## Abstract

Electrocautery surgical procedures are performed frequently in the United States. The exposure of smoke generated from surgical energy-based instruments such as the electrocautery, laser tissue ablation, and ultrasonic scalpel tissue dissection during surgery produce high levels of toxic, hazardous smoke, putting operating room (OR) personnel at a dangerous health risk. These instruments cauterize vessels and destroy tissue, and the fluid and blood produce gaseous material known as a smoke plume. There is a direct relationship during electrocauterization surgery between carbon monoxide released in the air and OR personnel experiencing nausea and headaches. Historically, air conditioning systems and natural face masks were believed to protect OR personnel from the dangerous smoke contaminate in the OR air. Currently, research has determined these items are not enough to shield and protect OR personnel from the smoke contaminated environment. There have been complaints of headaches, nasal drip, nausea, burning eyes, and colds lingering for an extended period of time. These symptoms are rarely reported to employee health. (Bree et al., 2017; Fencil, 2017; Wang et al., 2015; Shultz, 2014). Current wall suction evacuation systems used in ORs do not have adequate airflow to capture the smoke plume. Previously, researchers suggested that only team members at the direct surgical site were exposed. However, new research has proven that all members of the surgical team within the OR are exposed to a similar level of surgical smoke (Watson, 2015; York & Autry, 2018). The purpose of this project is to control smoke in the ORs, with a smoke evacuation system (SES) that can capture smoke plume efficiently to improve air quality.

Smoke exposure is a health hazard for OR personnel. Surgical smoke contents are described as being toxic. The primary concern is that smoke plume will continue if

electrocauterization devices are used and will continue to expose OR personnel to smoke hazards (Watson, 2015).

*Surgery Smoke Plume, Health Hazards, Smoke Evacuation System, Operating Room Experience*