

UTILIZING LASERS IN YOUR PERIO PROGRAM

presented by:

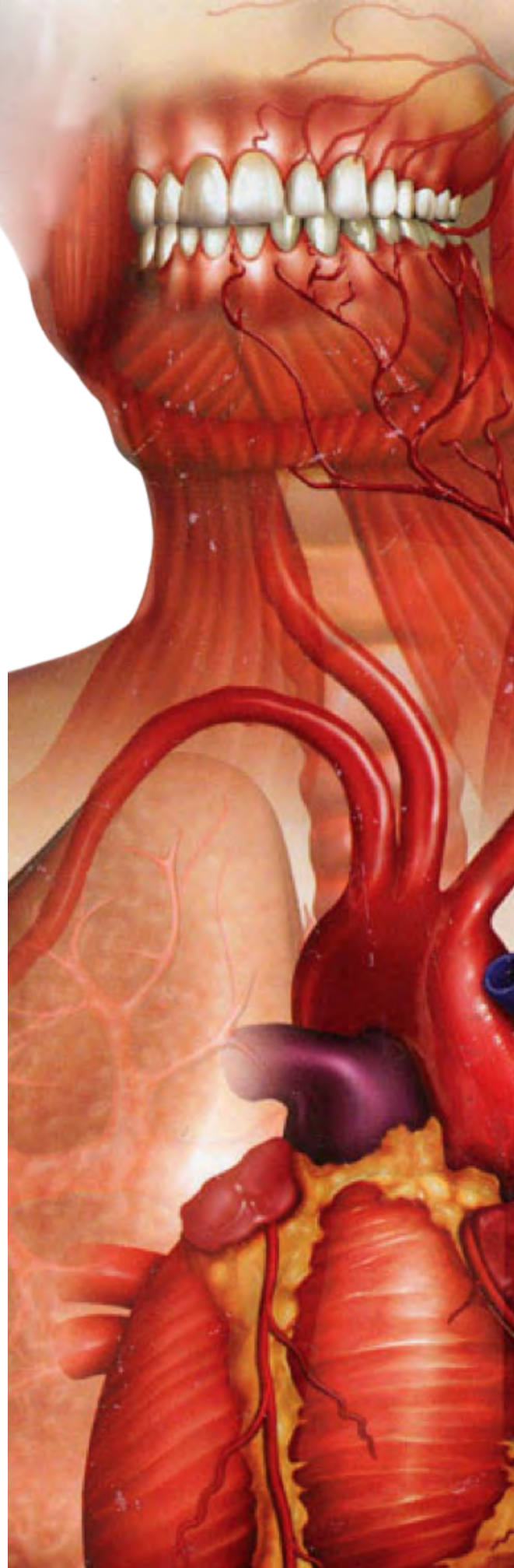


Joy Raske, RDH



Mouth-Body Connection

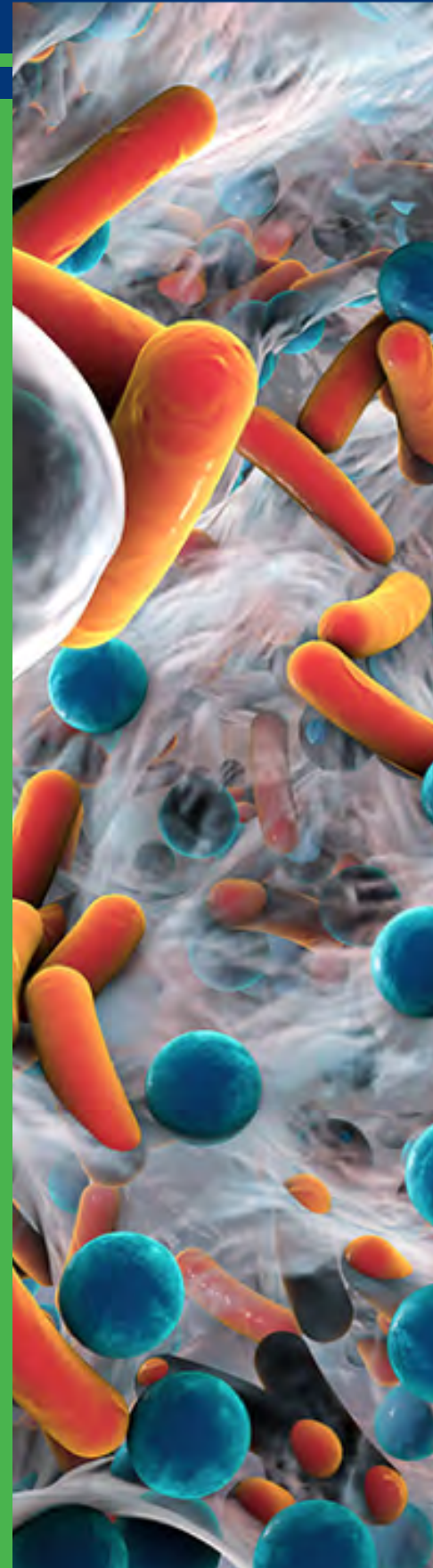
1. Hasturk, H., Kantarci, A. Activation and Resolution of Periodontal Inflammation and Its Systemic Impact. *Periodontol* 2000. 