UTILIZING LASERS IN YOUR PERIO PROGRAM

presented by:

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Advanced Dental Hygiene

AdvancedDentalHygiene.com

What does LASER Stand for?

Light

Amplifiaction by

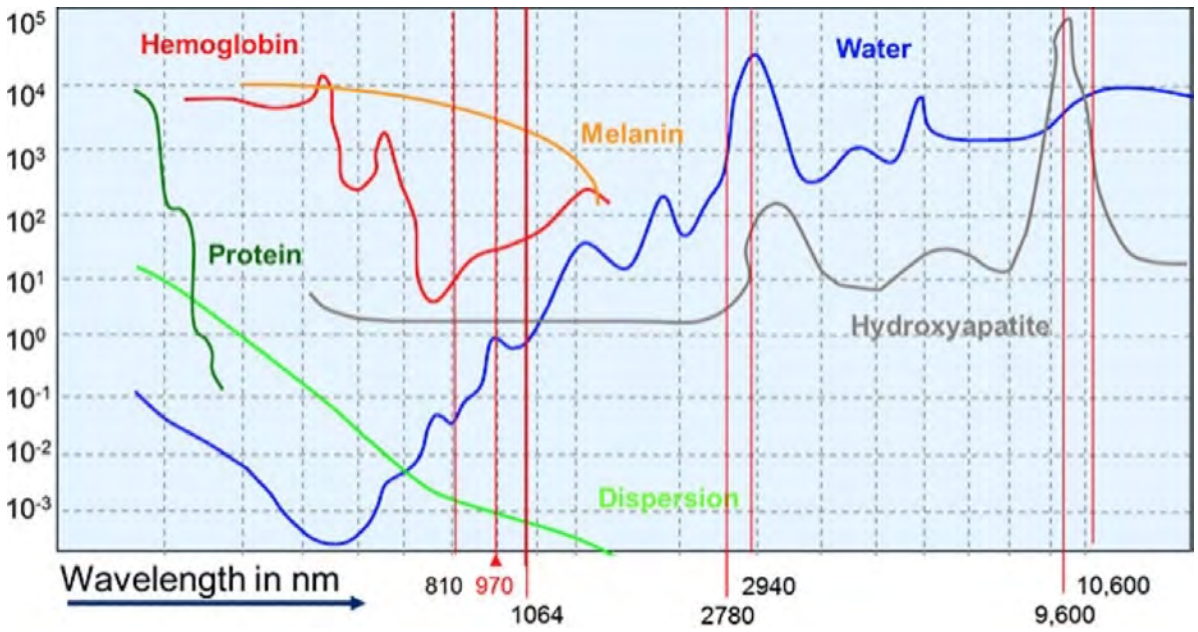
Stimulated

Emission of

Radiation

Why do certain lasers work more easily than others with fighting Perio?

Absorption Curves of Various Tissue Components



Articulated Arm

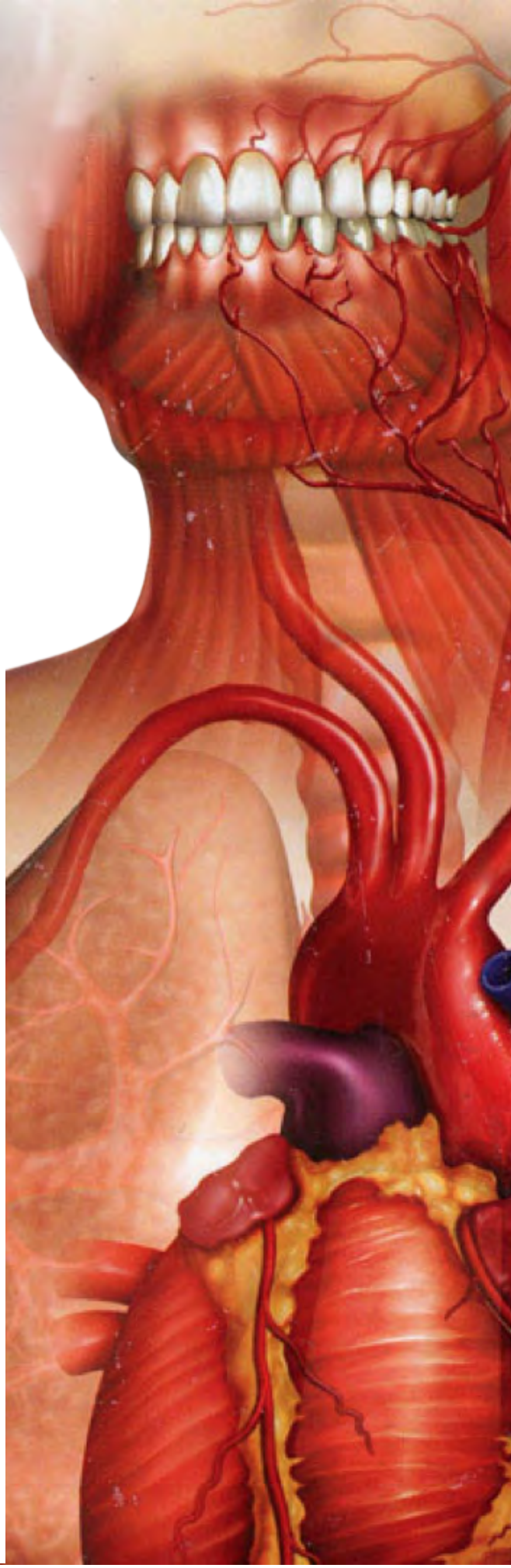
Hollow tubes, 45 degree mirrors

Hollow Waveguide

Semi rigid tube with internal reflective pathway

Lasers in Hygiene

Mouth-Body Connection



1. 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.

2. University of Florida. (2005, March 31). Live Oral Bacteria Found in Arterial Plaque. ScienceDaily.

3. 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.

4. 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.

5. 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.

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

Biofilm – The “bad guys”

