

# Airway Fires during Surgery

Airway surgeries that involve ignition sources to cut or coagulate tissue (e.g., electro-surgical units, lasers) pose a significant and sometimes deadly risk of fire. Hazards exist when these ignition sources are used in the oxygen-enriched atmospheres (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 electro-surgery will be removed from the surgical field because of risk of fire. For instance, some hospitals remove the electro-surgical unit when the tracheostomy tube is put on the surgical field.
- Do not use electro-surgical 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 only commercially available insulated probes. Do not use red rubber catheters as sheaths. The heat from the active electrode will ignite rubber even in 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 them wet.

## Ways to Minimize Airway Fires during Laser Surgery

- Use appropriate laser-resistant tracheal tubes during upper-airway surgery.
- Properly cleave and strip the laser fiber before use and as needed during surgery.
- Place the laser in standby mode when not in use.
- Allow the laser to be activated only by the person wielding it to minimize inadvertent activation.
- Deactivate the laser and place it in standby mode before removing it from the surgical site.
- During lower-airway surgery, 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.



Image provided courtesy of ECRI Institute.

## Ways to Fight Airway Fires

### 1a) Stop the Gas Flow\*

Disconnecting the breathing circuit is the quickest way to stop the gas flow.

### 1b) Remove the Tube from the Patient\*

Maintain the airway.

### 2) Extinguish the Fire

Operating room personnel other than the anesthesiologist should extinguish the removed tube and other smoldering materials. Remove segments of burned tube that may remain in the airway.

### 3) Care for 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>.

\* These steps should be done as quickly and simultaneously as possible.

For more information visit:  
[www.psa.state.pa.us](http://www.psa.state.pa.us)

This poster was adapted from “Airway Fires during Surgery”  
PA-PSRS Patient Safety Advisory,  
March 2007, Vol. 4, No.1.  
© 2007 Pennsylvania Patient Safety Authority