

Implementation of Smoke Evacuation Cautery in the OR: An Evidence-based Practice Improvement Project

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BACKGROUND

- Electrocautery smoke is produced when devices such as a bovie or cautery pencil are used in the operating room (OR) setting to stop bleeding and/or incise tissue. The high energy generated by these devices raises tissue temperature, causing tissue vaporization, which then creates surgical smoke (Ogg, 2020).
- Surgical smoke exposure has negative health consequences for OR personnel.
- Surgical smoke contains toxic chemicals and by-products and can contain viable malignant cells, viruses, and bacteria.
- Over one-third of the United States has smoke evacuation mandates enacted or pending.

LOCAL PROBLEM

- Currently, the state of Tennessee has no regulatory standards that directly require surgical smoke evacuation, and hospitals and/or surgery centers are responsible for enacting smoke evacuation policies (Limchantra et al., 2019).
- Project Purpose: Create and implement a smoke evacuation policy, educate OR personnel on the health hazards of electrocautery plume and proper smoke evacuation device use, and acquisition of smoke evacuation equipment.
- Project Aim: Reduce surgical smoke exposure to OR personnel at the surgery center as measured by an increase in smoke evacuation cautery compliance.

METHODS

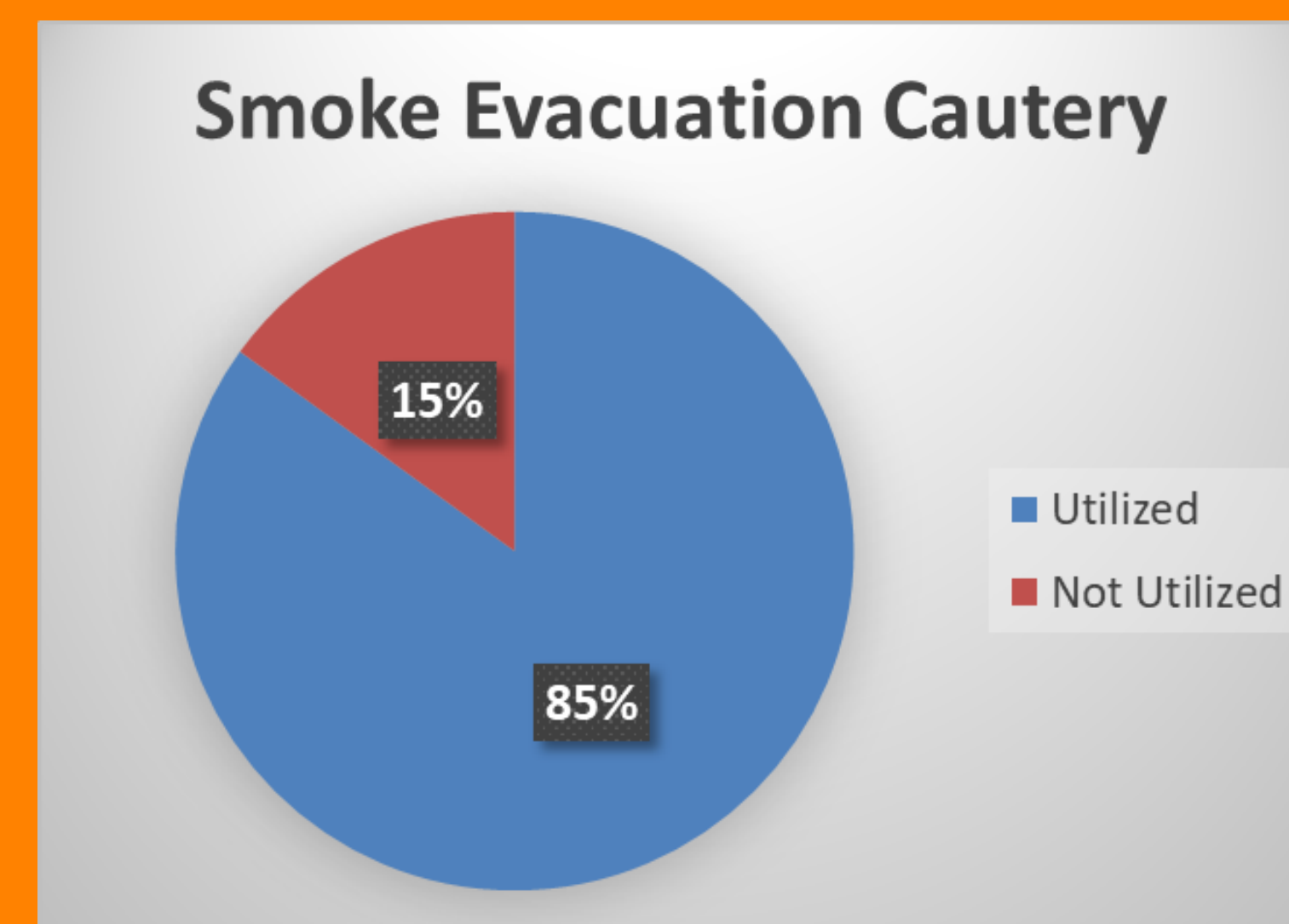
- The Model for Improvement (Plan-Do-Study-Act) was utilized to guide the project.
- Smoke evacuation cautery use and/or compliance was measured for surgeon 1 and 2.
- Perioperative personnel participation in knowledge pre-test, education, training, and competency verification on smoke evacuation cautery use.
- Perioperative personnel participation and satisfaction through the PDSA process.

