Best practices to prevent unexpected flame and smoke during surgical procedures

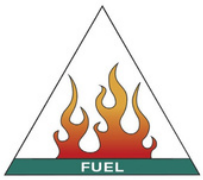
Between 2021 and 2022 there were 42 reported cases of unexpected flame or smoke surgical procedures in Utah

Surgeon

- Defibrillators
- Electrosurgical units and devices
- Fiber-optic lights
- Hand-held, battery-operated electrocautery devices
- High-speed burrs
- Lasers

Anesthesia professional

- Gases supporting combustion (eg, oxygen, nitrous oxide)
- Room air
- Oxygen sources
  - Open (eg, masks, nasal cannulas)
  - Closed (eg, endotracheal tubes, anesthesia circuits)



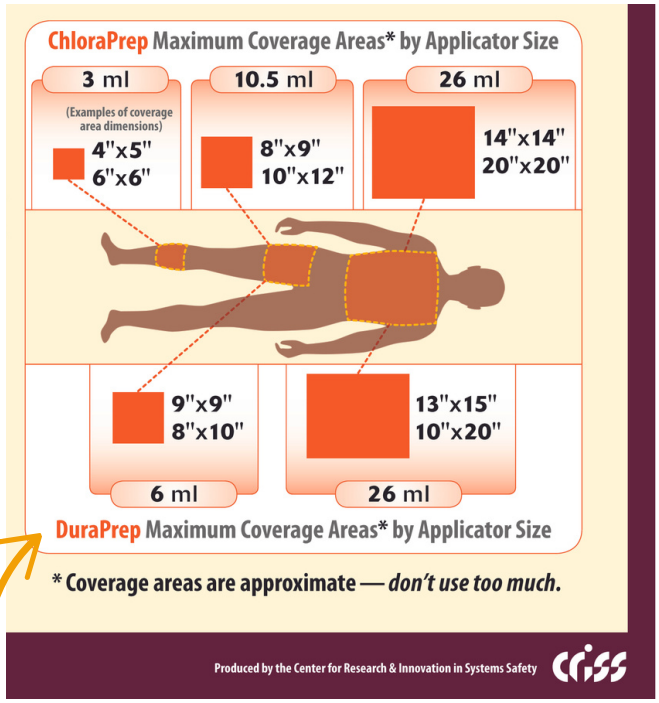
Nursing team members

- Body hair
- Chemicals (eg, alcohol-based prep solutions)
- Drapes
- Dry sponges
- Intestinal gases

1. Fire safety tool kit. AORN, Inc. http://www.aorn.org/PracticeResources/ToolKits/FireSafetyToolKit. Accessed August 26, 2014.
2. Resources and tools for preventing surgical fires. US Food and Drug Administration. http://www.fda.gov/drugs/drugsafety/safeuseinitiative/preventingsurgicalfires/ucm272680.htm. Accessed August 26, 2014.
3. Guidelines for safe environment of care, part I. In: *Perioperative Standards and Recommended Practices.* Denver, CO: AORN, Inc; 2014: 229-254.

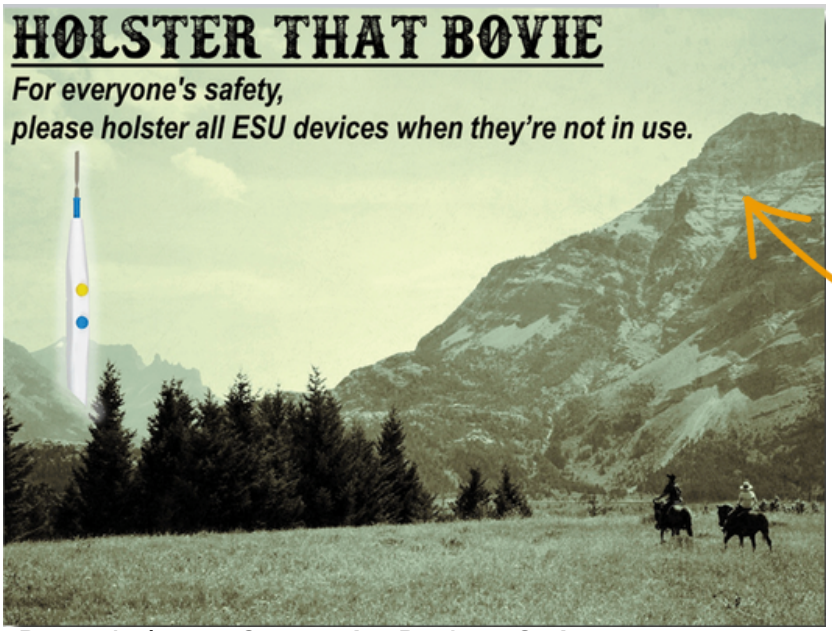
The Fire Triad

Review the parts of the fire triad and who is responsible for each



Preparation Areas

Remember alcohol-based preps need 3 minutes to dry on skin and 1 hour to dry on skin with hair



Betsy Lehman Center for Patient Safety

Bovie Safety

Many instances of fire and smoke in Utahn ORs could have been avoided if the bovie had been placed in its holster

Utah Department of Health & Human Services

For the full report and the printable PDF of this document please visit https://patientsafety.utah.gov/ publications/ or scan the QR code

The Christiana Fire Safety Protocol:

An easy way to improve the fire risk and safety assessment, performed immediately prior to the procedure during the timeout

The circulating or bedside RN assesses the potential fire risks creating a score if the following will be present during the procedure (one point each):

- Open oxygen source
- Available ignition source
- Surgical site above the xiphoid or < 30 cm/12 inches from oxygen source

Points are added together, with a score from 0 to 3 possible

Score of 0 = low level of risk	Score of 1 = low level of risk	Score of 2 = low level of risk with potential to convert to 3	Score of 3 = high level of risk
Initiate the routine fire safety protocol	Initiate the routine fire safety protocol	Initiate the routine fire safety protocol Observe closely for conversion to score of 3	Initiate the high fire safety protocol

Routine Fire Safety Protocol

- Check electrical equipment
- ensure preps dry & don't let preps pool
- close and remove bottles of flammable agents
- use standard draping procedure
- protect heat source when not in use
- activate heat source only when in line of sight
- deactivate heat unit before tip leaves surgical site,
- properly position foot controls and move when not in use

High Fire Safety Protocol

- All routine protocol measures
- Arrange drapes to minimize oxygen buildup underneath
- Keep oxygen concentrations below 30%
- Minimize the Electrical Surgical Unit (ESU) setting
- Use wet sponges as appropriate
- Have a basin and a syringe of sterile saline readily available
- Use an adherent incise drape, if possible, to help isolate head, face, neck, and upper-chest incisions

Utah Department of Health & Human Services

ChristianaCare Fire Safety Protocol

For the full report and the printable PDF of this document please visit https://patientsafety.utah.gov/ publications/ or scan the QR code