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SDS Accreditation Update

Be aware of fuel sources, ignition to reduce fire risk

How safe are your drapes, and do you really need to use oxygen?

Even though surgical-fire prevention is discussed by staff, sometimes, it takes a fire to make you realize how little you and your staff understand the risks of fire in an operating room.

At least, that's what **Richard J. Greco**, MD, a Savannah, GA-based plastic surgeon discovered when a fire occurred in his office-based surgery program. "My fire occurred many years ago, and there was not a lot of information on the causes and risks of intraoperative fires," he notes.

After his experience, Greco began to research the risks and discovered that although inpatient surgery programs paid attention to potential risks during lengthy procedures, surgery centers and office-based surgery programs did not take the risks as seriously because procedures performed in these locations were shorter and less complicated, he says.

"Fires have been reported in cases as small as the excision of a skin lesion," Greco warns. "If there is oxygen in use and there is a source of ignition such as a Bovie and there is something to burn, such as a drape, you can have a fire."

In recent years, two surgery centers in Illinois experienced fires and both involved hand-held Bovie that were not completely discharged, says **Jay Kiokemeister**, DO, president of the Illinois Freestanding Surgery Association.

"There were no injuries, but in one center, the Bovie was dropped into a trash receptacle that caught fire, creating the need to evacuate the center and causing significant damage to the building," he says. The other center experienced minor damage and did not evacuate the building because the Bovie was dropped into a heavily padded, plastic sharps container that did not burn as quickly, Kiokemeister adds.

"It is very easy to get busy and become rushed in a same-day surgery setting, but these fires point to the need to make sure employees are reminded on an ongoing basis to follow proper procedures with all equipment," he says.

Look carefully at your actions during surgery and evaluate what you can change to reduce the risks, Greco suggests. The staff of Effingham (IL) Surgery Center have looked carefully at potential causes of fires in the operating room. "We used a failure mode effect and analysis [FMEA] to identify the potential risks for surgical fire and to look at how we could minimize those risks," says **Leanne Bales**, RN, CNOR, administrator of the center.

"I like the FMEA approach to potential problems because it is a proactive way to make changes and it gets staff members involved in the process," she notes. The five nurses who worked on the FMEA for fire in the operating room presented their findings to the staff in training sessions that included fire hats for the presenters and fireball jawbreakers for audience members who could answer questions about surgical fire risks, Bales says.

One key to reducing the risk of fire is to recognize the potential for one to happen, she adds.

Awareness of the increased risk of fire when oxygen is in use is key, Greco explains. In fact, he suggests surgeons evaluate their need for oxygen prior to any procedure.

When patients are sedated without an anesthesiologist in an office-based program, surgeons tend to give oxygen routinely because it does ensure the patient maintains a good oxygen saturation rate, Greco says.

However, this is not always necessary, he adds. "If a surgeon uses pulse oximetry to monitor the patient during the procedure and administers oxygen only when necessary, the potential risk of fire is minimized because you've removed a combustible gas from the operating room," Greco explains.

If oxygen is used, use the lowest concentration necessary and use it in the open as opposed to allowing it to pool under surgical drapes, he recommends. "If it has to be administered under drapes, be sure you vent or suction the extra oxygen from under the drape," he says.

Finally, if you must use oxygen and you will be using an ignition source such as a laser or Bovie, be sure to turn off the oxygen and allow it to dissipate before turning on the laser or Bovie, Greco suggests. "There is no magic number for the amount of time you must wait for oxygen to dissipate, but any delay before activating a Bovie or laser will reduce the risk of ignition," he says.

The oxygen-use policy at Effingham Surgery Center requires the oxygen to be turned off one minute prior to activating a device such as a cautery, Bales says. "If the cautery is used on the face or neck area, the oxygen must stay off one minute after the cautery is turned off," she adds.

Operating room staff need to remember that they may smell smoke before they see fire because fluids used to prepare the surgical area may pool under the drapes and ignite where they can't be seen, Bales says. "Even if the flame is not hidden, in an oxygen-rich environment, a blue-flame may not be easily seen before drapes catch fire," she points out.

Once a fire is ignited, it needs fuel to burn, so you also need to look at drapes carefully, Bales adds. "Price is important when you evaluate drapes, but you also need to remember that some drapes burn more quickly than others. Vendors do have information on how quickly their drapes burn, but we don't take anyone's word," she says.

When evaluating drapes, Bales and her staff conduct their own burn test by placing a cautery against the drape and timing how quickly the drape catches fire and burns. While the test is designed to simulate real situations, staff members have water and fire extinguishers handy to extinguish fire quickly, she says. "We've found that you don't have to buy the most expensive drape to improve safety, but you do have to know what you're buying," she adds.

Pay attention to the manufacturers' recommendation for number of layers of drapes, Bales says.

"If you use too many layers, you give fire a chance to smolder and build into a more severe fire before you smell the smoke or see the flame," she explains.

Hair is also good fuel for fire, so staff members at Effingham Surgery Center use a water-based petroleum jelly to coat patients' mustaches, beards, pubic areas, and eyebrows, Bales adds.

"A single piece of hair can fuel a fire, so this is a simple precaution that can reduce risk of injury to a patient," she explains.

Another simple procedure that will reduce the risk of fire is for a nurse to tell the surgeon where the foot pedal has been placed, Bales says. This prevents accidental triggering of devices such as lasers, she says.

To avoid accidentally triggering other devices such as disposable cauteries, Bales has her staff remove the wire at the end of the instrument. "If the cautery is dropped into a container and the button is activated, the wire will get hot and cause a fire," she says. Removal of the wire prevents this situation from happening, she adds.

Make sure your staff are prepared in case of fire, Bales notes. "We have developed policies designed to help staff handle fire quickly so we can avoid injury to the patient and staff," she says.

The most important part of fire prevention is to make sure the topic is part of day-to-day activities, Greco stresses. "Talk about fire prevention, discuss the issue of oxygen with anesthesiologists before procedures, and actively think about what the risks might be and how they can be reduced," he says.

Sources

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