

General Recovery Care > Long-Term Acute Care Hospital (LTACH) General Recovery Guidelines > Long-Term Acute Care Hospital (LTACH) Level of Care Guideline (GRG-050)

# Long-Term Acute Care Hospital (LTACH) Level of Care Guideline

GRG: GRG-050 (LTACH GRG)

**MCG Health**  
General Recovery  
Care  
27th Edition

**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 - LTACH Admission and Alternatives
  - Clinical Indications for Admission to LTACH
  - Alternatives to Admission
- Hospitalization
  - General Recovery Course
  - Evaluation and Treatment
  - Discharge Criteria
- Discharge
  - Discharge Planning
  - Discharge Destination
- Evidence Summary
  - Background
- References
- Footnotes
- Definitions

## Care Planning - LTACH Admission and Alternatives

### Clinical Indications for Admission to LTACH

- Admission to LTACH may be indicated by **ALL** of the following(1)(2)(3)(4)(5)(6):
  - Patient is stable for transfer to LTACH, as indicated by **ALL** of the following(9)(10):
    - Hypotension absent
    - Cardiovascular status acceptable
    - Stable chest findings
    - Renal function acceptable
    - Pain adequately managed
    - No acute severe unstable neurologic abnormalities (eg, obtundation, coma, evidence of ongoing CNS embolization or ischemia, worsening hydrocephalus)
    - No acute significant hepatic dysfunction (eg, hepatic encephalopathy that is moderate to severe,<sup>[A]</sup> severe coagulopathy)
    - No active bleeding or unstable disorders of hemostasis (eg, no recent need for transfusion, severe thrombocytopenia with bleeding)
    - Intake acceptable
    - Isolation needs (if present) manageable at next level of care
    - Long-term enteral feeding (eg, PEG) and intravenous access established, not needed, or to be placed at next level of care(13)
  - Multidisciplinary assessment, ideally including palliative care, is documented and supports expectation that patient will benefit from and improve with LTACH care available at chosen facility (eg, hospice care not more appropriate or preferred).(14)(15)(16)(17)(18)(19)(20)(21)
  - Interdisciplinary LTACH care is appropriate for condition, as indicated by medically complex situation, including comorbidities that will require ongoing acute care and complex nursing needs and close (ie, daily) physician supervision, as indicated by **1 or more** of the following(22)(23)(24)(25):
    - Respiratory failure requiring ventilation management and weaning. See Ventilator Management Long-Term Acute Care Hospital (LTACH) Guideline [GRG](#).
    - Infectious disease condition requiring LTACH care (eg, endocarditis requiring long-term IV antibiotics and acute care and monitoring for unstable features such as recurring embolic phenomenon, or heart failure requiring daily adjustment and monitoring of diuretic therapy, fluids, and electrolytes)(26)(27)(28)

- Complex wound care condition requiring LTACH care (eg, large wound with necrosis requiring daily physician supervision, high-output fistula requiring fluid and electrolyte replacement)(29)(30)
- Cardiovascular condition requiring LTACH care (eg, heart failure with pulmonary hypertension requiring long-term IV vasodilator therapy, heart failure with need for intravenous vasoactive drugs (eg, dobutamine), need for continued support with high-concentration oxygen (greater than 40%), and daily adjustment and monitoring of diuretic therapy, fluids, and electrolytes)(31)(32)
- Other complex medical management situation requiring LTACH care (eg, diabetic peripheral vascular disease with surrounding cellulitis unresponsive to standard IV antibiotic course that requires long-term IV antimicrobial therapy with daily monitoring and adjustment of diabetes treatment and skin condition, chest tube management for persistent air leaks, traumatic brain injury with polytrauma)(33)(34)(35)
- Clinical assessment indicates expectation that patient will require long-term acute care and be in population subgroup that averages a length of stay greater than 25 days at an LTACH (eg, more rapid recovery not expected).[B]
- ☐ LTACH more appropriate than other levels of care (eg, skilled nursing facility, home healthcare), as indicated by **1 or more** of the following:
  - Clinical management needed beyond capabilities of alternative levels of care (eg, too frequent)
  - Frequent diagnostic services needed, including clinical assessment, laboratory, and imaging (ie, beyond capabilities of alternative levels of care)
  - More intensive skilled services (eg, specialty nursing care, onsite physician assessments) needed than available at lower level of care
  - Lower level of care has failed (eg, patient readmitted to acute care from lower level of care).

