

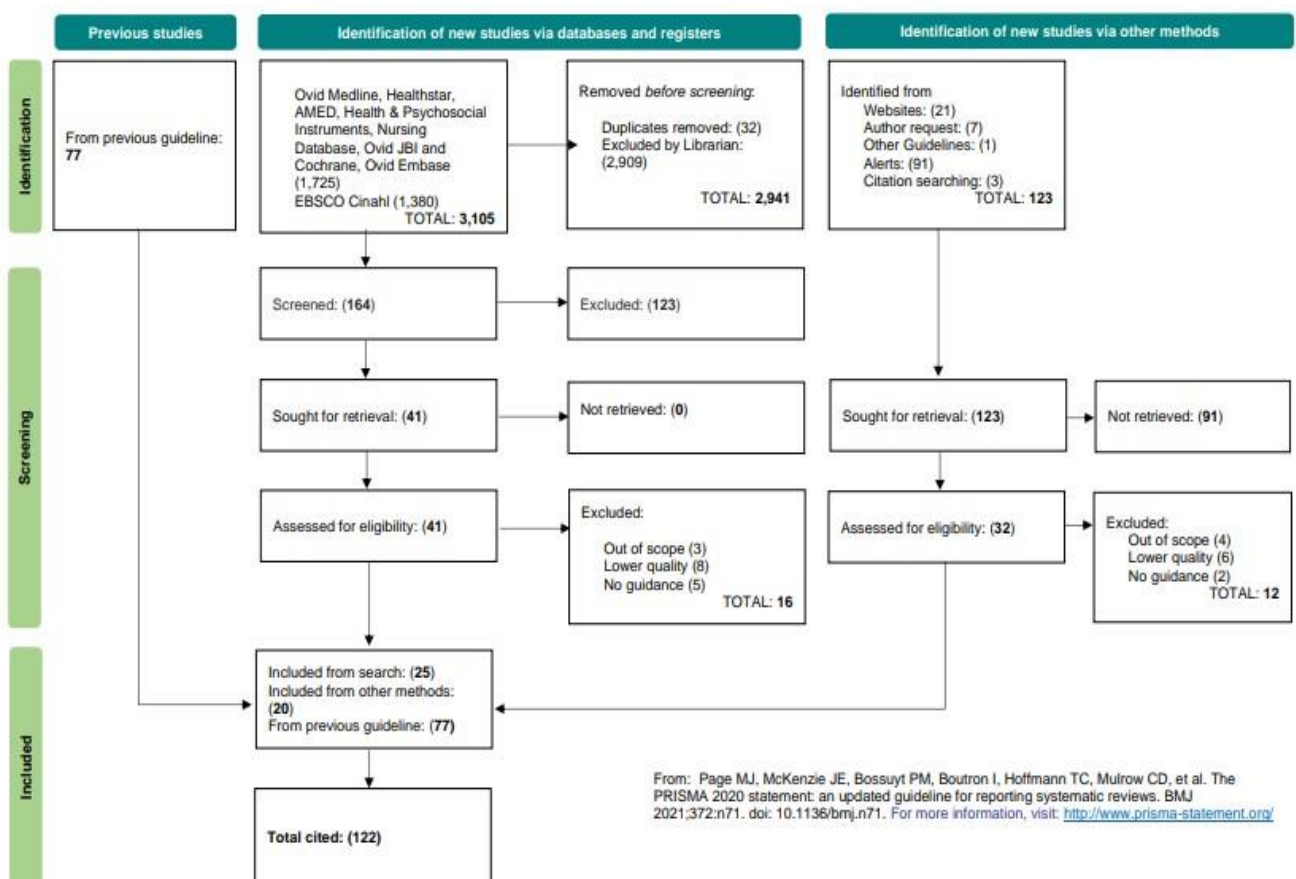
The Guideline for Surgical Attire was approved by the AORN Guidelines Advisory Board and became effective as of February 22, 2024.

