

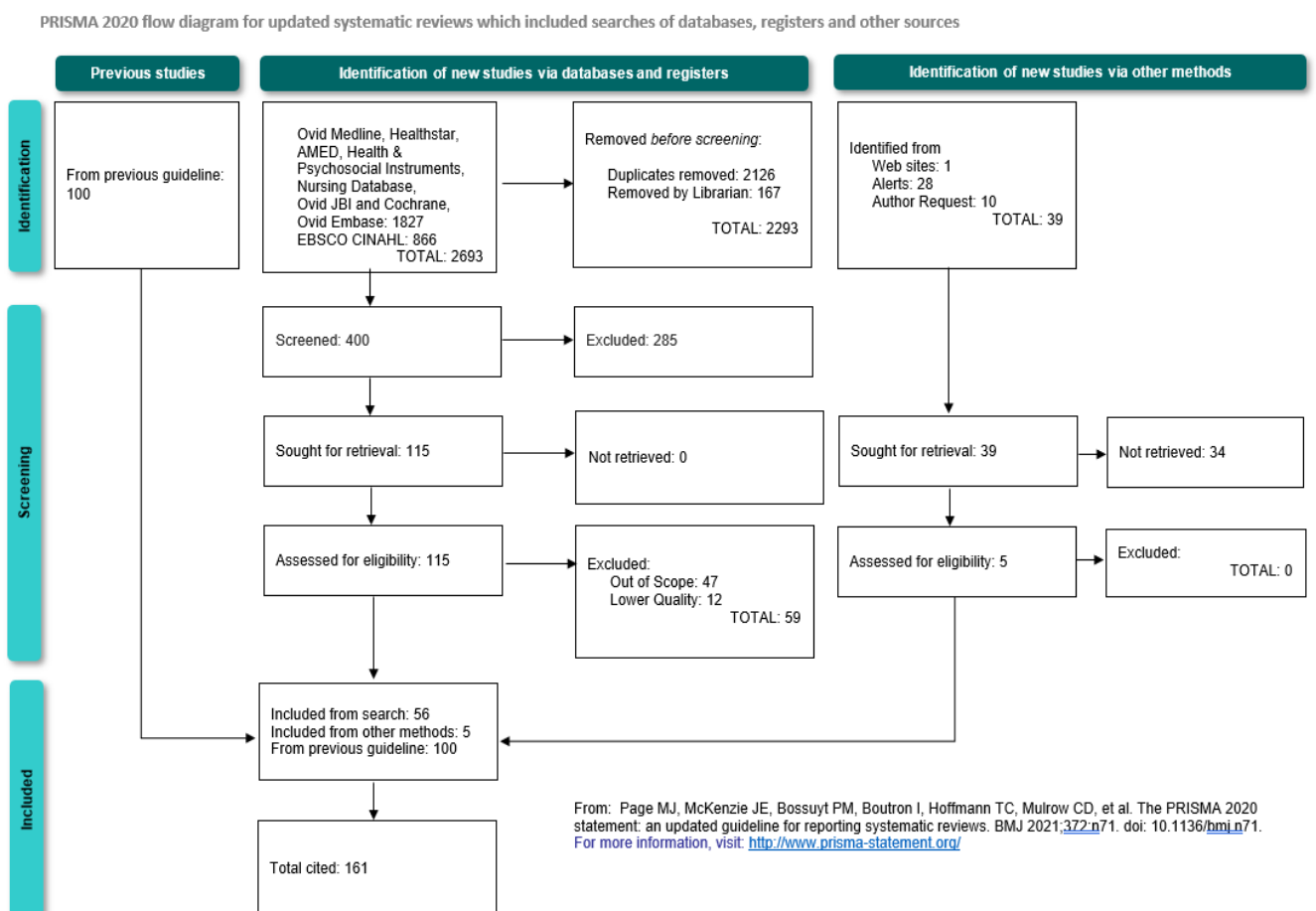
EVIDENCE REVIEW

The Guideline for Care and Cleaning of Surgical Instruments was approved by the AORN Guidelines Advisory Board and became effective October 16, 2025.

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 October 2019 through October 2024. 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 2025. 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.

