# Tracking Surgical Smoke Evacuation after Education: A Model for Improvement

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## Introduction

- The goal of this improvement project is to implement the Association of Perioperative Registered Nurses (AORN) Go Clear Award Recognition to educate perioperative personnel about the hazards of surgical smoke.
- 150 chemicals have been found in surgical smoke.
- Surgical smoke is as mutagenic as cigarette smoke, and the smoke produced can equal 27-30 cigarettes based on the surgical case.
- Carcinogenic components reach lower bronchioles of the lungs and increases risk for cardiovascular disease.
- Viable tumor cells are produced in the surgical smoke from tumor dissection.

**Figure 1.** Watch me! Video Clip depicting the effectiveness of surgical smoke evacuation.

## Method

**Participants**: Anesthesiologist, Certified Registered Nurse Anesthetist, Registered Nurses, Surgical technicians.
**Sampling**: Direct Observation
**Independent Variable**: Education about health hazards of surgical smoke
**Dependent Variable**: Implementation of smoke evacuation equipment.

**Methods**: The Go Clear Award Compliance Audit Form was used to record all audits for surgical cases.

| COMPLIANCE AUDIT METRICS | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Surgical smoke is evacuated on any smoke generating procedure with smoke evacuator, laparoscopic filter, and suction with inline filter. | The smoke evacuation device is positioned as close as possible to the generation of surgical smoke, within two inches. | An additional standard suction is used to evacuate fluid. | Perioperative team members wear personal protective equipment to dispose of contaminated filters and smoke supplies. | Smoke evacuation filters are used according to manufacturer's directions for use (eg, single use). |

Figure 2. Go Clear Award Compliance Audit Form.

## Evaluation Framework


Health Belief Model.


PDSA Cycle: Plan, Do, Study, Act

## Procedure

**Step 1**: Discussed plan with stakeholders such as Nurse Manager and Chief of Anesthesiology.
**Step 2**: Performed a gap analysis at the hospital in the Northeast United States.
Step 3: Held kick-off meeting for staff to describe the Go Clear Smoke Recognition Program initiative.
**Step 4**: A pre-education compliance audit was performed in the operating room for a 30 day period.
**Step 5**: Enrolled staff in AORN online educational module database.
**Step 6**: During an educational hour, staff completed the AORN educational module on the health hazards of surgical smoke.
Step 7: After education, a 30-day compliance audit was performed.

## Results

- The implementation of smoke equipment increased from 77% pre-education to 90% post-education.
- The total number of staff educated was 70% as of March 1st, 2025.
- The Chi Squared p- value result was 0.166, the null hypothesis can not be rejected.

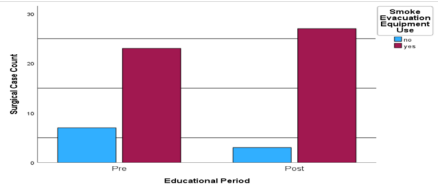


**Figure 3.** The y-axis represents the count of surgical cases , while the x-axis shows pre- and post-education periods..

## Conclusion

- Implementing the Association of Perioperative Registered Nurses Go Surgical Smoke Free Recognition Program was successful at a hospital in the Northeast United States.
- It is recommended that surgical smoke evacuation be implemented during all open and laparoscopic surgeries that create surgical smoke.
- It is recommended to use a N95 or high filtration surgical mask during surgeries to avoid surgical smoke exposure.

## Significance

- The Go Clear Award Recognition Program has been implemented in 79 hospitals, and 18 states have passed legislation making it mandatory for all operating rooms to have adequate evacuation systems.
- Implementing this program protect staff and patients from potential health hazards in the operating room.
- Future direction: It is important to create hospital and state policies. Future goals would focus on creating legislation that mandates the proper removal of surgical smoke in all operating rooms in the United States.

## Acknowledgements

Authors Note: There are no conflicts of interest to disclose

I would like to thank my advising committee; Dr. Elwell, Dr. Padula, and Avery for their support and edits throughout my DNP journey. I would like to thank Brian Robbery and Liz Ionelli for assistance with the operating room implementation. Finally, thank you to Dr. Walsh for helping me organize the and analyze my data.

## References:

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