Systemic or Infectious Condition GRG

GRG: MG-SIC (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:
  - Hemodynamic instability
  - Severe electrolyte abnormalities requiring inpatient care
  - Hypothyroidism and **1 or more** of the following(1)(2)(3)(4):
    - Hemodynamic instability
    - Altered mental status that is severe or persistent (eg, myxedema coma)

- Temperature dysregulation (eg, hypothermia)
- Cardiac arrhythmias of immediate concern
- Hypoxemia
- Tachypnea that persists despite observation care
- Significant pericardial effusion (eg, symptomatic, impacting cardiac function)
- Gastrointestinal symptoms requiring inpatient management (eg, symptomatic ascites, megacolon, ileus, persistent nausea and vomiting)
- Seizure (ie, felt to be secondary to hypothyroidism)
- Rhabdomyolysis requiring large-volume IV fluid infusion
- Acute renal failure (stage 3 acute kidney injury)

Hyperthyroidism and **1 or more** of the following(1)(5):

- Score of 45 or more on the Burch-Wartofsky Point Scale[A]
- Altered mental status that is severe or persistent
- Cardiac arrhythmias of immediate concern
- Temperature of 103.0 degrees F (39.5 degrees C) or more
- Pulmonary edema
- Hemodynamic instability

Adrenal crisis (due to adrenal insufficiency) and **1 or more** of the following(1)(6)(7)(8)(9)(10):

- Hemodynamic instability
- Seizures
- Hypoglycemia
- Severe electrolyte abnormalities requiring inpatient care
- Altered mental status that is severe or persistent
- Precipitating factor requiring hospitalization (eg, sepsis, trauma, hemorrhagic adrenalitis)

Pheochromocytoma or paraganglioma and **1 or more** of the following(8)(11)(12)(13):

- Severe hypertension (eg, SBP greater than 180 mm Hg or DBP greater than 120 mm Hg)
- Hypotension
- Bradycardia
- Severe tachycardia (heart rate 120 beats per minute or greater)
- End organ ischemia (eg, vasoconstriction-induced myocardial ischemia, stroke, mesenteric bowel ischemia, Acute kidney injury (stage 2), Acute renal failure (stage 3 acute kidney injury))
- Altered mental status
- Cardiac arrhythmias of immediate concern

Carcinoid crisis, as indicated by carcinoid tumor and **1 or more** of the following[B](14)(15):

- Severe blood pressure fluctuation
- Bronchospasm with wheezing attributable to carcinoid syndrome
- Hypotension

Hyperparathyroid crisis, as indicated by hyperparathyroidism and **1 or more** of the following(16)(17):

- Calcium greater than 14 mg/dL (3.5 mmol/L) or ionized calcium greater than 10 mg/dL (2.5 mmol/L)
- Calcium greater than 12 mg/dL (3 mmol/L) or ionized calcium greater than 8 mg/dL (2 mmol/L) with new (or presumed new) severe finding requiring inpatient management (eg, altered mental status, arrhythmia, cardiac conduction disturbance)(17)
- Hypotension
- Requirement for large-volume fluid resuscitation

- Acute pancreatitis attributable to hypercalcemia
- Altered mental status that is severe or persistent
- Cardiac arrhythmias of immediate concern
- Acute renal failure (stage 3 acute kidney injury)

− Hypo-osmolality (eg, due to acute water intoxication, heart failure, or liver disease) and **1 or more** of the following(18)(19)(20):

- Altered mental status that is severe or persistent
- Cerebral edema
- Anasarca or peripheral edema that is severe (eg, significant paroxysmal dyspnea, inability to ambulate or void, skin breakdown, concomitant ascites)
- Other neurologic abnormalities (eg, tremor, hypertonia or hypotonia, hyperreflexia, gait abnormalities)
- Hemodynamic instability

− Arginine vasopressin deficiency (central diabetes insipidus) or arginine vasopressin resistance (nephrogenic diabetes insipidus) and **1 or more** of the following(21)(22)(23):

- Recent head trauma(22)
- Recent cranial surgery(22)
- Coexisting metabolic disorder (eg, myxedema, adrenal insufficiency)(22)
- Testing required that necessitates hospital-based care beyond observation care (eg, water deprivation, hypertonic saline infusion, arginine infusion)(21)
- Suspected osmoreceptor dysfunction requiring frequent monitoring of electrolytes, fluid balance, and weight(22)
- Continuous infusion of vasopressin required (eg, during hyperhydration protocol for chemotherapy)(21)
- Seizure
- Altered mental status
- Vomiting that is severe or persistent
- Severe electrolyte abnormalities requiring inpatient care