- First component of gingivitis/periodontal disease

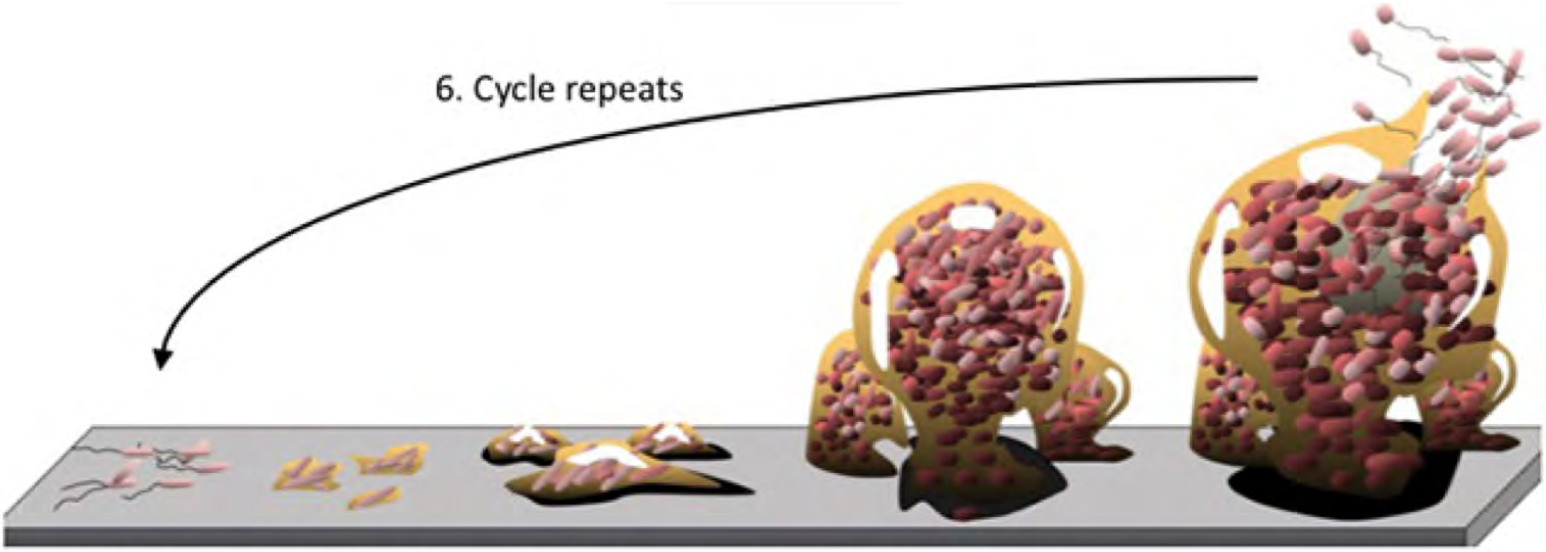
- Complex community of microorganisms protected by a secreted extracellular polymeric substance. As it becomes more mature, the microbes use a molecular communication to created a highly organized and adaptable infrastructure and become a living organism. (Fux CA, Costerton JW, Stewart PS, Stoodley P: Survival strategies of infection biofilms, Trends Microbiol 13:34-40, 2005)

- Develops resistance to UV light, bacteriophages, biocides, antibiotics, immune system responses, and environmental stresses. (Donlan RM, Costerton JW: Biofilms: survival mechanisms of clinically relevant microorganisms, Clin Microbiol Rev 15: 167-193, 2002.)

- **Biofilm is what you are targeting with the laser!!**

Convissar, Robert. A. Principles and Practice of Laser Dentistry. New York: Mosby 3:27, 2015.

What is really going on…



1. Single free floating bacteria land on surface

2. Bacterial cells aggregate and attach

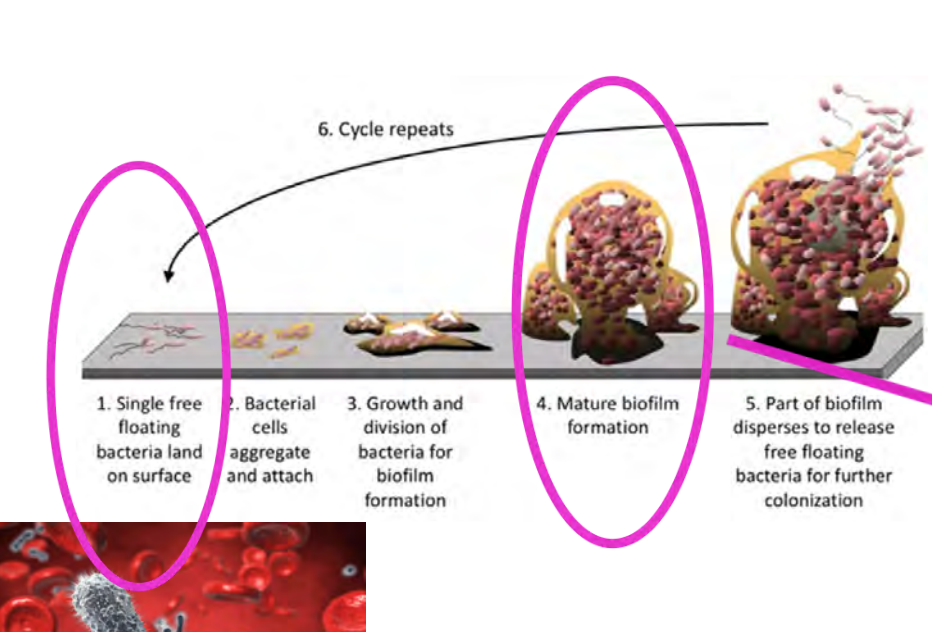
3. Growth and division of bacteria for biofilm formation

