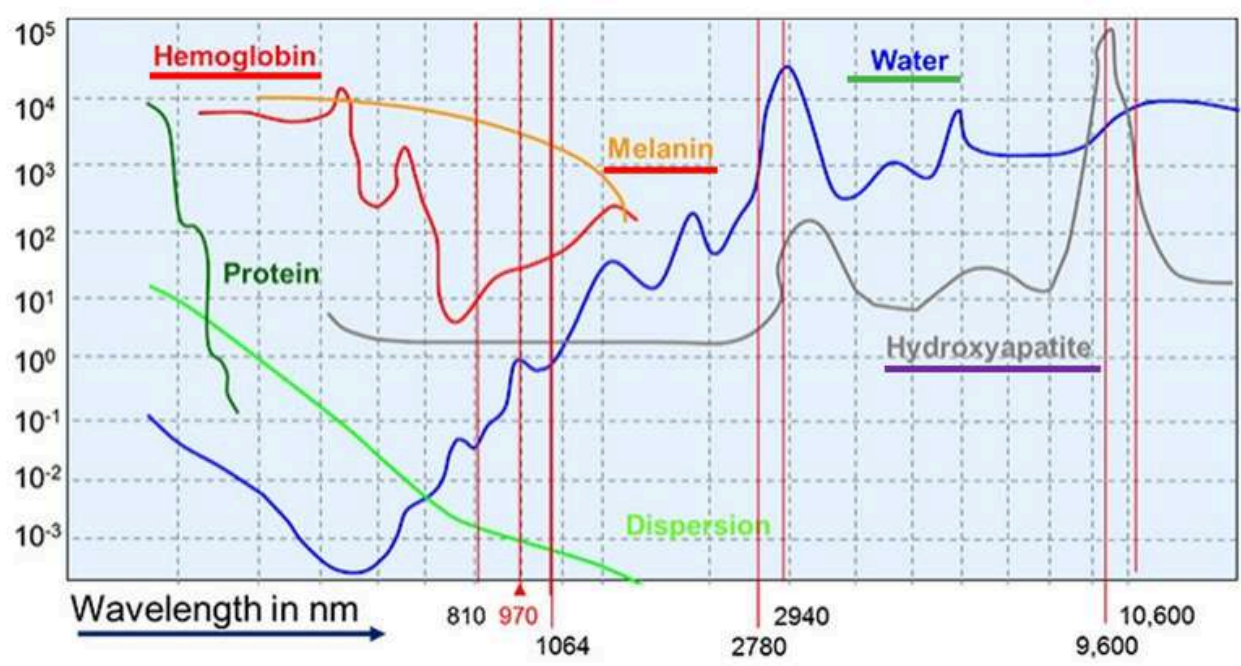
DENTAL lasers operate in the **Infrared, invisible** and visible, **Non-ionizing RADIATION** portion on the Electromagnetic Spectrum

# WHY DO CERTAIN LASERS WORK MORE EASILY THAN OTHERS FIGHTING PERIO?

Handwriting practice area with horizontal dashed lines on a pink background. A paperclip icon is located at the top right of this section.



# ABSORPTION CURVES OF VARIOUS TISSUE COMPONENTS



# FIBER OPTIC DELIVERY SYSTEMS







# Gain an understanding of **NEW TRENDS WITH LASERS**



- **Procedures pre-set for multiple clinicians** - Doctors, hygienists, specialists
- **Look of the laser** - Futuristic, light-weight, portable
- **Tips** - Uninitiated, Pre-initiated, Stronger tips, PBM

- **Multiple wavelengths in ONE LASER!** - For all clinicians, Hygiene only lasers
- **Using two wavelengths at ONCE** - Dual-wavelength
- **Super-Pulsing Technology**



- Procedures are all set-up
- For all clinicians
- No Guessing
- Plug and Play | Turn-key
- Everyone loves EASY
- Futuristic
- Light-weight | Portable

# NEWER LASER VS OLDER LASER




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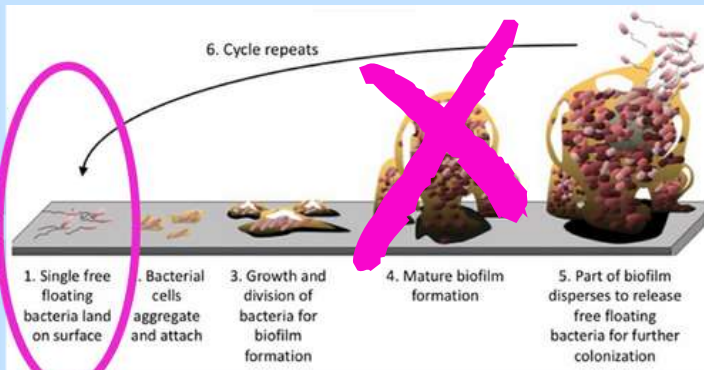
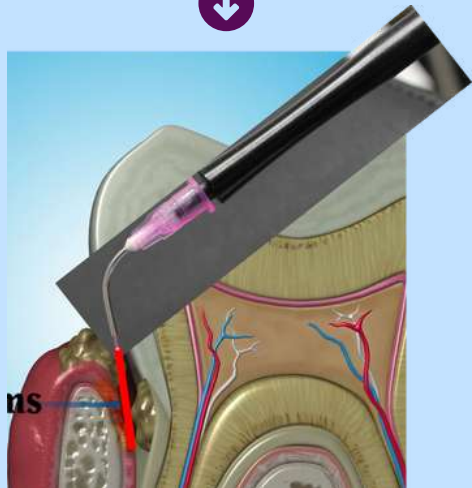
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# Laser Fibers | Laser Tips | PBM Attachments

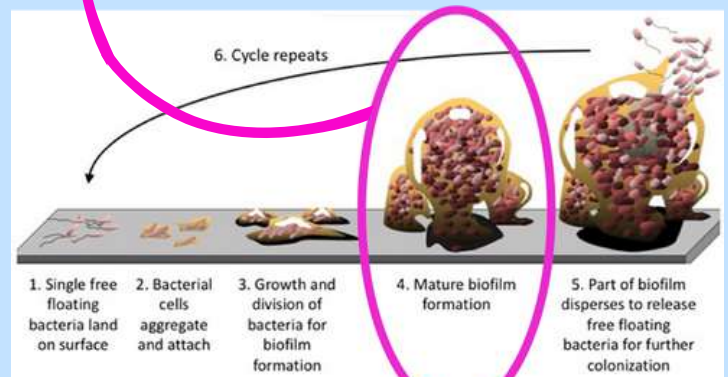


# WHAT IS THE DIFFERENCE BETWEEN UNINITIATED TIP VS INITIATED TIP

## UNINITIATED TIP



## INITIATED TIP



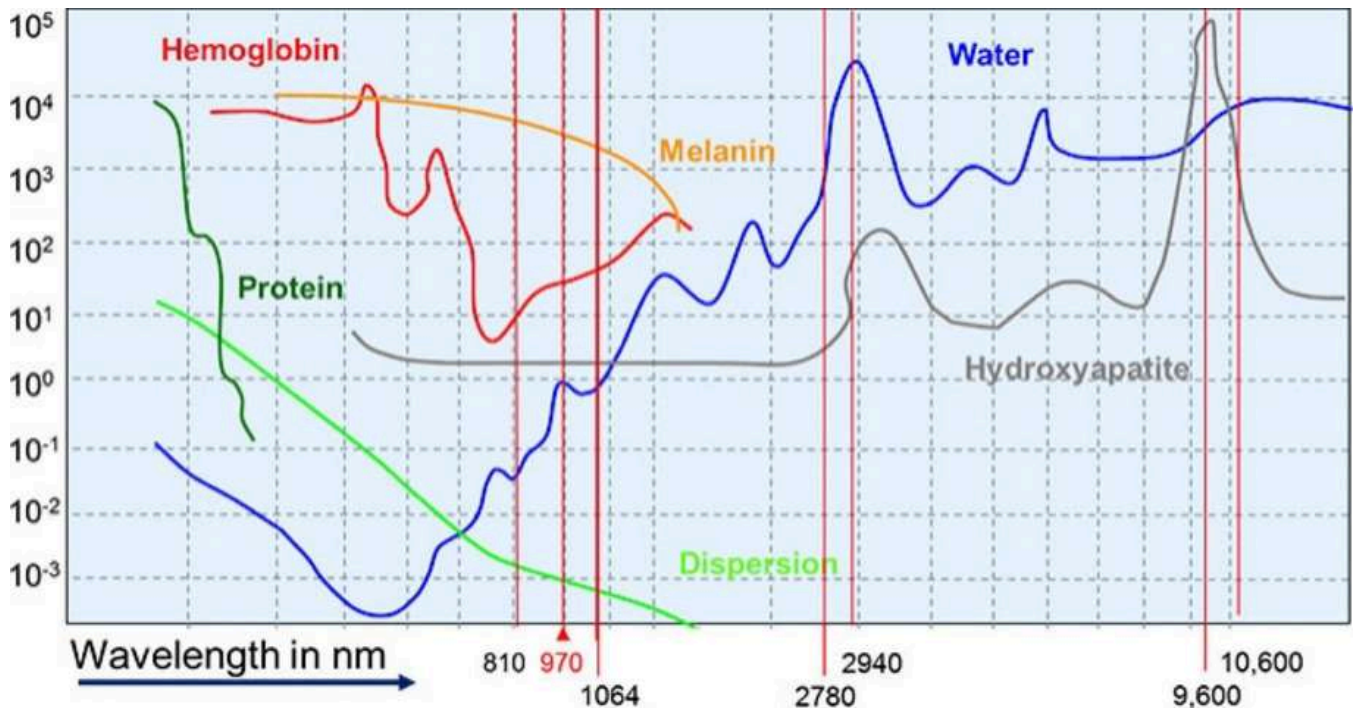
PICASSO™



# STRIP & CLEAVE LASERS

- Can be an option you choose on different lasers
- Cheaper tips - \$1.5-2 per use
- Tips can cost \$5-8 a piece
- If tip accidentally initiates can easily cleave it
- Program yourself

## LASER WAVELENGTHS & VARIOUS TISSUE COMPONENTS



## MULTIPLE WAVELENGTHS IN ONE LASER!



## COMBINING WAVELENGTHS

### Dual Wave (2 Wavelengths at the same time)

- **810nm**
  - More attracted to melanin in tissue (pigment-tissue color)
  - Superior coagulation
- **980nm**
  - More attracted to water
  - Bacteria composed 90% water
- **Used together = more efficient/faster/better results**



## HARD AND SOFT TISSUE LASER IN ONE

*Before*



*After*



- Ability to use laser for more procedures
  - Cut teeth, contour bone, surgical soft tissue, hygiene, and aesthetics all in one
- Larger units
- More settings/can be confusing
- Very costly 99k+

## PBM THERAPY

- Red light therapy
- Normally not fiber lasers
- Extra attachments | Sizes
- Additional procedures
- Usually these lasers are Class 3B
- Hygienists, assistants, doctors can all use
- These lasers can be used to reduce pain, reduce inflammation, accelerate healing
- Equals = better experience for patient



# HYGIENE ONLY LASERS

- Catered to hygienists
- Hygiene procedure names ~ Gingivitis, Perio Pockets
- Lower price point
- Max wattage is lower = 2-3 Watts
- Cool Colors | Easy to use | Portable



## LASER WHITENING

- Lasers have to be 7+ Watt
- Come with a larger attachment to treat quadrants
- Use that companies whitening
- More applications | More expensive lasers



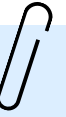
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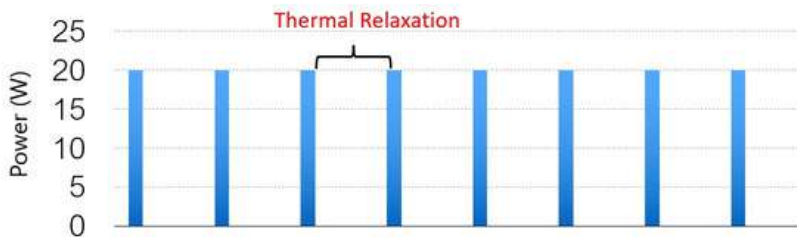


# SUPER PULSING TECHNOLOGY

- **Gemini** always shows your average Watt and figures out your duty cycle internally
- **Gemini's** Peak Power is fixed 10W or 20W
  - Single wavelength (10-Watt)
  - Dual wavelength (20-Watt)
- **Gemini EVO** Peak Power is fixed 50W or 100W
  - Single wavelength (50-Watt)
  - Dual wavelength (100-Watt)
- **Gemini** duty cycle (0.5%-20%)
- **Gemini EVO** duty cycle (.1% - 4%)
- Allows clinicians to work faster, less heat to tissue, less pain = effective, efficient cutting/time



## “SUPER-PULSED” DIODE LASERS



- Average power is a fraction of peak power. These lasers behave similarly to gated-pulse diode lasers, but are able to pulse much faster at higher peak powers.
- This example: 2 watts of average power, 20 watts of peak power, 1 millisecond pulse duration, 9 millisecond pulse interval, 10% duty cycle.