- Antitoxin administration or monitoring required beyond observation care (eg, botulism, cyanide poisoning)(24)
- Tick-borne disease (eg, Lyme disease, rickettsiosis, babesiosis, ehrlichiosis) with severe systemic manifestations (eg, Hemodynamic instability, hemolysis, hepatic failure, cerebral vasculitis)(25)
- Diphtheria(26)
- Anthrax
- Plague (*Yersinia pestis* infection)(27)

− Malaria and **1 or more** of the following(28):

- Hemodynamic instability (28)
- Altered mental status (28)
- Severe generalized weakness (eg, unable to sit or stand without assistance)(28)
- Seizure(28)
- Metabolic acidosis (eg, serum bicarbonate less than 15 mEq/L (mmol/L) or lactate greater than 45 mg/dL (5 mmol/L))(28)
- Severe anemia (eg, hemoglobin 5 g/dL (50 g/L) or less in child younger than 12 years, or 7 g/dL (70 g/L) or less in patient 12 years or older)(28)
- Hypoglycemia with a blood or plasma glucose less than 40 mg/dL (2.2 mmol/L)(28)
- Inability to maintain oral hydration (ie, need for IV fluid support)
- Major organ impairment (eg, Acute kidney injury (stage 2), Acute renal failure (stage 3 acute kidney injury), pulmonary edema, jaundice)(28)
- Significant bleeding(28)
- Hyperparasitemia (4% or higher)(28)

- Tetanus(24)(29)

- Infection (not covered by a specific guideline) and **1 or more** of the following(25)(30)(31)(32)(33)(34)(35):
  - Hemodynamic instability
  - Bacteremia
  - Hypoxemia
  - Acute kidney injury (stage 2)
  - Acute renal failure (stage 3 acute kidney injury)
  - Altered mental status that is severe or persistent
  - Pulmonary hemorrhage
  - New coagulopathy (eg, disseminated intravascular coagulation)
- Serotonin syndrome (serotonin toxicity), as indicated by **ALL** of the following(36)(37)(38):
  - Exposure to medication(s) that increases level of serotonin in CNS (eg, serotonin reuptake inhibitors, monoamine oxidase inhibitors, opioids, stimulants, triptans, antiseizure medications, linezolid)
  - Significant adverse clinical finding secondary to serotonin toxicity, as indicated by **1 or more** of the following:
    - Neurologic finding (eg, agitation, hypomania, hallucinations, Altered mental status, seizures)
    - Autonomic nervous system-related hyperactivity (eg, Hemodynamic instability, hypertension, blood pressure fluctuation, sweating, hyperthermia, vomiting, diarrhea)
    - Musculoskeletal findings (eg, rigidity, myoclonus, hyperreflexia, tremor, rhabdomyolysis, elevated creatinine kinase)
- Neuroleptic malignant syndrome, as indicated by **ALL** of the following[C](37)(39)(40)(41):
  - Exposure to a neuroleptic drug (eg, phenothiazine, butyrophenone) or dopamine-depleting drug (eg, alpha-methyltyrosine), or withdrawal of dopaminergic agent (eg, levodopa, amantadine)
  - Consistent clinical findings, including **1 or more** of the following:
    - Muscle rigidity
    - Akathisia (uncontrollable movement)
    - Hyperthermia
    - Altered mental status
    - Dysautonomia (eg, fluctuating blood pressure, tachycardia, hypersalivation, diaphoresis)
    - Hemodynamic instability
    - Acute rise in creatine kinase
    - Rhabdomyolysis
- Malignant hyperthermia (eg, exposure to volatile anesthetic agent or succinylcholine with hyperpyrexia, muscle rigidity, masseter spasm, or acute rise in serum potassium, creatine kinase, or myoglobin)[C](39)(40)(42)(43)
- Cholinergic syndrome and **1 or more** of the following(44)(45)(46):
  - Bronchorrhea, bronchospasm, or respiratory muscle weakness with Respiratory distress
  - Neuromuscular weakness or paralysis
  - Altered mental status
  - Seizures
  - Bradycardia
  - Hypotension
- Anticholinergic syndrome with severe symptoms (eg, Altered mental status, urinary retention, hyperthermia)(44)
- Sympathomimetic syndrome with severe symptoms (eg, seizures, Altered mental status, cardiac dysrhythmias)(44)
- Severe adverse drug or systemic toxin reaction (Altered mental status, Hypotension)(47)(48)

