Gastroenterology GRG

GRG: MG-GAS (ISC GRG)

MCG Health
General Recovery Care
30th Edition
Medical Admission Case Management GRG GRG

Note: An appropriate Optimal Recovery Guideline (ORG) should be identified and used whenever possible. This General Recovery Guideline (GRG) is intended to aid only in situations in which no ORG appears applicable.

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Admission to Inpatient Care

- Hospital admission is needed for appropriate care of the patient because of **1 or more** of the following:
  - Suspected acute intra-abdominal process, as indicated by **1 or more** of the following:
    - Hemodynamic instability (1)(2)
    - Peritoneal signs
    - Intra-abdominal abscess or phlegmon(1)(3)(4)

- Foreign body ingestion with signs or symptoms of gastrointestinal obstruction, erosion, or perforation (eg, battery, magnets, needles, small toys, laundry pods)[A](2)(5)(6)(8)(9)
- Other severe abdominal signs or symptoms necessitating inpatient care (eg, severe pain, free air)(1)(2)(3)(10)

- Multiple magnet ingestion, or ingestion of single magnet with other ferromagnetic foreign body[B](2)(9)
- Narcotic packet ingestion[C](11)

− Nonoperative management[D][E] of acute appendicitis requiring inpatient care, as indicated by **1 or more** of the following(12)(13):

- Complicated acute appendicitis (eg, perforation, abscess, diffuse peritonitis, severe phlegmon, free air, more than minimal free fluid, evidence of neoplasm or carcinomatosis)[F](12)(13)(18)(20)
- Uncomplicated acute appendicitis (eg, no perforation, abscess, or diffuse peritonitis) that is not appropriate[G] for outpatient treatment,[H] as indicated by **1 or more** of the following(12)(13)(20)(21)(22)(24):
  - Severe systemic illness (eg, Hemodynamic instability, sepsis-related organ dysfunction)(13)(22)
  - Appendicolith present[I]
  - Older than 60 years[J](12)(21)
  - Pediatric patient (ie, younger than 18 years)[K](2)(21)
  - Pregnancy[L](12)(13)(21)(22)
  - Type 2 diabetes(21)
  - Inflammatory bowel disease(13)(22)
  - Immunodeficiency (eg, absolute neutrophil count less than 500/mm^3 (0.5 x10^9/L), chronic immunosuppressive medication, AIDS)(13)(21)
  - Active malignancy (eg, not in remission, undergoing treatment or treatment planned)(21)(22)
  - Patient with another infection that requires treatment (eg, pneumonia, UTI)
  - Patient with concomitant acute exacerbation of chronic comorbidity (eg, COPD, heart failure)
  - Catheter (eg, indwelling access or port) or implant (eg, joint replacement, mechanical valve, permanent pacemaker, automated implantable cardioverter-defibrillator) at risk for bacterial seeding[M](22)
  - Abdominal or pelvic surgery in past month(22)
  - Allergy or severe reaction to first-line antibiotics (ie, potentially less effective regimen planned)(21)(22)
  - Recurrent appendicitis (ie, current episode is not the first)(21)
  - Acute kidney injury (stage 2) (21)
  - Acute renal failure (stage 3 acute kidney injury) (21)
  - Renal insufficiency or failure (creatinine clearance less than 60 mL/min/1.73m^2 (1.0 mL/sec/1.73m^2) or on dialysis)
     eGFR - Adult Calculator  eGFR - Pediatric Calculator(21)
- Uncomplicated appendicitis (eg, no perforation, abscess, or diffuse peritonitis) with unsuccessful nonoperative treatment,[D][H][N] as indicated by **ALL** of the following(12)(13)(21)(22):
  - Clinical findings indicative of continued need for hospital-based care (ie, patient not appropriate for discharge to lower level of care), as indicated by **1 or more** of the following:
    - Hemodynamic instability (13)(22)
    - Fever (13)
    - Pain insufficiently controlled (ie, effective pain control regimen appropriate for next level of care not established)(13)(22)
    - Patient unable to maintain hydration orally(13)(22)
    - Insufficient improvement or worsening of signs and symptoms of appendicitis(13)(22)
  - Inpatient care needed, as indicated by **1 or more** of the following:
    - Hospital-based treatment needed beyond observation care[O](12)

- Worsening of clinical findings such that inpatient treatment appropriate (eg, evolution into complicated appendicitis, determination that appendectomy necessary[P])(21)

- Hemoperitoneum(29)(30)
- Ascites and **1 or more** of the following(31)(32):
  - Hemodynamic instability
  - Peritoneal signs
  - Tachypnea, Hypoxemia, or other respiratory symptoms that persist despite observation care (eg, after paracentesis)(33)
- Diarrhea and **1 or more** of the following:
  - Dehydration that is severe or persistent (34)(35)(36)
  - Intractable bloody diarrhea (eg, more than 6 bloody stools per day)(34)(35)
  - Altered mental status that is severe or persistent (34)(35)
  - Peritoneal signs (34)(35)(37)
  - Severe abdominal pain (eg, intestinal ischemia suspected)(37)(38)(39)
  - Hemodynamic instability (34)(35)(37)
  - Severe electrolyte abnormalities requiring inpatient care (34)(40)
  - Acute kidney injury (stage 2) (34)
  - Acute renal failure (stage 3 acute kidney injury) (34)
- Suspected toxic megacolon(38)(41)(42)(43)
- Dysphagia and **1 or more** of the following:
  - Suspected cause that requires inpatient care (eg, caustic ingestion with significant damage, irretrievable foreign body)(7)(44)(45)(46)
  - Dehydration that is severe or persistent (7)(47)
  - Inability to manage secretions(7)
  - Hemodynamic instability (48)
  - Severe electrolyte abnormalities requiring inpatient care (40)
  - Acute kidney injury (stage 2)
  - Acute renal failure (stage 3 acute kidney injury)
- Gastroparesis and **1 or more** of the following(49):
  - Dehydration that is severe or persistent (47)(50)
  - Severe electrolyte abnormalities requiring inpatient care (40)(50)
  - Acute kidney injury (stage 2)
  - Acute renal failure (stage 3 acute kidney injury)
  - Vomiting that is severe or persistent (50)(51)(52)
- Encopresis or severe fecal impaction[Q][R] and **1 or more** of the following:
  - Ambulatory and observation care management (eg, oral medication, enemas) unsuccessful (eg, treatment not sufficiently effective, patient requires polyethylene glycol via NG tube)[S](53)(54)
  - Complication of fecal impaction requiring inpatient treatment (eg, moderate to severe abdominal pain, inability to hydrate enterally, bowel obstruction, obstructive uropathy, stercoral colitis)[T](53)(55)(56)
  - Treatment at alternative level of care not appropriate, as indicated by **1 or more** of the following:
    - Intensity of care (eg, volume and frequency of stooling) beyond capabilities of caregivers
    - Patient has comorbid medical complexity (eg, cystic fibrosis, gastrointestinal dysmotility disorder, gastrointestinal anatomic abnormality) that necessitates inpatient care due to increased monitoring needs or risk of complications.(53)(55)(57)
    - Failure of outpatient management(53)(54)(55)

