Diabetes

ORG: M-130 (ISC)
Link to Codes

MCG Health
Inpatient & Surgical Care
30th Edition

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Admission to Inpatient Care

Note: Some patients may be appropriate for Observation care. For consideration of observation care, see Diabetes: Observation Care ISC.

- Admission is indicated for **1 or more** of the following(1)(2):
  - Diabetic ketoacidosis that requires inpatient management, as indicated by **ALL** of the following(1)(6):
    - Plasma glucose level is consistent with ketoacidosis, or euglycemic diabetic ketoacidosis is suspected, as indicated by **1 or more** of the following:
      - Hyperglycemia (plasma glucose 200 mg/dL (11.1 mmol/L) or greater)(1)(6)
      - Any glucose level and prior history of diabetes[A](1)(6)
      - Plasma glucose is less than 200 mg/dL (11.1 mmol/L) and one or more risk factors for euglycemic diabetic ketoacidosis are present, as indicated by **1 or more** of the following[B](1)(6)(8)(9):
        - Pregnancy
        - Prolonged starvation
        - Heavy alcohol intake
        - Chronic liver or renal disease
        - Sepsis or severe infection
        - Insulin treatment prior to presentation (eg, self-treatment for observed elevated glucose)
        - Ketogenic (low-carbohydrate) diet
        - SGLT2 inhibitor
        - Pancreatitis
        - Glycogen storage disease
        - Other risk factor for euglycemic diabetic ketoacidosis or hypoglycemia
    - Ketonuria or ketonemia (eg, serum beta-hydroxybutyrate 3.0 mmol/L or higher, or moderate to large ketonuria (2+ or higher on urine ketone stick))[C](6)

- Acidosis as indicated by arterial or venous pH less than 7.30,[D] serum bicarbonate 18 mEq/L (mmol/L) or less, or anion gap greater than 12 (or above the upper limit of normal for local laboratory)[E](1)(6)
- Inpatient management appropriate, as indicated by **1 or more** of the following(1)(2):
  - Metabolic acidosis[E] (eg, arterial or venous pH less than 7.30, or anion gap greater than 12 (or above the upper limit of normal for local laboratory))[D] that recurs or persists despite observation care
  - Hypotension
  - Arterial or venous pH 7.25 or less[D]
  - Serum bicarbonate less than 15 mEq/L (mmol/L)
  - Altered mental status
  - Acute[F] rise in serum creatinine to 2 times its baseline[G] value or higher that persists despite observation care
  - Dehydration that persists despite observation care
  - Inability to maintain oral hydration (eg, IV fluid support required) or tolerate diet despite observation care
  - Significant electrolyte abnormality (eg, hypokalemia) that persists despite observation care
  - Pregnancy(17)
  - Glucose level persistently too high for next level of care (eg, concern for redevelopment of dehydration, electrolyte abnormality), or not sufficiently stable despite observation care
  - Inpatient treatment of underlying etiology of hyperglycemia needed (eg, infection requiring inpatient care)
  - Etiology of diabetic ketoacidosis unclear (ie, not thought to be secondary to missed insulin doses)
  - Patient without known outpatient insulin regimen (eg, newly diagnosed diabetes, outpatient insulin regimen not clear)

− Hyperglycemic hyperosmolar state, as indicated by **ALL** of the following[H](6):
- Plasma glucose greater than 600 mg/dL (33.3 mmol/L)
- Total serum osmolality greater than 320 mOsm/kg (mmol/kg)[I] or effective serum osmolality greater than 300 mOsm/kg (mmol/kg)[J]

− Hyperglycemia requiring inpatient care, as indicated by **1 or more** of the following(2)(6):
- Hemodynamic instability
- Altered mental status that is severe or persistent
- Dehydration that is severe or persistent
- Significant electrolyte abnormality (eg, hypokalemia, hyperkalemia, hypernatremia) that persists despite observation care
- Inability to maintain oral hydration (eg, IV fluid support required) or tolerate diet despite observation care
- Glucose level persistently too high for next level of care (eg, concern for redevelopment of dehydration, electrolyte abnormality), or not sufficiently stable despite observation care
- Inpatient treatment of underlying etiology of hyperglycemia needed (eg, infection requiring inpatient care)

