

Inpatient & Surgical Care > Common Complications and Conditions > Ambulatory Surgery Discharge and Complications: Common Complications and Conditions (CCC-044)

# Ambulatory Surgery Discharge and Complications: Common Complications and Conditions

CCC: CCC-044 (ISC)

**MCG Health**  
Inpatient & Surgical Care  
30th Edition

- Prevention
- Clinical Indications for Ongoing Inpatient Care
- Alternatives to Inpatient Care
- Discharge
- References
- Footnotes
- Definitions

## Prevention

- Prevention issues and possible preventive measures include(1)(2)(3):

☐ Maintain awareness of factors that increase risk of admission(4)(5)(6):

- Cardiac disease (eg, clinically significant or unstable heart failure, valvular disease, or coronary artery disease)(7)(8)
- Pulmonary disease (eg, clinically significant or unstable COPD, asthma, infant or child with chronic lung disease)
- Cerebrovascular disease (eg, recent stroke or TIA)
- Severe renal disease (eg, GFR less than 30 mL/min/1.73m<sup>2</sup> (0.5 mL/sec/1.73m<sup>2</sup>) or on dialysis)  eGFR - Adult Calculator
-  eGFR - Pediatric Calculator
- Uncorrected anemia
- Obstructive sleep apnea(9)(10)
- Active substance abuse or significant psychiatric illness
- Frailty(11)

☐ Prevent and manage postoperative symptoms and complications; examples include(12):

- Pain(13)(14)(15)
  - Provide Multimodal analgesia.(16)(17)(18)
- Nausea or vomiting(19)(20)
  - Assess risk for postoperative nausea and vomiting.
  - Provide preoperative antiemetic prophylaxis with serotonergic antagonist (eg, ondansetron), neurokinin 1 antagonist (eg, aprepitant), or dexamethasone for patient with history of postoperative nausea and vomiting or for procedures associated with postoperative vomiting.
  - Administer supplemental perioperative IV crystalloids.(21)

- Use non-narcotic analgesia.
- Avoid prolonged fasting (eg, allow liquid carbohydrate and fluid load up to 2 hours prior to surgery if appropriate).
- Postoperative pulmonary complications
  - Encourage preoperative smoking cessation.
  - Use incentive spirometry for upper abdominal and thoracic procedures.
  - Elevate head of bed.
- Postoperative thromboembolism(22)
  - Consider prophylaxis for high-risk patient (eg, morbid obesity, lower extremity surgery, malignancy, previous venous thromboembolism).
  - Encourage early ambulation.
- Postoperative delirium(23)
  - Optimize postoperative pain control.
  - Ensure postoperative sensory input maximized (eg, glasses, hearing aids).
  - Ensure postoperative metabolic stability (eg, electrolytes, glucose level, hydration).
  - Avoid benzodiazepines, if possible.
- Postoperative anemia
  - Correct preoperative deficiencies (eg, iron, vitamin B12, folate).
  - Consider preoperative erythropoietin.
- Postoperative urinary retention(24)(25)(26)
  - Assess risk for postoperative urinary retention.(26)(27)
  - Minimize opiate analgesics, if possible.
  - Consider prophylactic use of alpha-blocker in high-risk patients.(28)
- Operative site complications(29)
  - Ensure adequate hemostasis.
  - Correct preoperative clotting abnormalities.
  - Discontinue anticoagulants preoperatively, if possible.
- Preoperative patient education(12)

---

## Clinical Indications for Ongoing Inpatient Care

- Surgery or procedure performed on ambulatory basis may require inpatient stay for **1 or more** of the following[A](1)(2)(3)(7)(29)(30):
  - ☐ Inpatient care needed for clinically significant disease or condition identified preoperatively, as indicated by **1 or more** of the following:
    - Severe infection
    - Altered mental status
    - Dangerous arrhythmia
    - Hypotension
    - Hypoxemia
    - Other serious condition or finding that requires preoperative inpatient care (ie, cannot be treated in other setting)
  - ☐ Complex surgical approach or situation anticipated, as indicated by **1 or more** of the following(31):
    - Prolonged airway monitoring required (eg, severe obstructive sleep apnea, open neck procedure)(9)(32)
    - Other aspect or feature of procedure that indicates a likely need for prolonged postoperative care or monitoring
  - ☐ Procedure is not low risk[B] and high patient anesthetic risk identified preoperatively, as indicated by **1 or more** of the following[C](4)(33)(35)(36):
    - American Society of Anesthesiologists class IV or greater American Society of Anesthesiologists (ASA) Physical Status Classification System (37)
    - Severe frailty[D](39)(40)

- Severe valvular disease (eg, severe aortic stenosis)
  - Symptomatic coronary artery disease or heart failure
  - Symptomatic chronic lung disease (eg, COPD, chronic lung disease of prematurity)
  - Severe renal disease (eg, GFR less than 30 mL/min/1.73m<sup>2</sup> (0.5 mL/sec/1.73m<sup>2</sup>) or on dialysis)  eGFR - Adult Calculator  eGFR - Pediatric Calculator requiring prolonged monitoring of electrolytes, fluid status, anesthetic recovery, or respiratory status
  - Morbid obesity (eg, BMI greater than 40  BMI Calculator) with hemodynamic or respiratory problems (eg, severe obstructive sleep apnea, hypoventilation)(9)(41)(42)(43)(44)
  - Complex chronic condition in children (eg, ventilator-dependent, neuromuscular, genetic, or immunologic disease)(45)(46)
  - Other patient condition or finding that places patient at increased anesthetic risk such that prolonged postoperative inpatient monitoring or treatment is anticipated
- ☐ Presence of drug-related risk identified preoperatively, as indicated by **1 or more** of the following(2)(47):
- Procedure requires discontinuing medication (eg, antiarrhythmic medication, antiseizure or anticoagulant medication), which necessitates preoperative or prolonged postoperative inpatient monitoring or treatment.[E](48)(49)(50)
  - Preoperative use of drugs that may interact with anesthetic (eg, cocaine, amphetamines, monoamine oxidase inhibitor) such that prolonged postoperative monitoring or treatment is needed
- ☐ Inadequate outpatient care situation identified preoperatively, as indicated by **1 or more** of the following(3)(51)(52):
- Patient lives remote from medical facility and procedure has urgent complication potential, and temporary nearby residence cannot be arranged.
  - Patient will have postprocedure incapacitation (eg, self-management needs) and has inadequate assistance at home, and alternative level of care cannot be arranged.
- ☐ Intraoperative or postoperative event, condition, or finding that warrants inpatient stay (ie, requires hospital-based care beyond ambulatory surgery time frame (eg, across a second midnight)), as indicated by **1 or more** of the following(29)(53)(54):
- Inadequate physiologic recovery (eg, cardiovascular or respiratory status not normal or near preoperative baseline)
  - Hemodynamic instability
  - Dangerous arrhythmia
  - Respiratory abnormalities (eg, new Hypoxemia)
  - Acute kidney injury requiring continued inpatient care, as indicated by **ALL** of the following(55):
    - Acute kidney injury, as indicated by **1 or more** of the following:
      - Two-fold (or more) rise in serum creatinine from baseline
      - Reduction of more than 50% in estimated GFR from baseline  eGFR - Adult Calculator  eGFR - Pediatric Calculator
    - Worsening clinical status (eg, rising creatinine) despite postoperative care (eg, hydration)
  - Clinically significant electrolyte abnormalities (eg, hyperkalemia, hyponatremia)(56)(57)(58)
  - Altered mental status (eg, beyond usual anesthesia recovery time period)
  - Temperature not as expected and not appropriate for next level of care
  - Appropriate activity level for next level of care not achieved[F](59)
  - Operative site complication (eg, excessive drainage or bleeding)(60)
  - Significant postoperative finding that continues to require hospital-based care (eg, continued need for parenteral medication for pain or vomiting)(13)
  - Complications of procedure (eg, bowel injury, airway compromise, vascular injury, severe hemorrhage, need for ionotropic blood pressure support)(61)
  - Conversion to open or more complex procedure that requires inpatient postoperative care (eg, open vs laparoscopic cholecystectomy, abdominal vs vaginal hysterectomy, dissection far beyond usual scope of procedure)
  - Other intraoperative or postoperative event, condition, or finding that warrants inpatient stay