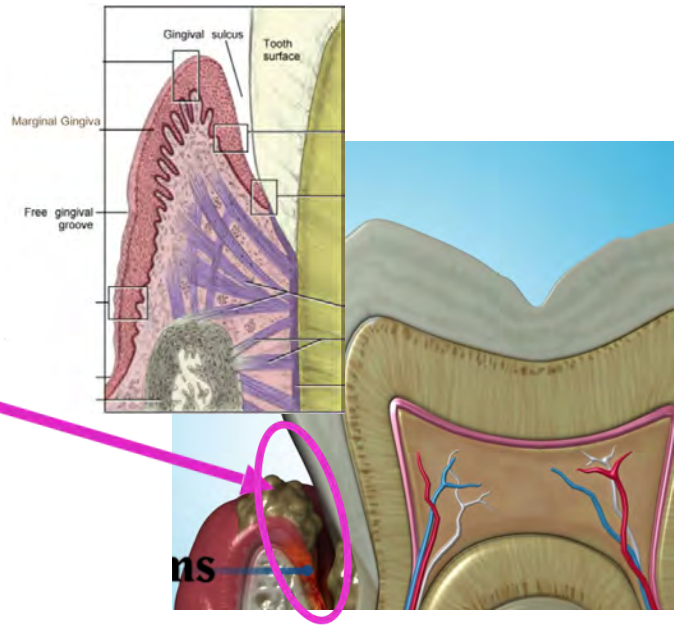
4. Mature biofilm formation

5. Part of biofilm disperses to release free floating bacteria for further colonization

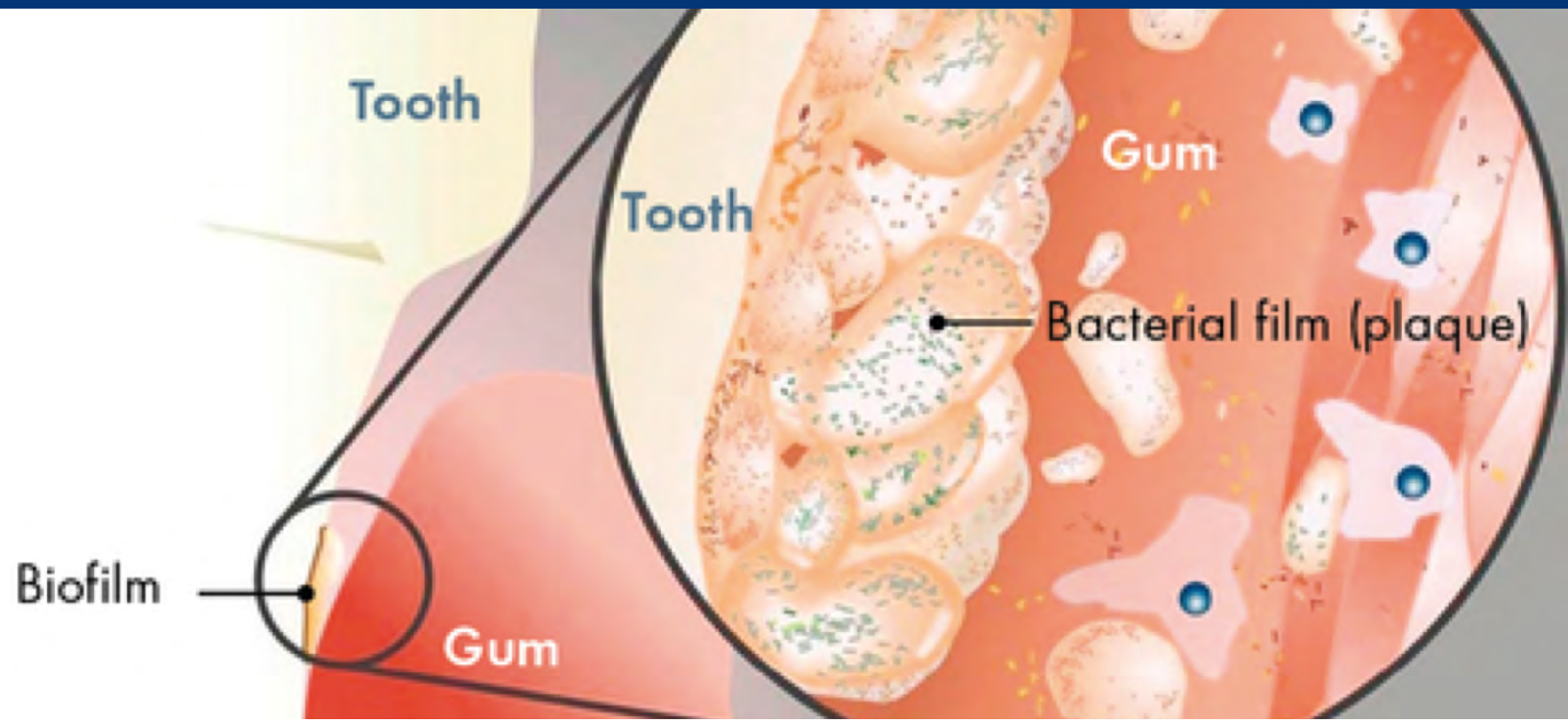
NOTES:

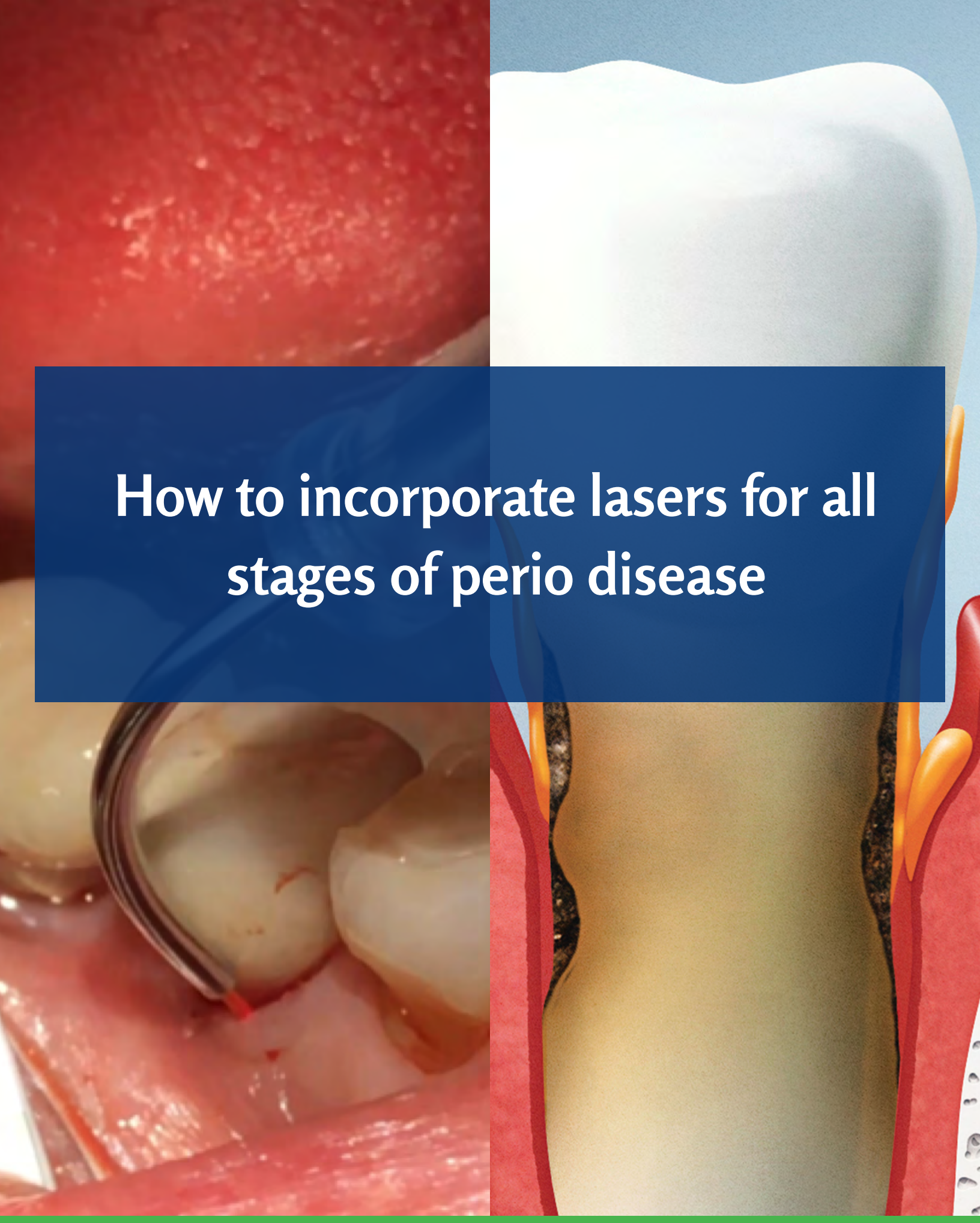
How Lasers Are Incorporated





Oh no!!





How to incorporate lasers for all stages of perio disease

Staging and Grading Periodontitis

STEP 1 | SCREEN + ASSESS **STEP 2** | ESTABLISH STAGE **STEP 3** | ESTABLISH GRADE

STAGING

The process of *classifying the severity* of a patient's disease. The primary determinant = clinical attachment loss (CAL) at the point of greatest loss (the worst tooth). If CAL not available, radiographic bone loss (RBL) can be used.