### Alternatives to Admission

- Alternatives include(1)(2)(29):
  - Recovery care (eg, inpatient rehabilitation facility, subacute or skilled care)(22)(23)(24)(36)
  - Home healthcare (eg, home health wound care, medication administration, ambulatory mechanical circulatory support)(31)
  - Palliative care, including formal hospice enrollment (eg, 6 to 12 months' life expectancy)(18)(19)

## Hospitalization

### General Recovery Course

Stage	Level of Care	Clinical Status	Interventions
1	<ul style="list-style-type: none"> <li>• LTACH care</li> <li>• Social Determinants of Health Assessment</li> <li>• Discharge planning. See Discharge Planning section in this guideline.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Clinical Indications met</b></li> </ul>	<ul style="list-style-type: none"> <li>• Inpatient interventions, as needed[C]</li> <li>• Influenza vaccine, if appropriate</li> </ul>
2	<ul style="list-style-type: none"> <li>• LTACH care</li> <li>• Social Determinants of Health Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Clinical status improving</b></li> </ul>	<ul style="list-style-type: none"> <li>• Transition to discharge regimen</li> <li>• Optimize level of function</li> <li>• Psychosocial assessment and management</li> </ul>
3	<ul style="list-style-type: none"> <li>• <b>Activity level acceptable</b></li> <li>• Social Determinants of Health Assessment</li> <li>• Floor to discharge</li> <li>• Complete discharge planning. See Discharge Planning section in this guideline.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hemodynamic stability</b></li> <li>• <b>Cardiovascular status acceptable</b></li> <li>• <b>Respiratory status acceptable</b></li> <li>• <b>Stable chest findings</b></li> <li>• <b>Airway status acceptable</b></li> <li>• <b>No chest tube, or status acceptable</b></li> <li>• <b>Temperature status acceptable</b></li> <li>• <b>No infection, or status acceptable</b></li> <li>• <b>Renal function acceptable</b></li> <li>• <b>Pain and nausea absent or adequately managed</b></li> <li>• <b>Vascular, soft tissue, and wound status acceptable</b></li> <li>• <b>Hepatic and biliary abnormalities absent or acceptable</b></li> <li>• <b>Neurologic status acceptable</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Intake acceptable</b></li> <li>• <b>Inpatient interventions not needed</b></li> </ul>

- **Abdominal status acceptable**
- **Urinary status acceptable**
- **Physiologic disorders absent, or status acceptable**
- **Electrolyte status acceptable**
- **No blood loss, or problem resolved**
- **Behavioral health status acceptable**

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(1)(2)(29)(40)(41)(42)(43)

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Recovery Milestones are indicated in **bold**.

## Evaluation and Treatment

- Common treatments and tests include(29)(44):
  - Bronchodilators, steroids, or chest physiotherapy(45)
  - Noninvasive ventilation(46)
  - Parenteral medication (eg, antibiotics)(45)
  - Enteral (preferred) or parenteral nutrition
  - Evaluation of swallowing function (eg, barium swallow or fiberoptic evaluation)
  - Imaging (as indicated)
  - Laboratory tests (as indicated)(47)
  - Surveillance testing for infection(48)(49)
  - Infection prevention program(38)(39)(48)
  - Delirium prevention and treatment
  - Pressure injury prevention program(50)
- Commonly scheduled interventions include:
  - Pulmonary consultation
  - Infectious disease consultation
  - Nutrition consultation(13)(51)
  - Speech-language pathology consultation (eg, for speech and swallowing evaluation)
  - Palliative care consultation(52)
  - Vision correction(53)
  - Physical therapy(54)
  - Respiratory therapy(55)
  - Protocol-driven weaning from mechanical ventilation(56)
  - Dialysis
  - Electromyogram and nerve conduction studies to evaluate for critical illness neuromyopathy
  - Wound care

## Discharge Criteria

- Continued LTACH stay is indicated until **1 or more** of the following are present(23)(24)(29)(36)(41):
  - 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(9)(42)(43)(57)(58):
        - Tachycardia absent
        - Hypotension absent
        - No evidence of inadequate perfusion (eg, no myocardial ischemia)
        - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)
    - Cardiovascular status acceptable, as indicated by **ALL** of the following:
      - Cardiac rhythm acceptable, as indicated by **1 or more** of the following(59):
        - Normal sinus or paced rhythm
        - Sinus arrhythmia or supraventricular arrhythmia (eg, atrial fibrillation) with ventricular rate controlled, and no need for cardioversion(60)
      - No severe cardiac arrhythmias noted (eg, sustained ventricular tachycardia, ventricular fibrillation)(59)
      - No severe cardiac or peripheral ischemia(61)(62)(63)
      - Heart failure or other cardiovascular disease is **1 or more** of the following(64)(65):
        - Not present