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(18):
  - 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(1):
  - Outpatient care in emergency department, rapid treatment site, urgent care center, or medical office(2)(19)
    - Parenteral insulin, parenteral fluid, electrolyte replacement[K]
    - Repeat laboratory testing
    - Trial of oral hydration and nutrition
  - Observation. See Diabetes: Observation Care ISC guideline as appropriate.
  - Home care
    - Home blood glucose monitoring
    - Parenteral insulin
    - Oral hydration and nutrition for diabetic ketoacidosis
    - Diabetes self-education and management

- Recovery facility
  - Parenteral fluids and insulin
  - Testing and education
  - Frequent assessment and treatment
  - Management of comorbidities

Hospitalization

Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
1	• ICU,[L] intermediate care,[M] or floor • Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Diabetes: Readmission Risk Assessment • Extended Stay Risk Assessment • Discharge planning	• **Clinical Indications met[N]** • Hyperglycemic and possibly acidotic • Possibly hypotensive • Dehydrated, possible abdominal pain and altered sensorium	• Ambulate with assistance as tolerated	• IV fluids, possible glucose infusion for ketosis with low serum glucose • IV medications • Begin oral hydration as tolerated	• Investigate for precipitating causes • IV volume replacement • Serum glucose, serum ketones, chemistries, ABG or venous pH measurements, [D] urinalysis • Bedside glucose monitoring every 30 minutes to 2 hours[O] • Endocrinology consultation as indicated	• Possible IV insulin[P] • Potassium and other electrolyte supplements as indicated • Transition to subcutaneous insulin[P]
2	• Floor • Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Diabetes: Readmission Risk Assessment • Extended Stay Risk Assessment	• **Hypotension absent** • **Mental status at baseline or improved** • **Acidosis absent or improved** • **Blood glucose under acceptable control or improved** • **Electrolyte abnormalities absent or improved** • **Renal function at baseline or improved**	• Activity as tolerated	• Oral or IV fluids, medications • Diet as tolerated	• Urinalysis, CBC, ketones, chemistries • Glucose monitoring • IV volume replacement • Diabetic education	• **IV insulin absent** • **Outpatient diabetic medication regimen initiated** • Subcutaneous insulin • Potassium and other electrolyte supplements as indicated
3	• Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Diabetes: Readmission	• **Hemodynamic stability** • **Mental status at baseline** • **No precipitating cause identified, or cause manageable in outpatient setting** • **Acidosis absent**	• **Ambulatory or acceptable for next level of care**	• **Oral hydration[Q]** • **Oral medications or regimen acceptable for next level of care** • **Oral diet or acceptable**	• Bedside glucose monitoring • Chemistries • Diabetic education	• **Outpatient diabetic medication regimen established**

	Risk Assessment • Extended Stay Risk Assessment • Floor to discharge • Complete discharge planning	• **Blood glucose under acceptable control** • **Dehydration absent** • **Electrolyte abnormalities absent or acceptable for next level of care** • **Renal function at baseline or acceptable for next level of care** • **Discharge plans and education understood**	**for next level of care**			

(1)(4)(6)(7)(22)(23)NNN

Recovery Milestones are indicated in **bold**.

Goal Length of Stay: 2 days

Note: Goal Length of Stay assumes optimal recovery, decision making, and care. Patients may be discharged to a lower level of care (either later than or sooner than the goal) when it is appropriate for their clinical status and care needs.

Extended Stay

Minimal (a few hours to 1 day), Brief (1 to 3 days), Moderate (4 to 7 days), and Prolonged (more than 7 days).

