Laser Safety Officer Training

Keith Brewster DDS

Jan LeBeau RDH BS
Disclosure:

I PRACTICE AS A GENERAL DENTIST IN DOWNTOWN DALLAS, TX. I HAVE ADVANCED HOURS AND TRAINING IN ORTHODONTICS, CEREC, GALILEOS 3D IMAGING INTEGRATION AND GUIDED SURGERY, OCCLUSION, TMJ, IMPLANTS, AND LASER. ACHIEVED FELLOWSHIP IN ACADEMY LASER DENTISTRY IN 2009. DISCLOSURE IS I HAVE PERFORMED LIVE IMPLANT SURGERIES FOR COMPENSATION.
Disclosure:
Jan LeBeau, RDH BS is the Clinical Chair of Dental Hygiene for Pacific Dental Services and has no affiliation with any commercial or corporate support.
Laser Safety

Class 4 Laser Controlled Area

WARNING

VISIBLe and/or INVISIBLe LASER RADIATION
Avoid Eye or Skin Exposure to Direct or Scattered Radiation.

Laser Eye Protection Required: OD ≥ 5 @ 970nm

970nm Wavelength Diode Laser
14 Watts Peak Power - 7 Watts Average Power

635-650 nm Diode Laser Maximum Power 1mW Continuous Wave

Laser Safety Officer: Dr. Scott Benjamin
Laser Safety

American National Standards Institute (ANSI)
Sets general and clinical standards that defines the **Requirements** for the safe use of lasers. The **National Laser Safety Standards** are established in ANSI Standards Committee Z136.

The Laser Institute of America (LIA)
Serves as Secretariat for the ANSI Laser Safety Committee Z136. The LIA creates and publishes the required laser standards and documents.
Laser Safety

These standards (Z136.1) include but are not limited to industry, defense, home use, and healthcare. Standards ANSI Z136.3 (USA) & CSA Z386 (Canada) further defines the requirements for the safe and effective use of lasers in the health care, this includes dental facilities.
The CSA Z386 Standard “Safe Use of Lasers in Health Care Facilities” is an adoption, with Canadian deviations, of the identically titled ANSI Z136.3 Standard “Safe Use of Lasers in Health Care Facilities” sets the general and clinical standards for the safe use of lasers in Canadian healthcare facilities.
Laser Safety

ANSI Standard Z136.1-2014 for the Safe Use of Lasers

- Defines:
  - Scope & Requirements for Laser Safety
  - Laser Classifications
  - Definitions and Laser Terminology
  - Measurement Standards
  - Hazard Evaluation
  - Criteria for Exposures of Eye and Skin
  - Personal Protective Equipment
  - Education and Training
  - Incident Reporting Mechanism
  - Engineering Controls
  - Labels and Signage
  - Laser Safety Officer (LSO)
Laser Safety

ANSI Standard Z136.3 for the Safe Use of Lasers in Health Care

Defines:

- Biological Hazards
- Laser Eyewear & PPE
- Healthcare Personnel Laser Training
- Incident Reporting Mechanism
- HCLS Engineering Controls
- Infection Control for HCLS
- Pathogen Control in LGAC
- Health Care Facility LSO
“Properly trained and licensed dental professionals must use lasers within their scope of practice and in a manner where the procedure is safe, effective and consistent with the clinician’s education, training and experience.”
“Laser safety training shall be required for the following Health Care Personnel (HCP):

1) Laser Safety Officer
2) Laser users
3) Laser operators
4) Technical support staff
5) Allied health personnel”
Training Programs

“Training programs shall be specific to the HCLS (lasers) in use, and to the procedures to be performed. Program criteria and content shall be in accordance with facility policy and procedure, applicable standards, and federal and state regulations.”

“Laser safety training programs shall provide a thorough understanding of all procedures required for establishing and maintaining a safe environment during the use of a HCLS.”