# SUPER-PULSED LASERS

“The **desired results** with the least risk of unwanted thermal damage can be achieved with very **short pulses** at the **highest power density** for the shortest time possible”



Source: K. Goharkhay, MD , DMD , A. Moritz, MD , DMD , P. Wilder-Smith, MD , DMD , U. Schoop, MD , DMD , W. Kluger, MD , S. Jakolitsch, MD , and W. Sperr, MD , DMD, Effects on Oral Soft Tissue Produced by a Diode Laser In Vitro, Lasers in Surgery and Medicine 25:401-406 (1999)

# Explanation of **INFLAMMATORY PROCESS**

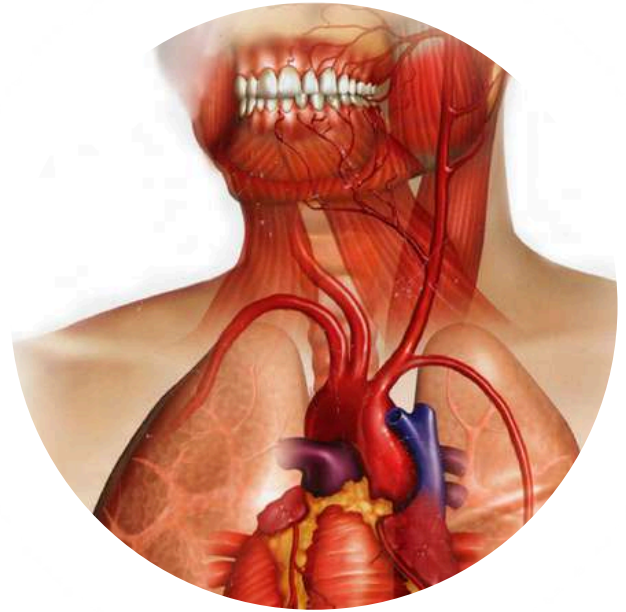
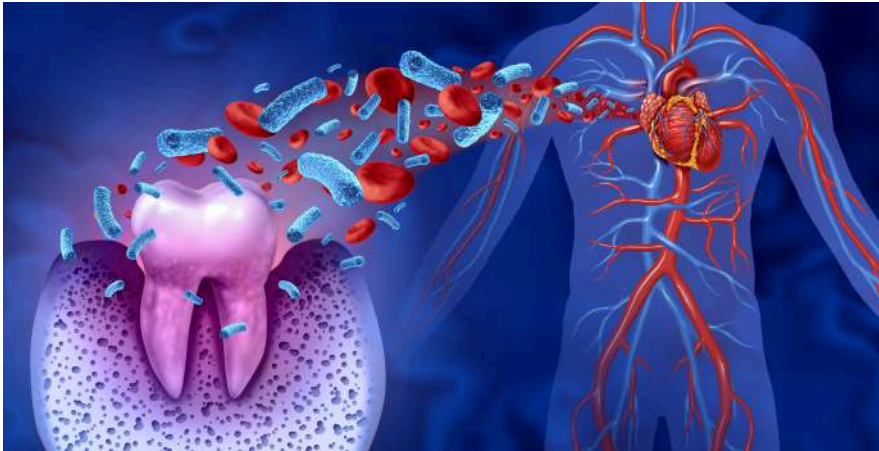
## **COVID - 19**

- People 65+ yrs and older
- Smoking
- Diabetes
- Chronic lung disease/asthma (Mod-severe)
- Serious heart conditions
- Obesity
- Immune weakening medications
- Cancer treatment
- Bone marrow or organ transplantation
- Liver Disease
- Kidney Disease

## **PERIODONTAL DISEASE**

- Advancing age
- Smoking
- Diabetes
- Pulmonary Disease
- Heart Disease (cardiovascular disease)
- Obesity/poor nutrition
- Medications
- Immunocompromised Status
- Low Birth weight and premature delivery
- Rheumatoid arthritis, osteoporosis
- Stress

# MOUTH-BODY CONNECTION



- Hasturk, H., Kantarci, A. Activation and Resolution of Periodontal Inflammation and Its Systemic Impact. *Periodontol* 2000. 2015; 69(1): 255-273 doi:10.1111/prd.12105.
- University of Florida. (2005, March 31). Live Oral Bacteria Found in Arterial Plaque. *ScienceDaily*.
- Desvarieux, M., Demmer, R.T., Rundek, T., et al. Relationship between Periodontal Disease, Tooth Loss, and Carotid Artery Plaque: The Oral Infections and Vascular Disease Epidemiology Study (INVEST). *Stroke*. 2003; 34(9): 2120-2125. doi:10.1161/01.STR.0000085086.50957.22.
- Dhadse, P., Gattani, D., Mishra, R. The Link between Periodontal Disease and Cardiovascular Disease: How Far We Have Come in Last Two Decades? *J Indian Soc Periodontol*. 2010; 14(3): 148-154. doi:10.4103/0972-124X.75908.
- Fisher, M.A., Borgnakke, W.S., Taylor, G.W. Periodontal Disease as a Risk Marker in Coronary Heart Disease and Chronic Kidney Disease. *Curr Opin Nephrol Hypertens*. 2010; 19(6): 519-526. doi:10.1097/MNH.0b013e32833eda38.



30+ yrs = 47%  
have Periodontitis



65+ yrs = 63%  
has Moderate to Severe Periodontitis

## ONE OUT OF EVERY TWO ADULTS HAS PERIODONTITIS



Eke PI, Dye BA, Wei L, Thornton-Evans GO, Genco RJ; CDC Periodontal Disease Surveillance workgroup: Prevalence of periodontitis in adults in the United States: 2009 and 2010. *J Dent Res*. 2012;91(10):914-920.

# INFLAMMATION PROCESS

**Gingivitis** – the first stage of periodontal disease, is defined as “gingival inflammation without loss of connective tissue attachment”.

**Periodontitis** – The presence of gingival inflammation at sites where there has been a pathological detachment of collagen fibers from cementum and the junctional epithelium has migrated apically.

This also leads to tooth-supporting alveolar bone loss and eventually tooth loss itself

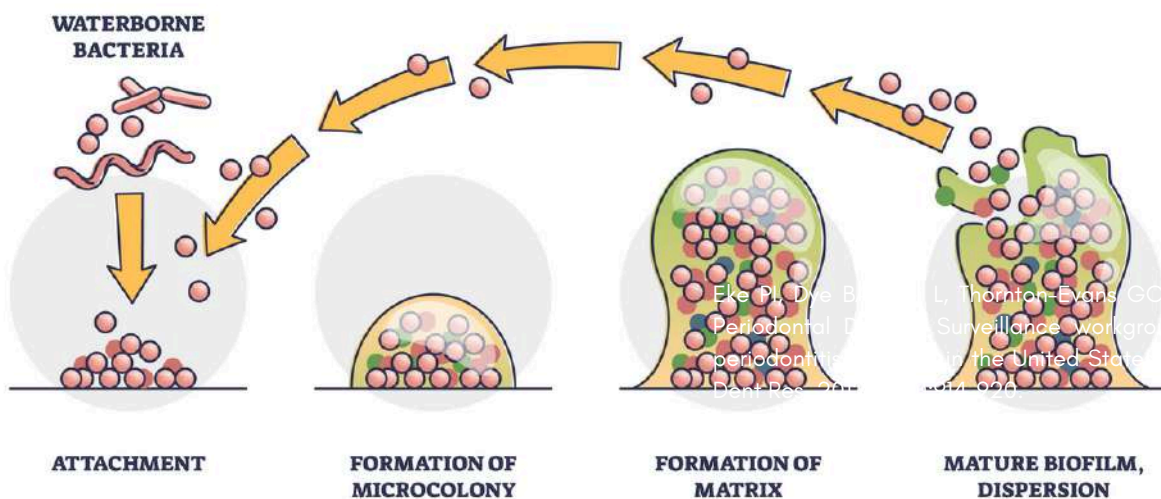
Armitage GC: Clinical evaluation of periodontal diseases, Periodontol 2000 7:39-53, 1995.



Manor A, Lebediger M, Shiffer A, Tovel H: Bacterial invasion of periodontal tissues in advanced periodontitis in humans, J Periodontol 55(10) 567-573, 1984.

# What Is Really Going On?

## BIOFILM





*This can grow below your gum line in just 48 hours.  
And your toothbrush can't stop it.*

**Scanning Electron Microscopy Image of Bacteria in a 6mm Periodontal Pocket.**

It took just 2 days for this colony of bacteria to grow below the gums. Toothbrush, rinse and floss can't reach it. The Perio Tray® holds medication deep below the gums to work against disease-causing bacteria.

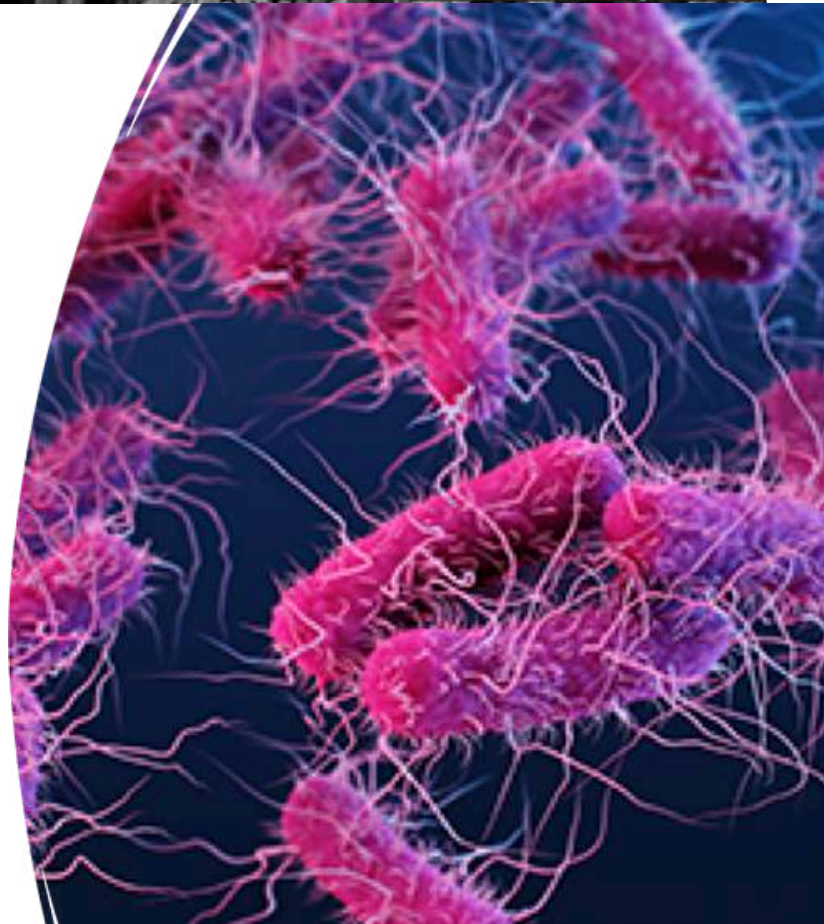
Ask us about the Perio Tray® today.

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## ANTIBIOTIC THERAPY

### **Penicillin, Tetracycline, Macrolide and Metronidazole**

- Penicillin's & Cephalosporins
  - Inhibit synthesis of bacterial cell walls
- Tetracyclines, Macrolides and Clindamycin
  - Inhibit bacterial growth by interfering with protein synthesis/destroying membrane
- Side effects – bacterial resistance, affect the entire body, superbugs



Soares GM, Figueiredo LC, Faveri M, Cortelli SC, Duarte PM, Feres M. Mechanisms of action of systemic antibiotics used in periodontal treatment and mechanisms of bacterial resistance to these drugs. J Appl Oral Sci. 2012;20(3):295-309. doi:10.1590/s1678-77572012000300002

# How Bacteria Become Resistance

Intrinsic	Inherently resistance to an antibiotic (not affected by the drug naturally) <sup>1-3</sup>
Mutational	Spontaneous chromosomal mutation that produces a genetically-altered bacterial population that is resistant to the drug (Cell mutates and then produces more cells all resistant to drug) <sup>1-4</sup>
Acquired Resistance	Horizontal acquisition from another microorganism of a genetic element that encodes antibiotic resistance (DNA is transferred from one cell to another) <sup>1, 5</sup>



1. Soares GM, Figueiredo LC, Faveri M, Cortelli SC, Duarte PM, Feres M. Mechanisms of action of systemic antibiotics used in periodontal treatment and mechanisms of bacterial resistance to these drugs. *J Appl Oral Sci.* 2012;20(3):295–309. doi:10.1590/s1678-77572012000300002
2. Walker CB. The acquisition of antibiotic resistance in the periodontal microflora. *Periodontol-2000.* 1996 Feb;10:79–88. doi: 10.1111/j.1600-0757.1996.tb00069.x. PMID: 9567938.
3. Nikaido H. Multidrug resistance in bacteria. *Annu Rev Biochem.* 2009;78:119–146.
4. Ince D, Hooper DC. Quinolone resistance due to reduced target enzyme expression. *J Bacteriol.* 2003;185:6883–6892.
5. Robicsek A, Strahilevitz J, Jacoby GA, Macielag M, Abbanat D, Park CH, et al. Fluoroquinolone-modifying enzyme: a new adaptation of a common aminoglycoside acetyltransferase. *Nat Med.* 2006;12:83–88.

## Be Cautious on Recommending Antibiotic therapy

- Non-specific or indiscriminate use of antibiotics may generate problems related to increase side-effects and bacterial resistance
- When properly used, systemic antibiotics are very important tools in the treatment of periodontal diseases as well as of other oral infections

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# Pre-Procedural Rinses



## MOUTHWASH ACTION

- Penetrates and breaks up biofilm to kill anaerobes and bacterial
- Oxidize volatile sulfur compounds
- Hard to get subgingival<sup>2</sup>

Drake, D: An In Vitro Comparative Study Determining Bactericidal Activity of Stabilized Chlorine Dioxide and Other Oral Rinses, J Clin Dent 2001;22:1-5.

Eakle WS, Ford C, Boyd RL. Depth of penetration in periodontal pockets with oral irrigation. J Clin Periodontol. 1986 Jan;13(1):39-44. doi: 10.1111/j.1600-051x.1986.tb01412.x. PMID: 3003166.

## Chlorhexidine Mouthwash

(Not recommended with Laser or Perio treatment)

- **Inhibits Fibroblastic activity**
- Does **not** help the healing process
- This will negatively effect what you do after laser

It is well known that chlorhexidine is toxic to bacteria, but recent evidence has suggested that chlorhexidine may also have harmful effects on gingival fibroblast proliferation as well as collagen and non-collagen protein production in cell culture

- Faria G, Cardoso CR, Larson RE, Silva JS, Rossi MA: Chlorhexidine-induced apoptosis or necrosis in L929 fibroblasts: A role for endoplasmic reticulum stress. Toxicol Appl Pharmacol. 2009 Jan 15;234(2):256-65
  - suggested that CHX may induce death in cultured L929 fibroblasts
- Mariotti AJI, Rumpf DA: Chlorhexidine-induced changes to human gingival fibroblast collagen and non-collagen protein production. J Periodontol. 1999 Dec;70(12):1443-8.
  - Looked at effects of using Chlorhexidine in wound healing. It stops fibroblasts from working and healing the site. the introduction of commercially available concentrations of chlorhexidine to surgical sites for short periods of time prior to wound closure can conceivably have serious toxic effects on gingival fibroblasts and may negatively affect wound healing.
  - Kampf, G. Acquired resistance to chlorhexidine- is it time to establish an antiseptic stewardship initiative? Journal of Hospital Infections. 2016 Nov; 94(3): 213-227
    - Patients developed resistance to CHX





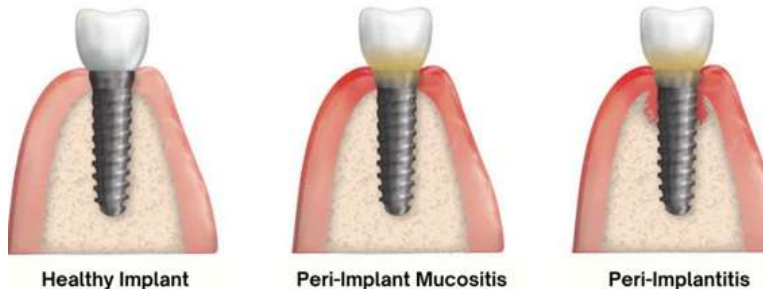


# Ultra Sensitive Rinse

## Great for Dental Implant Procedures and Maintenance

- Study compared ClōSYS Ultra Sensitive rinse with a placebo in the non-surgical treatment of peri-implant mucositis.
- ClōSYS rinse significantly reduced plaque and gingival indexes over placebo.
- Implant sites where ClōSYS rinse was applied improved more significant and faster than non-implant teeth.
- ClōSYS may assist in the reduction of inflammation around dental implants.

