

# Operating Room: Laser Safety

## Introduction

THE BRYN MAWR HOSPITAL    LANKENAU MEDICAL CENTER    PAOLI HOSPITAL  
Working Together to Serve the Community

### OPERATING ROOM

#### POLICY AND PROCEDURE MANUAL

**Subject:**                    Laser Safety

**Key Words:**                Laser, Smoke, Fire, Safety

**Policy:**                      Appropriate safety precautions must be taken and must be appropriately documented whenever laser surgery is performed.

**Purpose:**                      To ensure the safety of both patients and personnel during laser use.  
To provide documentation of all laser procedures.  
To provide for the proper care and maintenance of the lasers.

**Performed by:**              All health care workers under the direction of a trained laser operator and a laser credentialed physician. MLH system has outsourced some of these services.

**Equipment:**                Laser of choice, appropriate laser check list, smoke evacuator if indicated, and laser safety equipment.

#### Procedure:

##### A. Environmental Safety

Warning signs specific to the laser being used must be displayed conspicuously at all entrances to the areas where lasers are used.

1. Plume and noxious fumes must be evacuated through the filter device/smoke evacuation system that is used according to manufacturers written instructions.
2. High-filtration surgical masks for laser use must be worn during procedures that produce plume.

##### B. Fire Safety

1. Alcohol-based skin prep (**Prep Protocol**)
  - Alcohol-based antiseptics must be unit dosed in unit dosed applicators.
  - Tuck drip towels as needed to absorb excess prep solution. Remove drip towels before draping.

- Avoid getting solution into hair. If this happens, dry hair with towel. Dry time for hair, skin folds, and between digits will be much longer than 3 minutes and may vary.
- After applying solution wait until skin is dry (3 minutes) before draping. Skin will turn from shiny (wet) to dull when dry and no longer flammable.
- All solution soaked materials must be separately bagged and contained and/or removed from the room prior to the use of laser.(e.g. prepping dispensers, applicators, drip drapes) must be separately bagged and removed from the room prior to the use of laser. This includes items used by the anesthesia providers.
- "Prep Protocol" includes checking for dryness and confirming removal of drip towels and containment and/or removal of all prep items from the room.
- Documentation of "Prep Protocol" is included on white boards and perioperative records.

ALCOHOL-BASED PREP SOLUTIONS	DRYING TIME	TOWEL DRY
Chloro Prep – 26.5ml wand	3 Minutes minimum	No
10ml wand	1 Minutes 3 Minutes minimum	No
Dura Prep	3 Minutes	No Yes
Hibiclens		

2. Flame-resistant drapes or moistened, reusable fabrics should be used to drape the operative site.  
(Wet sponges or towels and fire-resistant drapes around the laser-tissue impact site decrease the potential for fire.)
3. Moistened, counted sponges may be inserted into the rectum

when procedures are performed in the perianal area.

4. A basin of water or saline and a fire extinguisher should be readily available.
5. A laser-safe endotracheal tube should be used during laser surgery in the aerodigestive tract. The cuff should be inflated with saline.
6. Electrical circuitry in the area of laser use should have adequate amperage to meet the power requirements of the specific laser. Liquids should not be placed on the laser unit, or on or near the foot pedal.
7. Both O<sub>2</sub> and N<sub>2</sub>O support combustion, during general anesthesia; the anesthesia provider will decrease FIO<sub>2</sub> (Fraction of inspired oxygen) to minimum amount possible to maintain adequate SpO<sub>2</sub>. Be aware of possible enriched O<sub>2</sub> and N<sub>2</sub>O atmospheres near the surgical site under the drapes, especially during head and neck surgery. Tent drapes to allow oxygen, which is slightly heavier than air to drain away from the patient's head and toward the floor.
8. During MAC and local anesthesia with head and neck surgery and/or any other procedure where no physical barrier is between the surgical site and the oxygen source (e.g. ether screen):

- a. Coat any exposed facial hair with water-soluble surgical lubricating jelly to make it non-flammable, including easily ignitable fine lanugo.
- b. Do not use alcohol.
- c. O<sub>2</sub> is to be decreased to minimum flow to maintain as adequate SpO<sub>2</sub>.
- d. If O<sub>2</sub> is in use the anesthesia provider is to notify the surgeon.
- e. The surgeon is responsible to indicate to the anesthesia provider when he/she will stop supplemental O<sub>2</sub> prior to beginning, and during use of the unit. At that time, the nasal cannula must be disconnected from the oxygen source, and the patient instructed to take a couple of deep breaths to clear any pooled oxygen from the airway and nasopharynx.

### C. Eye Safety

1. Laser-safe eye protection with appropriate wavelength and optical density must be worn by all health care workers in the room.
2. Patients' eyes must be protected by either moistened eye pads (CO<sub>2</sub> laser), or by goggles specific to laser wavelength.
3. Appropriate laser-protective eyewear should be available near the posted warning sign(s).
4. All viewing windows in the laser room should provide adequate protection specific to the laser wavelength.

### D. Laser Safety Operator

1. Laser Education Programs should be designed to meet individuals' needs and should include didactic and operational training, access to literature and publications, and periodic continuing education.
2. Personnel should be required to demonstrate appropriate skill levels before assuming responsibility for operating laser equipment.
3. On all procedures that include use of the laser, one person shall be assigned to function as the laser safety person. This person may not have any other responsibilities while the laser is in use.
4. The laser safety operator is responsible for:
  - a. laser safety protocol.
  - b. performing laser preoperative equipment check
  - c. operating the laser control panel
  - d. completing the laser documents

5. The **laser** must be test-fired prior to arrival of the patient in the Operating Room, as recommended by the manufacturer.
6. The **laser** beam should never be directed at any person, except when used on the patient.
7. Dull, ebonized, or nonreflective anodized instruments should be used near the **laser** site.
8. The surgeon will assume the responsibility for selecting mode of operation, wattage and the appropriate lens for each procedure.
9. To prevent accidental discharge of the **laser** beam into tissue to be lased, the operating surgeon should have only the **laser** foot pedal to operate. No other foot pedals should be available to the surgeon.
10. To prevent accidental discharge of the **laser** the **laser** will be placed in stand-by when not in use.
11. Access to **lasers** and keys must be restricted.

#### E. Credentials - Physicians

1. Only surgeons who have **laser** privileges granted by the hospital Credentials Committee are permitted to perform **laser** surgery.
2. A list of physicians who have been granted privileges must be maintained and available within the department.

#### F. Documentation

1. Cases requiring the **laser** must be specified when scheduled.
2. In the event of a malfunction during a procedure, an event report must be completed.

#### G. Care and Maintenance

1. Removable **laser** parts shall be stored in a protective area and be handled only by a **laser safety** operator.
2. At the conclusion of the **laser** procedure, the **laser** and its attachment are wiped down with an approved antimicrobial solution.
3. When technical difficulties arise with the **laser** unit that are beyond the realm of the **laser** operator's expertise, the Bioengineering Department or specific **laser** company should be notified.

**References:** AORN Perioperative Standards and Recommended Practices 2012.  
ECRI; CMS REF: S&C -07-11

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**Revision Date:** 11/12

**Replaces the following Policies/Procedures:**

**Laser Safety** Checklist (BMH - origination date July 1988; last revision date 6/97)

**Laser Safety** (origination date February 1988; last revision date 6/97)

**Laser Safety** In The Practice Setting (TLH - origination date June 1986; last revision date 6/97)

Proper Use and **Safety** Precautions with CO<sub>2</sub> **Laser** (PMH - origination date September 1996; last revision date 6/97)

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