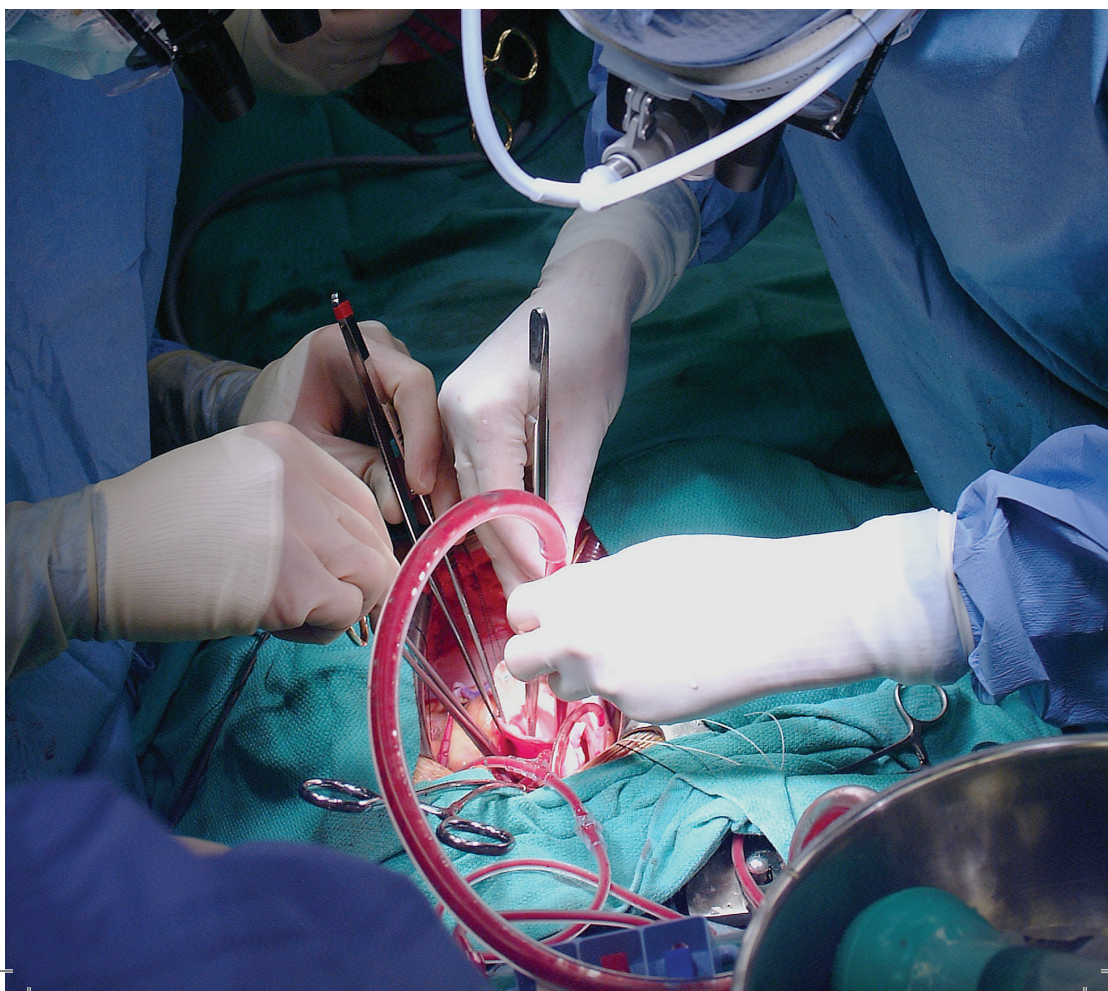




Environmental Health and Safety Surgical Fires

Education • Prevention • Management



Surgical Fires and Life Safety

Though they are considered rare occurrences in the health care environment, surgical fires* are certainly one of the most frightening and devastating experiences for everyone involved. While exact numbers are not available, of the more than 23 million inpatient surgeries and 27 million outpatient surgeries performed each year, estimates - based on data from ECRI and FDA - indicate that there are approximately 100 surgical fires each year, resulting in up to 20 serious injuries and one or two patient deaths annually (The Joint Commission Sentinel Event ALERT, Issue 29, June 24, 2003).

*The terms surgical and operating room include all invasive procedures and the locations where they are performed.

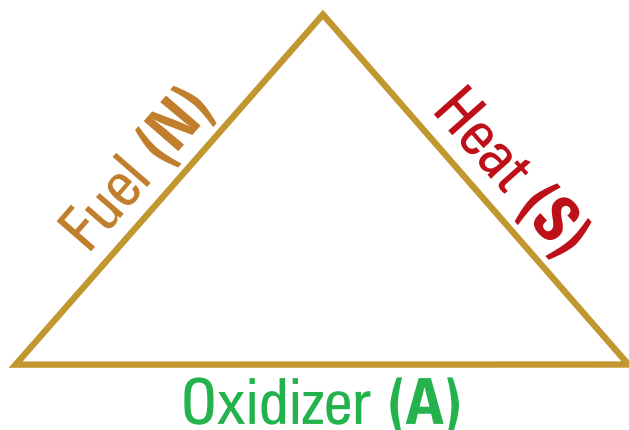
Education

Means of Egress. Staff and employees should review their department fire plan and walk at least two exit pathways on a quarterly basis. All exit paths from a given work floor must be walked at least annually.