Rezaei, N.M. et al. Treatment of Peri-Implant Mucositis using Stabilized Chlorine Dioxide Rinse, Peer-reviewed Poster Session #2339, International Assn. for Dental Research, Boston, July 2021



### WHAT IT DOES:

- Kills in 10 seconds 99% of Streptococci that cause dental plaques to form;
- Kills in 10 seconds 99% of major oral pathogens that cause gum disease;
- Inhibits re-growth of these bacteria for 36 hours.
- Protects tooth enamel and prevents cavities.

### HOW/WHEN TO USE ClōSYS

- Put 3-6 Tablespoons in Waterpik with water (line the bottom)
- Significantly helps pockets remain stable and helps keep reinfection down
- Swish 2x day for 30 seconds after brushing/flossing
- Make sure to gargle in back of throat and tonsils
- Has been used to help fight off Strep Throat



**BEFORE** (Lichen Planus)



Note the gum loss



**AFTER** 4 wks w/ **ClōSYS**



Note the gum growth

# Gingival Irrigation



- **D4921 Gingival Irrigation- Per Quadrant**
  - Irrigation of gingival pockets with medicinal agent. Not to be used to report use of mouth rinses or non-invasive chemical debridement.
- **Narrative:**
  - "Inflamed diseased periodontal pockets were disinfected by sub-gingival Irrigation with ClōSYS™ anti-bacterial decontaminant."
  - In chart notes: At no additional fee, infected pockets were treated with LLLT and decontamination with a diode laser

# ClōSYS More Info/ How to Order

## Order

- Amazon.com
- Local Drugstore (Walmart, Walgreens, Grocery Store)

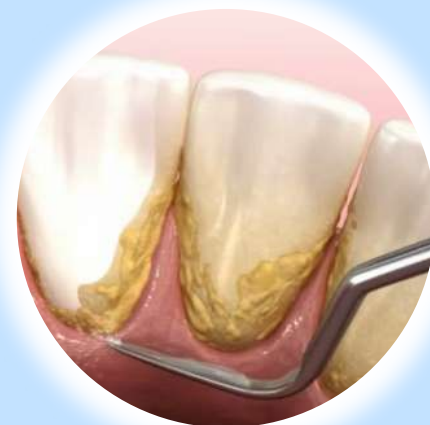
*Also available through most dental distributors (Patterson, Henry Schein, Benco, ect)*



# SCALING AND ROOT PLANING

- Conventional Gold Standard to treat periodontal disease
- Removes bacteria from the tooth
- Aim is to eliminate plaque/calc b/c they contain bacteria that release toxins that affect the gingiva and periodontal attachment

Coulibaly NT, Kone D, Kamagate A, Yao AI, Brou E. Etude de l'efficacité du curetage parodontal dans le traitement des poches [Efficacy of scaling and root planing in the treatment of periodontal pockets]. *Odontostomatol Trop.* 2002 Mar;25(97):17-21. French. PMID: 12061242.

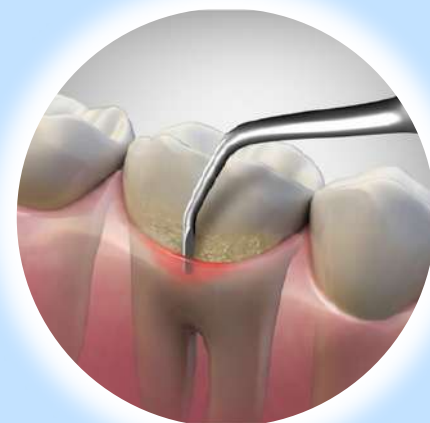


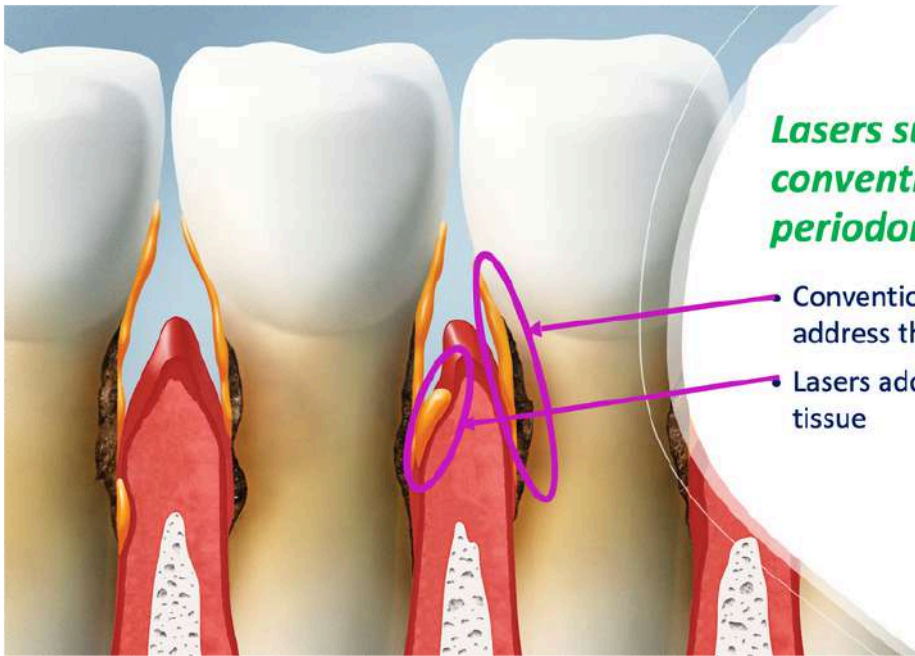
# IS MECHANICAL INSTRUMENTATION ENOUGH?

- The combination of mechanized scaling and effective hand instrumentation in combination with adjunctive therapies affords optimal results
- “These results indicate that a single session of scaling and root planing is clearly insufficient to maintain a healthy subgingival microflora”

Torfason, T., Kiger, R., Selvig, K. A., & Egelberg, J. (1979). Clinical improvement of gingival conditions following ultrasonic versus hand instrumentation of periodontal pockets. *Journal of clinical periodontology*, 6(3), 165-176.

Sbordone, L., Ramaglia, L., Gulletta, E., & Iacono, V. (1990). Recolonization of the subgingival microflora after scaling and root planing in human periodontitis. *Journal of Periodontology*, 61(9), 579-584.





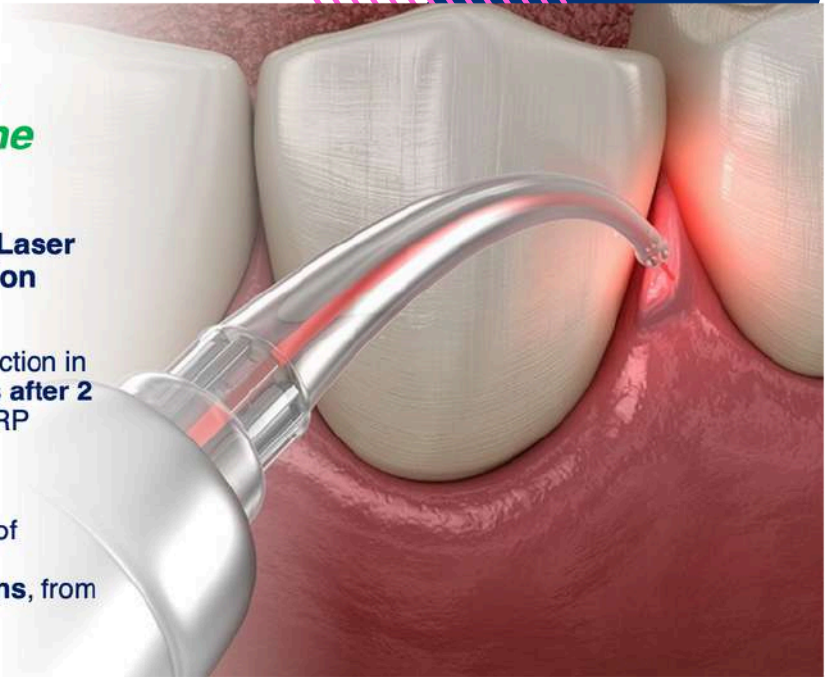
## Lasers support conventional periodontal therapy

- Conventional methods address the tooth
- Lasers address the gum tissue

## Research SRP + Laser / SRP Alone

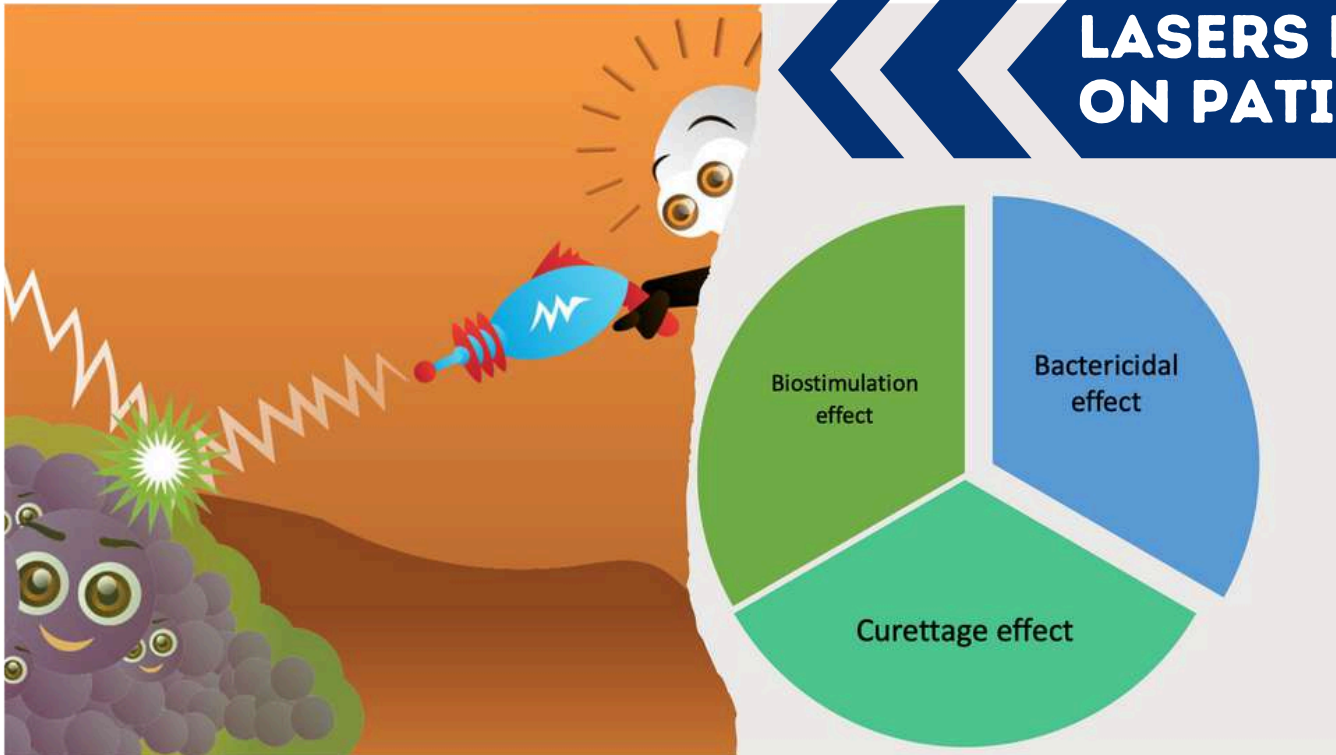
In ALL articles ~ SRP + Laser = more bacterial reduction than SRP alone

- Significantly higher reduction in **periodontal pathogens** after **2 months** compared to SRP alone<sup>1</sup>
- Considerable **bacterial elimination**, especially of **Actinobacillus actinomycetemcomitans**, from periodontal pockets<sup>2</sup>



1. Fenol A, Boban NC, Jayachandran P, Shereef M, Balakrishnan B, Lakshmi P. A Qualitative Analysis of Periodontal Pathogens in Chronic Periodontitis Patients after Nonsurgical Periodontal Therapy with and without Diode Laser Disinfection Using Benzoyl-DL Arginine-2-Naphthylamide Test: A Randomized Clinical Trial. *Contemp Clin Dent*. 2018 Jul-Sep;9(3):382-387.
2. Moritz A, Gutknecht N, Doertbudak O, et al. Bacterial reduction in periodontal pockets through irradiation with a diode laser: a pilot study. *J Clin Laser Med Surg*. 1997;15(1):33-37.
3. Crispino A, Figliuzzi MM, Iovane C, Del Giudice T, Lomanno S, Pacifico D, et al. Effectiveness of a diode laser in addition to non-surgical periodontal therapy: Study of intervention. *Ann Stomatol (Roma)* 2015;6:15-20.
4. Elavarasu S, Suthanthiran T, Thangavelu A, Mohandas L, Selvaraj S, Saravanan J. LASER curettage as adjunct to SRP, compared to SRP alone, in patients with periodontitis and controlled type 2 diabetes mellitus: A comparative clinical study. *J Pharm Bioallied Sci*. 2015;7(Suppl 2):S636-S642.
5. Gupta, Sunil Kumar et al. "An evaluation of diode laser as an adjunct to scaling and root planning in the nonsurgical treatment of chronic periodontitis: A clinico-microbiological study." *Dentistry & Medical Research*. 2016; 4(2): 44-49.

# LASERS EFFECT ON PATIENTS

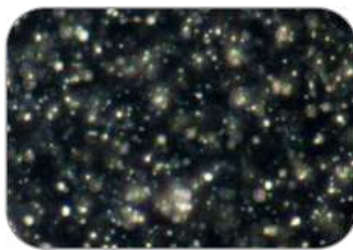


Fenol A, Boban NC, Jayachandran P, Shereef M, Balakrishnan B, Lakshmi P. A Qualitative Analysis of Periodontal Pathogens in Chronic Periodontitis Patients after Nonsurgical Periodontal Therapy with and without Diode Laser Disinfection Using Benzoyl-DL Arginine-2-Naphthylamide Test: A Randomized Clinical Trial. Contemp Clin Dent. 2018 Jul-Sep;9(3):382-387.

## HOW DOES THE LASER KILL BACTERIA?



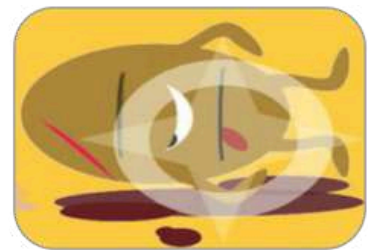
**Anerobic bacteria absorb laser energy**



**Vaporization of water**



**Destruction of cell wall**



**Bacterial cell Death**

Fenol A, Boban NC, Jayachandran P, Shereef M, Balakrishnan B, Lakshmi P. A Qualitative Analysis of Periodontal Pathogens in Chronic Periodontitis Patients after Nonsurgical Periodontal Therapy with and without Diode Laser Disinfection Using Benzoyl-DL Arginine-2-Naphthylamide Test: A Randomized Clinical Trial. Contemp Clin Dent. 2018 Jul-Sep;9(3):382-387.





