



# Practical Advice for Preventing Surgical Fires: Safety Strategies from the Front Lines

June 12, 2012

Cindi Fitzpatrick, BSN  
Preventing Surgical Fires Initiative

[www.fda.gov/preventingsurgicalfires](http://www.fda.gov/preventingsurgicalfires)



# Agenda

- Welcome and Overview
- Hospital Experiences and Best Practices
  - University of Michigan Health System
  - UCLA
  - Scripps Memorial Hospital La Jolla
- Surgical Fire Mitigating Strategies
- Everyone has a Role
  - Preventing Surgical Fires Initiative
  - Closing Remarks



# Learning Objectives

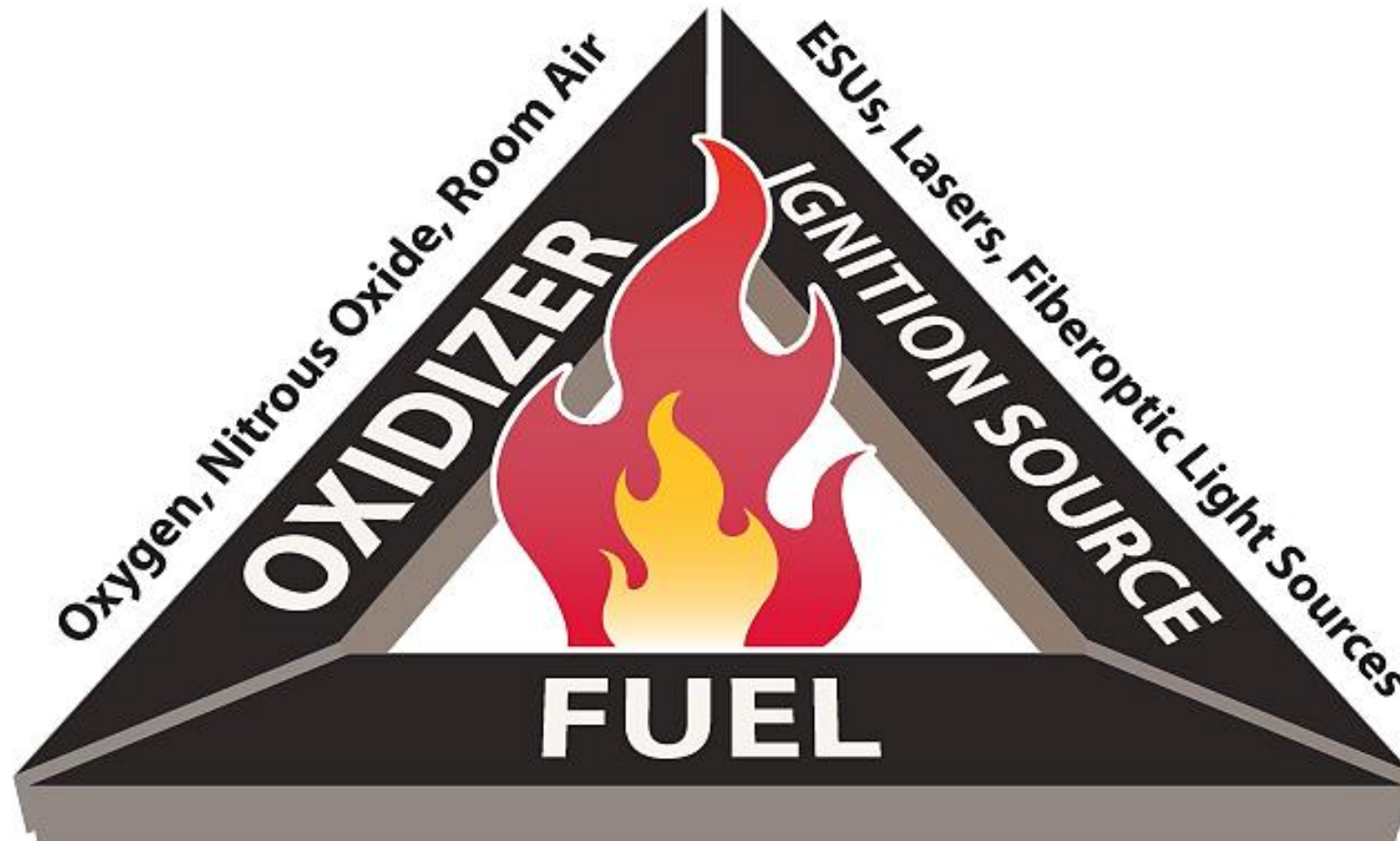
## You will be able to:

- identify the factors that contribute to surgical fires
- identify the lessons learned from the experiences and interventions of the presenters
- identify surgical fire prevention tools and mitigating strategies
- identify the 'Preventing Surgical Fires Initiative' efforts
- facilitate the adoption of risk reduction practices in your healthcare settings

# A Surgical Fire...

- Is a fire in, on, or around a patient who is undergoing a medical or surgical procedure
- Can happen in many procedural settings: hospital, ambulatory surgery center, health clinic, urgent care center, doctor's office
- Is preventable ---
  - Root causes are known
  - Solutions are known

# Preventing Surgical Fires Initiative



**Alcohol-based Skin Preps, Surgical Drapes, Patient**

# University of Michigan Health System

**Shawn Murphy, MS, RN, CNOR**

*Associate Hospital Administrator, Director of Nursing,  
Operating Rooms and Post-Anesthesia Department*

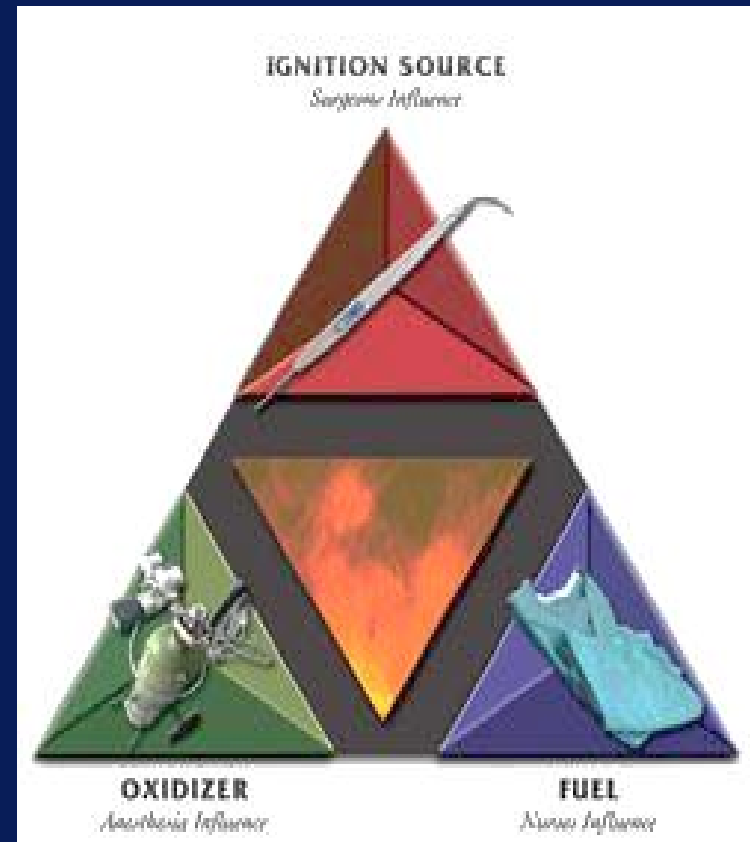
**Jahan Azizi, BS, CBET**

*Biomedical Engineer and Risk Management Consultant*

**Stephan Burdick**

*Business Systems Analyst, University of Michigan  
Health Services Learning Management Services*

# ***FIRE SAFETY IN THE OR: OXYGEN CONCENTRATION STUDY***



Jahan Azizi, Biomedical Engineer, Risk Management Consultant

Steve Burdick, Business Systems Analyst, UMHS Learning Management Services

Shawn Murphy, Associate Hospital Administrator and Director of Nursing, Operating Rooms and Post-Anesthesia Department (OR/PACU)



# *Incident 1: Mohs Reconstruction*

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- No flammable solutions or chemicals were used. Supplemental oxygen was administered through a nasal cannula at a flow rate of two liters per minute. The oxygen was shut off as surgery proceeded.
- The monopolar cautery unit was set at a low setting of 20 Watts. A stray spark made contact with a dry sponge and caused it to ignite.
- The sponge was thrown to the floor and doused with water to extinguish the flame.
- There was no harm to the patient; surgery continued, but now with the use of a dampened sponge.