2015; 69(1): 255-273. doi:10.1111/prd.12105.
2. University of Florida. (2005, March 31). Live Oral Bacteria Found in Arterial Plaque. *ScienceDaily*.
3. Desvarieux, M., Demmer, 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.



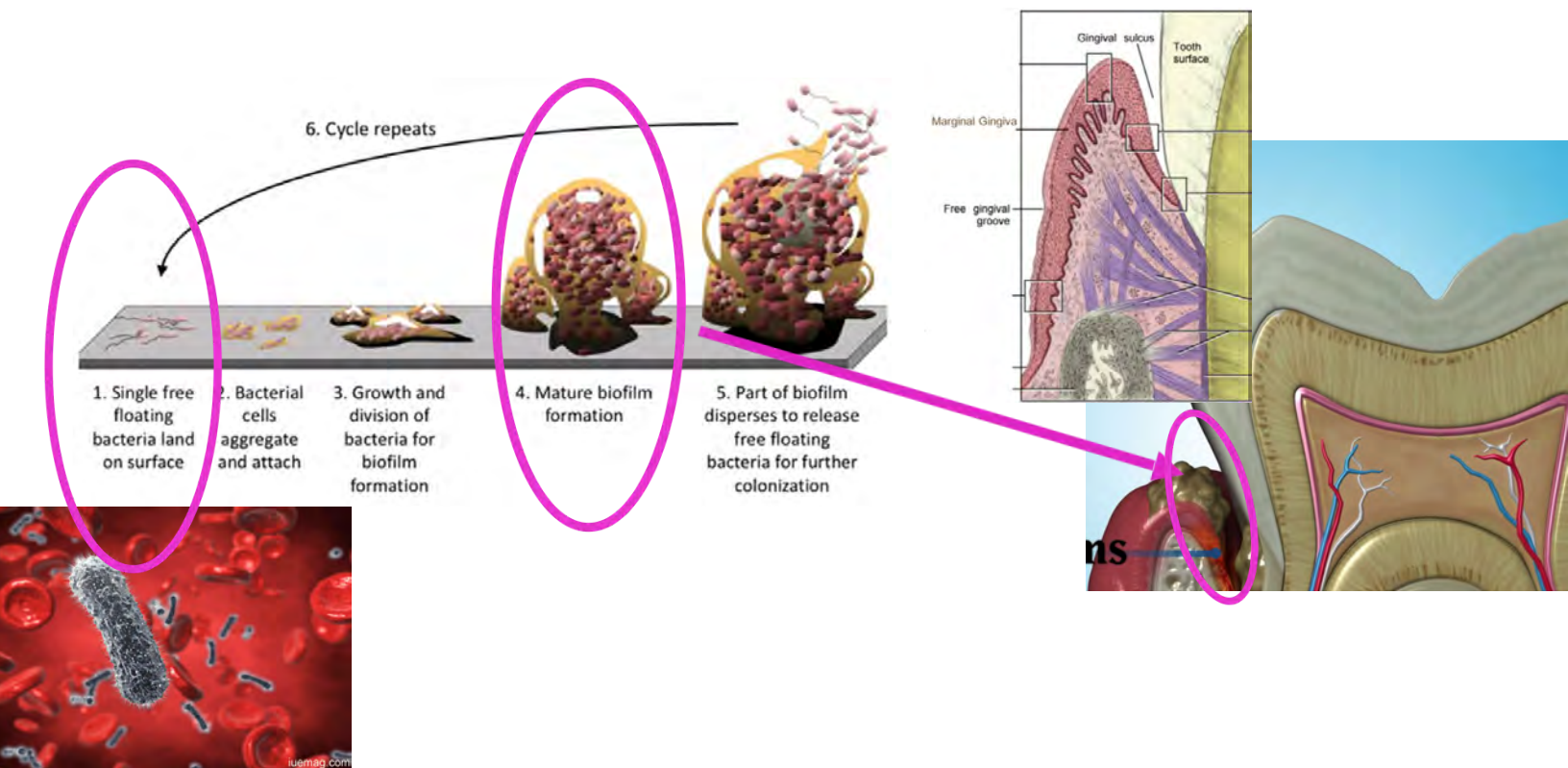
Biofilm – The “bad guys”

