

OPERATING ROOM SAFETY



Off-Site Locations

The objective of this training program is to identify hazards present in operating rooms and to list actions that can be taken to minimize these hazards.





OR Hazards

- Hazards present in the OR may include:
 - Blood/body fluid exposures from sharps
 - Exposure to released particulates
 - Exposures to waste anesthetic gases
 - Possible exposures to chemical cleaning agents
 - Slips/trips/fall hazards
 - Exposures to lasers
 - Hitting heads on OR lights
 - Electrical shock hazards
 - Fires

Blood/Body Fluid Exposures

- **50% of our sharps injuries occur during use. Procedures with the most sharps injuries:**
 - Suturing
 - Blood sampling
 - Intradermal injections (lidocaine)
 - Cutting (scalpel injuries)
 - Inserting peripheral I.V. line, setting up heparin lock





Blood/Body Fluid Exposures

- 50% of our sharps injuries occur after use.
Procedures with the most sharps injuries:
 - Withdrawing needle from patient
 - During clean up and disassembly
 - During disposal
 - Overfilled sharps container, protruding needles
 - Stuck by needle left in trash, laundry, beds, & on floor
 - Patient movement jars device

Blood/Body Fluid Exposures

- What can you do to prevent these exposures and injuries?
 - Utilize safe zone during each surgical procedure
 - Account for all sharps used
 - Dispose of sharp in sharps container immediately after use
 - When emptying suction canisters, always pour carefully and wear eye/face protection



Blood/Body Fluid Exposures

- Other actions include:
Using personal protective equipment (PPE)
 - Although PPE (gloves, mask) is used, consider wearing combination visor-mask to help prevent eye exposures



Blood/Body Fluid Exposures

- Should an exposure occur:
 - For eye/face exposures: Use an eyewash station and rinse for about 15 minutes
 - For a needlestick: Express blood from stick, wash with soap/water or use betadyne
 - Report exposures immediately to University Health Service at 585-275-1164





Particulate Releases

- Some procedures in the OR generate particulates into the air (i.e., from cauterizing blood vessels, using lasers)
- These particulates can have viable organisms present that can cause infections
- Preventive actions:
 - Use suction close to point of generation
 - Wear N95 respirator (medical clearance and fit testing is required)
 - Wear tight fitting safety goggles



Waste Anesthetic Gases

- Releases of anesthetic gases into an OR can result in loss of small motor skills, slowing of reflexes, mental confusion, tiredness
- Action by the anesthesiologist can minimize these exposures:
 - Ensure scrubber has capacity for planned use
 - Check all connections before use for leaks
 - Pack endotracheal tube to prevent leaks
 - Have equipment serviced/checked periodically

Cleaning Agents

- A number of cleaning agents are used for equipment and the room
- Those using the cleaning agents have the greatest potential of exposure.

Before use:

- Obtain instruction from your supervisor on proper use
- Read the product label and the MSDS
- Obtain and wear the required PPE for use



Slips/Trips/Falls

- The walking surface of OR locations can be slippery, causing an injury
- Take the appropriate precautions
 - Wear slip resistant foot wear
 - Report water/fluids on floor for clean up
 - Have personnel place a “CAUTION – WET FLOOR” sign on floor until cleaned





Lasers

- Recommendations for OR locations which utilize lasers
- The Laser Nurse/Technician must prepare the OR for use
 - Place any needed eye protection at the entries (needed except for certain ophthalmic procedures)
 - Some applications may require covering windows and other reflective surfaces
 - When personnel enter the room, verify they have laser eye protection on
 - Maintain a log of laser use

Head Injuries

- OR lights are adjustable. Sometimes they may be in a position that can cause a head injury
- Use these simple rules:
 - Keep light up, out of the way until needed
 - Once done using, move the light up, out of the way



Electrical Shocks

- Shocks are usually the result of faulty equipment
- Take the following actions:
 - Unplug power cords by holding the plug, never pull the cord
 - Never operate equipment if the ground plug is missing. Take the unit out of service for repairs
 - Should the plug or the cord's insulation be damaged, take the equipment out of service and for repair by Medical Engineering