Included were research and non-research literature in English, complete publications, and publications with dates within the time restriction when available. Historical studies were also included. 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. Articles identified in the search were provided to the project team for evaluation. The team consisted of the lead author and one evidence appraiser. The lead author and the evidence appraiser reviewed and critically appraised each article using the AORN Research or Non-Research Evidence Appraisal Tools as appropriate. A third appraiser was consulted if there was a disagreement between the lead author and the primary evidence appraiser. 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. See the PRISMA 2020 flow diagram (Figure 1) below for more information about the systematic review and nature of included studies and resources.

Figure 1: PRISMA 2020 Flow Diagram



On November 19, 2024, a medical librarian with a perioperative background conducted searches for relevant publications on websites of organizations selected by the author (including government departments). Full details of these supplementary searches is included in the Supplementary Content on the aorn.org web site. These results were also screened by two screeners: the medical librarian, and then the lead author.

On October 28, 2024, a medical librarian with a perioperative background conducted a systematic search of 18 health science databases, the names and date coverage of which are given in Table 1. These results were screened by the medical librarian, and then the lead author.

Table 1: Databases searched and coverage

Database	Database Coverage
AORN Full Text Journals@Ovid	
Books@Ovid	October 28, 2024
JB I EBP Database	Current to October 23, 2024
EBM Reviews: ACP Journal Club	1991 to October 2024
EBM Reviews: Cochrane Central Register of Controlled Trials	September 2024
EBM Reviews: Cochrane Database of Systematic Reviews	2005 to October 30, 2024
EBM Reviews: Cochrane Clinical Answers	October 2024
EBM Reviews: Cochrane Methodology Register	3rd Quarter 2012
EBM Reviews: Database of Abstracts of Reviews of Effects	1st Quarter 2016
EBM Reviews: Health Technology Assessment	4th Quarter 2016
EBM Reviews: NHS Economic Evaluation Database	1st Quarter 2016
AMED (Allied and Complementary Medicine)	1985 to September 2024
Embase	1974 to October 31, 2024
Health and Psychosocial Instruments	1985 to October 2024
Ovid Healthstar	1999 to September 2024
Ovid MEDLINE(R) ALL	1946 to October 31, 2024
Ovid Nursing Database	1946 to October Week 4 2024
CINAHL Complete via EBSCOhost	1937 to Current

Search strategy development process: The medical librarian referred to a search strategy used for the previous Guideline. A draft search strategy was developed using terms listed in the previous strategy and additional search terms identified from a meeting with the lead author. Using the MeSH Subject Headings database, additional search terms were identified and added to the search strategy. The strategy was limited following the constraints in the eligibility criteria outlined by the lead author.

Editor’s note: MEDLINE is a registered trademark of the US National Library of Medicine’s Medical Literature Analysis and Retrieval System, Bethesda, MD. Embase is a registered trademark of Elsevier B.V., Amsterdam, The Netherlands. CINAHL, Cumulative Index to Nursing and Allied Health Literature, is a registered trademark of EBSCO Industries, Birmingham, AL.

Search Strategies

Ovid (Medline, Cochrane, and Embase)

1 ("instrument disinfectant" or Pretreatment or "point of use" or "Delays in cleaning" or "pretreatment delay" or "dried matter on instruments" or biofoul or Tristel).ti,ab,kw. or ("bacterial adhesion" or biofilms).de,sh,hw. or bacteria/gd or "bacterial load"/st or endotoxins/st, ae, to or (enzymatic and (spray or gel or foam or detergent)).ti,ab,kw. 416375