- **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 create 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.



How Lasers Are Incorporated



Staging and Grading Periodontitis

STEP 1 | SCREEN + ASSESS

STEP 2 | ESTABLISH STAGE

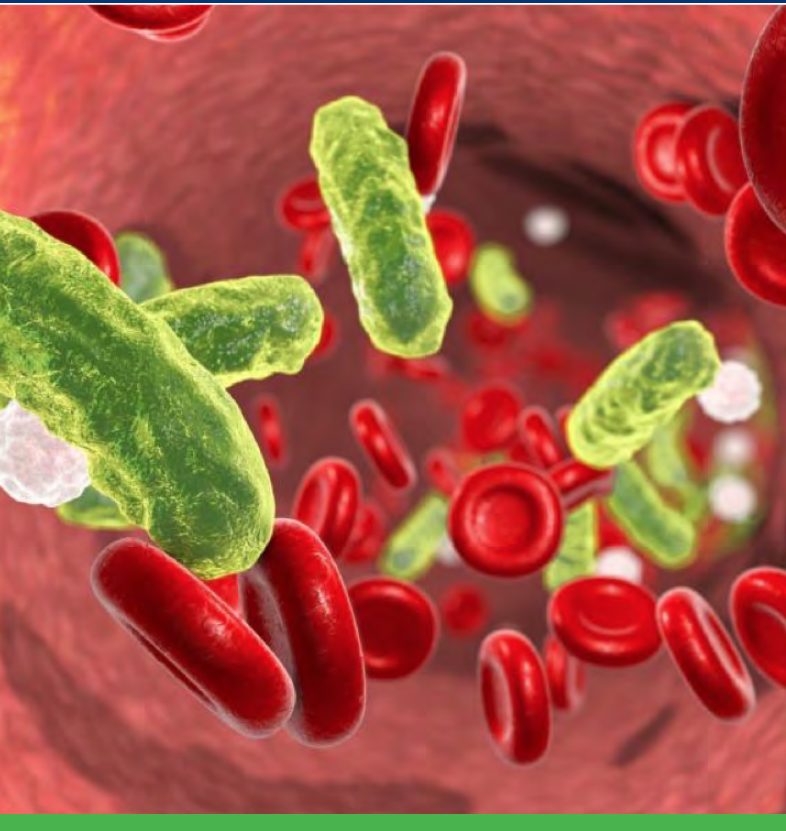
STEP 3 | ESTABLISH GRADE

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 |
| COMPLEXITY | Tooth loss | None | None | ≤4 teeth | ≥5 teeth |
| | Local | <ul style="list-style-type: none"> • Max probing depth: ≤4 mm • Mostly horizontal bone loss | <ul style="list-style-type: none"> • Max probing depth: ≤5 mm • Mostly horizontal bone loss | <ul style="list-style-type: none"> • 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 | | | | |