- At baseline
- Manageable at next level of care
- ☐ Respiratory status acceptable, as indicated by **ALL** of the following(66)(67):
  - 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
- ☐ Stable chest findings over past 24 hours, as indicated by **ALL** of the following(68):
  - Pleural effusion absent or stable for treatment at next level of care(69)
  - No stridor or gross hemoptysis
  - Pneumothorax absent or stable for treatment at next level of care(70)(71)
  - Postoperative changes (if present) stable for next level of care
  - No evidence of new infection or other chest complications
- ☐ Airway status acceptable, as indicated by **1 or more** of the following(72)(73)(74)(75):
  - Patient extubated, breathing adequately, and able to protect airway (eg, able to handle secretions)
  - Stable tracheostomy (eg, more than 48 hours old) in place
- ☐ No chest tube, or status acceptable, as indicated by **1 or more** of the following(76)(77):
  - No chest tube
  - Chest catheter management established for next level of care
- ☐ Temperature status acceptable, as indicated by **1 or more** of the following(78)(79)(80):
  - 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(81)(82)(83)(84):
  - No infection present
  - Infection status acceptable for next level of care, as indicated by **ALL** of the following(85):
    - 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
- ☐ Renal function acceptable, as indicated by **1 or more** of the following(86)(87):
  - Renal function normal (GFR of 90 mL/min/1.73m<sup>2</sup> (1.50 mL/sec/1.73m<sup>2</sup>) or more)  eGFR - Adult Calculator  eGFR - Pediatric Calculator
  - Renal function that is **ALL** of the following:
    - Impaired (estimated GFR less than 90 mL/min/1.73m<sup>2</sup> (1.50 mL/sec/1.73m<sup>2</sup>)) but stable or improving  eGFR - Adult Calculator  eGFR - Pediatric Calculator
    - Appropriate for management at next level of care
  - Renal function at baseline and appropriate for management at next level of care
  - Dialysis needed and performable at next level of care
- ☐ Pain and nausea absent or adequately managed, as indicated by **1 or more** of the following(88)(89)(90)(91)(92):
  - No pain or nausea
  - Minimal discomfort on oral medications
  - Pain and nausea managed on regimen performable at next level of care
- ☐ Vascular, soft tissue, and wound status acceptable, as indicated by **1 or more** of the following(93)(94)(95)(96)(97):
  - No vascular, soft tissue, or wound problems
  - Status acceptable, as indicated by **ALL** of the following:
    - No significant ischemia
    - No Bacteremia
    - No evidence of compartment syndrome
    - Neuromotor function at baseline or expected level of recovery and appropriate for management at next level of care
    - No new wound dehiscence or hematoma that cannot be managed at next level of care
    - Tissue necrosis absent, or treatment plan appropriate for next level of care
    - Vascular, soft tissue, and wound management appropriate for next level of care
- ☐ Hepatic and biliary abnormalities absent or acceptable, as indicated by **1 or more** of the following(98)(99)(100):
  - No abnormalities present
  - **ALL** of the following:
    - Liver function tests normal, stable, or improving

- Ascites absent, diminishing, or stable, with adequate respiratory function for next level of care
- Renal function acceptable
- Bilirubin stable or diminishing
- Encephalopathy absent or controlled adequately for next level of care
- No biliary obstruction, or current drainage and treatment plan appropriate for next level of care
- ☐ Neurologic status acceptable, as indicated by neurologic function and mental status being **1 or more** of the following(101)(102):
  - Normal
  - Baseline
  - Appropriate for next level of care
- ☐ Abdominal status acceptable, as indicated by **ALL** of the following(103):
  - Bowel sounds present
  - No ileus, signs of obstruction, or peritonitis
  - Abdominal distention absent or manageable at next level of care
- ☐ Urinary status acceptable, as indicated by **1 or more** of the following(104):
  - Adequate spontaneous voiding (eg, no severe urinary retention)
  - Urinary catheter and management regimen in place that is performable at next level of care
- ☐ Physiologic disorders absent, or status acceptable, as indicated by **1 or more** of the following(105)(106):
  - Physiologic disorders absent
  - Physiologic disorders controlled, as indicated by **ALL** of the following(107):
    - Glucose less than 250 mg/dL (13.88 mmol/L) or near baseline
    - No hypoglycemia(108)(109)
    - pH normal or at stable baseline(110)(111)
    - Dehydration, volume depletion, vomiting, or anasarca absent or adequately controlled for next level of care(112)
- ☐ Electrolyte status acceptable, as indicated by **1 or more** of the following(113):
  - Electrolyte abnormality manageable at next level of care<sup>[D]</sup>
  - 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)
    - Sodium greater than 135 mEq/L (mmol/L) and less than 145 mEq/L (mmol/L)
    - Calcium<sup>[E]</sup> 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)
    - Magnesium greater than 1.5 mEq/L (0.75 mmol/L) and less than 3.0 mEq/L (1.5 mmol/L)
- ☐ No blood loss, or problem resolved, as indicated by **1 or more** of the following(116)(117)(118):
  - No blood loss problem
  - Repeat evaluation shows blood loss resolved sufficiently (eg, hemoglobin at acceptable level and stable)
- ☐ Behavioral health status acceptable, as indicated by **1 or more** of the following:
  - No behavioral health issues
  - Behavioral health issues manageable at next level of care as indicated by **ALL** of the following:
    - Current functional status manageable at next level of care
    - Current behaviors manageable at next level of care
    - Risk of danger to self or others absent or manageable at next level of care(119)(120)
    - Substance misuse, withdrawal problems, or withdrawal management program needs absent or manageable at next level of care(121)
- ☐ 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(122):
  - Oral hydration, medications, and diet
  - Enteral hydration, medications, and diet
  - Administration routes performable at next level of care
- ☐ Inpatient interventions not needed; examples include:
  - Stat testing
  - Frequent vital signs, neurologic signs, or vascular checks not performable at next level of care
  - Cardiac monitoring
  - IV vasoactive agent or inotropic agent
  - Frequent respiratory therapy suctioning, pulmonary toilet, or other therapy that is not performable at next level of care
  - Procedure that is not available at next level of care (eg, biopsy, radiologically guided drainage, placement of central port)