- Other aspect of patient care needs or outpatient environment that renders inpatient treatment necessary(55)

- Complication of gastrostomy or jejunostomy feeding tube, as indicated by **1 or more** of the following:
  - Luminal perforation(58)
  - Gastrocolonic or gastrocutaneous fistula(59)
  - Cellulitis of surrounding area that requires inpatient treatment (eg, acuity of infection, rapidity of progression or treatment regimen requires patient monitoring or care that cannot be provided at other than inpatient level of care)(59)(60)
  - Necrotizing fasciitis(59)(60)
  - Peritonitis (eg, Peritoneal signs)(59)(60)
  - Gastric herniation or prolapse(59)
  - Ischemic necrosis of gastric wall ("buried bumper")(59)(60)
  - Bleeding with Hemodynamic instability or ongoing active hemorrhage (eg, decreasing hematocrit)(59)
  - Other complication of gastrostomy or jejunostomy unable to be resolved at lower level of care(59)(60)
- Complications of transplanted liver, as indicated by **1 or more** of the following(61)(62):
  - Acute graft rejection or graft vs host disease requiring inpatient management (eg, IV immunosuppression)(63)(64)(65)
  - Failure of transplanted liver, as indicated by **1 or more** of the following(63)(64)(66):
    - Acute hepatitis (eg, transaminase level greater than 1000 International Units per liter (IU/L))(63)
    - Acute elevation of prothrombin time to more than 50% above baseline or INR greater than 1.5(63)(67)
    - Marked rise in bilirubin (eg, 10 mg/dL (171 micromoles/L) or greater)(63)(65)(67)
    - New-onset or worsening hepatic encephalopathy(66)
    - Acute liver necrosis
  - Infection requiring inpatient management (eg, Hemodynamic instability, need for percutaneous or surgical drainage)(64)(68)
  - Biliary complications (bile leak, biliary stricture not amenable to outpatient treatment)(63)(64)(66)(69)
  - Vascular complications (eg, hepatic artery or portal vein thrombosis) not amenable to outpatient treatment(61)(63)(64)(66)(69)(70)
  - Other complication of transplanted liver (eg, autoimmune hepatitis, variceal bleeding, pleural effusion) requiring inpatient management(63)(66)(71)
- Complications of transplanted pancreas, as indicated by **1 or more** of the following:
  - Acute graft rejection requiring inpatient management (eg, IV immunosuppression)(72)(73)
  - Severe metabolic acidosis or dehydration that persists despite observation care(74)
  - Failure of transplanted pancreas, as indicated by **1 or more** of the following(73):
    - Serum amylase greater than 3 times the upper limit of normal or baseline
    - Serum lipase greater than 3 times the upper limit of normal or baseline
    - Imaging findings consistent with pancreatic inflammation or necrosis
  - Infection requiring inpatient management (eg, Hemodynamic instability, need for percutaneous or surgical drainage)(68)(72)(73)(74)
  - Other complication of transplanted pancreas (eg, graft thrombosis, pancreatic duct stricture, intra-abdominal hypertension, anastomotic leak) requiring inpatient management(72)(74)(75)
- Complications of transplanted intestine, as indicated by **1 or more** of the following:
  - Acute graft rejection requiring inpatient management (eg, IV immunosuppression)(73)(76)(77)(78)
  - Failure of transplanted intestine (eg, requiring parenteral nutrition)(73)(76)
  - Infection requiring inpatient management (eg, Hemodynamic instability, need for IV antimicrobial treatment)(68)(73)(76)(77)(78)(79)
  - Other complication of transplanted intestine (eg, sclerosing peritonitis, graft thrombosis, obstruction, or anastomotic leak, stricture, or perforation) requiring inpatient management(73)(76)

- Abdominal compartment syndrome and **ALL** of the following(80):
  - Sustained intra-abdominal pressure (eg, bladder pressure) greater than 20 mm Hg in adults and 10 mm Hg in children(80)(81)

    - New organ dysfunction or failure (eg, respiratory failure, Hemodynamic instability, Acute kidney injury (stage 2), Acute renal failure (stage 3 acute kidney injury), intestinal ischemia) due to increased intra-abdominal pressure(80)(81)
  - **Gastroenterology** condition, symptom, or finding for which observation care has failed or is not considered appropriate. See General Criteria: Observation Care ISC, General Admission Criteria GRG, or Pediatric General Admission Criteria GRG guideline as appropriate.

Supplemental Medicare Criteria

Note: These criteria are to be considered for Medicare patients if none of the standard Clinical Indications for Admission to Inpatient Care apply.

- Patient with Medicare coverage requires inpatient admission, as indicated by **1 or more** of the following(82):
  - Admitting clinician expects patient to require hospital care for less than 2 midnights but, based on complex medical factors documented in medical record, judges that inpatient care is necessary (case-by-case exception). The medical record must contain sufficient documentation to make clear the rationale for the exception.
  - Patient has need for intubation and mechanical ventilation that is new (ie, did not present to hospital already on mechanical ventilation).
  - Treatment plan for hospital admission includes procedure designated by CMS as inpatient only (ie, on Inpatient Only List).
  - Patient has already received medically necessary hospital care that meets 2-midnight benchmark (excluding activities such as triage/intake, delays in provision of care, or time added due to patient or family convenience). The medical record must contain sufficient documentation to make clear the medical necessity for hospital care across 2 or more midnights.

Alternatives to Admission

- Alternatives may include(2):
  - Outpatient care in emergency department, observation care (see General Criteria: Observation Care ISC guideline as appropriate), rapid treatment site, urgent care center, or medical office(34)(35)
    - IV hydration and electrolytes
    - Antiemetics(50)(51)
    - Prokinetic agent(50)(51)
    - Diuretics
    - Antidiarrheal or antisecretory drugs(34)(35)(83)
    - Laboratory evaluation, including CBC, pregnancy test, serum electrolytes and chemistries, lactate, lipase, liver and renal function tests, coagulation studies, C-reactive protein, procalcitonin, toxicology screen, and stool tests(83)(84)
    - NG aspiration
    - Abdominal imaging (eg, ultrasound, x-ray, CT scan, MRI, nuclear scan)(85)(86)(87)(88)(89)
    - Endoscopy (diagnostic or interventional)(69)
    - Paracentesis
    - Gastroenterology, surgical, or interventional radiology consultations
    - Scheduling for outpatient ERCP(33)(69)(90)
    - Gastric emptying scintigraphy (preferred) or wireless motility capsule for suspected gastroparesis or gastrointestinal dysmotility(50)(51)
    - Repeat laboratory tests
    - Repeat examination in 6 to 8 hours
    - Outpatient antibiotics, diuretics, laxatives, enemas, dietary restrictions, or other therapies, with outpatient follow-up in 24 to 48 hours(35)(36)(55)
  - Home care
    - IV fluids, electrolytes, or antibiotics

