

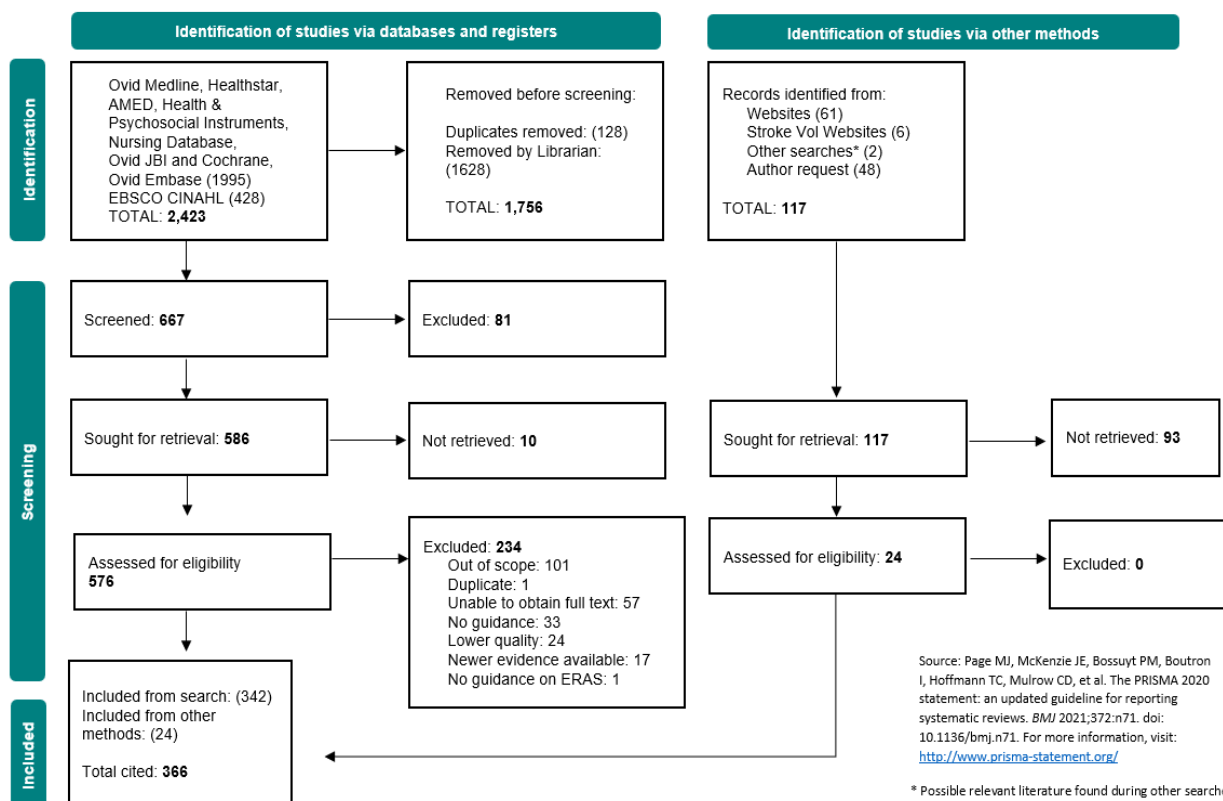
EVIDENCE REVIEW

The Guideline for Implementation of ERAS was approved by the AORN Guidelines Advisory Board and became effective November 21, 2024.