“Retraining programs should be provided at intervals determined by the applicable regulations, but not less frequently than every five years for laser users, laser operators, LSO, and DLSOs and LSSC (if assigned).”

American National Standard (ANSI) for the Safe Use of Lasers  Z-136.3-2011  
Section 5.2  
Laser Institute of America; Publisher
<table>
<thead>
<tr>
<th>ANSI Laser Classifications</th>
</tr>
</thead>
</table>

**Class 1 Laser Systems**
Any laser or laser system containing a laser that cannot emit laser radiation at levels that are known to cause eye or skin injury during normal operation.

**Class 1M Laser Systems**
Considered incapable of producing hazardous exposure unless viewed with Collecting optics.

**Class 2 Laser Systems**
Visible lasers considered incapable of emitting laser radiation at levels that are known to cause skin or eye injury within the time period of the human eye aversion response (0.25 seconds).

**Class 2M Laser Systems**
Emits in the visible portion of the spectrum, and is potentially hazardous if viewed with collecting optics.

**Class 3R Laser Systems**
A laser system that is potentially hazardous under some direct and specular reflection viewing condition if the eye is appropriately focused and stable.

**Class 3B Laser Systems**
Medium-powered lasers (visible or invisible regions) that present a potential eye hazard for intrabeam (direct) or specular (mirror-like) conditions. Class 3B lasers do not present a diffuse (scatter) hazard or significant skin hazard expect for higher powered 3B lasers operating at certain wavelengths.
ANSI Laser Classifications

Class 4 Laser Systems

• “High-powered lasers (visible or invisible) considered to present potential acute hazard to the eye and skin for both direct (intrabeam) and scatter (diffused) conditions. Also have potential hazard considerations for fire (ignition) and byproduct emissions from target or process materials.”

• “Is a hazard to the eye or skin from the direct beam, may pose a fire hazard or diffuse reflection hazard, and may also produce laser generated air contaminants (LGAC) and hazardous plasma radiation.”*

All Dental and Medical Surgical Laser Systems

Laser Institute of America; Publisher
Class 4 Laser
Required Labels

Label Stating Laser’s Wavelength ($\lambda$) & Maximum Power

\[
\begin{align*}
\lambda &= 970 \text{ nm } \pm \text{ 15nm} \\
P_{\text{max}} &= 14 \text{ W} \\
\lambda &= 635 - 650 \text{ nm} \\
P_{\text{max}} &= 1 \text{ mW} \\
\end{align*}
\]

IEC 60825-1:2007

Label Stating Laser’s Potential Danger & Laser Classification

CAUTION

VISIBLE AND INVISIBLE LASER RADIATION. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION. CLASS 4 LASER PRODUCT

Laser Radiation Symbol
## Requirements by Lasers Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Control Measures</th>
<th>Training</th>
<th>Laser Safety Officer (LSO)</th>
<th>Engineering Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Required</td>
<td>Not Required</td>
<td>Not Required</td>
<td>Not Required</td>
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<tr>
<td>1M</td>
<td>Required</td>
<td>Application Dependent</td>
<td>Application Dependent</td>
<td>Application Dependent</td>
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<tr>
<td>2</td>
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<td>3B</td>
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<td>4</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

*American National Standard (ANSI) for the Safe Use of Lasers Z136.1-2014 Table 1-1; 3 Laser Institute of America; Publisher*
Nominal Hazard Zone

- WARNING
  - Class 4 Laser Controlled Area
  - VISIBLE and/or INVISIBLE LASER RADIATION
  - Avoid Eye or Skin Exposure to Direct or Scattered Radiation.
  - Laser Eye Protection Required: OD 5 @ 970nm
  - 970nm Wavelength Diode Laser
  - 14 Watts Peak Power
  - 7 Watts Maximum Average Power
  - 635-660 nm Diode Laser Maximum Power 1mW Continuous Wave

  Laser Safety Officer: (RDH Name)
  Laser Safety Site Contact: Jan LeBeau, RDH, CMLSO
Nominal Hazard Zone

• Nominal Hazard Zone (NHZ) is the controlled area where the laser is being fired.

