

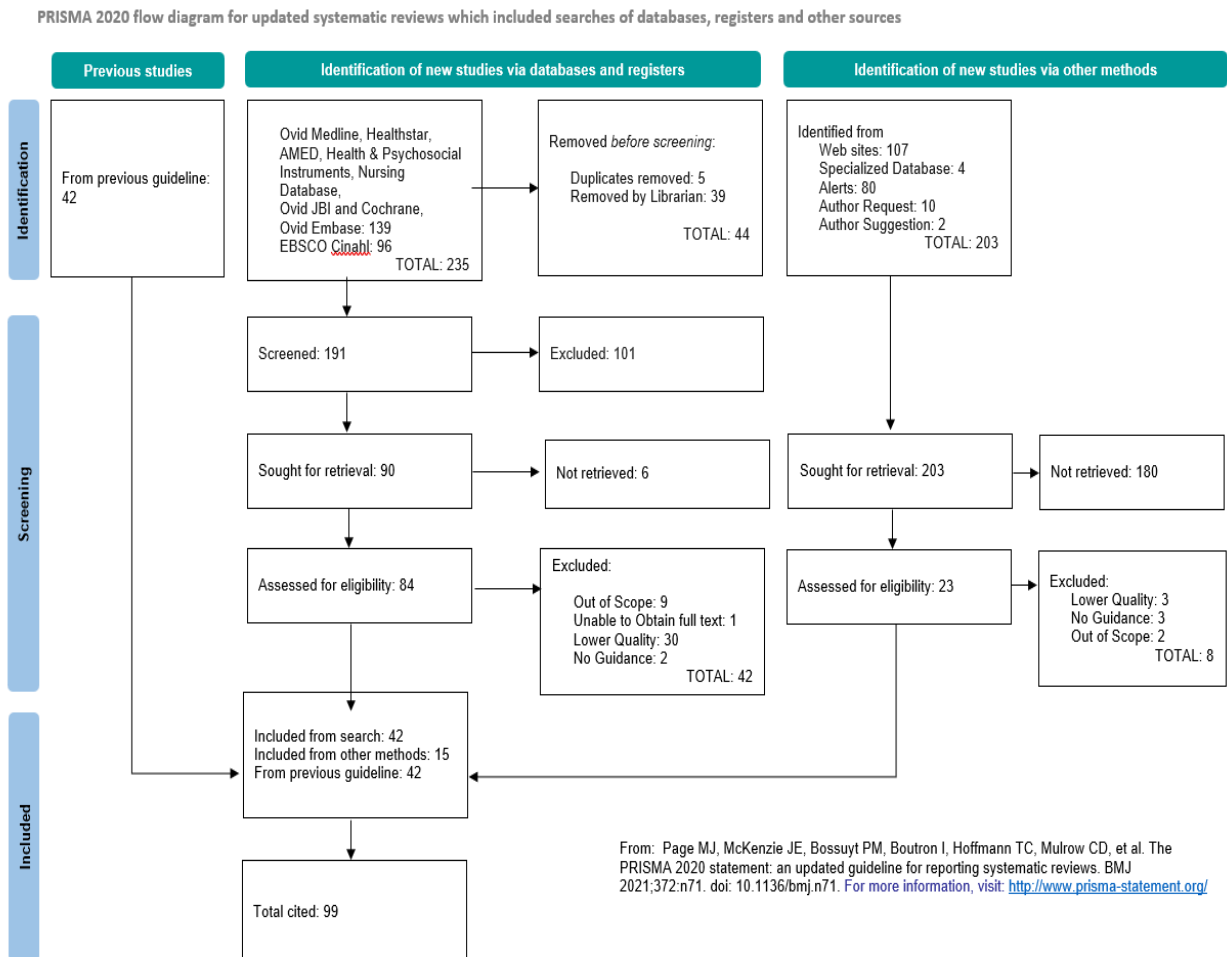
EVIDENCE REVIEW

The Guideline for Sharps Safety was approved by the AORN Guidelines Advisory Board and became effective January 1, 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 January, 2018 through November, 2023. 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 June, 2024. 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 30, 2023, 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 November 27, 2023, a medical librarian with a perioperative background conducted a systematic search of 17 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	Coverage
AORN Full Text Journals@Ovid	November 7, 2023
Books@Ovid	November 7, 2023
JBI EBP Database	Current to November 22, 2023
EBM Reviews: ACP Journal Club	1991 to October 2023
EBM Reviews: Cochrane Central Register of Controlled Trials	October 2023
EBM Reviews: Cochrane Database of Systematic Reviews	2005 to November 15, 2023
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 October 2023
Embase	1974 to 2023 November 28
Health and Psychosocial Instruments	1985 to October 2023
Ovid Healthstar	1902 to 1998, 1999 to August 2023
Ovid MEDLINE(R) ALL	1946 to November 28, 2023
Ovid Nursing Database	1946 to November Week 3 2023
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)

