Code Red at the Bedside: Enhancing Patient Safety During Bedside Surgical Procedures

Hackensack Meridian *Health*

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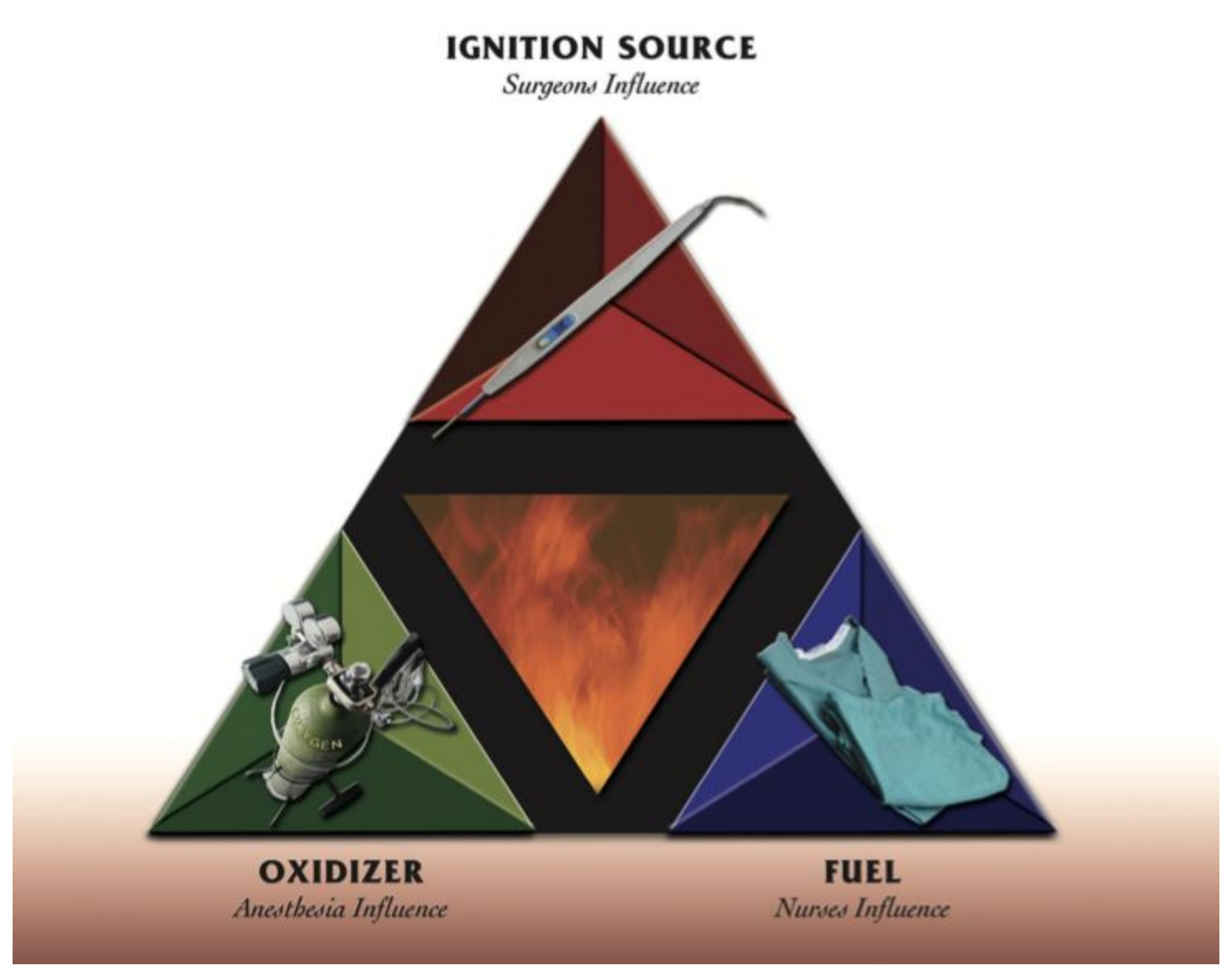
Background

The surge in COVID-19 cases necessitated an increase in bedside open tracheostomies performed within the Critical Care Unit (CCU) at Ocean University Medical Center. Due to patient acuity and fragility, these elderly patients were deemed too unstable for transport to the Operating Room (OR). To mitigate risk, surgeons performed procedures at bedside. However, this practice highlighted a critical disparity: patient care units lack the comprehensive fire safety infrastructure and protocols standard within OR suites

Description of Team

Ocean University Medical Center is a 23 OR facility, who initiated a fire safety protocol initiative, utilizing a small collaborative team of the Director of Surgical Services, OR Clinical Nurse Education Specialist(CNES) and an outside surgical fire safety specialist.