EVIDENCE REVIEW

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 March 2018 through December 2022. 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 September 2023. 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 December 14, 2022, 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 December 6, 2022, a medical librarian with a perioperative background conducted a systematic search of 16 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	
Books@Ovid	December 5, 2022
JBIC EBP Database	Current to December 17, 2022
EBM Reviews: ACP Journal Club	1991 to November 2022
EBM Reviews: Cochrane Central Register of Controlled Trials	November 2022
EBM Reviews: Cochrane Database of Systematic Reviews	2005 to December 7, 2022
EBM Reviews: Cochrane Clinical Answers	November 2022
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 December 2022
Embase	1974 to 2022 December 09
Health and Psychosocial Instruments	1985 to October 2022
Ovid Healthstar	1902 to 1998, 1999 to September 2022
Ovid MEDLINE(R) ALL	1946 to December 09, 2022
Ovid Nursing Database	1946 to November Week 5 2022
CINAHL Complete via EBSCOhost	1937 to December 2022

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)

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1. ("covered arms" or "bare below the elbow" or "uncovered arms" or forearm or "upper extremity" or beard or "facial hair" or stubble or sideburns or "external ear" or "outer ear" or "false eyelashes" or "eyelash extensions" or nape or scurf or "exfoliative dermatitis" or desquamati\$ or seborrhea or "seborrheic dermatitis" or shed\$ or "super shedder").ti,ab. or (dandruff or dander or dermatitis).de,sh,hw. or arm/mi or "ear, external"/mi or eyelashes/mi or head/mi or hair/mi or scalp/mi 418,165
2. jewelry/mi or (bouffant or "disposable hats" or "bunny suit" or coveralls or hoods or "surgical hood" or cotton or "low linting" or woven or "disposable scrubs" or "patient attire" or skullcap or "surgical headcover" or jumpsuit or fleece or necklaces or earrings or "active barrier apparel" or "street clothes" or labret or "visible stud").ti,ab. or (antimicrobial and (fabric or textiles)).ti,ab,kw. 57,135
3. ((surgical and (gown or "shoe cover"))) or (shoe and (covers or boots)) or (surg\$ and cap) or ((nostril or nose or microdermal or dermal or visible) and piercing) or (antimicrobial adj3 (textiles or fabric))).ti,ab. or vestex.dm,mv,my. 8,972
4. clothing/mi or "surgical attire"/mi or shoes/mi or (uniforms or "nurse uniforms" or "personal clothing" or "cloth hat" or headcover or "head covering" or "long sleeves" or "cover apparel" or "religious head coverings" or badge or "identification badge" or lanyard or "head scarf" or hijab or veil or yarmulke or kippah or turban or "operative attire scrubs" or stethoscopes or tie or footwear).ti,ab. or ((lab or white) and coat).ti,ab. 32,312
5. "cell phone"/mi or smartphone/mi or "computers, handheld"/mi or (backpack or briefcase or "fanny pack" or purse or "mobile device" or "palm pilot" or "mobile communication device").ti,ab. or ((cellular or mobile or smart) and phone).ti,ab. or ((portable or tablet) and computer).ti,ab. or (personal and (electronics or "electronic devices")).ti,ab. or (ipad or iphone).ti,ab. 42,368
6. (anesthesiologists or police).de,sh,hw. or ("nurse anesthetist" or "patient transport" or surgeon or circulator).ti,ab. or (("operating room" or scrubbed) and personnel).ti,ab. or ((perioperative or surgical or circulating) and nurse).ti,ab. or ((surgical or "x-ray") and technologist).ti,ab. or ("law enforcement" or police) and officers).ti,ab. 444,323
7. "operating rooms"/st or ("procedure room" or "c-section" or "sterile processing department" or "instrument processing" or "cardiac catheterization laboratory" or "interventional radiology").ti,ab. or (("laminar flow" or restricted) and areas).ti,ab. or ((surgical or endoscopy) and suite).ti,ab. or ((surgical or operating) and theat\$).ti,ab. or (invasive and procedures).ti,ab. 139,757
8. bacteria/mi or dust/mi or fomites/mi or pollen/mi or "disease transmission, infectious"/pc or "cross infections"/pc or "surgical wound infections"/pc or "staphylococcus aureus"/py or "bacterial infections"/mi, pc, tm or (colonization or "disease superspreader event").ti,ab. or ((hospital or nosocomial or "surgical site" or "postoperative wound") and infection).ti,ab. 455,939
9. laundering.de,sh,hw. or ("laundrying scrubs" or "hospital laundering service" or "washing machine" or dryer or "residential washing machine" or "high efficiency").ti,ab. or ((facility or home) and laundered).ti,ab. or (laundry and service).ti,ab. 8,2962
10. (((chemotherapy or antineoplastics) adj3 contamination of scrubs) or ((allergy or "allergic reaction" or sensitivity) adj3 "laundry detergent") or ("scrub dispenser" or "surgical attire dispensing machines" or "storage of laundered scrubs") or (transport\$ adj3 "surgical attire") or "shift change").ti,ab. 1,238
11. decontamination/mt, st or disinfection/mt, st or cleaning.ti,ab. 75,043
12. 6 or 7 576,638
13. 9 or 11 157,158
14. 1 and 12 3,785
15. 2 and 12 549
16. 3 and 12 703
17. 4 and 13 499
18. 8 or 11 522,838
19. 5 and 18 575