- Home parenteral nutrition(51)(91)(92)
- Repeat specimen collections
- Repeat home assessments for abdominal distention and gastrointestinal function
- Nutritional assessment and assessment of adherence to restrictions
- Discontinuation or dose modification of contributing or precipitating agent(50)(51)

- Recovery facility
  - IV antibiotics and other parenteral therapies
  - Continued IV hydration
  - Frequent assessment of temperature, gastrointestinal function, and mental status
  - Observation for development of pain, bleeding, or respiratory compromise

Hospitalization

General Recovery Course

Stage	Level of Care	Clinical Status	Interventions
1	• ICU or intermediate care[U] • Social Determinants of Health Assessment • Discharge planning. See Discharge Planning Tool SR.	• **Clinical Indications met[V]**	• Inpatient interventions as needed • NPO if enteral studies planned or bowel rest needed
2	• Floor • Social Determinants of Health Assessment	• **No ICU or intermediate care needs**	• Inpatient interventions continue • Transition to oral routes
3	• **Activity level acceptable** • Social Determinants of Health Assessment • Floor to discharge • Complete discharge planning	• **Hemodynamic stability** • **Abdominal status acceptable** • **Pain and nausea absent or adequately managed** • **Temperature status acceptable** • **Volume status acceptable for next level of care** • **Oral hydration[W]** • **Hepatic and biliary abnormalities absent or acceptable** • **General Discharge Criteria met**	• **No inpatient interventions needed** • **Intake acceptable**

(10)(37)(38)(47)

Recovery Milestones are indicated in **bold**.

Benchmark Length of Stay (BLOS): Access diagnosis and procedure code-specific BLOS via Search functions.

Discharge Criteria

- Continued inpatient stay is needed until **1 or more** of the following are present:
  - Acceptable patient status for next level of care is achieved.
  - **ALL** of the following are present:
    - Hemodynamic stability, as indicated by **1 or more** of the following:
      - Hemodynamic abnormalities at baseline or acceptable for next level of care
      - Patient hemodynamically stable, as indicated by **ALL** of the following(93)(94):
        - Tachycardia absent
        - Hypotension absent
        - No evidence of inadequate perfusion (eg, no myocardial ischemia)
        - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)
    - Abdominal status acceptable, as indicated by **ALL** of the following(1):
      - Bowel sounds present
      - No ileus, signs of obstruction, or peritonitis
      - Abdominal distention absent or manageable at next level of care
    - Pain and nausea absent or adequately managed, as indicated by **1 or more** of the following(95)(96)(97)(98)(99):
      - No pain or nausea
      - Minimal discomfort on oral medications
      - Pain and nausea managed on regimen performable at next level of care
    - Temperature status acceptable, as indicated by **1 or more** of the following(100)(101)(102):
      - Temperature less than 100.5 degrees F (38.1 degrees C) (oral) and greater than 96.8 degrees F (36 degrees C) (rectal)
      - Temperature as expected for disease process and appropriate for management at next level of care
    - Volume status acceptable for next level of care
    - Oral hydration[W]
    - Hepatic and biliary abnormalities absent or acceptable, as indicated by **1 or more** of the following(103)(104)(105):
      - No abnormalities present
      - Hepatic and biliary status acceptable for next level of care, as indicated by **ALL** of the following:
        - Liver function tests normal, stable, or improving
        - Ascites absent, diminishing, or stable, with adequate respiratory function for next level of care
        - Renal function acceptable
        - Bilirubin stable or diminishing
        - Encephalopathy absent or controlled adequately for next level of care
        - No biliary obstruction, or current drainage and treatment plan appropriate for next level of care
    - Activity level acceptable, as indicated by **1 or more** of the following:
      - Patient ambulatory and can perform ADL as appropriate for age and development
      - Activity at baseline
      - Activity level acceptable for next level of care
    - Intake acceptable, as indicated by **1 or more** of the following(106):
      - Oral hydration, medications, and diet
      - Enteral hydration, medications, and diet

- Administration routes performable at next level of care

No inpatient interventions needed; examples include:

- Percutaneous drainage (eg, abscess, biliary tract) procedures
- Urgent endoscopic studies or dye procedures
- Gastrointestinal decompression, such as nasogastric or other tube suction, with continuing ileus or other acute intra-abdominal process
- Continued inpatient observation for complete ileus or other acute abdominal findings

General Discharge Criteria GRG met or Pediatric General Discharge Criteria GRG met (if either is relevant or necessary for patient's condition)

Case Management

See Medical Admission Case Management GRG GRG for further information.

Discharge Destination

- Post-hospital levels of admission may include:
  - Home.
  - Home healthcare. See Medical Admission Home Care GRG HC or Geriatric Admission Home Care GRG HC for further information.
  - Recovery facility care. See Medical Admission Recovery Facility Care GRG RFC or Geriatric Admission Recovery Facility Care GRG RFC for further information.
  - Inpatient rehabilitation facility. See Inpatient Rehabilitation Facility (IRF) Admission Recovery Facility Care GRG RFC for further information.

Evidence Summary

Criteria

The evidence for the clinical indications found in this guideline includes 53 published peer reviewed articles, 9 specialty society or other evidence-based guidelines, 2 Cochrane systematic reviews, and 16 book sections.

Rationale

Use of this MCG care guideline helps the clinician identify patient-specific complex clinical factors that make it reasonable to expect a necessity for hospital care across 2 or more midnights. The evidence-based clinical criteria assist the clinician in the decision to appropriately admit a patient to inpatient care. For Medicare enrollees, MCG care guidelines also support the clinician in the decision to appropriately admit a patient to inpatient care when there is not an expectation of 2 or more midnights of hospital care (eg, CMS' Two-Midnight Rule exceptions).

Use of these evidence-based clinical criteria to support decision making around the need for inpatient treatment is of clinical benefit to the patient and is crucial for quality patient care. Use of evidence-based clinical criteria ensures patients receive the most appropriate care for their specific condition, reduces unnecessary risks, promotes recovery, and provides a standard that can reduce disparities in care. Evidence-based clinical criteria not only help align treatment decisions with best practice, but they can also help reduce unwarranted variation in care by fostering consistency and equality in healthcare provision across regions and facilities. Appropriate use of the evidence-based clinical criteria in conjunction with the Supplemental Medicare Criteria ensures Medicare patients receive full access to Medicare benefits (eg, inpatient care), without risk of delay or decreased access, based on variables such as clinical severity of illness, length of provision of

medically necessary hospital-level care, or satisfaction of specified Medicare criteria as directed by CMS. Use of these criteria will help ensure that the patient receives necessary care in the appropriate setting.

