

# Airway Fires during Surgery

**Airway surgeries that use ignition sources such as ESU (electrosurgical unit) and laser systems pose a significant and sometimes deadly risk of fire. Hazards exist when ignition sources are within the oxygen-enriched environment (i.e. more than 23% O<sub>2</sub>) that are commonly present in the airway during surgery.**

## Ways to Minimize Airway Fires During Electrosurgery

### During Tracheostomy

- Establish protocols to address when electrosurgery will be removed from the surgical field. Example: remove the electrosurgical unit when tracheostomy tube is placed on the surgical field.
- Do not use electrosurgical units to cut tracheal rings and enter the airway. Instead, use a “cold” scissors or a scalpel to avoid the risk of fire

### In the Oropharynx

- Use insulated probes for the electrosurgical unit. **DO NOT USE** red rubber catheters as sheaths or insulators for bare probes. The heat from the active electrode will ignite rubber even in room air.
- Scavenge around the surgical site with separate suction to catch leaking O<sub>2</sub> and nitrous oxide.
- Soak gauze or sponges used with uncuffed tracheal tubes to minimize gas leakage into the oropharynx, and keep the gauze or sponges wet throughout the entire procedure.

## Ways to Minimize Airway Fires During Laser Surgery

- Limit the laser output to the lowest clinically acceptable power density and pulse duration.
- Use appropriate laser-resistant tracheal tubes during oral or airway laser surgery. Follow manufacturer’s recommendation regarding use of laser wavelength specific tracheal tube
- Properly cleave and strip the laser fibers before use and as needed during surgery. Cleaveing and stripping should be done by trained staff.
- Allow the laser to be activated and fired by the person wielding the laser delivery system (i.e. handpiece, laser fiber) to minimize inadvertent activation.
- Deactivate the laser and place it on **STAND BY** mode when not in use and before removing it from the surgical site.
- Keep the laser fiber tip in view and make sure it is clear of the end of the bronchoscope or tracheal tube before laser emission.
- Use a water-based rather than oil-based lubricant on tracheal tubes.

## Ways to Fight Airway Fires

### 1a STOP THE GAS LOW

- Disconnect the breathing circuit – this is the quickest way to stop the gas flow.

### 1b REMOVE THE TUBE FROM THE PATIENT

- Maintain airway patency

### 2 EXTINGUISH THE FIRE

- Operating Room personnel other than the anesthesiologist/anesthetist should extinguish the smoldering tube.
- Remove segments of burned tube that may remain in the airway.

### 3 CARE OF THE PATIENT

- Reestablish the airway and resume ventilating with air until certain that nothing is left burning in the airway; then switch to 100% O<sub>2</sub>.

**NOTE:** Step 1a and 1b should be done as quickly and simultaneously as possible

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