- Extended stay beyond goal length of stay may be needed for(4):
  - Failure to meet discharge criteria (recovery milestones within final day in Optimal Recovery Course)
    - Expect brief stay extension.
  - Treatment of precipitating causes(6)
    - Infection, sepsis, stroke, alcohol abuse, illicit drug use, pancreatitis, trauma, and MI may precipitate diabetic decompensation.
    - Expect brief to moderate stay extension.
  - Development of significant hypoglycemia(1)(7)(29)
    - Anticipate adjustment of insulin therapy.
    - Expect brief stay extension.
  - Complications of treatment(1)(7)(23)
    - Cerebral edema may occur from too rapid correction of hyperglycemia and hyperosmolarity.
    - Vascular thrombosis, hypoxemia, noncardiogenic pulmonary edema, severe electrolyte abnormalities, and other complications may occur in the course of treatment.
    - Anticipate rapid evaluation and intervention.
    - Expect brief to moderate stay extension.
  - Complications of decompensated diabetes (eg, acute gastric dilatation, persistent metabolic, electrolyte, or neurologic derangement)(23)
    - Acute metabolic encephalopathy may require airway protection with intubation and mechanical ventilation.
    - Less rapid resolution may require continued inpatient care.
    - Expect brief to moderate stay extension.
  - Active comorbidities, including(30):
    - Renal failure(31)(32)
    - Heart failure(33)
    - Myocardial ischemia(34)
    - Atrial fibrillation(35)
    - Decompensated cirrhosis(36)
    - Neuropathic or vascular ulcers of lower extremities(37)
    - Severe peripheral vascular disease
    - Obesity hypoventilation syndrome(38)
    - Expect brief stay extension.

- Outpatient treatment regimen not established
  - Patient or caregiver may need more time to gain knowledge and skills necessary to safely treat diabetes at next level of care (eg, ability to measure blood glucose, calculate insulin dosage, administer insulin).
  - Anticipate education and training on needed skills and assessment of safety for discharge to next level of care.
  - Expect brief stay extension.

See Common Complications and Conditions ISC for further information.

Discharge

Discharge Planning

- Discharge planning includes[R]:
  - Assessment of needs and planning for care, including(40)(41):
    - Develop and modify treatment plan (involving multiple providers) as needed.
    - Evaluate and address preadmission functioning as needed.
    - Evaluate and address psychosocial status issues as indicated. See Psychosocial Assessment SR for further information.
    - Evaluate and address social determinants of health (eg, housing, food). See Social Determinants of Health Screening Tool SR for further information.(6)(42)
    - Evaluate and address patient or caregiver preferences as indicated.
    - Identify skilled services needed at next level of care, with specific attention to:
      - Coordination of care with chronic condition management program(43)(44)
      - Medication management, adherence instruction, and side effects assessment(45)(46)
      - Nutrition and hydration management(43)
      - Ongoing education required(47)
  - Early identification of anticipated discharge destination; options include(41)(48):
    - Home; considerations include:
      - Home safety assessment. See Home Safety Assessment SR for further information.
      - Patient safe to go home; examples include(49)(50)(51):
        - Medical status stable for patient's condition
        - Functional care can safely be provided with available resources.
        - Mental status stable for patient's condition
        - Medication availability confirmed and reconciliation complete
        - Patient/caregiver education completed with written discharge instructions provided
        - Community resources identified and referrals made, as needed
        - Home care arranged, if indicated
        - Necessary medical equipment delivery arranged or available in home, if indicated
        - Necessary medical supplies ordered, or patient/caregiver can obtain, if indicated
      - Access to follow-up care
      - Self-management ability if appropriate. See Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Assessment SR for further information.
      - Caregiver need, ability, and availability
    - Post-acute skilled care or custodial care as indicated. See Discharge Planning Tool SR for further information.
  - Transitions of care plan complete, including(41)(48)(52):
    - Patient and caregiver education complete.
      - See Teach-Back Tool SR for further information.
      - See Diabetes: Patient Education for Clinicians SR for further information.
    - Medication reconciliation completion includes(46)(53):
      - Compare patient's discharge list of medications (prescribed and over-the-counter) against provider's admission or transfer orders.
      - Assess each medication for correlation to disease state or medical condition.
      - Report medication discrepancies to prescribing provider, attending physician, and primary care provider, and ensure accurate medication order is identified.
      - Provide reconciled medication list to all treating providers.
      - Confirm that patient or caregiver can acquire medication.
      - Educate patient and caregiver.
        - Provide complete medication list to patient and caregiver.
        - Importance of presenting personal medication list to all providers at each care transition, including all provider appointments
        - Reason, dosage, and timing of medication (eg, use "teach-back" techniques)(54)

- Encourage communication between patient, caregiver, and pharmacy for obtaining prescriptions, setting up home medication delivery, and reviewing for drug-drug interactions.
- See Medication Reconciliation Tool SR for further information.

