

ADH lecture outline - Follows Curriculum Guidelines and Standards of Dental Lasers, Standard Proficiency Course

- I. Introduction
 - a. About the instructor
 - b. Affiliations
 - c. Course Objectives, what you will learn
 - d. Go through Booklet, extra forms in back, evals, hands-on checklist
 - e. Scientific based research
 - f. Scope of Practice - State by State laws and regulations
- II. Fundamentals of lasers (History and Physics of Lasers)
 - A. Production of laser light
 1. Quantum theory
 2. Stimulated emission
 - B. Electromagnetic spectrum
 1. Regions and boundaries
 - a. Ultraviolet (1 - 400 nm)
 - b. Visible (400 - 750 nm)
 - c. Infrared (750+ nm)
 2. Laser wavelengths
 - C. Characteristics of laser light
 1. Spatial and temporal beam coherency
 2. Monochromaticity
 3. Collimation
 - D. Laser requirements, delivery systems and emission modes
 1. Laser cavity (How do Lasers produce light inside the machine itself)
 - a. Active medium
 - b. Pumping mechanism
 - c. Optical resonator
 2. Delivery systems
 - a. Fixed lens and mirror
 - b. Articulated arm
 - c. Waveguide
 - d. Optical fiber
 3. Emission mode
 - a. Continuous wave
 - b. Chopped or gated
 - c. Pulsed
 - E. Summary of laser effects on tissue
 1. Reflection, scattering, transmission, absorption
 2. Photothermal effects
 - a. Warming
 - b. Coagulation, tissue shrinkage, hemostasis
 - c. Vaporization, ablation
 - d. Carbonization
 3. Photoacoustic effect
 - a. Disruption
 4. Photochemical effects
 - a. Stimulation of chemical reactions

- b. Breaking of molecular bonds
- 5. Fluorescence
- 6. Biostimulation
 - a. Photodynamic therapy

III. Review of laser types, device characteristics, and clinical applications in dentistry

- A. Laser types
 - 1. Argon laser
 - 2. Diode lasers
 - 3. Neodymium lasers
 - 4. CO2 laser
 - 5. Erbiums
- B. Device characteristics
 - 1. Beam diameter
 - a. spot size, power density
 - 2. Fluence
 - a. Energy density

IV. Laser safety

- A. Standards organizations and regulatory requirements
 - 1. U.S. FDA Center for Devices and Radiological Health (CDRH)
 - 2. American National Standards Institute (ANSI)
 - 3. U.S. Occupational Safety and Health Administration (OSHA)
 - 4. State and local regulatory agencies
- B. Eye Protection
 - 1. Safety Glasses
 - 2. Loupe Inserts
- C. Environment
 - 1. Proper warning sign posted
 - 2. Hazards - tips, cords, reflective surfaces
- D. Device Safety
 - 1. Labels, Key codes, on/off, emergency stop buttons
 Laser safety mechanisms
- E. Nitrous Oxide
- F. Implants
- G. Laser Safety Officer
 - 1. Responsibilities
- H. Infection Control
 - a. Plume hazards and precautions
 - b. Sterilization, disposal of biological hazards
 - c. High volume evacuation present
 - d. High filtration Mask
- J. Laser Calibration

BREAK - 10 MIN

- 1. Practice turning on lasers

2. Inserting the tip/bending tip
3. Stripping and Cleaving
4. Toggling between procedures
5. Practice on various lasers
6. Get Attendees interactive and conversating, excited
7. Turn off lasers until Hygiene-lesion section

V. Clinical Applications

A. Preparing the Laser

- a. How to Strip and Cleve a Fiber
- b. Initiated vs Uninitiated

B. Continuous vs Pulsed

- a. Absorption Threshold
- b. Duty Cycle
 1. Pulse Duration
 2. Pulse Interval
 3. Gemini laser
 4. Golden Rule of Lasers

C. Dentist Procedures

- a. Technique
- b. Biopsies
- c. Frenectomies
- d. Troughing
- e. Gingivectomies
- f. Oral Vascular Malformation