- 2 (((sterile or ionized) adj1 water) or "instrument air").ti,ab,kw. or "water microbiology"/st or "water supply"/st 17216
- 3 ("cart washers" or Impingement or ultrasonic or "washer disinfectant" or "washing system" or brush\$).ti,ab,kw. 322031
- 4 ("toxic anterior segment syndrome" or "viscoelastic material" or "toxic endothelial cell destruction" or ((ophthalmic or phacoemulsification) and (handpiece or instrument))).ti,ab,kw. or Ophthalmologic Surgical Procedures/is 3343
- 5 ("case cart" or "robotic instruments" or "powered surgical equipment" or "arthroscopic shavers" or "rigid endoscopes").ti,ab,kw. or laryngoscopes/mi, st or "robotic surgical procedures"/is or (Transport\$ and "surgical instruments").ti,ab,kw. or ((loan\$ or lend\$ or vendor or representative) and instruments).ti,ab,kw. 7381
- 6 (("cross infection" or "equipment contamination" or "surgical wound infection") and (corro\$ or leach\$ or Humid\$ or Pit\$ or rust)).ti,ab,kw. or "cross infection"/pc, su, tm or "equipment contamination"/ae, pc, st or "surgical wound infection"/pc, tm 108244
- 7 Humipak.mv,ti,ab,kw. 0
- 8 "antineoplastic agents"/ae, po, to, st, ip or "creutzfeldt-jakob syndrome"/pc, su, tm or "prion diseases"/pc, tm or mitomycin/ae, to or (deactivat\$ and ("cytotoxic medication" or chemotherapy or "chemotherapeutic agent" or "antineoplastic agent" or antineoplastics)).ti,ab,kw. 169142
- 9 (instrument adj1 (coating or dipping or drying or marking or tape)).ti,ab,kw. or "surgical instruments"/st, mi, vi or "equipment and supplies"/ec, mi, st, sd 11324
- 10 (magnification or inspection or "cleaning verification" or "insulation test" or "TOSI test" or borescope or "test object surgical instrument" or (magnifi\$ and light\$) or ((protein or hemoglobin) and test\$)).ti,ab,kw. or "adenosine triphosphate"/an, st or "luminescent measurements"/is, mt, st or "microbial sensitivity tests"/is, mt, st 640637
- 11 "occupational hazards".ti,ab,kw. or "occupational exposure"/ae, ec, pc, st, sn or "chemical safety"/is, mt, st, sn or detergents/ae, to, po, st 72115
- 12 (("instrument cleaning" or "instrument processing") and (cadavers or animals)).ti,ab,kw. 0
- 13 ((Ergonomics or "ergonomic assessment") and ("sterile processing" or "instrument processing" or "central processing")).ti,ab,kw. 15
- 14 "adjustable height sink".ti,ab,kw. or (("sterile processing" or "instrument processing" or "central processing").ti,ab,kw. and (lighting or noise).de,sh,hw.) 110
- 15 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 1740267
- 16 ("central services department" or "instrument cleaning" or "instrument processing" or "medical device reprocessing" or "satellite sterile processing" or "sterile processing department").ti,ab,kw. 904
- 17 disinfection/is, mt, st or sterilization/is, mt, st or decontamination/ec, is, mt, st or "risk management"/og, mt, st or "infection control"/ec, is, mt, st or asepsis.ti,ab,kw. 83552
- 18 16 or 17 84314
- 19 15 and 18 25274
- 20 13 or 14 or 19 25399
- 21 alfa m\$.m_auts.585
- 22 ofstead c\$.m_auts. 221
- 23 rutala w\$.m_auts. 1482
- 24 kremer t\$.m_auts. 696
- 25 rojo c\$.m_auts. 407
- 26 weber dav\$.m_auts. 460

27	21 or 22 or 23 or 24 or 25 or 26	3600
28	limit 27 to english language	3387
29	limit 28 to yr="2019 -Current"	880
30	remove duplicates from 29	393
31	from 30 keep	
30,34,118,131,147,150,152,155,171,178,195,214,222,228,239,249,251,296,308,335,344,371,373		
23		
32	from 30 keep 88,120,138-139,158-159,168-170,191,207,215,232,279-280,307,366,381,392	
19		
33	from 30 keep 101,164,176,204,219,224,274,283,288,293,326,337,340,343	14
34	from 30 keep 3,25,156-157,166,183,205,209,211,227,250,287,300,328,339,345,354-355,369,379	20
35	31 or 32 or 33 or 34	76
36	limit 20 to embase records	25386
37	limit 36 to english language	22892
38	limit 37 to medline records	22887
39	limit 38 to yr="2019 -Current"	3490

EBSCOhost (CINAHL)

S23	S20 OR S21	
Limiters - Publication Date: 20190101-20241131; English Language; Peer Reviewed; Exclude MEDLINE records		
		866
S22	S20 OR S21	6,444
S21	AU ofstead, cor* OR AU rutala, william OR AU kremer, terra OR AU rojo, cheron OR AU weber, david OR AU alfa, michelle	288
S20	S13 OR S14 OR S19	6,199
S19	S15 AND S18	6,190
S18	S16 OR S17	20,130
S17	(MH "Sterilization and Disinfection/MT/ST") or (MH "Risk Management/MT/ST") or (MH "Infection Control/EC/MT/ST") or (MH "Asepsis") or "decontamination"	20,017
S16	"central services department" or "instrument cleaning" or "instrument processing" or "medical device reprocessing" or "satellite sterile processing" or "sterile processing department"	180
S15	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12	
		208,117
S14	(("sterile processing" or "instrument processing" or "central processing")) AND ((MH "Noise") OR (MH "Lighting")) OR ("adjustable height sink")	4
S13	((Ergonomics or "ergonomic assessment")) AND (("sterile processing" or "instrument processing" or "central processing"))	5
S12	(("instrument cleaning" or "instrument processing")) AND ((cadavers or animals))	1
S11	(MH "Occupational Exposure/AE/EC/PC/ST") or (MH "Chemical Safety/MT/ST") or (MH "Detergents/AE/PO/ST") or "occupational hazards"	16,270