- Allergic reaction with severe symptoms, as indicated by **1 or more** of the following(49)(50)(51)(52)(53)(54)(55)(56):
  - Airway edema (pharyngeal, epiglottic, or laryngeal edema)
  - Stridor
  - Respiratory distress
  - Bronchospasm
  - Hemodynamic instability
- Allergen challenge required and history of severe symptoms, IV fluid resuscitation, or hospitalization during prior exposure(55)(56)(57)
- Edema (eg, of lower extremities) or lymphedema and **1 or more** of the following(58)(59)(60):
  - Severe functional disability (eg, cannot perform ADL, concern for patient safety)
  - Skin breakdown or infection that requires care that cannot be provided at alternative level of care
  - Diagnostic or therapeutic intervention that cannot be provided at alternative level of care
- Insufficient nutritional intake in adult or child, as indicated by **ALL** of the following(61)(62)(63)(64)(65)(66):
  - Patient unable to ingest or unable to digest sufficiently to maintain nutritional status such that supplemental enteral nutrition (eg, NG tube, gastrostomy, or jejunostomy) or parenteral nutrition is necessary[D]
  - Initiation or necessary adjustments to regimen cannot be performed at lower level of care
- Severe acute malnutrition in child younger than 18 years requiring hospitalization,[E] as indicated by **ALL** of the following(64)(65)(66):
  - Severe malnutrition, as indicated by **1 or more** of the following(64)(67)(68):
    - Weight for height or length that is 3 standard deviations or more below the mean for an age-standardized and sex-standardized population (-3 z score)[F]
    - Age 6 months or younger with weight for height or length that is 2 standard deviations or more below the mean for an age-standardized and sex-standardized population (-2 z score)[F]
    - Mid-upper arm circumference that is **1 or more** of the following(69)(70):
      - 3 standard deviations or more below the mean for an age-standardized and sex-standardized population (-3 z score)[F]
      - Less than 115 mm in child age 6 to 59 months
      - Less than 110 mm in child younger than 6 months
    - Edema due to malnutrition (eg, not attributable to renal, liver, or cardiac disease)[G](67)(69)(70)
  - Inpatient care required, as indicated by **1 or more** of the following(67)(72):
    - Acute medical condition (eg, dehydration, infection, hypoglycemia, electrolyte abnormality, dyspnea, neurologic symptom)
    - Severe 3+ or 4+ edema (eg, of lower extremities)[G]
    - Age 6 months or younger and **1 or more** of the following:
      - Ineffective breast or bottle feeding
      - Any amount of edema[G]
- Refeeding syndrome (findings within 5 days of initiation or increase in feeding) requiring inpatient care, as indicated by **1 or more** of the following(73)(74)(75)(76)(77):
  - Severe electrolyte abnormalities requiring inpatient care (73)
  - Neurologic symptoms (eg, tremors, fasciculations, encephalopathy, paralysis, seizure)(73)(78)
  - Cardiac symptoms (eg, arrhythmia, heart failure, conduction defect, hypotension)(78)
  - Pulmonary symptoms (eg, respiratory failure, dyspnea, pulmonary edema)(78)
  - Hematologic abnormalities (eg, hemolysis)(78)
  - Rhabdomyolysis(78)
  - Sodium retention with fluid overload(78)
  - Thiamine deficiency with lactic acidosis, Wernicke syndrome, or Korsakoff psychosis(78)

- Heatstroke or hyperthermia,[H] as indicated by **ALL** of the following(39)(79)(80):
  - Elevated core temperature attributable to environmental exposure or exertion
  - Severe finding due to elevated core temperature, as indicated by **1 or more** of the following:
    - Severe hyperthermia (body temperature greater than 105 degrees F (40.6 degrees C))(80)
    - Hemodynamic instability
    - Altered mental status
    - Seizures
    - Rhabdomyolysis
    - Acute kidney injury (stage 2) or Acute renal failure (stage 3 acute kidney injury)
    - Acute liver injury (eg, new INR elevation of 1.5 or greater; aspartate aminotransferase, alanine aminotransferase, or gamma-glutamyl transpeptidase greater than 100 units/L (1.67 mckat/L); new direct bilirubin greater than 2 mg/dL (34 micromoles/L); or new total bilirubin greater than 5 mg/dL (86 micromoles/L) attributable to hyperthermia)
    - Disseminated intravascular coagulation
    - Diffuse pulmonary infiltrates with Hypoxemia (eg, acute respiratory distress syndrome) attributable to hyperthermia
- Hypothermia (temperature less than 95 degrees F (35 degrees C) rectal)(81)(82)
- Frostbite(82)(83)
- Electrocution(84)
- Decompression sickness(85)(86)
- High altitude cerebral edema or pulmonary edema(87)