• The NHZ is different for every laser being used and is determined by that laser’s **Nominal Ocular Hazard Distance (NOHD)**.

• NHZ is essentially the entire operatory.
Nominal Ocular Hazard Distance

- 10’ (3.1m) xLase (Lasers4Dentistry) 1,064 nm
- 5’ (1.5m) SIROLaser (Sirona) 970 nm
- 30’7” (9.3m) Alta MLS (Dental Photonics) 980 nm
- 8’7” (2.6m) ilase (Biolase) 940 nm
- 8’7” (2.6m) ilase (Biolase) 810 nm
- 38’9” (11.8m) ezlase (Biolase) 940 nm
- 15’7” (4.7m) Biolase Epic (Biolase) 940 nm
- ? Picasso (AMD) 810 nm

*As reported by the manufacturers*
## Nominal Ocular Hazard Distance

<table>
<thead>
<tr>
<th>Distance</th>
<th>Device Type</th>
<th>Wavelength (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12’10” (3.9m)</td>
<td>Precise LTM (CAO)</td>
<td>810</td>
</tr>
<tr>
<td>6’11” (2.1m)</td>
<td>Precise SHP (CAO)</td>
<td>810</td>
</tr>
<tr>
<td>?</td>
<td>SOL (DenMat)</td>
<td>808</td>
</tr>
<tr>
<td>12’10” (3.9m)</td>
<td>Odyssey (Ivoclar)</td>
<td>810</td>
</tr>
<tr>
<td>3’11” (1.2m)</td>
<td>Navigator (Ivoclar)</td>
<td>810</td>
</tr>
<tr>
<td>4’8” (1.4m)</td>
<td>SL3 Laser (Zila)</td>
<td>808</td>
</tr>
<tr>
<td>3’ (.90)m</td>
<td>NV Microlaser (Zila)</td>
<td>808</td>
</tr>
<tr>
<td>?</td>
<td>Claros (elexxion)</td>
<td>808</td>
</tr>
<tr>
<td>?</td>
<td>Nano (elexxion)</td>
<td>808</td>
</tr>
</tbody>
</table>

*As reported by the manufacturers*
## Nominal Ocular Hazard Distance

<table>
<thead>
<tr>
<th>Distance</th>
<th>Equipment</th>
<th>Wavelength</th>
<th>Laser Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7’9” (2.4m)</td>
<td>LightScalpel</td>
<td>10,600nm</td>
<td>CO\textsubscript{2}</td>
</tr>
<tr>
<td>0’2” (.05m)</td>
<td>Solea</td>
<td>9,300nm</td>
<td>CO\textsubscript{2}</td>
</tr>
<tr>
<td>21’8” (6.6m)</td>
<td>LightWalker DT</td>
<td>2490nm</td>
<td>Er:YAG</td>
</tr>
<tr>
<td>88’7” (27m)</td>
<td>LightWalker DT</td>
<td>1064nm</td>
<td>Nd:YAG</td>
</tr>
<tr>
<td>21’8” (6.6m)</td>
<td>LightWalker AT</td>
<td>2490nm</td>
<td>Er:YAG</td>
</tr>
<tr>
<td>88’7” (27m)</td>
<td>LightWalker AT</td>
<td>1064nm</td>
<td>Nd:YAG</td>
</tr>
<tr>
<td>0’2” (.05m)</td>
<td>ilase+Waterlase</td>
<td>2780nm</td>
<td>Er,Cr:YSGG</td>
</tr>
<tr>
<td>8’7” (2.6m)</td>
<td>ilase+Waterlase</td>
<td>940nm</td>
<td>Diode</td>
</tr>
</tbody>
</table>