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- 20. 8 and 12 11,299
- 21. limit 14 to english language 3,574
- 22. limit 21 to yr="2018 -Current" 1,165
- 23. limit 15 to english language 497
- 24. limit 23 to yr="2018 -Current" 161
- 25. limit 16 to english language 661
- 26. limit 25 to yr="2018 -Current" 254
- 27. limit 17 to english language 460
- 28. limit 27 to yr="2018 -Current" 150
- 29. limit 19 to english language 544
- 30. limit 29 to yr="2018 -Current" 306
- 31. limit 20 to english language 10,298
- 32. limit 31 to yr="2018 -Current" 3,077
- 33. 22 or 24 or 26 or 28 or 30 or 32 4,963
- 34. limit 33 to cochrane library 4,963
- 35. limit 34 to embase records 4,409
- 36. limit 35 to human 3,411
- 37. limit 36 to medline records 3,272
- 38. limit 37 to humans 3,272
- 39. limit 38 to original articles 3,272
- 40. limit 39 to primary source 3,272
- 41. limit 40 to (letters or original articles or reports or "review articles" or nursing practice or "text/reference" or best practice information sheets or recommended practices or systematic reviews or letters to the editor or journal article or clinical trial or practice guideline or case reports or clinical trial,all or controlled clinical trial or letter or monograph or position paper or report or article or article in press or clinical study or clinical trial, all or comparative study or "corrected and republished article" or evaluation study or government publication or guideline or introductory journal article or legal case or legislation or multicenter study or observational study or pragmatic clinical trial or "research support, american recovery and reinvestment act" or research support, nih, extramural or research support, nih, intramural or research support, non us gov't or research support, us gov't, non phs or research support, us gov't, phs or "systematic review" or technical report or validation study or randomized controlled trial or articles) 3,265
- 42. remove duplicates from 41 1,725

EBSCOhost (CINAHL)

S22	S14 OR S15 OR S16 OR S17 OR S19 OR S20 Limiters - Published Date: 20180301-20221231; English Language; Peer Reviewed; Exclude MEDLINE records; [Include] Human	1,380
S21	S14 OR S15 OR S16 OR S17 OR S19 OR S20	14,008
S20	S8 AND S12	5,390