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Preparation and Planning

To enhance fire safety during bedside surgical procedures involving electrocautery, a project was initiated to equip OR teams with mobile CO2 fire extinguishers when doing off unit procedures. A review of existing fire safety standards was conducted, and the OR Clinical Nurse Education Specialist (CNES) researched portable fire extinguisher options suitable for transport between the OR and patient care units. In collaboration with the surgical fire safety specialist, a tailored educational program was created to support implementation of the new process. Biweekly progress meetings were held with the Director and OR CNES to address equipment acquisition and protocol development.

Assessment

The CCU environment presents an elevated fire risk during bedside surgical procedures due to increased ambient oxygen concentrations and limited immediate access to appropriate fire suppression equipment. This risk is exacerbated during periods of high patient census, such as those experienced during the COVID-19 pandemic, where room sharing was necessary. A 2021 safety assessment, conducted following a surgical time-out and fire risk assessment, revealed the absence of suitable fire extinguishers in close proximity to the surgical field. The available extinguishers, classified as ABC type, were located remotely and are contraindicated for use on open wounds or body cavities. This deficiency creates a significant patient safety concern, as all three elements of the fire triangle are present without immediate access to an appropriate fire extinguisher. Delayed response times due to unavailable or inappropriate extinguishers can result in increased burn severity, potentially leading to patient mortality. The use of an incorrect extinguisher type on an open wound can introduce contaminants, increasing the risk of surgical site infection and associated complications.

Implementation

- In collaboration with Materials Management, a dedicated mobile cart was procured to house the CO2 fire extinguisher.
- The CNES then coordinated with the Facilities Director to obtain a 5lb CO2 fire extinguisher, which was subsequently mounted on the cart.
- Perioperative staff received initial competency training on the use of the portable fire cart and participated in a comprehensive fire safety in-service. Annual fire safety training, inclusive of the portable fire cart protocol, is conducted for all perioperative personnel by the fire safety specialist.

Outcomes

Implementation of the portable fire cart has enhanced patient safety protocols for procedures performed outside of the operating room. This initiative has fostered a stronger safety culture by improving preparedness for potential surgical fires, thereby creating a safer environment for both patients and staff. The surgical team has a readily available fire extinguisher in case of an emergency. In previous practice, it was not available. Furthermore, the readily available fire suppression provided by the cart mitigates institutional legal risks associated with surgical fires. This reduced response time mitigates the potential for severe burns and subsequent complications, including infection, extended hospital stays, and mortality.

Implications for Perioperative Nursing

Most of our potential fires were airway fires occurring during tracheostomies. The first defense is to smother the fire with a moist saline or a wet towel. If an extinguisher is needed, a CO2 type is used as it will not contaminate the surgical site with fine powder like an ABC extinguisher would (ECRI, 2009). The Anesthesia Patient Safety Foundation also notes that CO2 extinguishers are highly effective for airway fires (APSF, 2011)

- Before any bedside procedure, perioperative nurses should conduct a proactive fire risk assessment to identify hazards and create a procedure-specific fire safety plan.
- Nurses should advocate for and utilize specialized fire safety protocols and equipment, like mobile CO2 extinguisher carts, for bedside procedures outside of the operating room.
- Nurses must ensure that appropriate fire suppression equipment is immediately accessible whenever an electrosurgical device is used at the bedside.
- Perioperative nurses should participate in ongoing fire safety education and hands-on competency validation to ensure they can effectively prevent and manage a fire.
- Nurses need to be prepared with adaptable fire safety plans and deployable equipment to safely manage surge capacity situations that may increase the frequency of bedside procedures.

References Available Upon Request