
Working Together to Serve the Community

Department of Anesthesia

Policy Name: OR Fire Prevention Policy

Policy Purpose: Appropriate safety precautions for oxygen therapy during general anesthesia and procedures where no physical barrier is between the surgical site and oxygen source.

1. In facial surgery under MAC Anesthesia electrocautery must not take place during the administration of oxygen. The oxygen tubing must be disconnected from the oxygen source.
2. The surgeon is responsible to indicate to the anesthesia provider when electrosurgical/cautery is to be used. The anesthesia provider will stop supplemental O₂ prior to beginning, and during use of the cautery unit. At that time, the nasal canula 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.
3. Oxygen will be used only as a rescue measure if the patient is becoming hypoxic under sedation.
4. Sedation will be kept at a light level to minimize the need for supplement oxygen.
5. Should it be necessary to administer oxygen, the surgeon will be notified and Cauterization must be discontinued until oxygen is no longer needed.
6. If the patient is unable to maintain an adequate SpO₂ without supplemental oxygen, then the surgeon must be notified and one of three options chosen: the surgery is to be cancelled, the procedure may be done without sedation, or general endotracheal anesthesia induced.
7. If a fire does occur, the oxygen flow should be immediately discontinued, the fire quenched, and the appropriate treatment instituted.

B. Oxygen Therapy in Intubated Patients requiring laser surgery of the Upper Airway

1. In patients requiring laser surgery of the upper airway, the lowest possible FI_{O2} should be delivered consistent with and adequate SpO₂. The oxygen must be diluted with medical grade helium or medical air. N₂O should never be used for this purpose.
2. A cuffed, armored, laser-safe endotracheal tube must be used.
3. The endotracheal cuff should be inflated with sterile saline solution diluted with methylene blue dye (the saline will help quench a fire if the laser penetrated the balloon and the dye will help warn the surgeon of a balloon leak).
4. If a leak develops around the endotracheal tube, the surgery should be stopped and the endotracheal tube replaced if possible. If it is not considered safe to replace the tube, then a discussion with the surgeon must ensue as to whether or how to proceed.
5. In the event of a fire, the gas flow should be discontinued, ventilation stopped and the tube immediately removed. The fire should be quenched, and then the airway reestablished. Resume ventilation with air initially. When it is certain that no burning embers remain, then switch to 100% oxygen. The airway must be examined, the extent of the damage assessed, and the patient treated accordingly.

C. Oxygen Therapy for Intubated or Tracheostomy Patients requiring Electrocautery during Airway Surgery

1. In patients requiring electrocautery during airway surgery, the lowest possible FIO₂ should be delivered consistent with an adequate SpO₂. The oxygen must be diluted with medical air or medical grade helium, but not N₂O.
2. If the endotracheal tube is uncuffed with a leak, or if the endotracheal tube or tracheostomy tube is cuffed and a leak cannot be prevented, the leak pressure should be noted and documented on the anesthesia record.
3. Patients with endotracheal tube or tracheostomy tube leaks should be ventilated at inflating pressures below the leak pressure if consistent with patient safety. The leak and inflating pressures are to be documented on the anesthesia record
4. If there is an endotracheal tube or tracheostomy tube leak and adequate ventilation cannot be accomplished below the leak pressure, the surgeon is to be notified and consideration should be given to exchanging the tube.
5. If it not considered safe to exchange the endotracheal tube and in the presence of a continued leak, consideration should be given to packing the pharynx with saline soaked sponges. Every effort should be made to time cauterization so that it does not take place during controlled inspiration and thus increase the risk of ignition. This requires close communication among the OR team members.
6. During tracheostomy procedure, the electrocautery is not to be used to open the trachea, and is not to be used until the tracheostomy tube is in place and the cuff inflated.
7. In the event of fire, immediately and rapidly:
 - Disconnect the breathing circuit from the tracheal tube
 - Remove the tracheal tube. Have another team member extinguish it.
 - Remove cuff-protective devices and any segments of burned tube that may remain smoldering in the airway.
 - 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% oxygen.
 - Save involved materials and devices for later investigation.

References:

"Fighting Airway Fires" Healthcare Risk Control Risk Analysis.
January 1996.Vol 9, Surgery and Anesthesia 10.

ECRI. A Clinicians Guide to Surgical Fires, how they occur, how to prevent them, how to put them out (guidance article).

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