- Plan communicated to patient, caregiver, and all members of care team, including(55):
  - Inpatient care and service providers
  - Primary care provider
  - All post-discharge care and service providers
- Appointments planned or scheduled, which may include(6):
  - Primary care provider(56)
  - Behavioral health provider(57)
  - Dentist
  - Diabetes care and education specialists(43)
  - Dietitian(43)
  - Endocrinologist
  - Foot and nail care by trained care provider(58)
  - Ophthalmologist
  - Other
- Outpatient testing and procedure plans made, which may include:
  - Laboratory testing(6)
  - Other
- Referrals made for assistance or support, which may include:
  - Alcohol and other drug abuse or dependence treatment(6)
  - Behavioral health services (eg, counseling)(57)
  - Educational program (eg, chronic condition management, self-management)(56)(59)
  - Financial, for follow-up care, medication, and transportation(60)
  - Self-help or support groups(61)
  - Tobacco use treatment(6)(62)
  - Other
- Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include(6):
  - Glucose monitoring supplies (eg, lancets, wipes, glucometer, test strips)(63)
  - Syringes and needles for subcutaneous injections
  - Other

Discharge Destination

- Post-hospital levels of admission may include:
  - Home.
  - Home healthcare. See Home Care Indications for Admission Section HC in Diabetes guideline in Home Care.
  - Recovery facility care. See Recovery Facility Care Indications for Admission Section RFC in Diabetes guideline in Recovery Facility Care.

Evidence Summary

Criteria

The evidence for the clinical indications found in this guideline includes 11 published peer reviewed articles, 2 specialty society or other evidence-based guidelines, and 2 book sections.

Analysis of national hospital discharge data for a commercially insured population shows 39.9% of patients seen in an emergency department with a principal diagnosis of diabetes with ketoacidosis, hyperglycemia, or hyperosmolarity were admitted to inpatient care.(3) **(EG 3)** Analysis of hospital discharge data for a Medicare-insured population shows 53.0% of patients seen in an emergency department with a principal diagnosis of diabetes with ketoacidosis, hyperglycemia, or hyperosmolarity were admitted to inpatient care.(3) **(EG 3)** Analysis of an all-payer database shows a mean length of stay of 4.0 days for patients admitted to inpatient care.(4) **(EG 3)** For diabetic ketoacidosis, a consensus expert guideline, an emergency medicine textbook, and a narrative review state that most patients with diabetic ketoacidosis should be treated as inpatients, often in the ICU, while some mild, uncomplicated cases (eg, mild acidosis, mild electrolyte abnormalities, stable vital signs) can be treated initially in observation care with outpatient discharge if the ketoacidosis resolves.(1)(2)(5) **(EG 2)** Specialty society guidelines and a narrative review state that all patients with a hyperglycemic hyperosmolar state should be treated as inpatients.(1)(6)(7) **(EG 2)** An emergency medicine textbook and a narrative review note that patients with symptomatic hyperglycemia in the absence of diabetic ketoacidosis or a hyperosmolar state may require inpatient care if they do not improve with observation care. Additionally, those with acute or chronic comorbid conditions that could complicate recovery may be appropriate for inpatient care.(2)(8) **(EG 2)**

Alternatives

Hyperglycemia can be treated in emergency department observation units.(1)(2)(19) **(EG 2)** Selected reliable nonpregnant patients with mild diabetic ketoacidosis and without other indications for inpatient care can be initially treated in observation care with inpatient admission dependent on response to treatment.(20)(21) **(EG 2)**