---

## Alternatives to Inpatient Care

- Alternatives to inpatient stay extension include(1)(2):
  - Home care
    - Care for patient who is homebound and intermittent skilled assessment or management of care is required; examples include:
      - Wound care
      - Drain care
      - Catheter care
      - IV medication
      - Rehabilitation services (physical therapy, occupational therapy)
      - Enteral or parenteral nutrition
  - Recovery facility[G]

---

## Discharge

- Inpatient stay may be needed until **ALL** of the following are present(1)(2):
  - Physiologic recovery
  - Stable vital signs
  - Patient alert
  - Temperature appropriate
  - Activity level appropriate
  - Operative site appropriate
  - Postoperative effects resolved or managed
  - Voiding status acceptable
  - Competent person available to accompany patient (if required)
  - No complicating features

---

## References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12. [ Context Link 1, 2, 3, 4 ]
2. Hernandez A, Sherwood ER. Anesthesiology principles, pain management, and conscious sedation. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:315-348. [ Context Link 1, 2, 3, 4, 5 ]
3. Lerman J. Pediatric ambulatory anesthesia: an update. Current Opinion in Anaesthesiology 2019;32(6):708-713. DOI: 10.1097/ACO.0000000000000787. [ Context Link 1, 2, 3 ] View abstract...
4. Walsh MT. Improving outcomes in ambulatory anesthesia by identifying high risk patients. Current Opinion in Anaesthesiology 2018;31(6):659-666. DOI: 10.1097/ACO.0000000000000653. [ Context Link 1, 2 ] View abstract...
5. Sivasundaram L, et al. Emergency department utilization after outpatient hand surgery. Journal of the American Academy of Orthopedic Surgeons 2020;28(15):639-649. DOI: 10.5435/JAAOS-D-19-00527. [ Context Link 1 ] View abstract...
6. Teja B, et al. Incidence, prediction, and causes of unplanned 30-day hospital admission after ambulatory procedures. Anesthesia and Analgesia 2020;131(2):497-507. DOI: 10.1213/ANE.0000000000004852. [ Context Link 1 ] View abstract...

7. Cohn SL. Preoperative cardiac risk assessment and perioperative management. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:329-335. [ Context Link 1, 2 ]
8. Lerman BJ, Popat RA, Assimes TL, Heidenreich PA, Wren SM. Association between heart failure and postoperative mortality among patients undergoing ambulatory noncardiac surgery. *JAMA Surgery* 2019;154(10):907-914. DOI: 10.1001/jamasurg.2019.2110. [ Context Link 1 ] View abstract...
9. American Society of Anesthesiologists Task Force on Perioperative Management of patients with obstructive sleep apnea. Practice guidelines for the perioperative management of patients with obstructive sleep apnea: an updated report by the American Society of Anesthesiologists Task Force on Perioperative Management of patients with obstructive sleep apnea. *Anesthesiology* 2014;120(2):268-286. DOI: 10.1097/ALN.000000000000053. (Reaffirmed 2025 Jun) [ Context Link 1, 2, 3 ] View abstract...
10. Szeto B, et al. Outcomes and safety among patients with obstructive sleep apnea undergoing cancer surgery procedures in a freestanding ambulatory surgical facility. *Anesthesia and Analgesia* 2019;129(2):360-368. DOI: 10.1213/ANE.0000000000004111. [ Context Link 1 ] View abstract...
11. Reeves JJ, Mannix E, Burton BN, Gabriel RA, Waterman RS. Functional status as a marker of need for hospital admission following outpatient hernia repair. *Journal of Perioperative Practice* 2021;31(5):175-180. DOI: 10.1177/1750458920925346. [ Context Link 1 ] View abstract...
12. Afonso AM, Tokita HK, McCormick PJ, Twersky RS. Enhanced recovery programs in outpatient surgery. *Anesthesiology Clinics* 2019;37(2):225-238. DOI: 10.1016/j.anclin.2019.01.007. [ Context Link 1, 2 ] View abstract...
13. Correll DJ. Perioperative pain management. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:313-322. [ Context Link 1, 2 ]
14. Roth B, Boateng A, Berken A, Carlyle D, Vadivelu N. Post-operative weaning of opioids after ambulatory surgery: the importance of physician stewardship. *Current Pain and Headache Reports* 2018;22(6):40. DOI: 10.1007/s11916-018-0694-4. [ Context Link 1 ] View abstract...
15. Oliver JA, et al. Ambulatory pain management in the pediatric patient population. *Current Pain and Headache Reports* 2022;26(1):15-23. DOI: 10.1007/s11916-022-00999-y. [ Context Link 1 ] View abstract...
16. D'Souza RS, Johnson RL. Regional and multimodal treatments of perioperative pain. In: Benzon H, editor. Practical Management of Pain. 6th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:355-373.e8. [ Context Link 1 ]
17. Pozek JJ, De Ruyter M, Khan TW. Comprehensive acute pain management in the perioperative surgical home. *Anesthesiology Clinics* 2018;36(2):295-307. DOI: 10.1016/j.anclin.2018.01.007. [ Context Link 1 ] View abstract...
18. Finnerup NB. Nonnarcotic methods of pain management. *New England Journal of Medicine* 2019;380(25):2440-2448. DOI: 10.1056/NEJMr1807061. [ Context Link 1 ] View abstract...
19. Manahan MA, et al. Postoperative Nausea and Vomiting with Plastic Surgery: A Practical Advisory to Etiology, Impact, and Treatment. *Plastic and Reconstructive Surgery* 2018;141(1):214-222. DOI: 10.1097/PRS.0000000000003924. [ Context Link 1 ] View abstract...
20. Efune PN, Minhajuddin A, Szmuk P. Incidence and factors contributing to postdischarge nausea and vomiting in pediatric ambulatory surgical cases. *Paediatric Anaesthesia* 2018;28(3):257-263. DOI: 10.1111/pan.13333. [ Context Link 1 ] View abstract...
21. Jewer JK, Wong MJ, Bird SJ, Habib AS, Parker R, George RB. Supplemental perioperative intravenous crystalloids for postoperative nausea and vomiting. *Cochrane Database of Systematic Reviews* 2019, Issue 3. Art. No.: CD012212. DOI: 10.1002/14651858.CD012212.pub2. [ Context Link 1 ] View abstract...
22. Samama CM, Benhamou D, Aubrun F, Bosson JL, Albaladejo P. Thromboprophylaxis for ambulatory surgery: Results from a prospective national cohort. *Anaesthesia, Critical Care & Pain Medicine* 2018;37(4):343-347. DOI: 10.1016/j.accpm.2018.01.003. [ Context Link 1 ] View abstract...
23. American Geriatrics Society Expert Panel on Postoperative Delirium in Older Adults. American Geriatrics Society abstracted clinical practice guideline for postoperative delirium in older adults. *Journal of the American Geriatrics Society* 2015 (JAG reaffirmed 2021);63(1):142-150. DOI: 10.1111/jgs.13281. (Reaffirmed 2025 Jun) [ Context Link 1 ] View abstract...
24. Jackson J, et al. Systematic review of interventions for the prevention and treatment of postoperative urinary retention. *BJS Open* 2019;3(1):11-23. DOI: 10.1002/bjs5.50114. [ Context Link 1 ] View abstract...
25. Drissi F, Gillion JF, Roquilly A, Luyckx F, Duchalais E, For Club Hernie. Nationwide analysis of urinary retention following inguinal hernia repair: results from the National Prospective Hernia Registry. *World Journal of Surgery* 2020;44(8):2638-2646. DOI: 10.1007/s00268-020-05538-7. [ Context Link 1 ] View abstract...