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

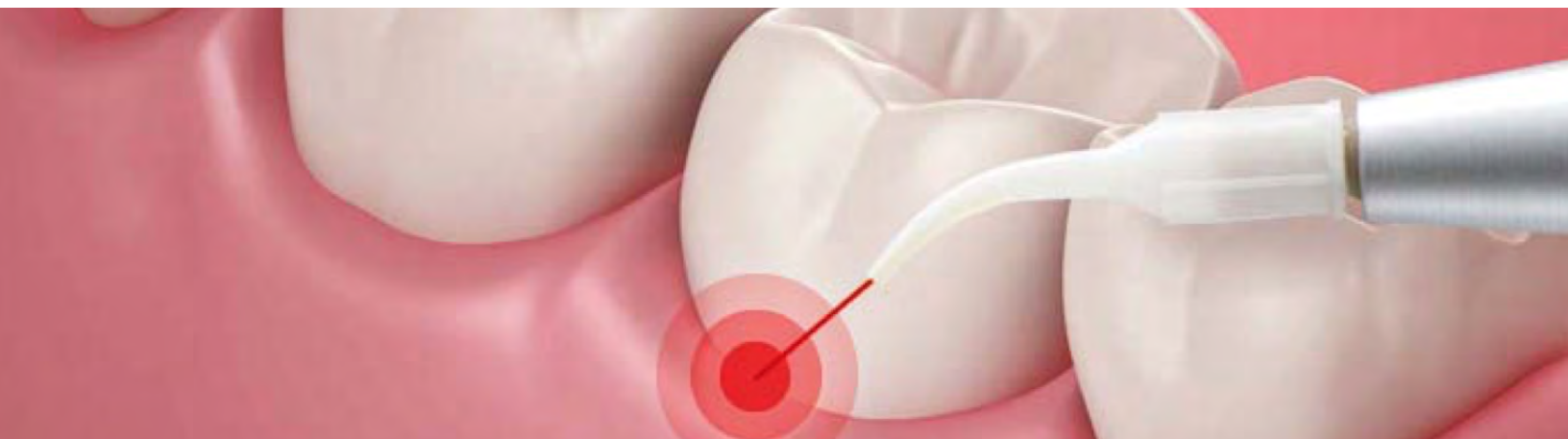
- We inadvertently pick up bacterial infection in one area of mouth and move it to other areas

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.

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

(Same thing)



Laser Decontamination – (LD)

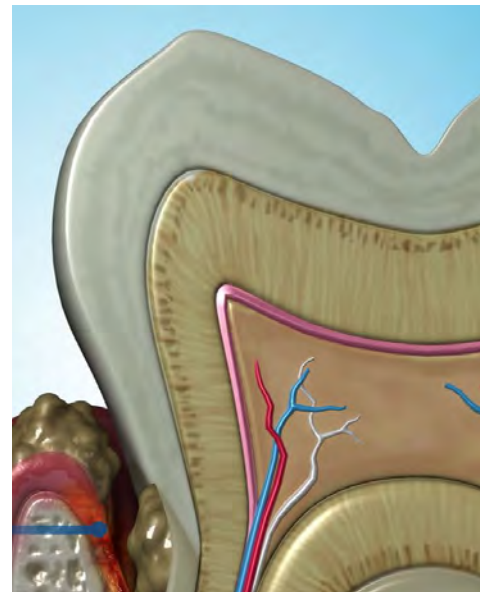
(Why I call it LD and why it is ok to initiate your tip in some states)

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.