Smoke Evacuation Cautery Compliance

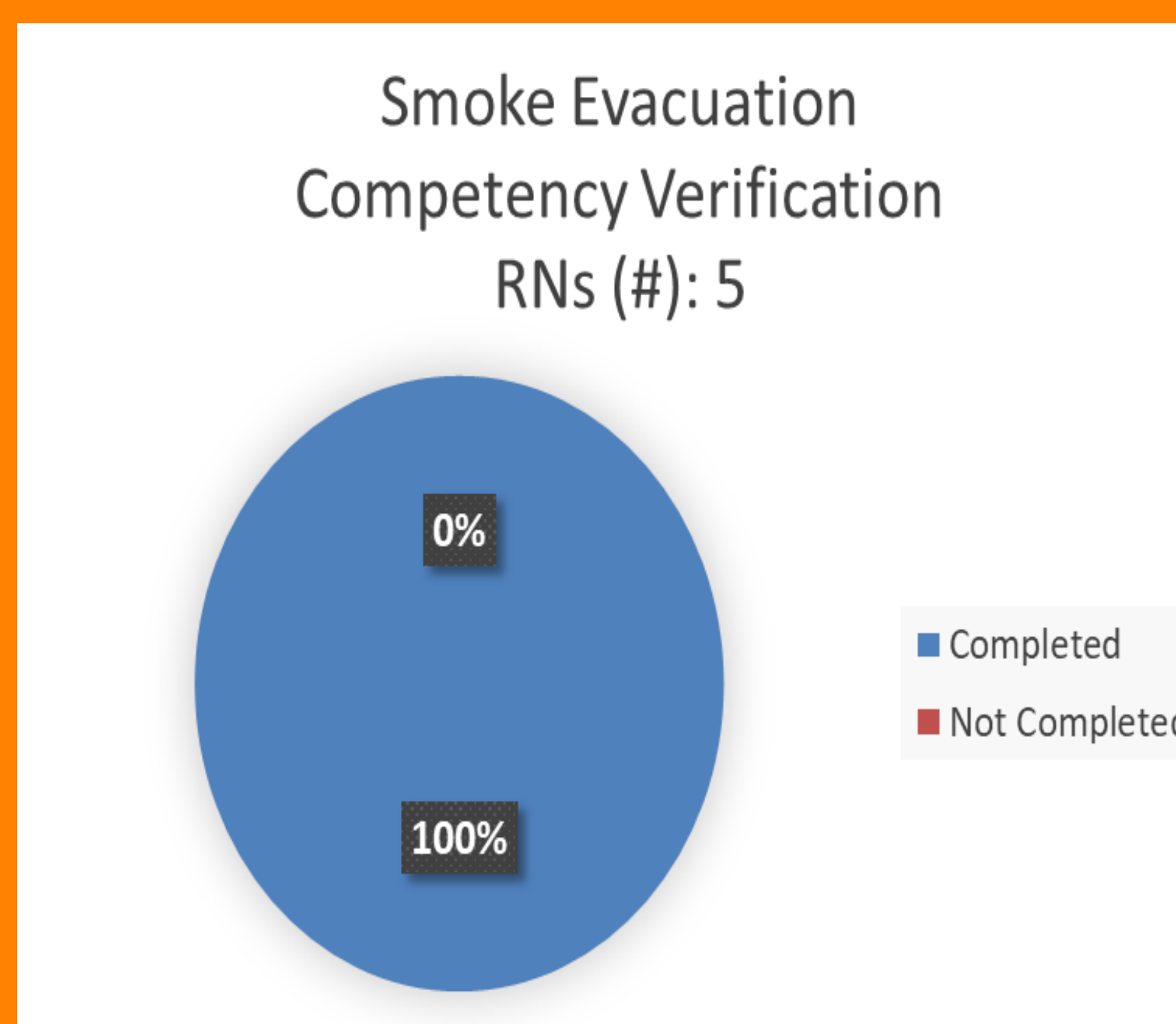