26. McDermott CD, et al. Postoperative urinary retention. *Urogynecology* (Philadelphia, Pa.) 2023;29(4):381-396. DOI: 10.1097/SPV.0000000000001344. [ Context Link 1, 2 ] View abstract...
27. Mull HJ, et al. The nature and severity of adverse events in select outpatient surgical procedures in the Veterans Health Administration. *Quality Management in Health Care* 2018;27(3):136-144. DOI: 10.1097/QMH.0000000000000177. [ Context Link 1 ] View abstract...
28. Ghuman A, de Jonge SW, Dryden SD, Feeney T, Buitrago DH, Phang PT. Prophylactic use of alpha-1 adrenergic blocking agents for prevention of postoperative urinary retention: A review & meta-analysis of randomized clinical trials. *American Journal of Surgery* 2018;215(5):973-979. DOI: 10.1016/j.amjsurg.2018.01.015. [ Context Link 1 ] View abstract...
29. Yepuri N, Pruekprasert N, Cooney RN. Surgical complications. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery*. 21st ed. Elsevier; 2022:238-283. [ Context Link 1, 2, 3 ]
30. Pang G, Kwong M, Schlachta CM, Alkhamesi NA, Hawel JD, Elnahas AI. Safety of same-day discharge in high-risk patients undergoing ambulatory general surgery. *Journal of Surgical Research* 2021;263:71-77. DOI: 10.1016/j.jss.2021.01.024. [ Context Link 1 ] View abstract...
31. Skues MA. High-risk surgical procedures and semi-emergent surgical procedures for ambulatory surgery. *Current Opinion in Anaesthesiology* 2020;33(6):718-723. DOI: 10.1097/ACO.0000000000000918. [ Context Link 1 ] View abstract...
32. Apfelbaum JL, et al. 2022 American Society of Anesthesiologists practice guidelines for management of the difficult airway. *Anesthesiology* 2022;136(1):31-81. DOI: 10.1097/ALN.0000000000004002. [ Context Link 1 ] View abstract...
33. Zaydfudim VM, Hu Y, Adams RB. Principles of preoperative and operative surgery. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery*. 21st ed. Elsevier; 2022:187-222. [ Context Link 1, 2, 3, 4, 5 ]
34. Bilimoria KY, et al. Development and evaluation of the universal ACS NSQIP surgical risk calculator: a decision aid and informed consent tool for patients and surgeons. *Journal of the American College of Surgeons* 2013;217(5):833-842.e1-e3. DOI: 10.1016/j.jamcollsurg.2013.07.385. [ Context Link 1, 2 ] View abstract...
35. Sweitzer B, Rajan N, Schell D, Gayer S, Eckert S, Joshi GP. Preoperative care for cataract surgery: the Society for Ambulatory Anesthesia position statement. *Anesthesia and Analgesia* 2021;133(6):1431-1436. DOI: 10.1213/ANE.0000000000005652. [ Context Link 1 ] View abstract...
36. Rajan N. The high-risk patient for ambulatory surgery. *Current Opinion in Anaesthesiology* 2020;33(6):724-731. DOI: 10.1097/ACO.0000000000000919. [ Context Link 1 ] View abstract...
37. Subramanyam R, Yeramaneeni S, Hossain MM, Anneken AM, Varughese AM. Perioperative respiratory adverse events in pediatric ambulatory anesthesia: development and validation of a risk prediction tool. *Anesthesia and Analgesia* 2016;122(5):1578-1585. DOI: 10.1213/ANE.0000000000001216. [ Context Link 1 ] View abstract...
38. Varley PR, et al. Clinical utility of the risk analysis index as a prospective frailty screening tool within a multi-practice, multi-hospital integrated healthcare system. *Annals of Surgery* 2021;274(6):e1230-e1237. DOI: 10.1097/SLA.0000000000003808. [ Context Link 1 ] View abstract...
39. Rothenberg KA, et al. Association of frailty and postoperative complications with unplanned readmissions after elective outpatient surgery. *JAMA Network Open* 2019;2(5):e194330. DOI: 10.1001/jamanetworkopen.2019.4330. [ Context Link 1 ] View abstract...
40. Charipova K, Urits I, Viswanath O, Urman RD. Preoperative assessment and optimization of cognitive dysfunction and frailty in the ambulatory surgical patient. *Current Opinion in Anaesthesiology* 2020;33(6):732-739. DOI: 10.1097/ACO.0000000000000901. [ Context Link 1 ] View abstract...
41. Sharma S, Arora L. Anesthesia for the morbidly obese patient. *Anesthesiology Clinics* 2020;38(1):197-212. DOI: 10.1016/j.anclin.2019.10.008. [ Context Link 1 ] View abstract...
42. Hajmohamed S, Patel D, Apruzzese P, Kendall MC, De Oliveira G. Early postoperative outcomes of super morbid obese compared to morbid obese patients after ambulatory surgery under general anesthesia: a propensity-matched analysis of a national database. *Anesthesia and Analgesia* 2021;133(6):1366-1373. DOI: 10.1213/ANE.0000000000005770. [ Context Link 1 ] View abstract...
43. Tumminello ME, Hogan MG, Leonardi C, Barton JS, Cook MW, Davis KG. Morbid obesity not a risk for serious complications following outpatient surgery. *American Surgeon* 2022;Online. DOI: 10.1177/00031348221103656. [ Context Link 1 ] View abstract...
44. Wu V, Lo N, Lin RJ, Zirkle M, Anderson J, Lee JM. Admission of Patients With Obstructive Sleep Apnea Undergoing Ambulatory Surgery in Otolaryngology-Head and Neck Surgery. *Annals of Otolaryngology, Rhinology and Laryngology* 2022;131(9):941-945. DOI: 10.1177/00034894211048783. [ Context Link 1 ] View abstract...