*As reported by the manufacturers*
Nominal Hazard Zone

- The NHZ MUST be designated with appropriate signage.
- NHZ (operatory) should be restricted to the patient and only necessary personnel.
- All persons in the NHZ (operatory) MUST wear appropriate eye protection!
Warning Signs

• Must be placed at every entrance into the NHZ (Nominal Hazard Zone / Operatory)
• Laser Classification
• Laser Radiation Symbol
• Potential Danger / Harm
• Should only be displayed when laser is in use
• Must identify needed eyewear (O.D. & WL)
• Must identify Wavelength and Maximum Power

New Sign as of January 2014
Warning Signs

New Sign as of January 2014
Laser Protective Eyewear

Appropriate eye wear
Must have the Wavelength & Optical Density Laser Filtration for the Laser Being Used Marked on the Frame or Lens.
Magnification
Required Optical Density for the Laser Protective Eyewear

Appropriate LPE Must have the Wavelength & Optical Density / Laser Filtration for the Laser Being Used Marked on the Frame or Lens.
Potential Risks to the Eye from Laser Light:

- **Cornea**: 1400nm – 1mm WL
- **Aqueous Humor**: 1400nm – 1mm WL
- **Lens**: 1400nm – 3.0µ WL
- **Retina**: 400nm – 1400nm WL (Visible & Infrared)
Retina Damage

Damaged caused by the failure to wear appropriate eyewear.
Retina Damage

Damaged Area
Hemorrhaging
## Required Optical Density for the Laser Protective Eyewear

### Various Models of Lasers

<table>
<thead>
<tr>
<th>Model</th>
<th>Wavelength (nm)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5 LightScalpel</td>
<td>10,600</td>
<td>CO$_2$</td>
</tr>
<tr>
<td>+4 Solea</td>
<td>9,300</td>
<td>CO$_2$</td>
</tr>
<tr>
<td>+4 LightWalker DT</td>
<td>2490</td>
<td>Er:YAG</td>
</tr>
<tr>
<td>+7 LightWalker DT</td>
<td>1064</td>
<td>Nd:YAG</td>
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<tr>
<td>+4 LightWalker AT</td>
<td>2490</td>
<td>Er:YAG</td>
</tr>
<tr>
<td>+7 LightWalker AT</td>
<td>1064</td>
<td>Nd:YAG</td>
</tr>
<tr>
<td>+4 ilase+Waterlase</td>
<td>2780</td>
<td>Er,Cr:YSGG</td>
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<tr>
<td>+4 ilase+Waterlase</td>
<td>940</td>
<td>Diode</td>
</tr>
</tbody>
</table>

* As reported by the manufacturers
Required Optical Density for the Laser Protective Eyewear

- +4 Precise LTM (CAO) 810 nm
- +4 Precise SHP (CAO) 810 nm
- +4 SOL (DenMat) 808 nm
- +4 Odyssey (Ivoclar) 810 nm
- +4 Navigator (Ivoclar) 810 nm
- +10 SL3 Laser (Zila) 808 nm
- +4 NV Microlaser (Zila) 808 nm
- +6 Claros (elexxion) 808 nm
- +6 Nano (elexxion) 808 nm

* As reported by the manufacturers
Required Optical Density for the Laser Protective Eyewear

- **+5** xLase (Lasers4Dentistry) 1,064 nm
- **+5** SIRO Laser (Sirona) 970 nm
- **+5** Alta MLS (Dental Photonics) 980 nm
- **+4** ilase (Biolase) 940 nm
- **+4** ilase (Biolase) 810 nm
- **+4** ezlase (Biolase) 940 nm
- **+4** Biolase Epic (Biolase) 940 nm
- **+?** Picasso (AMD) 810 nm

* As reported by the manufacturers
Everyone in the NHZ Needs Laser Eye Protection
Laser energy should never be directed at an area that is not intended to receive energy.

Specular reflections should be reduced if not completely eliminated.

