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| Course Approved By |  |
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| Date of Issue |  |

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Kentucky Board of Dentistry



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Louisville, KY 40222

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http://dentistry.ky.gov

**CONTINUING EDUCATION COURSE VERIFICATION FORM**

**201 KAR 8:562 Section 14, 201 KAR 8:571 Section 7 – Courses for laser debridement registration for dental hygienists**

*(Please print in ink or type your responses)*

Course Title

Course Hours

Course Provider/Organization

Course Provider/Organization Address

Number & Street

City State ZIP Phone #

Course Provider/Organization Email Address:

Organization Website (if applicable)

The Kentucky Board of Dentistry requires a dental hygienist applying to be certified in laser debridement must show successful completion of a course that meets or exceeds the Academy of Laser Dentistry’s Category II Standard Proficiency level certification course as described in the Curriculum Guidelines and Standards for Dental Laser Education.

There are two pre-requisites to Standard Proficiency:

1. Having successfully completed a pre-requisite introductory course which is available online and is equal to or greater than 2.5 credit hours.
2. Owning or having access to a dental laser and using it within the scope of practice.

The Category II Standard Proficiency course, in brief includes a minimum of 12 hours of specific education activity, which should include hands on training on the specific device the practitioner intends to use and a measured outcome learning verification exercise.

The course completion certificate issued by the course provider must include the type of laser/lasers and wavelengths on which the participant was trained.

**COURSE OUTLINES**

**Introductory Course**

Introductory courses are intended to be educational, informational and primarily didactic. This level of education is intended for anyone interested in lasers in dentistry.

I. Introduction

A. Self-graded pre-test (optional)

II. Fundamentals of lasers

A. Production of laser light

1. Quantum theory

2. Stimulated emission

1. Electromagnetic spectrum
2. Regions and boundaries
3. Ultraviolet (1 – 400 nm)
4. Visible (400 – 750 nm)
5. Infrared (750+ nm)

2. Laser wavelengths

C. Characteristics of laser light

1. 1. Spatial and temporal

coherency

1. Monochromaticity
2. Collimation
3. Laser requirements, delivery systems and emission modes
4. Laser cavity
5. Active medium
6. Pumping mechanism
7. Optical resonator
8. Delivery systems
9. fixed lens and mirror
10. articulated arm
11. Waveguide
12. Optical fiber
13. Emission mode
14. Continuous wave
15. Chopped or gated
16. Pulsed
17. Summary of laser effects on tissue
18. Reflection, scattering, transmission, absorption
19. Photothermal effects
20. Warming
21. Coagulation, tissue shrinkage, hemostasis
22. Vaporization, ablation
23. Carbonization
24. Photoacoustic effect
25. Disruption
26. Photochemical effects
27. Stimulation of chemical reactions
28. Breaking of molecular bonds
29. Fluorescence
30. Biostimulation

a. Photodynamic therapy

1. Review of types of lasers, delivery systems, special device characteristics, and clinical applications in dentistry

#### Laser types

1. Argon laser

2. CO2 laser

3. Diode lasers

1. 4. Erbium lasers
2. 5. Holmium laser
3. 6. Neodymium lasers
4. 7. Other lasers
5. B. Device characteristics
6. Wavelength
7. Beam diameter (spot size)
8. Power
9. Energy density
10. Repetition rate (if applicable)
11. Exposure duration
12. Total energy

C. Clinical applications

1. Intraoral soft tissue surgery
2. Treatment of apththous ulcers
3. Sulcular debridement (soft tissue curettage)
4. Composite curing
5. Tooth shade lightening
6. Caries removal
7. Cavity preparation
8. Enamel modification
9. Illumination for caries detection
10. Illumination for endodontic orifice location
11. Removal of coronal pulp

12. Experimental applications

IV. Laser safety

1. Standards, organizations, and regulatory requirements
2. U.S. FDA Center for Devices and Radiological Health (CDRH)
3. American National Standards Institute (ANSI )
4. U.S. Occupational Safety and Health Administration (OSHA)
5. State and local regulatory agencies
6. Laser safety officer
7. Laser safety mechanisms
8. Adverse effects reporting mechanism
9. Eye and tissue protection
10. Environment
11. Proper warning sign posted
12. Limited access
13. Reflective surfaces minimized
14. High volume evacuation present
15. Laser external cooling system (if applicable)
16. Electrical components (cords and footswitch)
17. Gases
18. Training