45. Edmonson MB, et al. Association of patient characteristics with postoperative mortality in children undergoing tonsillectomy in 5 US states. *Journal of the American Medical Association* 2022;327(23):2317-2325. DOI: 10.1001/jama.2022.8679. [ Context Link 1 ] View abstract...
46. Kapellen T, et al. ISPAD clinical practice consensus guidelines 2022: Management of children and adolescents with diabetes requiring surgery. *Pediatric Diabetes* 2022;23(8):1468-1477. DOI: 10.1111/pedi.13446. (Reaffirmed 2025 Jul) [ Context Link 1 ] View abstract...
47. Urman RD, Rajan N, Belani K, Gayer S, Joshi GP. Malignant hyperthermia-susceptible adult patient and ambulatory surgery center: Society for Ambulatory Anesthesia and Ambulatory Surgical Care Committee of the American Society of Anesthesiologists position statement. *Anesthesia and Analgesia* 2019;129(2):347-349. DOI: 10.1213/ANE.0000000000004257. [ Context Link 1 ] View abstract...
48. Joglar JA, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the diagnosis and management of atrial fibrillation: a report of the American College of Cardiology/American Heart Association joint committee on clinical practice guidelines. *Journal of the American College of Cardiology* 2024;149(1):Online. DOI: 10.1016/j.jacc.2023.08.017. (Reaffirmed 2025 Mar) [ Context Link 1, 2, 3, 4 ] View abstract...
49. Eljilany I, El-Bardissy A, Elewa H. The dilemma of peri-procedural warfarin management: a narrative review. *Clinical and Applied Thrombosis/Hemostasis* 2021 Jan-Dec;27:10760296211012093. DOI: 10.1177/10760296211012093. [ Context Link 1 ] View abstract...
50. Douketis JD, Spyropoulos AC. Perioperative management of patients taking direct oral anticoagulants: a review. *Journal of the American Medical Association* 2024;332(10):825-834. DOI: 10.1001/jama.2024.12708. [ Context Link 1, 2 ] View abstract...
51. Guidelines for Ambulatory Anesthesia and Surgery. [Internet] American Society of Anesthesiologists. 2023 Oct Accessed at: <https://www.asahq.org/>. [created 2003; accessed 2025 Apr 07] [ Context Link 1 ]
52. Miller DJ, Nelson SE, Shah AS, Ganley TJ, Flynn JJM. Outpatient pediatric orthopedic surgery. *Orthopedic Clinics of North America* 2018;49(1):55-62. DOI: 10.1016/j.ocl.2017.08.007. [ Context Link 1 ] View abstract...
53. Najjar P, Peetz AB. Postoperative complications. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:292-296. [ Context Link 1 ]
54. Levin WI, Reilly JJ Jr. Management of postoperative pulmonary complications. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:391-396. [ Context Link 1 ]
55. Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO clinical practice guideline for acute kidney injury. *Kidney International*. Supplement 2012;2(1):1-138. (Reaffirmed 2025 Apr) [ Context Link 1 ]
56. Smith SG, Schreiber MA. Shock, electrolytes, and fluid. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery*. 21st ed. Elsevier; 2022:44-94. [ Context Link 1 ]
57. Mount DB. Fluid and electrolyte disturbances. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL, editors. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill Education; 2022:338-356. [ Context Link 1 ]
58. Kliegman RM, et al. Electrolyte and acid-base disorders. In: Kliegman RM, et al., editors. *Nelson Textbook of Pediatrics*. 22nd ed. Elsevier; 2025:485-525. [ Context Link 1 ]
59. Hoeffel DP, Daly PJ, Kelly BJ, Giveans MR. Outcomes of the first 1,000 total hip and total knee arthroplasties at a same-day surgery center using a rapid-recovery protocol. *Journal of the American Academy of Orthopaedic Surgeons*. Global Research & Reviews 2019;3(3):e022. DOI: 10.5435/JAAOSGlobal-D-19-00022. [ Context Link 1, 2 ] View abstract...
60. MacKoul P, Danilyants N, Touchan F, van der Does LQ, Haworth LR, Kazi N. Laparoscopic-assisted myomectomy with uterine artery occlusion at a freestanding ambulatory surgery center: a case series. *Gynecological Surgery* 2020;17(1):7. DOI: 10.1186/s10397-020-01075-2. [ Context Link 1 ] View abstract...
61. Yorkgitis BK, Peetz AB. Perioperative hemostasis. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:286-291. [ Context Link 1 ]

---

## Footnotes

[A] The terms "ambulatory" and "outpatient" are used interchangeably. The definition of an ambulatory procedure is not uniformly agreed upon. Contractual agreements (eg, between payers and providers) or regulatory language (eg, CMS' Two-Midnight Rule) often set the time frame of an ambulatory procedure. Of note,

an ambulatory procedure may include an overnight stay in a hospital or facility. In other words, not all ambulatory procedures are "day cases" (patient discharged the day of surgery). Some patients, even if undergoing a procedure with an ambulatory goal length of stay (GLOS), require inpatient care depending on various patient and procedural factors. The proportion of patients who are usually treated on an ambulatory basis varies by procedure and patient group (eg, age, comorbidities). This guideline is designed to help identify those patients who, despite an ambulatory GLOS, require inpatient care. [ A in Context Link 1 ]

[B] Low-risk procedures are usually considered those that are not intrathoracic, intraperitoneal, or vascular.(33) Some orthopedic procedures are low risk (eg, arthroscopy).(33) Examples of low-risk procedures include endoscopic gastrointestinal, laryngeal, sinus, intrauterine, ureteral, or bladder procedures; cataract surgery; most breast surgery (eg, biopsy, partial or simple complete mastectomy); hemorrhoidectomy; hernia repair; female incontinence surgery; tonsillectomy; nasal septal or polyp procedures; myringotomy; tympanoplasty; and parotid, thyroid, or parathyroid procedures.(33)(34) [ B in Context Link 1, 2 ]

[C] The risk factors listed do not necessarily or automatically identify a patient in whom a potentially ambulatory procedure should instead be performed on an inpatient basis. Specific details such as which procedure is being considered and the overall clinical status of the patient are necessary to complete assessment of suitability for ambulatory surgery.(33)(34) [ C in Context Link 1 ]