A laser is not a drill, it has a biological effect on tissue even when NOT in contact.

Intraoral mirrors CAN BE USED!
Non-Beam Hazards

- Electrical Hazards
- Respiratory Hazards
- Fire Hazards
- Human Factors
- Control Measures
- Engineering Controls / Safety Mechanisms
- Laser Safety Officer
Respiratory Hazards - Laser Plume
Respiratory Hazards

• Laser plume is a biological hazard of gas fumes created when tissue is ablated (vaporized), also referred to as Laser Generated Airborne Contaminants (LGAC).

• Laser plume can contain vital strains of the Human Papilloma Virus (HPV) and other organisms.

• **High Volume Evacuation (HVE) should be used when a laser is in use to remove the laser plume.**

• Surgical masks must be worn.
7.4.2.3 Respiratory Protection.

“At present there is no suitable half-mask respirator (fitting over the nose and mouth) used for the specific purpose of excluding all laser generated plume particulates, bacteria, viruses, gases, vapors, or other irritants. Surgical masks are not designed to provide protection from plume contents. Surgical masks are intended to protect the patient from the contaminated nasal or oral droplets of anyone with access to the surgical field. Filtration materials in masks designed to protect against plume, have time limited effectiveness, and must be changed as needed. Therefore, the HCF shall rely on appropriate LEV techniques as the first line of protection for occupational exposure to LGAC.”
Fire Hazards
Never Use an Alcohol Gauze
Manufacturers of laser products are required to certify that their products comply with the Federal Laser Product Performance Standard (Title 21, Code of Federal Regulations, Part 1040) promulgated and enforced by CDRH.
Required Engineering Controls

Federal Laser Product Performance Standard (FLPPS)

- Labeling of the device
- Software Self Check (POST)
- Password Locking Mechanism
- Fiber Interlock Switch
- Automatic Sleep Mode
- Visual & Auditory Laser Emission Indicators
- Guarded activation Switch
  - Foot Control “Safety” Cover
  - Recessed Finger Switch
- Containment Case Interlock
- Emergency Shut Off Switch
Whenever there is ever **ANY** Concern of a Malfunction or a Potential Problem the laser should be shut down immediately utilizing the **Red Laser Stop Button**.
Emergency Shut Off Button
Infection Control

• Fibers and handpieces must be autoclaved between each patient.
• Disposable tips (canulas) must be properly discarded after each patient.
• Bending tool and fiber cutter must be autoclaved if contaminated.
Proper Infection Control

Images courtesy of Joel White, D.D.S., M.S.
University of California San Francisco School of Dental Medicine
Division of Biomaterials and Bioengineering
Scoring & Cleaving a Fiber
The Cleaved End of the Fiber is Considered a Sharp

Dispose of it Appropriately!
Laser Safety Officer (LSO)

- All facilities where Class 4 Lasers are in use are Required to have a Designated Laser Safety Officer.
Laser Safety Officer

- Ensures that all appropriate protocols have been established and are being followed.
- Ensures that staff has been appropriately trained on laser use and safety.
- Responsible for management and reporting of accidents or occurrences of a laser-induced injury.
- LSO is typically an auxiliary staff member.
- Some states require the LSO has formal training (CE) and is registered with the state.
Deputy Laser Safety Officer

• “If deemed necessary, a DLSO should be appointed by management or the LSO to perform the duties and fulfill the responsibilities of the LSO when the LSO is not available in large HCF. For institutions with multiple divisions or locations, a system of DLSOs may be deemed necessary.

• The DLSO can be the laser user, laser operator, or other trained person responsible for the laser safety program.”

American National Standard (ANSI) for the Safe Use of Lasers Z-136.3-2011
Section 1.3
Laser Institute of America; Publisher
Laser Safety Site Contact

• “If deemed necessary, in facilities with diversity of laser use and use sites, a LSSC should be appointed by management or the LSO to oversee all operational aspects of laser safety at each site where lasers are being used, in large HCF (e.g., outlying clinical areas such as ophthalmology clinic, day surgery unit, neonatal intensive care unit, dermatology clinic, etc.).

