Testimony on Ohio Senate Bill 86

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Chairman Huffman, Vice Chair Johnson, Ranking Member Antonio, and members of the Senate Health Committee.

Thank you for allowing me to testify today in strong support of Senate Bill 86. My name is Dr. Kay Ball and I have been a perioperative (surgical) nurse for over 48 years. I'm currently a perioperative consultant and an adjunct professor of nursing at Otterbein University.

Surgical smoke is created when human tissue is coagulated, cut, or ablated using an energy device, such as electrosurgery or laser. In other words, it's the smoke from burning flesh or burning tissue. And about 1 million healthcare providers are exposed to surgical smoke each year.

Surgical smoke is hazardous to the surgical team and to the patient. It contains carcinogenic and mutagenic cells and over 150 hazardous chemicals (very similar to what is found in cigarette smoke). It contains toxic gases and vapors, such as benzene (which is a known trigger for leukemia), hydrogen cyanide, formaldehyde (which can cause nasal cancer), bioaerosols, dead and live cellular material, blood fragments, and viruses. Surgical smoke also contains ultrafine particles in which 77% are less than 1.1 microns in size. For comparison, a strand of human hair is about 70 microns in size. Research has shown that exposure to particles less than 10 microns in size can lead to asthma and chronic obstructive pulmonary disease. Research shows that the average daily impact of surgical smoke on the surgical team is the equivalent to inhaling the smoke of 27-30 unfiltered cigarettes.

Research studies have demonstrated the transmission of viruses (eg, human papilloma virus) in surgical smoke to health care providers. So this continues to be a major concern with COVID-19 still lurking around today. Even the American College of Surgeons has recommended that it's members evacuate surgical smoke to prevent exposure to COVID when surgery is performed on COVID positive patients..

In addition to the danger to health care workers, surgical smoke can cause cancer cells to metastasize to an incision site during laparoscopic procedures on patients having cancer removed (better known as "port site metastasis"). Patients also can absorb the contaminants of surgical smoke during laparoscopic procedures causing problems such as nausea, headaches, and double vision in recovery. Patient safety is also a concern when the presence of surgical smoke obstructs the surgeon's vision of the target site. Babies born by C-section when electrosurgery is used can breathe in their mother's surgical smoke at birth. Aesthetically, that's an awful image to envision.

Surgical smoke can be controlled through cost-effective smoke evacuators that effectively and efficiently rid the air of the hazardous ultrafine particles and toxic gases in the smoke. Contaminated surgical smoke evacuation devices (like the collection device, tubing, and filters)

are disposed of as hazardous waste in proper disposal containers. Controlling surgical smoke does not require construction costs or changes to the facility's HVAC system or general room ventilation.

Exposure to surgical smoke is a workplace safety hazard for surgical team members. My PhD research that was published in 2010 demonstrates that nurses who work in surgery report twice the incidence of respiratory problems as compared to the general population. Similar research that I conducted was published in March 2022 and resulted in the same outcomes. So twelve years have passed and nurses are still reporting respiratory problems. This is a workplace safety issue that must be addressed ***now***. One nurse in my recent survey wrote, "I've been a surgery nurse for 49 years. I scrubbed and circulated every day…I had to leave my job because I became asthmatic at work and my doctor advised me NOT to work in surgery where smoke was not evacuated." Another wrote, "When I was a floor nurse, I didn't have any respiratory issues and my allergies were much better. Since I've started in to OR, my respiratory issues have dramatically increased." I've attached other comments made by nurses who participated in my research. I have a colleague in Atlanta who is a Gynecology Registered Nurse First Assistant. Because of her respiratory problems, she was told by her doctor that she can't work in surgery unless smoke evacuation devices are available and used. Nurses are leaving the OR because of hazards like this.

Since my second survey was conducted during April 2020, when the COVID-19 pandemic was starting to peak, many nurses commented that they fear that the COVID-19 virus may be transmitted within surgical smoke. SAGES, the Society of American Gastroenterologists and Endoscopic Surgeons, in March of 2020, even published a paper on the need to control surgical smoke during laparoscopic procedures. But this is merely a recommendation. Other organizations have made recommendations, like the Association of periOperative Registered Nurses, but that's not enough. We need legislation. One orthopedic surgeon, who performed both of my total hip replacement procedures, told me that he'll evacuate surgical smoke when there is legislation in Ohio. So the passage of Senate Bill 86 is vital.

In an Ohio survey, only 20% of the perioperative nurses said that surgical smoke is always evacuated. And only 36% responded that their facility has a policy to control surgical smoke. Senate Bill 86 will address these shortfalls as hospitals and ambulatory surgery centers will be required to simply adopt and implement a policy to prevent human exposure to surgical smoke by using appropriate smoke evacuation systems.

Thank you for your attention to this workplace safety hazard and for your support for Senate Bill 86. I'd be glad to answer any questions you may have about my testimony or my research on the hazards of surgical smoke.