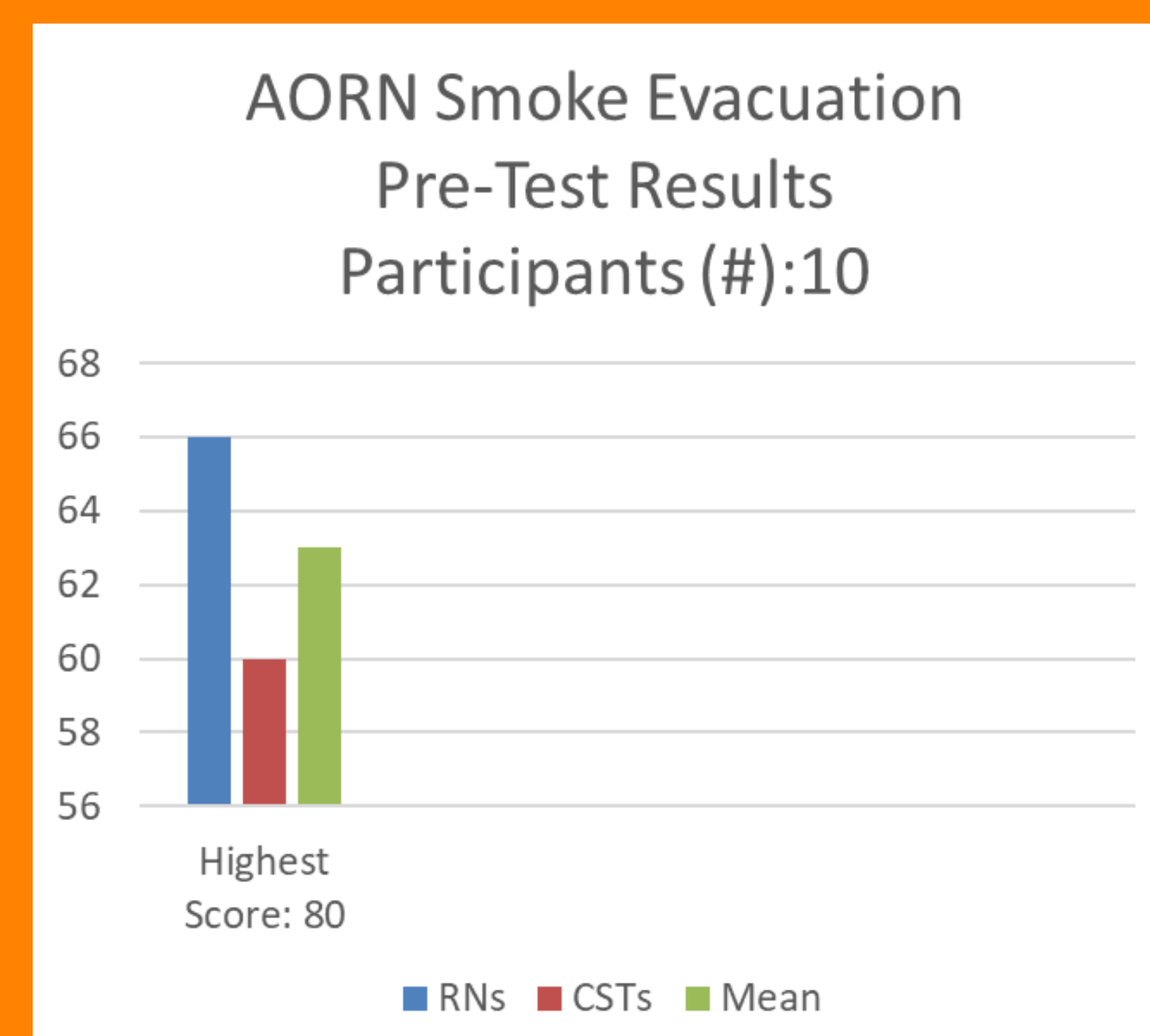
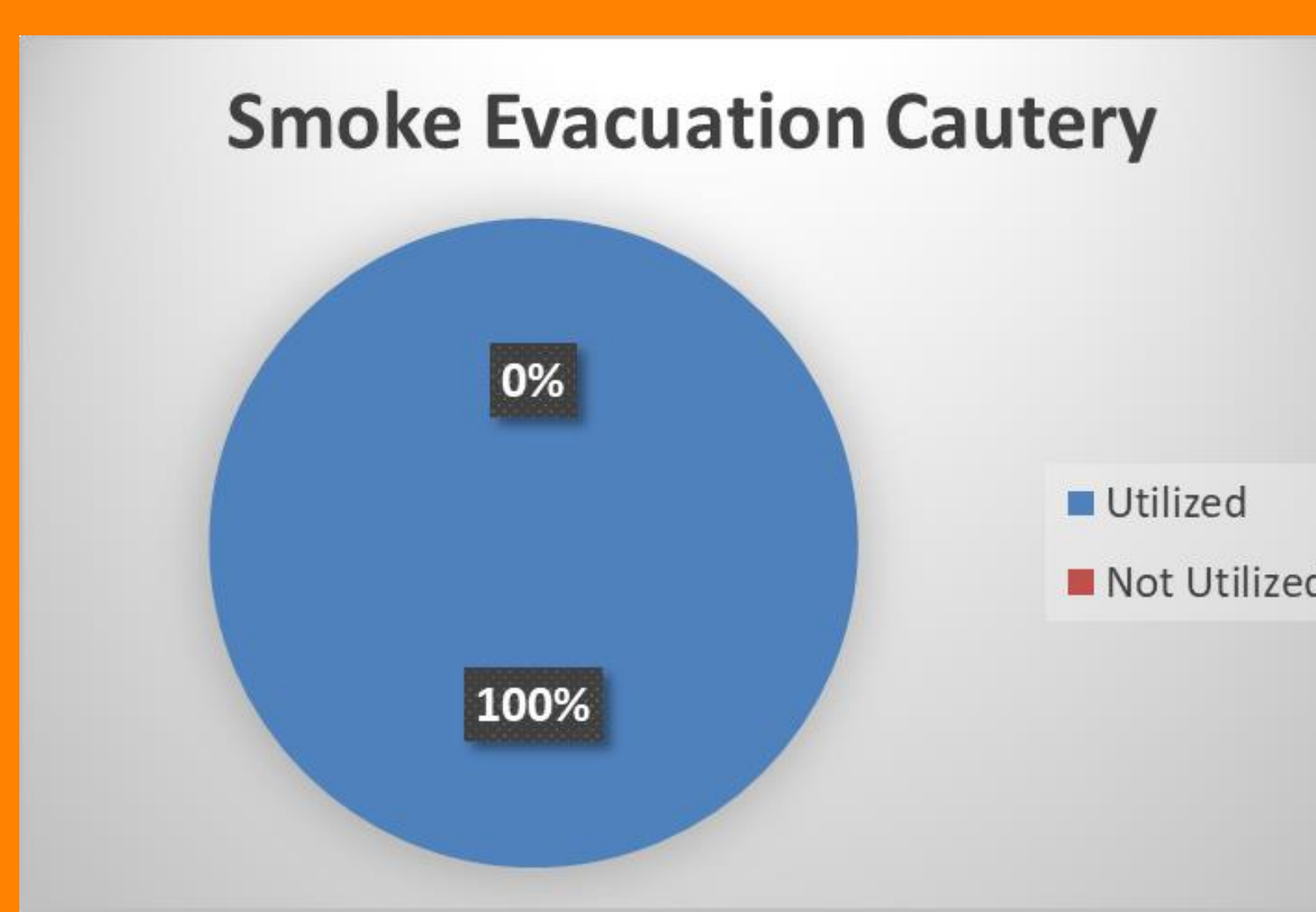
Surgeon 1: 85%