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 August 19, 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 October 4, 2023, 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	November 20, 2023
JBIC EBP Database	Current to November 15, 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 Clinical Answers	October 2023
EBM Reviews: Cochrane Methodology Register	3 rd Quarter 2012
Abstract of Reviews of Effects	1 st Quarter 2016
EBM Reviews: Health Technology Assessment	4 th Quarter 2016
EBM Reviews: NHS Economic Evaluation Database	1 st Quarter 2016
AMED (Allied and Complementary Medicine)	1985 to October 2023
Embase	1974 to 17 November 2023
Health and Psychosocial Instruments	1985 to October 2023
Ovid Healthstar	1908-1998, 1999 to August 2023
Ovid MEDLINE(R) ALL	1946 to November 20, 2023
Ovid Nursing Database	1946 to November Week 2 2023
CINAHL Complete via EBSCOhost	1937 to October 2023

Search strategy development process: A draft search strategy was developed using terms during 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. "surgical procedures, operative".de,sh,hw. or ("Surgical Procedures" or surgery).ti,ab,kw.

2. traumatology.de,sh,hw. or ("Surgical Traumatology" or "trauma surgery").ti,ab,kw.
3. ("Elective Surgical Procedures" or "Ambulatory Surgical Procedures").de,sh,hw. or (day adj2 surg\$).ti,ab,kw. or ("short-stay" adj2 surg\$).ti,ab,kw. or "fast-track surgery".ti,ab,kw.
4. "Cesarean Section".de,sh,hw. or ("Abdominal Delivery" or "C-Section" or "Caesarean Section").ti,ab,kw.
5. 1 or 2 or 3 or 4
6. ("surgical clearance" or "patient admission").de,sh,hw. or ((Preadmission or "pre-admission" or "pre-surgical") adj2 ("Physical Examination" or testing)).ti,ab,kw. or "Hospital Admission Tests".ti,ab,kw.
7. gastroparesis.de,sh,hw. or "gastric stasis".ti,ab,kw.
8. "postoperative care".de,sh,hw. or ("postoperative outcomes" or "postoperative rehabilitation").ti,ab,kw. or "length of stay".de,sh,hw.
9. "Enhanced Recovery After Surgery".de,sh,hw. or ("Enhanced Postsurgical Recovery" or Prehabilitation).ti,ab,kw. or (enhanced and recover\$ and after and surg\$).ti,ab,kw. or "enhanced recovery".ti,ab,kw. or ((enhanced or accelerated or ERAS) adj2 (recover* or pathway or program* or protocol* or optimi\$ or rehab* or implement\$ or team)).ti,ab,kw.
10. "Preoperative Exercise".de,sh,hw. or ("Pre-operative" adj2 (preparation or Conditioning or Exercise or Rehabilitation)).ti,ab,kw.
11. ("respiratory aspiration of gastric contents" or "Diet, Carbohydrate Loading").de,sh,hw. or "respiratory aspiration of gastric contents"/pc or (aspiration and pneumonia).ti,ab,kw. or ("gastric acid aspiration syndrome" or "Inhaled refluxed gastric contents" or "preoperative fasting" or "ASA fasting guidelines" or "carbohydrate loading" or "fasting before surgery" or fasting).ti,ab,kw.
12. anesthesia/ae or anesthetics/ae or "anesthesia, general"/ae
13. "multimodal pain strategies".ti,ab,kw. or (("enhanced recovery after surgery" or ERAS) adj3 ("Analgesics, Opioid" or opioids or "opioid analgesics")).ti,ab,de,sh,hw. or ((pain adj2 (blocks or pumps)) and "multimodal pain").ti,ab,kw. or "liposomal bupivacaine".ti,ab,kw.
14. "Early ambulation".de,sh,hw. or (Early adj2 (Mobilization or walking)).ti,ab,kw.
15. (Semaglutide or ozempic or rybelsus).ti,ab,de,hw,dr,mf. or Semaglutide/ae or ozempic/ae
16. (delay\$ adj2 "gastric emptying").ti,ab,kw.
17. 15 and 16
18. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 17
19. 5 and 18
20. ((perioperative or "operating room") and nursing).de,sh,hw. or "perioperative nurse navigator".ti,ab,kw.
21. 19 and 20
22. ("health equity" or "Health Disparate, Minority and Vulnerable Populations" or "social determinants of health" or "health services accessibility").de,sh,hw. or ("minority populations" or "health disparate populations" or "Health Services Geographic Accessibility" or "Medication Access" or "Program Accessibility").ti,ab,kw. or ("Access to" adj7 (Care or "health services" or treatment)).ti,ab,kw. or ((accessibility or availability) adj7 "health services").ti,ab,kw.
23. 19 and 22
24. 19 or 21 or 23
25. limit 24 to english language
26. limit 25 to human
27. limit 26 to yr="2018 -Current"