# WHAT ARE WE DOING?

## Laser Bacterial Reduction



This is like a pre-procedural rinse but reduces bacteria UNDER the gums

1

## Lasers and Bacteria Research



### Lasers are bactericidal

- The diode laser group showed **100% reduction of long-term bacteria** (Periodontal specific), whereas 58.4% of the controls showed an improvement
- The diode laser group **reduced their bleeding on probing (BOP) by 96.9%** compared to 66.7% in the control group

Moritz A, Schoop U, Goharkhay K, et al: Treatment of periodontal pockets with a diode laser. Department of Conservative Dentistry, Dental School of the University of Vienna, Austria, Lasers Sug Med 22 (5):302-311, 1998.

## LBR – What are we doing?



**Reduce or eliminate risk of bacteremia** caused from instrumentation

- Allows us to remove bacteria and reduce bacterial flow into your bloodstream

**Prevent cross-contamination**

- We inadvertently pick up bacterial infection in one area of mouth and move it to other areas

**Lower microcount in aerosols** created **during ultrasonic instrumentation**

Assaf M, Yilmaz S, Kuru B, Ipci SD, Noyun U, Kadir T. Effect of the diode laser on bacteremia associated with dental ultrasonic scaling: A clinical and microbiological study. Photomed Laser Surg. 2007;25:250-6.

# SETTINGS

- Settings need to be higher and pulsing
- Bacterial inactivation at 50-60°C
- Protein denaturation
- Setting too high could initiate tip
- Pulsing of the laser helps
- Super-pulsed/different pulsing settings

# WHEN DO WE PERFORM THIS TREATMENT

## When is LBR incorporated?



### LBR is performed prior to:

- Probing
- Polishing
- Ultrasonic
- Scaling

2

### LBR 1st

- Reduce microbes released during hygiene visit
- Microbes released in the body & aerosols



# IDEAL PATIENTS FOR THIS TREATMENT



## **D4341, D4342 SRP 1-3 teeth & 4+ teeth**

- Done FULL mouth each visit to reduce bacteria in sulcus, these pts need extra help

## **D4346 Scaling in presence of generalized moderate or severe gingival inflammation**

- Patients have severe inflammation, bleeding. Reduce bacteria

## **D4910 Periodontal Maintenance**

- This is a MUST have procedure! Patients have a biofilm problem, help clean deeper than current instrumentation, help them manage between visits, improve pockets over time

## **D1110 Prophylaxis-adult (maybe even D1120 child)**

- Healthy patient & bleeding patient – knock down bacteria to reduce risk bacteremia, aerosols, cross-contamination with instruments, help keep mouth healthy between visits

## **D4355 Full mouth debridement**

- Reduce bacteria, clean deeper than instruments, stimulate healing of tissue after

## Medically Compromised Patients need more help



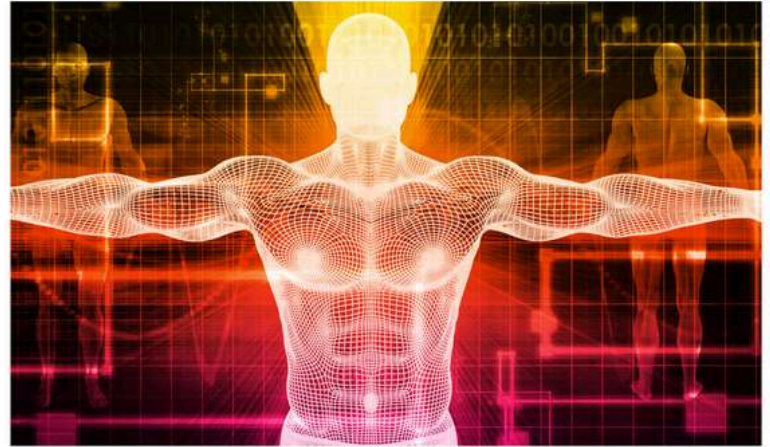
Lasers can help target and reduce periodontal pathogens (periodontal controlled)<sup>1,2</sup>



~ Laser group reduced total bacteria count and delayed recolonization during a 3-month observation<sup>1</sup>



Lasers can help stimulate the healing process, collagen repair, blood flow and pocket reduction<sup>3</sup>



1. Samulak, R., Suwała, M. & Dembowska, E. Nonsurgical periodontal therapy with/without 980 nm diode laser in patients after myocardial infarction: a randomized clinical trial. *Lasers Med Sci* 36, 1003–1014 (2021).
2. Assaf M, Yilmaz S, Kuru B, Ipci SD, Noyun U, Kadir T. Effect of the diode laser on bacteremia associated with dental ultrasonic scaling: A clinical and microbiological study. *Photomed Laser Surg.* 2007;25:250–6.
3. Ren, C., McGrath, C., Jin, L. et al. Effect of diode low-level lasers on fibroblasts derived from human periodontal tissue: a systematic review of in vitro studies. *Lasers Med Sci* 31, 1493–1510 (2016)
4. Conlan MJ, Rapley JW, Cobb CM. Biostimulation of wound healing by low-energy laser irradiation. A review. *J Clin Periodontol.* 1996 May;23(5):492–6. doi: 10.1111/j.1600-051x.1996.tb00580.x. PMID: 8783057.

# RESULTS AND INCREASING PROFITS

## RESULTS WE SEE

- Less bleeding with cleaning
- Less sensitivity
- Pockets reduce overtime with good home care
- Overall better feeling after cleaning (patient feedback)





## How are offices leveraging this?

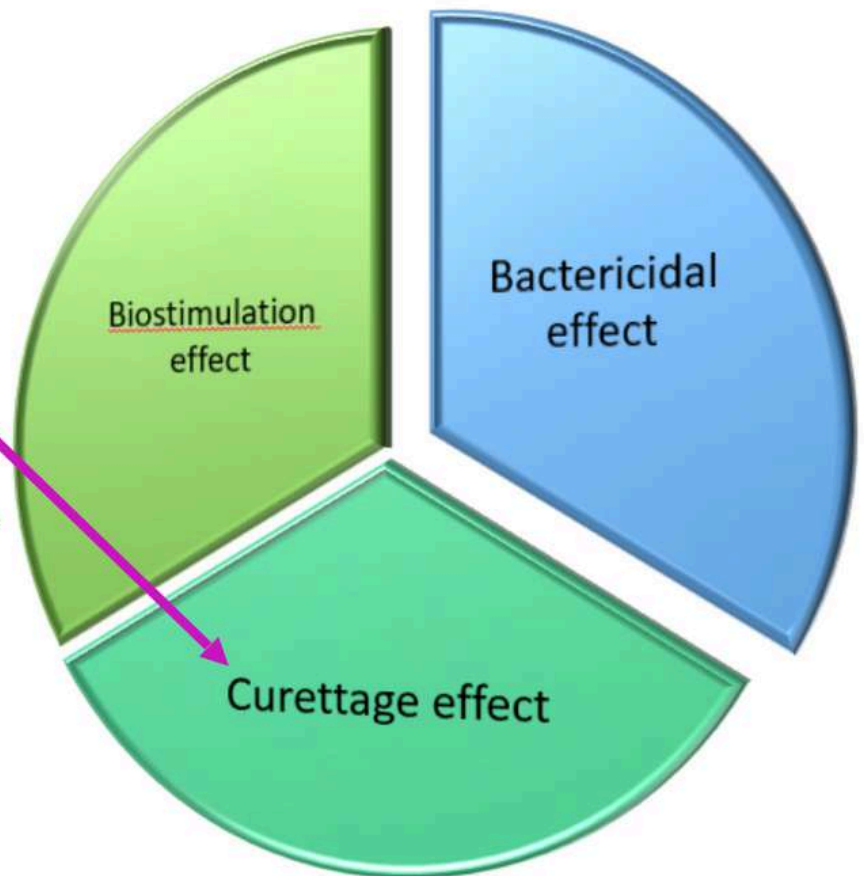
- Mandatory LBR procedure with every cleaning
- Consent to NOT have LBR
- Incorporating into prophy/maintenance fee
- Laser hardware fee
- Package deal (irrigation, Fl, cancer screen)

## ROI FOR LBR (RETURN ON INVESTMENT)

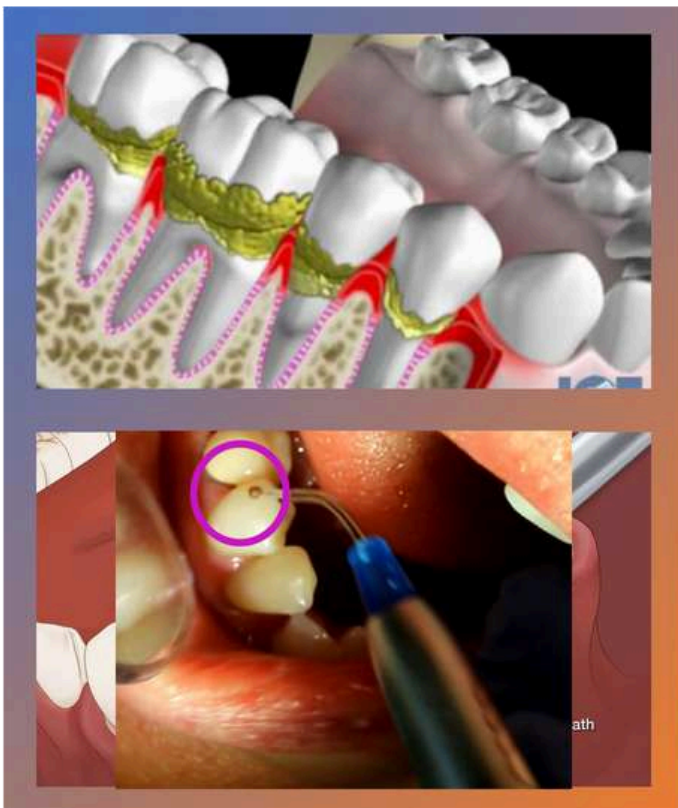
- LBR \$35 **4 Day Work Week** **\$44**
  - 4 pts day=\$140, week=\$560, \$2240 month, 26,880 yr/ \$36,608
  - 5 pts day=\$175, week=\$700, \$2800 mo, 33,600 yr / \$45,760
  - 6 pts day=\$210, week=\$840, \$3360 mo, \$40,320 yr / 54,912
  - 8 pts day=\$280, week=\$1120, \$4480 mo, \$53,760 yr / \$73,216
- **Buy a laser \$7000**
  - Paid off in 3 months with ONLY doing 4 patients a day LBR

# Laser Decontamination (Laser Curettage)

**Laser curettage** is an effective way to **remove colonies of different bacteria** thriving in **small pockets** located at the **base of teeth**. If left untreated, the condition can have an adverse effect on oral health and compromise the immune system<sup>1,2</sup>



1. Zingale J, Harpenau L, Chambers D, Lundergan W. Effectiveness of root planing with diode laser curettage for the treatment of periodontitis. J Calif Dent Assoc. 2012 Oct;40(10):786-93. PMID: 23316559.
2. Lin J, Bi L, Wang L, Song Y, Ma W, Jensen S, Cao D. Gingival curettage study comparing a laser treatment to hand instruments. Lasers Med Sci. 2011 Jan;26(1):7-11. doi: 10.1007/s10103-009-0732-x. Epub 2009 Sep 30. PMID: 19789937.



## Laser Curettage - Laser Decontamination

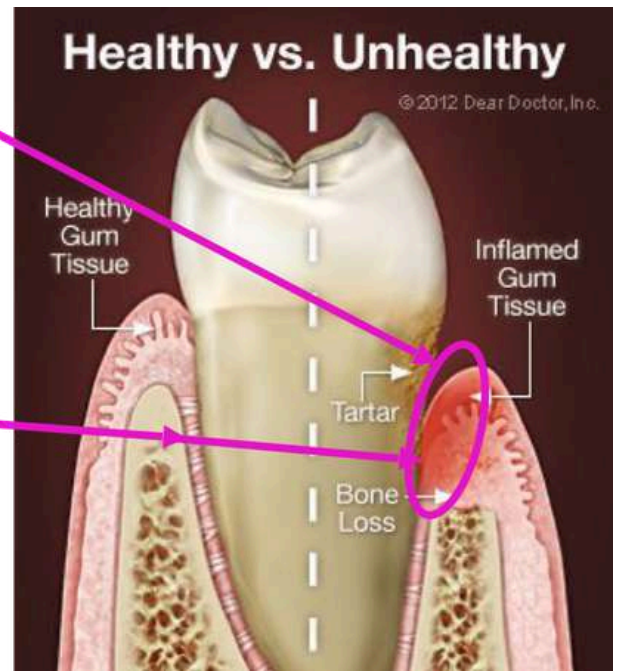
- Laser is attracted to *darker-diseased tissue* (red-orange complex bacteria)<sup>1</sup>
- This nonsurgical therapy uses very low settings and **decontaminates** rather than cuts the tissue<sup>2</sup>
- Reduction in probing depths, better looking tissue
- Ideal for patients with periodontal disease, gum pocketing, gingival bleeding, medically compromised

1. Convissar, RA: Principles and Practice of laser Dentistry, New York: Mosby, (3) 31. 2011. Print.
2. Coluzzi DJ, Convissar RA: Atlas of laser applications in dentistry, Chicago, 2007. Quintessence.

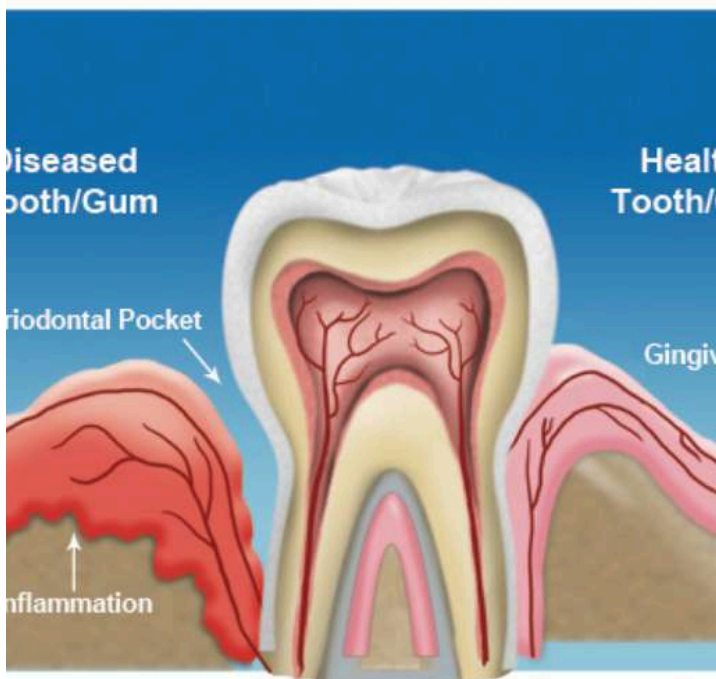
# WHAT ARE WE DOING?