L. Laser use documentation

V. Infection control

A. Identification and disposal of biologic hazards

B. Plume hazards and precautions

#### Sterilization

1. Post-test examination (optional)

**5.2 Standard Proficiency Course**

The curriculum for basic level of education in laser usage includes specific device instruction with demonstrated proficiency in didactic and hands-on knowledge. Hands-on exercises include demonstration and clinical simulation with appropriate oral tissues (e.g. cow or pig jaws), and must meet participation course guidelines. Practitioners must demonstrate competency by written and clinical simulation and examination in the safety aspects of laser use prior to using lasers on patients. This is the level of education that defines the standard of care. Dental auxiliaries are encouraged to demonstrate competency in the safety aspects of laser use. Industry representatives, researchers, and others who demonstrate and operate lasers must demonstrate competency by written and clinical simulation and examination in the safety aspects of laser use.

1. Introduction

A. Self-graded pre-test (optional)

II. Fundamentals of lasers

A. Production of laser light

1. Quantum theory

2. Stimulated emission

1. Electromagnetic spectrum
2. Regions and boundaries
3. Ultraviolet (1 – 400 nm)
4. Visible (400 – 750 nm)
5. Infrared (750+ nm)

2. Laser wavelengths

C. Characteristics of laser light

1. Spatial and temporal beam

coherency

1. Monochromaticity
2. Collimation

D. Laser requirements, delivery systems and emission modes

1. Laser cavity
2. Active medium
3. Pumping mechanism
4. Optical resonator
5. Delivery systems
6. Fixed lens and mirror
7. Articulated arm
8. Waveguide
9. Optical fiber
10. Emission mode
11. Continuous wave
12. Chopped or gated

c. Pulsed E. Summary of laser effects on tissue

1. Reflection, scattering, transmission, absorption
2. Photothermal effects
3. Warming
4. Coagulation, tissue shrinkage, hemostasis
5. Vaporization, ablation
6. Carbonization
7. Photoacoustic effect
8. Disruption
9. Photochemical effects
10. Stimulation of chemical reactions
11. Breaking of molecular bonds
12. Fluorescence

6. Biostimulation

a. Photodynamic therapy

1. Review of laser types, device characteristics, and clinical applications in dentistry
2. Laser types

1. Argon laser

2. CO2 laser

3. Diode lasers

1. Erbium lasers
2. Holmium laser
3. Neodymium lasers
4. Other lasers
5. Device characteristics
6. Wavelength
7. Beam diameter (spot size)
8. Power
9. Energy density
10. Repetition rate (if applicable)
11. Exposure duration
12. Total energy

C. Clinical applications

1. Intraoral soft tissue surgery
2. Treatment of aphthous ulcers
3. Sulcular debridement (soft tissue curettage)
4. Composite curing
5. Tooth shade lightening
6. Caries removal
7. Cavity preparation
8. Enamel modification
9. Illumination for caries detection
10. Illumination for endodontic orifice location
11. Removal of coronal pulp
12. Experimental applications
13. Laser safety

#### 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
5. Laser safety officer
6. Laser safety mechanisms
7. Adverse effects reporting mechanism

#### Eye and tissue protection

#### Environment

1. Proper warning sign posted
2. Limited access
3. Reflective surfaces minimized

#### High volume evacuation present

1. Laser external cooling system (if applicable)
2. Electrical components (cords and footswitch)

#### Gases

#### Training

#### Laser use documentation

#### V. Clinical simulation (specific hands-on demonstration)

#### Laser instrument set-up and operation

#### Delivery system

1. Type
2. Assembly
3. Inspection
4. Maintenance
5. Sterilization standards and protocol

#### Set laser operating parameters

#### Test fire laser

#### Infection control

1. Identification and disposal of biologic hazards
2. Plume hazards and precautions

3. Sterilization

#### C. Treatment objective and surgical technique simulation on bovine tissues or other suitable biologic tissues or inanimate objects

