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Lasers in Medicine

Rotorua GP CME 2010
General Practice Conference & Medical Exhibition

Laser Applications in Dentistry

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75
SCHOOL OF DENTISTRY
Commemorating 75 years of Excellence in Oral Health 1935-2010

My clinical journey with lasers 1989+

- High power**
 - 10600 nm Carbon dioxide
 - 2940 nm Er:YAG
 - 2790 nm Er,Cr:YSGG
 - 2100 nm Ho:YAG
 - 1064 nm Nd:YAG
 - 980 nm Diode
 - 940 nm Diode
 - 532 nm KTP
 - 514.5 nm Argon
 - 488 nm Argon
- Low power**
 - 830 nm LLLT
 - 655 nm Fluoresc
 - 635 nm PDT
 - 670 nm PDT



Laser applications: low power

- 3D scanning (CAD-CAM)
- Laser activated fluoride (photonic conversion)
- Biostimulation LLLT
- PDT
 - Oral lesions
 - Photoactivated disinfection (PAD)
- Doppler flowmetry
- Fluorescence diagnosis
 - Dental caries
 - Subgingival calculus
 - Endodontic infection

60% of dentists have Class 2 diagnostic lasers

DiagnoDENT

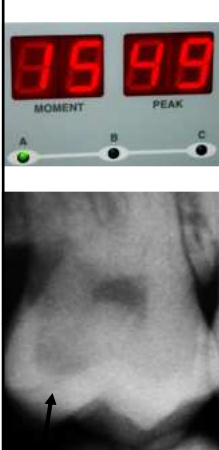


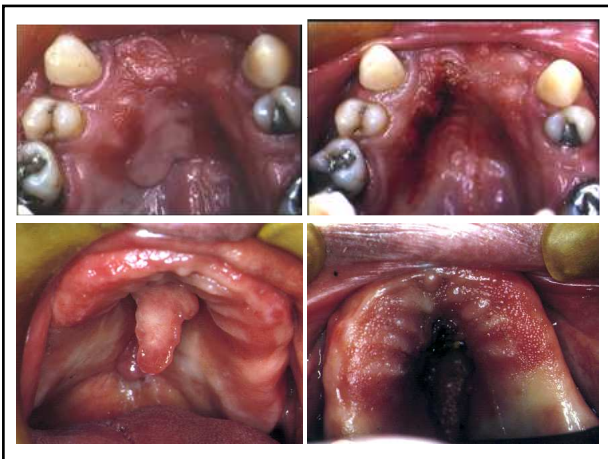

Photo-activated disinfection and biostimulation




High power lasers **Soft tissue**

- Market penetration**
 - 5-7% of GP dentists have Class 4 lasers (Aust, USA)
 - Hygienists can use lasers
 - No separate itemization for laser procedures
- Most common configurations**
 - Erbium YAG or YSGG
 - Diode 940, 980, 810 nm or KTP
- Soft tissue applications**
 - Replacement for scalpel and electrosurgery
 - Cosmetic surgery
 - Pre-prosthetic surgery
 - Removal of lesions
 - Mucosal resurfacing
 - Troughing
 - Coagulation

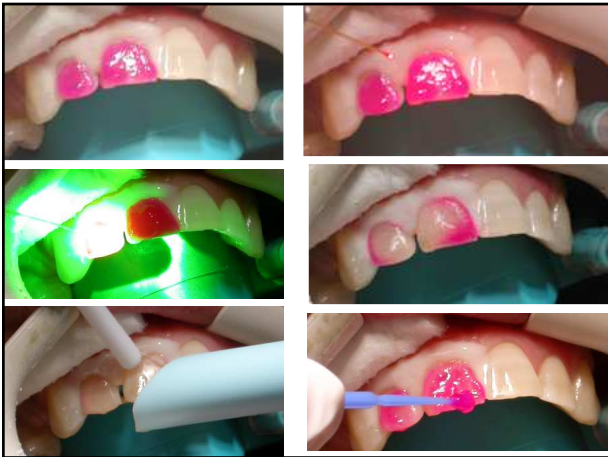




Hard tissue applications

- "Drill and fill" (Er)
 - Caries removal
 - Removal of restorations
 - Cavity preparation
 - Etching
 - Laser-induced analgesia
- Cosmetic dentistry (KTP, argon)
 - Resin curing
 - Photothermal bleaching
 - Photodynamic bleaching
- Periodontics (Er)
 - Removal of calculus
 - Debriding dental implants
 - Disinfection
- Bone surgery (Er)
 - Crown lengthening
 - Implant placement
 - Sinus lifts
 - Osteotomies and osteotomies
- Endodontics "root canals" (Er)
 - Smear layer removal
 - Shock wave generation
 - Cavitation cleaning
 - Disinfection
 - also diodes and Nd:YAG



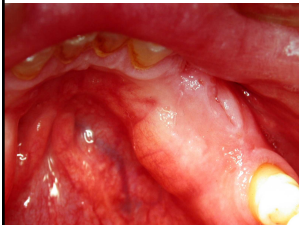
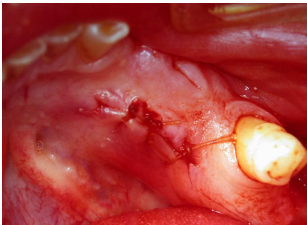





A single session of in-office KTP laser photodynamic bleaching resulted in a clinically significant improvement in tooth shade in teeth with tetracycline discoloration.



Ostectomy with Er:YAG Laser
(open flap method)





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