Hospitalization

A specialty society guideline recommends that diabetic devices (eg, automated insulin delivery systems or continuous glucose monitoring sensors) should be continued in the inpatient setting, if resources and training are available, with confirmatory point-of-care glucose measurements performed for decisions on insulin dosing or hypoglycemia management.(6) **(EG 2)** The same guideline recommends that inpatients be given the opportunity for diabetic self-management if they are competent to do so and if self-management is appropriate.(6) **(EG 2)**

Readmission risk and reduction: A multivariate analysis of a national database evaluating 30-day readmissions after an episode of diabetic ketoacidosis (59,961 patients) found that multiple comorbidities (Charlson Comorbidity Index score of 3 or greater) and end-stage renal disease were independent risk factors for 30-day readmission.(28) **(EG 2)**

Length of Stay

Analysis of national hospital discharge data shows 40% of hospitalized adult patients with the principal diagnosis of diabetes with ketoacidosis, hyperglycemia, or hyperosmolarity were discharged in 2 days or less.(4) **(EG 3)**

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(18); 42 CFR 419.22(64); 42 CFR 422.101(65)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(66); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(67); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(68); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(69)

Medicare Coverage Determinations: Medicare Coverage Database(70)

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Footnotes

[A] Specialty society guidelines state that diabetic ketoacidosis may be diagnosed in patients with a prior history of diabetes, irrespective of their glucose levels at presentation, if ketosis and acidosis criteria are present.(1)(6) [A in Context Link 1]

[B] Although most patients with diabetic ketoacidosis (DKA) will present with hyperglycemia, some patients with risk factors (eg, hypoglycemic agents, impaired gluconeogenesis, starvation) may have what is termed "euglycemic DKA," with normal or only mild elevations of serum glucose.(1)(2)(8)(9)(10) [B in Context Link 1]

[C] Measurement of ketones can be performed via the nitroprusside reaction in urine or serum, but this provides only a semi-quantitative estimation (eg, mild, moderate); does not measure beta-hydroxybutyrate, the principal ketone produced in diabetic ketoacidosis (DKA); and thus can underestimate the ketone burden. A more complete measurement of ketonemia can be obtained via a measurement of serum beta-hydroxybutyrate.(1) Ketones can also be elevated in non-DKA states such as starvation ketosis or alcoholic ketoacidosis.(2) [C in Context Link 1]

[D] Analyses have concluded that venous and arterial pH measurements are highly correlated, with small differences between them that are usually not clinically significant, including in patients with diabetic ketoacidosis.(2)(11)(12) [D in Context Link 1, 2, 3, 4]

[E] A specialty society guideline states that anion gap is not recommended as a first-line diagnostic criterion, but identifies an anion gap of greater than 12 as corroborating evidence for diabetic ketoacidosis, which may be useful when ketone measurements are not available.(1) The upper limit of normal for anion gap of the local laboratory may be a more appropriate indicator when available and may vary between laboratories depending on the analyzers used; the normal range generally runs between 8 and 12.(13) It should be noted that a falsely normal or falsely low anion gap (anion gap acidosis is present but not detected by standard calculation) may occur if serum albumin is low (eg, severe malnutrition, nephrotic syndrome) or if cations are elevated that are not used in the anion gap calculation (eg, lithium, calcium, magnesium, immunoglobulins); these substances can be measured and the anion gap adjusted when there is clinical suspicion for ketoacidosis despite an apparently normal anion gap.(14) There may be concomitant causes of acidosis (eg, lactate, salicylates) and metabolic alkalosis (eg, from severe vomiting or metabolic compensation for chronic hypercapnia) that can complicate interpretation of measured pH.(1)(2)(15) Metabolic acidosis with concomitant metabolic alkalosis may present with a normal (or near-normal) serum bicarbonate and pH; in such cases, the anion gap may be the only indicator that significant metabolic acidosis is present.(15) An anion gap calculator, which can correct the anion gap for low serum albumin and also identify acidosis in the setting of concurrent metabolic alkalosis, is available at www.mdcalc.com/calc/1669/anion-gap. [E in Context Link 1, 2]