- Complications of transplanted organ (ie, not covered elsewhere),[I] as indicated by **1 or more** of the following(88)(89):
  - Acute graft rejection (or graft vs host disease) requiring inpatient management (eg, IV immunosuppression)(90)(91)
  - Acute failure of transplanted organ necessitating inpatient care (eg, cannot be managed in other setting)
  - Infection requiring inpatient management (eg, Hemodynamic instability, need for IV antimicrobial treatment)(92)
  - Other complication of transplanted organ requiring inpatient management
- Heavy metal poisoning (eg, lead, mercury, arsenic, cadmium) with acute organ toxicity (eg, seizures, acute nephropathy, acute lung injury, acute hepatotoxicity, myocardial injury) not responsive to observation care(44)(93)(94)(95)
- Isolation indicated that cannot be performed outside hospital setting
- **Systemic or Infectious 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(96):
  - 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 include:
  - 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
    - Correction of electrolytes with IV fluid and electrolyte administration(18)(19)
    - Correction of endocrine disorder effects with medications (eg, beta-blockers, steroids, glucose)(1)(5)(6)(8)(10)
    - Initiation of IV antibiotics, re-examination, and outpatient follow-up(33)(34)(35)
    - IV fluids, H1-antihistamines and H2-antihistamines, steroids, and epinephrine administration with observation (1 or more hours) for allergic reaction[J](49)(53)
    - Emergency department evaluation and toxicology consultation with outpatient follow-up(44)(97)
    - Emergency department evaluation, monitoring, screening laboratory tests, treatment, and outpatient follow-up after observation for fever, seizures, mental status change, respiratory function, hemodynamic stability, drug toxicity, and other conditions(44)(80)(84)(97)
  - Home care(98)
    - IV antibiotics and antifungal and antiviral agents(99)
    - Nursing visit with assessment
    - Wound care
    - Further outpatient diagnostic evaluation
  - Recovery facility
    - IV fluid and medications
    - Ongoing assessment, testing, and treatment

Hospitalization

General Recovery Course

Stage	Level of Care	Clinical Status	Interventions
1	• ICU or intermediate care[K] • Social Determinants of Health Assessment • Discharge planning. See Discharge Planning Tool SR. • Possible Isolation	• **Clinical Indications met[L]**	• Inpatient interventions as needed
2	• Floor • Possible Isolation • 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** • **Respiratory status acceptable** • **Neurologic status acceptable** • **Temperature status acceptable** • **No infection, or status acceptable** • **No neutropenia, or status acceptable** • **Isolation not indicated, or is performable at next level of care** • **Electrolyte status acceptable** • **General Discharge Criteria met**	• **Intake acceptable** • **No inpatient interventions needed**

(1)(5)(18)(31)(32)(33)(39)(44)(49)(73)(74)(75)(76)(80)(84)(86)(88)(89)(97)(100)(101)(102)(103)(104)

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(105)(106):
        - Tachycardia absent
        - Hypotension absent
        - No evidence of inadequate perfusion (eg, no myocardial ischemia)
        - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)
    - Respiratory status acceptable, as indicated by **ALL** of the following(107)(108)(109)(110):
      - Patient breathing comfortably (or near baseline) and able to protect airway (eg, able to handle secretions)
      - Tachypnea absent
      - Oxygen saturation greater than 90%, near baseline, or measurement not indicated for condition
      - Supplemental oxygen or respiratory treatments not needed or are performable at next level of care
      - Airflow measurements greater than 60% of predicted, at stable baseline, or measurement not indicated for condition
      - Partial pressure of carbon dioxide and pH normal, at stable baseline, or measurement not indicated for condition
    - Neurologic status acceptable, as indicated by neurologic function and mental status being **1 or more** of the following(111)(112):
      - Normal
      - Baseline
      - Appropriate for next level of care
    - Temperature status acceptable, as indicated by **1 or more** of the following(113)(114)(115):
      - 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

− No infection, or status acceptable, as indicated by **1 or more** of the following(114)(115)(116)(117)(118):
- No infection present
- Infection status acceptable for next level of care, as indicated by **ALL** of the following(24):
  - WBC count normal, stable, or declining with treatment
  - Adequate treatment performable at next level of care
  - Organism and sensitivities identified, or adequate clinical response to empiric therapy
  - Repeat cultures negative or not needed

− No neutropenia, or status acceptable, as indicated by **1 or more** of the following(32)(119)(120)(121)(122):
- No neutropenia problem
- Neutropenia adequately resolved or stabilized, as indicated by **1 or more** of the following:
  - Afebrile
  - Absolute neutrophil count greater than 500/mm^3 (0.5 $x10^9$/L)
  - No high-risk findings, as indicated by **ALL** of the following:
    - Hypotension absent
    - Tachypnea absent
    - Hypoxemia absent
    - No evidence of significant focal infection (eg, cellulitis, pneumonia, tunnel infection, perirectal abscess)
    - No evidence of infection with drug-resistant organism
    - Mental status normal or at baseline
    - Heart failure absent, improved, or at baseline
    - No acute or acute-on-chronic renal failure (eg, creatinine less than or equal to 2.5 mg/dL (221 micromoles/L) or at baseline)
    - No uncontrolled arrhythmia, hypocalcemia or hypercalcemia, or hyponatremia (eg, serum sodium of 135 mEq/L (mmol/L) or less)
    - Liver function normal, at baseline, or improved
    - Multinational Association for Supportive Care in Cancer (MASCC) Risk Index score of 21 or more or Clinical Index of Stable Febrile Neutropenia (CISNE) score of 2 or less[M](122)(123) MASCC Calculator
- Isolation not indicated, or is performable at next level of care