[D] Precise definitions of severe frailty vary. The Risk Analysis Index is one frailty screening tool that has been studied and used in preoperative populations.(38) [ D in Context Link 1 ]

[E] Very few patients with atrial fibrillation or atrial flutter (same criteria for anticoagulation apply) require inpatient care or need to have their inpatient stay extended due to a need to achieve immediate therapeutic anticoagulation (ie, stay in the hospital to receive IV unfractionated heparin until warfarin-induced anticoagulation is sufficient). Most patients, including those with clear indications for long-term anticoagulation, do not need immediate anticoagulation, as the risk of an embolic event within the few days until their warfarin becomes therapeutic is very low (a small fraction of 1% per day).(48) Only patients deemed to be at particular risk for embolization (eg, mechanical valve, recent stroke or transient ischemic attack) are candidates for bridge therapy.(48) In addition, the vast majority of patients are eligible to be anticoagulated through use of an oral direct thrombin inhibitor (eg, dabigatran), an oral coagulation factor Xa inhibitor (eg, rivaroxaban, apixaban, edoxaban), or low-molecular-weight heparin, all of which achieve full anticoagulation rapidly (eg, a few hours after first dose).(48)(50) [ E in Context Link 1 ]

[F] The patient may need supported ambulation, non-weight-bearing or partial-weight-bearing ambulation, or transfer and gait training with crutches or walker.(59) [ F in Context Link 1 ]

[G] Recovery facility care is usually indicated only for the patient who came from a recovery facility for ambulatory surgery. [ G in Context Link 1 ]

## Definitions

### Activity level appropriate

- Activity level appropriate: ambulatory or appropriate activity level post procedure[A](1)(2)

### References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.
2. Chang M, Horvath R. The postanesthesia care unit. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2484-2511.e5.

### Footnotes

- A. The patient may need supported ambulation, non-weight-bearing or partial-weight-bearing ambulation, or transfer and gait training with crutches or walker.

## Altered mental status

- Altered mental status (ie, different from baseline), as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Confusional state (eg, disorientation, difficulty following commands, deficit in attention)
  - Lethargy (eg, awake or arousable, but with drowsiness; reduced awareness of self and environment)
  - Obtundation (ie, arousable only with strong stimuli, lessened interest in environment, slowed responses to stimulation)
  - Stupor (ie, may be arousable but patient does not return to normal baseline level of awareness)
  - Coma (ie, not arousable)

## References

1. Maher PJ. Confusion. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:126-131.e1.
2. Lei C, Smith C. Depressed consciousness and coma. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:117-125.e1.
3. Abraham G, Maher PJ. Delirium and dementia. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:1269-1280.e2.
4. Holler-Managan YF. Neurologic evaluation. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:3550-3560.

## American Society of Anesthesiologists (ASA) Physical Status Classification System

- American Society of Anesthesiologists (ASA) Physical Status Classification System[A](2)(3)(4)
  - Class I: Normal healthy patient
  - Class II: Patient with mild systemic disease
  - Class III: Patient with severe systemic disease
  - Class IV: Patient with severe systemic disease that is constant threat to life
  - Class V: Moribund patient who is not expected to survive without the operation

## References

1. Sankar A, Johnson SR, Beattie WS, Tait G, Wijeyesundera DN. Reliability of the American Society of Anesthesiologists physical status scale in clinical practice. British Journal of Anaesthesia 2014;113(3):424-32. DOI: 10.1093/bja/aeu100.
2. Foley C, Kendall MC, Apruzzese P, De Oliveira GS. American Society of Anesthesiologists Physical Status Classification as a reliable predictor of postoperative medical complications and mortality following ambulatory surgery: an analysis of 2,089,830 ACS-NSQIP outpatient cases. BMC Surgery 2021;21(1):Online. DOI: 10.1186/s12893-021-01256-6.
3. Horvath B, Kloesel B, Todd MM, Cole DJ, Prielipp RC. The evolution, current value, and future of the American Society of Anesthesiologists physical status classification System. Anesthesiology 2021;135(5):904-919. DOI: 10.1097/ALN.0000000000003947.
4. Mayhew D, Mendonca V, Murthy BVS. A review of ASA physical status - historical perspectives and modern developments. Anaesthesia 2019;74(3):373-379. DOI: 10.1111/anae.14569.

## Footnotes

- A. Note: There is no accepted standardization of terms used in this classification system.(1)

## Competent person available to accompany patient (if required)

- Competent person available to accompany patient (if required) and stay with patient on first postoperative night at next level of care(1)

### References

- Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.

## Dangerous arrhythmia

- Dangerous arrhythmia, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Heart rhythms that are inherently dangerous or unstable, as indicated by **1 or more** of the following(5)(6):
    - Resuscitated ventricular fibrillation or cardiac arrest
    - Ventricular escape rhythm
    - Sustained ventricular tachycardia (30 seconds or more of ventricular rhythm at greater than 100 beats per minute)
    - Nonsustained ventricular tachycardia and **1 or more** of the following:
      - Acute myocarditis
      - Myocardial ischemia
  - Unstable cardiac conduction defects, as indicated by **1 or more** of the following(7):
    - Type II second-degree atrioventricular block
    - Third-degree atrioventricular block
    - New-onset left bundle branch block with suspected myocardial ischemia
  - Heart rhythms of concern due to **1 or more** of the following(8):
    - Hypotension
    - Respiratory distress
    - Association with other significant symptoms (eg, syncope)(7)(9)(10)(11)

### References

- Curtis AB, Tomaselli GF. Approach to the patient with cardiac arrhythmias. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:1145-1162.e7.
- Dalal AS, Van Hare GF. Disturbances of rate and rhythm of the heart. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:2844-2859.e1.
- Joglar JA, et al. 2023 HRS Expert Consensus Statement on the management of arrhythmias during pregnancy. Heart Rhythm 2023;20(10):Online. DOI: 10.1016/j.hrthm.2023.05.017.
- Myerburg RJ, Lampert R. Cardiac arrest and life-threatening arrhythmias. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:312-317.
- Garan H. Ventricular arrhythmias. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:332-340.
- Goldberger JJ, Albert CM, Myerburg RJ. Cardiac arrest and sudden cardiac death. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:1349-1386.
- Patton KK, Olgin JE. Bradyarrhythmias and atrioventricular block. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:1312-1320.
- Kalman JM, Sanders P. Supraventricular tachycardias. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:1245-1271.

9. Joglar JA, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the diagnosis and management of atrial fibrillation: a report of the American College of Cardiology/American Heart Association joint committee on clinical practice guidelines. Journal of the American College of Cardiology 2024;149(1):Online. DOI: 10.1016/j.jacc.2023.08.017. (Reaffirmed 2025 Mar)
10. Zimetbaum P, Goldman L. Supraventricular ectopy and tachyarrhythmias. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:322-332.
11. Zimetbaum P, Goldman L. Bradycardias and conduction system delays. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:317-322.

