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# Surgical Fires Not So Uncommon

***Employing the Right Forensic Expert Can Prove Invaluable***

**Albert L. de Richemond, P.E., Consulting Engineer**  
*Specializing in evaluating surgical fires*



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In Pennsylvania, where hospitals are required to report medical errors, surgical fires occur once in every <sup>1</sup>87,646 operations or 28 fires a year. Pennsylvania's data suggest that nationally these fires affect between <sup>2</sup>550 and 650 patients a year, including 20 to 30 who suffer serious burns or deaths. Since most other states do not require hospitals and surgery centers to report surgical fires, the true national number is unknown and likely to be significantly underreported.

Surgical fires are fires that involve a patient and occur in surgical or medical treatment environments such as operating rooms, treatment rooms, intensive care units and other areas where patients may be medically treated. Reportedly, <sup>3</sup> 44 percent of surgical fires occur on the patient's head, neck or chest and 21% occur in the airway.

From these fires, patients can incur injuries that result in disfigurement, permanent disability or death. While major property damage is rare, equipment damage is a more common result from surgical fires.

The healthcare community has been long aware of surgical fires and much has been published about such fires, their prevention, and their suppression. A surgical fire is considered a "never event" by many governing and concerned bodies, in that it should never happen. Consequently, when a surgical fire occurs and someone is injured, the focus is often on the medical device. The actual cause, however, might be traced back to improper procedures, not following device instructions, or unrecognized risks.

During surgery, heat sources (electrosurgical pencils, electrocautery pens, laser fibers) are often used near oxidizers (air, oxygen, nitrous oxide) and fuels (surgical drapes, linens, patient hair, oxygen facemasks, tracheal tubes). If these three ingredients — heat sources, oxidizers and fuels — come together in the right combination and at a suitable time, a fire can occur.

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<sup>1</sup> *PA Patient Safety Advisory*, 2007, Sept; 4(3):82:

[http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2007/sep4\(3\)/Pages/82](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2007/sep4(3)/Pages/82)

<sup>2</sup> *Heath Devices*, Oct. 2009, Vol.38, (10): 317, ECRI Institute

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The most frequent cause of surgical fires is too much oxygen getting into the surgical site where therapeutic heat sources are used. Other fires that occur during surgery include fires in equipment (e.g., flaming laser fiber, arcing in broken electrical cord, shorted battery), fires with flammable liquids (including alcohol-based skin preps, collodion, tinctures, and acetone), and fires from mislaid equipment (e.g., fiber optic light source, endoscope, electrocautery devices).

Investigating the cause of a surgical fire requires that all materials used in, on and around the patient be saved for examination. Often the pattern of burning indicates how and where the fire started. Medical records, such as the anesthesia record, surgeon's notes, and perioperative notes, can help define what happened and when. Interviews with the staff involved can provide information about the start of the fire, what it looked like, how much smoke there was, and how the fire was put out. Photographs of the injuries are also useful in determining the fire's point of origin and spread.



Determining the cause of a surgical fire can help in the settlement and eventual outcome of a matter. Typically, the anesthesia provider and surgeon are often the main defendants while the hospital is the secondary defendant. However, hospitals can often have added exposure because they are required to create and enforce proper procedures, provide medical instruments, equipment and surgical materials, and offer prevention education and suppression training. The experienced forensic expert can be an invaluable asset to the attorney or insurance company in the investigation of the cause of surgical fires.

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### About the Author:



#### **Albert L. de Richemond, P.E.**

Mr. de Richemond, P.E. is a mechanical engineer with a Master's degree who has a unique specialty in investigating and evaluating surgical fires. He is also experienced in matters involving machine design, guarding and safety.

Prior to coming to CESI, he worked for nine years as the associate director for accident and forensic investigation at ECRI Institute in Plymouth Meeting, PA. Mr. de Richemond's responsibilities included the investigation and evaluation of more than 250 medical device accidents and fires for health care organizations, insurers and law firms. He participated in the development of several national standards used in the United States and Canada regarding medical device safety. He also lectured on medical device safety, oxygen safety, electrosurgical safety, disaster preparedness, surgical laser use and safety, and medical gas and vacuum system safety.

To explore how Mr. de Richemond can assist you with matters involving surgical fires or with medical device issues, product liability, manufacturing, or guarding matters, please contact him directly. There is never a charge for an initial consultation on any type of case or incident. Mr. de Richemond can be reached at 610-296-2250 or [aderichemond@ces-experts.com](mailto:aderichemond@ces-experts.com)

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