

## Patient Safety Tip of the Week

### November 30, 2021 Fire in the OR

Our many columns on surgical fires have focused on fires on or around the patient, discussing both surgical fire prevention and immediate interventions to minimize patient harm.

But we haven't discussed much about what happens in OR's with more extensive fires or fires elsewhere in the hospital. A recent AORN article ([Ervine 2021](#)) notes that, all too often, routine fire drills in medical facilities “do not go beyond the red line of the OR”. Ervine goes on to describe how to involve OR staff in fire drills. She highlights the importance of involving all OR staff, including surgeons and anesthesiologists, in the planning process as well as the drills themselves and the post-drill evaluation.

The planning phase includes establishing a date and time for the drill and alerting the local fire department that this will be a drill. Ervine notes that planning and drills may uncover unexpected vulnerabilities, such as strobe lights that don't work, audio alarms that cannot be heard, and fire doors that do not automatically close. Another important facet is to determine the evacuation route for your department. Do team members evacuate outside of the facility, or do they go to the next fire compartment? Does your department have more than one fire compartment?

Ervine suggests using multiple scenarios in your fire drills. For example, in one room the team could be in the middle of a procedure (complete with the radio playing at whatever the “normal” volume would be during a routine procedure). In another room the patient might just be transported to the room. And in another room, the team could be in the process of completing the procedure. Ervine also sometimes includes a scenario where there is a shortage of stretchers in the OR suite. She also includes a scenario where a staff member remains behind when the rest of the team evacuates (to test whether the other team members and the charge nurse make sure they can account for the entire team after they have evacuated to the designated space).

Planning also includes determining whether you have the appropriate fire extinguishers located throughout your department. (See our comments below on appropriate location and type of fire extinguishers in the OR.) Ervine also notes you should know where the fire pulls are located. Knowing the location of the closest fire pull is paramount in promptly alerting all staff quickly. And, as part of the planning, you should review your facility's policy and procedure on who is responsible and allowed to shut off medical gases.

One facet we find deficient in drills of almost any kind in medical facilities is lack of appropriate monitoring on compliance with required steps and overall performance in the drills. Ervine notes that the “facilitator” of the fire drill needs to make sure the monitors of the drills have all the tools they need to evaluate the actions of staff during the drills. Those tools should include a checklist of items to record and some sort of scoring system. Monitors are present in each room and there should be an additional monitor in the hall near the entrance to your OR. The latter evaluates who is responding to the alarm, how promptly they arrived, and if they brought fire extinguishers with them.

Ervine assembles the perioperative team for a briefing just before starting the drill. The acronyms RACE (Rescue, Alarm, Confine, Extinguish/Evacuate) and PASS (Pull, Aim, Squeeze, Sweep) are reviewed. The different types and locations of fire extinguishers are discussed, as well as each team member’s assignment during the drill. Room and hallway monitors and charge nurse monitor review the evaluation forms with the facilitator.

Ervin holds a debriefing with the entire team at the end of the evacuation. Each team monitor reads the scenario from his or her room and reports how they were notified of the emergency; what decisions they made to care for the patient; if they could hear the alarm, see the flashing strobe lights, and hear any overhead paging that might have occurred during the drill.

Either the facilitator or the safety officer should provide feedback to the team of their observations during the fire drill and evacuation. During the debriefing, team members should also provide their feedback for the drill itself.

Note that Ervine recommends the debriefing take place at the end of the evacuation. We’d actually take it a step further and include as part of the drill restoration of the activities which had been ongoing in each OR prior to the fire alarm being pulled. For example, you might find that no one has turned medical gases back on, or that shortcuts were taken in re-establishing sterile procedure.