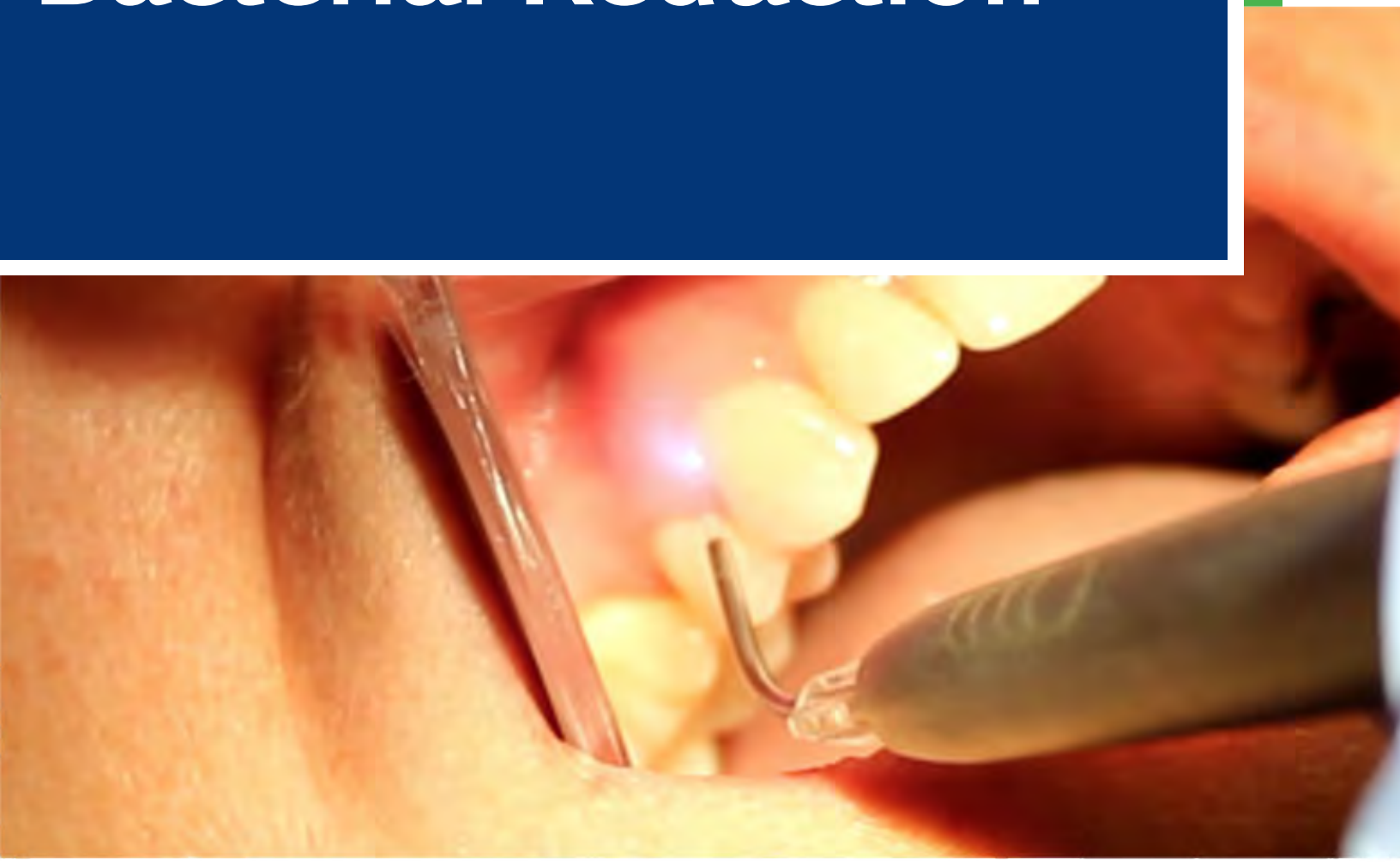
	STAGING FACTOR	STAGE I	STAGE II	STAGE III	STAGE IV
SEVERITY	Interdental CAL	1 - 2 mm	3 - 4 mm	≥5 mm	≥5 mm
		MILD > MODERATE		MODERATE > SEVERE	
					
	RBL	Coronal third (<15%)	Coronal third (15-33%)	Extends beyond 33% of root	Extends beyond 33% of root
	Tooth loss	None	None	≤4 teeth	≥5 teeth
COMPLEXITY	Local	• Max probing depth: ≤4 mm • Mostly horizontal bone loss	• Max probing depth: ≤5 mm • Mostly horizontal bone loss	• Max probing depth: ≥6 mm • Vertical bone loss: >3 mm • Furcation involvement • Moderate ridge defects	Additional dysfunction, occlusal trauma, defects, bite collapse. *Requires further assessment.*
EXTENT	For each stage describe the extent as localized, generalized, or molar/incisor pattern				

Brought to you by:

adha American Dental Hygienists' Association waterpik

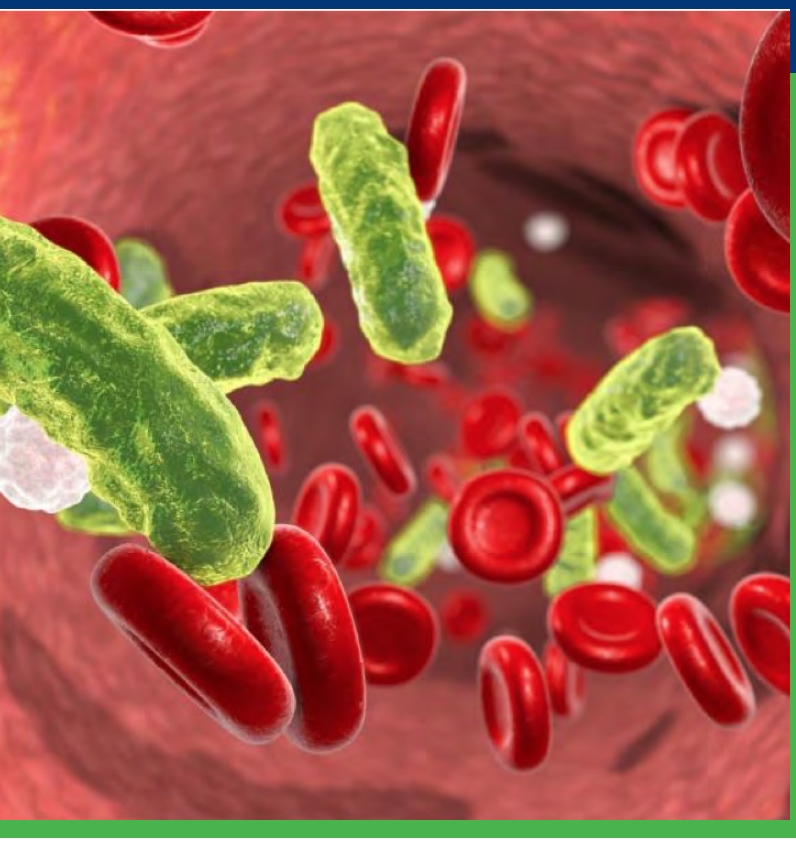
NOTES:

Laser
Bacterial Reduction



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

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.

When is LBR incorporated?

LBR is performed prior to:

- Probing
- Polishing
- Ultrasonic
- Scaling

Results We See

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

ROI for LBR

(Return on Investment)