[F] 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.(16) [F in Context Link 1]

[G] 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).(16) [G in Context Link 1]

[H] Patients with hyperosmolar state can present with mild elevations in ketonemia (eg, due to lactic acidosis, starvation ketosis) or with a mixed hyperosmolar state with concomitant diabetic ketoacidosis.(2)(7) [H in Context Link 1]

[I] Total serum osmolality can be directly measured in the serum or estimated using the equation (2 x sodium ion (in mEq/L)) + glucose (in mg/dL)/18 + BUN (in mg/dL)/2.8.(1) [I in Context Link 1]

[J] Effective serum osmolality is calculated using the equation (2 x sodium ion (in mEq/L)) + glucose (in mg/dL)/18.(1) [J in Context Link 1]

[K] Some patients with mild to moderate uncomplicated diabetic ketoacidosis may be managed with intermittent subcutaneous insulin instead of a continuous insulin infusion.(1)(6)(20) [K in Context Link 1]

[L] Admission to the ICU may be necessary for a hyperosmolar state and obtundation, osmolality greater than 350 mOsm/kg (mmol/kg), severe hypernatremia (eg, greater than 160 mEq/L (mmol/L)), or for ketoacidosis with pH less than 7.0, bicarbonate less than 10 mEq/L (mmol/L), beta-hydroxybutyrate greater than 6.0 mmol/L, rapidly changing electrolytes, hypotension, high-volume fluid resuscitation, respiratory insufficiency, life-threatening arrhythmias, obtundation, acute kidney injury, or severe precipitating condition (eg, sepsis).(1)(5)(7)(22)(23) See Intensive Care Guidelines ISC for further information. [L in Context Link 1]

[M] Admission to the intermediate care unit is indicated for hyperosmolar state without coma but requiring frequent testing and treatment (eg, glucose and electrolyte testing, insulin adjustments).(1)(6) Intermediate unit admission is also recommended for patients with moderate diabetic ketoacidosis without stupor or coma who have a pH between 7.0 and 7.25, serum bicarbonate between 10 and 14 mEq/L (mmol/L), or beta-hydroxybutyrate between 3.0 and 6.0 mmol/L.(1) See Intermediate Care Guidelines ISC for further information. [M in Context Link 1]

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

[O] Continuous glucose monitoring has been advocated by several specialty society guidelines as a useful modality for detecting severe hypoglycemic and hyperglycemic events.(6)(24)(25) Continuous glucose monitoring is not recommended for use in ICU settings due to concerns about inaccuracies in patients who are hypovolemic, hypoperfused, hypoxic, edematous, or receiving vasopressor agents.(26) Certain drugs, including acetaminophen, may also affect the accuracy of these devices.(26) [O in Context Link 1]

[P] A specialty society guideline states that IV insulin should be administered using validated written or computerized protocols that allow for predefined adjustments in the insulin dosage based on glycemic fluctuations.(6) Some patients with diabetic ketoacidosis can be treated without IV insulin, using subcutaneous insulin protocols.(6)(20)(27) [P in Context Link 1, 2]

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

[R] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(39) [R in Context Link 1]

Definitions

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)

Adult Readmission Risk Assessment

- Risk of readmission is increased by presence (upon admission or during hospital stay) of **1 or more** of the following(1):
  - Clinically significant comorbid illness that necessitates (during current hospital stay) new or intensified treatment, prolongs length of stay, or impacts discharge level of care (eg, heart failure, COPD, active malignancy, cirrhosis, dementia, psychosis)(1)(2)(3)
  - End-stage renal disease or new need for dialysis(1)
  - Malnutrition[A](1)
  - Need for parenteral nutrition or supplemental enteral tube feeding (eg, via gastrostomy tube or jejunostomy tube)(1)
  - Need for transfusion of platelets or red blood cells(1)
  - Need for supplemental oxygen after discharge (new or pre-existing)(1)
  - Potential barriers to postdischarge clinical care (eg, homelessness, lack of transportation, impaired access to care or medication, active substance abuse)(1)
  - Frailty (ie, as indicated by a frailty measurement tool)[B][C](1)(5)(6)(7)
  - Two or more emergency department visits and/or inpatient admissions within previous 6 months(1)(8)

