Our Journey to Pass a Surgical Plume Evacuation Law

How a nurse-led coalition effected change in Illinois

ABSTRACT

Surgical plume is produced when heat-generating instruments are used to cut, cauterize, or vaporize tissue during surgery. Surgical plume can rapidly diffuse, and without the use of plume evacuators to ensure it is captured, filtered, and removed, health care workers and patients are at risk for inhalation exposure to airborne contaminants, including smoke and biological hazards. The use of surgical plume evacuators in health care facilities is inconsistent across the United States. This article describes the experience of two nurses who led a grassroots coalition to pass a surgical plume evacuation law in Illinois. It also outlines strategies they used in the legislative process that nurses can apply to their own efforts to advocate for health policy change at the state level.

Keywords: advocacy, health policy, leadership, nurses, policy, surgical plume

Despite being members of one of the largest and most trusted U.S. professions,[1,2] nurses have minimal involvement in health policy advocacy at the state and federal levels.[2-5] Barriers to nurses' political engagement include a lack of knowledge about the legislative process and its complexities, work and family life demands, and a lack of confidence in effecting policy change.[3]

However, the American Nurses Association's *Code of Ethics for Nurses with Interpretive Statements* affirms that nurses have a responsibility to participate in health policymaking and advocacy.[6] Likewise, the American Association of Colleges of Nursing's *Essentials: Core Competencies for Professional Nursing Education* includes health policy and advocacy as required competencies in undergraduate and graduate nursing curricula.[7] The American Organization for Nursing Leadership suggests that nurse leaders participate in health care policy creation by contacting legislative officials and joining professional organizations.[8] The National Academy of Medicine's 2021 report *The Future of Nursing 2020–2030: Charting a Path to Achieve Health Equity* also calls for nurses to be politically active to advance health, noting that nurses are "bridge builders" who can effectively work with policymakers.[9]

Opportunities exist for nurses to be politically active by using their voice and expertise to create awareness, educate, build relationships with legislators, and collaboratively implement policy changes through the legislative and regulatory processes in their states. In 2020, the two of us, both perioperative nurses, formed an Illinois-based grassroots coalition to address surgical plume evacuation—a safety issue affecting both health care workers and patients. Together, we led advocacy efforts to achieve passage of a surgical plume evacuation law in our state. This article discusses the hazards of surgical plume exposure and the importance of surgical plume evacuation laws, our coalition's development and vision, the process of getting the law passed, and the strategies we used to effectively advocate for change.

BACKGROUND

Surgical plume is produced when heat-generating surgical instruments like photothermal lasers, ultrasonic instruments, and electrosurgical devices are used to cut, cauterize, or vaporize tissue,[10] which occurs in

nearly all surgical procedures.[11] The heat generated from these devices causes the tissue cells to erupt and release their contents.[12] Surgical plume can rapidly diffuse throughout the room, and without the use of plume evacuators to ensure it is captured, filtered, and removed, health care workers and patients are at risk for inhalation exposure to a range of well-documented contaminants.[13-16] Researchers have identified the following hazardous contents in surgical plume: carcinogenic compounds such as benzene and toluene; carbon monoxide; and biological hazards such as bloodborne pathogens, cell fragments, bacteria, HIV, and human papillomavirus.[17-20] Surgical masks have been found to be ineffective at filtering out the harmful particles contained in the plume.[18]