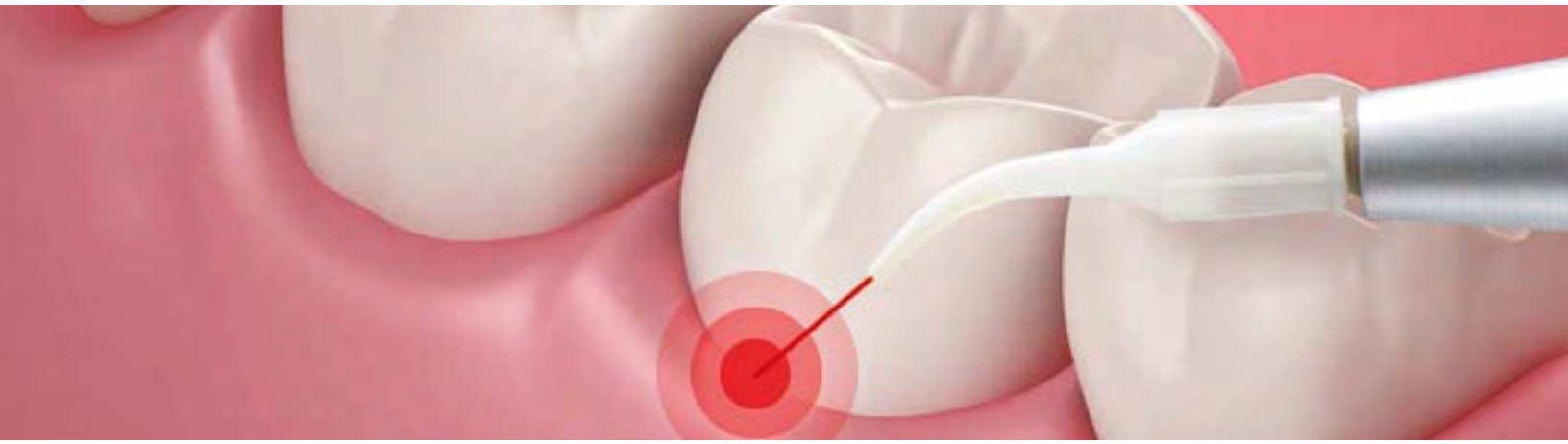
- LBR $35 ~ **4 Day Work Week** **$44**
  - 4 pts day=$140, week=$560, $2240 month, 26,880 yr/ $36,608
  - 5 pts day=$175, week=$700, $2800 mo, 33,600 yr / $45,760
  - 6 pts day=$210, week=$840, $3360 mo, $40,320 yr / 54,912
  - **8 pts day=$280, week=$1120, $4480 mo, $53,760 yr / $73,216**

- **Buy a laser $7000**
  - Paid off less than 3 months with ONLY doing 4 patients a day LBR

Laser Decontamination

Laser-Assisted Periodontal Therapy (LAPT)
Laser Decontamination (LD)

(Same thing)

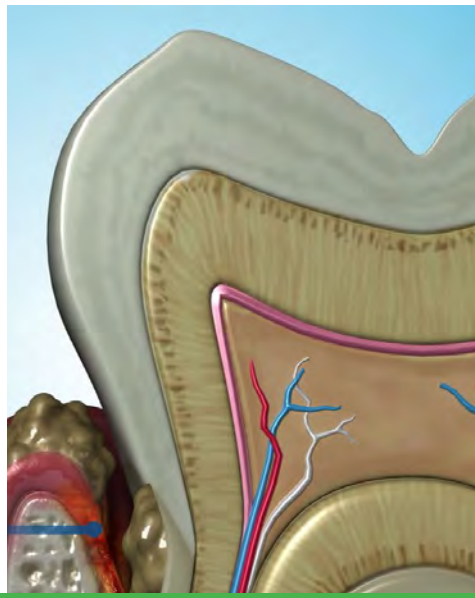


Laser Decontamination – (LD)

(Why I call it LD and why it is ok to initiate your tip in some states)

Just as conventional root debridement **removes biofilm** and accretions from the hard **tooth** surface, laser decontamination **removes biofilm** within the **necrotic tissue of the pocket wall.** The laser energy interacts strongly with inflamed tissue components (diseased tissue, red-orange complex bacteria) and less strongly with healthy tissue.

Convissar, RA: Principles and Practice of laser Dentistry, New York: Mosby, (3) 31. 2011. Print.



This nonsurgical therapy uses very low settings and decontaminates rather than cuts the tissue.

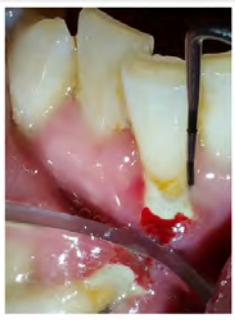
Coluzzi DJ, Convissar RA: Atlas of laser applications in dentistry, Chicago, 2007. Quintessence.

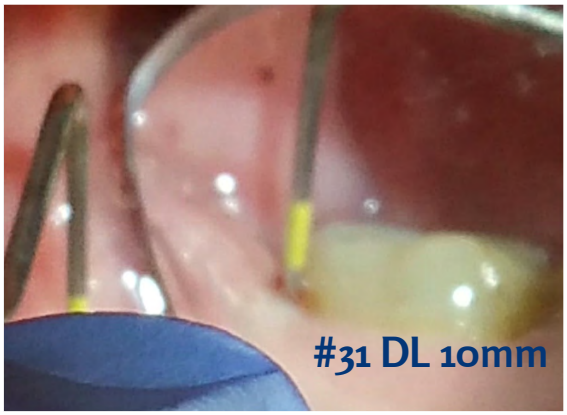
When is LD incorporated?

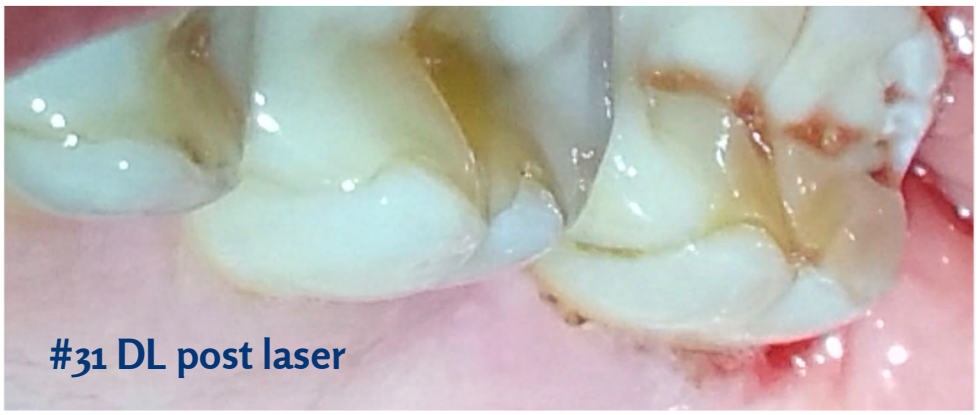
LD is performed after

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

Who is LD for?

STAGE I	STAGE II	STAGE III	STAGE IV
1 - 2 mm	3 - 4 mm	≥5 mm	≥5 mm
MILD > MODERATE		MODERATE > SEVERE	
			
Coronal third (<15%)	Coronal third (15-33%)	Extends beyond 33% of root	Extends beyond 33% of root
None	None	≤4 teeth	≥5 teeth
• Max probing depth: ≤4 mm • Mostly horizontal bone loss	• Max probing depth: ≤5 mm • Mostly horizontal bone loss	• Max probing depth: ≥6 mm • Vertical bone loss: >3 mm • Furcation involvement • Moderate ridge defects	Additional dysfunction, occlusal trauma, defects, bite collapse. *Requires further assessment.*
			
			





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

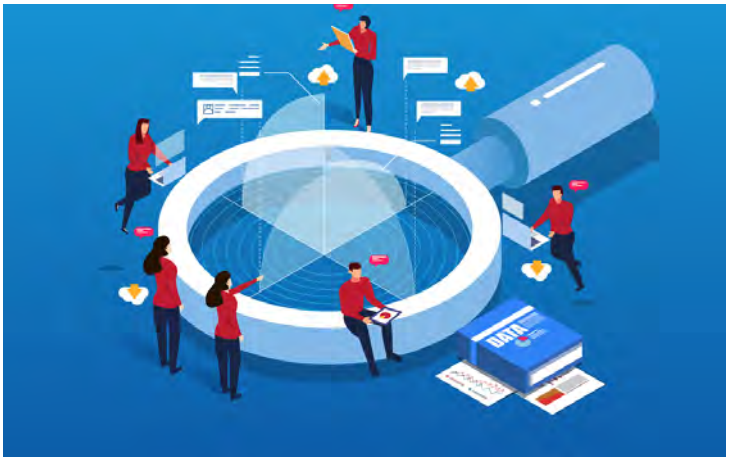
Heather Gill, RDH Lakewood, CO

LD Full Quad – Immediate post-op

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 alone1
- Considerable **bacterial elimination**, especially of **Actinobacillus actinomycetemcomitans,** from periodontal pockets2



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.