## Laser Decontamination

- **Decontaminating** the gingival lining of the pocket wall
- **Reducing bacteria** in pocket
- Reducing biofilm that has migrated into gingival wall
- Inducing biostimulation-- Promoting **healing** of the tissues
- The laser will help us clean deeper into the tissue where we can't get with our instruments



## SETTINGS



- Settings need to be lower
- If setting is too high – cut tissue
- Low setting to only attract diseased bacteria
- Setting could be continuous or Super-pulsed
- Tip could become initiated
- Patient should not feel HOT or uncomfortable

1



# WHAT IS GOING ON INSIDE THE BODY

- On a cellular level, metabolism is increased
- Increased production of ATP (adenosine triphosphate), the fuel that powers the cell
- Normalize cell function and promote tissue healing
- Lasers also start the healing process thru hemostasis and coagulation<sup>1-3</sup>

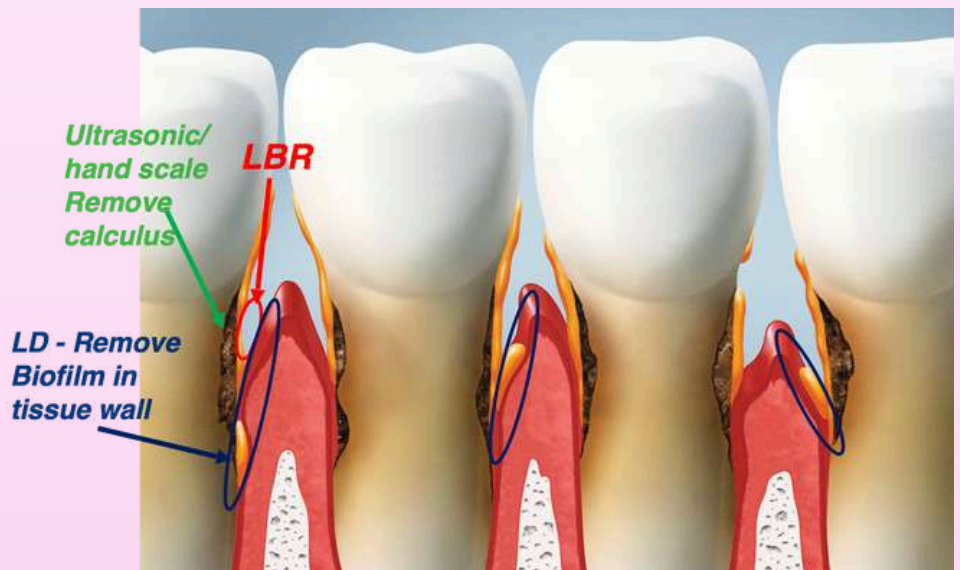
## 2

## WHEN DO WE PERFORM THIS TREATMENT

### Laser Decontamination

LD is performed after

- *Ultrasonic and scaling*
- *At the end of the cleaning appt*



# IDEAL PATIENTS FOR THIS TREATMENT



## **D4341, D4342 SRP 1-3 teeth & 4+ teeth – These are the ideal patients**

- Performed on any pocket 4+mm to help gum infection, stimulate pockets to heal, guide tissue to adhere to tooth so pocket disappears. Charge fee includes LBR/LD

## **D4910 Periodontal Maintenance**

- If a patient had one or two infected pockets BUT didn't need SRP. Can do at end of appt

## **D4346 Scaling in presence of generalized moderate or severe gingival inflammation**

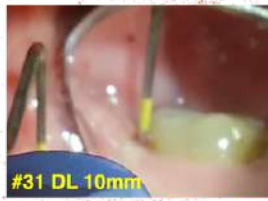
- These patients need LBR BUT if tons of deep 3mm/4mm could do light LD meaning treat each area with 1-2 passes with laser to stimulate healing and decontaminate



Four horizontal dotted lines for text entry, located within a light blue rounded rectangular area.



# RESULTS AND INCREASING PROFITS



#31 DL 10mm



#31 DL post laser



#31 DL 4.5mm  
3-week post op

LD on a single tooth



Pre-op



Immediate post-op



4 week post-op

LD with bad home care

Heather Gill, RDH Lakewood, CO



8mm initial therapy



Immediate post op with  
coagulation



4mm at 4mo perio maint

LD on 8mm pocket

Heather Gill, RDH Lakewood, CO



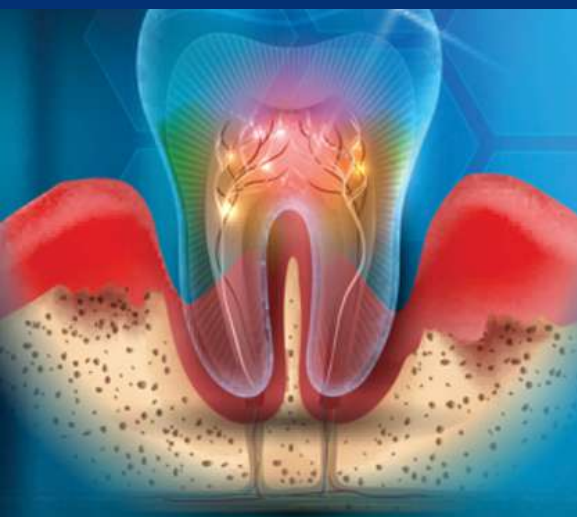
LD Full Quad –  
Immediate post-op

## RESULTS WE SEE TYPICAL FEES

- Pocket reduction
- Gums heal quickly
- Bone regeneration
- Patients respond great
- \$50-500
  - Quadrant fee \$75-225



# CAL ARTICLES AND LASERS



- 160 vertical bone loss defects randomly put into 2 groups – SRP | SRP+laser<sup>1</sup>
- PI, BOP, GR, CAL, PD- all measured at 6 weeks, 12w, 18w, 6 months, 12 months<sup>1</sup>
- Results – 76% of pockets in laser group had PD  $\leq$ 3mm after 1 yr compared to 56% in SRP only<sup>1</sup>
- Total bacteria count significantly lower in laser groups at 12w and 6 mo follow up
- Specifically high decrease with *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Prevotella intermedia*<sup>1</sup>
- Conclusion – SRP + Laser has significantly reduced CAL and PD compared to SRP alone<sup>1</sup>
- Diode laser group had significant improvement than non laser group<sup>2</sup>

1. Nammour S, El Mobadder M, Maalouf E, Namour M, Namour A, Rey G, Matamba P, Matys J, Zeinoun T, Grzech-Leśniak K. Clinical Evaluation of Diode (980 nm) Laser-Assisted Nonsurgical Periodontal Pocket Therapy: A Randomized Comparative Clinical Trial and Bacteriological Study. *Photobiomodul Photomed Laser Surg*. 2021 Jan;39(1):10-22. doi: 10.1089/photob.2020.4818. Epub 2020 Aug 31. PMID: 32865464.

2. Khan, Farheen; Chopra, Rahul; Sharma, Nikhil; Agrawal, Eiti; Achom, Maydina; Sharma, Preeti. Comparative evaluation of the efficacy of diode laser as an adjunct to modified Widman flap surgery for the treatment of chronic periodontitis: A randomized split-mouth clinical trial. *Journal of Indian Society of Periodontology* 25(3):p 213-219, May-Jun 2021. | DOI: 10.4103/jisp.jisp\_252\_20

# WHAT ABOUT BONE REGENERATION?

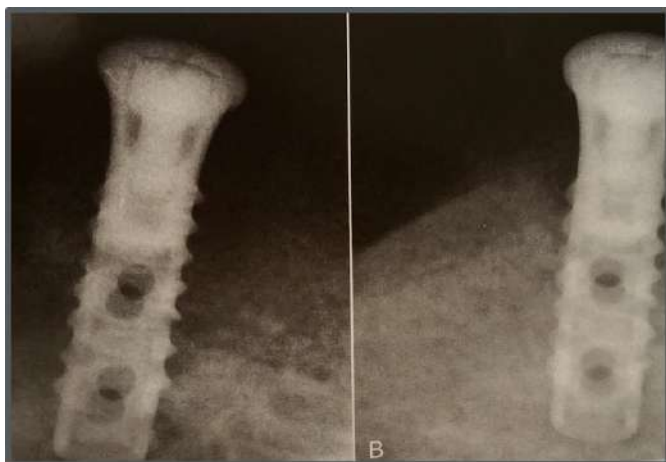
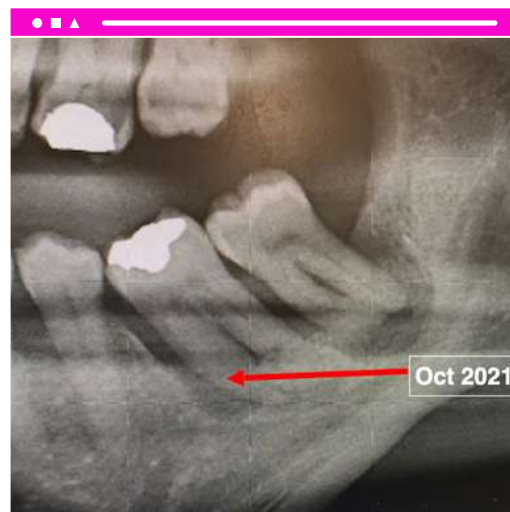
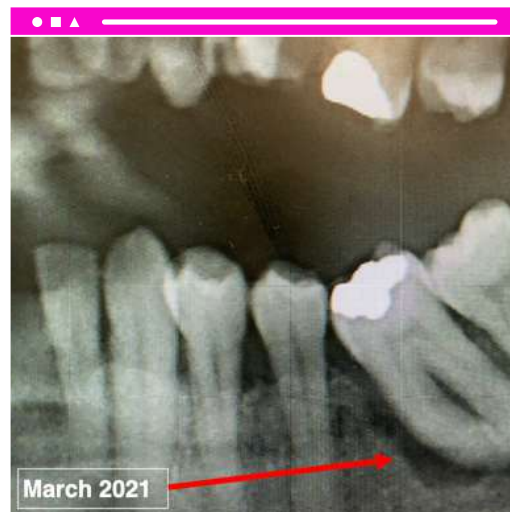
## RESEARCH ARTICLES ON REGENERATION

- Findings showed a positive effect on the proliferation of both **gingival fibroblasts** and **periodontal ligament fibroblasts**, as well as their responses to inflammation

Ren, C., McGrath, C., Jin, L. et al. Effect of diode low-level lasers on fibroblasts derived from human periodontal tissue: a systematic review of in vitro studies. *Lasers Med Sci* 31, 1493–1510 (2016)

- Diode lasers have a biostimulatory effect on bone tissue as well as enhanced **osteoblastic** (bone-forming cells) proliferation

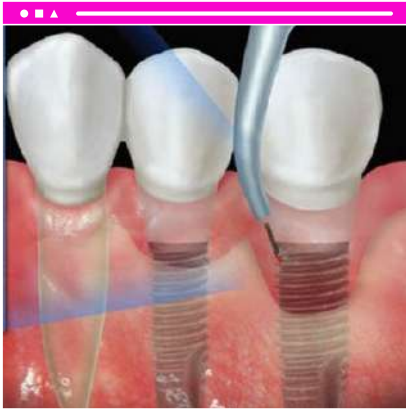
Amid R, Kadkhodazadeh M, Ahsaie MG, Hakakzadeh A. Effect of low level laser therapy on proliferation and differentiation of the cells contributing in bone regeneration. *J Lasers Med Sci*. 2014;5(4):163–170.



Pires Oliveria DA, de Oliveria RF, et al: Evaluation of low-level laser therapy of osteoblastic cells, *Photomed laser surg* 26(4):401-404, 2008

Dortbudak O, Haas R, Mallath-Pokorny G: Biostimulation of bone marrow cells with a diode soft laser, *Clin Oral Implants Res* 11(6):540-545, 2000

# WHAT ABOUT TREATING IMPLANTS WITH A LASER?



## PERI-IMPLANT MUCOSITIS

- Gum infection/infection in the tissue
- Disinfect gum pocket
- Clean deeper than we can get with our instruments
- Stimulate healing

## PERI-IMPLANTITIS

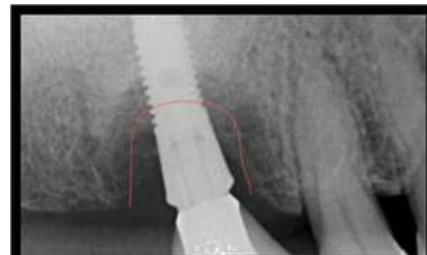
*Laser therapy can provide **immediate decontamination***

Most likely they need a surgical approach

- Bone loss evident on X-rays
- Deep probe readings
- Attachment loss
- Infection present

# TECHNIQUE IS VERY IMPORTANT!

Angulation of laser tip & time in pocket



Malmqvist S, Liljeborg A, Qadri T, Johannsen G, Johannsen A. Using 445 nm and 970 nm Lasers on Dental Implants-An In Vitro Study on Change in Temperature and Surface Alterations. *Materials* (Basel). 2019;12(23):3934. Published 2019 Nov 27. doi:10.3390/ma12233934

# LBR vs LD PROCEDURES



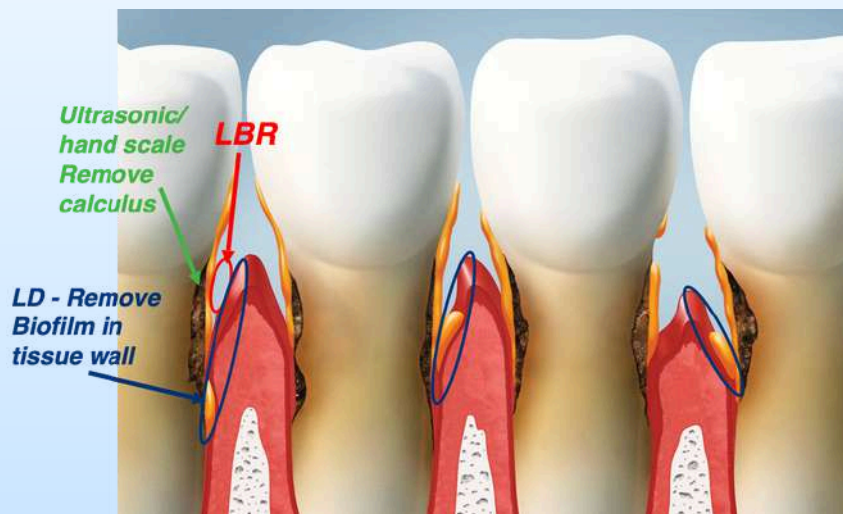
## DIFFERENCE BETWEEN PRE AND POST-PROCEDURAL LASER APPLICATION

### LASER BACTERIAL REDUCTION

- Pre-procedural
- Ideal patients-everyone (1110, 4910, SRP)
- Uninitiated
- Fiber is inserted below gumline .5-1mm, aim laser towards bottom of pocket, spray laser energy targeting free floating bacteria
- Usually charge out on a whole mouth
- Setting is usually higher and is pulsing

### LASER DECONTAMINATION

- Post-procedural
- Ideal patients-SRP's, severe inflammation and pockets 5+mm
- Initiated or self-initiated
- Fiber inserted to base (bottom) of pocket, aim laser into tissue and rub fiber against tissue pulling fiber tip from bottom of pocket to the top. Targeting the diseased necrotic biofilm in the tissue wall
- Charge by quadrant
- Setting is lower and is continuous



## VERBIAGE TIPS

- Give them the “why” behind your recommendation
- Make this **part of SRP** and not “in addition to”
- Use words like “infection”, “disease” no softeners
- Show them their perio chart
- By the time you do all this the patient will be asking what to do
  - This will make the conversation easier and the patient will most likely accept

# VERBIAGE TIPS

- Get excited, the more you stay positive the better your patients will feel about accepting treatment
- Be confident, you know what you are talking about and your patients trust you
- Making it a part of their out-of-pocket investment will help them understand this is the standard of care in your office

## VERBIAGE EXAMPLE

- Mrs. Jones, after finishing your periodontal exam I found that you have **gum disease**. This is an **infection** in your tooth, gum tissue and the supporting structures. If untreated, gum disease can lead to **severe bone loss** and eventual **tooth loss**. It can be managed and treated a variety of ways and fortunately we have some proven tools we can use to help keep this under control and stop the disease progression for a period of time.
- Then stop talking, let your patient ask questions. They will ask what “tools” you have and that is when you tell them about the laser.