D. Photobiomodulation or Low-Level-Laser-Therapy (LLLT)

1. Therapeutic Lasers - How they work, Video. Mitochondria, ATP, C

Reactive

2. Pain Therapy
3. Patient Skin Type
3. TMJ Therapy
4. Biostimulation
5. Before and afters
 - a. Kid bike accident/face laser
 - b. Post extraction site
 - c. Bone growth around implant
 - d. healing 3rd molars
6. Oral Mucositis, Cancer treatments
7. Where is technology and new research and Science going

VI. Hygiene/Periodontal Disease

A. Gingivitis

B. Periodontitis

C. Biofilm

- a. What is really going on in the mouth

D. Benefits of Laser Therapy

E. Hygiene Procedures

1. Lesion Treatments - Aphthous Ulcer / Herpetic Lesion
 - a. Power, Settings, protocols
 - b. Videos
 - c. Before / after photos

- d. Verbalization / What are we really doing
- e. Codes
- f. Fees
- g. Practice with Typodonts, Checkoff sheet
- 2. Root Surface Desensitization
 - a. Power, settings, protocols
 - b. Videos
 - c. Verbalization / What are we really doing
 - d. Codes
 - e. Fees
 - f. Practice with Typodonts, Checkoff sheet
- 3. Laser Bacterial Reduction (LBR)
 - a. Power, Settings, protocols, technique
 - b. Videos
 - c. What are we really doing
 - d. Verbiage with patients
 - e. Consent Forms
 - f. Codes
 - g. Fees
 - h. ROI (Return on Investment)
 - i. Practice with Typodonts
- 4. Laser Assisted Periodontal Therapy (LAPT) / Laser Decontamination (LD)
 - a. Power, Settings, protocols
 - b. Definitions -What are we doing
 - c. Videos
 - d. Technique
 - e. Before/after photos
 - f. Verbiage with patients
 - g. Consent forms
 - h. Codes
 - i. Fees
 - j. ROI
 - k. Practice with Typodonts
- 5. Coagulation
 - a. Power, setting, protocols
 - b. What are we doing
- 6. Whitening
 - a. Protocols, power, settings
 - b. Before/after
 - c. Video
- F. Adverse Reactions/ Complications
- G. Insurance
 - 1. Non-Covered Services Bill
 - 2. Delta Dental
 - a. Option 1, Advanced gum Care
 - b. Other Insurance Codes
 - c. Oral Irrigation
 - 1. Chlorhexidine
 - 2. Stella Life Healing Mouthwash

- 3. Oracare Mouthwash
 - d. Option 2
 - 3. Documentation
 - a. What to chart
 - b. Examples
- H. Treatment Planning
 - A. When to incorporate laser
 - 1. Periodontal cleaning, Adult Prophy (4910, 1110)
 - 2. SRP - Scaling and Root Planing
 - a. Post care Instructions after Laser-Assisted Periodontal Therapy
 - b. Treatment Planing
 - 3. LBR, Lesions, Desensitization
 - 4. LAPT/LD
 - 5. Diagnosis
 - 6. Considerations
 - 7. Guidelines
 - B. Classifications of Periodontal and Peri-implant Diseases and Conditions
 - a. Staging, grading, extent and distribution
 - b. ADA Case Types (Old classification system)
 - C. How to Treatment Plan
 - D. Laser Supporting Article
 - E. 6-Week Re-evaluation
 - F. Sample Patient Treatment Planning
 - a. Caring Carlos
 - 1. Background, Medical History, Dental History, Periodontal Evaluation, Radiographs, Soft-Tissue Evaluation, Hard Tissue Evaluation, Preliminary Photos, Precautions, Treatment Plan, Expectations
 - 2. Results, pics, radiographs
 - b. Mediterranean Tom
 - c. Extra Case Studies to work on in small groups
- I. How to Present Treatment
- J. Marketing your Laser
- K. Questions / Finish / Research Articles/ Bibliography/ what's next
- L. Test

VII. Hands-on simulation on Typodonts and Pig jaws
 Hand in Hands-on Checklist and Evaluations to get Attendance Verification