Surgeon 2: 100%

Surgeon 1



Surgeon 2



INTERVENTIONS

- Pre-test completed to assess OR staff knowledge on smoke evacuation and hazards of cautery smoke.
- OR staff participation in smoke evacuation education sessions.
- Smoke evacuation device use competency verification tool completed by OR circulators.
- Utilized smoke evacuation cautery in place of standard cautery for surgeon 1 and surgeon 2 for all mastectomy cases.
- Created a smoke evacuation policy template for the ASC to utilize if TN enacts smoke evacuation legislation.

RESULTS

- Surgeon 1: Utilized smoke evacuation cautery for 85% of mastectomy cases. Surgeon 1 did not continue to utilize smoke evacuation.
- Surgeon 2: Utilized smoke evacuation cautery for 100% of plastics cases. Surgeon 2 continues to utilize smoke evacuation cautery for all cases.
- A smoke evacuation policy was created to be utilized if Tennessee enacts smoke evacuation legislation.
- RN circulators completed smoke evacuation cautery competency,
- OR staff (RNs & CSTs) participated in smoke evacuation education sessions.
- Quality Assurance Performance Improvement (QAPI) initiative.

CONCLUSIONS

- Utilizing smoke evacuation cautery reduces perioperative personnel and patient exposure to hazardous surgical smoke contents, complaints of malodorous smoke from patients and staff, and personnel exposure to undeclared viruses and/or malignancies.
- Sustainability and smoke-free ORs will prepare the project site if state laws mandate smoke evacuation in Tennessee.