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Footnotes

A. There are many tools used to assess for malnutrition in adults. Near universal elements include recent weight loss and low muscle mass. Most tools include criteria based on BMI. Some include criteria around etiology such as low food intake vs disease burden or inflammation.(4) The Malnutrition Universal Screening Tool (MUST) is available at www.mdcalc.com/calc/10190/malnutrition-universal-screening-tool-must. The Nutrition Risk Screening 2002 (NRS-2002) tool is available at www.mdcalc.com/calc/4012/nutrition-risk-screening-2002-nrs-2002. A document that outlines the elements and scoring of several

tools can be downloaded from https://aspenjournals.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Fjpen.1440&file=jpen1440-sup-0001-Appendix.docx.

B. There are numerous measurement tools used to assess for frailty. Some of the more commonly used scales (with score indicating frailty in parentheses) include the following: Frailty Phenotype (3 or higher), 40-item Frailty Index (0.25 or higher), Study of Osteoporotic Fracture Index (2 or higher), Edmonton Frail Scale (8 or higher), FRAIL Scale (3 or higher), Clinical Frailty Scale (5 or higher), and Tilburg Frailty Indicator (5 or higher).(5)

C. Frailty may be described as a phenotype or as an accumulation of health deficits. The Fried phenotype delineates a clinical syndrome resulting from altered metabolism coupled with abnormal stress responses.(6) This model includes 5 characteristic features: exhaustion (energy level), weakness (hand grip strength), slowness (gait speed), physical inactivity (falls), and weight loss.(6)(7) The presence of 3 or more of these deficits indicates the presence of frailty.(6)(7) Frailty as deficit accumulation considers findings in multiple domains (eg, cognitive, physical, nutritional, laboratory) and high-risk comorbidities.(6)(7) In this model, the degree of frailty is quantified by the number of indicative items present.(6)

Altered mental status

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

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Altered mental status that is severe or persistent

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

References

1. Maher PJ. Confusion. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:126-131.e1.
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Cardiac arrhythmias of immediate concern

- Cardiac arrhythmias or findings of immediate concern, as indicated by **1 or more** of the following(1)(2)(3):
  - Heart rhythms that are inherently dangerous or unstable, as indicated by **1 or more** of the following(4)(5)(6):
    - Resuscitated ventricular fibrillation or cardiac arrest
    - Ventricular escape rhythm
    - Sustained ventricular tachycardia (30 seconds or more of ventricular rhythm at greater than 100 beats per minute)
    - Nonsustained ventricular tachycardia and **1 or more** of the following:

- Suspected cardiac ischemia as cause or consequence of ventricular tachycardia
- Acute myocarditis

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

References

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Dehydration that is severe or persistent

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

References

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2. Al-Awqati Q, Radhakrishnan J. Disorders of sodium and water. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:733-744.e1.

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4. Greenbaum LA. Maintenance and replacement therapy. In: Kliegman RM, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:525-529.

Diabetes: Readmission Risk Assessment

- Risk of readmission is increased by presence of **1 or more** of the following(1):
  - Multiple comorbidities (Charlson Comorbidity Index score of 3 or greater)(1)

References

1. Hurtado CR, et al. Causes and predictors for 30-day re-admission in adult patients with diabetic ketoacidosis in the United States: a nationwide analysis, 2010-2014. Endocrine Practice 2019;25(3):242-253. DOI: 10.4158/EP-2018-0457.

Extended Stay Risk Assessment

- Risk of extended length of stay is increased by presence of **1 or more** of the following(1):
  - Acute renal failure (stage 3 acute kidney injury)
  - Acute heart failure (eg, pulmonary edema)

References

1. Premier PINC AI™ Healthcare Database (PHD), 01/01/2023-12/31/2024. Premier, Inc.

Hemodynamic instability

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

References

1. Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Koch E, Lovett S, Nghiem T, Riggs RA, Rech MA. Shock index in the emergency department: utility and limitations. Open Access Emergency Medicine 2019;11:179-199. DOI: 10.2147/OAEM.S178358.
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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)

References

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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.