• The LSSC can also be the laser user, laser operator, or other trained person responsible for the laser safety program.”
AZRRA-NIR
APPLICATION FOR
REGISTERING
NON-IONIZING
RADIATION DEVICES
(1 per Facility)
MEDICAL DIRECTOR ACKNOWLEDGEMENT STATEMENT

I, ____________________________, am the designated Medical Director of _____________________________. I am: _____________________________.

(Facility Name)

a. A licensed practitioner of the healing arts, qualified to perform these procedures in accordance with my scope of practice as defined by my licensing board.

b. The licensed practitioner establishing written protocol procedures for each laser use.

c. The licensed practitioner with prescribing authority for prescription medications, ointments, etc.

d. Available to provide required functions.

______________________________
Signature

______________________________
Date
LASER SAFETY OFFICER (LSO) ACKNOWLEDGMENT STATEMENT

A.A.C. R12-1-1434. B.

The LSO shall administer the laser radiation protection program and shall:

1. Ensure that maintenance or service for Class 3b and Class 4 lasers is performed only by technicians trained to provide the maintenance or service by either the manufacturer's service organization or the registrant;
2. Approve or reject written service, maintenance, and operating procedures;
3. Investigate, document, and report all incidents as required by R12-1-1436;
4. Select protective eyewear as required by R12-1-1435, along with any other protective equipment;
5. For health care facilities, establish authorization and operating procedures, including preoperative and postoperative checklists, for use by operating room personnel;
6. Ensure that authorized personnel are trained in the assessment and control of laser hazards;
7. Select signs, symbols, and labels as required by R12-1-1427;
8. Perform laser radiation protection surveys as required by R12-1-1421 and R12-1-1441;
9. Classify or verify the classification of lasers and laser systems used under the LSO's jurisdiction;
10. Evaluate the hazard of laser use areas, treatment areas, and controlled areas, as required by R12-1-1421(C).

I, ____________________________ am the designated Laser Safety Officer for ____________________________

(Name of Laser Facility)

I perform all of the duties listed above in R12-1-1434 B, 1 through 10, of the Arizona Administrative Code.

__________________________
Signature

__________________________
Date
Procedures and Protocols

Facility Policies on Laser Safety Procedures and Protocols

The purpose of this document is to define the practice’s protocols for the safe and effective use of lasers and light based technologies in the performance of oral healthcare for this facility. As lasers present special dangers to individuals (patients and staff) who are present in the ‘controlled’ area known as the Nominal Hazard Zone (NHZ), specific considerations and protocols must be followed. These precautions greatly reduce the primary risks of fire, electrical injury, biologic, and especially optical injury.

The use of all Health Care Laser Systems (HCLS) and laser products are to be used in accordance with the American National Standards Institute (ANSI) Z136 standards. More specifically the HCLS will be used in accordance with the ANSI standards documents Z136.1, The Safe Use of Lasers, and Z136.3, The Safe Use of Laser in Healthcare. All laser systems and products are to be used as specified by the manufacturer’s classification and instructions. All-HCLS will have periodic safety audits of laser systems, related equipment, and accessories at least once every 3 months.

The facility has the following Class 3 and 4 laser systems:

<table>
<thead>
<tr>
<th>Laser System</th>
<th>Wavelength (µM)</th>
<th>Laser Class</th>
<th>NOHD</th>
<th>Eyewear’s OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All Health Care Personnel (HCP) in the facility will be properly trained to the level as related to their role and potential exposure to laser radiation. Licensed dental professionals must use lasers within their scope of practice and in a manner where the procedure is safe, effective and consistent with the clinician’s education, training and experience. The training programs shall be specific to the HCLS (lasers) to be utilized, and to the procedures to be performed. Program criteria and content shall be in accordance with facility policies and procedures, applicable standards, and government regulations (local, state, and federal). All personnel that are laser users, laser operators, Laser Safety Officers (LSO), Deputy Laser Safety Officers (DLSO), and Laser Safety Site Contact (LSSC) will have appropriate retraining programs at intervals determined by the applicable regulations, but not less frequently than every five years.