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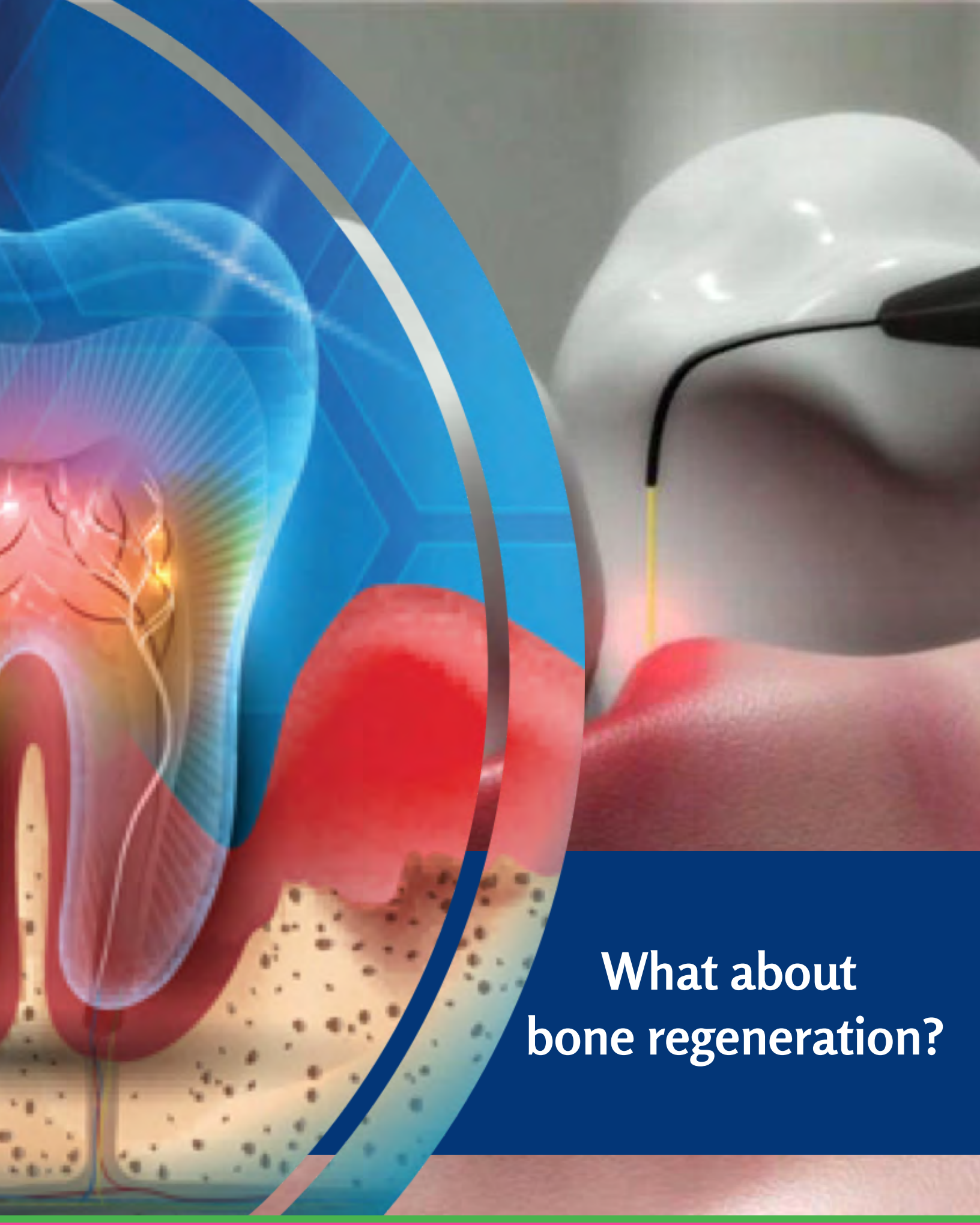
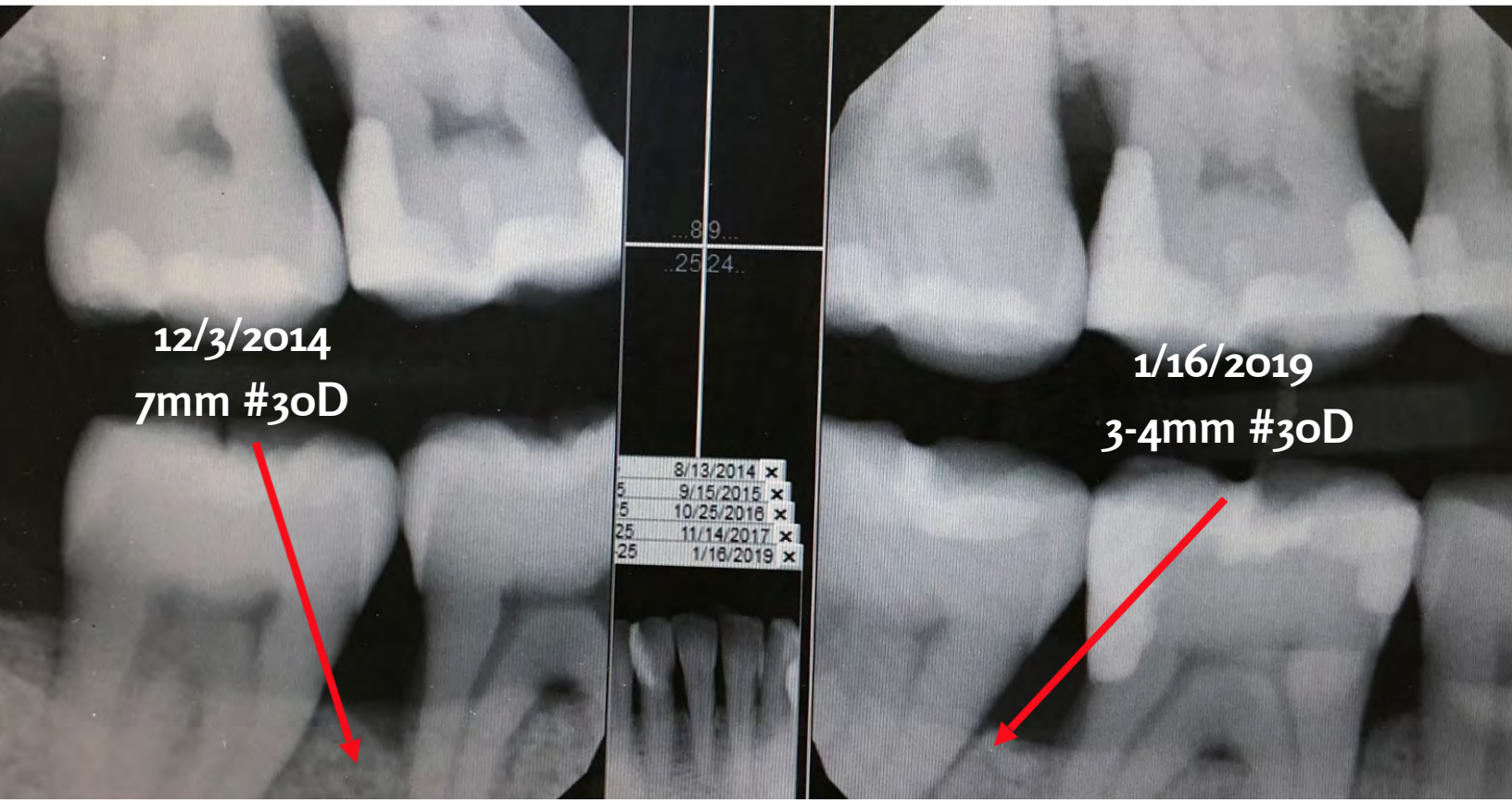


What about bone regeneration?