S19	S5 AND S18	357
S18	S8 OR S11	114,727
S17	S4 AND S12	337
S16	S3 AND S13	356
S15	S2 AND S12	278
S14	S1 AND S12	7,860
S13	S9 OR S11	13,545
S12	S6 OR S7	157,531
S11	((MH "Sterilization and Disinfection/ST/MT") OR (MH "Disinfectants/ST")) OR cleaning	12,223
S10	(((chemotherapy or antineoplastics) N3 contamination of scrubs) OR ((allergy or "allergic reaction" or sensitivity) N3 "laundry detergent")) OR (("scrub dispenser" or "surgical attire dispensing machines" or "storage of laundered scrubs")) OR (transport\$ N3 "surgical attire") OR "shift change"	17
S9	(MH "Laundry Department/ST") OR ("laundrying scrubs" or "hospital laundrying service" or "washing machine" or dryer or "residential washing machine" or "high efficiency") OR (((facility or home) and laundered)) OR ((laundry and service) OR laundrying)	1,436
S8	((MH "Bacteria") OR (MH "Pollen/MI") OR (MH "Dust"))) OR ((MH "Staphylococcus Aureus") OR (MH "Communicable Diseases/PC") OR (MH "Disease Transmission/PC"))) OR ((MM "Surgical Wound Infection/PC") OR (MH "Bacterial Infections/MI/PC/TM") OR (MM "Cross Infection/PC"))) OR (colonization or "disease superspreader event" or fomites) OR (((hospital or nosocomial or "surgical site" or "postoperative wound") and infection))	105,074
S7	(MM "Operating Rooms/ST") OR ("procedure room" or "c-section" or "sterile processing department" or "instrument processing" or "cardiac catheterization laboratory" or "interventional radiology") OR (("laminar flow" or restricted) and areas)) OR (((surgical or endoscopy) and suite)) OR (((surgical or operating and theat*))) OR ((invasive and procedures))	56,531
S6	((MH "Police") OR (MH "Nurse Anesthetists") OR (MH "RN First Assistants"))) OR (MH "Anesthesiologists") OR (MM "Surgical Technologists/ST") OR (("nurse anesthetist" or "patient transport" or surgeon or circulator)) OR (("operating room" or scrubbed) and personnel)) OR (((perioperative or surgical or circulating) and nurse)) OR (((surgical or "x-ray") and technologist)) OR (("law enforcement" or police) and officers))	105,802
S5	((MH "Cellular Phone") OR (MH "Computers, Hand-Held"))) OR (backpack or briefcase or "fanny pack" or purse or "mobile device" or "palm pilot" or "mobile communication device" OR smartphone) OR (((cellular or mobile or smart) and phone)) OR (((portable or tablet) and computer)) OR ((personal and (electronics or "electronic devices")))) OR (ipad or iphone)	30,903
S4	(MM "Masks/ST") OR (((surgical or "ear loop") and masks)) OR "mask ties" OR ((surgical and (gown or "shoe cover")))) OR ((shoe and (covers or boots)))) OR ((surg\$ and cap)) OR (((nostril or nose or microdermal or dermal or visible) and piercing)) OR ((antimicrobial adj3 (textiles or fabric))) OR vestex	1,775
S3	((MM "Clothing/ST") OR (MH "Protective Clothing"))) OR (MH "Shoes/ST") OR (uniforms or "nurse uniforms" or "personal clothing" or "cloth hat" or headcover or "head covering" or "long sleeves" or "cover apparel" or "religious head coverings" or badge or "identification badge" or lanyard or "head scarf" or hijab or veil or yarmulke or kippah or turban or "operative attire scrubs" or stethoscopes or tie or footwear or "surgical attire")) OR (((lab or white) and coat))	29,262

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S2	((MH "Jewelry") OR (MH "Body Piercing/ST")) OR (bouffant or "disposable hats" or "bunny suit" or coveralls or hoods or "surgical hood" or cotton or "low linting" or woven or "disposable scrubs" or "patient attire" or skullcap or "surgical headcover" or jumpsuit or fleece or necklaces or earrings or "active barrier apparel" or "street clothes" or labret or "visible stud") OR (antimicrobial and (fabric or textiles))	8,948
S1	((MH "Ear, External/MI") OR (MH "Dermatitis, Exfoliative")) OR (arm or eyelashes or head or hair or scalp) OR (dandruff or dander or dermatitis) OR ("covered arms" or "bare below the elbow" or "uncovered arms" or forearm or "upper extremity" or beard or "facial hair" or stubble or sideburns or "external ear" or "outer ear" or "false eyelashes" or "eyelash extensions" or nape or scurf or "exfoliative dermatitis" or desquamate* or seborrhea or "seborrheic dermatitis" or shed* or "super shedder")	236,067

Web Searches// All searches were done in 2022 unless otherwise noted.

12/14: Used google.com to search for "association of surgical technologists." 2] Chose first result. 3] Under "About" drop-down menu, chose "Position Statements," and then "Surgical Attire." 4] Saved result for author screening. (x3)

12/14: Used google.com to search for "american college of surgeons." 2] In top RIGHT corner of screen, clicked on the 3 "bars." 3] Scrolled to "Statements," under the "About Us" heading. 4] Scrolled to result, saved for author screening. (x2)

12/14: Used google.com to search for APIC [Association for Professionals in Infection Control and Epidemiology]. 2] Unable to find anything appropriate for search here, went to online APIC TEXT. 3] Scanned table of contents, saved result for author screening.

12/14: Used google.com to search for "Healthcare Laundry Accreditation Council." 2] Under "At A Glance" menu, chose "Articles, Reports, Presentations." 3] Scrolled to result, saved for author review.

12/14: Used google.com to search for "Healthcare Laundry Accreditation Council." 2] Under "Standards" menu, chose "Standards Documents." 3] Saved "Accreditation Standards" for author review.

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Scrolled to "Payment for PPE" box. 4] Scrolled to result, saved for author screening. (x2).

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Scrolled to "Standards" box. 4] Scrolled to result, saved for author screening.