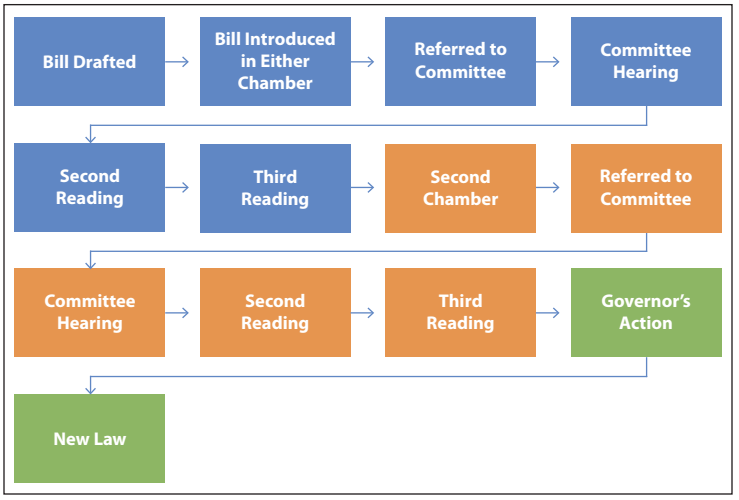
Surgical plume evacuation legislation. Despite numerous studies highlighting the risks of surgical plume exposure, the use of surgical plume evacuators as a safety measure is inconsistent across the United States. Without laws requiring their use, the practice of evacuating surgical plume is at the discretion of individual providers and facilities. In a 2021 policy analysis, Vortman and Thorlton noted a lack of universal plume evacuation policies and practices at individual health care facilities, and that not all facilities evacuate plume; they therefore recommended that states enact surgical plume evacuation laws.[21] Professional organizations such as the Association of periOperative Registered Nurses (AORN) and the International Council on Surgical Plume have made addressing surgical plume exposure a legislative priority and recommend plume evacuation to protect health care workers and patients.[22, 23]

OUR VISION

A coalition is a group of individuals interested in a common goal. Coalitions are formed to address an urgent issue, empower people, provide services, and create real change.[24] Grassroots coalitions involve using a collective voice to implement change, are driven by decisions made from the bottom up, and encourage participation from community members.[25] The goal of our grassroots coalition was to eliminate surgical plume exposure in every surgical workplace in Illinois.

Prior to forming our coalition in March 2020, unbeknownst to each other, we had both been working toward the enactment of surgical plume evacuation legislation. One of us, PJS, had written letters to Illinois's governor and state legislators—including State Senator Julie Morrison—asking for their support for a plume evacuation bill. After PJS attended a virtual town hall held by State Senator Morrison, for which she had submitted a question calling attention to the bill, Morrison contacted her and agreed to sponsor it. Morrison and her staff worked with PJS to write the bill. On February 14, 2020, SB 3753, A Bill Amending the University of Illinois Hospital Act, was introduced in the Illinois General Assembly.[26] The bill required hospitals and ambulatory surgery centers to adopt policies to evacuate surgical plume produced by the use of energy-based devices. However, in March 2020, the COVID-19 pandemic halted government activities and ended further legislative movement on the bill.

Figure 1. The Legislative Process in Illinois[28]



A bill passed by the Illinois General Assembly (both House and Senate) becomes law when the governor signs it or fails to act within 60 days. Each bill is assigned a bill number: HB indicates a bill that originated in the House; SB indicates a bill that originated in the Senate. If a bill is vetoed by the governor, it can become law if both chambers of the Illinois General Assembly vote by a two-thirds majority to override the governor's veto.

At the same time, RKV had conducted a policy analysis to identify policy options and feasible recommendations to address surgical plume evacuation.[21] Based on her findings, she decided to contact state and national professional nursing associations and urge them to advocate for a surgical plume evacuation law in Illinois. RKV began searching for colleagues in Illinois also interested in advocating for such a law. Through the power of networking, we connected.

Together, we have over 50 years of perioperative nursing experience, and PJS specializes in surgical plume consulting and advocacy. We discovered that our ideas, spheres of influence, and personal networks were compatible and complementary. To merge our efforts and leverage our individual resources, we decided to co-lead the grassroots coalition to advocate for surgical plume evacuation legislation in Illinois.

We aimed to build a robust campaign based on 1) evidence about the hazards of surgical plume and 2) surgical plume evacuation consensus standards from national and international agencies. Although national associations have been at the forefront of efforts to pass plume evacuation legislation in other

states, we recognized the value of local leadership and advocacy. From prior experience, we knew that legislators like to work with their constituents and are more likely to develop closer relationships with community-based advocates. We decided our coalition would not use lobbyists, lawyers, or support from special interest groups; thus, the legislation would be free from out-of-state influence and exclusively serve Illinois health care professionals and patients.