1. Indications and contraindications of laser use in dentistry
2. Alternate methods of treatment

D. Discussion of treatment sequence, patient management, postoperative instructions

#### E. Management of complications

#### F. Surgical and healing assessment

1. Practice management
2. Practice organization and management, staff training and patient education
3. Financial and insurance considerations
4. Malpractice considerations, jurisprudence, ethics
5. Record keeping, adverse effects reporting mechanism, informed consent
6. Laser bibliography
7. General bibliography for lasers in dentistry
8. Subject bibliography for specific dental applications
9. Current research and future developments

IX. Conclusion

1. Written post-test
2. Post-test clinical simulation
3. Course evaluation
4. Certificate of attendance

# Advanced Proficiency Course

Practitioners must have successfully completed a Category II course. Practitioners then gain additional knowledge and experience by one or more of the following:

1. In-office mentor preceptor program

2. University or other accredited dental education program

1. Scientific session educational program
2. Patient care
3. Independent study of the literature

This level of education is elective, and represents an advanced level of clinical competency in safety and clinical use. This level of education is intended for Dentists and Dental Hygienists and includes assessment by written examination, clinical simulation proficiency, and clinical case presentation. This level is also intended for dental auxiliaries, industry representatives, researchers, and others who demonstrate and operate lasers. Assessment of these individuals is by written and clinical simulation proficiency in the safety aspects of laser use.

I. Introduction

A. Self-graded pre-test (optional)

II. Fundamentals of lasers

A. Production of laser light

1. Quantum theory

2. Stimulated emission

B. Electromagnetic spectrum

1. Regions and boundaries
2. Ultraviolet (1 – 400 nm)
3. Visible (400 – 750 nm)
4. Infrared (750+ nm)
5. 2. Laser wavelengths

### C. Characteristics of laser light

1. Spatial and temporal beam coherency

2. Monochromaticity

1. Collimation

### D. Laser requirements, delivery systems and emission modes

1. Laser cavity
2. Active medium
3. Pumping mechanism
4. Optical resonator
5. Delivery systems
6. Fixed lens and mirror
7. Articulated arm
8. Waveguide
9. Optical fiber
10. Emission mode
11. Continuous wave
12. Chopped or gated
13. Pulsed

### Summary of laser effects on tissue

1. Reflection, scattering, transmission, absorption
2. Photothermal effects
3. Warming
4. Coagulation, tissue shrinkage, hemostasis
5. Vaporization, ablation
6. Carbonization
7. Photoacoustic effect
8. Disruption
9. Photochemical effects
10. Stimulation of chemical reactions
11. Breaking of molecular bonds
12. Fluorescence
13. Biostimulation

a. Photodynamic therapy

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

A. Laser types

1. Argon laser
2. CO2 laser
3. Diode lasers
4. Erbium lasers
5. Holmium laser
6. Neodymium lasers
7. Other lasers

### Device characteristics

1. Wavelength
2. Beam diameter (spot size)
3. Power
4. Energy density
5. Repetition rate (if applicable)
6. Exposure duration
7. Total energy

C. Clinical applications

1. Intraoral soft tissue surgery
2. Treatment of aphthous ulcers
3. Sulcular debridement (soft tissue curettage)
4. Composite curing
5. Tooth shade lightening
6. Caries removal
7. Cavity preparation
8. Enamel modification
9. Illumination for caries detection
10. Illumination for endodontic orifice location
11. Removal of coronal pulp
12. Experimental applications

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. Laser safety officer

### Laser safety mechanisms

### Adverse effects reporting mechanism

### Eye and tissue protection

### Environment

1. Proper warning signs posted
2. Limited access
3. Reflective surfaces minimized

### High volume evacuation present

### Laser external cooling system (if applicable)

### Electrical components (cords and footswitch)

### Gases

### Training

### Laser use documentation

### Clinical simulation (specific hands-on demonstration)

### Laser instrument set-up and operation

1. Delivery system
2. Type
3. Assembly
4. Inspection
5. Maintenance
6. Sterilization standards and protocol
7. Set laser operating parameters
8. Test fire laser

