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Patient safety

Scoring fire risk for surgical patients

Fires in the operating room are a risk that requires prevention, vigilance, and quick action to prevent patient injury. To heighten awareness, the Christiana Care Health System (CCHS) in Newark, Del, has added a Surgical Fire Risk Assessment Score to its Patient Identification and Surgical Site documentation form.

"What brought this issue to our attention were 2 surgical fires. One occurred in the electrophysiology lab and the other in the OR with a patient having a carotid endarterectomy. Both cases involved a high concentration of oxygen, surgery above the xiphoid, and a heat source," Judith Townsley, RN, MSN, CPAN, director of clinical operations for perioperative services, told *OR Manager*.

The chairman of the anesthesiology department, Kenneth Silverstein, MD, developed the fire risk assessment score after the fires were investigated by ECRI (www.ecri.org), a nonprofit organization that researches health services and technology, and Russell Phillips & Associates (www.phillipsllc.com), consultants in fire, code compliance, and emergency management.

Assigning a fire risk score

The fire risk assessment is performed by the entire surgical team (anesthesia provider, surgeon, and nurse) before the incision is made and is documented by the circulating nurse, notes Denise Dennison, RN, BSN, CNOR, staff development specialist. (See assessment guide, page 20.)

The assessment requires the surgical team to identify the 3 key elements that are necessary for a fire to start—the fire triangle:

- heat
- fuel
- oxygen.

In the OR, 3 key risks are:

- surgical site or incision above the xiphoid
- open oxygen source (ie, patient receiving supplemental oxygen via face mask or nasal cannula)
- available ignition source (ie, electrosurgery unit, laser, or fiberoptic light source).

In the assessment, each of these risks is given a score of 1. The scores are tabulated to determine a total fire risk score.

Score 3 = High risk. All 3 components of the fire triangle are present.

Score 2 = Low risk with potential to convert to high risk. This score is given when the procedure is in the thoracic cavity, the ignition source is remote from an open oxygen source, the ignition source is close to a closed oxygen source, or no supplemental oxygen is used.

Score 1 = Low risk. Only supplemental oxygen is being used.

Each risk score has a fire protocol assigned to maximize patient safety (sidebar). The documentation form allows the circulating nurse to indicate that the high-risk protocol was initiated. It also allows for documentation that sufficient time was allowed for fumes to dissipate when an alcohol-based prep solution is used.

Communication heightens awareness

Since adding the fire risk assessment to the OR documentation, communication among the surgical team members as well as identification of the fire risk triangle have vastly improved, notes Dennison.

"The secret to success of this process is that this formal communication and documentation make everyone involved aware of the potential risk of a fire," says Townsley.

Surgical site fire risk assessment guide

Alcohol-based prep solution had sufficient time for fumes to dissipate. ❑ Yes ❑ No ❑ NA			Verified by:
			(Circulating RN signature) Print name _____ ❑ High Risk Fire Protocol initiated
(Circle appropriate option)	Y	N	
*Surgical site or incision above the xiphoid	1	0	
*Open oxygen source (patient receiving supplemental oxygen via any variety of face mask or nasal cannula)	1	0	
*Available ignition source (ie, electrosurgery unit, laser, fiberoptic light source)	1	0	
Total score			
Scoring: 3 = High risk 2 = Low risk w/potential to convert to high risk 1 = Low risk			
Complete this section if risk score increases to 3 during procedure ❑ High Risk Fire Protocol Initiated Signature/title _____ Print name _____ Time _____			

Note: This is a section of a form entitled Identification of Patient, Procedure and Surgical Side/Sites, and Fire Risk Assessment. Source: Christiana Care, Newark, Del.

Just recently, Mary Cay Curran, RN, perioperative clinical process coordinator, says she witnessed a discussion between a nurse and surgeon about the fire risk for a patient undergoing an arteriovenous fistula procedure. The surgeon challenged the nurse's lower fire risk score because of the way the patient's arm was positioned and the fact that the graft was being done in the upper part of the arm. Both agreed the fire risk was a 3, and the nurse immediately prepared the OR for the higher risk.

Curran has also witnessed nurses and surgeons telling the anesthesiologist they are going to use the ESU, which prompts the anesthesiologist to turn the 100% oxygen down for a patient with a high-risk score.

"Enhancing communication between providers has strengthened our focus on providing clinical excellence for our patients," says Townsley. ❖

—Judith M. Mathias, RN, MA

An ECRI fire prevention poster can be downloaded from the OR Manager Toolbox at www.ormanager.com.

References

Bruley M E. Surgical fires: Perioperative communication is essential to prevent this rare but devastating complication. *Qual Saf Health Care.* December 2004;13:467-471.

Meltzer H S, Granville R, Aryan H E, et al Gel-based surgical preparation resulting in an operating room fire during a neurosurgical procedure: Case report. *Neurosurg.* April 2005;102:347-349.

Paugh D H, White K W. Fire in the operating room during tracheotomy: A case report. *AANA J.* April 2005;73:97-100.

Fire risk protocols

Score 3 = High risk

The circulating nurse and anesthesia provider take these precautions.

Circulating nurse

- Verifies fire triangle, including verbal confirmation of the oxygen percentage
- Ensures appropriate draping techniques to minimize oxygen concentration under the drapes (ie, tenting, incise drape)
- Minimizes ESU setting
- Assesses that enough time has been allowed for fumes of alcohol-based prep solutions to dissipate (minimum of 3 min)
- Encourages use of wet sponges
- Ensures a basin of sterile saline and bulb syringe are available for fire suppression.

Anesthesia provider

- Ensures that a syringe full of saline is in reach for procedures conducted within the oral cavity
- Documents oxygen concentrations and flows
- Uses the MAC circuit for oxygen administration initially at FiO_2 of .30 using fresh gas flows of at least 12 L/min.

Score 2 = Low risk with potential to convert to high risk

Standard fire safety precautions are followed with the potential to convert to high-risk precautions if necessary.

Standard precautions are to:

- observe alcohol-based prep drying times (minimum of 3 min)
- protect heat sources (eg, using the ESU pencil holster)
- use standard draping procedure.

Score 1 = Low risk

Standard fire safety precautions are followed.