THE BILL'S BEGINNINGS

Because the pandemic halted the 2020 Illinois General Assembly session and progress on SB 3753, we decided to restrategize and prepare to reintroduce the bill in the January 2021 session. With the assistance of State Senator Morrison and her staff, on February 26, 2021, the new bill, SB 1908, was introduced.[27] To follow is an overview of the process we followed and the strategies we employed to achieve passage of the bill.

Learning the process. To lead a grassroots initiative, coalition leaders must understand the legislative process in the state where the advocacy work is performed. Every state's legislative process differs. We sought to learn about the process in Illinois by exploring the Illinois General Assembly website and the resources provided by the Illinois office of the American Nurses Association. (For a brief overview of Illinois's legislative process, see Figure 1.[28]) In preparation for the 2021 legislative session, we gathered facts about the legislative process and familiarized ourselves with the political terminology we would need to talk to legislators.

Writing letters. Prior to forming the coalition, PJS used letter writing as a strategy to seek sponsorship for the bill, and we continued to write letters throughout the process to ask legislators for their support. Letters to legislators are most effective when they include positive statements, impactful words, specific and concise language, an attention-grabbing question in the opening paragraph, and strong supportive evidence. The letter should clearly explain the issue at hand. In the closing paragraph, it is imperative to state the intended action to be taken by the legislator, such as agreeing to serve as a sponsor or cosponsor, or to vote yes on the bill.[29]

Sponsorship. A bill's sponsor takes responsibility for introducing the bill and getting it passed. Cosponsors can help create awareness of the bill, explain its details to their colleagues, and garner support for it—which leads to less debate and quicker movement of the bill through the legislative process. Coalition leaders can identify potential sponsors and cosponsors by researching their state senators' and representatives' backgrounds, assigned committees, and political views. In our case, after State Senator Morrison agreed to sponsor the bill, another state senator, Laura Murphy, volunteered to cosponsor it. When the bill later moved to the House chamber, State Senator Morrison secured sponsorship from State Representative Angelica Guerrero-Cuellar and cosponsorship from another state representative, Natalie Manley. We developed close working relationships with our sponsors and their staffers, who kept us updated on the process, what we needed to do, and what to expect at committee hearings. Our grassroots approach of leading the advocacy efforts ourselves—without lobbyists or special interest groups—helped us develop trust with the legislators and staff.

BROADENING THE COALITION AND BUILDING RELATIONSHIPS

Based on our observations of other states' efforts to pursue surgical plume evacuation legislation, we noticed that nurses acted as the primary advocates for this legislation. However, because surgical plume exposure affects all individuals in the perioperative environment, we decided to take a multidisciplinary approach by inviting other health care stakeholders, such as hospital and ambulatory surgery administrators, risk management professionals, surgeons, anesthesia clinicians, and surgical scrub technicians, to join us. To find potential coalition members, we contacted colleagues, current and past employers, and relevant professional associations like the Association of Surgical Technologists and the Ambulatory Surgery Center Association. We distributed an evidence packet on surgical plume to interested stakeholders and held virtual presentations about the hazards of plume exposure and mitigation strategies.

Because our efforts took place during the pandemic, we communicated with our coalition members through e-mail, text, virtual meetings, and phone calls. We sent frequent updates on the bill's status, dates of upcoming open hearings, voting results, and questions posed by legislators, and thanked them for their support. We encouraged them to write letters to legislators urging them to support the bill. We welcomed their input, questions, ideas, and concerns, and asked them to spread the word about the bill to their colleagues.

We also regularly communicated with professional organizations that had a vested interest in the work. For example, we joined AORN's monthly government affairs conference calls to update AORN members across the state and the nation on our progress and to offer insight into what aspects of our efforts were working well. Likewise, we provided updates to the Illinois Council of periOperative Registered Nurses, the Ambulatory Surgery Center Association, and to AORN chapters in Illinois and other states. We also held one-on-one virtual meetings with AORN members interested in pursuing legislation in their own states.