Observation care

- When a Clinical Indication says "…despite (or beyond) observation care," the intent is to signify that, despite an attempt to address a sign, symptom, finding, or treatment need in observation care, a continued need for hospital-based care persists beyond the observation care time frame (ie, Observation Care Discharge Criteria are not met). The time frame of observation care is determined by regulation (eg, CMS's Two-Midnight Rule) or payer-provider contractual agreement. MCG's understanding of observation care is that it must be finite and of short duration. The Two-Midnight Rule for Medicare patients (inpatient is defined as medical necessity for hospital-based care across 2 or more midnights) provides a good example of what is meant by a short duration (ie, observation care should not continue beyond the second midnight).

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

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.
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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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1. Scanlon A, Reinisch C. Social determinants of health. In: Harding MM, Kwong J, Hagler D, Reinisch C, editors. Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems. 12th ed. St. Louis, MO: Mosby; 2023:18-20.
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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.

Footnotes

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

definition of tachycardia, but this tachycardia (absent associated findings such as chest pain or hypotension) may not be clinically important. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term tachycardia. Whether a heart rate above or below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.

Tachypnea

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

References

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

Footnotes

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

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

Codes

ICD-10 Diagnosis: E08.00, E08.01, E08.10, E08.11, E08.21, E08.22, E08.29, E08.311, E08.319, E08.3211, E08.3212, E08.3213, E08.3219, E08.3291, E08.3292, E08.3293, E08.3299, E08.3311, E08.3312, E08.3313, E08.3319, E08.3391, E08.3392, E08.3393, E08.3399, E08.3411, E08.3412, E08.3413, E08.3419, E08.3491, E08.3492, E08.3493, E08.3499, E08.3511, E08.3512, E08.3513, E08.3519, E08.3521, E08.3522, E08.3523, E08.3529, E08.3531, E08.3532, E08.3533, E08.3539, E08.3541, E08.3542, E08.3543, E08.3549, E08.3551, E08.3552, E08.3553, E08.3559, E08.3591, E08.3592, E08.3593, E08.3599, E08.36, E08.37X1, E08.37X2, E08.37X3, E08.37X9, E08.39, E08.40, E08.41, E08.42, E08.43, E08.44, E08.49, E08.51, E08.52, E08.59, E08.610, E08.618, E08.620, E08.621, E08.622, E08.628, E08.630, E08.638, E08.65, E08.69, E08.8, E08.9, E09.00, E09.01, E09.10, E09.11, E09.21, E09.22, E09.29, E09.311, E09.319, E09.3211, E09.3212, E09.3213, E09.3219, E09.3291, E09.3292, E09.3293, E09.3299, E09.3311, E09.3312, E09.3313, E09.3319, E09.3391, E09.3392, E09.3393, E09.3399, E09.3411, E09.3412, E09.3413, E09.3419, E09.3491, E09.3492, E09.3493, E09.3499, E09.3511, E09.3512, E09.3513, E09.3519, E09.3521, E09.3522, E09.3523, E09.3529, E09.3531, E09.3532, E09.3533, E09.3539, E09.3541, E09.3542, E09.3543, E09.3549, E09.3551, E09.3552, E09.3553, E09.3559, E09.3591, E09.3592, E09.3593, E09.3599, E09.36, E09.37X1, E09.37X2, E09.37X3, E09.37X9, E09.39, E09.40, E09.41, E09.42, E09.43, E09.44, E09.49, E09.51, E09.52, E09.59, E09.610, E09.618, E09.620, E09.621, E09.622, E09.628, E09.630, E09.638, E09.65, E09.69, E09.8, E09.9, E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.65, E10.69, E10.8, E10.9, E10.A0, E10.A1, E10.A2, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2,

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