## Hemodynamic instability

- Hemodynamic instability, as indicated by **1 or more** of the following:
  - Vital sign abnormality not corrected by appropriate treatment, as indicated by **1 or more** of the following[A]:
    - Tachycardia that persists despite appropriate treatment (eg, treatment of underlying cause, despite observation care)[A]
    - Hypotension that persists despite appropriate treatment (eg, treatment of underlying cause, despite observation care)[A]
    - Orthostatic hypotension that persists despite appropriate treatment (eg, treatment of underlying cause, despite observation care)[A]
  - Severe hypotension in adult patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure less than 80 mm Hg(1)[A]
    - Shock index greater than 1.0 (shock index is the heart rate divided by systolic blood pressure)[A](2)(3)(4)
    - Mean arterial pressure[B] less than 65 mm Hg  MAP Calculator[A](1)(6)
    - IV inotropic or vasopressor medication required to maintain adequate blood pressure or perfusion(3)(6)
    - Hypoperfusion due to hypotension, as indicated by **ALL** of the following:
      - Hypotension
      - Evidence of hypoperfusion, as indicated by **1 or more** of the following:
        - Lactate of 2.0 mmol/L (18 mg/dL) or more secondary to hypotension (ie, hypoperfusion)[C](3)(6)(8)
        - Metabolic acidosis (arterial or venous[D] pH less than 7.35) not otherwise explained(3)(6)(8)
        - Significant end organ dysfunction due to hypotension (eg, Altered mental status, myocardial ischemia, 2-fold or higher acute increase in serum creatinine)(3)(6)
  - Severe hypotension in pediatric patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure less than 80 mm Hg in child 6 to 17 years of age[A](14)
    - Systolic blood pressure less than 75 mm Hg in child 6 months to 5 years of age[A](14)
    - Shock index greater than 0.9 in child 13 to 17 years of age (shock index is the heart rate divided by systolic blood pressure)[A](2)(15)
    - Shock index greater than 1.0 in child 7 to 12 years of age (shock index is the heart rate divided by systolic blood pressure)[A](2)(15)
    - Shock index greater than 1.2 in child 4 to 6 years of age (shock index is the heart rate divided by systolic blood pressure)[A](2)(15)
    - IV inotropic or vasopressor medication required to maintain adequate blood pressure or perfusion(5)(6)
    - Hypoperfusion due to hypotension, as indicated by **ALL** of the following:
      - Hypotension
      - Evidence of hypoperfusion, as indicated by **1 or more** of the following:
        - Lactate of 2.0 mmol/L (18 mg/dL) or more secondary to hypotension (ie, hypoperfusion)[C](6)(8)
        - Metabolic acidosis (arterial or venous pH less than 7.35) not otherwise explained[D](5)(6)(14)
        - Significant end organ dysfunction due to hypotension (eg, Altered mental status, myocardial ischemia, 2-fold or higher acute increase in serum creatinine)(5)(6)(14)

## References

1. Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Koch E, Lovett S, Nghiem T, Riggs RA, Rech MA. Shock index in the emergency department: utility and limitations. Open Access Emergency Medicine 2019;11:179-199. DOI: 10.2147/OAEM.S178358.
3. Angus DC. Approach to the patient with shock. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:658-665.
4. Balhara KS, Hsieh YH, Hamade B, Circh R, Kelen GD, Bayram JD. Clinical metrics in emergency medicine: the shock index and the probability of hospital admission and inpatient mortality. Emergency Medicine Journal 2017;34(2):89-94. DOI: 10.1136/emermed-2015-205532.
5. Weiss SL, Tissieres P, Peters MJ. Shock. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:600-611.
6. Singer M, et al. The Third International Consensus definitions for sepsis and septic shock (Sepsis-3). Journal of the American Medical Association 2016;315(8):801-810. DOI: 10.1001/jama.2016.0287.
7. Wardi G, Brice J, Correia M, Liu D, Self M, Tainter C. Demystifying lactate in the emergency department. Annals of Emergency Medicine 2020;75(2):287-298. DOI: 10.1016/j.annemergmed.2019.06.027.
8. Kraut JA, Madias NE. Lactic acidosis. New England Journal of Medicine 2014;371(24):2309-2319. DOI: 10.1056/NEJMr1309483.
9. Olivieri L, Chasm R. Diabetic ketoacidosis in the pediatric emergency department. Emergency Medicine Clinics of North America 2013;31(3):755-773. DOI: 10.1016/j.emc.2013.05.004.
10. Maloney GE, Glauser JM. Diabetes mellitus and disorders of glucose homeostasis. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:1543-1558.e2.
11. Arnold TD, Miller M, van Wessel KP, Evans JA, Balogh ZJ. Base deficit from the first peripheral venous sample: a surrogate for arterial base deficit in the trauma bay. Journal of Trauma 2011;71(4):793-7; discussion 797. DOI: 10.1097/TA.0b013e31822ad694.
12. Malinoski DJ, Todd SR, Slone S, Mullins RJ, Schreiber MA. Correlation of central venous and arterial blood gas measurements in mechanically ventilated trauma patients. Archives of Surgery 2005;140(11):1122-5. DOI: 10.1001/archsurg.140.11.1122.
13. Zakrisson T, McFarlan A, Wu YY, Keshet I, Nathens A. Venous and arterial base deficits: do these agree in occult shock and in the elderly? A Bland-Altman analysis. Journal of Trauma and Acute Care Surgery 2013;74(3):936-9. DOI: 10.1097/TA.0b013e318282747a.
14. Alexander PMA, et al. Cardiovascular dysfunction criteria in critically ill children: the PODIUM consensus conference. Pediatrics 2022;149(1 Suppl 1):S39-S47. DOI: 10.1542/peds.2021-052888F.
15. Ramgopal S. The shock index among children presenting to the emergency department: analysis of nationally representative sample. Journal of Emergency Medicine 2024;67(2):e146-e156. DOI: 10.1016/j.jemermed.2024.03.022.