Related CMS Coverage Guidance

This guideline supplements but does not replace, modify, or supersede existing Medicare regulations or applicable National Coverage Determinations (NCDs) or Local Coverage Determinations (LCDs).

Code of Federal Regulations (CFR): 42 CFR 412.3(82); 42 CFR 419.22(107); 42 CFR 422.101(108)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(109); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(110); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(111); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(112)

Medicare Coverage Determinations: Medicare Coverage Database(113)

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Footnotes

[A] Patients with button batteries seen in the esophagus on x-ray should undergo immediate endoscopic removal.(5)(6) Most patients undergoing endoscopic foreign body removal may be discharged if there are no other indications for admission.(7) Asymptomatic patients with button batteries in the stomach or beyond, who have no history of prior esophageal disease, no magnet co-ingestion, and reliable follow-up, may be observed as outpatients, with repeat interval x-ray studies and a plan for removal if the battery is still present after 2 to 4 days.(5)(6) [A in Context Link 1]

[B] Patients with multiple magnet ingestions (or a single magnet ingestion with one or more ferromagnetic foreign body ingestions) should be admitted for surgical removal or possible nonoperative therapy with laxatives and radiographic monitoring.(9) [B in Context Link 1]

[C] Patients with narcotic packet ingestion require monitoring for bowel obstruction or drug toxicity until passage of the packet. Surgical intervention may be required for obstruction, failure to pass the packet, or toxic drug leakage.(11) [C in Context Link 1]

[D] This criteria set is designed to help identify patients being treated nonoperatively who should have this treatment performed on an inpatient basis. If appendectomy is planned or performed, the appropriate appendectomy guideline should be used. [D in Context Link 1, 2, 3]

[E] An evidence-based guideline and a narrative review conclude that nonoperative management (ie, initial treatment with antibiotics) of uncomplicated appendicitis is a reasonable approach in properly selected patients (adult and pediatric), within a care setting that is appropriate (eg, sufficient follow-up available), and with patients (or caregivers) who are well-informed of the risks involved (eg, recurrence rate, likelihood of interval appendectomy).(12)(13) [E in Context Link 1, 2]

[F] Complicated appendicitis is variously defined and may be treated nonoperatively (eg, IV antibiotics with as-needed percutaneous drainage as inpatient) or by immediate appendectomy.(12)(13)(14) Retrospective cohort studies have shown success rates between 67% and 88% for adult and pediatric patients with complicated appendicitis managed nonoperatively.(15)(16)(17) Analysis of a database that included 41,848 adult patients with complicated appendicitis (mean age 48.9 years) found that 70.7% of patients underwent appendectomy during their index hospitalization; almost all of these (94.6%) were performed within 48 hours of admission.(18) This group of patients who underwent appendectomy for complicated appendicitis within 48 hours of admission had a median length of stay of 5 days (interquartile range 3 to 7 days).(18) A specialty society guideline recommends appendectomy over nonoperative treatment for pregnant patients with complicated appendicitis or an appendicolith.(19) [F in Context Link 1]

[G] These exclusion criteria are largely drawn from 2 randomized controlled trials examining outpatient treatment of adult patients with uncomplicated appendicitis.(21)(22) [G in Context Link 1]

[H] A randomized controlled trial (599 adult patients from Finland, mean age 36 years) compared oral moxifloxacin alone with a regimen of 2 doses of IV ertapenem sodium followed by 5 days of oral antibiotics (levofloxacin and metronidazole) in patients with uncomplicated acute appendicitis (ie, no appendicolith, perforation, abscess, or suspicion of tumor), with a primary outcome of treatment success defined as discharge from the hospital without surgery and no recurrent appendicitis over 1 year of follow-up.(21) In this study, treatment success was achieved by 70.2% in the oral antibiotic only group and 73.8% in the IV and oral antibiotics group, a result that failed to meet criteria of noninferiority, but did meet the objective of a greater than 65% success rate in both groups.(21) In this study, the median duration of the index hospital stay (ie, emergency department or inpatient) did not differ between groups; the median (interquartile range) length of stay was 28.9 (23.0 to 41.9) hours in the oral antibiotic only group and 29.9 (23.3 to 43.2) hours in the initial IV antibiotic group.(21) In a randomized controlled trial comparing nonoperative (antibiotic) treatment with appendectomy in adult patients in the United States with uncomplicated appendicitis, the antibiotic group received IV antibiotics for at least 24 hours, followed by 10 days of oral antibiotics (metronidazole plus ciprofloxacin or cefdinir).(22) Of the 776 patients in the antibiotic group (mean age 38 years), 47% were discharged from the emergency department (ie, not admitted as an inpatient), and of these patients, 79% (or 37% of all-antibiotic patients) were discharged within 24 hours of randomization.(22) Within the antibiotic group, the presence or absence of an appendicolith influenced results. Specifically, the rates of interval appendectomy within 30 days (16% vs 31%) and within 90 days (25% vs 41%) were higher in those with an appendicolith, while the rate of resolution of symptoms by day 7 was lower (53% vs 38%).(22) A longer-term follow-up of this study reported that rates of subsequent appendectomy for

patients treated nonoperatively were 40% (95% confidence interval (CI) 36% to 44%) at 1 year among 78% who returned surveys and 46% (95% CI 42% to 49%) at 2 years among 58% who returned surveys.(23) A meta-analysis of 4 randomized trials and 10 case control studies comparing appendectomy (66,988 patients) with initial nonoperative management (5048 patients) for pediatric patients with simple appendicitis found that nonoperative management had a 30-day failure rate of 20% (95% CI 11% to 29%) and a 1-year to 5-year failure rate of 32% (95% CI 25% to 38%).(24) [H in Context Link 1, 2]

[I] Appendicolith is a calcified fecal concretion in the appendix resulting in internal luminal obstruction.(21) The presence of an appendicolith is considered a contraindication to nonoperative treatment (some consider it a relative contraindication).(12)(13)(19)(21)(22) The failure rate of nonoperative treatment is significantly higher in patients with an appendicolith.(12)(13)(20)(21)(22)(24) [I in Context Link 1]

[J] A narrative review concludes that data concerning nonoperative treatment in older patients are limited.(13) In the Comparison of Outcomes of Antibiotic Drugs and Appendectomy (CODA) trial, the mean age of patients treated nonoperatively was 38.3 years, with a standard deviation of 13.4 years; in the Appendicitis Acuta (APPAC) II trial, patients older than 60 years were excluded.(21)(22) [J in Context Link 1]