# *Incident 2: Ascending Aortic Aneurysm Repair*

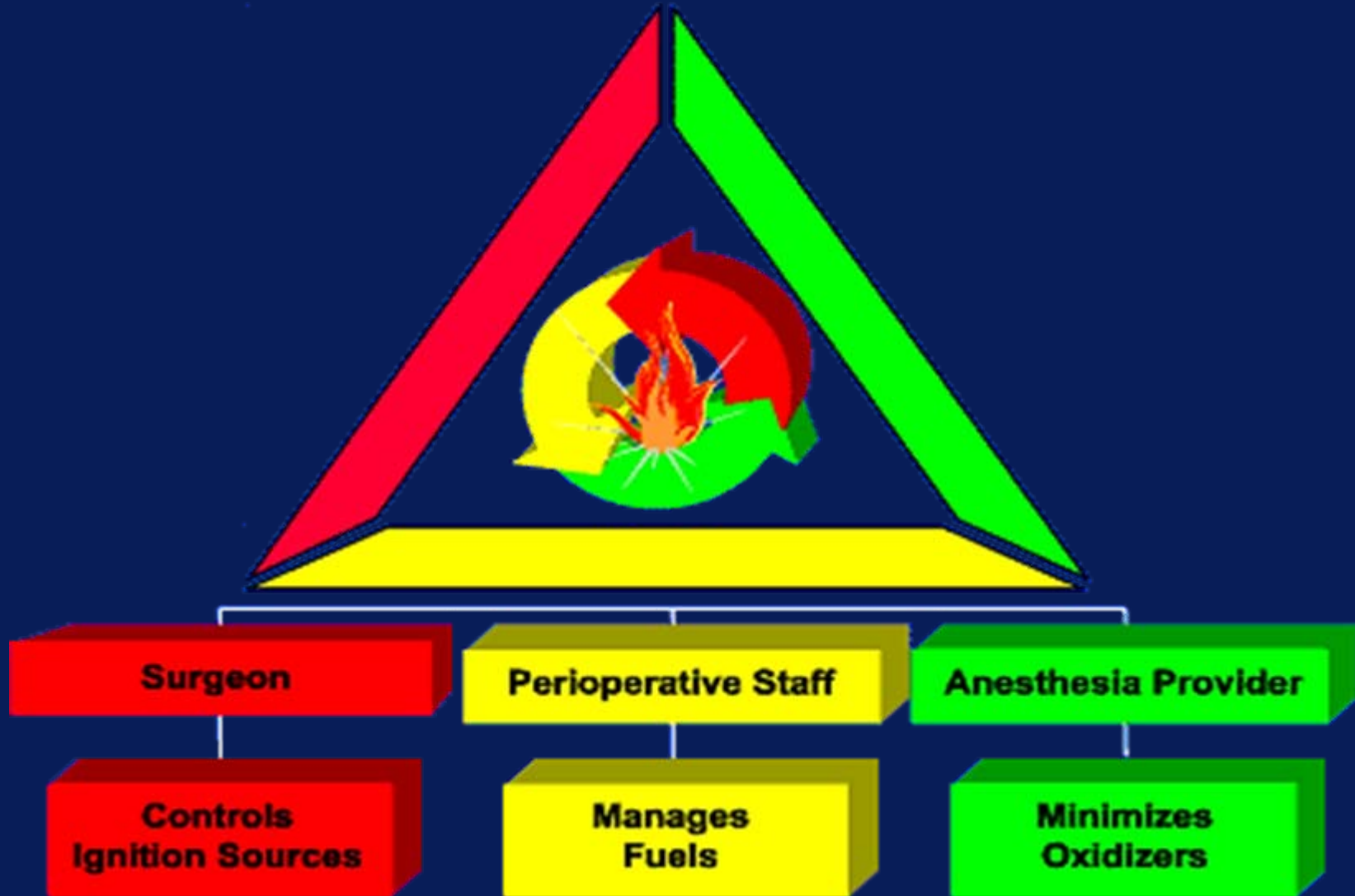
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- Surgery to repair an ascending aortic aneurysm, pt intubated, employed a monopolar ESU fitted with a regular tip.
- A sponge caught on fire when the surgeon brushed the dry lap sponge with the activated ESU tip while closing the sternum.
- Surgeon removed the sponge, and it was immersed in cold water.
- There was no injury to the patient, the surgeon, or any member of the surgical team.

# *Incident 3: Anterior Cruciate Ligament Reconstruction*

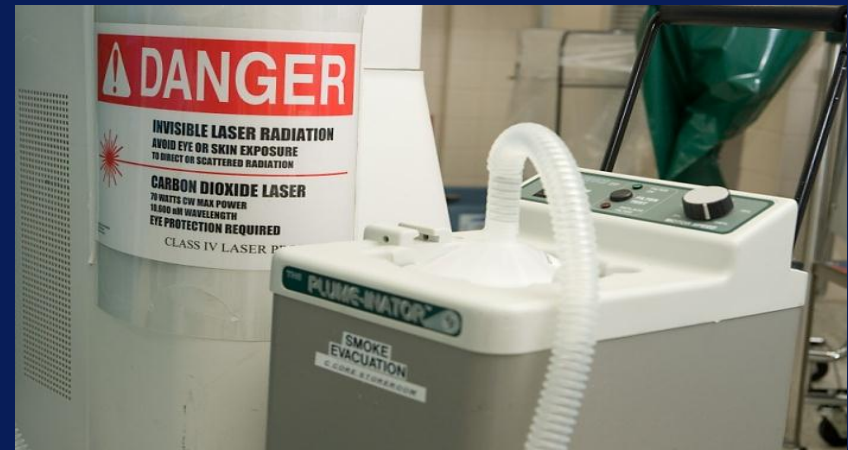
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- During closure, the arthroscopic surgery scope was removed from the light cord and turned off. The bare light source cord was laid on the surgical field.
- Surgeon said he smelled something peculiar, and the hazardous placement of the light cord was recognized.
- The area was doused with saline solution. The light cord caused a small hole in the drape. No flame or smoke detected. No harm to the patient or staff.
- Lack of a suitable holstering system for the cord was demonstrated to be a factor.



