Guideline for Surgical Smoke Safety Evidence Review and PRISMA

Evidence Review

The Guideline for Surgical Smoke Safety was approved by the AORN Guidelines Advisory Board and became effective as of October 14, 2021.

A medical librarian with a perioperative background conducted a systematic search of the databases Ovid MEDLINE, Ovid Embase, EBSCO CINAHL, and the Cochrane Database of Systematic Reviews. The search was limited to literature published in English from **January 2015 through June 2020**. At the time of the initial search, weekly alerts were created on the topics included in that search. Results from these alerts were provided to the lead author until **April 2021.** The lead author requested additional articles that either did not fit the original search criteria or were discovered during the evidence appraisal process. The lead author and the medical librarian also identified relevant guidelines from government agencies, professional organizations, and standards-setting bodies.

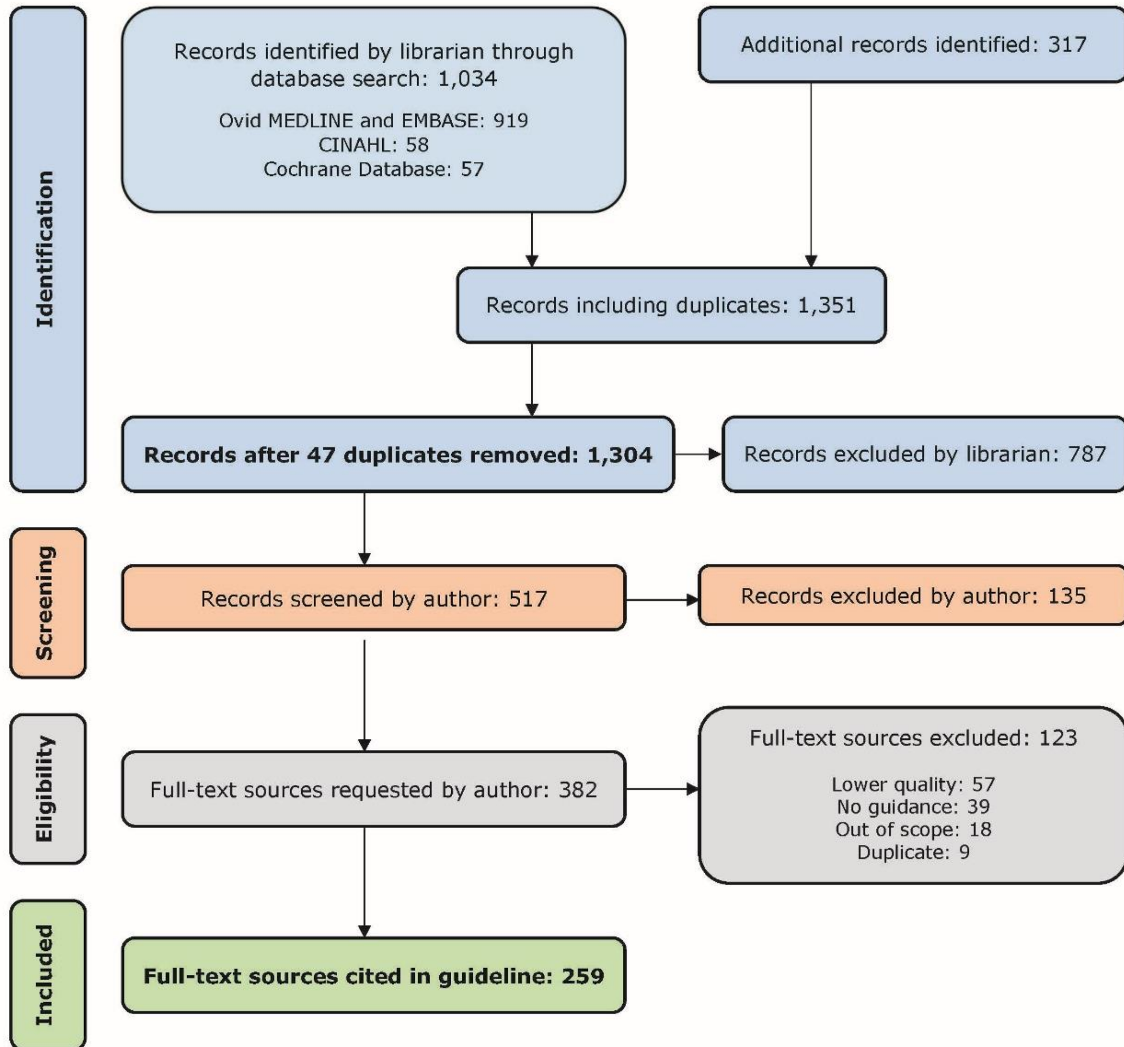
Search terms included *(active or passive) [close to] filtration, aerosol generating procedures, aerosol generating procedures and (surg* or device or instrument), air pollutants (occupational), bacterial aerosols, bioaerosol*, cautery and (surg* or device or instrument), cautery smoke, coronavirus infections, COVID-19, diathermy, diathermy and (surg* or device or instrument), diathermy fume, diathermy mist, diathermy plume, diathermy smoke, diathermy (surgical) and (surg* or device or instrument), dissection, dissection and (surg* or device or instrument), (electrosurg* or laser or ultrasonic) and (surg* or device or instrument), electrocautery, electrocautery and (surg* or device or instrument), electrocautery exhaust, electrocautery fume, electrocautery mist, electrocautery plume, electrocautery smoke, electrocoagulation, electrocoagulation and (surg* or device or instrument), electrostatic precipitation, electrosurg*, electrosurg* and (surg* or device or instrument), electrosurg* exhaust, electrosurg* fume, electrosurg* mist, electrosurg* plume, electrosurg* smoke, HIV, human immunodeficiency virus, human papillomavirus, laparoscopy, laparoscopy and (surg* or device or instrument), laser exhaust, laser fume, laser mist, laser plume, laser smoke, laser surgery, laser surgery and (device or instrument), laser therapy smoke, lasers, lasers and (surg* or device or instrument), local exhaust ventilation, occupational air pollutants, occupational hazards, operative procedures, operative procedures and (surg* or device or instrument), Papillomaviridae, particulate matter, (smoke or aerosol) [close to] evacuation, (surgery, operative+) and smoke, smoke extract*, smoke inhalation injury, surg* fume, surg* mist, surg* plume, surg* smoke, surgical procedures (operative) and smoke, surgical smoke precipitator, tissue ablation, tissue ablation and (surg* or device or instrument), (ultrastatic or ultrafine) [close to] particulate, viral aerosols,* and *virus aerosols.*

