

Surgical Fires

1. Why is this so important?
2. What has changed? What is CMS doing now?
3. Describe how to suppress various fires within the OR (including in and on a patient).
4. Use the building (e.g., smoke compartments, sprinkler protection, rated doors) to protect your patients.



Prevention, Suppression and Evacuation



Importance of Preparedness



Bowl of alcohol mistaken for saline, Connecticut

ET Tube burns in patients throat, Minnesota



ECRI PHOTO



During cyst removal, Florida

Smoking and sparks from machine interrupts surgery, Massachusetts



RPA CASE STUDY

- ✦ 64 year old male patient
- ✦ Bilateral temporal artery biopsy
- ✦ Right temporal biopsy completed without incident



LEFT TEMPORAL BIOPSY

- ✦ Turned table & put mask on patient
- ✦ Prepped again with 26 mL applicator alcohol-based prep solution
- ✦ Patient was re-draped
- ✦ Incision made with instrument
- ✦ Electrocautery activated . . .





THE ISSUES

- ✦ No Fire Risk Assessment
- ✦ Open delivery oxygen (100%) & use of electrocautery
- ✦ Use of alcohol-based prep solution:
 - ✦ Large applicator on head / neck
 - ✦ Inadequate total dry time for hairy area
- ✦ Poor Communication
- ✦ Fire Response



Surgical Fires...

Main causes remain...

- ✦ Open delivery oxygen
- ✦ Heat devices
- ✦ Alcohol-based Preps
- ✦ Lack of **communication**



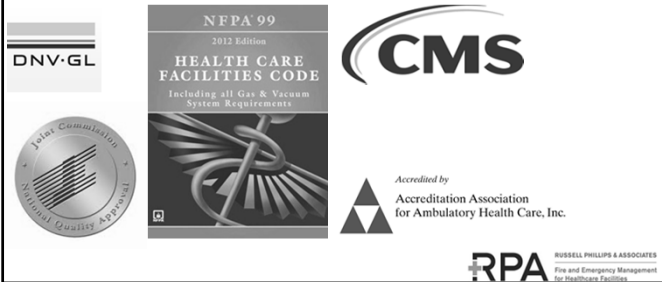


Preventing Surgical Fires:

"Surgical fires can usually be prevented by educating staff about risk and prevention strategies. Such education should be part of all undergraduate medical, nursing, and other allied health profession education."



NFPA 99 – Chapter 15



Hello K933!!!

ID PREFIX	
K933	<p>Features of Fire Protection – Fire Loss Prevention in Operating Rooms</p> <p>Periodic evaluations are made of hazards that could be encountered during surgical procedures, and fire prevention procedures are established. When flammable germicides or antiseptics are employed during surgeries utilizing electrosurgery, cautery or lasers.</p> <ul style="list-style-type: none"> • packaging is non-flammable. • applicators are in unit doses. • Preoperative "time-out" is conducted prior the initiation of any surgical procedure to verify: <ul style="list-style-type: none"> ○ application site is dry prior to draping and use of surgical equipment. ○ pooling of solution has not occurred or has been corrected. ○ solution-soaked materials have been removed from the OR prior to draping and use of surgical devices. ○ policies and procedures are established outlining safety precautions related to the use of flammable germicide or antiseptic use. <p>Procedures are established for operating room emergencies including alarm activation, evacuation, equipment shutdown, and control operations. Emergency procedures include the control of chemical spills, and extinguishment of drapery, clothing and equipment fires. Training is provided to new OR personnel (including surgeons), continuing education is provided, incidents are reviewed monthly, and procedures are reviewed annually.</p> <p>15.13 (NFPA 99)</p>



NFPA 99 – Chapter 15.13

- + Fire Prevention Procedures
- + Hazard Assessment
- + Germicides and Antiseptics
- + Emergency Procedures
- + Orientation and Training



NFPA 99 – Chapter 15.13

15.13.3.9 Emergency Procedures.

15.13.3.9.1 Procedures for operating room/surgical suite emergencies shall be developed.

15.13.3.9.2 Procedures shall include alarm actuation, evacuation, and equipment shutdown procedures and provisions for control of emergencies that could occur in the operating room, including specific detailed plans for control operations by an emergency control group within the organization or a public fire department.

15.13.3.9.3 Emergency procedures shall be established for controlling chemical spills.

15.13.3.9.4 Emergency procedures shall be established for extinguishing drapery, clothing, or equipment fires.

15.13.3.10 Orientation and Training.

15.13.3.10.1 New operating room/surgical suite personnel, including physicians and surgeons, shall be taught general safety practices for the area and specific safety practices for the equipment and procedures they will use.

15.13.3.10.2 Continuing safety education and supervision shall be provided, incidents shall be reviewed monthly, and procedures shall be reviewed annually.



Prevention



*"Surgical fires
are 100% preventable, and it is through your
vigilance that they will be prevented"*
AORN

*"Fire prevention
Procedures shall
be established"*
15.13.2



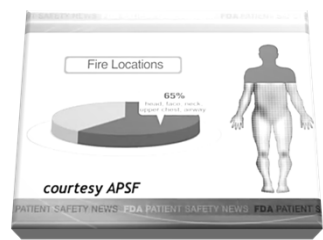
American Society of
Anesthesiologists 

Prevention of OR fires includes:

- + Minimizing or avoiding an **oxidizer-enriched atmosphere** near the surgical site
- + Safely managing ignition sources
- + Safely managing fuels



The affects of oxygen...