Bone 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

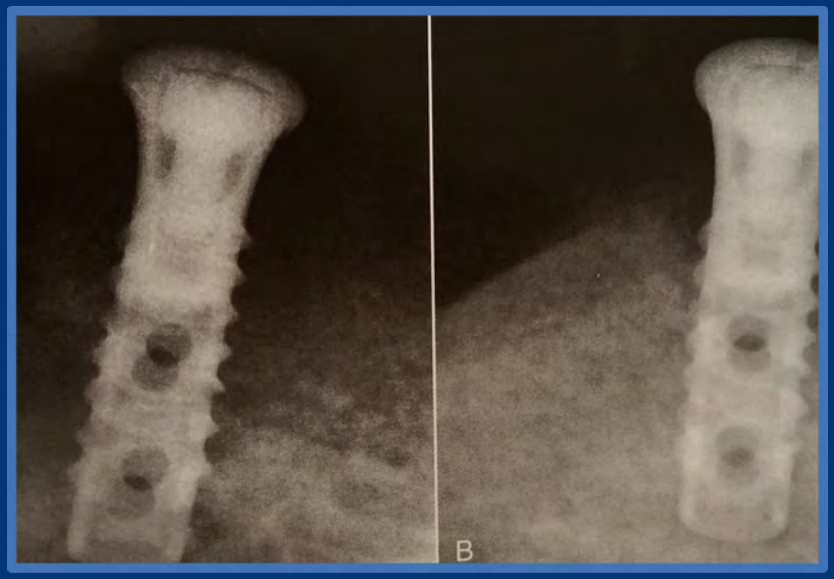
Amid R, Kadkhodazadeh M, Ahsaie MG, Hakakzadeh A. Effect of low level laser therapy on proliferation and differentiation of the cells contributing in bone regeneration. J Lasers Med Sci. 2014;5(4):163–170.

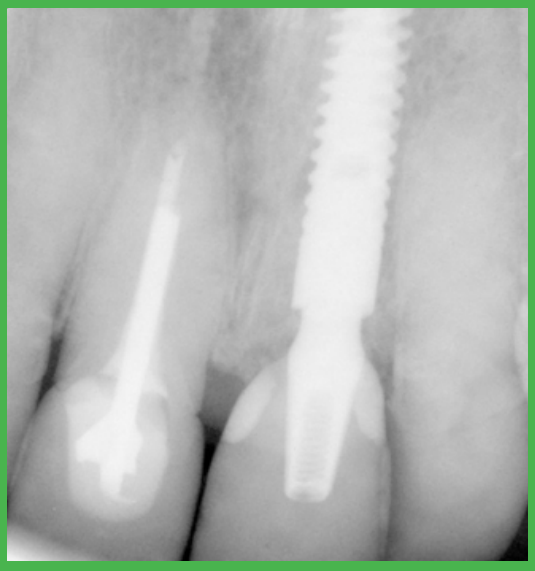
Pires Oliveria DA, de Oliveria RF, et al: Evaluation of low-level laser therapy of osteoblastic cells, Photomed laser surg 26(4):401-404, 2008

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

Peri-Implant Mucositis

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





Tips to effectively implement laser into your periodontal program

Start out small

- Start with a couple cases a day
- Many start with incorporating it as part of ALL SRP appointments
- Be sure to present as a whole and not as extra. This is part of the "non-surgical therapy", "non-invasive", "SRP" etc
- How is laser different?
- ➢Scaling and root planning removes the bacteria and debris from the root surface ~ Laser removes bacteria from the gingival tissue
- Team meeting ~ discuss what patients we always use laser on, so everyone is on board
- If you try every case, you can get discouraged and then the laser will just "collect dust"

NOTES:

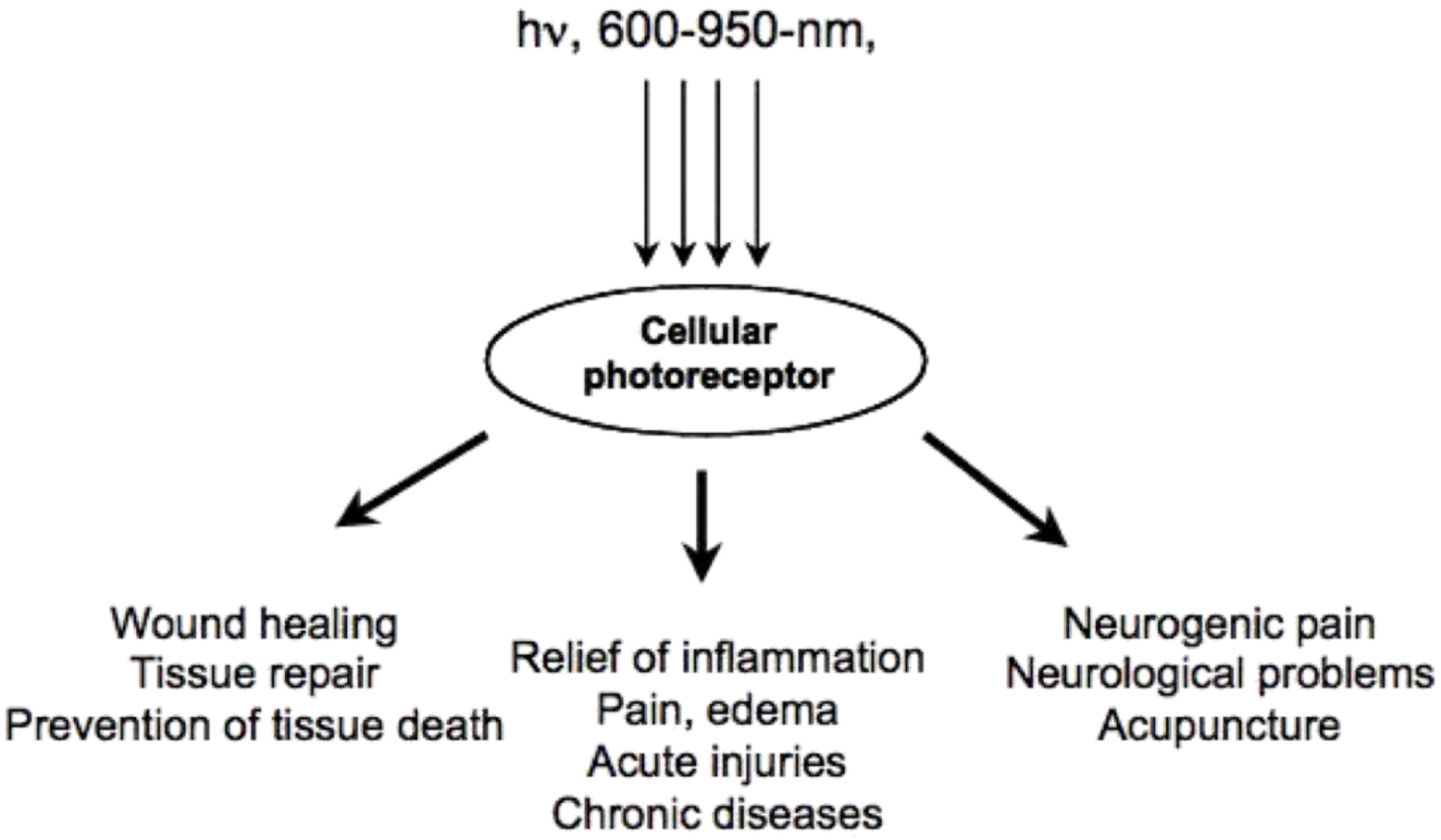
Incorporating Laser into Hygiene

- First start with every SRP appointment (LBR & LD)
- Gingivitis appointments – especially with heavy bleeding
- Then incorporate it for every 4910 / shorter-recall maintenance appt
- LBR is important to help reduce the bacteria
- These patients build up more bacteria and need extra help
- Helps keep the bacteria levels down between visits
- Medically compromised patients
- Every hygiene appointment
- Aerosol management
- Reduce microbes released in the cleaning
- Whole body health focus
- Consent form
- Team meeting to keep everyone saying the same things, focused on laser

Training

- Seek out a perio course
  - All team members attend (RDH/DDS)
- Proper hands-on laser training
  - Makes everyone feel comfortable and confident delivering laser therapy
- Verbalization training
  - Practice working on your “script” or verbiage
  - Team meetings to discuss what is working/not working
  - Get ALL staff on board/same messaging from front to back
  - Practice on co-workers or loved ones

PBM or Low-Level Laser Therapy



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.

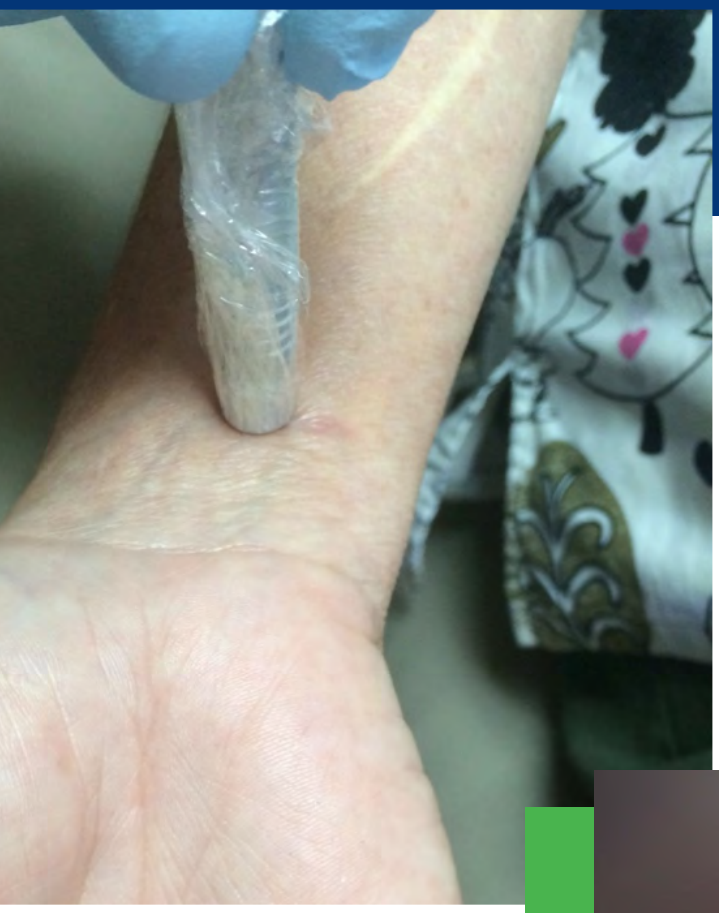
PBM Uses In Dentistry

- 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

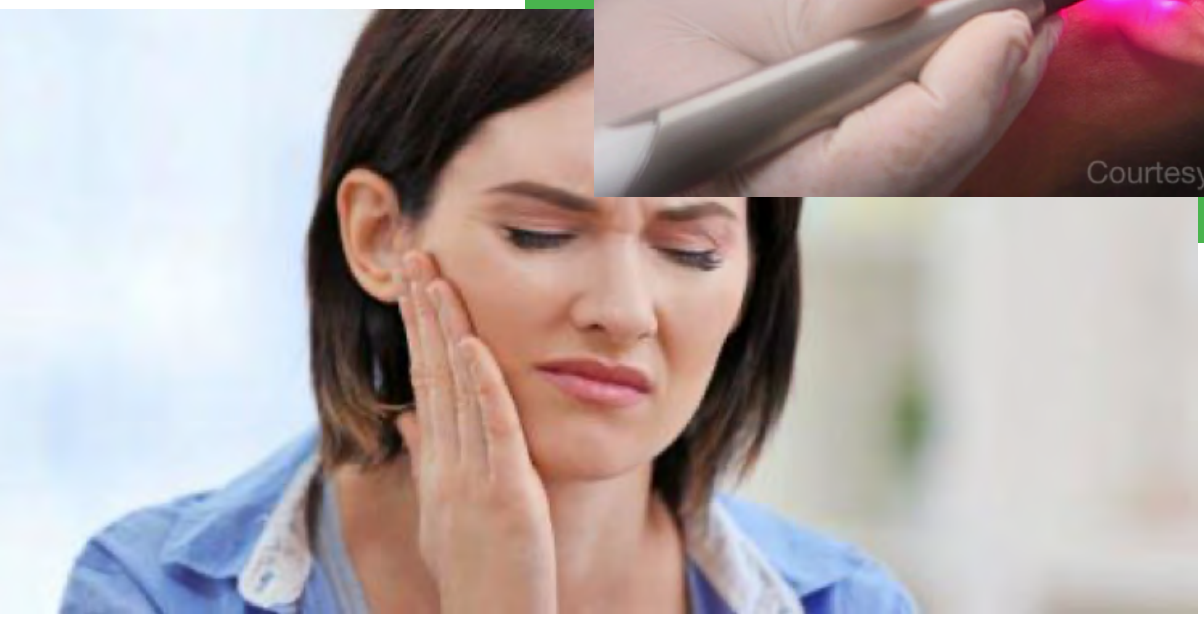
NOTES:

3 hour comprehensive PBM Course

PBM in Hygiene



- Nausea & gagging
- TMJ Pain relief
- Anesthetic/Analgesic effect



Tips to Incorporate Laser During Hygiene Visit

- During the cleaning or LBR appointment talk about the laser
- If they don't know, they can't ask for it
- Create Hype
- Get all office staff on board talking about it
- Put on website
- Offer special

Thank You

I hope you had fun today and are now as excited about lasers as I am!! Thank you for having me!

Looking to **Elevate** your **Hygiene Practice** with **lasers**?

Visit: **AdvancedDentalHygiene.com**

Online and **LIVE** courses every week!

Contact Info:

Joy Raskie, RDH

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