# Discharge

## Discharge Planning

- Initiate discharge planning at admission(23)(24)(29)(36)(41)(123)(124):
  - Elements determined by multidisciplinary team
  - Discharge plan written and accessible to all team members, including patient and family
  - Expected outcomes identified
  - Timeline included
  - Anticipate decisions regarding:
    - Optimal site for discharge
      - If discharged to home, how to ensure patient's safety and stability
    - Financial and insurance coverage for alternative sites
    - Appropriate members of discharge team, including patient and family
- Evaluate clinical status:
  - Medical conditions
  - Cardiac
  - Hemodynamic
  - Respiratory, including respiratory rate, coughing, wheezing, sputum production, severity of dyspnea, evidence of retraction, hypoxemia, hypercapnia, or respiratory acidosis
  - Neuropsychiatric, including confusion, lethargy, anxiety, restlessness, insomnia, or coma
  - Fluid balance
  - Nutritional status
  - Signs of infection
- Identify respiratory and ventilatory support required(45):
  - Establish discontinuation plan and timeline.
  - Requirements include:
    - Type, method of application, and duration of mechanical ventilation
    - Oxygen therapy
    - Aerosol therapy
    - Airway clearance therapy
    - Monitoring and diagnostic procedures
- Identify continuing requirements for care:
  - Pain management plan. See Pain Management [SR](#).
  - IV fluids, antibiotics, and medication.
  - Deep venous thrombosis prophylaxis
  - Management of complications and comorbidities (eg, diabetes, hypertension)
  - Nutrition and fluid management
  - Wound management. See Wounds Due to Surgery, Injury, or Pressure [SR](#).
  - Rehabilitation(125)
    - Ability to perform ADL and IADL. See Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Assessment [SR](#).
    - Gait training, occupational therapy, and physical therapy
    - Cognitive therapy
    - Speech therapy
    - Need for and availability of assistive devices
    - Ability to continue rehabilitation on outpatient basis
- Identify and evaluate site for continuing care[F]:
  - Establish patient's long-term goals and needs.
  - Evaluate ability of facility to:
    - Meet ventilatory and respiratory needs
    - Provide care for medical conditions
    - Provide 24-hour coverage
    - Provide therapies and rehabilitation
  - Evaluate safety of facility for patient's care.
  - If on home ventilation(126):
    - Establish nutritional route.
    - Stabilize ventilator settings.
    - Arrange home and environment to minimize exertion.
    - Assess home safety (see Home Safety Assessment [SR](#)):
      - Home ventilator equipment is safe for home use:
        - Adequate electrical wiring

