



Operating Room Fire Safety

Although a fire occurring in an operating room is a relatively rare occurrence, the consequences can be devastating. This training module will provide information that can be taken to prevent fires in areas with an oxygen-enriched environment, as well as steps to take when a fire occurs.

After reading the training module, participants will be able to:

- Identify the components of the fire triangle
- Identify the action to take if a fire occurs at St. Joseph Hospital
- Identify proper handling of electrosurgical cautery pencil
- Identify appropriate fire safety steps to take when performing head and neck surgery

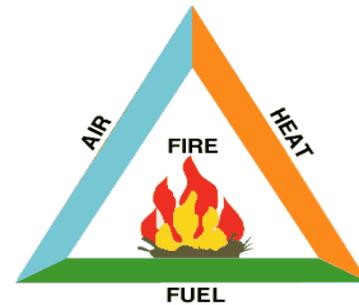
Safe usage of medical equipment and supplies has to be achieved through the education and vigilance of the personnel who are actually using these supplies and equipment in operative or procedural settings. The elements of the fire triangle must be kept apart.

Thank you for your participation in this very important safety matter.

Fire Triangle

Understanding the “fire triangle” is the most basic concept in fire prevention and control. In order for any fire to occur, three critical elements must be present:

- A fuel or combustible material
- An ignition or heat source
- Oxygen in sufficient quantities to support combustion



When all three of these elements come together, combustion is the result. However, if only one of these elements is removed from contact with the other two, the threat of fire can be minimized. Thus, if oxygen, heat or the fuel supply can be removed, there is minimal risk of fire.

O.R. Environment

In normal situations we are usually safe when the three elements are kept apart. In the Operating Room, however, factors come into play that increase the risk of these three elements coming into intimate contact:

- The O.R. environment contains combustible materials of all types, including gauze sponges, towels, drapes and plastic materials (such as various tubes, syringes and suction canisters)
- The use of high-energy heat or ignition sources is increasingly common, including lasers, fiberoptic light sources, ESUs and other electrical equipment (such as microscopes, endoscopes, monitors and hyperthermia units)
- There is an oxygen-enriched environment. Oxygen-enriched atmospheres exist routinely wherever inhalation anesthesia is used. In many instances of regional or local anesthesia, the patient receives supplemental oxygen to counteract the respiratory depressant effects of sedation. Nitrous oxide, which is frequently used as an adjunct to anesthesia, will support combustion just as readily as oxygen.

The O.R. team must be aware that all of these elements (fuel, ignition sources and oxygen) are present in an operating room every time there is procedure and must take every precaution to ensure that they are kept apart.

During head and neck procedures, particular attention must be given to prepping, draping and positioning the patient, as patients with their heads draped are more susceptible to fire because supplemental oxygen can accumulate under the drapes. To decrease the risk of fire, the prep solution must be given adequate time to dry (2-3 minutes), especially if there is alcohol in the solution. Draping and positioning the patient should be performed in a manner that does not allow pooling of oxygen under the drapes. Every effort should be made to use no more oxygen than is necessary to maintain adequate oxygen level. If possible, provide room air of less than or equal to 30% oxygen, depending on patient needs. Oxygen can also be combined with air to decrease the risk of fire. If facial hair is exposed, coat the hair with a water-soluble surgical lubricating jelly to make it nonflammable. Additionally, moisten sponges, gauze and pledgets (and their strings) to render them ignition resistant. This is also true for chest procedures, where oxygen may pool in the open body cavity.

During all procedures, as a proactive safety measure, sterile water or saline must be on the back table prior to ESU, argon beam coagulator (ABC) or lasers being used. Additional safety measures that should be taken when performing electrosurgery, electrocautery or laser surgery are as follows:

- Stop supplemental O2 at least one minute before and during use of the unit, if possible. (Surgical team communication is essential)
- Activate the unit only when the active tip is in view, especially if 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)
- Place lasers in standby mode when not in active use
- Do not place rubber catheter sleeves over electrosurgical electrodes

Fiberoptic Light Sources

Fiberoptic light sources can start fires. Complete all cable connections before activating the source. Place the light source in standby mode, or turn the unit off when disconnecting cables. Never leave a light cord that is still luminating on top of the patient drapes. Although surgical drapes are fire retardant, they are still flammable.

Fire Extinguishers

The fire extinguishes of choice in an operative or procedural environment are halon or CO2 extinguishers. These are readily available and routinely checked for expiration dates at St. Joseph Hospital.

In Case of a Fire at St. Joseph Hospital

If a fire does occur, initiate Code Red.

Additionally, in operative or procedural areas, the following steps should be taken in order:

- Immediately smother/put out the fire (when safe to do so)
- Remove the burning material from contacting the patient (drapes, ETT, etc.)
- Have the anesthesiologist stop the flow of gases (i.e., O2, N2O, Desflurane, etc.)
- Set off the fire alarm (pull station) and call Security at extension 64900
- Evacuate the patient, if necessary
- Save any material/devices for follow-up investigation

Please Complete Post Test

This post test will evaluate your understanding of the fire prevention concepts.

References

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