Narrative nursing comments representing common shared themes from Kay Ball's research: "A Mixed Method Survey on the Impact of Exposure to Surgical Smoke on Perioperative Nurses" (2020)

SMOKE	EYE	PLUME	NURSE	COVID
I have a goal to leave OR nursing in 5 years because I will not continue to be exposed to surgical **smoke**…it is upsetting no one cares enough to address this well documented problem out of complacency.	I also have noticed dull head pain and increased dry **eyes**.	Our healthcare workers health is on the line every day being exposed to these hazards of surgical **plume**!	Circulating **nurse** station in all four O.R.s is directly in front of outtake air exchange vent.	Most interestingly, in consideration of the current situation with **COVID**-19, people are embracing the practice of smoke evacuation with even greater vigor!
…my chest would get super tight during and after the cases because of **smoke** plume.	For a few days it made my **eyes** water and gave me some sinus-like symptoms.	At the time I was using nasal inhalers routinely and would need to leave the room to cough (at the beginning of totals) because of bronchospasm from his smoke **plume**.	I've been in a surgery **nurse** for 49 years. I scrubbed and circulated every day…I had to leave my job because I became asthmatic at work and my PCP advised me not to work in surgery where smoke was not evacuated.	…our physicians don't believe that surgical smoke is a problem, but they have sure insisted on it since this **COVID** pandemic!
Since I have learned more about surgical **smoke** exposure, I am becoming aware of different symptoms that I didn't have before…	It doesn't take long before I feel sick in those cases. It will trigger a migraine, cause a tight chest with difficulty breathing, nose starts running, **eyes** get watery, nausea, and coughing. The terrible odor generated from the case can even be smelled in the Preop/PACU areas.	At the time I was using nasal inhalers routinely and would need to leave the room to cough (at the beginning of totals) because of bronchospasm from his smoke **plume**.	As **nurse** educator my office is 50 yards from the surgical suites. Prior to our efforts to reduce surgical smoke there was often severe odor all the way down that hall and easily smelled in my office.	Now we are experiencing **COVID**-19, our facility manager has required us to use a smoke evacuator for each case.
I believe the OR environment exacerbates my recurrent sinusitis/allergies…The surgical **smoke** triggers coughing spells.	Despite having a mask on, the surgical smoke can sometimes exacerbate dry cough, and	If there is a lot of smoke **plume** coming from the field, I cough and have watery eyes. I am a circulator, so I	When I was a floor **nurse**, I didn't have any respiratory issues and my allergies were much better. Since I've started in to	We were about to start a staff nurse-driven trial of smoke evac systems when **COVID** 19 began. Now all are very

	irritation of my **eyes**.	leave the room if this occurs.	OR, my respiratory issues have dramatically increased.	interested in smoke evac because of it.
Today, whenever there is a cigarette smoker around or the pollen is bad, my chest tightens up and I think to myself, "Is it because of the past 19 years being exposed to **smoke** plume?"	I believe I have decreased sense of smell and dry **eyes** related to surgical smoke.	…in addition to bovie smoke and laser we are also exposed to **plume** smoke from laparoscopic ports.	My mother was an OR **nurse** and died from pulmonary fibrosis.	I've been trying to implement a SE (smoke evacuation) program at our facility for years, without administrative support. Now with **COVID**-19, they are starting to see their liability with not providing a SE system.
I've worked with a general surgeon… who had throat cancer related to surgical **smoke** exposure. Diagnosed 2018.	When I first began working in the operating room, I noticed a sensitivity to surgical smoke... it made my **eyes** water and gave me some sinus-like symptoms.	In my present job when I circulate or scrub cases with **plume** from either bovie or CO2 laser I have a terrible headache by midmorning.	As a circulator, I am further away from the smoke than the surgeons and scrub **nurses**. We have tried to implement a "smoke free" environment; however, the surgeons are not all on board.	Our facility has never had a smoke evacuation system until the **COVID**-19 pandemic.
I have history of environmental allergies. I believe the surgical **smoke** exacerbated this condition.	I was frequently working in plastic surgery room where a large volume of smoke was generated. I had frequent headaches, tearing **eyes**, cough. These symptoms are much better now with the smoke evacuation program in place.	Every state needs to mandate that the smoke evacuation bovies are used on every case all the time. Our healthcare workers health is on the line every day being exposed to these hazards of surgical **plume**!	I had a coworker who died from lung cancer at age 35, she was an OR **nurse**. Another one was diagnosed with brain cancer, another one breast, another one uterine cancer, all OR **nurses**. A neurosurgeon I worked with is currently being treated for laryngeal cancer.	We just started adding surgical smoke evacuation tools to every case since the **COVID**-19 pandemic started as surgical smoke can aerosolize the virus. I am surprised we are just doing this now. It makes me wonder what else we have been exposed to.