− Electrolyte status acceptable, as indicated by **1 or more** of the following(19):
- Electrolyte abnormality manageable at next level of care[N]
- No electrolyte abnormality, as indicated by **ALL** of the following:
  - Potassium greater than 3.5 mEq/L (mmol/L) and less than 5.0 mEq/L (mmol/L)(124)
  - Sodium greater than 135 mEq/L (mmol/L) and less than 145 mEq/L (mmol/L)(23)(125)
  - Calcium[O] greater than 8.5 mg/dL (2.13 mmol/L) and less than 10.5 mg/dL (2.63 mmol/L)
  - Phosphorus greater than 2.5 mg/dL (0.81 mmol/L) and less than 5.0 mg/dL (1.62 mmol/L)(128)
  - Magnesium greater than 1.5 mEq/L (0.75 mmol/L) and less than 3.0 mEq/L (1.5 mmol/L)(128)

− 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(129):
- Oral hydration, medications, and diet

- Enteral hydration, medications, and diet
- Administration routes performable at next level of care

− No inpatient interventions needed; examples include:

- Vital signs, neurologic signs, or vascular checks more often than feasible at next level of care
- Cardiac or respiratory monitoring
- IV fluid to replace significant ongoing losses
- Supplemental oxygen or respiratory therapy (eg, nebulization) needs not appropriate for next level of care
- Procedure or care needed not appropriate for next level of care

− 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 41 published peer reviewed articles, 4 specialty society or other evidence-based guidelines, and 44 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(96); 42 CFR 419.22(130); 42 CFR 422.101(131)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(132); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(133); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(134); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(135)

Medicare Coverage Determinations: Medicare Coverage Database(136)

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Footnotes

[A] The Burch-Wartofsky Point Scale assigns points for thermoregulatory function, central nervous system effects, gastrointestinal or hepatic dysfunction, cardiovascular symptoms, and precipitating events. An online calculator is available at www.mdcalc.com/burch-wartofsky-point-scale-bwps-thyrotoxicosis. [A in Context Link 1]

[B] Triggers of carcinoid crisis in patients with carcinoid tumors include surgical manipulation, biopsy, radionuclide therapy, sympathomimetic drugs, and abdominal palpation.(14)(15) [B in Context Link 1]

[C] Expert advice in management of malignant hyperthermia or neuroleptic malignant syndrome is available from the Malignant Hyperthermia Association of the United States through their website at www.mhaus.org/healthcare-professionals/managing-a-crisis/ or at their 24-hour hotline 1-800-644-9737. [C in Context Link 1, 2]

[D] The intention is to identify patients with physiologic difficulty maintaining sufficient nutritional status rather than patients for whom access to food is the issue. [D in Context Link 1]

[E] In children, malnutrition may be defined by anthropometric measures (eg, weight for height, mid-upper arm circumference) in relation to standardized populations. The Centers for Disease Control and Prevention (CDC) recommends that tables developed by the World Health Organization be used in children up to 2 years of age and CDC-developed tables be used for children age 2 years or older. Both sets can be obtained and downloaded from www.cdc.gov/growthcharts/cdc-data-files.htm. Z scores may be determined with tables available at www.who.int/tools/child-growth-standards/standards/weight-for-age.(64)(65)(66) [E in Context Link 1, 2]

[F] Deviation categorized by number of standard deviations below the mean is a z score. For example, a z score of minus 1 (-1) in weight for height would mean the child is one standard deviation below the mean weight for their age, sex, and height. Z scores may be determined with tables available at www.cdc.gov/growthcharts/zscore.htm.(64)(65)(66) [F in Context Link 1, 2, 3]

[G] Severe malnutrition is characterized by significant loss of weight, muscle mass, and body fat with resultant accumulation of edema.(62)(67)(71) Severity of edema may be graded from 1+ to 4+, with 1+ edema characterized by 2 mm or less of depression of the skin when pressed and almost immediate rebound, 2+ edema seen with 4 mm of depression and a few seconds to rebound, 3+ edema seen with 6 mm of depression and 10 to 19 seconds to rebound, and 4+ edema seen with 8 mm or more of depression of the skin when pressed with prolonged time to rebound of 20 seconds or more.(62) [G in Context Link 1, 2, 3]

[H] The definition of heatstroke commonly includes a core body temperature of 104 degrees F (40 degrees C) or higher; however, hyperthermia-related organ failure may occur at lower temperatures.(79) [H in Context Link 1, 2]