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Saved for author screening.

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Scrolled to "Hazards and Solutions" box. 4] Scrolled to result, under "OSHA Publications and Fact Sheets on PPE." 5] Scrolled to result, saved for author screening.

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Scrolled to "Hazards and Solutions" box. 4] Scrolled to result, under "PPE selection and managing workplace PPE programs." 5] Scrolled to result, saved for author screening.

12/15: Used google.com to navigate to osha.gov. 2] Under "Topics," chose "Personal Protective Equipment." 3] Scrolled to "Hazards and Solutions" box. 4] Scrolled to "Eye and Face Protection," under "Related Safety and Health Topics Pages" heading. 5] Scrolled to result, saved for author screening.

12/15: Used google.com to navigate to cdc.gov. 2] Chose "Health Topics" in dark blue navigation bar. 3] Looked under "I" and found "Infection Control." 4] Scrolled to "Guidelines Library." 5] Under "Healthcare Personnel Guidelines & Guidance" heading, chose "Infection Control in Healthcare Personnel." 6] Scrolled to and clicked link for "Guideline for infection control in healthcare personnel, 1998." 7] Clicked link in orange "Superseded" box. 8] Saved citation for author screening.

12/15: Used google.com to navigate to cdc.gov. 2] Chose "Health Topics" in dark blue navigation bar. 3] Looked under "I" and found "Infection Control." 4] Scrolled down to "MRSA" heading. 5] Scrolled down, clicked link for "Strategies to Prevent Hospital-onset Staphylococcus aureus Bloodstream Infections in Acute Care Facilities." 6] Saved for author screening.

12/15: Used google.com to navigate to cdc.gov. 2] Chose "Health Topics" in dark blue navigation bar. 3] Looked under "I" and found "Infection Control." 4] Clicked on yellow box, for "CDC's Core Infection

Evidence Review/PRISMA Guideline for Surgical Attire Prevention and Control Practices for Safe Healthcare Delivery in All Settings." 5] Saved for author screening.

12/15: Noticed ASTM standard mentioned in 2021 CFR document regarding footwear. 2] Used google.com to search for ASTM standard. 3] Chose first result, saved for author screening.

12/15: Was updating other CFR resources, and noticed that this one was not included in citations. 2] Used google.com to navigate to govinfo.gov, which is the site used for the other CFR resources. 3] Chose "Citation" tab, then "Code of Federal Regulations" from the drop-down menu. 4] Chose "Most recent" for "Year" drop-down menu. 5] Chose "29" for "Title Number" drop-down menu. 6] Entered "1910" in the "Part" field, and "133" in the "Subpart" and "Section" fields. 7] Saved for author review.

1/11/2023: During work for another project, used google.com to find site for American Society of Anesthesiologists. 2] Navigated to asahq.org. 3] Opened "Research & Guidelines" drop-down menu, and chose "ASA Standards & Guidelines." 4] Browsed resources; saved for author screening.

RESULTS

Studies that offer insights that can inform perioperative nursing practice in the area of perioperative team communication were included in this review. Studies that appeared to meet the inclusion criteria were excluded if they were of lower quality, provided no guidance, were duplicates of already-included studies, full text was not available in English, the results were not applicable or generalizable to the perioperative practice setting, were the wrong setting, or wrong population. A synthesis of the study results informed construction of practice recommendations and this synthesis is described briefly in the corresponding rationales that follow each practice recommendation. Additional information about each included study is found in the evidence table that corresponds to the published guideline.

PUBLICATION HISTORY

- Originally published March 1975, AORN Journal, as AORN "Standards for proper OR wearing apparel."
- Format revision March 1978, July 1982.
- Revised March 1984, March 1990. Published as proposed recommended practices, August 1994.
- Revised November 1998; published December 1998. Reformatted July 2000.
- Revised November 2004; published in *Standards, Recommended Practices, and Guidelines*, 2005 edition. Reprinted February 2005, *AORN Journal*.
- Revised October 2010 for online publication in *Perioperative Standards and Recommended Practices*.
- 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.
- Revised 2019 for online publication in *Guidelines for Perioperative Practice*.
- Minor revisions in May 2021, addition to Section 5 Head Coverings (5.3.2, 5.3.3), for online publication in *Guidelines for Perioperative Practice*.
- Revised February 2024 for online publication in *Guidelines for Perioperative Practice*.
- Scheduled for review 2029.