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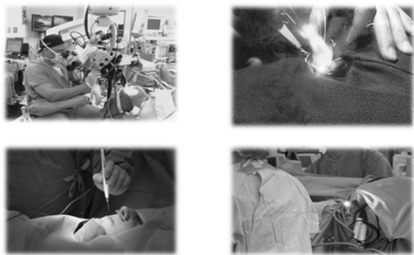
Oxygen - Risk Reduction Strategies



+ What does your hospital do to educate anesthesia providers on their contribution to the fire triangle ?

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HEAT



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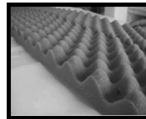
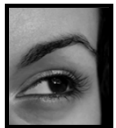
Critical Heat Conversation



- + Oxygen Enrichment Atmospheres
- + Communication among surgeons and anesthesia providers
- + What does your hospital do to educate surgeons on their contribution to the fire triangle?



FUELS



Germicides and Antiseptics

15.13.3.6 – A preoperative “time out” period shall be conducted prior to the initiation of any surgical procedure using flammable liquid germicides or antiseptics to verify the following:

- + Application site of flammable germicide or antiseptic is dry prior to draping
- + Pooling of solution has not occurred or has been corrected
- + Any solution-soaked material have been removed from the operating room prior to draping and use of electrosurgery, cautery or lasers”



Allow alcohol to dry

*"Do not apply drapes until **all** flammable preps have **fully dried**; soak up spilled or pooled agent."*

- ECRI



ECRI
Institute
The Benchmark of Science
The Integrity of Independence



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Fire Risk Assessment Form

RPA RUSSELL PHILLIPS & ASSOCIATES Fire and Emergency Management for Healthcare Facilities		CORPORATE OFFICE 500 CrossKeys Office Park Fairport, NY 14450 p. 585.223.1130 f. 585.223.1180 www.phillipsrpa.com	
SURGICAL SITE FIRE RISK ASSESSMENT SCORE			
Airway Surgery (i.e., Tracheostomy, uvuloplasty, T&A); extreme high risk for fire. <input type="checkbox"/> Yes <input type="checkbox"/> No		Alcohol based prep solution had sufficient time for fumes to dissipate. <input type="checkbox"/> Yes <input type="checkbox"/> No	
(Circle appropriate option)		Y N	Verified By:
• Surgical site or incision above the Xiphoid		1 0	(Circulating RN Signature)
• Open Oxygen source (Patient receiving supplemental oxygen via any variety of face mask or nasal cannula)		1 0	
• Available Ignition source (i.e., electrosurgery unit, laser, fiberoptic lightsource)		1 0	Print Name:
Scoring: 3=High Risk; 2=Low Risk w/ potential to convert to high risk; 1=Low Risk		TOTAL SCORE:	

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Emergency Procedures

15.13.3.9.4 "Emergency procedures shall be established for extinguishing drapery, clothing, or equipment fires."



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Surgical Site / Skin / Hair Sponges Fire / Oral Cavity

- ✦ Most Common!
- ✦ Scrub Tech suppresses most of the time
- ✦ Don't forget to CHECK
- ✦ Fire procedure should include language on how to deal with this type of fire



** Some steps occur simultaneously*



Drape Fires



Fire Extinguishers

- ✦ What type of extinguisher do you have in your OR?
- ✦ Last resort for fire on a patient



Roles and Responsibilities



Take care of the room



Maintain the Airway



Roles and Responsibility



Final decision maker

Assist and help move table



Fire Response Teams

Are your responders ready to handle a surgical fire?

What if evacuation of 1 or more ORs have to take place?



Charge Nurse – Make Decisions



- Must know:
- ✦ When to evacuate
 - ✦ Where to evacuate
 - ✦ Who is first
 - ✦ Who is last
 - ✦ Accountability of staff
 - ✦ Work with arriving Fire Department



When / When Not to Evacuate?



Fire Still Burning



Fire is Out



Most Important Steps

- ✦ Shut door to fire room



- ✦ Does your hospital have a policy on who shuts off the gases to the room and when?



- ✦ Do staff know where the shut-offs are?



Orientation and Training

15.13.3.10.3 – “Fire exit drills shall be conducted annually or more frequently as determined by the applicable building code.”



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Orientation and Training

15.13.3.10.1 – “New operating room /surgical suite personnel, including physicians and surgeons shall be taught.....”



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The Take Away...

- Fire prevention procedures shall be established
 - Include fire risk assessment
- Fire procedures shall be developed which:
 - Complement the building fire protection features
 - Guide staff on various fires they will encounter
 - Provide clear roles and responsibilities for all staff
- Conduct annual surgical fire safety training for all members of the surgical team



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Evidence-based References

1. NFPA® 99 – Chapter 15
2. ECRI Institute
3. APSF Fire Prevention Algorithm (updated March 2013)
4. Joint Commission - 06/07/2016 Joint Commission and CMS Adopt 2012 NFPA 101 Life Safety Code
5. AORN
 - Fire Safety Tool Kit
 - Surgical Fire Prevention and Extinguishment
6. American Society of Anesthesiologists
 - Patient Safety Highlights 2014 - Operating Room Fire Safety
 - Practice Advisory For the Prevention and Management of Operating Room Fires

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QUESTIONS?

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