- Ventilator alarm system
  - Smoking prohibited or permitted only in appropriate locations
  - Contingency plans for power failure
  - Durable medical equipment company ensures rapid response to equipment failure and routine maintenance.
  - Safe storage and regular inventory of oxygen supply
  - Fire detector
- Family and caregiver demonstrate ability to manage equipment.
- Family and caregiver demonstrate ability to manage care, including:
  - Suctioning secretions
  - Tracheostomy
  - Oxygen
  - Assistance with ADL and IADL, transfers, and ambulation
- Use of air filter
- Assess psychosocial factors and schedule referrals (see Psychosocial Assessment [SR](#)):
  - Financial resources
  - Preferences of patient and family for treatment and advance directives
  - Anxiety, irritability, or restlessness
  - Depression, helplessness, or hopelessness
  - Negative self-image
  - Need for change in lifestyle and social and family roles
  - Need for coping skills training
  - Need for relaxation techniques
  - Adequacy of social support for patient, family, and caregiver, including:
    - Characteristics of caregiver and ability to tolerate prolonged stress
  - Need for support or referrals to community agencies
  - Language or communication problems
  - Transportation to facility or for follow-up care
  - Behavioral problems or impaired cognition, including:
    - Difficulty communicating and memory problems
    - Abusive, inappropriate, delusional, hallucinating, resistant, or wandering behaviors
- Ensure that follow-up care and referrals to specialists are scheduled:
  - Refer to disease management program, as appropriate and available.
- Ensure durable medical equipment is available:
  - Ramps and handrails
  - Bathroom equipment, including grab bars and shower seat
  - Specialty bed
  - Wheelchair, walker, or other ambulatory device
  - Wound care supplies and equipment
  - Suction
  - Communication system or devices
  - Nebulizer
  - Oxygen and catheters
  - Weight scale
  - Blood pressure equipment
  - Alternative source of power
- If patient requires high-technology equipment(31):
  - Assess capability of facility to provide equipment and safe appropriate care.
  - Assess home safety (see Home Safety Assessment [SR](#)):
    - Adequate electrical wiring
    - Contingency plans for power failure
    - Durable medical equipment company ensures rapid response to equipment failure and routine maintenance.
    - Safe storage and regular inventory of oxygen supply
    - Fire detector
  - Ensure that family and caregiver are able to manage equipment.
- Ensure that family and caregiver are able to manage care, including assistance with ADL and IADL, transfers, and ambulation.
- Assess knowledge and understanding of patient, family, and caregiver about condition and treatment.
- Complete patient, family, and caregiver education (see Education: Patient, Family, and Caregiver [SR](#)):
  - Requirements of facility and continued involvement in patient care, if not discharged to home
  - How to manage complications and comorbidities
  - How to perform ADL and IADL, with assistance and limitations
  - How to manage pain



- o Safety factors
- o Medication administration, side effects, drug and food interactions, and allergic reactions
- o Nutrition and fluid requirements
- o Measures to promote adequate sleep
- o How to use oxygen and other equipment safely
- o How to manage wounds, if present
- o How to seek relief from demands of caregiving
- o Plan for emergency measures
- o Follow-up care and referrals
- o How to recognize signs and symptoms of complications and when to seek medical intervention

## Discharge Destination

- Post long-term acute care hospital (LTACH) levels of admission may include:
  - o Home.
  - o Home healthcare. See indications for admission to home healthcare in Alternatives to Admission section in this guideline.
  - o Recovery facility care. See indications for admission to recovery facility care in Alternatives to Admission section of this guideline.

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## Evidence Summary

### Background

LTACHs are designed for care of patients who, while clinically stable enough to not require ongoing critical care at a short-stay acute care hospital (eg, ICU care), do require a level of care (wound care, nursing care, daily physician oversight) that is beyond the capability of other levels of post-acute care such as a skilled nursing facility.(1)(2)(3) **(EG 2)** LTACH care is designed to apply to patients with this level of care need who are not expected to improve quickly; specifically, LTACHs are expected to have an average length of stay of greater than 25 days for Medicare patients (Medicare patients account for approximately 2/3 of LTACH patients).(1)(2) **(EG 2)** The target population is chronically severely ill patients who have the potential for improvement, but this improvement is expected to take several weeks to occur, and the intensity and specialization of care required is beyond that provided in a post-acute care setting (eg, skilled nursing facility, home healthcare, inpatient rehabilitation facility).(1)(2)(3)(7) **(EG 2)** Analysis of national hospital discharge data shows that less than 2% of adult patients hospitalized for one of the following primary diagnoses are discharged to an LTACH: cellulitis, COPD, heart failure, myocardial infarction, pneumonia, and UTI.(8) **(EG 3)**