28. limit 27 to humans
29. limit 28 to cochrane library
30. limit 29 to embase records
31. limit 30 to full systematic reviews
32. limit 31 to medline records
33. limit 32 to original articles
34. limit 33 to "review articles"
35. limit 34 to primary source
36. limit 35 to (editorial or journal article or letter or report)
37. limit 36 to (embase or medline)
38. limit 37 to primary source
39. limit 38 to "humans only (removes records about animals)"
40. limit 39 to "humans only (removes records about animals)"
41. limit 40 to last 5 years
42. limit 41 to ("reviews (best balance of sensitivity and specificity)" or "therapy (best balance of sensitivity and specificity)" or "diagnosis (best balance of sensitivity and specificity)" or "causation-etiology (best balance of sensitivity and specificity)" or "qualitative (best balance of sensitivity and specificity)" or "therapy (optimized)" or "reviews (optimized)" or "qualitative studies (optimized)" or "clinical prediction guides (best balance of sensitivity and specificity)")
43. limit 42 to (journal or report)
44. limit 43 to medline
45. remove duplicates from 44

EBSCOhost (CINAHL)

S30	S28 AND S29	428
S29	S23 OR S24 OR S25 Limiters - Publication Date: 20180101-20231131; English Language; Peer Reviewed; Exclude MEDLINE records; [Include] Human; Publication Type: Case Study, Commentary, Corrected Article, Editorial, Journal Article, Legal Case, Letter, Meta Analysis, Meta Synthesis, Nurse Practice Acts, Practice Acts, Practice Guidelines, Randomized Controlled Trial, Research, Research Instrument, Review, Standards, Statistics, Systematic Review	6,427
S28	S23 OR S24 OR S25 Limiters - Publication Date: 20180101-20231131; English Language; Peer Reviewed; Exclude MEDLINE records; Human	6,427
	Narrow by SubjectMajor: - outcome assessment	
	Narrow by SubjectMajor: - enhanced recovery after surgery	
	Narrow by SubjectMajor: - surgery, operative	
S27	S23 OR S24 OR S25 Limiters - Publication Date: 20180101-20231131; English Language; Peer Reviewed; Exclude MEDLINE records; [Include] Human	6,427
S26	S23 OR S24 OR S25	43,959
S25	S21 AND S23	279