# Heat Sources

- **Electrosurgical unit (ESU)**
- **Laser**
- **Argon beam coagulators**
- **Drills & burrs**
- **Static electricity**
- **Fiber optic light sources**
- **Defibrillators**



# *Fuel Sources*

- **Alcohol preps**
  - DuraPrep®
  - ChloroPrep®
- **Drapes**
  - Fabric & disposable
- **Gauze/dressings**
- **Body hair**
- **Ointments**



# *Oxidizer Sources*

- Oxygen & gas cylinders
- Nitrous oxide-thermal decomposition
- Regular room air
- Anesthesia machine/ ventilator
- Wall outlets



# *Considerations for Light Sources/Cables*

- **Connect to scope before turning on**
- **Turn off prior to disconnecting**
- **Never lay illuminated or hot light cable on drapes**



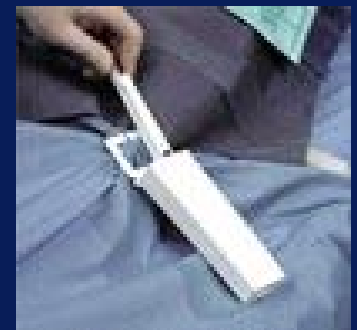


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# *Precautions to reduce ignition source*

## Use of Electrosurgical Unit (ESU)

- **Do not use in presence of flammable solution**  
Wait 3 min. for alcohol prep to dry & fumes to evaporate (manufacturer recommendation).
- **Do not use near oxygen or nitrous oxide**
- **Always use the quiver/safety holster**
- **Never coil and secure cord w/metal instrument**
- **Ensure active electrode tip fits securely**
- **Keep the active electrode tip clean**
- **Never alter the device**







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# *Online Education*

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- **A task force to reduce OR fire risk was convened, and collaborated for 18 months on targets and strategies.**
- **An online educational module for OR personnel was developed, and refined for specific audiences (OR staff, surgical faculty, other) working in procedural areas.**
- **One of the solutions resulting from this committee is the newly-added feature to tailor the learning to the learner.**

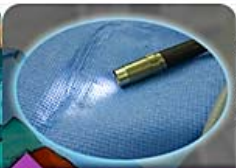
# Online Education tailored education through screening



E.S.U.



Lasers



Fiber Optics



Drills and Burs

## 1. Are ANY of the following devices used in your area?

Electrical Surgical Unit (ESU)  
Electrical Cautery Unit (ECU and a type of ESU)  
Laser, Fiberoptic lights or scopes, Surgical Drills  
Surgical burs, and Surgical Saws

YES

NO



Screened by use of  
**Heat/Ignition sources**

# Online Education tailored education through screening

Topics  
Tailored  
for staff in  
procedural  
areas



M LEARNING Fire Safety in Surgical/Procedural Areas

PDF PRINT SEARCH PREV. NEXT

Screening Questions

Competency Criteria

Introduction: The Fire Triangle

Fire Prevention and the Role of the Surgical Team

Fire Triangle: Oxygen/Oxydizer

Fire Triangle: Fuels

Fire Triangle: Heat/Ignition

Fire Response: R.A.C.E.

Test yourself: Case Study 1

More case studies

photos

QUIZ

! This learning module will not be recorded in your transcript.

To receive credit, go to the Catalog Search page and search using the green "Search and Enroll" button.

M LEARNING Fire Safety in Surgical/Procedural Areas

## Managing the risk of surgical/procedural fire

### Competency

All UMHS faculty and staff identify and prevent fire hazards and respond appropriately to fire incidents according to institutional safety requirements.

### Critical Behaviors

- **Identify** oxygen, heat and fuel sources in the surgical/procedural setting specific to your work area
- **Participate** in a fire risk assessment and scoring protocol prior to each surgery/procedure
- **Demonstrate** behaviors to reduce the risk of surgical fires based on your surgical team role
- **Respond** effectively to unanticipated near hit or actual fire events to minimize harm and prevent reoccurrence

**How much time will I need?**

Learning module: 15 minutes  
 Quiz: 10 minutes

**Who is the audience for this lesson?**

All surgeons at UMHS and any member of a procedural team working with Electrical Surgical Unit (ESU), Electrical Cautery Unit (ECU and a type of ESU), Laser, Fiberoptic lights or scopes, Surgical Drills, Surgical burs, and Surgical Saws

**What are the requirements?**

Read this module and pass the quiz with a score of 80% or higher.

**Additional resources**

[Link to fire safety policy](#)

[Link to videos](#)

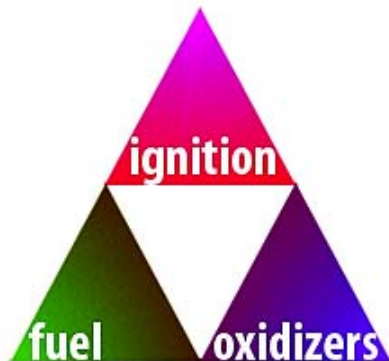
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 Last modified: May 7, 2012 (fshurdick)

# Emphasis Fire Triangle

## Fire Prevention and the Role of the Surgical Team



### Fire Triangle



Each person on the surgical/procedural team can impact the fire triangle, therefore each team member has a role in fire prevention and response.

Because oxygen is in the air and surrounds everything and is always present, the key to prevention is controlling heat (ignition) and fuel sources (flammable materials).

# Scenario-based Learning

## Case Study: Oxygen-rich environment

### Test yourself: Case Study 1: Oxygen-rich Environments

What would **you** do?



An oxygen-rich environment

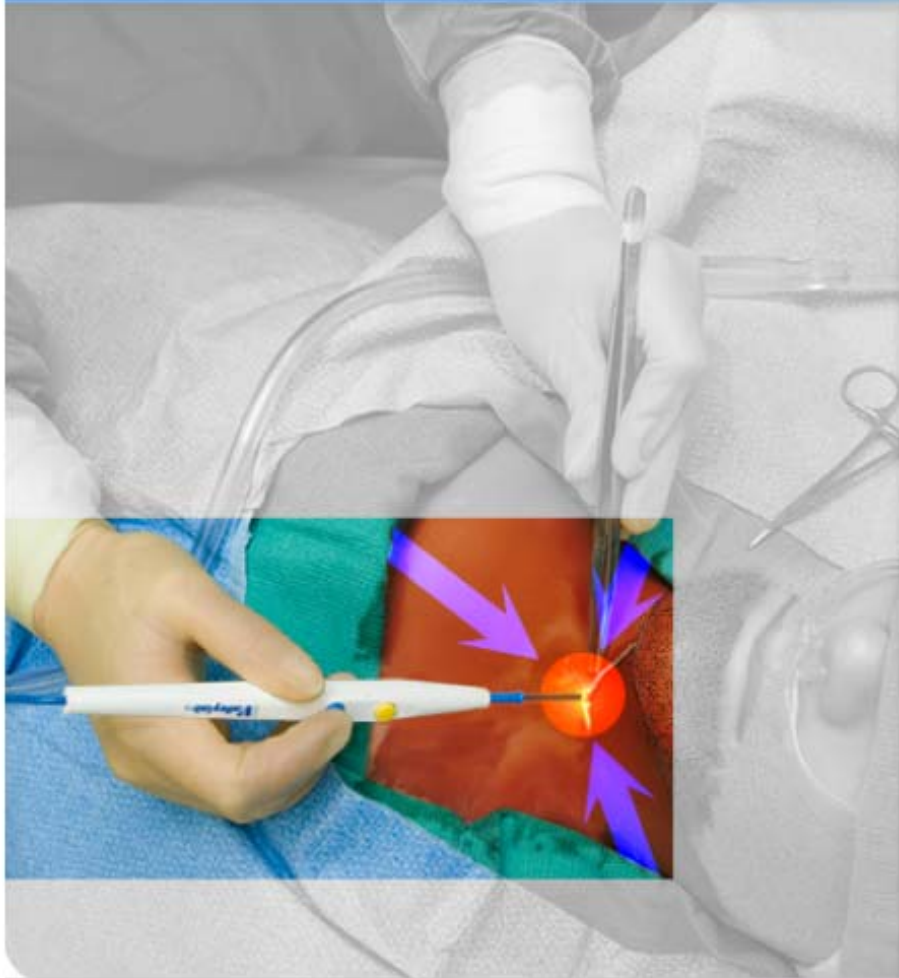
During a neck scar revision, 100% oxygen was delivered through a nasal cannula.