[I] Post-transplant complications for the most commonly transplanted organs are covered in other General Recovery Guidelines as follows: heart transplant in Cardiology GRG GRG, lung transplant in Pulmonary Disease GRG GRG, liver or pancreas transplant in Gastroenterology GRG GRG, renal transplant in Urologic Disease GRG GRG, hematopoietic stem cell transplant in Medical Oncology GRG GRG, and intestine transplant in General Surgery or Procedure GRG GRG. [I in Context Link 1, 2]

[J] Patients with a history of progressively severe reactions or biphasic reactions (eg, initial followed by delayed anaphylactic signs and symptoms) require more prolonged observation.(49)(53) [J in Context Link 1]

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

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

[M] The MASCC Risk Index and the CISNE score are validated prediction tools used to stratify febrile neutropenic adult patients into low-risk or high-risk categories.(32)(122)(123) [M in Context Link 1]

[N] Patients with chronic disease (eg, renal failure with potassium greater than 5 mEq/L (mmol/L) or liver disease with sodium less than 135 mEq/L (mmol/L)) with chronically abnormal electrolytes are often manageable on an outpatient basis.(19) [N in Context Link 1]

[O] The calcium level should be corrected for hypoalbuminemia. An ionized calcium level may be more accurate than a total serum calcium level, especially in the setting of acidosis, renal failure, massive transfusions, or the presence of a paraprotein.(126)(127) [O in Context Link 1]

Definitions

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)

References

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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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Anasarca

- Anasarca is generalized edema that is widespread and may be more pronounced in dependent areas (eg, back while lying down, legs while sitting up).(1)

References

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Bacteremia

- Bacteremia refers to blood culture isolation of a bacterial species that is likely to be pathologic and not a contaminant.(1)(2)

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Bradycardia

- Bradycardia[A], as indicated by **1 or more** of the following(1)(2)(3):
  - Heart rate less than 50 beats per minute in adult (age 18 years or older)[B]

- Heart rate less than 55 beats per minute in adolescent 13 to 17 years of age
- Heart rate less than 60 beats per minute in child or adolescent 6 to 12 years of age
- Heart rate less than 65 beats per minute in child 3 to 5 years of age
- Heart rate less than 70 beats per minute in child 1 to 2 years of age
- Heart rate less than 80 beats per minute in infant 6 to 11 months of age
- Heart rate less than 90 beats per minute in infant 3 to 5 months of age

References

1. Kusumoto FM, et al. 2018 ACC/AHA/HRS guideline on the evaluation and management of patients with bradycardia and cardiac conduction delay: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Circulation 2019;140(8):e382-e482. DOI: 10.1161/CIR.0000000000000628. (Reaffirmed 2025 Jun)
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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. An evidence-based specialty society guideline has defined bradycardia in adults as less than 50 beats per minute.(1)

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)

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1. 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.
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Electrolyte status acceptable

- Electrolyte status acceptable, as indicated by **1 or more** of the following(1):
  - Electrolyte abnormality manageable at next level of care[A]
  - No electrolyte abnormality, as indicated by **ALL** of the following:
    - Potassium greater than 3.5 mEq/L (mmol/L) and less than 5.0 mEq/L (mmol/L)(2)
    - Sodium greater than 135 mEq/L (mmol/L) and less than 145 mEq/L (mmol/L)(3)(4)
    - Calcium[B] greater than 8.5 mg/dL (2.13 mmol/L) and less than 10.5 mg/dL (2.63 mmol/L)
    - Phosphorus greater than 2.5 mg/dL (0.81 mmol/L) and less than 5.0 mg/dL (1.62 mmol/L)(7)

- Magnesium greater than 1.5 mEq/L (0.75 mmol/L) and less than 3.0 mEq/L (1.5 mmol/L)(7)

References

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Footnotes

A. Patients with chronic disease (eg, renal failure with potassium greater than 5 mEq/L (mmol/L) or liver disease with sodium less than 135 mEq/L (mmol/L)) with chronically abnormal electrolytes are often manageable on an outpatient basis.(1)

B. The calcium level should be corrected for hypoalbuminemia. An ionized calcium level may be more accurate than a total serum calcium level, especially in the setting of acidosis, renal failure, massive transfusions, or the presence of a paraprotein.(5)(6)

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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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.
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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.

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

References

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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.

Hypoxemia absent

- Hypoxemia absent, as indicated by **1 or more** of the following(1):
  - Arterial oxygen saturation (SpO_2) of 90% or greater or arterial partial pressure of oxygen (PaO_2) of 60 mm Hg (8.0 kPa) or greater on room air[A][B]
  - Oxygen requirements are stable and arranged for at next level of care.

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. 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. Specific target values (ie, 90% or 60 mm Hg (8.0 kPa)) may require adjustment when care is delivered at high altitude.(2)

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.

