Introduction

The purpose of this study was to educate OR staff (physicians, nurses, anesthesia, surgical technologists) at Maple Grove Hospital (MGH) in Maple Grove, MN to the dangers of inhaling surgical smoke. A PowerPoint presentation and poster were developed to educate OR staff and surgeons about the dangers of surgical smoke inhalation on both staff and patients. A 10-question post-survey showed an understanding of the dangers of the inhalation of surgical smoke and consensus for protective equipment for patients and staff. This knowledge will be presented to hospital leadership to guide recommendations for purchase of surgical smoke evacuation devices.

Background

SURGICAL SMOKE

A by-product of the thermal desiccation of tissue (such as by cautery or laser)

Contains over 150 toxic chemicals, bacteria and viruses

Documented to be dangerous to those who inhale it

(Surgeon using cautery)

A PowerPoint presentation was shown to the OR staff and physicians at MGH (3 staff meetings and 2 Surgery Committee meetings).

2 poster presentations were also shown to staff, and left in the staff and physician lounges.

A post-survey was given to confirm knowledge of the risks of smoke inhalation, and demonstrate support for new policy

The results of the survey will be shared with hospital leadership to support recommendations for regulation and use of surgical smoke evacuation devices.

Methods

Knowledge disseminated through presentations and posters highlighting results of peer reviewed research articles delineating the known toxic chemicals of surgical smoke.

5 PowerPoint presentations were shown to the OR staff and physicians at MGH (3 staff meetings and 2 Surgery Committee meetings).

2 poster presentations were also shown to staff, and left in the staff and physician lounges.

A post-survey was given to confirm knowledge of the risks of smoke inhalation, and demonstrate support for new policy

The results of the survey will be shared with hospital leadership to support recommendations for regulation and use of surgical smoke evacuation devices.

Discussion

The post-survey results show the staff and physicians at MGH are now aware of:

- the risks of inhaling plume from surgical smoke and lasers;
- OSHA and AORN recommendations that health care organizations should provide a surgical smoke free environment;
- peer-reviewed, evidence-based guidelines for patient and staff safety.

This supports the recommendation that MGH leadership initiate a trial of smoke evacuation devices to be used during surgical cases requiring electrosurgical cautery.

Post-Survey Results

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>PERCENT CORRECT *</th>
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</thead>
<tbody>
<tr>
<td>Surgical smoke contains which of the following chemicals (select all that apply)</td>
<td>100%</td>
</tr>
<tr>
<td>Surgical smoke contains an estimated 150 chemicals</td>
<td>100%</td>
</tr>
<tr>
<td>A seminal study found that smoke generated from an electrosurgical unit on 1g of tissue is the equivalent of smoking __ unfiltered cigarettes (multiple choice)</td>
<td>99%</td>
</tr>
<tr>
<td>Standard surgical masks are effective at filtering smoke when worn correctly (true / false)</td>
<td>100%</td>
</tr>
<tr>
<td>AORN recommends that perioperative team members should use the following method to evacuate smoke (multiple choice)</td>
<td>99%</td>
</tr>
<tr>
<td>Hazards to perioperative team members health, when exposed to surgical smoke, are categorized as __ (multiple choice)</td>
<td>100%</td>
</tr>
<tr>
<td>Researchers who implanted samples of surgical smoke in the lower backs of mice in a 2015 study found __ (multiple choice)</td>
<td>99%</td>
</tr>
<tr>
<td>In a study of awake patients undergoing Moh's surgery, % of the patients reported awareness of a burning odor when the surgical team was not evacuating surgical smoke, and % of patients reported the same awareness when the surgical team was evacuating smoke (multiple choice)</td>
<td>100%</td>
</tr>
<tr>
<td>In a study of surgical smoke absorption during laparoscopic surgery, the chemical __ increased threefold in the urine of 82 patients who underwent laparoscopic surgery (multiple choice)</td>
<td>100%</td>
</tr>
<tr>
<td>Maple Grove Hospital should mandate the use of smoke evacuation equipment during surgery (yes / no)</td>
<td>95% yes; 3% undecided (surgeon); 1% no (surgeon)</td>
</tr>
</tbody>
</table>

* n = 100 (95% response rate)

65 OR staff (RN, Surgical Tech, Anesthesia Provider) ; 35 Surgeons

References


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