# ADD 1-2 SENTENCES ABOUT LASER

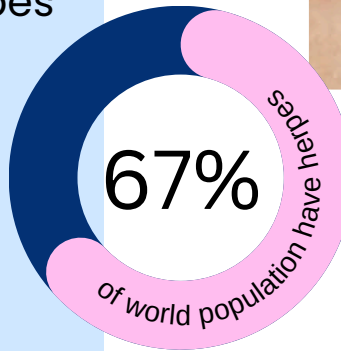
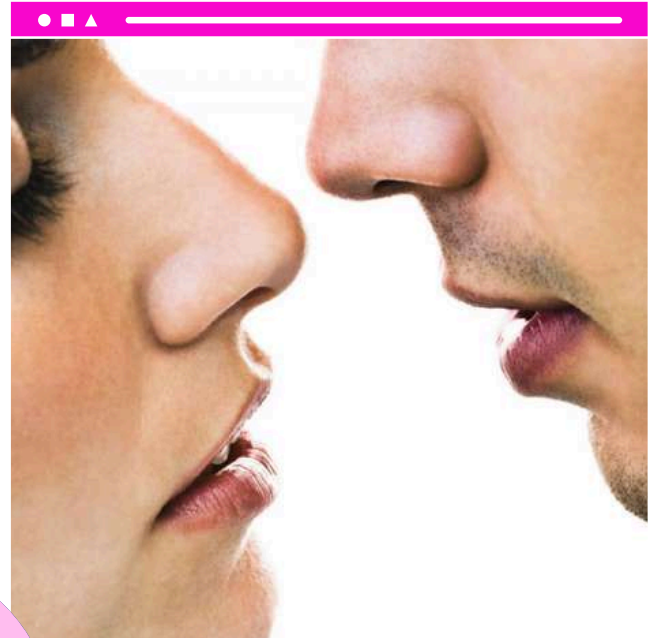
- Explain SRP like you normally do
- Pick 1-2 sentences about laser
  - I am going to use the laser to clean deeper into your tissue and stimulate healing
  - I am going to use the laser to decontaminate your gums
  - I am going to use my laser to target the disease in your gum tissue, pull out the infection and stimulate the collagen to tighten those pockets back up

Handwriting practice lines on a white background, consisting of multiple horizontal dotted lines.

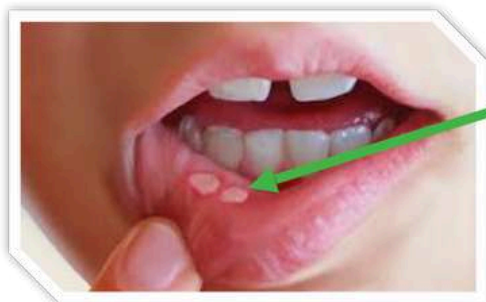
Handwriting practice lines on a light blue background, consisting of multiple horizontal dotted lines. The area is decorated with two blue paperclip icons at the top corners.

# LESION TREATMENT

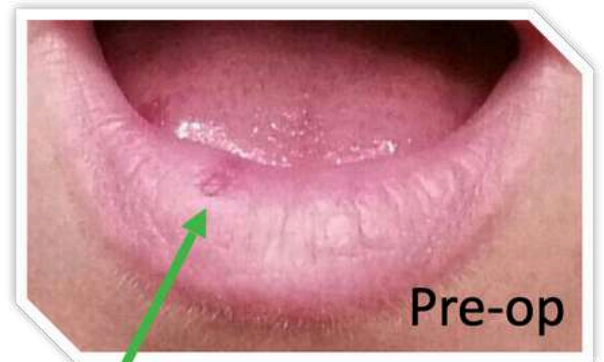
- 3.7 billion people have (HSV-1) under the age of 50
- 2 Types
  - Herpes Simplex type 1
    - Oral-oral contact (herpes labialis)
  - Herpes Simplex Type 2
    - Skin to skin - Sexually transmitted (genital herpes)
- Both highly infectious/incurable



World Health Organization. Herpes simplex virus. Available at: [who.int/news-room/fact-sheets/detail/herpes-simplex-virus](http://who.int/news-room/fact-sheets/detail/herpes-simplex-virus). Accessed March 27, 2020.



**Canker Sores  
OR  
Cold Sores**



# WHAT ARE WE DOING?

1

- Killing viral particles
- Inactivating lesion
- Begin healing and dormant process
- Cauterizes nerve endings
- Biostimulating the area

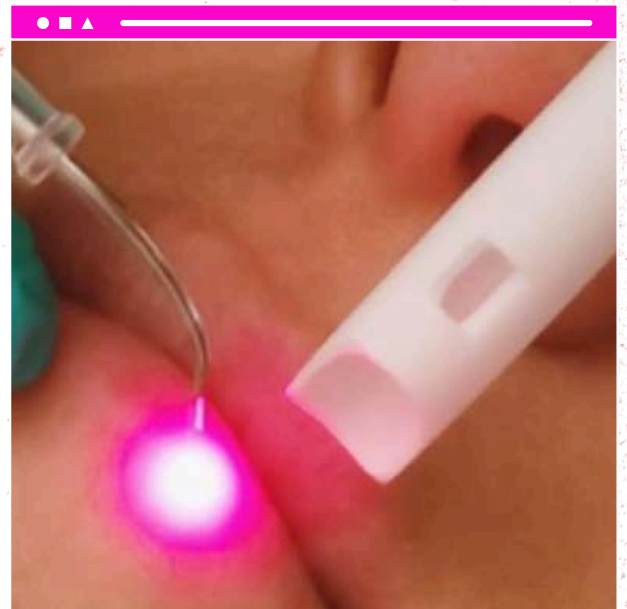


2

## Herpes Labialis (Cold Sores)

- Ideally performed ASAP
  - Right when the patient feels it coming on
  - First day of lesion
  - Can perform at any stage of virus – promotes healing

## WHEN DO WE PERFORM THIS TREATMENT



# COLD SORE TREATMENT

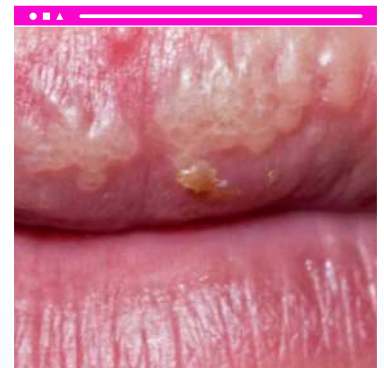


Alejandra Bougrat RDH

## IDEAL PATIENTS FOR THIS TREATMENT

- Anyone with a lesion
- Anyone experiencing pain
  - Patient leaves pain free
- Helps reduce the reoccurrence!

# 3



Schindl AI, Neumann R. Low-intensity laser therapy is an effective treatment for recurrent herpes simplex infection. Results from a randomized double-blind placebo-controlled study. *J Invest Dermatol.* 1999 Aug;113(2):221-3

1. Liberman LH, Hutto T, Dudley A. Treating Herpetic Lesions With Laser Therapy. *Dimensions of Dental Hygiene.* 2020 Apr 28.
2. Javid K, Kurtzman G. Management of Oral Viral Lesions With a Diode Laser. *Dentistry Today.* 2019;Aug 1.
3. Namvar MA, Vahedi M, Abdolsamadi HR, Mirzaei A, Mohammadi Y, Azizi Jalilian F. Effect of photodynamic therapy by 810 and 940 nm diode laser on Herpes Simplex Virus 1: An in vitro study. *Photodiagnosis Photodyn Ther.* 2019 Mar;25:87-91. doi: 10.1016/j.pdpdt.2018.11.011. Epub 2018 Nov 14. PMID: 30447412.
4. "The treatment of herpes labialis with a diode laser ( 970 nm ) – a field study." (2015).
5. Brignardello-Petersen R. Treatment of lesions associated with herpes labialis with low level laser therapy may result in a decrease of pain and recovery time compared with acyclovir. *J Am Dent Assoc.* 2017;148:e153.
6. Khalil M, Hamadah O. Association of photodynamic therapy and photobiomodulation as a promising treatment of herpes labialis: a systematic review. *Photobiomodul Photomed Laser Surg.* 2022;40(5):299-307. doi:10.1089/photob.2021.0186

## RESULTS AND INCREASING PROFITS

- It immediately will feel "numb"
- Patient leaves pain free!
- Immediately start the healing process
- Shrink throughout the day / crust over the next day
- Offices charge \$50-200

# 4



## Practice Builder | New Patients

- NEW procedure/treatment
- Other offices DON'T offer this treatment
- Create awareness
- Most people know someone that gets cold sores
- Great time to give them a biz card-have them give us a call
  - Offer special (1<sup>st</sup> one half off)

# VERBALIZATION – CREATING AWARENESS

- Let all your patients know you have this laser and what it does
- Create the Hype! If they don't know, they won't ask
- While you are doing their teeth cleaning or LBR
- "Our laser also helps get rid of cold sores and canker sores. When we use the laser it immediately puts the lesion into the healing mode and instead of it lasting 10 days, it will crust over within 24 hours." Explain all the different things you do with your laser (sensitivity, LBR/LD)
- "We have a laser that can reduce pain, inflammation and accelerate healing. If you know anyone that gets cold sores/canker sores, we can use the laser and it immediately puts the lesion into the healing mode and instead of it lasting 10 days, it will crust over within 24 hours of us using the laser."

# Desensitization Treatment

## WHAT ARE WE DOING?

- Changing the viscosity of the fluid in the dental tubules
- Can use varnish afterwards

1

## WHEN DO WE PERFORM THIS TREATMENT

- When the patient is experiencing sensitivity
- Beginning of hygiene appointment
  - Patient has better experience

2

## IDEAL PATIENTS FOR THIS TREATMENT

- Anyone experiencing sensitivity
  - Dentin Hypersensitivity<sup>2</sup>
- This is for exposed dentin

3



1. Gojkov-Vukelic M, Hadzic S, Zukanovic A, Pasic E, Pavlic V. Application of Diode Laser in the Treatment of Dentine Hypersensitivity. Med Arch. 2016;70(6):466-469. doi:10.5455/medarh.2016.70.466-469

2. Asnaashari M, Moeini M. Effectiveness of lasers in the treatment of dentin hypersensitivity. J Lasers Med Sci. 2013;4(1):1-7.

# RESULTS AND INCREASING PROFITS

# 4

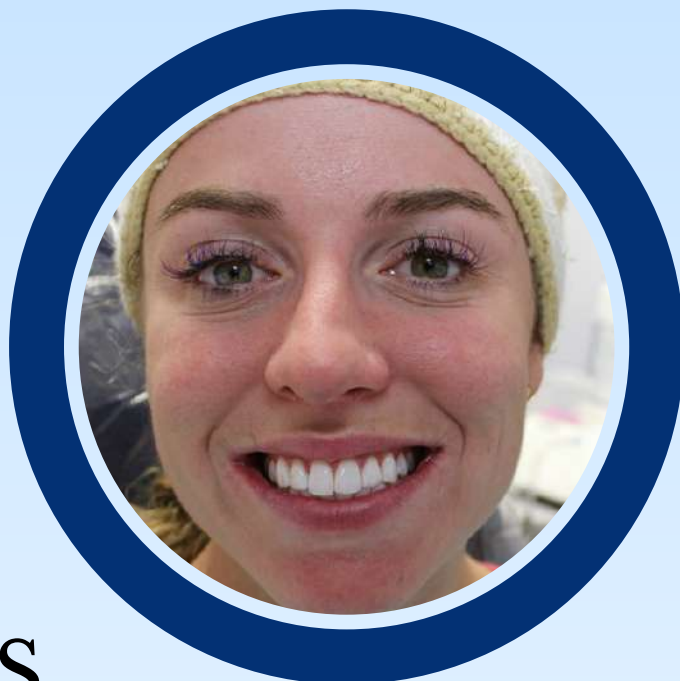
- Can last a very LONG time
- If it comes back check - **What is causing the sensitivity?**
  - Abrasive toothpaste -No tarter control toothpaste
  - Check bite if it comes back
- **Most times it is occlusal forces**
- Make sure they are in the correct bite appliance
- Typical fees \$25-\$225



## CREATE AWARENESS

- Most people have at least 1 sensitive area
- Sometimes they don't let us know
- While performing hygiene visit talk about "extras" the laser can do
- "The laser can also help with sensitive teeth"

# WHITENING



LASER ACTIVATES  
THE WHITENING GEL  
TO WORK FASTER







# UMBRELLA TONGUE, LIP AND CHEEK RETRACTION



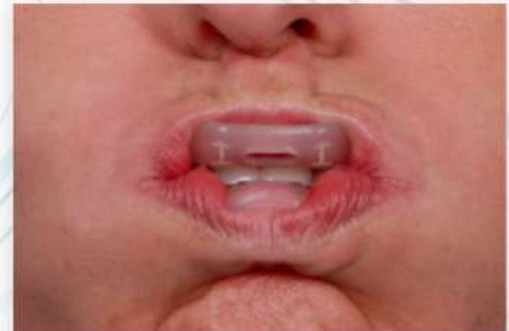
## ✔ Step 2

Ask the patient to place the tip of their tongue on the roof of their mouth.