OR Fire Safety

- JCAHO's Sentinel Event Alert on fires in the OR requires personnel:
 - Be trained on the use of fire equipment
 - Know methods for rescue & escape
 - Know location of med gases shut-offs and electrical controls
 - Know location and activation of fire alarm system



Learning Objectives

- All OR staff need to:
 - Identify the types of fires that can occur in OR's
 - Understand OR's fire procedures
 - Know the location of fire fighting equipment
 - Understand the proper operation of fire equipment
 - Know how to prevent OR fires

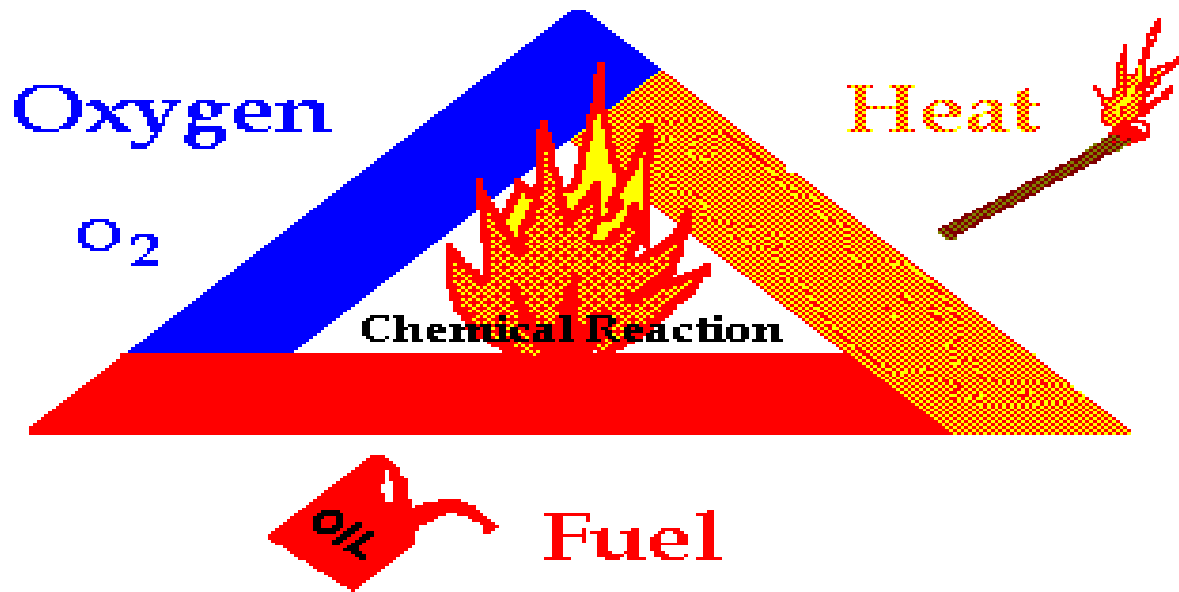


The OR Fire Problem

- 100 surgical fires occur in OR's each year
- Ignition sources
 - Electro surgical units account for 68% of fires
 - Lasers account for 13% of fires
- Most common location is in patient's airway (34% head or 28% face)
- O₂ enriched atmospheres was a contributing factor in 74% of the cases

In order to understand how fire extinguishers work, you first need to know a little bit about fire.

Fire Triangle



Essentially, fire extinguishers put out fire by taking away one or more elements of the fire triangle.



Common surgical fire HEAT sources & prevention

- Electro surgical units and lasers
 - Place ESU in holsters
 - Place lasers in stand-by mode
- Fiber-optic headlights or endoscopes
 - Never lay these sources lying on surgical drapes



Common surgical fire **FUEL** sources & prevention

- Prepping/ointments solutions
 - Allow sufficient evaporation time
- Dressings – gauze, sponges
 - Keep away from heat sources
- Linens and surgical drapes
 - Drape to facilitate dissipation of gases
 - Scavenge with separate suction
- Anything with an electrical plug
 - Inspect cords and equipment
- Patient – hair
 - Large clean shaven area
 - Use soluble lubricating jelly