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121. Addressing withdrawal management and intoxication management. In: Mee-Lee D, Shulman GD, Fishman MJ, Gastfriend DR, Miller MM, Provence SM, editors. *ASAM Criteria Treatment Criteria for Addictive, Substance-Related, and Co-Occurring Conditions*. 3rd ed. Carson City, NV: The Change Companies; 2013:127-173. [ Context Link 1 ]
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124. Mizuma K, et al. Clarifying differences in viewpoints between multiple healthcare professionals during discharge planning assessments when discharging patients from a long-term care hospital to home. *Evaluation and Program Planning* 2020;82:101848. DOI: 10.1016/j.evalprogplan.2020.101848. [ Context Link 1 ] View abstract...
125. Thrush A, Rozek M, Dekerlegand JL. The clinical utility of the functional status score for the intensive care unit (FSS-ICU) at a long-term acute care hospital: a prospective cohort study. *Physical Therapy* 2012;92(12):1536-1545. DOI: 10.2522/ptj.20110412. [ Context Link 1 ] View abstract...
126. Sterni LM, et al. An official American Thoracic Society clinical practice guideline: pediatric chronic home invasive ventilation. *American Journal of Respiratory and Critical Care Medicine* 2016;193(8):e16-e35. DOI: 10.1164/rccm.201602-0276ST. (Reaffirmed 2022 Jul) [ Context Link 1 ] View abstract...

## Footnotes

[A] Mild or low-grade hepatic encephalopathy (also known as minimal or covert hepatic encephalopathy) presents as unawareness (mild), euphoria or anxiety, shortened attention span, impairment of calculation ability, or lethargy. Moderate to severe or high-grade hepatic encephalopathy (also known as overt encephalopathy) includes disorientation (eg, to time, place, or person), inappropriate behavior, impaired responsiveness to stimuli, confusion, stupor, or coma.(11)(12) [ A in Context Link 1 ]

[B] Some payers (eg, CMS) have instituted criteria (eg, 3-day minimum ICU or CCU stay at transferring acute care hospital or at least 96 hours of mechanical ventilation during stay in LTACH) that a patient must meet if the receiving LTACH facility is to be reimbursed at the usual LTACH rate. Under this paradigm, LTACH facility care for a patient not meeting these criteria would be reimbursed at a lower site-neutral rate. These promulgated minimum criteria should not be interpreted as criteria to identify patients appropriate for an LTACH. For example, very few patients with a 3-day stay in an ICU require LTACH care. Likewise, the vast majority of patients on a mechanical ventilator for 96 hours or more will not require a very long, slow weaning process appropriate for an LTACH.(1)(2) [ B in Context Link 1 ]

[C] In addition to condition-specific care, particular attention may be warranted to prevent complications and acquired infections (eg, pressure injuries, ventilator-associated pneumonia, catheter-associated infection).(37)(38)(39) [ C in Context Link 1 ]

[D] 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.(113) [ D in Context Link 1 ]

[E] 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.(114)(115) [ E in Context Link 1 ]

[F] Possible sites include subacute care, acute rehabilitation, skilled nursing facility, home, and home with home healthcare support. The patient may transition among the sites according to their changing medical condition. [ F in Context Link 1 ]

## Definitions

### Abdominal status acceptable

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

### References

1. Martinez JP. Abdominal pain. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:211-220.e1.

### Activity level acceptable

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

- Activity at baseline
- Activity level acceptable for next level of care

## Airway status acceptable

- Airway status acceptable, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Patient extubated, breathing adequately, and able to protect airway (eg, able to handle secretions)
  - Stable tracheostomy (eg, more than 48 hours old) in place

## References

1. Cavallone LF, Vannucci A. Review article: Extubation of the difficult airway and extubation failure. *Anesthesia and Analgesia* 2013;116(2):368-83. DOI: 10.1213/ANE.0b013e31827ab572.
2. Ortega R, Connor C, Rodriguez G, Spencer C. Videos in clinical medicine. Endotracheal extubation. *New England Journal of Medicine* 2014;370(3):e4. DOI: 10.1056/NEJMvcm1300964.
3. Difficult Airway Society Extubation Guidelines Group, et al. Difficult Airway Society Guidelines for the management of tracheal extubation. *Anaesthesia* 2012;67(3):318-40. DOI: 10.1111/j.1365-2044.2012.07075.x.
4. Ouellette DR, et al. Liberation from mechanical ventilation in critically ill adults: an official American College of Chest Physicians/American Thoracic Society clinical practice guideline: inspiratory pressure augmentation during spontaneous breathing trials, protocols minimizing sedation, and noninvasive ventilation immediately after extubation. *Chest* 2017;151(1):166-80. DOI: 10.1016/j.chest.2016.10.036.

## Bacteremia

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

## References

1. Owens TA, Fowler VG Jr, Pilkington EF III. Infective endocarditis. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1528-1536.
2. Lowy FD. Staphylococcal 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; 2022:1178-1188.