[K] There are reports on case series of pediatric patients with uncomplicated appendicitis initially treated nonoperatively with antibiotics; however, none of these reports describe initial treatment with antibiotics as an outpatient.(20)(25)(26) A narrative review concludes that data are lacking concerning the outpatient treatment of children.(13) A large analysis of a cohort of 370 children with acute uncomplicated appendicitis who were treated initially nonoperatively (mean age 12 years) reports all patients were admitted to inpatient care, with a mean inpatient length of stay of 1.5 days (does not include duration of care in emergency department).(20) Analysis of 10,394 children managed nonoperatively for uncomplicated appendicitis reported a median inpatient length of stay of 1 day; of these, 18.4% failed nonoperative therapy (defined by subsequent surgical code for appendectomy or perforated appendix) within 14 days, 19.2% failed nonoperative therapy within 2 years, and 23.3% failed nonoperative therapy within 5 years.(27) [K in Context Link 1]

[L] A narrative review concludes that data concerning nonoperative treatment in pregnant patients are limited.(13) Pregnancy was an exclusion criterion in randomized trials concerning nonoperative outpatient treatment.(21)(22) Analysis of 8087 pregnant women (median age 27 years) admitted with complicated appendicitis found that 44.5% were initially treated nonoperatively; of these, 73.5% failed nonoperative management and required interval surgery.(28) A multivariate analysis performed in this study found that nonoperative treatment was associated with longer hospital stays and a higher risk of complications, including preterm labor, premature rupture of membranes, and infectious complications.(28) A specialty society guideline recommends appendectomy over nonoperative treatment for pregnant patients with complicated appendicitis or an appendicolith.(19) [L in Context Link 1]

[M] The Comparison of Outcomes of Antibiotic Drugs and Appendectomy (CODA) trial excluded patients within 90 days of placement of catheter or implant.(22) [M in Context Link 1]

[N] Adult patients with uncomplicated appendicitis treated nonoperatively with IV antibiotics can be transitioned to oral antibiotics and discharged to home if they are able to maintain adequate oral intake, have adequate pain control, are improving clinically, and have arrangements for appropriate follow-up care.(12)(13)(21)(22) [N in Context Link 1]

[O] A narrative review cautions that antibiotic response may be delayed (ie, longer monitoring on antibiotics may be necessary) in patients who are 45 years of age or older and in those who present with fever, elevated inflammatory markers, or with symptoms for more than 48 hours.(13) [O in Context Link 1]

[P] If appendectomy becomes necessary, the applicable appendectomy guideline should be used. [P in Context Link 1]

[Q] Fecal impaction is defined as a large mass of compacted feces at any intestinal level that cannot be evacuated spontaneously and is usually due to chronic constipation.(53) Encopresis is defined as the repeated passage of feces into inappropriate places (eg, fecal incontinence into underpants) and is a result of liquid or soft stool leaking around a large mass of stool in the rectum.(53)(54) [Q in Context Link 1, 2]

[R] Even with high-dose polyethylene glycol (eg, 25 to 40 mL/kg/hr via NG tube), it can take days (eg, 2 to 6 days) to achieve discharge readiness (eg, no retained stool in colon by imaging, clear stools).(53) [R in Context Link 1, 2]

[S] The majority of children with fecal impaction can be treated as outpatients with oral polyethylene glycol or enemas.(55) [S in Context Link 1]

[T] Stercoral colitis is an inflammatory condition of the colon caused by the pressure and distention of impacted fecal material against the colonic intraluminal wall. The resultant compression on the bowel vasculature leads to bowel ischemia and may cause pressure necrosis, ulceration, and, in severe cases, bowel perforation and peritonitis. Because symptoms can be nonspecific, the diagnosis is made on CT scan.(56) [T in Context Link 1]

[U] See Intensive, Intermediate, and Telemetry Care Guidelines ISC. [U in Context Link 1]

[V] See Clinical Indications for Admission to Inpatient Care in this guideline. [V in Context Link 1]

[W] Some patients may have their hydration needs met via alternative means (eg, percutaneous endoscopic gastrostomy tube). [W in Context Link 1, 2]

Definitions

Abdominal status acceptable

- Abdominal status acceptable, as indicated by **ALL** of the following(1):
  - Bowel sounds present
  - No ileus, signs of obstruction, or peritonitis
  - Abdominal distention absent or manageable at next level of care

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1. Martinez JP. Abdominal pain. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:211-220.e1.

Activity level acceptable

- Activity level acceptable, as indicated by **1 or more** of the following:
  - Patient ambulatory and can perform ADL as appropriate for age and development
  - Activity at baseline
  - Activity level acceptable for next level of care

Acute kidney injury (stage 2)

- Acute kidney injury (stage 2) with significant clinical findings, as indicated by **ALL** of the following(1)(2)(3):
  - Acute[A] kidney injury (stage 2), as indicated by **1 or more** of the following[B]:
    - Acute[A] rise in serum creatinine between 2 and 2.9 times its baseline value[C] (increase of 3 times baseline would qualify as stage 3 acute kidney injury)
    - Decreased urine output,[D] as indicated by **ALL** of the following:
      - Assessment of urine output appropriate (eg, adequate volume status, no urinary obstruction)
      - Urine output less than 0.5 mL/kg/hr for 12 hours
  - Significant clinical findings, as indicated by **1 or more** of the following[B]:

- Hemodynamic instability
- Worsening clinical status despite observation care (eg, rising creatinine or urine output remains less than 0.5 mL/kg/hr)
- Altered mental status
- Cardiac arrhythmias of immediate concern
- Severe hypertension (SBP greater than 180 mm Hg or DBP greater than 120 mm Hg in adults or greater than the 95th percentile for age, gender, and height plus 30 mm Hg in pediatric patients)(4)(5)
- Significant respiratory findings (eg, pulmonary edema) that are severe (eg, Hypoxemia) or persist despite observation care
- Clinically significant electrolyte abnormality that is severe (eg, hyperkalemia with severe ECG findings)[E] or persists despite observation care
- Clinically significant metabolic abnormality (eg, metabolic acidosis) that is severe or persists despite observation care

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Footnotes

A. A specialty society practice guideline defines acute kidney injury as a change in renal function that is known or presumed to have occurred over the previous 7 days.(1)

B. In determining the stage of acute kidney injury (eg, stage 2 vs stage 3), patients should be staged according to the criteria that give them the highest stage.(1)

C. If the baseline serum creatinine is not known, absent known or suspected chronic kidney disease, a baseline serum creatinine can be approximated by assuming an estimated GFR of 75 mL/min/1.73m^2 (1.25 mL/sec/1.73m^2).(1) eGFR - Adult Calculator eGFR - Pediatric Calculator