## ✔ Step 3

Choose one side of the mouth in which to start, and then comfortably insert the other side of the retractor into the cheek.



## ✔ Step 4

Use the tabs to center the retractor with the patient's mouth.



## ✔ Step 5

Check that the patient's tongue is resting comfortably behind the guard, ensuring easy access.



Do not place the tongue guard on top of the patient's tongue.

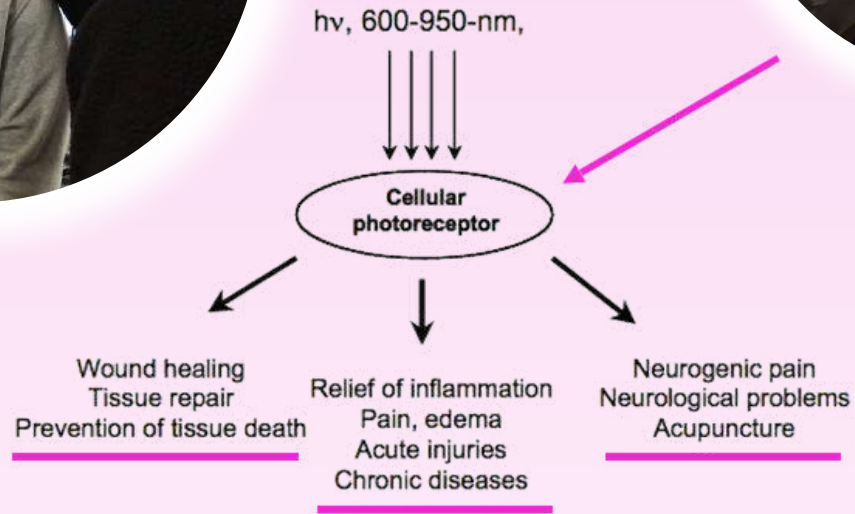


## Advanced Laser Procedures



## WHAT IS PHOTOBIO-MODULATION

Photo (light), bio (life & cells), modulation  
(modify or influence change)



Hamblin MR, Demidove TN. Mechanisms of low level light therapy. In: Hamblin MR, Waynant RW, Anders J, editors. Mechanisms for Low-Light Therapy, January 22 and 24, 2006, San Jose, Calif. Proc. SPIE 6140. Bellingham, Wash.: SPIE – The International Society for Optical Engineering, 2006:614001-1 614001-12.

# PBM / BIOSTIMULATION / THERAPEUTIC LASERS

- 400-1064nm
- Lasers in the red part of spectrum superficially absorbed
- Infrared (NIR) lasers penetrate 3-5cm (not in visible light spectrum)
- Mucosa transparent, skin and bone moderately transparent, **muscles** greatest absorption of light
- Many immune cells and nerves are peripheral, close to the surface
- Meaning they can be absorbed and affected directly by photons (what laser puts out)
- Laser light stimulates natural biological processes. Only affecting redox (decreased oxidation-reduction) (acidic) cells making them alkaline, able to perform optimally. Not affect healthy cells
- ATP (fuel of the cells) cytochrome c oxidase is inhibited by NO.
- Laser light will dissociate the binding between NO and cytochrome c allowing it to resume ATP production



# Variables for PBM Therapy

**(COULD IMPACT THE SAFETY AND EFFECTIVENESS OF PAIN THERAPY)**

- Power output
- Distance from the skin surface
  - Many PBM devices are used in contact (touching) of skin
  - Can cause reflection off skin-If PBM tip is away from skin.
  - **Definitely affects dosage**
- Range of movement of the handpiece
- Patient skin type
- Fitzpatrick Skin Type Scale



## PBM USES IN DENTISTRY

- Post extraction
- Dry Socket
- Endodontics – root canal/post-op pain
- Implants
- Restorative Procedures, Fillings, Cementing Crowns
- Dental Infections
- Nerve Regeneration
- Orthodontics (movement of teeth-stimulation)

- **Mucositis**
- **Nausea & Gagging**
- **Facial Pain Relief After Long Dental Appointments**
- **TMJ/TMD**
- **Analgesic & Acupuncture like affects**
- Sinusitis
- **Dry Mouth**- Stimulation mode
- Paresthesia
- Gingival Grafts

# TMJ & TREATMENT OF FACIAL PAIN

- Find out where they are experiencing pain and/or soreness
- Talk calmly, ask patient to relax and take deep breaths
- Place laser on skin, treat that area



## NAUSEA & GAGGING

- Apply laser to P6 acupuncture point
- Reduces nausea & gagging
- Bioinhibition
- High anxiety or very strong gagger-apply laser to all 3 points

## LASER SAFETY STANDARDS



## ANSI (American National Standards Institute)

- Provides guidance for the safe use of laser systems
- Defining control measures for lasers
- ANSI Z136.1 – Safe use of lasers
- Provides recommendations for the safe use of lasers and laser systems
- Foundation of laser safety programs for industrial, military, medical and educational applications
- <https://www.lia.org/store/laser-safety-standards/z136-standards>
- Cost \$225 – PDF or hardcopy, 253 pages
- ANSI Z136.3 – Safe use of Lasers in Health Care
- Provides guidance for users working with lasers in healthcare
- <https://webstore.ansi.org/Standards/LIA/ANSIZ1362018>
- PDF or Hard Copy (\$170), 128 pages



## LASER REGULATION IN THE USA

### FDA (Food and Drug Administration) within them is the CDRH (Center for Devices and Radiological Health)

- Responsible for implementing and enforcing safety protocols for the various laser types and making sure all safety measures are being following
- Standardize the manufacture of laser products
- Owners manual instructs how to use the device for particular procedures and safety

### OSHA (Occupational Safety and Health Administration)

- Federal gov agency. Primarily concerned with a safe workplace environment and worker safety



## WHO IS LASER SAFETY TRAINING FOR?

Detailed training in laser safety must be provided for all personnel using or working in the presence of class 3B & 4 lasers<sup>1</sup>

Anyone that is associated with

- Operating the laser
- Prepping the laser
- Maintaining/servicing the laser
- Employers who are establishing proper laser safety policies and procedures and training programs

All training must be documented and documentation retained on file 1-2

1.American National Standard (ANSI) for the Safe Use of Lasers Z136.1-2022; Laser Institute of America; Publisher

2.Barat, Ken. Laser Safety: Tools and Training. Boca Raton, Taylor & Francis Group LLC, 2014



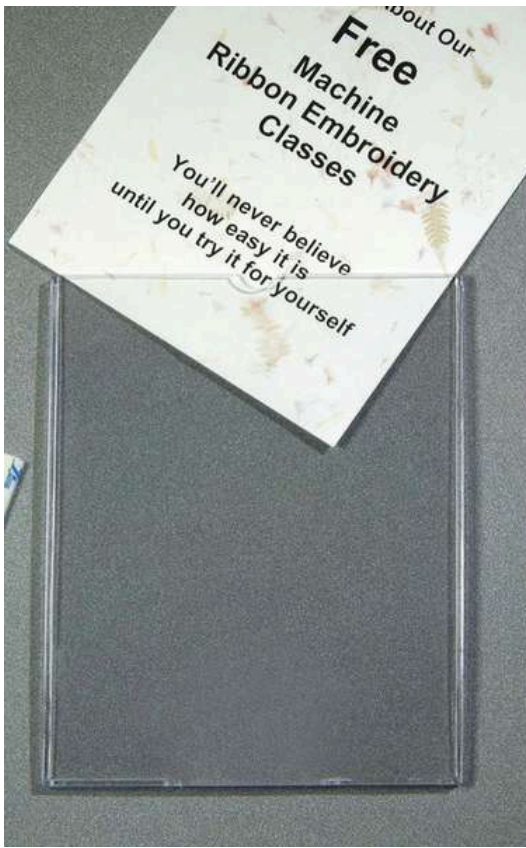
# REFRESHER TRAINING

- Retraining programs should be provided at minimum every 5 years (ANSI Z136.3 section 5.2.2)
- User that hasn't used laser in awhile might have forgotten
- User that uses laser daily may be more lax/complacent on safety duties and could use a refresher
- LSO determines intervals of retraining

## Warning | Danger Sign PLACED OUTSIDE THE OPERATORY



# REMOVE SIGN WHEN NOT IN USE



## Location of Warning Signs

- Displayed where they best serve to warn onlookers
- Removed when not in use
- Clear wall mount, Velcro, laminate sign
- Only have sign up when laser is in use to warn others of laser radiation



# Laser Glasses to be worn by everyone in room

**(PATIENT, CLINICIAN, ASSISTANT)**

Check the wavelength on glasses match wavelength on laser



Only use Soap and water to clean laser glasses/inserts



## LASER LOUPES INSERTS

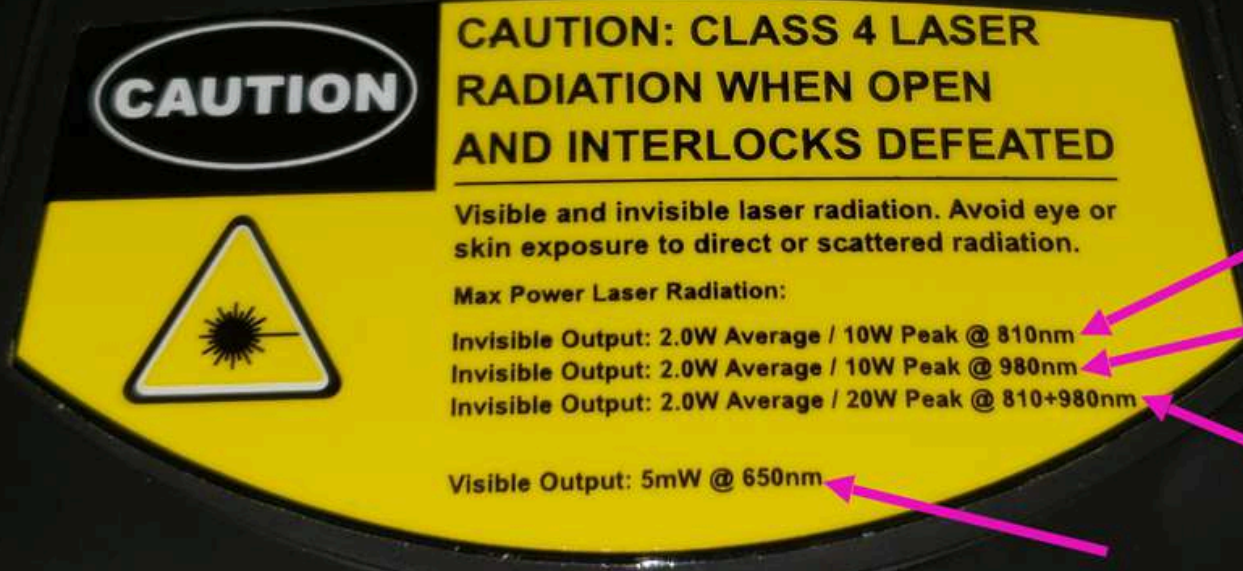


- Innovative Optics
- <https://innovativeoptics.com/>
- Contact Ryan 612-281-8662