Maintenance of Records Related to Laser Systems

The following records will be maintained for seven (7) years:
- Laser education and training records for all related personnel.
- Protective eyewear maintenance logs for the inspection, and removal from service.
- Inspection, calibration, service, and maintenance records.
- Laser related incidence/accident reports and related correspondence.

Laser Safety Officer (LSO)

The following individual, has been designated as the Laser Safety Officer (LSO) has the authority and responsibility to monitor and enforce the control of laser hazards and to effect the knowledgeable evaluation and control of laser hazards. The LSO shall ensure that appropriate laser safety education and training has been provided to all people associated with lasers such as providers, clinicians, staff, technicians, students, and other health care personnel (HCP). The LSO shall ensure maintenance of records of laser safety education and training of those HCP. The LSO may delegate appropriate procedures and responsibilities to other suitably trained HCP’s to help ensure that all HCLS and the environments they are utilized are properly maintained and utilized in a safe and effective manner.

Laser Safety Officers (LSO) Responsibilities

- Verification of laser classification for Class 3b or Class 4 lasers or laser systems in the facility.
- Hazard evaluation of laser areas, including Nominal Hazard Zones (NHZ).
- Maintaining accurate records of all Class 3b and Class 4 lasers.
- Ensuring that adequate policies, protocols, and procedures are established and are properly followed for the control of laser hazards.
- Ensuring that the Laser Protective Eyewear (LPE) is appropriate, in satisfactory condition, properly used, and is routinely inspected.
- Ensuring that all of the required labels and signs are appropriate in place and their routine inspection.
- Conduct periodic safety audits of laser systems, related equipment, and accessories.
- To conduct surveys and inspections of all areas where laser equipment is used. To periodically inspect the functionality of the laser systems, related equipment, accessories, and safety features and ensure corrective action is taken if required.
- Suspend, restrict, or terminate laser or laser system operation, if laser hazard controls are determined inadequate.
- Overview and ensuring that all HCP are trained on the use and safety.
- Controlling and managing the passwords and, or keys for activating the laser.
- Participate in accident investigations involving lasers and issuing other incident/accident, notifications and report any significant laser related injury to the laser manufacturer and appropriate agencies.
- Assuring the necessary records required by government regulations are maintained.

Laser Incident Reporting Protocol

The Laser Safety Officer (LSO) or an appropriately designated person:
A. Shall notify the manufacturer of the laser system and the applicable agency by telephone within 24 hours of any incident that has caused or may have caused:
   1. Permanent loss of sight in either eye, or
   2. Third-degree burns of the skin involving more than 5 percent of the body surface as estimated by the rule of nines.
B. Shall notify the manufacturer of the laser system and the applicable agency by telephone within five working days of any incident that has or may have caused:
   1. Any second-degree burn of the skin larger than one inch (2.54 centimeters) in greatest diameter, or
   2. Any third-degree burn of the skin, or an eye injury with any potential loss of sight.
C. Shall file a written report with the manufacturer of the laser system and the applicable agency of any known exposure of an individual to laser radiation or collateral radiation within 30 days of its discovery, describing:
   1. Each exposure of the individual to laser or collateral radiation that exceeds the applicable Maximum Permissible Exposure (MPE), and
   2. Any incident that triggered a notice requirement in sections (A) or (B) above.
   3. These written reports shall describe the extent of exposure to each individual including:
      1. An estimate of the individual’s exposure,
      2. The level of laser or collateral radiation involved,
      3. The cause of the exposure, and
      4. The corrective steps taken or planned to prevent a recurrence.
Sample Laser Inspection & Maintenance, Form
Laser Calibration & Inspection Log