MAKING A CASE

When bills pass through the legislative process in the Illinois Senate and House chambers, each chamber holds committee hearings in which committee members read and debate bills and witness testimony is

provided.[28] We were invited to attend every committee hearing and were asked to provide testimony and respond to legislators' questions.

Creating evidence packets. We created an evidence packet for the legislators in preparation for committee hearings that presented information on surgical plume and its hazards, research and standards that supported the proposed legislation, and copies of our testimony. We included summaries of recent consensus-based surgical plume safety standards and practices from national and international government agencies and organizations and the hierarchy of research evidence.[17, 30-36] We also included a one-page fact sheet that briefly explained the surgical plume problem and how the bill would address it (see *Surgical Plume Evacuation Fact Sheet*). We distilled the information into key bullet points, keeping each point concise to hold the reader's attention. Our contact information was provided at the end of the fact sheet.

Prior to the committee hearings, which occurred virtually because of social distancing mandates, we e-mailed the evidence packets to the bill sponsors and their staff to distribute to the committee members.

Writing and delivering testimony. As coalition leaders, we prepared and delivered oral and written testimony at the committee hearings in both chambers (see http://links.lww.com/AJN/A252). We learned that written testimony is typically about five typed paragraphs, while oral testimony is shorter and delivered in two to three minutes. We used several techniques to deliver effective testimony (see *Tactics for Delivering Oral and Written Testimony*). In both forms of testimony, we first thanked the committee chair and members, introduced ourselves, and then explained the purpose of the bill. We kept to the key points, avoided unnecessary information, and refrained from using excessive medical or technical terminology. We spoke and wrote with passion and energy. We informed the committee why the proposed legislation was needed and assured them that feasible, reliable, and cost-effective solutions were available to fix the problem. We concluded by asking for yes votes and thanked the committee for their time and for the opportunity to discuss the issue. We also made sure to stay within the allotted time frame for oral testimony given by the chair of the committee.

Witness slips. Witness slips are an electronic form of documentation in which individuals or groups declare a position on a particular bill, whether as a proponent, in opposition, or neutral. Witness slips can be submitted online on the Illinois General Assembly's website ahead of a hearing. The witness slips are then counted and read at hearings when bills are debated in the House and Senate chambers; legislators take note of the number of witness slips submitted in support of or in opposition to a bill.

Surgical Plume Evacuation Fact Sheet

It's Time to Ensure "Clean Air" in the Operating Room

Surgical Smoke Plume Evacuation—SB 1908
Requires hospitals and ambulatory surgery centers in Illinois to adopt policies to ensure the mitigation of surgical smoke with an appropriate evacuation system for every procedure that generates surgical smoke plume as a result of the use of energy-based devices including electrosurgery units and lasers.

Background:
- Surgical plume is the vaporization of substances (e.g., tissue, fluid, blood) into a gaseous form and is a byproduct of surgical instruments used to destroy tissue (e.g., lasers, electrosurgery units).
- In states without surgical plume evacuation legislation, it is up to the health care facility to implement surgical smoke evacuation policies and procedures. Individual choice often results in noncompliance and puts staff at risk on a daily basis.
- Patients, perioperative team members, observers, and anyone entering an operating room where surgical plume is present are at risk for exposure to its associated hazards.

Risks of Exposure to Surgical Plume:
- Surgical plume contains a variety of contaminants that are harmful to the surgical team and patients.
- In vitro studies of bacterial and viral contamination have found viable *Escherichia coli*, *Staphylococcus aureus*, human papillomavirus, hepatitis viruses, human immunodeficiency virus, and the potential for the presence of SARS-CoV-2 and variants in surgical plume, as well as toxic substances such as benzene, toluene, carbon monoxide, formaldehyde, and hydrogen cyanide.
- Surgical plume can also contain aerosolized blood (plasma, cells, or fragments of cells) and bloodborne pathogens.