Isolation

- Isolation, as indicated by **1 or more** of the following[A][B](2):
  - Contact precautions, as indicated by **1 or more** of the following[C]:
    - Major draining abscess or decubitus ulcer, until drainage stops or can be contained by dressing
    - Acute viral conjunctivitis
    - Impetigo
    - Pediculosis (lice)
    - Known or suspected infection or colonization with multidrug-resistant organism
    - *Clostridioides difficile*
    - Child with bronchiolitis
    - For diapered or incontinent persons: gastroenteritis, hepatitis A or E
    - Severe primary, mucocutaneous, or disseminated *Herpesvirus hominis* (herpes simplex), until lesions are dry and crusted
    - Other infection or colonization with organism known to be transmitted via environmental contamination (eg, norovirus, rotavirus)
  - Droplet precautions (known or suspected infection with pathogen transmittable by large particle droplets from respiratory secretions), as indicated by **1 or more** of the following[D]:
    - Pharyngeal diphtheria until 2 cultures are negative 24 hours apart
    - Epiglottitis due to *Haemophilus influenzae*
    - Seasonal influenza
    - Meningitis due to *Haemophilus influenzae* or *Neisseria meningitidis* until 24 hours after effective therapy
    - Mumps (infectious parotitis) until 5 days after swelling onset
    - Group A *Streptococcus* skin, wound, or major burn (with contact isolation)
    - Pneumonia adenovirus (with contact isolation)
    - Pneumonia due to group A *Streptococcus*, *Mycoplasma pneumoniae*, child with type b *Haemophilus influenzae*
    - *Bordetella pertussis* (whooping cough) until 5 days of effective antibiotic therapy
    - Pneumonic plague (*Yersinia pestis*) until 48 hours of effective antibiotic therapy
    - Rubella until 7 days after rash onset
    - Other pathogenic agent transmittable by droplets
  - Airborne precautions (known or suspected infection with pathogenic agent transmittable by aerosol that can remain suspended in the air), as indicated by **1 or more** of the following[E](3):
    - Severe acute respiratory syndrome (SARS) or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection (with contact isolation)
    - *Mycobacterium tuberculosis*
    - Novel influenza A infection (eg, avian H5N1, H5N2, H7N9)
    - Measles until 4 days after rash onset, or for duration of illness if immunocompromised
    - Disseminated varicella zoster or infection in immunocompromised patient (with contact isolation)
    - Viral hemorrhagic fever (eg, *Ebolavirus*, Marburg; with contact isolation)
    - Other pathogenic agent transmittable by aerosol
  - Protective environment required following allogeneic hematopoietic stem cell transplant[F]

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1. Clinical Care Considerations. Clinical Considerations for Care of Children and Adults with Confirmed COVID-19 [Internet] Centers for Disease Control and Prevention. Accessed at: https://www.cdc.gov/covid/?CDC_AAref_Val=https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-care/clinical-considerations-index.html. Updated 2023 Aug [accessed 2024 Sep 23]
2. Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. [Internet] Centers for Disease Control and Prevention. 2024 Sep Accessed at: https://www.cdc.gov/infectioncontrol/. [accessed 2025 Sep 02]
3. Center for International Blood and Marrow Transplant Research (CIBMTR), et al. Guidelines for preventing infectious complications among hematopoietic cell transplant recipients: a global perspective. Bone Marrow Transplantation 2009;44(8):453-455.

Footnotes

A. Most patients who do not have clinical indications for inpatient care can continue their appropriate level of isolation at other levels of care (eg, home, recovery facility).(1)

B. The indications and specifics for various infection control measures vary by diagnosis and can change over time. Detailed and up-to-date recommendations from the Centers for Disease Control and Prevention are available at www.cdc.gov/infectioncontrol/guidelines/isolation/updates.html, www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html, www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm, www.cdc.gov/flu/avianflu/novel-flu-infection-control.htm, and www.cdc.gov/vhf/ebola/clinicians/index.html.

C. Contact precautions include hand hygiene, single-patient rooms (preferred) or cohorting of patients colonized with the same pathogen, use of personal protective equipment for patient contact (gloves and gowns), coverage and containment of infected or colonized areas of the patient's body during transport, use of disposable patient care equipment where applicable, use of patient-dedicated nondisposable equipment where applicable, cleaning and disinfecting nondisposable equipment prior to reuse on another patient, and daily or more frequent cleaning and disinfection of patient rooms and room equipment.

D. Droplet precautions include hand hygiene, single-patient rooms (preferred) or cohorting of patients colonized with the same pathogen, use of masks for patient exposure, and masking of patient during transport.

E. Airborne precautions include hand hygiene, single-patient airborne infection isolation (negative pressure) room exhausted to the outside or through HEPA filtration, and use of personal protective equipment for patient contact (fit-tested N95 or higher level mask, gloves, and gowns). In the event of a large outbreak, patients known or presumed to have the same infection may be cohorted.