D. The use of urine output as an indicator of acute kidney injury is important, as change in urine output can occur before a noticeable rise in creatinine.(1)(3) It is also suggested that urine output can identify patients with acute kidney injury that may otherwise be missed.(1)(3) However, urine output as a metric is only valid under the appropriate conditions. For example, the patient must not be hypovolemic, there must not be urinary obstruction, and the collection and measurement of urinary output must be complete and accurate.(1)(3) Use of urinary output to define acute kidney injury can be inaccurate in obese patients due to the nonlinear relationship between body weight and urine output. For example, in a 100-kg (220-lb) patient, urine output of 45 mL/hr over 12 hours (adequate output) would qualify as stage 2 acute kidney injury.(1)(3)

E. ECG findings include peaked T-waves, PR interval greater than 0.20 seconds, QRS interval greater than 0.12 seconds, and arrhythmia.(6)(7)

Acute renal failure (stage 3 acute kidney injury)

- Acute[A] kidney injury (stage 3),[B] as indicated by **1 or more** of the following[C](1)(2)(3):
  - Acute[A] rise in serum creatinine to 3 times its baseline value[D] or higher
  - Acute[A] rise in serum creatinine to at least 1.5 times its baseline value[D] (increase of 50%) and serum creatinine is greater than 4 mg/dL (354 micromoles/L)
  - In child younger than 18 years, estimated GFR less than 35 mL/min/1.73m^2 (0.58 mL/sec/1.73m^2) eGFR - Pediatric Calculator and **1 or more** of the following:
    - Acute[A] rise in serum creatinine to at least 1.5 times its baseline value[D] (increase of 50%)
    - Within past 48 hours, rise in serum creatinine greater than 0.3 mg/dL (26.5 micromoles/L)
  - Decreased urine output,[E] as indicated by **ALL** of the following:
    - Assessment of urine output appropriate (eg, adequate volume status, no urinary obstruction)
    - Oligoanuria, as indicated by **1 or more** of the following:
      - Urine output less than 0.3 mL/kg/hr for 24 hours
      - Anuria (urine output less than 0.1 mL/kg/hr) for 12 hours
  - Initiation of renal replacement therapy required(4)

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Footnotes

A. A specialty society practice guideline defines acute kidney injury as a change in renal function that is known or presumed to have occurred over the previous 7 days.(1)

B. For purposes of these criteria, the term acute renal failure can be viewed as stage 3 acute kidney injury in the KDIGO classification system.(1) Of note, in the ICD-10 diagnostic coding system (main coding scheme used in labeling diagnoses), the relevant codes covering the clinical entity of significant acute kidney injury use the term acute kidney failure (eg, code N17.9).

C. In determining the stage of acute kidney injury (eg, stage 2 vs stage 3), patients should be staged according to the criteria that give them the highest stage.(1)

D. If the baseline serum creatinine is not known, absent known or suspected chronic kidney disease, a baseline serum creatinine can be approximated by assuming an estimated GFR of 75 mL/min/1.73m^2 (1.25 mL/sec/1.73m^2).(1) eGFR - Adult Calculator eGFR - Pediatric Calculator

E. The use of urine output as an indicator of acute kidney injury is important, as change in urine output can occur before a noticeable rise in creatinine.(1)(3) It is also suggested that urine output can identify patients with acute kidney injury that may otherwise be missed.(1)(3) However, urine output as a metric is only valid under the appropriate conditions. For example, the patient must not be hypovolemic, there must not be urinary obstruction, and the collection and measurement of urinary output must be complete and accurate.(1)(3) Use of urinary output to define acute kidney injury can be inaccurate in obese patients due to the

nonlinear relationship between body weight and urine output. For example, in a 100-kg (220-lb) patient, urine output of 45 mL/hr over 12 hours (adequate output) would qualify as stage 2 acute kidney injury.(1)(3)

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)

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Altered mental status that is severe or persistent

- Altered mental status (ie, different from baseline) that is severe or persistent, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Confusional state (eg, disorientation, difficulty following commands, deficit in attention) that persists despite appropriate treatment (eg, of underlying cause, despite observation care)
  - Lethargy (eg, awake or arousable, but with drowsiness; reduced awareness of self and environment) that persists despite appropriate treatment (eg, of underlying cause, despite observation care)
  - 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.
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4. Holler-Managan YF. Neurologic evaluation. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:3550-3560.

Cardiac arrhythmias of immediate concern

- Cardiac arrhythmias or findings of immediate concern, as indicated by **1 or more** of the following(1)(2)(3):
  - Heart rhythms that are inherently dangerous or unstable, as indicated by **1 or more** of the following(4)(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:
      - Suspected cardiac ischemia as cause or consequence of ventricular tachycardia
      - Acute myocarditis
  - Unstable cardiac conduction defects, as indicated by **1 or more** of the following(7)(8):
    - Type II second-degree atrioventricular block
    - Third-degree atrioventricular block
    - New-onset left bundle branch block with suspected myocardial ischemia(9)
  - Any heart rhythm and **1 or more** of the following(5)(8)(10)(11)(12)(13):
    - Continuous long-term ECG monitoring needed (eg, initiation of drug requiring monitoring beyond observation care)
    - Patient has automatic implantable cardioverter-defibrillator that is repeatedly firing, malfunctioning, or in need of immediate adjustment of settings beyond scope of observation care.
  - Heart rhythms of concern due to **1 or more** of the following(8):
    - Hypotension
    - Respiratory distress
    - Association with other significant symptoms (eg, syncope)(10)(11)

References

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Dehydration that is severe or persistent

- Dehydration and **1 or more** of the following(1)(2)(3)(4):
  - Clinical findings of severe dehydration, as indicated by **1 or more** of the following:
    - Hemodynamic instability
    - Acute renal failure (stage 3 acute kidney injury)
    - Acute kidney injury (stage 2)
    - Serum sodium greater than 150 mEq/L (mmol/L)
  - Dehydration that is persistent, as indicated by **ALL** of the following:
    - Oral rehydration therapy not tolerated or insufficient to adequately correct dehydration
    - Dehydration persists despite appropriate treatment (eg, IV fluids, observation care)

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Fever

- Fever is defined as a core[A] temperature greater than or equal to 100.4 degrees F (38 degrees C).[B](2)(3)

References

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Footnotes

A. While a rectal temperature can be considered a core reading, it is not always practical. Tympanic membrane temperature is not usually considered a core reading; however, the devices that measure this temperature often are (or can be) programmed so that they automatically adjust readings to reflect a core

temperature equivalent.(1)

B. There is not a universally accepted definition of fever, as various temperatures are proposed as the cutoff that constitutes a fever.

General Discharge Criteria met

- General Discharge Criteria met or Pediatric General Discharge Criteria met (if either is relevant or necessary for patient's condition)

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)

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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)

Hemodynamic stability

- Hemodynamic stability, as indicated by **1 or more** of the following:
  - Hemodynamic abnormalities at baseline or acceptable for next level of care
  - Patient hemodynamically stable, as indicated by **ALL** of the following(1)(2):
    - Tachycardia absent
    - Hypotension absent
    - No evidence of inadequate perfusion (eg, no myocardial ischemia)
    - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)

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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. Ramgopal S, Sepanski RJ, Martin-Gill C. Empirically derived age-based vital signs for children in the out-of-hospital setting. Annals of Emergency Medicine 2023;81(4):402-412. DOI: 10.1016/j.annemergmed.2022.09.019.