Health Consequences from Exposure:
- Surgical plume can cause ocular and upper respiratory tract irritation, releases a noxious odor during surgery, creates visual problems in the surgical field, and has mutagenic and carcinogenic potential.

Recommendation:
- Passage of ***SB 1908 Surgical Smoke Plume Evacuation*** in Illinois, to ensure statewide compliance with a requirement for surgical plume evacuation in every operating room and during every surgical procedure where energy-based devices are used.

For more information, contact:
Penny Smalley, RN, CMLSO, pennyjs@aol.com
Rebecca Vortman, DNP, RN, CNOR, NEA-BC, rvortm2@uic.edu

We asked our coalition members to submit witness slips on the Illinois General Assembly website as proponents of the bill and to encourage their colleagues to do the same. We gave them instructions on how to access the site and prepare and submit the slips. We monitored the witness slips, which are posted publicly, to identify unknown proponents and opponents. We were fortunate that very few opponents emerged. None of the handful of opponents offered any written statements or opposition testimony during the hearings.

Social media. While social media can be used to gain community support and is widely used for political advocacy, it can also swiftly derail a policy initiative. We conducted a risk assessment on the use of social media as a tactic to seek support for our bill and decided not to use it. Because surgical plume evacuation is a debated and controversial topic—despite its national and international support as a standard of practice[17, 30]—and we understood there could be groups in the state opposed to the bill, we felt it was unnecessary to bring attention to the legislation through social media. Therefore, we asked our coalition members to avoid social media attention on SB 1908 to help the bill move through the legislative process as quickly as possible.

Tactics for Delivering Oral and Written Testimony

- Timing is essential: ask how much time is allotted to speak. Practice your testimony and ensure it fits that time frame.
- Give yourself time to revise your testimony.
- Print your written testimony in a large, bold font for ease of reading.
- Send copies of your testimony to the committee members the day before the hearing.
- Address your testimony to the chair (Madame Chair, Chairman) and committee members.
- Begin by thanking those present and introduce yourself with your key affiliation.
- Speak or write with passion and energy. Make your testimony personal.
- Explain why the subject is important, who it affects and how, why the bill is needed, what solutions it provides, and the expected outcomes.
- When speaking, pause between ideas and emphasize key points.
- Address only critical information.
- Avoid using technical medical terminology.
- Use powerful verbs and state exactly how you want the committee to vote.
- Look directly at the chair while speaking, especially when making key points.
- End your testimony by asking for a yes vote and thank the committee for the opportunity to address them.

NEW KNOWLEDGE

During our advocacy journey, we learned new terms such as *bill analysis*, *agreed bills list*, and *consent calendar*. The purpose of a bill analysis, which is typically conducted early in the legislative process, after the bill is drafted but before it is introduced, is to explain how the bill would change existing law and to identify the cost and operational considerations should the bill be enacted.[37] The analysis helps determine which committees will hear the bill (for example, our bill was not assigned to the appropriations committee because our bill analysis claimed no significant financial impact). State Senator Morrison's legislative team asked us, as content experts, to contribute to writing this analysis. When the bill moved to the House, we helped to review and revise the bill analysis to be sure it was consistent with the analysis written for the Senate.

In the Senate chamber, the agreed bills list is a list of bills that have no opposition—so the bill is expected to pass when it is called to the floor for a vote.[37] Likewise, in the House chamber, the consent calendar is a list of uncontroversial bills and resolutions for which no debate is needed.[37] SB 1908 made it to both the agreed bills list and the consent calendar. This was because we had great support from our coalition; strong, impactful proponent testimony; no opposition testimony; and dedicated bill sponsors and their staffers, who advocated behind the scenes for the votes needed both during committee hearings and on the floors of the Senate and the House.