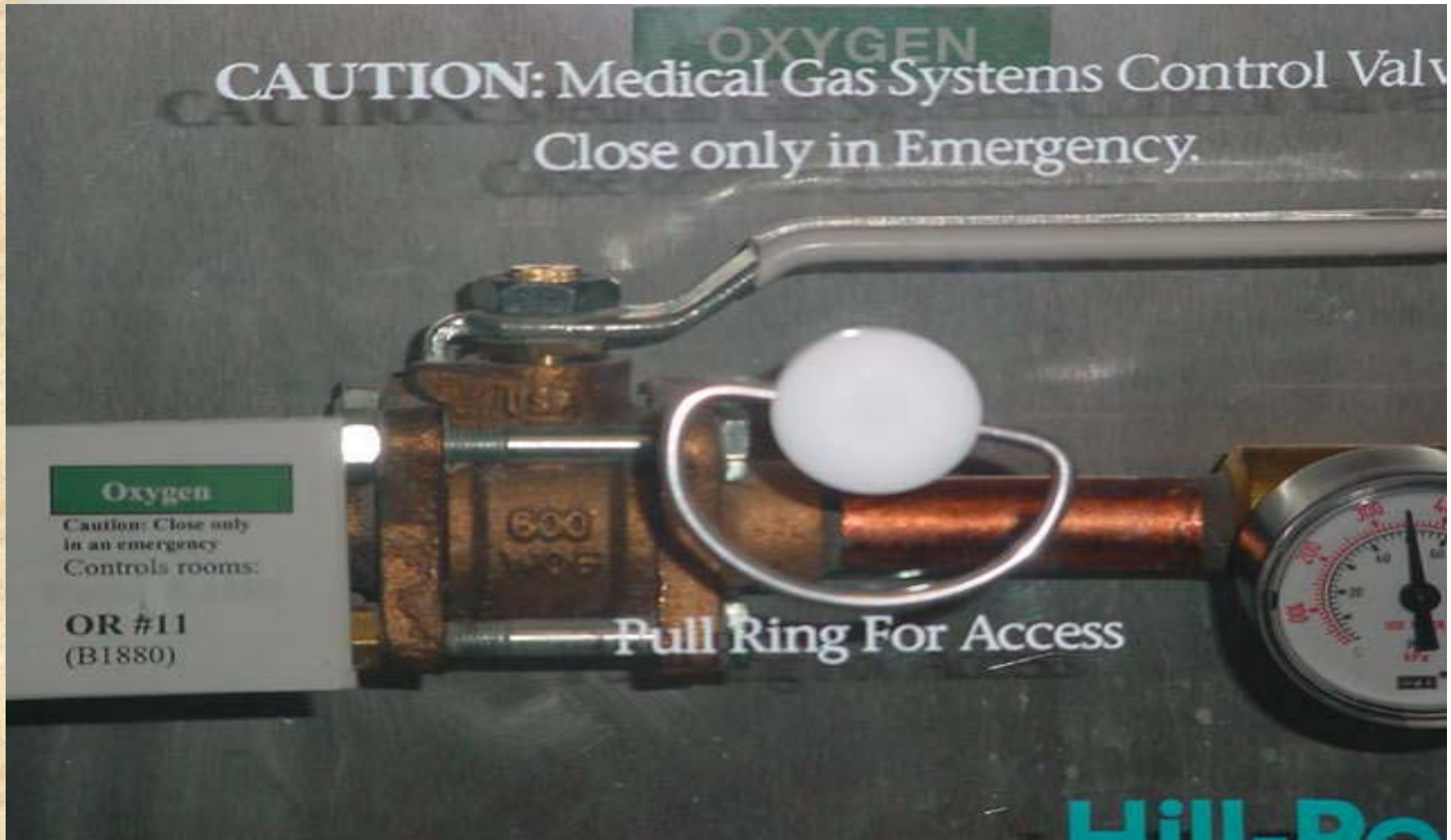


Common surgical fire OXYGEN sources & prevention

■ Oxygen

- Maintain adequate ventilation especially under drapes of patients having face or neck surgery
- Know O₂ shut off locations
- Use medical air when possible because it has < 30% oxygen

Example of OR Shut Off Valve





OR Fire Procedures

R.A.C.E.

- **R**escue The Patient
 - General OR Fire Safety
 - Airway Fires
 - Drape Fires
 - Equipment Fires



OR Fire Procedures R.A.C.E.