Included were research and non-research literature in English, complete publications, and publications with dates within the time restriction when available. Excluded were non-peer-reviewed publications and older evidence within the time restriction when more recent evidence was available. Editorials, news items, and other brief items were excluded. Low-quality evidence was excluded when higher-quality evidence was available, and literature outside the time restriction was excluded when literature within the time restriction was available. Citations from the original guideline were retained when newer research was not available or the citations remained relevant in explaining the rationale for a practice recommendation **(Figure 1)**.

Articles identified in the search were provided to the project team for evaluation. The team consisted of the lead author and three evidence appraisers. The lead author divided the search results into topics and assigned members of the team to review and critically appraise each article using the AORN Research or Non-Research Evidence Appraisal Tools as appropriate. The literature was independently evaluated and appraised according to the strength and quality of the evidence. Each article was then assigned an appraisal score. The appraisal score is noted in brackets after each reference, as applicable.

Each recommendation rating is based on a synthesis of the collective evidence, a benefit-harm assessment, and consideration of resource use. The strength of the recommendation was determined using the AORN Evidence Rating Model and the quality and consistency of the evidence supporting a recommendation. The recommendation strength rating is noted in brackets after each recommendation.

Figure 1: PRISMA 2009 Flow Diagram



Adapted from Moher D, Liberati A, Tetzlaff J, Atman DG; The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. PLoS Med. *2009;6(6):e1000097.*

Publication History

- Originally published December 2016 in *Guidelines for Perioperative Practice* online.
- Evidence ratings revised and minor editorial changes made to conform to the current AORN Evidence Rating model, September 2019, for online publication in *Guidelines for Perioperative Practice.*
- Revised in October 2021 for online publication in Guidelines for Perioperative Practice.

Scheduled for review in 2026.