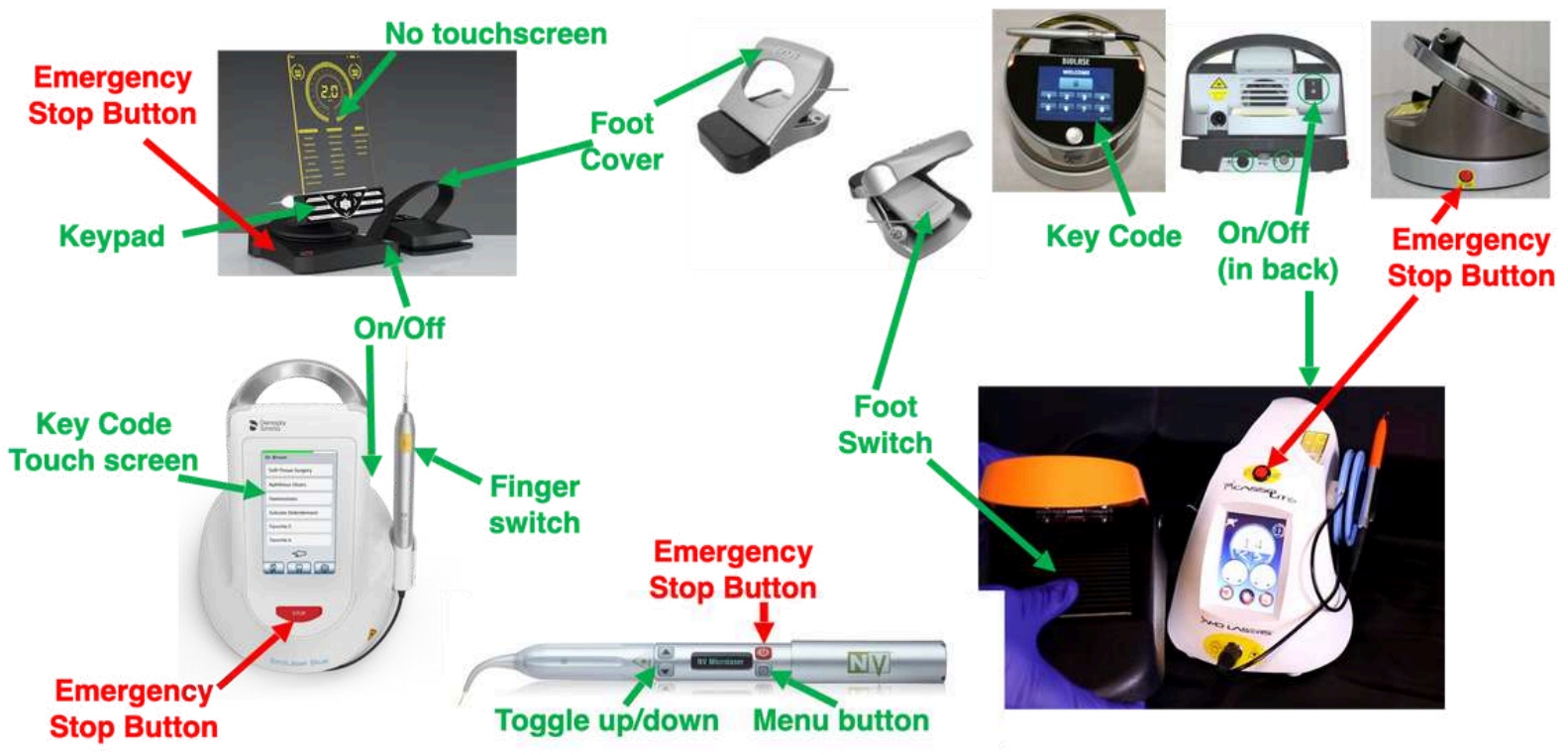


- Orascoptic
- Universal inserts
- Covers 810-980nm

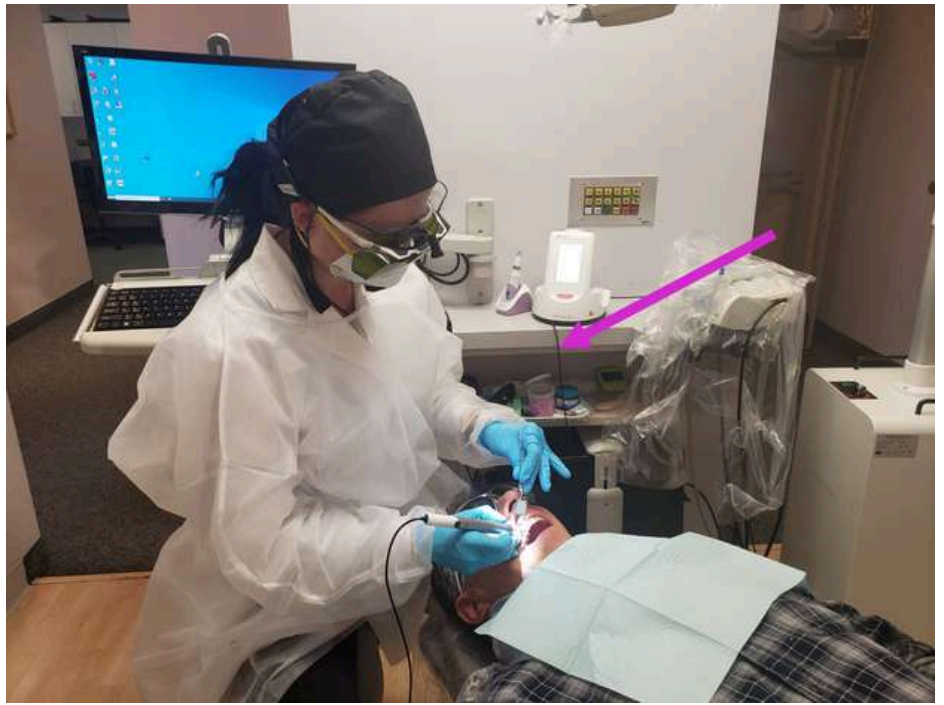
# LABEL SHOWS WAVELENGTH | POWER



# EMERGENCY STOP BUTTONS, KEYS, CODES



## HAZARDS



# TIPS ARE SINGLE-USE ONLY

**Read your manual to see what they recommend for sterilizing**

- Biolase Epic tips can withstand one autoclave cycle
- Dentsply Sirona Tips come Sterile

Some companies recommend wiping with CaviWipes



Read manual regarding PBM/Whitening Handpiece- most **CAN'T** be autoclaved

**If unsure-READ MANUAL**

# DO NOT USE ALCOHOL



# Nitrous Oxide, Oxygen & Laser

- January 2005: ANSI Standard Revision
- Nitrous Oxide/Oxygen **can be** used with proper scavenger and suction techniques
- Use High-Evacuation for all procedures if patient is using Nitrous/O<sub>2</sub>

1. VanCleave, Andrea M et al. "The effect of intraoral suction on oxygen-enriched surgical environments: a mechanism for reducing the risk of surgical fires." *Anesthesia progress* vol. 61,4 (2014): 155-61. doi:10.2344/0003-3006-61.4.155

- Responsible for educating the dental team in safe use of the laser
- Who needs Training?
  - Anyone entering the Nominal Ocular Hazard Distance (NOHD)
    - 8.7 feet Gemini. 1.04 in with eye protection
    - 15 feet – Biolase Epic
- Enforcing safety practices
  - "laser in use" signs
  - laser off or standby mode
  - LSGU
  - High-vac suction
  - Limit reflective surfaces
- Test fire laser before patient in chair – daily
- Keep records of incidents that relate to failure of laser or any adverse effects related to laser therapy – report such incidents as prescribed by law
  - Assure medical follow-up has been sought or has occurred



# Calibration | Maintenance

- Recommendation - every 1-2 years (all laser manufacturers-ck safety manual)
- Ask for PMI report and keep on hand (Periodic Maintenance Inspection)
- Some laser companies do this for free
  - Check turnaround time.
- Recommendation of technicians certified in servicing their laser. Request demo while laser is out
- Keep all servicing, maintenance paperwork - VERY IMPORTANT
- If you notice something, send in immediately

**PMI Report**

Customer Name: Dr. Hayes Unit Serial Number: 204053  
Laser Type: Diode Date of Service: 2-9-18

**Safety Inspection**  
Interlock: Pass/Fail Power Cord: Pass/Fail Visual Inspection: Pass/Fail

**Operational Inspection**  
Foot Pedal: Pass/Fail Fiber Optic Delivery System: Pass/Fail NA  
Aiming Beam: Pass/Fail NA User Interface: Pass/Fail  
Audible Tone: Pass/Fail NA Lasing Light: Pass/Fail  
Signage Posted: Yes/No NA Safety Goggles: Pass/Fail NA

**Output Readings**

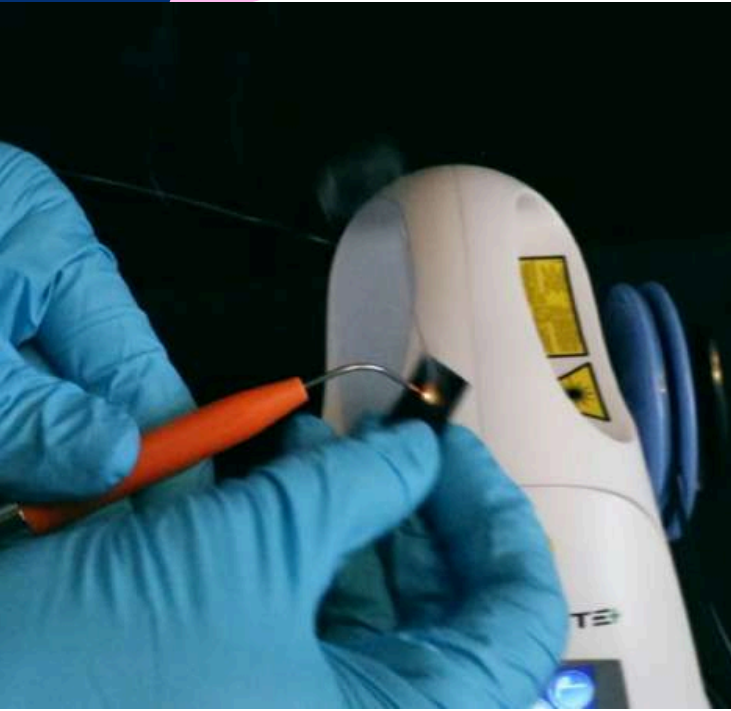
Setting	Actual Reading
0.5 W:	<u>1.49 W</u>
1.0 W:	<u>1.1 W</u>
2.0 W:	<u>2.0 W</u>
3.0 W:	<u>2.9 W</u>
5.0 W:	<u>5.1 W</u>
10.0 W:	_____

Note: Repair done per  
manufacturer's manual

Technician: [Signature]

SvenTech Inc. | 1037 Main Street Antioch, IL 60002 | Phone: 847.838.1456 (5273)  
mail@sventechlasers.com | sventechlasers.com

# Laser Plume



- **Use of high-volume evacuation system to remove aerosols and laser plume is recommended**
- Keep high-vac as close to working area of laser to capture all contaminants
- Plume is composed of 95% water and 5% particulate matter, organic and inorganic chemicals, and microorganisms<sup>1</sup>
  - Organic chemicals such as benzene, toluene, formaldehyde, and cyanide have been isolated within the plume; inorganic chemicals include carbon monoxide, sulfur, and nitrogen compounds. <sup>2</sup>

1. Douglas OH: Laparoscopic hazards of smoke, Surg Serv Manage AORN 3(3), 1997.  
2. Ulmer B: Air quality in the operating room, Surg Serv Manage AORN 3(3), 1997.

## Ventilation

- Options for laser plume - General ventilation, local exhaust ventilation, room suction systems, smoke evacuators, filters<sup>1,2</sup>
- Recommended - combo of general room and local exhaust ventilation<sup>1</sup>(CDC recommendations) (OSHA Standard 29 CFR 1910.1000)
- Importance of a smoke evacuator
- Captures the pollutants close to the source of emission, reduces unpleasant odor, minimizes exposure
- Contains suction unit (vacuum pump), filter, hose and an inlet nozzle
- High efficiency in airborne particle reduction (capture velocity of 100-150 feet per min)
- Filter - HEPA - change filter regularly on all ventilation systems

1. <https://www.cdc.gov/niosh/docs/hazardcontrol/hc11.html>

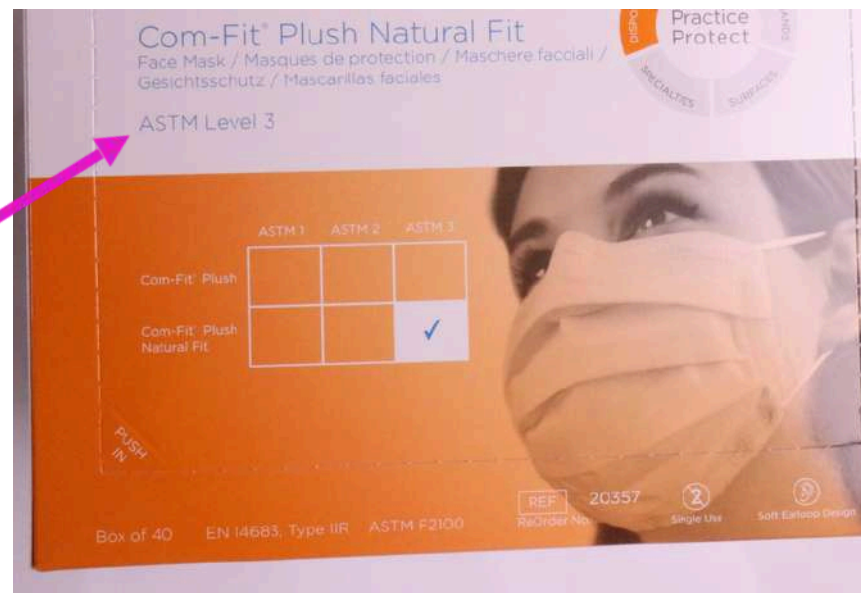
2. Barrett WL, Garber SM. Surgical smoke: a review of the literature. Is this just a lot of hot air?. Surg Endosc. 2003;17(6):979-987.





# High-efficiency filtration mask or N95 respirator

- **HEPA respirator masks such as N95** -filtration efficiency of 99.93% can filter submicrometer-sized particles<sup>1,2</sup>
- Level 3 Mask has particle filtration efficiency of 99.75% at 0.1  $\mu$
- Common mask 5.0- $\mu$ -filtration efficiency of 91.53%
- To protect yourself and your clients, proper PPE and high-efficiency mask/respirator is recommended.<sup>3</sup>



1. Katoch S, Mysore V. Surgical Smoke in Dermatology: Its Hazards and Management. J Cutan Aesthet Surg. 2019;12(1):1-7.

2. Lu W, Zhu XC, Zhang XY, Chen YT, Chen WH. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2016;34(9):643-646.

3. Barrett WL, Garber SM. Surgical smoke: a review of the literature. Is this just a lot of hot air?. Surg Endosc. 2003;17(6):979-987.

## Laser Safety Officer Responsibilities

- Keeper of the key
- Establishing standard procedures
- Understanding laser operational characteristics and output limitations
- Designating controlled areas and posting warning signs
- Supervising staff education and training
- Ensuring laser maintenance, beam alignment, and calibration
- Overseeing personal protective wear and medical surveillance
- Familiarity with biological and other hazards
- Knowledge of regulations like OSHA and ANSI
- Defining hazard and no-hazard zones
- Maintaining a log of laser use and parameters



# Laser Safety Officer Training (LSO)

Email [JoyRaskieRDH@gmail.com](mailto:JoyRaskieRDH@gmail.com)

To be the 1st to know about our LSO training along with all safety forms your office needs to stay complaint



## Training



- Seek out a perio/hygiene course
  - All team members attend (RDH/DDS)
  - This is where true implementation happens
- Proper hands-on laser training
  - Makes everyone feel comfortable and confident delivering laser therapy
- Verbalization training
- Verbalization + Hands-on technique confidence=better bottom line \$\$
- Team meetings to discuss what is working/not working

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- Get **excited**, the more you stay positive the better your patients will feel about accepting treatment
- Be **confident**, you know what you are talking about and your patients trust you
- Think about your **delivery**
  - **Direct Eye Contact** is important
- Making it a **part of their out of pocket investment** will help them understand this is the standard of care in your office
- During the hygiene & restorative appts, talk about the laser
  - Create the Hype, be excited

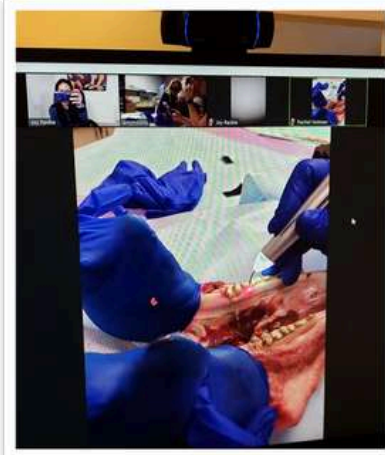


A series of horizontal dotted lines on a light pink background, intended for handwritten notes.

# Diode Laser Training and Certification

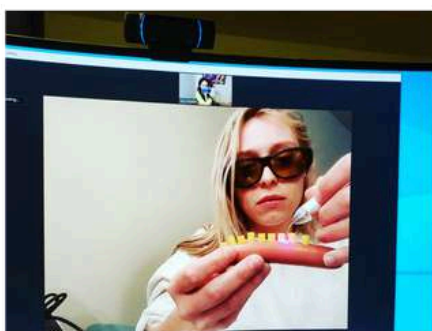
*Live and Online Laser Training Courses*  
**Advanced Dental Hygiene**

**AdvancedDentalHygiene.com**



**Attend Online –  
We can ship you  
a laser for the  
hands-on**

**AdvancedDentalHygiene.com/12CEonline**



**12CE Online Laser  
Certification**  
*2.5 Hour Live, hands-on  
With Your Laser  
At your office/home*

*Don't have a laser-we can  
ship you a laser to borrow*

**Confidence**



# Thank You!

I hope you had fun today and are now as excited about lasers as I am!!

Thank you for having me!

Let's create Excitement in your Dental Hygiene Practice with lasers?

Visit: [AdvancedDentalHygiene.com](http://AdvancedDentalHygiene.com)

Online and LIVE courses **every week**



Contact Info:  
**Joy Raskie, RDH**  
[AdvancedDentalHygiene.com](http://AdvancedDentalHygiene.com)

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