## Footnotes

- A. Criteria based upon clinician-acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.
- B. The mean arterial pressure (MAP) takes into account both SBP and DBP readings.(3)(5)
- C. There are numerous causes of an elevated lactate level. The most common are cardiogenic or hypovolemic shock, severe heart failure, severe trauma, or sepsis. However, there are also other etiologies to consider such as vigorous exercise, seizures, liver disease, or medication use (eg, metformin, beta2-agonists); therefore, interpretation of elevated lactate levels requires consideration of the clinical context (eg, well-appearing post exercise vs hypotensive). The severity and persistence of the elevation can sometimes be helpful in this differentiation. In most instances of lactic acidosis, blood pH is less than 7.35, with a serum bicarbonate level of 20 mEq/L (mmol/L) or lower. However, a coexisting respiratory or metabolic alkalosis can mask these findings.(7)(8)
- D. Analyses have concluded that venous and arterial pH measurements are highly correlated, with small differences between them that are usually not clinically significant.(9)(10)(11)(12)(13) If a mixed acid-base disorder is suspected, an arterial blood gas is indicated.(10)

## Hypotension

- Hypotension, as indicated by **1 or more** of the following:
  - Hypotension in adult patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure less than 90 mm Hg[A][B](1)
    - Mean arterial pressure[C] less than 70 mm Hg[A][B]  MAP Calculator(1)(2)
    - Decrease in baseline systolic blood pressure of 30 mm Hg or more, with significant signs or symptoms due to lower blood pressure (eg, near syncope, syncope, chest pain)[A][B](1)
  - Hypotension in pediatric patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure less than 110 mm Hg in child 13 to 17 years of age[A][D](3)
    - Systolic blood pressure less than 100 mm Hg in child 6 to 12 years of age[A][D](3)
    - Systolic blood pressure less than 95 mm Hg in child 3 to 5 years of age[A][D](3)
    - Systolic blood pressure less than 90 mm Hg in child 1 or 2 years of age[A][D](3)
    - Systolic blood pressure less than 80 mm Hg in infant 6 to 11 months of age[A][D](3)
    - Systolic blood pressure less than 70 mm Hg in infant 3 to 5 months of age[A][D](3)
    - Systolic blood pressure less than 65 mm Hg in infant 1 or 2 months of age[A][D](3)

## References

1. Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Puskas MA, Jones AE. Shock. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:34-41.e1.
3. Anderson CC, Kapoor S, Mark TE. Pediatric parameters and equipment. In: Anderson CC, Kapoor S, Mark TE, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 23rd ed. Elsevier; 2024:i-iii.

## Footnotes

- A. Criteria based upon clinician-acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.
- B. Interpretation of blood pressure requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline blood pressure, medications, and clinical impact. For example, an elderly patient with heart failure may be prescribed medication with the intentional goal of a reduced pressure. If the patient's baseline SBP is 92 mm Hg to 96 mm Hg, absent signs or symptoms of hypotension, an emergency department SBP of 86 mm Hg should not automatically be categorized as hypotensive. This would hold for mean arterial pressure (MAP) as well. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term hypotension. Whether a blood pressure below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.
- C. The mean arterial pressure (MAP) takes into account both SBP and DBP readings.
- D. Interpretation of blood pressure requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline blood pressure, medications, and clinical impact. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term hypotension. Whether a blood pressure below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.

## Hypoxemia

- Hypoxemia, as indicated by **1 or more** of the following(1):
  - Patient without baseline need for supplemental oxygen with oxygen saturation (SpO<sub>2</sub>) of less than 90% or arterial blood gas partial pressure of oxygen (PaO<sub>2</sub>) of less than 60 mm Hg (8.0 kPa) on room air[A][B]
  - Patient without baseline need for supplemental oxygen who now requires supplemental oxygen to keep SpO<sub>2</sub> greater than 89% or PaO<sub>2</sub> greater than 59 mm Hg (7.9 kPa)[A]
  - Patient with baseline need for supplemental oxygen who now requires increased supplemental oxygen to maintain oxygenation at baseline or acceptable level

## References

- Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
- Jamali H, et al. Racial disparity in oxygen saturation measurements by pulse oximetry: evidence and implications. Annals of the American Thoracic Society 2022;19(12):1951-1964. DOI: 10.1513/AnnalsATS.202203-270CME.
- Rojas-Camayo J, et al. Reference values for oxygen saturation from sea level to the highest human habitation in the Andes in acclimatised persons. Thorax 2018;73(8):776-778. DOI: 10.1136/thoraxjnl-2017-210598.

## Footnotes

- A. Pulse oximetry (SpO<sub>2</sub>) may underestimate arterial saturation (SaO<sub>2</sub>), especially in people with dark skin pigmentation, thick skin, cold body temperature, or who are wearing colored nail polish, and thus may not accurately detect hypoxemia.(2) Where appropriate, pulse oximetry should be measured after warming fingers or removing nail polish. Pulse oximetry results should be assessed within the context of the patient's clinical presentation, and performance of an arterial blood gas considered for a more accurate assessment of oxygenation if indicated.(2) Specific target values may require adjustment when care is delivered at high altitude.(3)
- B. Criteria based upon clinician-acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

## Multimodal analgesia

- Multimodal analgesia involves the utilization of 2 or more analgesic agents with different mechanisms of action in order to provide additive or synergistic pain control, while minimizing side effects and reliance on opioids.(1)(2)(3)

## References

- D'Souza RS, Johnson RL. Regional and multimodal treatments of perioperative pain. In: Benzon H, editor. Practical Management of Pain. 6th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:355-373.e8.
- George S, Johns M. Review of nonopioid multimodal analgesia for surgical and trauma patients. American Journal of Health-System Pharmacy 2020;77(24):2052-2063. DOI: 10.1093/ajhp/zxaa301.
- Finnerup NB. Nonnarcotic methods of pain management. New England Journal of Medicine 2019;380(25):2440-2448. DOI: 10.1056/NEJMra1807061.

## No complicating features

- No complicating features requiring inpatient care; examples include(1)(2)(3):
  - Severe complications of procedure (eg, bowel injury, airway compromise, vascular injury, hemorrhage)
  - Extensive (eg, dissection far beyond usual scope of procedure) or prolonged (eg, surgery length significantly beyond that expected) surgery performed requiring inpatient postoperative care
  - Conversion to open or complex procedure that requires inpatient care (eg, open vs laparoscopic cholecystectomy, abdominal vs vaginal hysterectomy)
  - Comorbid condition or test result identified during or after procedure that requires inpatient care (eg, severe infection, compartment syndrome)
  - Severe complications of anesthesia (eg, postepidural puncture headache, malignant hyperthermia)

## References

1. Yepuri N, Pruekprasert N, Cooney RN. Surgical complications. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:238-283.
2. Redelmeier DA. Postoperative care and complications. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:2672-2677.
3. Smith SG, Schreiber MA. Shock, electrolytes, and fluid. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:44-94.

## Operative site appropriate

- Operative site appropriate, as indicated by **ALL** of the following(1):
  - Surgical site is dry or as expected for procedure.
  - Bleeding is absent or as expected for procedure.

## References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.

## Orthostatic hypotension

- Orthostatic hypotension,[A][B] as indicated by **1 or more** of the following(1)(2)(3):
  - Fall in SBP of 20 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position
  - Fall in DBP of 10 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position

## References

1. Shibao C, Lipsitz LA, Biaggioni I, American Society of Hypertension Writing Group. Evaluation and treatment of orthostatic hypotension. Journal of the American Society of Hypertension 2013 Jul-Aug;7(4):317-324. DOI: 10.1016/j.jash.2013.04.006.
2. Dalal AS, Van Hare GF. Syncope. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:592-599.
3. Fang JC, O'Gara PT. History and physical examination: an evidence-based approach. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:123-140.