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## Test yourself: Case Study 1: Oxygen-rich Environments

What would **you** do?



An oxygen-rich environment

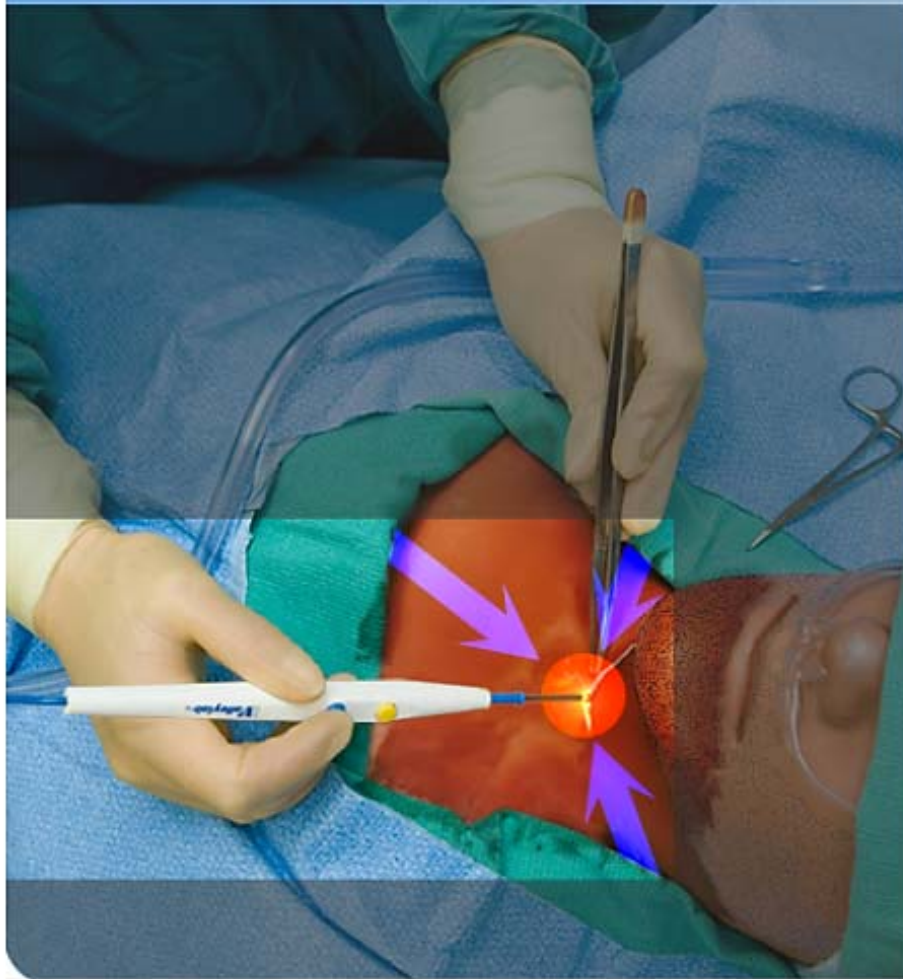
As the procedure continued, oxygen pooled under the drapes.

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## Test yourself: Case Study 1: Oxygen-rich Environments

What would **you** do?



### An oxygen-rich environment



The proximity of the **electrocautery** and highly concentrated **oxygen** increased the possibility of igniting nearby **fuel** sources and endangered the patient.

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# Assessing the Risk Fire Risk Score & Interventions

## Classification of Fire Risk for Surgical or Invasive Procedures

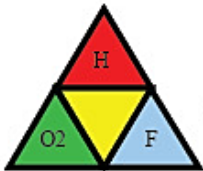
**High Risk** = 3 or more boxes checked below

**Medium Risk** = 2 boxes

**Low Risk** = 1 or less

### Risk Criteria

|   |  |
|---|--|
| <input type="checkbox"/> Use of an open oxygen source (nasal O2 or face mask) | <input type="checkbox"/> Alcohol based prep solutions used at any point in procedure                         |
| <input type="checkbox"/> Surgical procedure above the xiphoid                 | <input type="checkbox"/> Use of electrocautery unit (ESU) or other ignition source (laser, fiberoptics, etc) |



**Verbal communication of fire risk level at "Time-out"**

### Oxygen Delivery Anesthesia Control Gases

Verbal communication of fire risk ("Time-out")  
Plus:

- Verbal communication of oxygen percentage
- Oxygen concentration is documented and lowered to 30%
- Stop Oxygen flow 1 minute before ESU is activated
- Utilize laser-safe ET tube for Laser airway surgery
- Syringe of saline (Airway fires)

### Fuel and Draping Nursing Control Fuel

Verbal communication of fire risk ("Time-out")  
Plus:

- Tent drapes to allow anesthesia gases to dissipate
- Maximize perimeter around incision and utilize occlusive drapes where appropriate
- Have basin of saline available for suppression
- Alcohol based prep solutions require minimum of 3 min dry time
- Eliminate any pooling of prep solution
- Use wet sponges on the surgical field

### Ignition Sources Surgeon Control Heat

Verbal communication of fire risk ("Time-out")  
Plus:

- Minimize ESU settings
- Inform anesthesia before activating ignition source (laser, ESU)
- Verbal communication of settings
- Use wet sponges on the surgical field
- Follow ESU Safety
  - use ESU holster when not in use,
- Follow Laser Safety Policy
  - activate only when in sight
  - laser on "Stand-by" when in use
- Monitor fiber-optic light cables
- Use saline on burs and saws to minimize sparking

## Test yourself: Case Study 1: Oxygen-rich Environments

### Neck scar revision



### What is the fire risk level?

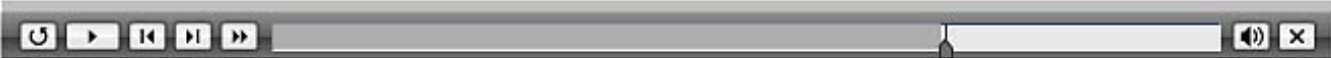
Check all the risk criteria below that apply to this procedure:

- Alcohol based prep solution used on patient
- Electrosurgery unit (ESU) or other ignition source used (laser, fiberoptics, drills, etc)
- Open oxygen source used (nasal O2 or face mask)
- Surgical procedure above the xiphoid

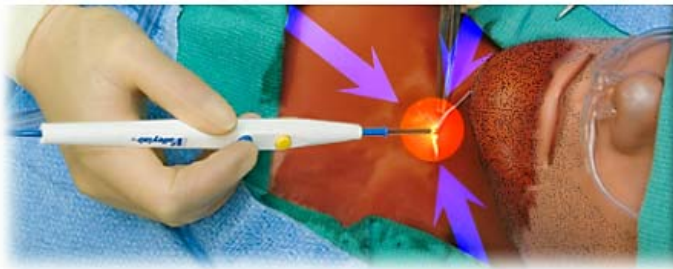


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# Neck scar revision



# < 1. Assess the Risk

## What is the fire risk level?

Check all the risk criteria below that apply to this procedure:

- Alcohol based prep solution used on patient
- Electrosurgery unit (ESU) or other ignition source used (laser, fiberoptics, drills, etc)
- Open oxygen source used (nasal O2 or face mask)
- Surgical procedure above the xiphoid