- S10 (magnification or inspection or "cleaning verification" or "insulation test" or "TOSI test" or borescope or "test object surgical instrument") OR (magnifi* and light*) OR ((protein or hemoglobin) and test*) OR (MH "Adenosine Triphosphate/AN/ST") or (MH "Luminescent Measurements/MT/ST") or (MH "Microbial Culture and Sensitivity Tests/MT/ST") 101,138
- S9 (MH "Surgical Instruments/ST") or (MH "Equipment and Supplies/EC/ST") or (instrument N1 (coating or dipping or drying or marking or tape) 1,663
- S8 (MH "Antineoplastic Agents/AE/PO/ST") or (MH "Creutzfeldt-Jakob Syndrome/PC/SU/TM") or (MH "Prion Diseases/PC/TM") or (MH "Mitomycins/AE") or (deactivat* and ("cytotoxic medication" or chemotherapy or "chemotherapeutic agent" or "antineoplastic agent" or antineoplastics)) 14,126
- S7 Humipak 0
- S6 (MH "Cross Infection/PC/SU/TM") or (MH "Equipment Contamination/AE/PC/ST") or (MH "Surgical Wound Infection/PC/TM") or (("cross infection" or "equipment contamination" or "surgical wound infection") and (corro* or leach* or Humid* or Pit* or rust)) 21,813
- S5 ((MH "Robotic Surgical Procedures") AND instrument*)) or (MH "Laryngoscopy/ST") or (("case cart" or "robotic instruments" or "powered surgical equipment" or "arthroscopic shavers" or "rigid endoscopes") OR (Transport* and "surgical instruments") OR (loan* or lend* or vendor or representative) and instruments)) 3,143
- S4 ((MH "Eye Surgery") AND instrument*) or ((ophthalmic or phacoemulsification) and (handpiece or instrument)) OR ("toxic anterior segment syndrome" or "viscoelastic material" or "toxic endothelial cell destruction") 529
- S3 "cart washers" or Impingement or ultrasonic or "washer disinfectant" or "washing system" or brush* 20,979
- S2 (MH "Water Microbiology/ST") or (MH "Water Supply/ST") or (((sterile or ionized) N1 water)) OR "instrument air" 1,181
- S1 (MH "Biofilms") or (MH "Endotoxins/AE/ST") or (MH "Bacteria") or ("instrument disinfectant" or Pretreatment or "point of use" or "Delays in cleaning" or "bacterial adhesion" OR "pretreatment delay" or "dried matter on instruments" or biofoul or Tristel or "bacterial adhesion") OR (enzymatic and (spray or gel or foam or detergent)) 32,175

Web Searches// All searches conducted in 2024.

11/19: While adding another resource, noticed one from the WHO website. 2] Saved for author screening.

Publication History:

- Originally published February 1988, AORN Journal.
- Revised March 1992.
- Revised November 1996; published January 1997, AORN Journal.
- Reformatted July 2000.
- Revised November 2001; published March 2002, AORN Journal.
- Revised 2007; published in Perioperative Standards and Recommended Practices, 2008 edition.
- Minor editing revisions made to omit PNDs codes; reformatted September 2012 for publication in Perioperative Standards and Recommended Practices, 2013 edition.
- Revised September 2014 for online publication in Perioperative Standards and Recommended Practices.
- Minor editing revisions made in November 2014 for publication in Guidelines for Perioperative Practice, 2015 edition.
- Evidence ratings revised in Guidelines for Perioperative Practice, 2018 edition, to conform to the current AORN Evidence Rating Model.
- 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 October 2020 for online publication in Guidelines for Perioperative Practice.
- Revised October 2025 for online publication in Guidelines for Perioperative Practice, PRISMA 2020 used.