- "Perioperative nursing"/st, sn or Surgeons/sn or "Operating room technicians"/ed, st, sn or "operating room nursing".de,sh,hw. or ("perioperative nursing" or "operating

	room staff" or "Perianesthesia nursing" or "surgical nurse" or "perioperative nurse" or "Scrubbed personnel" or "surgical technologist").ti,ab.	
2	"operating rooms"/st or ("procedure room" or "sterile processing department" or "instrument processing" or "cardiac catheterization laboratory" or "interventional radiology").ti,ab,kw. or ((surgical or endoscopy) and suite).ti,ab,kw. or ((surgical or operating) and theat\$).ti,ab,kw.	44,086
3	1 or 2	68,129
4	(Needles or "surgical instruments" or Sutures or Syringes or "Bone wires" or "surgical stapling").de,sh,hw.	155,371
5	(Sharps or scalpels or "surgical instruments" or sutures or (surgical and (scissors or hooks or staples)) or (hypodermic and (needles or syringe))).ti,ab,kw.	113,648
6	"Infection control"/is or "protective devices".de,sh,hw.	37,579
7	((blunt and tip) adj2 needles) or (safety and (devices or scalpels or "engineered sharps")) or ("hands-free passing" or "neutral zone" or "double gloving" or "protective devices" or "standard precautions") or (("chain mail" or mesh or indicator) and glov\$).ti,ab,kw.	77,686
8	(("virus inhibiting" or "bacteria inhibiting") and glov\$).ti,ab,kw.	9
9	("needlestick injuries" or "blood-borne pathogens" or "universal precautions").de,sh,hw.	17,709
10	((sharps or scalpel) and injur\$) or (recapping or "blood-borne pathogens" or "bloodborne pathogens" or "universal precautions").ti,ab,kw.	14,658
11	(needlestick or "needle-stick" or ((Needlestick or "needle-stick") adj2 injur\$) or (needle and (injur\$ and stick))).ti,ab,kw.	10,201
12	((wire or kirschner or "k-wire") adj (injur\$ or stick)).ti,ab,kw.	1,230
13	("accidents, occupational" or "occupational injuries" or "occupational exposure").de,sh,hw. or ("blood exposure accident" or "Occupational blood exposure" or "percutaneous exposure" or "Percutaneous injury" or "Occupational accidents" or "occupational-related injuries").ti,ab,kw.	261,214
14	4 or 5 or 6 or 7 or 8	358,309
15	9 or 10 or 11 or 12 or 13	288,300
16	14 and 15	15,271
17	3 and 16	398
18	(Rate adj2 (injur\$ or transmission)).ti,ab,kw.	30,351
19	18 and (8 or 9 or 10)	285
20	exp "Health Disparate, Minority and Vulnerable Populations"/ or ("vulnerable communities" or "inner city health care organizations" or "urban health care organizations").ti,ab,kw. or ((minority or "health disparate" or "medically underserved") adj2 population).ti,ab,kw.	209,043
21	19 and 20	0
22	"Post-exposure prophylaxis".de,sh,hw. or "post exposure prophylaxis".ti,ab,kw.	12,715
23	22 and (8 or 9 or 10)	733
24	("Safety device availability" or "safety devices").ti,ab,kw.	2,124
25	((economic adj2 barrier) or ("vulnerable communities" or "inner city health care organizations" or "urban health care organizations")).ti,ab,kw.	2,682
26	24 and 25	0
27	(("Skin pigmentation" or "skin color" or "skin tone") adj6 "indicator glove").ti,ab,kw.	0
28	17 or 21 or 23 or 26 or 27	1,128

29	remove duplicates from 28	552
30	limit 29 to english language	504
31	limit 30 to human	467
32	limit 31 to yr="2018 -Current"	94
33	limit 32 to humans	94

EBSCOhost (CINAHL)