## Footnotes

- A. Concomitant measurements of the heart rate are important to measure to help diagnose subtypes of orthostatic hypotension (eg, the lack of a compensatory increase in heart rate is typical of autonomic failure and an exaggerated tachycardia may be reflective of volume depletion). However, the heart rate is not a

component of the definition of orthostatic hypotension, which relies upon blood pressure alone.(1)(2)(3)

- B. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

## Patient alert

- Patient alert (at baseline mental status)(1)(2)

### References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.
2. Chang M, Horvath R. The postanesthesia care unit. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2484-2511.e5.

## Physiologic recovery

- Physiologic recovery: cardiovascular, respiratory, and hemodynamic status normal or near preoperative baseline(1)(2)(3)

### References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.
2. Redelmeier DA. Postoperative care and complications. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:2672-2677.
3. Chang M, Horvath R. The postanesthesia care unit. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2484-2511.e5.

## Postoperative effects resolved or managed

- Postoperative effects resolved or managed, as indicated by **ALL** of the following(1)(2)(3):
  - Pain: absent or managed and appropriate for next level of care
  - Nausea and vomiting: absent or adequately treated and appropriate for next level of care
  - Headache, dizziness, or drowsiness: absent or mild and appropriate for next level of care

### References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.
2. Hernandez A, Sherwood ER. Anesthesiology principles, pain management, and conscious sedation. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:315-348.
3. Redelmeier DA. Postoperative care and complications. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:2672-2677.

## Respiratory distress

- Respiratory distress, as indicated by **ALL** of the following(1)(2)(3)(4):

- Patient with **1 or more** of the following:
  - Dyspnea (difficulty breathing)
  - Tachypnea
  - Abnormal breathing pattern (eg, chest retractions)
  - Other evidence of difficulty breathing
- Evidence of respiratory compromise, as indicated by **1 or more** of the following:
  - Hypoxemia
  - Altered mental status
  - Other evidence of respiratory compromise (eg, respiratory acidosis)

## References

1. Braithwaite SA, Wessel AL. Dyspnea. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:194-201.e2.
2. Naureckas ET, Solway J. Disturbances of respiratory function. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL, editors. Harrison's Principles of Internal Medicine. 21st ed. McGraw Hill Education; 2022:2133-2139.
3. Matthay MA, Ware LB. Acute respiratory failure. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:642-652.
4. Rakoczy K. Acute respiratory failure. In: Gershel JC, Rauch DA, editors. Caring for the Hospitalized Child: A Handbook of Inpatient Pediatrics. 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2023:749-754.

## Stable vital signs

- Stable vital signs: systemic blood pressure and pulse within 20% of the preanesthetic level or appropriate for next level of care(1)(2)

## References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.
2. Chang M, Horvath R. The postanesthesia care unit. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2484-2511.e5.

## Tachycardia

- Tachycardia,[A][B] as indicated by **1 or more** of the following:
  - Heart rate greater than 100 beats per minute in adult[A][B](1)
  - Heart rate greater than 85 beats per minute in child 13 to 17 years of age[A][C](2)
  - Heart rate greater than 95 beats per minute in child 6 to 12 years of age[A][C](2)
  - Heart rate greater than 110 beats per minute in child 1 to 5 years of age[A][C](2)
  - Heart rate greater than 120 beats per minute in infant 3 to 11 months of age[A][C](2)
  - Heart rate greater than 150 beats per minute in infant 1 or 2 months of age[A][C](2)

## References

1. Schrager DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Anderson CC, Kapoor S, Mark TE. Pediatric parameters and equipment. In: Anderson CC, Kapoor S, Mark TE, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 23rd ed. Elsevier; 2024:i-iii.

## Footnotes

- A. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.
- B. Interpretation of heart rate requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline heart rate, medications, and clinical impact. For example, an elderly patient on a beta-blocker medication with a baseline resting heart rate of 60 beats per minute may be clinically tachycardic at a heart rate of 94 beats per minute. Likewise, a patient who is upset, in pain, or nervous in the emergency department with a heart rate of 106 beats per minute may meet the technical definition of tachycardia, but this tachycardia (absent associated findings such as chest pain or hypotension) may not be clinically important. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term tachycardia. Whether a heart rate above or below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.
- C. Interpretation of heart rate requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline heart rate, medications, and clinical impact. A patient who is upset, in pain, or nervous in the emergency department with an elevated heart rate may meet the technical definition of tachycardia, but this tachycardia (absent associated findings such as hypotension) may not be clinically important. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term tachycardia. Whether a heart rate above or below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.

## Tachypnea

- Tachypnea,<sup>[A][B]</sup> as indicated by **1 or more** of the following:
  - Respiratory rate greater than 20 breaths per minute in adult<sup>[A][B]</sup>(1)
  - Respiratory rate greater than 18 breaths per minute in child 13 to 17 years of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 22 breaths per minute in child 6 to 12 years of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 25 breaths per minute in child 3 to 5 years of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 30 breaths per minute in child 1 or 2 years of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 40 breaths per minute in infant 6 to 11 months of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 45 breaths per minute in infant 3 to 5 months of age<sup>[A][B]</sup>(2)
  - Respiratory rate greater than 55 breaths per minute in infant 1 or 2 months of age<sup>[A][B]</sup>(2)

## References

1. Schrager DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Anderson CC, Kapoor S, Mark TE. Pediatric parameters and equipment. In: Anderson CC, Kapoor S, Mark TE, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 23rd ed. Elsevier; 2024:i-iii.

## Footnotes

- A. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

B. Interpretation of respiratory rate requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline respiratory rate and whether the respiratory rate is indicative of significant underlying respiratory or other pathology. A mildly increased respiratory rate (eg, 20 to 22 breaths per minute in an adult), absent other indications of serious illness (eg, hypoxemia, metabolic acidosis, decreased tidal volume, pain), may be transitory and not clinically important. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term tachypnea. Whether a respiratory rate above the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment. In addition, the measurement of the respiratory rate is subject to error. A medical textbook states that because there can be significant breath-to-breath variation in respiratory rate, the rate should be assessed for at least 30 seconds, preferably for a full minute.<sup>(1)</sup> This same textbook also states that new technologies designed to measure the respiratory rate have not proved to be clinically useful.<sup>(1)</sup>

## Temperature appropriate

- Temperature appropriate: patient afebrile or temperature appropriate for next level of care<sup>(1)(2)</sup>

### References

1. Yepuri N, Pruekprasert N, Cooney RN. Surgical complications. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:238-283.
2. Santos AP, Onkendi E, Dissanaik S. Surgical infections and antibiotic use. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:223-237.

## Voiding status acceptable

- Voiding status acceptable, as indicated by **1 or more** of the following<sup>(1)</sup>:
  - Voiding spontaneously
  - Urinary catheter in place and instructions given for follow-up
  - No voiding, but instructions given (eg, return to care if not voiding within 12 hours)

### References

1. Hyman JB, Goren O, Wilson SH, Philip B. Ambulatory (outpatient) anesthesia. In: Gropper MA, et al., editors. Miller's Anesthesia. 10th ed. Elsevier; 2025:2149-2184.e12.