There is often confusion about fire extinguishers and the OR. Are they required in the OR? What type? A recent APSF “Rapid Response” ([Williams 2021](#)) clarifies these issues. It highlights discrepancies between recommendations of the National Fire Protection Association (NFPA) and those of ASA, APSF, and ECRI. NFPA and The Joint Commission require a fire extinguisher within 75 feet of every working location and that “clean agent-or water mist-type fire extinguishers shall be provided in operating rooms.” ASA, APSF, and ECRI do not believe the regulatory requirements are sufficient for protecting patients or staff in the event of a fire in the operating room. Specifically, the recommendation is that CO2 extinguishers be available. APSF also agrees with the specific ECRI recommendation that a 5 lb. CO2 extinguisher be mounted just inside the entrance of each operating room. (The APSF Rapid Response notes that a comment in the Annex (A.16.10.1.4) of the NFPA-99 document states that a CO2 extinguisher could be used in lieu of a clean agent extinguisher and that this comment can be cited if there is local resistance to supplying CO2 extinguishers in each operating room.)

The APSF “Rapid Response” makes a very important point about differences when the fire is on the patient vs. elsewhere in the OR. Specifically, it notes that in the event of a fire on the patient, a fire extinguisher is **not** the first method for extinguishing the fire. All surgical procedures that have a high risk of a fire (see our many columns on surgical fires listed below) must have a basin of water or saline readily available on the OR table. That would be the fastest method of dousing a fire on the patient. If the drapes are on fire, they should be pulled off the patient onto the floor and then a fire extinguisher could be used on the burning drapes. It would be an unusual occasion to require that a fire extinguisher be used on the patient. They also note that most OR drapes are impervious to water, which is why an extinguisher is needed if they are on fire. Just a reminder – materials that are said not to support combustion in room air, such as drapes and surgical gowns, may quickly ignite in oxygen-enriched environments ([Culp 2013](#)).

We like the way that Ervine has included multiple scenarios into the drills to account for circumstances that might complicate responses. You’ll recall we sometimes have added 2 drills together. For example, 2 incidents sometimes take advantage of fire alarms – behavioral health patients absconding or infants being abducted. We don’t think you need to add those to an OR fire drill (the perpetrators in these 2 scenarios would not likely pull a fire alarm in the OR). But the idea of adding complicating factors into your fire drills remains a good consideration.

The Ervine article is a good reminder that you need to prepare for potential fires in the OR. Of course, using drills to prepare for fires elsewhere in your healthcare facility is also important. Another recent AORN article has some good recommendations for those ([Croke 2021](#)). We also refer you back to our October 21, 2014 Patient Safety Tip of the Week “[The Fire Department and Your Hospital](#)” which had lots of information about hospital fires, including special considerations for fires in your MRI suites or behavior health units.

And, of course, don’t forget all our columns, listed below, on preventing and responding to surgical fires.

#### **Our prior columns on surgical fires:**

- December 4, 2007     [“Surgical Fires”](#)
- April 29, 2008     [“ASA Practice Advisory on Operating Room Fires”](#)
- November 2009     [“ECRI: Update to Surgical Fire Prevention”](#)
- January 2011       [“Surgical Fires Not Just in High-Risk Cases”](#)
- March 2011         [“APSF Fire Safety Video”](#)
- November 2011     [“FDA Initiative on Preventing Surgical Fires”](#)
- December 13, 2011 [“Surgical Fires Again”](#)
- April 24, 2012     [“Fire Hazard of Skin Preps Oxygen”](#)
- April 2013         [“Reminder: Hand Sanitizers Are Flammable”](#)
- June 25, 2013     [“Update on Surgical Fires”](#)

- October 1, 2013 “[Fuels and Oxygen in OR Fires](#)”
- August 12, 2014 “[Surgical Fires Back in the News](#)”
- December 16, 2014 “[More on Each Element of the Surgical Fire Triad](#)”
- December 2015 “[Unique Ignition Sources in Surgical/OR Fires](#)”
- January 10, 2017 “[The 26-ml Applicator Strikes Again!](#)”
- January 9, 2018 “[More on Fire Risk from Surgical Preps](#)”
- June 2018 “[ISMP on Fire Risk from Skin Preps](#)”
- July 2018 “[FDA on Surgical Fires](#)”
- September 11, 2018 “[Lessons from a Surgical Fire](#)”
- May 7, 2019 “[Simulation Training for OR Fires](#)”
- July 2019 “[Surgical Fire – A New Risk Factor](#)”
- July 28, 2020 “[Electrosurgical Safety](#)”
- July 2021 “[Unique Way to Rapidly Identify Oxygen Flow](#)”

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