S24	S20 AND S23	907
S23	S19 AND S22	43,959
S22	S1 OR S2 OR S3 OR S4	688,218
S21	((MH "Health Services Accessibility") OR (MH "Social Determinants of Health") OR (MH "Diversity, Equity, Inclusion")) OR ("minority populations" or "health disparate populations" or "Health Services Geographic Accessibility" or "Medication Access" or "Program Accessibility") OR ("Access to" N7 (Care or "health services" or treatment)) OR ((accessibility or availability) N7 "health services")	140,512
S20	((MH "Operating Room Nursing") OR (MH "Perioperative Nursing")) OR "perioperative nurse navigator"	16,942
S19	S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S14 OR S15 OR S18	147,257
S18	S16 AND S17	9
S17	(delay* N2 "gastric emptying")	799
S16	Semaglutide or ozempic or rybelsus	592
S15	(MH "Early Ambulation") OR (Early N2 (Mobilization or walking)) OR (postoperative N2 (ambulation or mobil* or walking))	3,601
S14	S12 OR S13	2,038
S13	(pain N2 pumps) OR ("liposomal bupivacaine" or "postoperative pain management" or "multimodal pain strategies" OR "multimodal pain")	1,843
S12	((MH "Analgesics, Opioid") OR (MH "Narcotics")) AND ((MH "Enhanced Recovery After Surgery") OR ERAS)	207
S11	((MH "Anesthesia, General/AE") OR (MH "Anesthesia/AE") OR (MH "Anesthetics/AE"))	4,562
S10	("respiratory aspiration of gastric contents" or "Carbohydrate Loading diet") OR (aspiration and pneumonia) OR ("gastric acid aspiration syndrome" or "Inhaled refluxed gastric contents" or "preoperative fasting" or "ASA fasting guidelines" or "carbohydrate loading" OR "fasting before surgery" or fasting)	36,369
S9	(MH "Prehabilitation") OR (("Pre-operative" N2 (preparation or Conditioning or Exercise or Rehabilitation)))	552
S8	(MH "Enhanced Recovery After Surgery") OR ("Enhanced Postsurgical Recovery" or Prehabilitation) OR ((enhanced and recover* and after and surg*)) OR "enhanced recovery" OR (((enhanced or accelerated or ERAS) N2 (recover* or pathway or program* or protocol* or optimi* or rehab* or implement* or team)))	7,678
S7	(MH "Postoperative Care") OR (MH "Length of Stay") OR (("postoperative outcomes" or "postoperative rehabilitation"))	74,753
S6	(MH "Gastroparesis") OR "gastric stasis"	816
S5	((MH "Patient Admission") OR ""surgical clearance"") OR (((Preadmission or "pre-admission" or "pre-surgical") N2 ("Physical Examination" or testing))) OR "Hospital Admission Tests"	24,336
S4	(MH "Cesarean Section") OR ("Abdominal Delivery" or "C-Section" or "Caesarean Section")	24,467
S3	(MH "Traumatology") OR ("Surgical Traumatology" or "trauma surgery")	2,713
S2	((MH "Surgery, Elective") OR (MH "Ambulatory Surgery")) OR (day N2 surg*) OR ("short-stay" N2 surg*) OR "fast-track surgery"	24,542
S1	(MH "Surgery, Operative") OR ("Surgical Procedures" or surgery)	666,972

Web Searches// All searches conducted in 2023.

12/1: Used google.com to search, veterans affairs "enhanced recovery." 2] Chose top result. 3] Saved for author screening.

12/1: Used google.com to search, ahrq "enhanced recovery". 2] Chose top result for Toolkit. 3] Browsed results, saved for author screening. (x8)

12/1: Used google.com navigate to Centers for Medicare and Medicaid, cms.gov. 2] Under "Priorities," and then "Key Initiatives," chose "Opioids." 3] Saved for author screening.

12/1: Used google.com to search for "enhanced recovery after surgery." 2] Chose result for Amer Assoc of Nurse Anesthesiology. 3] Browsed results; saved for author screening. (x19)

12/1: Used google.com to navigate to ERAS Society (erassociety.org).

12/1: Used google.com to navigate to ERAS Society (erassociety.org). 2] Chose "Publications" under "Healthcare Professionals" menu. 3] Browsed results; saved for author screening. (x4)

12/1: Used google.com to navigate to ERAS Society (erassociety.org). 2] Chose "Expert Reviews" under "Healthcare Professionals" menu. 3] Browsed results; saved for author screening. (x6)

12/1: Used google.com to navigate to ERAS Society (erassociety.org). 2] Chose "Guidelines" drop-down menu, and then "View all." 3] Browsed Guidelines, saved for author review. (x20)

RESULTS

Studies that offer insights that can inform perioperative patient care in the area of implementation of Enhanced Recovery after Surgery (ERAS) 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 appeared in the Guidelines for Perioperative Practice November 21, 2024 (eGuidelines+)
- **Scheduled for review: 2029**