8mm initial therapy



Immediate post op with coagulation



4mm at 4mo perio maint

LD on 8mm pocket

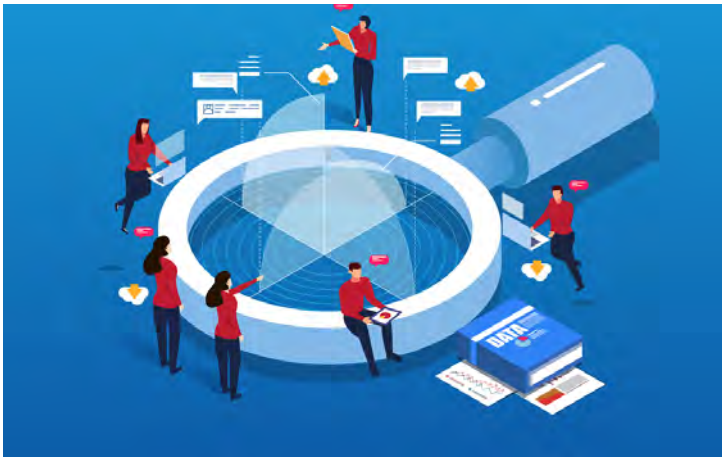


**LD Full Quad –
Immediate post-op**

Research SRP + Laser | SRP Alone

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

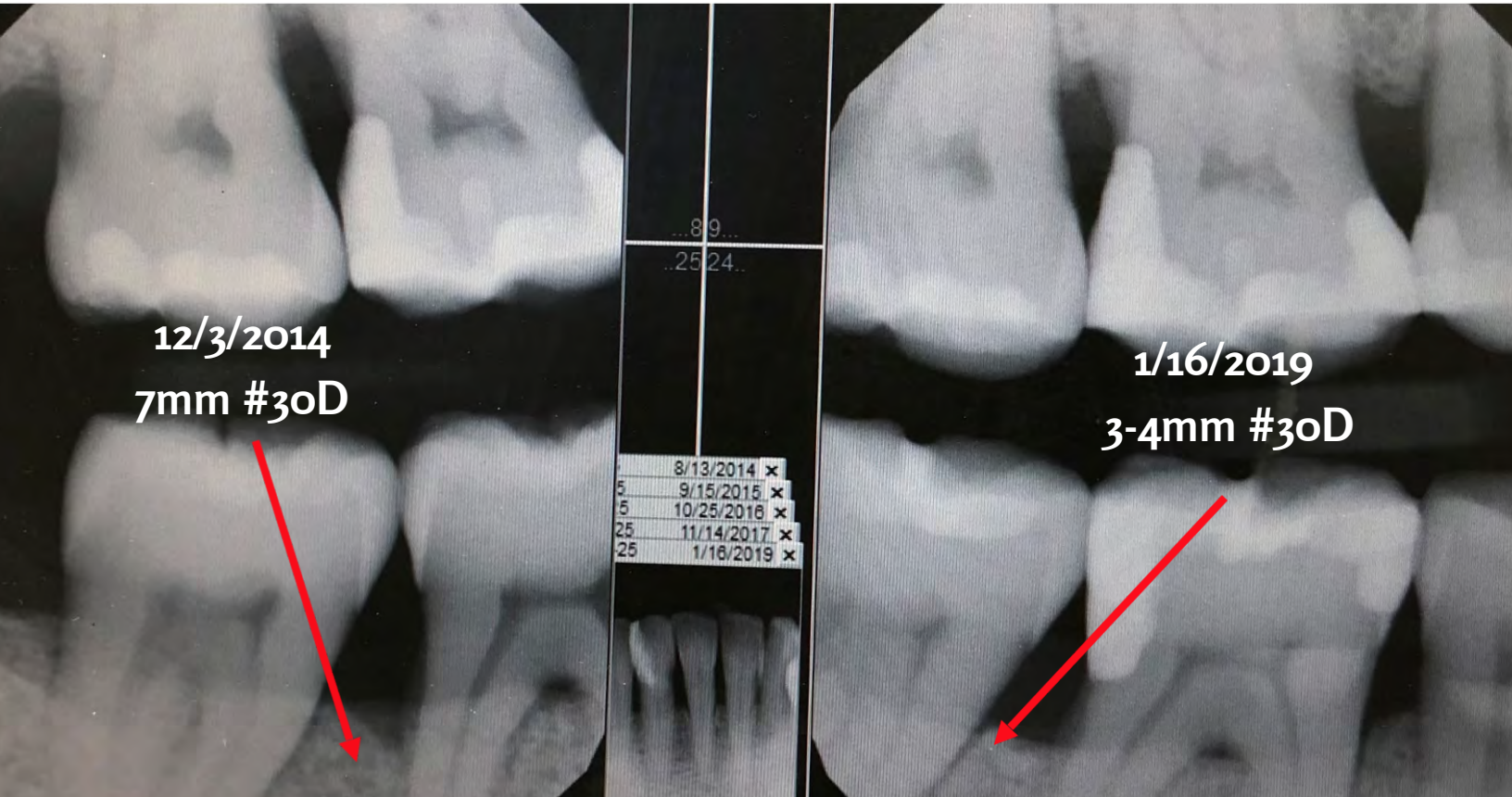
- Significantly higher reduction in **periodontal pathogens** after **2 months** compared to SRP alone¹
- Considerable **bacterial elimination**, especially of **Actinobacillus actinomycetemcomitans**, from periodontal pockets²