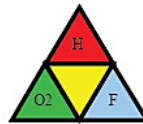


## Classification of Fire Risk for Surgical or Invasive Procedures

High Risk = 3 or more boxes checked below  
 Medium Risk = 2 boxes  
 Low Risk = 1 or less

| Risk Criteria   |  |
|---|--|
| <input type="checkbox"/> Use of an open oxygen source (nasal O2 or face mask) | <input type="checkbox"/> Alcohol based prep solutions used at any point in procedure                         |
| <input type="checkbox"/> Surgical procedure above the xiphoid                 | <input type="checkbox"/> Use of electrocautery unit (ESU) or other ignition source (laser, fiberoptics, etc) |

# 2. Interventions >



Verbal communication of fire risk level at "Time-out"

### Oxygen Delivery Anesthesia

Control Gases

- Verbal communication of fire risk ("Time-out")
- Plus:
- Verbal communication of oxygen percentage
  - Oxygen concentration is documented and lowered to 30%
  - Stop Oxygen flow 1 minute before ESU is activated
  - Utilize laser-safe ET tube for Laser airway surgery
  - Syringe of saline (Airway fires)

### Fuel and Draping Nursing

Control Fuel

- Verbal communication of fire risk ("Time-out")
- Plus:
- Tent drapes to allow anesthesia gases to dissipate
  - Maximize perimeter around incision and utilize occlusive drapes where appropriate
  - Have basin of saline available for suppression
  - Alcohol based prep solutions require minimum of 3 min dry time
  - Eliminate any pooling of prep solution
  - Use wet sponges on the surgical field

### Ignition Sources Surgeon

Control Heat

- Verbal communication of fire risk ("Time-out")
- Plus:
- Minimize ESU settings
  - Inform anesthesia before activating ignition source (laser, ESU)
  - Verbal communication of settings
  - Use wet sponges on the surgical field
  - Follow ESU Safety
    - o use ESU holster when not in use,
  - Follow Laser Safety Policy
    - o activate only when in sight
    - o laser on "Stand-by" when in use
  - o Monitor fiber-optic light cables
  - o Use saline on burs and saws to minimize sparking

**Oxygen Delivery  
Anesthesia Provider**  
Control Gases

**Fuel and Draping  
Nursing & Surgeon**  
Control Fuel

**Heat (Ignition) Sources  
Surgeon & Nursing**  
Control Heat

Verbal communication of fire risk ("Time-out")

**Interventions to reduce risk**

- *Verbal communication of oxygen percentage*
- *Oxygen concentration is documented and lowered to 30%*
- *Stop Oxygen flow 1 minute before ESU is activated*
  - Utilize laser-safe ET tube for Laser airway surgery
  - *Prepare a syringe of saline (Airway fires)*

Verbal communication of fire risk ("Time-out")

**Interventions to reduce risk:**

- Nursing interventions:
  - Use wet sponges & towels on the surgical field
  - Have basin of saline available for suppression
- Alcohol based prep solutions require minimum of 3 min dry time
- Eliminate any pooling of prep solution

Verbal communication of fire risk ("Time-out")

**Interventions to reduce risk:**

- Minimize ESU settings
- Inform anesthesia before activating ignition source (laser, ESU)
- Verbal communication of settings
- Use wet sponges & towels on the surgical field
  - Follow ESU Safety
    - use ESU holster when not in use
  - Follow Laser Safety Policy
    - activate only when in sight
    - laser on "Stand-by" when in use
  - Monitor fiber-optic light cables
- Use saline on burrs and saws to minimize sparking

**Surgeon Interventions:**

- Tent drapes to allow anesthesia gases to dissipate
- Maximize perimeter around incision and utilize occlusive drapes where appropriate

**Nursing interventions:**

- Follow ESU Safety
  - use ESU holster when not in use
- Monitor fiber-optic light cables

# Heat (Ignition) Sources

## Surgeon & Nursing

### Control Heat

Verbal communication of fire risk (“Time-out”)

#### **Interventions to reduce risk:**

- Minimize ESU settings
- Inform anesthesia before activating ignition source (laser, ESU)
- Verbal communication of settings
- Use wet sponges & towels on the surgical field
- Follow ESU Safety
  - use ESU holster when not in use,
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  - laser on “Stand-by” when in use
- Monitor fiber-optic light cables
- Use saline on burrs and saws to minimize sparking

#### **Nursing interventions:**

- Follow ESU Safety
  - use ESU holster when not in use,
- Monitor fiber-optic light cables

# Reinforcing the Message

## Post-testing

### Test yourself: Case Study 1: Oxygen-rich Environments

Fire Triangle



**In this scenario, which of the following represents the completed fire triangle?**

- A) Betadine, Electrocautery, Static Electricity
- B) Electrocautery, Nasal cannula, Regular room air
- C) Nasal cannula, Electrocautery, Sponges, linens & hair

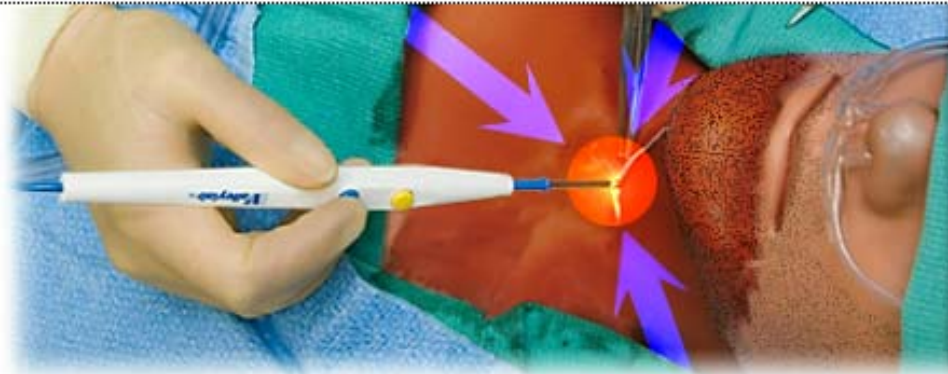
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## Test yourself: Case Study 1: Oxygen-rich Environments

Fire Triangle



**In this scenario, how could the risk of fire be reduced?**

- A) Lowering the electrocautery power if the oxygen concentration cannot be reduced
- B) Preventing oxygen from becoming trapped by venting the drapes
- C) Momentarily stopping the flow of oxygen to allow time for it to dissipate before activating the electrocautery
- D) All of the above

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# More Heat Source Scenarios Lasers, Fiber Optic Lights, Defib, and more

What would **you** do?



## Lasers and Fire Risk

The smoldering soon started to **flame** undetected, because the smoke and heat were contained under the drapes.

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What would **you** do?



## Heat from Light Sources

The heat from the cable ignited drapes on the patient...

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# *Contact Information*



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# UCLA Medical Center

**Erik Eggins, CHSP**

*Director of Safety*

**Virginia Broughton, RN, CNOR**

*Administrative Nurse I*

*Quality Assurance Coordinator*

*Main Operating Room*

# UCLA Health System Fire Safety in Oxygen Enriched Environments

## OVERVIEW OF PROGRAMS

Presented By

**Erik Eggins**  
Director  
Safety Department

**and Virginia Broughton**  
Administrative Nurse  
Main Operating Room

Ronald Reagan UCLA Medical Center  
& Neuropsychiatric Hospital



Santa Monica – UCLA Medical  
Center & Orthopaedic Hospital



# Program Overview

UCLA Health System conducts annual fire safety training for staff working in areas identified as O<sup>2</sup> enriched (procedure rooms with atmospheres above 20% O<sup>2</sup>). Training is mandatory and employee completion is tracked.