## Behavioral health status acceptable

- Behavioral health status acceptable, as indicated by **1 or more** of the following:
  - No behavioral health issues
  - Behavioral health issues manageable at next level of care as indicated by **ALL** of the following:
    - Current functional status manageable at next level of care
    - Current behaviors manageable at next level of care
    - Risk of danger to self or others absent or manageable at next level of care(1)(2)
    - Substance misuse, withdrawal problems, or withdrawal management program needs absent or manageable at next level of care(3)

## References

1. Young HW, Shapiro MA. Suicidal Behavior. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:1358-1365.e4.
2. Wasserman D, et al. The European Psychiatric Association (EPA) guidance on suicide treatment and prevention. *European Psychiatry* 2012;27(2):129-41. DOI: 10.1016/j.eurpsy.2011.06.003. (Reaffirmed 2022 Jun)
3. Addressing withdrawal management and intoxication management. In: Mee-Lee D, Shulman GD, Fishman MJ, Gastfriend DR, Miller MM, Provence SM, editors. *ASAM Criteria Treatment Criteria for Addictive, Substance-Related, and Co-Occurring Conditions*. 3rd ed. Carson City, NV: The Change Companies; 2013:127-173.

## Cardiovascular status acceptable

- Cardiovascular status acceptable, as indicated by **ALL** of the following:
  - Cardiac rhythm acceptable, as indicated by **1 or more** of the following(1):
    - Normal sinus or paced rhythm
    - Sinus arrhythmia or supraventricular arrhythmia (eg, atrial fibrillation) with ventricular rate controlled, and no need for cardioversion(2)
  - No severe cardiac arrhythmias noted (eg, sustained ventricular tachycardia, ventricular fibrillation)(1)
  - No severe cardiac or peripheral ischemia(3)(4)(5)
  - Heart failure or other cardiovascular disease is **1 or more** of the following(6)(7):
    - Not present
    - At baseline

- Manageable at next level of care

## References

1. Yealy DM, Kosowsky JM. Dysrhythmias. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:890-920.e2.
2. January CT, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association task force on practice guidelines and the Heart Rhythm Society. *Circulation* 2014;130(23):e199-e267. DOI: 10.1161/CIR.0000000000000041. (Reaffirmed 2022 Jun)
3. O'Gara PT, et al. 2013 ACCF/AHA Guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013;127(4):e362-e425. DOI: 10.1161/CIR.0b013e3182742cf6. (Reaffirmed 2022 Jun)
4. Amsterdam EA, et al. AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014;130(25):e344-e426. DOI: 10.1161/CIR.0000000000000134. (Reaffirmed 2022 Jul)
5. Aufderheide TP. Peripheral arteriovascular disease. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:1008-1021.e3.
6. Heidenreich PA, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation* 2022;145(18):e895-e1032. DOI: 10.1161/CIR.0000000000001063. (Reaffirmed 2022 Jun)
7. Harrison N, Levy PD. Heart failure. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:934-954.e6.

## Electrolyte status acceptable

- Electrolyte status acceptable, as indicated by **1 or more** of the following(1):
  - Electrolyte abnormality manageable at next level of care<sup>[A]</sup>
  - 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)
    - Sodium greater than 135 mEq/L (mmol/L) and less than 145 mEq/L (mmol/L)
    - Calcium<sup>[B]</sup> 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)
    - Magnesium greater than 1.5 mEq/L (0.75 mmol/L) and less than 3.0 mEq/L (1.5 mmol/L)

## References

1. Pfenning CL, Slovis CM. Electrolyte disorders. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:1525-1542.e2.
2. Bishop KD, Rizack T. Oncologic emergencies. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1436-1442.
3. Chonchol M, Smogorzewski MJ, Stubbs JR, Yu AS. Disorders of calcium, magnesium, and phosphate balance. In: Yu AS, Chertow GM, Luyckx VA, Marsden PA, Skorecki K, Taal MW, editors. Brenner and Rector's The Kidney. 11th ed. Philadelphia, PA: Elsevier; 2020:580-613 e10.

## 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.(2)(3)

## 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)(3)(4)(5):
    - Tachycardia absent
    - Hypotension absent
    - No evidence of inadequate perfusion (eg, no myocardial ischemia)
    - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)

## References

1. Puskarich MA, Jones AE. Shock. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:34-41.e1.



2. Lewis J, Patel B. Shock. In: Gershel JC, Rauch DA, editors. *Caring for the Hospitalized Child: A Handbook of Inpatient Pediatrics*. 2nd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2018:69-78.
3. Ingbar DH, Thiele H. Cardiogenic shock and pulmonary edema. 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; 2022:2250-2257.
4. Brant EB, Seymour CW, Angus DC. Sepsis and septic shock. 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; 2022:2241-2249.
5. Singer M, et al. The Third International Consensus definitions for sepsis and septic shock (Sepsis-3). *Journal of the American Medical Association* 2016;315(8):801-810. DOI: 10.1001/jama.2016.0287.