- **A**ctivate Building Fire Alarm System
 - Fire Detection Devices
 - Phone Call to 911 or Security 275-3333



OR Fire Procedures R.A.C.E.

- Confine
 - Compartmentalization by closing doors
 - HVAC Issues
 - Gas Shut Off



R.A.C.E.

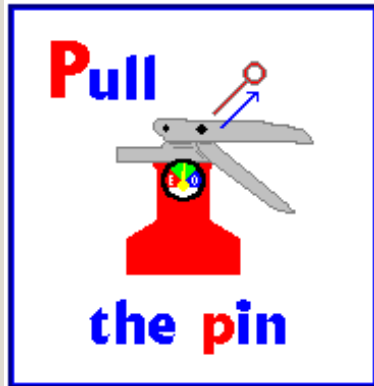
■ **E**xtinguish

- Saline Solution
- Fire Extinguishers
 - P.A.S.S.

■ **E**vacuate

- Staff Responsibilities

REMEMBER P.A.S.S.



Pull the pin

This will allow you to discharge the extinguisher

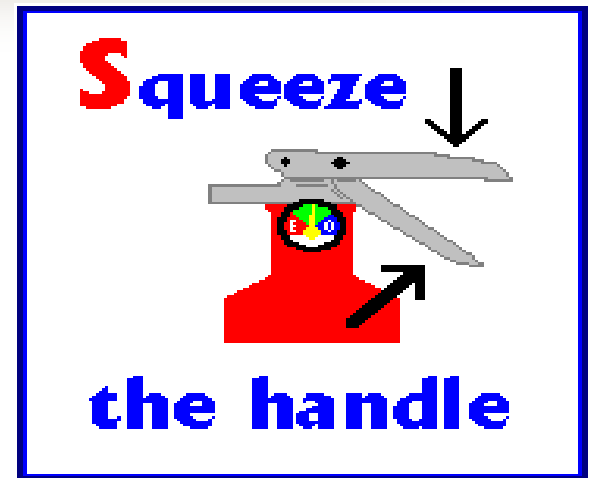
Aim at the base of the fire

If you aim at the flame (which is frequently the temptation), the extinguishing agent will fly right through and do no good. You want to hit the fuel.



Squeeze the top handle or lever.

This depresses a button that releases the pressurized extinguishing agent in the extinguisher.



Sweep from side to side

Until the fire is completely out. Start using the extinguisher from a safe distance away, then move forward. Once the fire is out, keep an eye on the area in case it re-ignites.



General OR Fire Safety

- At the first sign of smoke or flames
 - Stop the flow of breathing gases to the patient
 - Remove the burning material from in or around the patient
 - Care for the patient medically



Special Considerations - Airway Fire

- Prevention – Use air instead of O₂ when possible
 - Use laser resistant endotracheal tube
 - Soak gauze/sponges used with uncuffed tracheal tubes to minimize leakage
- Recognize that a fire exists (Black smoke from patients mouth)
- Use saline solution to put out fire
- Remove endotracheal tube from patient (save for investigation)
- Examine the airway to be sure the fire is out and nothing is still burning
- Re-establish an airway, perform bronchoscopy (to remove particulate matter)
- Treat as medically indicated



Special Considerations – Drape Fire

- Extinguish the fire with saline solution or smother
- Saline and water may be ineffective due to the repellent surfaces
- Remove the drape from the patient



Special Considerations

- Extinguish only if small and if you know you have the proper fire extinguisher
- Even if the fire is out, an evacuation may be required due to smoke



Evacuation Considerations

- Narrow corridors and doorways
- Items blocking the evacuation routes
- Bringing the table to “wheels” if power is lost
- Forgetting to unplug ALL equipment before evacuation
- Knowing your receiving site
- Limited plugs and outlets at receiving site



Fires: Know The 7 Absolutes

1. Ensure proper application of and drying of prep solutions
2. Clear the prep area of any pooled prep solutions
3. Inflate the endotracheal tube with methylene blue–tinted water or saline solution
4. Ensure drapes are vented and remain vented. Use evacuation suction if area can't be kept vented
5. Ensure basin of sterile water or saline solution is readily available
6. Smother flames
7. Apply the dispersing electrode to a clean, dry, hair free surface