**Identified Departments:** *Operating Rooms (outpatient & inpatient), GI Labs, Labor & Delivery Rooms & Dermatology*

# Training Overview

- Pre-Test to assess staff knowledge**
- 30 minute lecture**
- 20 minute safety video**
- Post-Test to compare before and after knowledge**
- 5 minute Q&A session**

# Pre/Post Test

## UCLA Health System Fire Safety in O2 Enriched Environment

### Pre-Test

Name: \_\_\_\_\_ Title: \_\_\_\_\_ Department: \_\_\_\_\_ Date: \_\_\_\_\_

1. In the event of a fire, which of the following is NOT an appropriate R-A-C-E action:
  - a) **Remove:** Remove all patients and personnel from the immediate fire area
  - b) **Alarm:** Activate wall mounted fire alarm, call 911, and run down the hallway screaming "FIRE"!
  - c) **Contain:** Close all doors surrounding the fire area to prevent the spread of smoke and fire.
  - d) **Extinguish:** Attempt to extinguish the fire, if safe to do so.
2. Which type of fire extinguisher is best to be used on a smoldering drape fire in an Operating Room?
  - a) Type A (Pressurized water)
  - b) Type A-B-C (Clean Agent)
  - c) Type B-C (Carbon dioxide)
  - d) Any of the above
3. A "Code Red" P.A. announcement and/or an audible alarm in the building indicate:
  - a) The ventilation system has been turned off
  - b) There is a blood spill in the building.
  - c) There is a real or suspected fire in the building
  - d) It is time to take a break
4. After the "Code Red" activation, which of the following statements is NOT true?
  - a) An immediate evacuation of all affected areas is required
  - b) Everyone should ensure that all other staff is aware of the alarm and location
  - c) Staff should ensure that unoccupied spaces are checked before evacuating the area
  - d) Staff in the affected area should start closing doors and respond (only if available) to the announced fire alarm location with a fire extinguisher
5. For staff working in the Medical Center, what is the correct phone number to call to report an emergency?
  - a) #36 & 911
  - b) #36 only
  - c) 911 only
  - d) 74#

# 30 Minute Lecture Course Outline

- ❑ **Introduction:** average number of OR fires in US yearly, how fires are reported, media reports, impacts on organizations, etc.
- ❑ **Fire Triangle:** ignition sources, fuel and oxidizers in their area
- ❑ **Hazards:** specific to their area (e.g., electrical, oxygen & other medical gases, heat sources, lasers, flammable materials & liquids, etc.
- ❑ **Alarm, Detection and Suppression Systems:** specific to their area (e.g., smoke detection, sprinklers, pre-action systems, fire extinguishers, O<sup>2</sup> shut-off valves, compartmentalization features, etc.

# 30 Minute Lecture Course Outline

- ❑ **Prevention:** medical equipment inspections are confirmed, controlling heat sources, managing fuels, minimize oxygen concentrations, safe use of ESUs and other ignition sources, use of time-outs to review Laser safety practices on the sterile field, etc.

- ❑ **Review Fire Alarm Response Protocols: R.A.C.E.**

R=Remove; A=Activate Alarm; C=Contain Fire; E=Extinguish and Evacuate

- ❑ **Review Fire Extinguisher use: Type, Locations & P.A.S.S.**

P=Pull Pin; A=Aim Nozzle; S=Squeeze Trigger; S=Sweep from side-to-side



10 lb Clean Agent fire extinguishers in all ORs and Procedure Rooms.



# 30 Minute Lecture Course Outline

## □ Review Extinguishing Fires in a Patient: Airway & Cavity

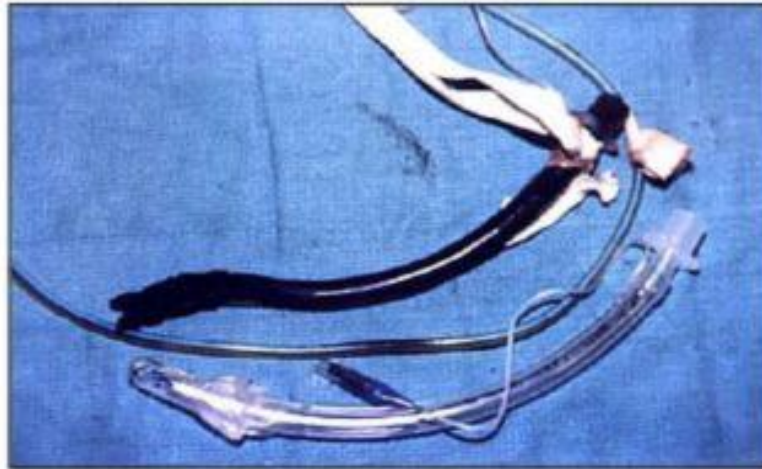


Figure 1. The top tracheal tube (blackened color) was ignited during electrocautery use to enter the trachea during a tracheostomy. The tube damage is similar to that described in the PA-PSRS reports above, although the photo is not from the reported cases. The bottom tube is an exemplar tube for comparison. Image provided courtesy of ECRI Institute.

## □ Review Extinguishing Fires on a Patient: Preps, Drapes, Hair, etc.

# Video Presentation

## **Anesthesia Patient Safety Foundation DVD**

*Prevention and Management of Operating Room Fires*

*Produced in 2009 - Length: 18:13*

## **HCPPro DVD**

*OR Surgical Fire Training – How to prevent and respond to surgical fires*

*Produced in 2004 – Length 23:25*

# Additional Training

- ❑ Hands-on Fire Extinguisher Training using a Digital Fire Extinguisher Training System



- ❑ OR Evacuation Drills (partnered with Office of Emergency Preparedness)

# Challenges and Experiences

- Physicians training and buy-in (anesthesia representative essential)
- Re-enforcing the need to include fire safety in timeouts
- Reporting of near misses and small incidents (sparks, flashes, smoke, etc.)
- Ensuring that new employees receive training prior to working in O<sup>2</sup> environment
- No major incidents to report

# Fire Safety in Oxygen Enriched Environments

## Contact Information

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Director, Safety Department

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# **Scripps Memorial Hospital La Jolla**

**David Dockweiler, MD**

*Operating Room Medical Director*

# Fire Safety in the Operating Room

David Dockweiler M.D.