ACHIEVING PASSAGE

SB 1908 received unanimous support in both chambers and was signed into law by Illinois's governor on August 20, 2021, three months after its introduction.[27] The original University of Illinois Hospital Act was now modified by Public Act 102-0533, containing the new section on surgical smoke plume evacuation. (For a complete overview of the bill's progression through the Illinois General Assembly, see http://links.lww.com/AJN/A249.) Our team affirmed that nurses could use their knowledge and expertise to effect change. Our coalition's work provides an example to the nursing community of how to become politically engaged and enact state-level policy change.

The successful passage of SB 1908 happened because the leaders and members of the coalition were dedicated and committed. As coalition leaders, we were usually available at a moment's notice, worked daily on the legislative goal, and recognized that our leadership was a dynamic and fluid process.

IMPLICATIONS AND RECOMMENDATIONS

We recommend that nurses interested in leading a coalition to support surgical plume legislation—or any legislation—visit their state legislature's website and learn how the legislative process works in their

state. Nurses interested in advancing practice through making or amending policy should conduct an assessment to determine the status of any existing or pending legislation by searching their state legislature's website for relevant bills. Aspiring nurse advocates may find it beneficial to work with experienced mentors and collaborators and partner with organizations that share a similar stance or legislative agenda.

Since surgical plume evacuation laws are state based, it is important that coalitions include state advocates with knowledge and expertise on the management of surgical plume. As was the case in Illinois, legislators wanted to hear from their constituents. Building strong relationships between the coalition and state-based professional organizations is also critical.

When pursuing surgical plume evacuation legislation, it's wise to take a multidisciplinary approach that engages not only perioperative nurses but also the entire surgical team. We recognized that nurses were not the only members of the surgical team affected by surgical plume exposure; therefore, we strived to include other health care workers as part of the coalition.

During the legislative process, nurses can identify groups opposed to a bill by monitoring witness slips. Based on our observations, stakeholder groups opposed to legislation often post legislative updates on their websites encouraging their members to vote against a bill. Nurses and coalition leaders can explore these websites; read posted announcements, meeting minutes, and agendas; and attend open meetings to learn why the group is opposed to the legislation. Next, they can schedule a time to meet with the group's leaders, offer education, and share their perspective to facilitate mutual understanding.

Beyond passage. As explained by Patton and colleagues, policy and advocacy work are never done even after a law has passed.[38] A law could be rescinded or intentionally or unintentionally ignored—for instance, due to inadequate funding at health care facilities to support compliance with the law or a lack of willingness to comply. Additionally, the regulations established for compliance may fall short of what was originally intended in the law. Outcomes of new laws should be evaluated.[38]

As such, since the enactment of the revised law, we have continued our advocacy work by being involved in the regulatory process, which begins after a law is passed. When SB 1908 was enacted, the Illinois Department of Public Health was appointed as the regulatory agency to develop the rules for compliance. These rules were proposed in committee, discussed, and drafted for public comment. We participated in the rule-making process by attending committee meetings and providing expert recommendations to ensure the intent of the law was represented in the rules. The criteria required to prove health care facilities' compliance with the law included proof of implementation of a policy to evacuate surgical plume, and proof of staff education and training on operating the evacuation equipment as well as how to properly protect perioperative personnel from bloodborne pathogens when handling plume evacuation tubing, filters, and absorbers. Once the public comments were reviewed and the rules were approved internally, the final rules were published in September 2022. Health care facilities in Illinois were expected to be in compliance by December 1, 2022.

CONCLUSION

Our coalition established a strong mission and vision, applied evidence to solve a practice problem, and effected change by taking action through legislation. Enacting surgical plume evacuation legislation is an important step in protecting the health and safety of perioperative teams and patients. Our success in Illinois increases the possibility that more states will adopt similar legislation. ▼

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Rebecca K. Vortman is a clinical assistant professor in the Department of Population Health Nursing Science at the University of Illinois Chicago College of Nursing in Springfield. Penny J. Smalley is a Chicago-based independent nurse consultant and director of education and regulatory affairs for the International Council on Surgical Plume. Contact author: Rebecca K. Vortman, rvortm2@uic.edu.
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