Hepatic and biliary abnormalities absent or acceptable

- Hepatic and biliary abnormalities absent or acceptable, as indicated by **1 or more** of the following(1)(2)(3):
  - No abnormalities present
  - Hepatic and biliary status acceptable for next level of care, as indicated by **ALL** of the following:
    - Liver function tests normal, stable, or improving
    - Ascites absent, diminishing, or stable, with adequate respiratory function for next level of care
    - Renal function acceptable
    - Bilirubin stable or diminishing
    - Encephalopathy absent or controlled adequately for next level of care
    - No biliary obstruction, or current drainage and treatment plan appropriate for next level of care

References

1. Ghany MG, Hoofnagle JH. Approach to the patient with liver disease. 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; 2022:2546-2553.
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3. Greenberger NJ, Paumgartner G, Pratt DS. Diseases of the gallbladder and bile ducts. 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; 2022:2641-2652.

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. Puskarich 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.

Hypotension absent

- Hypotension absent,[A] as indicated by **1 or more** of the following:
  - Hypotension absent in adult patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure greater than or equal to 90 mm Hg[A](1)
    - Mean arterial pressure[B] greater than or equal to 70 mm Hg  MAP Calculator[A](1)(2)

- Blood pressure at patient's baseline (eg, healthy adult with low systolic blood pressure), at intentional therapeutic goal (eg, patient with heart failure), or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)

- Hypotension absent in pediatric patient, as indicated by **1 or more** of the following:
  - Systolic blood pressure greater than or equal to 110 mm Hg in child 13 to 17 years of age[A](3)
  - Systolic blood pressure greater than or equal to 100 mm Hg in child 6 to 12 years of age[A](3)
  - Systolic blood pressure greater than or equal to 95 mm Hg in child 3 to 5 years of age[A](3)
  - Systolic blood pressure greater than or equal to 90 mm Hg in child 1 or 2 years of age[A](3)
  - Systolic blood pressure greater than or equal to 80 mm Hg in infant 6 to 11 months of age[A](3)
  - Systolic blood pressure greater than or equal to 70 mm Hg in infant 3 to 5 months of age[A](3)
  - Systolic blood pressure greater than or equal to 65 mm Hg in infant 1 or 2 months of age[A](3)
  - Blood pressure at patient's baseline (eg, healthy child with low systolic blood pressure), at intentional therapeutic goal, or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)

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. Puskarich 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. The mean arterial pressure (MAP) takes into account both SBP and DBP readings.

Hypoxemia

- Hypoxemia, as indicated by **1 or more** of the following(1):
  - Patient without baseline need for supplemental oxygen with oxygen saturation (SpO_2) of less than 90% or arterial blood gas partial pressure of oxygen (PaO_2) 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_2 greater than 89% or PaO_2 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

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Footnotes

A. Pulse oximetry (SpO_2) may underestimate arterial saturation (SaO_2), 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.

Intake acceptable

- Intake acceptable, as indicated by **1 or more** of the following(1):
  - Oral hydration, medications, and diet
  - Enteral hydration, medications, and diet
  - Administration routes performable at next level of care

References

1. Hoffer LJ, Bistrian BR, Driscoll DF. Enteral and parenteral nutrition. 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; 2022:2539-2546.

No inpatient interventions needed

- No inpatient interventions needed; examples include:
  - Percutaneous drainage (eg, abscess, biliary tract) procedures
  - Urgent endoscopic studies or dye procedures
  - Gastrointestinal decompression, such as nasogastric or other tube suction, with continuing ileus or other acute intra-abdominal process
  - Continued inpatient observation for complete ileus or other acute abdominal findings

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

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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.

Pain and nausea absent or adequately managed

- Pain and nausea absent or adequately managed, as indicated by **1 or more** of the following(1)(2)(3)(4)(5):
  - No pain or nausea
  - Minimal discomfort on oral medications
  - Pain and nausea managed on regimen performable at next level of care

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5. Fourth consensus guidelines for the management of postoperative nausea and vomiting: erratum. Anesthesia and Analgesia 2020;131(5):e241. DOI: 10.1213/ANE.0000000000005245.

Peritoneal signs

- Peritoneal signs, as indicated by **1 or more** of the following(1)(2):
  - Rebound tenderness
  - Rigid abdomen
  - Involuntary guarding

References

1. Bush LM, Levison ME. Peritonitis and intraperitoneal abscesses. In: Bennett JE, Dolin R, Blaser MJ, editors. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Philadelphia, PA: Elsevier; 2020:1009-1036.e5.
2. Landmann A, Bonds M, Postier R. Acute abdomen. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery. 21st ed. Elsevier; 2022:1134-1149.

Renal function acceptable

- Renal function acceptable, as indicated by **1 or more** of the following(1)(2)(3):
  - Renal function normal (GFR of 90 mL/min/1.73m^2 (1.50 mL/sec/1.73m^2) or more) eGFR - Adult Calculator eGFR - Pediatric Calculator
  - Renal function that is **ALL** of the following:
    - Impaired (estimated GFR less than 90 mL/min/1.73m^2 (1.50 mL/sec/1.73m^2)) but stable or improving eGFR - Adult Calculator eGFR - Pediatric Calculator
    - Appropriate for management at next level of care
  - Renal function at baseline and appropriate for management at next level of care
  - Dialysis needed and performable at next level of care

References

1. Kliegman RM, et al. Renal failure. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:3242-3253.
2. Agarwal A, Barasch J. Acute kidney injury. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:770-775.e1.
3. Cohen D, Valeri AM. Treatment of irreversible renal failure. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:840-848.

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.