- 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.

NOTES:

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.



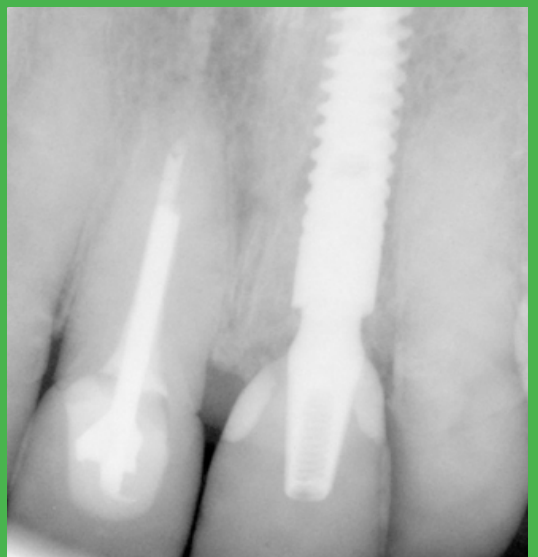
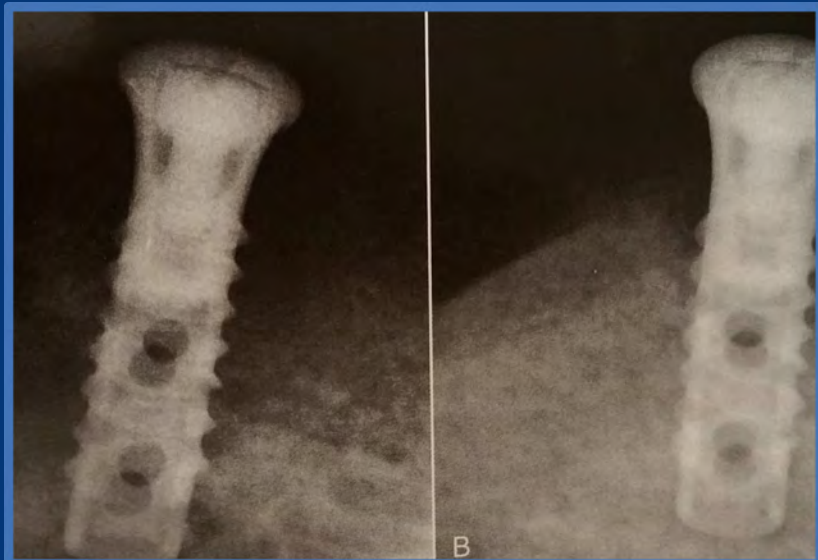
Pires Oliveria DA, de Oliveria RF, et al: Evaluation of low-level laser therapy of osteoblastic cells, *Photomed laser surg* 26(4):401-404, 2008

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



PBM in Hygiene



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



Courtesy of Prof. Dr. G. Olivi & Dr. M. O



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!



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