S1	(MH "Surgical Technologists") OR (MH "Operating Room Nursing") OR (MH "Perioperative Nursing") OR (MH "Surgeons") OR "perioperative nursing" or "operating room staff" or "Perianesthesia nursing" or "surgical nurse" or "perioperative nurse" or "Scrubbed personnel" or "surgical technologist"	36,124
S2	("procedure room" or "sterile processing department" or "instrument processing" or "cardiac catheterization laboratory" or "interventional radiology") OR ((surgical or endoscopy) and suite)) OR (((surgical or operating) and theat*))	12,380
S3	S1 OR S2	47,621
S4	(MH "Surgical Stapling") OR (MH "Surgical Instruments") or (MH "Needles") OR (MH "Syringes") OR (MH "Sutures")	16,435
S5	(Sharps or scalpels or "surgical instruments" or sutures OR "bone wires") OR ((surgical and (scissors or hooks or staples))) OR ((hypodermic and (needles or syringe)))	35,209
S6	(MH "Protective Devices") OR (MH "Infection Control")	34,621
S7	(((blunt and tip) N2 needles) or (safety and (devices or scalpels or "engineered sharps"))) OR ("hands-free passing" or "neutral zone" or "double gloving" or "protective devices" or "standard precautions") OR (("chain mail" or mesh or indicator) and glov*)	28,861
S8	(("virus inhibiting" or "bacteria inhibiting") and glov*)	1
S9	(MH "Universal Precautions") OR (MH "Bloodborne Pathogens") OR (MH "Needlestick Injuries") OR ((sharps or scalpel) and injur*) OR (recapping or "blood-borne pathogens" or "bloodborne pathogens" or "universal precautions")	8,567
S10	(needlestick or "needle-stick") OR (((Needlestick or "needle-stick") N2 injur*) OR ((needle and (injur* and stick)))	4,342
S11	((wire or kirschner or "k-wire") N1 (injur* or stick))	69
S12	(MH "Occupational-Related Injuries") OR (MH "Accidents, Occupational") OR (MH "Occupational Exposure") OR "blood exposure accident" or "Occupational blood exposure" or "percutaneous exposure" or "Percutaneous injury" or "Occupational accidents" or "occupational injuries"	36,993
S13	S4 OR S5 OR S6 OR S7 OR S8	98,177
S14	S9 OR S10 OR S11 OR S12	40,429

S15	S13 AND S14	6,735
S16	S3 AND S15	301
S17	(Rate N2 (injur* or transmission))	6,986
S18	S8 OR S9	8,567
S19	S17 AND S18	140
S20	("vulnerable communities" or "inner city health care organizations" or "urban health care organizations") OR ("Minority and Vulnerable Populations") OR ((minority or "health disparate" or "medically underserved") N2 population))	3,942
S21	S19 AND S20	0
S22	(MH "Postexposure Follow-Up") OR "post exposure prophylaxis"	2,125
S23	S18 AND S22	388
S24	"Safety device availability" or "safety devices"	4,860
S25	(economic N2 barrier) OR ("vulnerable communities" or "inner city health care organizations" or "urban health care organizations")	882
S26	S24 AND S25	1
S27	("Skin pigmentation" or "skin color" or "skin tone") N6 "indicator glove"	0
S28	S16 OR S21 OR S23 OR S26 OR S27	704
S29	S16 OR S21 OR S23 OR S26 OR S27 Limiters - Publication Date: 20180101-20231131; English Language; Peer Reviewed; [Include] Human	30

Web Searches// All searches conducted in 2023.

12/6: Used google.com to navigate to ECRI, ecri.org. 2] Chose "Browse Topics" and then "Clinical Specialty" tab. 4] Chose "Surgery." 3] Clicked "Advanced Search" on right, specified date range as 1/1/2018 to today. 4] Browsed results, saved for author screening

12/6: Used google.com to navigate to ECRI, ecri.org. 2] Searched for "sharps" in search bar. 3] Browsed results, saved for author screening.

12/5: Used google.com to navigate to astm.org. 2] Searched for "Gloves" in search box. 3] Browsed results, saved for author screening. (x2)

12/5: Used google.com to navigate to the American Academy of Orthopaedic Surgeons, aaos.org. 2] Chose "About AAOS" from top navigation bar. 3] Chose "About the AAOS" from sub-menu. 4] Scrolled to "Bylaws, Policies & Statements." 5] Chose "Statements & Resolutions." 6] Chose "Information Statements." 7] Browsed results, saved for author screening.

12/5: Used google.com to navigate to the American Assoc of Nurse Anesthesiology, aana.com. 2] Chose "Practice" from the top navigation menu. 3] Scrolled to "Professional Practice Manual" and scrolled to "Sections of the Manual." Expanded all sections. 4] Browsed results, saved for author screening.

12/5: Used google.com to navigate to the American Society of Anesthesiologists (asahq.org). 2] Under "Research & Guidelines" from navigation menu, chose "ASA Standards, Guidelines, and Statements." 3] Browsed results, saved for author review.