Severe electrolyte abnormalities requiring inpatient care

- Severe electrolyte abnormalities requiring inpatient care, as indicated by **ALL** of the following(1)(2)(3):
  - Electrolyte abnormality is not at acceptable patient baseline (eg, treatment effect).
  - Severe abnormality, as indicated by **1 or more** of the following:
    - Sodium[A] less than 130 mEq/L (mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(4)(5)
    - Sodium[A] less than 135 mEq/L (mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, seizures)(4)(5)
    - Sodium greater than 150 mEq/L (mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(4)
    - Sodium greater than 145 mEq/L (mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, seizures)(4)
    - Potassium less than 2.5 mEq/L (mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(6)
    - Potassium less than 3 mEq/L (mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, ECG findings,[B] paresis, paralysis)(6)(7)
    - Potassium greater than 6.5 mEq/L (mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(6)
    - Potassium greater than 5 mEq/L (mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, ECG findings,[C] paresis, paralysis)(6)(7)(8)
    - Calcium[D] less than 7 mg/dL (1.75 mmol/L) or ionized calcium less than 3.2 mg/dL (0.8 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(9)(11)
    - Calcium[D] less than 8.6 mg/dL (2.15 mmol/L) or ionized calcium less than 4.65 mg/dL (1.16 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, seizures, arrhythmia, cardiac conduction disturbance)(9)(11)
    - Calcium[D] greater than 14 mg/dL (3.5 mmol/L) or ionized calcium greater than 10.0 mg/dL (2.50 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(10)(11)
    - Calcium[D] greater than 12 mg/dL (3 mmol/L) or ionized calcium greater than 8.0 mg/dL (2.0 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, arrhythmia, cardiac conduction disturbance)(10)(11)
    - Phosphorus less than 1 mg/dL (0.32 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(12)
    - Phosphorus less than 1.5 mg/dL (0.48 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, seizures)(12)
    - Phosphorus greater than 10 mg/dL (3.2 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(12)
    - Phosphorus greater than 4.5 mg/dL (1.45 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, crush injury, Altered mental status, seizures, arrhythmia, cardiac conduction disturbance)(12)
    - Magnesium less than 1 mg/dL (0.41 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(12)
    - Magnesium less than 1.5 mg/dL (0.62 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, seizures, arrhythmia, cardiac conduction disturbance)(12)
    - Magnesium greater than 4.9 mg/dL (2 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(12)
    - Magnesium greater than 3.0 mg/dL (1.23 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, Altered mental status, arrhythmia, cardiac conduction disturbance)(12)
    - Uric acid greater than 20 mg/dL (1.19 mmol/L) not corrected to near normal or near chronic baseline despite observation care treatment(13)
    - Uric acid greater than 8 mg/dL (0.48 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, arrhythmia, cardiac conduction disturbance, seizure)(13)

References

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12. Yu ASL. Disorders of magnesium and phosphorus. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:766-769.e1.
13. Walter RB, Appelbaum FR. The acute leukemias. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:1259-1266.

Footnotes

A. In patients with hyperglycemia, a corrected serum sodium should inform decision making.(4)
B. ECG manifestations of hypokalemia include ST-segment depression, flattened T-waves, and increased U-wave prominence.(7)
C. ECG changes associated with hyperkalemia include peaked T-waves, prolonged PR interval, loss of P-waves, prolonged QRS interval, or sinus bradycardia. Other manifestations include second-degree or third-degree atrioventricular block or a junctional escape rhythm. The ultimate result of hyperkalemia can be ventricular fibrillation, pulseless electrical activity, or asystole. ECG changes are not a sensitive indicator of severe hyperkalemia; patients with severe hyperkalemia may have minimal or nondiagnostic abnormalities. While a normal ECG does not exclude hyperkalemia, it does confer a much lower risk of dangerous arrhythmia. Hyperkalemic patients with isolated T-wave abnormalities are at low risk of a serious adverse event overall, while patients with conduction abnormalities and other more severe ECG findings are at higher risk.(6)(7)(8)
D. An ionized calcium level may be more accurate than a total serum calcium level, especially in the setting of acidosis, renal failure, multiple transfusions, hypoalbuminemia, or the presence of a paraprotein.(9)(10)

Social Determinants of Health Assessment

- Risk of poor health outcomes may be increased by the presence of **1 or more** of the following social determinants of health(1)(2)(3):
  - Housing insecurity, as indicated by **1 or more** of the following:
    - Individual or caregiver's current living situation is **1 or more** of the following(4):
      - Does not have own housing (eg, staying in a hotel, shelter, or with others)
      - Has own housing (eg, house, apartment), but at risk of losing it in the future (ie, behind on rent or mortgage)

    - Has own housing (eg, house, apartment), but has lived in 3 or more places in past year
  - Current housing has **1 or more** of the following:
    - Electrical appliances (eg, stove, refrigerator) not working or unavailable
    - Insufficient heating or cooling
    - Insufficient ventilation
    - Lead paint or pipes
    - Mold
    - Pests (eg, bugs) or rodents
    - Smoke detectors not working or unavailable
- Food insecurity, as indicated by **1 or more** of the following(5):
  - In the past year, individual or caregiver ran out of food and did not have money to buy more food.
  - In the past year, individual or caregiver worried that they would run out of food before they received money to buy more food.
- Insufficient transportation, as indicated by **1 or more** of the following(6):
  - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of transportation.
  - In the past year, individual or caregiver missed nonmedical activities, work, or could not get things needed for daily living due to lack of transportation.
- Insufficient utilities, as indicated by **1 or more** of the following(7):
  - Utilities (eg, electricity, water, gas, or oil) are currently shut off or unavailable.
  - In the past year, electric, water, gas, or oil company threatened to shut off services.
- Personal safety risk, as indicated by **2 or more** of the following(5):
  - Individual is sometimes or frequently physically hurt by another person (including family member).
  - Individual is sometimes or frequently insulted or talked down to by another person (including family member).
  - Individual is sometimes or frequently threatened with physical harm by another person (including family member).
  - Individual is sometimes or frequently screamed or cursed at by another person (including family member).
- Insufficient dependent care, as indicated by **1 or more** of the following:
  - In the past year, individual or caregiver was unable to work due to lack of dependent care.
  - In the past year, individual or caregiver was unable to work more (additional) hours due to lack of dependent care.
  - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of dependent care.
  - In the past year, individual or caregiver missed nonmedical activities (eg, school, church, social activity) due to lack of dependent care.
- Depression risk, as indicated by **ALL** of the following(8):
  - In the past 2 weeks, individual had little interest or pleasure in normal activities on at least several days.
  - In the past 2 weeks, individual felt down, depressed, or hopeless on at least several days.

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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)

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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. 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.

Tachycardia absent

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

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. 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.

Tachypnea

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

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. 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.(1) This same textbook also states that new technologies designed to measure the respiratory rate have not proved to be clinically useful.(1)

Temperature status acceptable

- Temperature status acceptable, as indicated by **1 or more** of the following(1)(2)(3):
  - Temperature less than 100.5 degrees F (38.1 degrees C) (oral) and greater than 96.8 degrees F (36 degrees C) (rectal)
  - Temperature as expected for disease process and appropriate for management at next level of care

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2. Melia MT. Approach to fever or suspected infection in the normal host. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:1845-1851.
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Vomiting that is severe or persistent

- Vomiting and **1 or more** of the following(1)(2)(3)(4):
  - Pattern or content of vomitus suggests severe underlying cause or complication (eg, projectile, feculent, bilious, coffee ground, bloody).
  - Appropriate antiemetic treatment (eg, in observation care) does not sufficiently reduce vomiting.
  - Treatment regimen necessary to adequately control vomiting requires inpatient level of care (eg, not available in outpatient setting).

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