### Infection control

1. Identification and disposal of biologic hazards
2. Plume hazards and precautions

3. Sterilization

C. Treatment objective and surgical technique simulation on bovine tissues or other suitable biologic tissues or inanimate objects

1. Indications and contraindications of laser use in dentistry

1. Alternate methods of treatment

D. Discussion of treatment sequence, patient management, postoperative instructions

### Management of complications

### Surgical and healing assessment

G. Post-test clinical simulation

VI. Clinical summary of laser usage

1. Pretreatment
2. Diagnostic tests
3. Clinical exams
4. Tooth vitality
5. Hard tissue tests
6. Radiographics
7. Soft tissue exams, including pocket depth measurement (if applicable)
8. Other
9. Diagnosis and treatment plan
10. Diagnosis
11. Treatment
12. Possible treatment alternatives
13. Indication
14. Contraindications
15. Informed consent

B. Treatment

1. Objective
2. Laser operating parameters
3. Wavelength
4. Power
5. Repetition rate (if applicable)
6. Beam diameter (spot size)
7. Exposure duration
8. Treatment sequence
9. Management of complications
10. Surgical prognosis
11. Treatment record
12. Patient management
13. Post-operative instructions

C. Follow-up care

1. Side effects and complications (if any)
2. Assessment of treatment (with time intervals)
3. Long-term results
4. Healing assessment
5. Case documentation
6. Practice management
7. Practice organization and management, staff training and patient education
8. Financial and insurance considerations
9. Malpractice considerations, jurisprudence, ethics
10. Record keeping, adverse effects reporting mechanism, informed consent
11. Laser bibliography
12. General bibliography for lasers in dentistry
13. Subject bibliography for specific dental applications

IX. Current research and future developments

1. Conclusion
2. Written post-test
3. Clinical simulation (post-test)
4. Clinical case studies
5. Course evaluation
6. Certificate of attendance

# Educator Course

This course provides specific instruction in planning and presenting the Standard Proficiency Course. Course structure is both lecture and participation. Prerequisites include three years participation in Standard Proficiency level and two years status at Advanced Proficiency.

1. Introduction
2. Teaching lectures, small groups, laboratories, case studies
3. How students learn
4. Videotaping assessments of teacher skills
5. Critique and feedback on teaching technique
6. How to teach
7. Critical thinking
8. Optimal learning experiences
9. Criteria
10. Learning modalities
11. Visual
12. Auditory
13. Kinesthetic
14. Tactile
15. Olfactory
16. Gustatory
17. Multiple intelligence
18. Logical-mathematical
19. Linguistic
20. Musical
21. Bodily/Kinesthetic
22. Interpersonal
23. Intrapersonal

D. Creativity in Teaching

1. Problem presentation
2. Preparation
3. Generation of ideas
4. Incubation
5. Validation
6. Outcome assessment
7. Teaching excellence in laser dentistry
8. Focus on selected content
9. Use of eye movement, continuous eye contact
10. Use of body movement
11. Use of gestures for emphasis
12. Use of language – metaphors, storytelling, personal experience, anecdotes
13. Use of voice, sound tone, etc.
14. Use of numbers, calculations, logic, classification, critical thinking
15. Use of interpersonal skills engaging students in collaborative learning
16. Use of intrapersonal skills, revealing self to encourage students to connect learning with past experiences, memories, introspection.
17. Course Administration
18. Registration
19. Facilities
20. Audiovisual Equipment
21. Laser Equipment and Accessories
22. Faculty and Sponsorship
23. Course Schedule and Elements
24. Recordkeeping
25. Conclusion
26. Examination of knowledge of subject matter
27. Examination of teaching
28. Course evaluation
29. Certification

***I certify that this course meets or exceeds the guidelines outlined in the Dental Practice Act. I understand that, under Kentucky Law, the submission of any false, fradulent, or forged statement, document, or other matter in connection with this form is grounds for criminal prosecution.***

Course Provider/Organization Signature Date