12/5: Used google.com to navigate to the Association of Surgical Technologists web site, ast.org. 2] Chose "Position Statements" under "About" from the top navigation menu. 3] Chose "CSPS Statements" from "Position Statements." 4] Browsed results, saved for author screening.

12/5: Used google.com to navigate to the Association of Surgical Technologists web site, ast.org. 2] Chose "Position Statements" under "About" from the top navigation menu. 3] Chose "Position Statements" from "Position Statements." 4] Browsed results, saved for author screening.

12/5: Used google.com to navigate to the Association of Surgical Technologists web site, ast.org. 2] Chose "Position Statements" under "About" from the top navigation menu. 3] Chose "Aseptic Technique" from "Position Statements." 4] Browsed results, saved for author screening.

12/5 Used google.com to navigate to World Health Organization, who.int. 2] Chose "Health Topics" from menu at top navigation. 3] Chose "Tools and toolkits." 4] Scrolled to "Occupational hazards in the health sector." 5] Chose "Occupational Infections." 6] Browsed results, saved for author screening. (x3)

12/5 Used google.com to navigate to World Health Organization, who.int. 2] Chose "Health Topics" from menu at top navigation. 3] Under "Resources" heading, chose "Publications." 4] From main "Publications" page, chose "All" on right. 5] In "Health Topic" field, chose "Hepatitis." 6] Browsed results, saved for author screening.

12/5 Used google.com to navigate to World Health Organization, who.int. 2] Chose "Health Topics" from menu at top navigation. 3] Under "Resources" heading, chose "Publications." 4] From main "Publications" page, chose "All" on right. 5] In "Health Topic" field, chose "HIV" and narrowed "Publication Type" to "Guidelines." 6] Browsed results, saved for author screening. (x2)

12/5 Used google.com to navigate to World Health Organization, who.int. 2] Chose "Health Topics" from menu at top navigation. 3] Under "Resources" heading, chose "Publications." 4] From main "Publications" page, chose "All" on right. 5] In "Health Topic" field, chose "Injections." 6] Browsed results, saved for author screening.

12/5 Used google.com to navigate to World Health Organization, who.int. 2] Chose "Health Topics" from menu at top navigation. 3] Under "Resources" heading, chose "Publications." 4] From main "Publications" page, chose "All" on right. 5] In "Health Topic" field, chose "Medical devices." 6] Browsed results, saved for author screening.

12/5: Author requested resources from APIC. Used google.com to navigate to apic.org. 2] Under "Resources" menu at the top, chose "Topic-specific infection prevention." 3] Scrolled to "Vaccine Preventable Diseases." 4] Browsed results, saved for author screening.

12/5: Author requested resources from APIC. Used google.com to navigate to apic.org. 2] Under "Resources" menu at the top, chose "Topic-specific infection prevention." 3] Scrolled to "Vaccine Preventable Diseases." 4] Browsed results, navigated to World Health Org resource. 5] Scrolled to "Complete list of WHO Vaccines Position Papers"; browsed results, saved for author screening.

12/4: Used google.com to search for "hicpac". 2] Chose first result, <https://www.cdc.gov/hicpac/index.html>. 3] Followed link to "Guidelines & Guidance Library." 4] Browsed statements, saved for author review.

12/4: Used google.com to search "american college of surgeons." 2] Chose the "For Medical Professionals" option from top left of screen. 3] From "Menu" in upper right corner, under "About Us," chose "Statements." 4] Browsed statements, saved for author review. (x3)

12/4: Used google.com to search "dnv healthcare". 2] Scrolled to result mentioning NIAHO Accreditation. 3] Scrolled to "DNV Hospital Accreditation" heading. 4] Browsed results, saved for author screening.

12/4: Used google.com to search "sharps site:jointcommission.org". 2] Browsed results. 3] Saved result for author screening.