OR Medical Director

Scripps Memorial Hospital

La Jolla, California

People need to be—

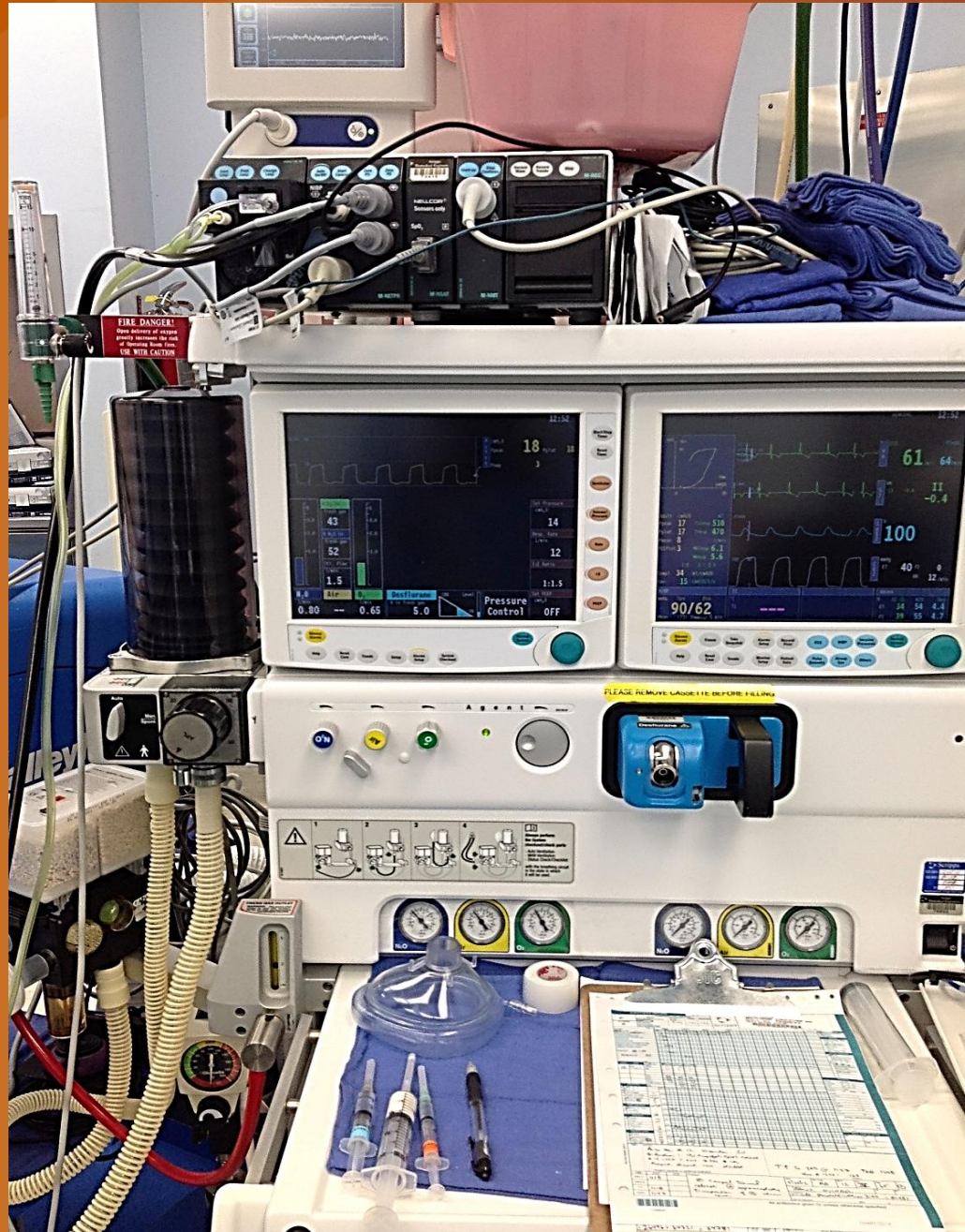
Persuaded

Machinery can be—

Mandated







# Fire Risk Assessment

- Performed by Anesthesiologist
- Integrated into the Time Out pre-procedural checklist
- Quickly performed
- Negligible workflow disruption

# Fire Risk Assessment

- **Low** - Fire triangle incomplete, no further action or discussion

# Fire Risk Assessment

- **Moderate** - Fire triangle complete, risk of fire acknowledged, location of fire suppressing tools known to team members

# Fire Risk Assessment

- **High** - Fire triangle complete, *and* surgery above the diaphragm *with* the presence of unconfined or poorly confined oxidants. Should trigger a discussion among the team on ways to manage, minimize, or eliminate the risk of fire.

# Contact Information

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# US Food and Drug Administration

**Priscilla Callahan Lyon, M.D.**

*Division of Nonprescription Clinical Evaluation  
(DNCE)*

*Center for Drug Evaluation and Research (CDER)  
Food and Drug Administration (FDA)*





# Practical Advice for Preventing Surgical Fires

Priscilla Callahan Lyon, M.D.  
FDA/CDER/DNCE

# Background

- Approximately 50 million surgical cases per year in the United States
- ECRI Institute (patient safety organization) estimates 550 – 650 surgical fires per year in the United States
- There are patient injuries and deaths from these fires – either directly related to thermal injury or from complications
- These fires are preventable

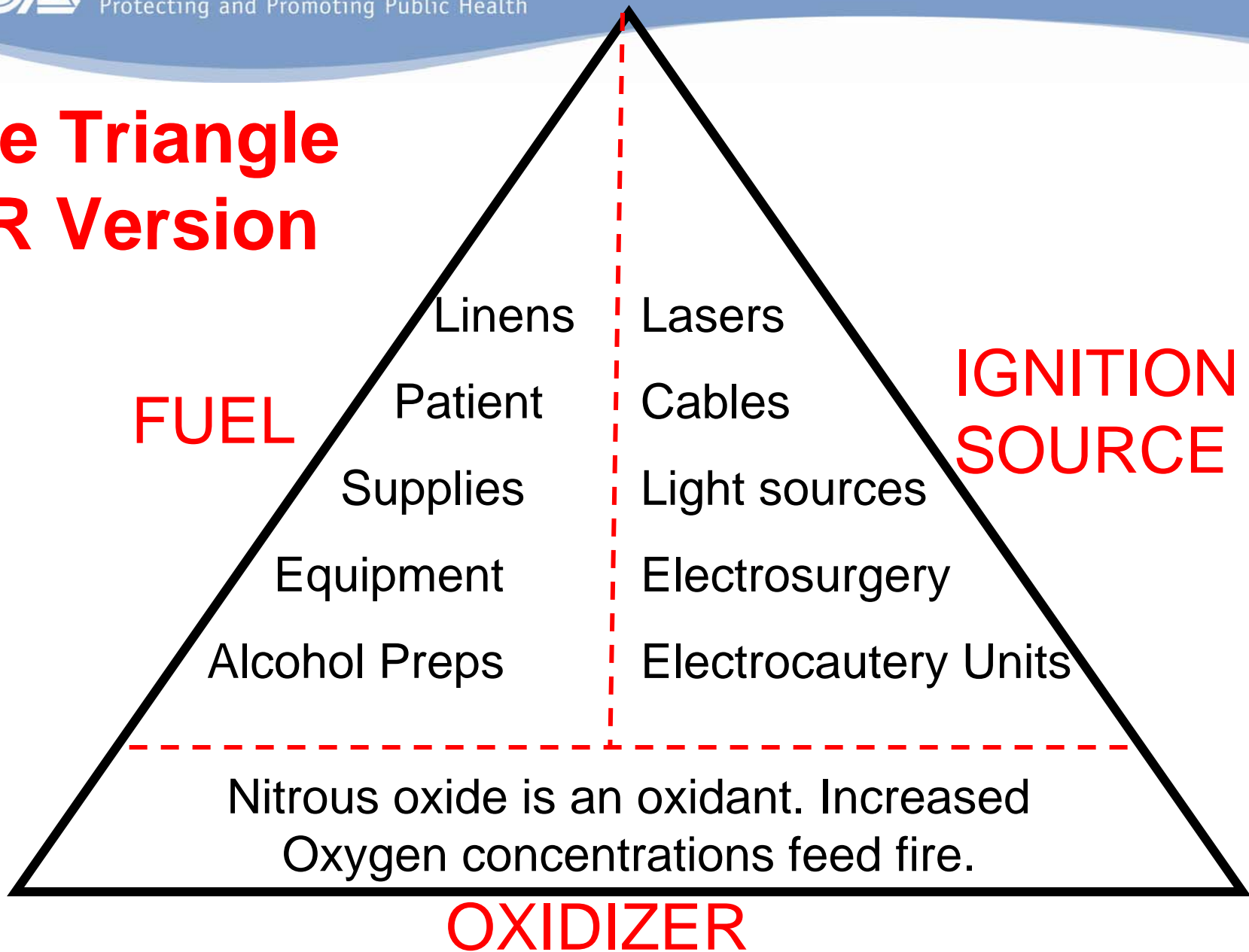
# The Risks

- Surgical suites almost always have all three elements of the fire triangle present.
- Surgical suites are frequently an oxygen-enriched environment; materials may become flammable more quickly and burn more intensely.
- Nitrous oxide also acts as an oxidizer.