Fire Drills. Passive fire drill scenarios are created for operating room staff to test their ability to prevent and manage a fire incident. The entire surgical team is required to participate in these drills. An interdisciplinary team meeting approach is recommended.

Prevention

Risk reduction. The basic elements of a fire are always present during surgery and a misstep in procedure or inattention can quickly result in a catastrophe. However, virtually all surgical fires are preventable and their impact can be lessened through an understanding of fire and how it works. The surgical team must be in a constant "fire prevention" mode. Fires require three elements: FUEL, HEAT and OXYGEN. Eliminate any leg of the triangle (see below) and the fire goes out. Nurses (N) control the fuel; Surgeons (S) control the heat source; and Anesthesiology (A) controls the oxidizer. Recognize the potential fire hazards. Communicate and prepare as a team.



Note: the applicability of the following recommendations must be considered separately for each patient, consistent with their needs.

Only you can prevent a surgical fire

- Both O_2 and N_2O support combustion. Beware of enriched O_2 and N_2O atmospheres near the surgical site and under the drapes, especially during head and neck surgery.
- Question the need for 100% O_2 for open delivery during facial surgery. Use air or FiO_2 at <30% for open delivery (consistent with patient needs).
- Minimize O_2 and N_2O build up beneath the surgical drapes. Tent drapes to dissipate gases.
- Use and incise drape to isolate head and neck incisions from O_2 and alcohol vapors.
- Do not drape patient until all flammable preps have fully dried.
- Coat facial hair near the surgical site with water-soluble surgical lubricating jelly to make it less combustible.

Oxygen and Cautery

- Oxygen is an accelerant!
- Surgeon should confer with Anesthesiologist for possible need to drop FiO_2 to less than 30% when using ignition source (electrocautery) near the lung or neck or in the presence of a known or suspected air leak associated with the airway, endotracheal tubes or the lung.

During oropharyngeal surgery

- Scavenge the oropharynx with separate suction.
- Use wet gauze or sponges with uncuffed tracheal tubes to minimize leakage of O_2 into the oropharynx. Keep them wet.
- Moisten sponges, gauze, and pledgets (and their strings) to resist igniting.

When using electrosurgery, electrocautery, or lasers

- Stop supplemental O_2 at least one minute before and during the use of the unit if possible (Surgical team communication is essential).
- Activate the unit **ONLY** when the tip is in view (especially when looking through a microscope).
- Deactivate the unit **BEFORE** the tip leaves the surgical site.
- Place electrosurgical electrodes in a holster or another location off the patient when not in active use (i.e., when not needed within the next few moments).
- Do not place red rubber catheter sleeves over electrosurgical electrodes.
- Fiberoptic light sources **CAN** start fires. Complete all cable connection before activating the source. Place source in standby when disconnecting cables.
- Place lasers in “standby” when not in active use.
- Defibrillator units can cause arcing fires due to inadequate grounding. Maintain good skin contact and use gel appropriately.

Surgical Prep Solutions

Be aware of prep solutions that contain high alcohol content (>70%) and exercise caution if they are used. These solutions include, but are not limited to, Chloraprep, Duraprep, Isopropyl Alcohol and Benzoin. These high alcohol content prep solutions should be avoided in emergent cases, when re-prepping a patient, and head and neck cases. This is due to the inability to allow 3 minute dry time and the risk of pooled solutions.



Management - Fighting a surgical fire

In general....

- Know and follow Cleveland Clinic OR fire plan for your area

In a patient airway...

- Immediately shutdown oxygen
- Disconnect circuit
- Extubate if required

On a patient or the table...

- Immediately smother or extinguish the fire with saline or remove the burning material from the patient
- If needed, use a CO2 fire extinguisher to extinguish the fire

In the OR, but not in/on the patient...

- Immediately extinguish the fire with a portable fire extinguisher
- Protect the patient

Outside the OR suite...

- Continue surgical procedure but stay in the emergency standby mode
 - Monitor fire response activity
 - Evacuate the patient(s) if necessary
- A copy of this brochure should be inserted into surgical area fire plans and posted in OR suites.

Reporting an OR Fire...

- Activate the nearest fire alarm pull station
- Call the Cleveland Clinic Police 42222 or 911 Off-Campus (ASC, FHC)
- Document the incident in the Safety Event Reporting System (SERS)

For more information regarding Surgical Fires and Life Safety contact:

Environmental Health and Safety

(216) 445-1688 or (216) 444-6588

Intranet: <http://intranet.ccf.org/qpsi/environmental/fire/>