F. Protective environment precautions include hand hygiene, HEPA filtration for incoming air, positive pressure relative to the corridor, daily surface cleaning and disinfection, and N95 mask for patient during transport.

Neurologic status acceptable

- Neurologic status acceptable, as indicated by neurologic function and mental status being **1 or more** of the following(1)(2):
  - Normal
  - Baseline
  - Appropriate for next level of care

References

1. Lowenstein DH, Josephson SA, Hauser SL. Approach to the patient with neurologic 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; 2022:3277-3282.
2. Kochanek PM, Bell MJ. Neurologic emergencies and stabilization. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:581-588.

No infection, or status acceptable

- No infection, or status acceptable, as indicated by **1 or more** of the following(1)(2)(3)(4)(5):
  - No infection present
  - Infection status acceptable for next level of care, as indicated by **ALL** of the following(6):
    - WBC count normal, stable, or declining with treatment
    - Adequate treatment performable at next level of care
    - Organism and sensitivities identified, or adequate clinical response to empiric therapy
    - Repeat cultures negative or not needed

References

1. Hooper DC, Shenoy ES, Elshaboury RH. Treatment and prophylaxis of bacterial infections. 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; 2022:1148-1163.
2. Blum FC, Biros MH. Fever in the adult patient. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:90-95.e1.
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5. Sifri CD. Approach to fever and suspected infection in the immunocompromised host. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:1851-1862.
6. Singh M, Fernandez-Frackelton M. Bacteria. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:1586-1609.e3.

No inpatient interventions needed

- No inpatient interventions needed; examples include:
  - Vital signs, neurologic signs, or vascular checks more often than feasible at next level of care
  - Cardiac or respiratory monitoring
  - IV fluid to replace significant ongoing losses
  - Supplemental oxygen or respiratory therapy (eg, nebulization) needs not appropriate for next level of care
  - Procedure or care needed not appropriate for next level of care

No neutropenia, or status acceptable

- No neutropenia, or status acceptable, as indicated by **1 or more** of the following(1)(2)(3)(4)(5):
  - No neutropenia problem
  - Neutropenia adequately resolved or stabilized, as indicated by **1 or more** of the following:
    - Afebrile
    - Absolute neutrophil count greater than 500/mm^3 (0.5 x10^9/L)
    - No high-risk findings, as indicated by **ALL** of the following:
      - Hypotension absent
      - Tachypnea absent

- Hypoxemia absent
- No evidence of significant focal infection (eg, cellulitis, pneumonia, tunnel infection, perirectal abscess)
- No evidence of infection with drug-resistant organism
- Mental status normal or at baseline
- Heart failure absent, improved, or at baseline
- No acute or acute-on-chronic renal failure (eg, creatinine less than or equal to 2.5 mg/dL (221 micromoles/L) or at baseline)
- No uncontrolled arrhythmia, hypocalcemia or hypercalcemia, or hyponatremia (eg, serum sodium of 135 mEq/L (mmol/L) or less)
- Liver function normal, at baseline, or improved
- Multinational Association for Supportive Care in Cancer (MASCC) Risk Index score of 21 or more or Clinical Index of Stable Febrile Neutropenia (CISNE) score of 2 or less[A](5)(6) MASCC Calculator

References

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2. Choe JH, Crawford J. Disorders of blood cell production in clinical oncology. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, editors. Abeloff's Clinical Oncology. 6th ed. Philadelphia, PA: Elsevier; 2020:514-522.e2.
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6. Zheng B, Toarta C, Cheng W, Taljaard M, Reaume N, Perry JJ. Accuracy of the Multinational Association of Supportive Care in Cancer (MASCC) and Clinical Index of Stable Febrile Neutropenia (CISNE) scores for predicting serious complications in adult patients with febrile neutropenia: A systematic review and meta-analysis. Critical Reviews in Oncology/Hematology 2020;149:102922. DOI: 10.1016/j.critrevonc.2020.102922.

Footnotes

A. The MASCC Risk Index and the CISNE score are validated prediction tools used to stratify febrile neutropenic adult patients into low-risk or high-risk categories. (1)(5)(6)

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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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.

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

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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.

Respiratory status acceptable

- Respiratory status acceptable, as indicated by **ALL** of the following(1)(2)(3)(4):
  - Patient breathing comfortably (or near baseline) and able to protect airway (eg, able to handle secretions)
  - Tachypnea absent
  - Oxygen saturation greater than 90%, near baseline, or measurement not indicated for condition
  - Supplemental oxygen or respiratory treatments not needed or are performable at next level of care
  - Airflow measurements greater than 60% of predicted, at stable baseline, or measurement not indicated for condition

- Partial pressure of carbon dioxide and pH normal, at stable baseline, or measurement not indicated for condition

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)

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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)

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.

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.

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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.

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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)

Tachypnea absent

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

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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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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).

References

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