12/4: Used google.com to navigate to The National Institute for Occupational Safety and Health (NIOSH), [cdc.gov/niosh/index.htm](https://www.cdc.gov/niosh/index.htm). 2] Scrolled to "NIOSH A-Z Index"; chose "Sharps" under "S". 3] Scrolled to "Resources" box; chose "Protection Healthcare Personnel." 4] Scrolled to "Occupational Infection Prevention." 5] Saved for author screening. (x6)

12/4: Used google.com to navigate to The National Institute for Occupational Safety and Health (NIOSH), cdc.gov/niosh/index.htm. 2] Scrolled to "NIOSH A-Z Index"; chose "Sharps" under "S". 3] Scrolled to link under "Medical Providers" heading, sending me to the Univ of California San Francisco's National Clinician Consultation Center web site. 4] Under "PEP: Post-Exposure Prophylaxis," clicked on "Online PEP Quick Guide." 5] Saved for author review

12/4: During browsing in the International Safety Center, noticed that org referenced in compilation of safety device list. 2] Used google.com to navigate to International Sharps Injury Prevention Society (ISIPS), isips.org. 3] Scrolled to "Needlesticks" heading. 4] Saved for author review. (x3)

12/4: Used google.com to navigate to American Nurses Assoc., nursingworld.org 2] Chose "Practice & Advocacy" at the top of the page, and then "Sharps." 3] Scrolled to "Legislation." 4] New tab opened on this sub-topic, browsed to result, saved for author review.

12/4: Used google.com to navigate to American Nurses Assoc., nursingworld.org 2] Chose "Practice & Advocacy" at the top of the page, and then "Sharps." 3] Scrolled to result, saved for author review.

12/4: After using ISC web site for other resources, clicked "Resources" tab from top navigation. 2] Scrolled to "Exposure Resource Links." 3] Saved for author screening. (x11)

12/4: After using ISC web site for other resources, clicked "Resources" tab from top navigation. 2] Scrolled to "Exposure Resource Links." 3] Browsed links on NCCC site. Saved for author screening.

12/4: After using ISC web site for other resources, clicked "Resources" tab from top navigation. 2] Scrolled to result, saved for author screening.

12/4: While looking at a CDC resource on 12/1, noticed additional resources listed. 2] Clicked on link for "International Safety Center" (fka EPINet). 3] Clicked "EPINet Reports" from top menu, navigated to each year's report since 2018. 4] Saved for author review. (x3)

12/4: While looking at a CDC resource on 12/1, noticed additional resources listed. 2] Clicked on link for "International Safety Center" (fka EPINet). 3] Clicked "EPINet Reports" from top menu, navigated to each year's report since 2019. 4] Saved for author review. (x6)

12/1: After using ISC web site for other resources, clicked "Resources" tab from top navigation. 2] Scrolled to result, saved for author screening.

12/1: While looking at an FDA resource on 11/30, noticed additional resources listed. 2] Clicked on link for "National Occupational Research Agenda (NORA) Stop Sticks Campaign." 3] Noticed "Resources" at the bottom of the web site. 4] Saved for author review.

12/1: While looking at an FDA resource on 11/30, noticed additional resources listed. 2] Clicked on link for this reference. 3] Saved for author review.

12/1: While looking at an FDA resource on 11/30, noticed additional resources listed. 2] Clicked on link for "National Occupational Research Agenda (NORA) Stop Sticks Campaign." 3] Saved for author review. (x6)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Evaluating and Controlling Exposure." 5] Browsed results; clicked on linked result, but found this one instead. 6] Saved result for author review.

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Additional Resources." 5] Browsed results; saved result for author review. (x4)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Standards." 5] Clicked on "Related Information." 5] Browsed results in "Standard Interpretations." Saved for author review. (x4)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Standards." 5] Saved result for author review.

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Evaluating and Controlling Exposure." 5] Saved result for author review. (x10)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Hazard Recognition." 5] Browsed results; saved result for author review. (x2)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "Enforcement." Saved result for author review. (x6)

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to "General Guidance"; saved for author review.

11/30: Used google.com to navigate to osha.gov. 2] Chose "A TO Z INDEX" at top Right. 3] Scrolled to topics under "B" and found "Bloodborne Pathogens and Needlestick Prevention"; clicked on that. 4] Scrolled to result; saved for author review. (x2)

11/30: Used google.com to search "Sharps Injury Prevention site:fda.gov". 2] Browsed results; saved for author review. (x4)

11/30: Used google.com to search "Medical Devices with Sharps Injury Prevention site:fda.gov". 2] Browsed results; saved for author review. (x2)

11/30: Used google.com to search "Sharps Injury Prevention site:fda.gov". 2] Browsed results; saved for author review.

EID Journal [Emerging Infectious Diseases]: 2019 to present, handsearching

PUBLICATION HISTORY

- Originally published June 2013 online in Perioperative Standards and Recommended Practices.
- Evidence ratings revised 2013 to conform to the AORN Evidence Rating Model.
- 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 updated AORN Evidence Rating Model.
- Revised 2019 for online publication in Guidelines for Perioperative Practice.
- Revised January 2025 using PRISMA2020 for publication in Guidelines for Perioperative Practice online.
- Scheduled for review 2030.