## The Risks (cont.)

- The operating room area may be ‘tense’ and emergencies occur that require rapid decision making and actions.
- Just like the “Code Blue” team trains so everyone knows their role, members of the surgical team should all know their role if a fire occurs.

# Fire Triangle OR Version



# Recommendations

- Include a 'Fire Risk Assessment' as part of the pre-operative time-out period.
  - Highest risk procedures are those which involve an ignition source and require supplemental oxygen
  - Risk is even higher when the ignition source is operated near the oxygen supply (head, neck, upper chest)

# Recommendations (cont.)

- Encourage Communication Among Members of the Surgical Team
  - This is particularly important between the anesthesiologist (controller of the oxygen/nitrous oxide) and the surgeon (controller of the ignition sources)
  - Be certain the surgeon does not begin the procedure until the prep agent has time to completely dry
  - Any member of the surgical team should feel able to speak up if they have a concern

# Recommendations (cont.)

- Plan How to Manage a Surgical Fire
  - Every member of the team should know what action to take if a fire occurs
  - Conduct regular fire drills!
  - Consider making training (and re-training) required for ALL members of surgical teams
  - Make sure the correct type of fire extinguishers are available in the OR area and that everyone knows where they are located
  - Keep saline handy
  - Have an evacuation plan – for patients and the staff



# Recommendations (cont.)

- Encourage the Safe Use of Supplemental Oxygen
  - Evaluate the oxygen needs of each individual patient and use the minimum supplementation required
  - Use a closed delivery system when possible (especially if >30% oxygen flow is needed)
  - Take extra precautions to remove oxygen from the surgical field before an ignition source is used (such as venting, blowing, or suctioning the oxygen away)

# Recommendations (cont.)

- **Make Certain Alcohol-Based Skin Preparation Agents Are Used Correctly**
  - Alcohol-based preps are flammable; avoid pooling of the solution during the prep process - particularly under the patient
  - Remove the alcohol-soaked drapes after prepping
  - Allow adequate drying time; read the product labeling
  - Remember drying takes longer if the prep area is hairy or there are skin folds
  - Use the correct amount of prep solution
  - Make sure the skin is dry before draping the patient and proceeding with surgery

# Recommendations (cont.)

- **Make Certain Surgical Equipment Is Used Correctly**
  - If an ignition source is needed near the supplemental oxygen - such as head/neck/chest surgery - allow time for the oxygen concentration to decrease
  - When not being used, place ignition sources, such as cautery devices, in a holster - not on the patient or drapes
  - Remember (and remind others) everything ignites and burns more quickly around oxygen; even materials that are 'Flame Resistant'

# What FDA is Doing

- FDA regulates the drugs (oxygen, skin preparation agents) and devices (drapes, ECUs, lasers). The products are labeled with appropriate warnings and these are reviewed regularly.
- This goal of this initiative is to increase OR Fire awareness and provide resources for healthcare providers.

# Conclusion

## Plan and Communicate

- These are preventable events.
- You do NOT want a fire in your operating room.
- You do NOT want a patient or staff member to be injured.
- We can work together to prevent these fires!



# Preventing Surgical Fires Initiative



Alcohol-based Skin Preps, Surgical Drapes, Patient

# Goals for the Initiative

FDA and its partners launched the “Preventing Surgical Fires Initiative” to:

- increase awareness of factors that contribute to surgical fires
- disseminate surgical fire prevention tools
- promote the adoption of risk reduction practices throughout the healthcare community



# Initiative Partners

- American Academy of Orthopaedic Surgeons
- American Academy of Physician Assistants
- American Association of Nurse Anesthetists
- American Association of Surgical Physicians Assistants
- American Society for Healthcare Engineering
- American Society for Healthcare Risk Management
- American Society of Anesthesiologists
- American Society of PeriAnesthesia Nurses
- Anesthesia Patient Safety Foundation
- Association of periOperative Registered Nurses
- Association of Surgical Technologists
- Children's Hospital – Boston





# Initiative Partners (cont.)

- Christiana Care Health System
- Council on Surgical and Postoperative Safety
- Dartmouth-Hitchcock Medical Center
- ECRI Institute
- Fairview Health Services - Minneapolis
- Institute for Safe Medication Practices
- Joint Commission
- Medical Product Safety Network
- Pennsylvania Patient Safety Authority
- Society of American Gastrointestinal and Endoscopic Surgeons
- Surgicalfire.org
- Veterans Affairs National Center for Patient Safety




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## Drugs

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### Preventing Surgical Fires

#### Collaborating to Reduce Preventable Harm

Surgical fires are fires that occur in, on or around a patient who is undergoing a medical or surgical procedure. An estimated 550 to 650 surgical fires occur in the United States per year, some causing serious injury, disfigurement, and even death.<sup>1</sup> Despite the fact that the root causes of surgical fires are well-understood, surgical fires still occur. Many healthcare organizations have developed tools, implemented strategies, and conducted education and outreach efforts to reduce the risk of fires. To supplement these efforts, FDA and its partners are launching the "Preventing Surgical Fires" initiative to:

- increase awareness of factors that contribute to surgical fires
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Courtesy of Anesthesia Patient Safety Foundation

### Spotlight

- [Webinar: Practical Advice for Preventing Surgical Fires-- Safety Strategies from the Front Lines](#)
- [Get e-mail updates on Preventing Surgical Fires](#)
- [FDA and Partners Working to Prevent Surgical Fires](#)

### Contact FDA

301-796-7600  
[cdersafeuseinitia@fda.hhs.gov](mailto:cdersafeuseinitia@fda.hhs.gov)

**Safe Use Initiative**  
Office of the Center Director  
WO 51-1341  
10903 New Hampshire Avenue  
Silver Spring, MD 20993

To find out more about the "Preventing Surgical Fires" initiative or to get involved, contact the [Safe Use Initiative](#).

<sup>1</sup> ECRI Institute New Clinical Guide to Surgical Fire Prevention. Health Devices October 2009

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## Drug Safety and Availability

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## Resources and Tools for Preventing Surgical Fires

### Educational Videos:

- [FDA Videos hosted by Medscape \(Non-CME and CME\)](#)
  - [Surgical Fires: How They Start and How to Prevent Them](#) [↗](#) – FDA Expert Interview  
 No registration required. *No CME credits are available for this version.*



- [Prevention of Surgical Fires](#) [↗](#)  
**Continuing Medical Education (CME) credits are available to physicians for this video.**  
*Please see the Medscape.org site for CME details. (Registration required.)*
- [Prevention and Management of Operating Room Fires](#) [↗](#)  
 With the assistance of ECRI Institute, The Anesthesia Patient Safety Foundation (APSF) has produced this 18-minute long video describes best practices to prevent the potentially devastating complication of a fire in the operating room. The intended audience is everyone who works in the OR during surgery. Watch the video online or request a complimentary DVD.
- [FDA Patient Safety News: Preventing Fires in the Operating Room](#) [↗](#)  
 This 3 minute FDA video clip for health care professionals, summarizes the main points of APSF's video, "Prevention and Management of Operating Room Fires."





## Drugs

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# Preventing Surgical Fires Initiative

[www.fda.gov/preventingsurgicalfires](http://www.fda.gov/preventingsurgicalfires)

**Email updates**  on the surgical fire safety efforts to reduce preventable harm

**Questions or comments?** Contact us by:

- Email: [cdersafeuseinitia@fda.hhs.gov](mailto:cdersafeuseinitia@fda.hhs.gov)
- Phone: 301-796-7600

# Thank you!!!