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# Laser Incident / Accident Reporting Form

**Office Name:** ____________________________  **Phone #:** ____________________________

**Office Address:** ____________________________

**Name of the Laser Safety Officer (LSO):** ____________________________

**Contact Person (if different from LSO):** ____________________________

**Laser Device:** ____________________________  **Wavelength(s):** __________ nm  **Laser Class:** __________

**Name of Injured Person:** ____________________________

**Address:** ____________________________  **Phone #:** ____________________________

**Home:** ____________________________  **Work:** ____________________________  **Cell:** ____________________________

**Date of Incident:** __________  **Time:** __________

**Person Operating the Laser Device:** ____________________________

**Nature of Injury:**

- [ ] Permanent loss of sight in either eye
- [ ] Third-degree burn of the skin involving more than 5 percent of the body surface
- [ ] Third-degree burn of the skin involving less than 5 percent of the body surface
- [ ] Second degree burn of the skin larger than one inch (2.54 cm) in greatest diameter
- [ ] Eye injury with any potential loss of sight
- [ ] Other ____________________________

**Extent of Injury:** ____________________________

**Cause of the Incident:** ____________________________

**Corrective steps taken or planned to prevent a recurrence:** ____________________________

**Estimated Amount of Radiation and Individual's Exposure:** ____________________________

**Incident Reported by:**

- [ ] Telephone
- [ ] In Writing
- [ ] Other: ____________________________

**Organization:** ____________________________  **Date:** __________  **Time:** __________

**Individual's Name:** ____________________________  **Position:** ____________________________

**Additional Report by:**

- [ ] Telephone
- [ ] In Writing
- [ ] Other: ____________________________

**Organization:** ____________________________  **Date:** __________  **Time:** __________

**Individual's Name:** ____________________________  **Position:** ____________________________

Attach any additional documents, statements, correspondence, and amendments to this form.

**Completed By (Print Name):** ____________________________  **Title:** ____________________________

**Signature:** ____________________________  **Date:** ____________________________

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*Copyright © 2013 Advanced Integration & Monitoring (AIM) Inc.*
Certificate of Completion

(Attendee Name)

The Attendee Named Above has Successfully Completed the Program and is Entitled to

8 Hours of Hands-On Participation Credits

of Continuing Medical/Dental Education for the Training Course

Utilization of the 970nm Diode Laser & Laser Safety in Dentistry

Jan M. LeBeau RDH BS
Dr. Scott Benjamin, DDS
Course Instructor

________ September 27, 2013, _________
(Date)

The Content of this Course was Conformant with the Curriculum Guidelines Set Forth By

Academy of Laser Dentistry
for the Safe and Effective Use of Lasers in Dentistry &

ANSI Z136.3-2005
American National Standard for Safe Use of Lasers in Health Care Facilities

The attendee has satisfactorily completed:

Simulated hands-on laser training and testing on clinical dental procedures & a didactic multiple choice examination of 100 questions on laser Utilization, Terminology, Technical Considerations, Biological Effects, & Laser Safety

Academy of General Dentistry Course Subject Classification Code 135 Laser Therapy

Advanced Integration & Monitoring is designated as an Approved PACE Program Provider by the Academy of General Dentistry. The formal continuing education programs of this program provider are accepted by AGD for Fellowship, Mastership and membership maintenance credit. Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement.

The current term of approval extends from 10/1/2010 to 9/30/2014. Provider ID# 213325

(Authorized Signature)
Laser Safety Review

1. Get Trained.
2. Have a Laser Safety Officer (LSO).
3. Appropriately train the entire office team.
4. Complete any regulatory required paperwork.
5. Use laser safety signs.
6. Always wear appropriate eyewear.
7. Use HVE and well fitting surgical masks.
8. Do not use alcohol wipes.
Questions