## Hepatic and biliary abnormalities absent or acceptable

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

### References

1. Ghany MG, Hoofnagle JH. Approach to the patient with liver disease. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL, editors. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill Education; 2022:2546-2553.
2. Befeler AS, Bacon BR. Cirrhosis and its complications. 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; 2022:2624-2633.
3. Greenberger NJ, Paumgartner G, Pratt DS. Diseases of the gallbladder and bile ducts. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL, editors. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill Education; 2022:2641-2652.

## Hypotension absent

- Hypotension absent, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - SBP greater than or equal to 90 mm Hg in adult or child 10 years or older
  - Mean arterial pressure[A] greater than or equal to 70 mm Hg in adult or child 10 years or older
  - Mean arterial pressure[A] at patient's baseline (eg, healthy adult with low SBP), 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)
  - SBP greater than or equal to sum of 70 mm Hg plus twice patient's age in years in child 1 to 9 years of age
  - SBP greater than or equal to 70 mm Hg in infant 1 to 11 months of age

### References

1. Jones D, Di Francesco L. Hypotension. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:657-64.
2. Massaro AF. Approach to the patient with shock. 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; 2022:2235-2241.
3. Horeczko T. Pediatric cardiac disorders. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:2109-2131.e1.
4. Singh S, Holmes JF. Pediatric trauma. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:2052-2066.e3.

### Footnotes

- A. The mean arterial pressure takes into account both systolic and diastolic blood pressure readings and is calculated as Mean Arterial Pressure (MAP) = 1/3 SBP + 2/3 DBP.

## Inpatient interventions not needed

- Inpatient interventions not needed; examples include:
  - Stat testing
  - Frequent vital signs, neurologic signs, or vascular checks not performable at next level of care
  - Cardiac monitoring

- IV vasoactive agent or inotropic agent
- Frequent respiratory therapy suctioning, pulmonary toilet, or other therapy that is not performable at next level of care
- Procedure that is not available at next level of care (eg, biopsy, radiologically guided drainage, placement of central port)

## 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, Bistran 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.

## 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, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. *Nelson Textbook of Pediatrics*. 21st ed. Philadelphia, PA: Elsevier; 2020:557-563.e1.

## No blood loss, or problem resolved

- No blood loss, or problem resolved, as indicated by **1 or more** of the following(1)(2)(3):
  - No blood loss problem
  - Repeat evaluation shows blood loss resolved sufficiently (eg, hemoglobin at acceptable level and stable)

## References

1. Gaddy JD, Dupre AA. Disorders of hemostasis. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:1486-1499.e2.
2. Dyke C, et al. Universal definition of perioperative bleeding in adult cardiac surgery. *Journal of Thoracic and Cardiovascular Surgery* 2014;147(5):1458-1463.e1. DOI: 10.1016/j.jtcvs.2013.10.070.
3. Bartoszko J, et al. Comparison of two major perioperative bleeding scores for cardiac surgery trials: universal definition of perioperative bleeding in cardiac surgery and European coronary artery bypass grafting bleeding severity grade. *Anesthesiology* 2018;129(6):1092-1100. DOI: 10.1097/ALN.0000000000002179.

## No chest tube, or status acceptable

- No chest tube, or status acceptable, as indicated by **1 or more** of the following(1)(2):
  - No chest tube
  - Chest catheter management established for next level of care

## References

1. Zardo P, Busk H, Kutschka I. Chest tube management: state of the art. *Current Opinion in Anaesthesiology* 2015;28(1):45-9. DOI: 10.1097/ACO.0000000000000150.
2. Toth JW, Reed MF, Ventola LK. Chest tube drainage devices. *Seminars in Respiratory and Critical Care Medicine* 2019;40(3):386-393. DOI: 10.1055/s-0039-1694769.

## No infection, or status acceptable

- No infection, or status acceptable, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - No infection present
  - Infection status acceptable for next level of care, as indicated by **ALL** of the following(5):
    - 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*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:90-95.e1.
3. Oxman DA. Undiagnosed fever in hospitalized patients. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1659-1664.
4. Mick NW. Pediatric fever. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:2067-2077.e2.
5. Singh M, Fernandez-Frackelton M. Bacteria. In: Walls RM, editor. *Rosen's Emergency Medicine*. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:1586-1609.e3.

## Orthostatic hypotension

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

## References

1. Shibao C, Lipsitz LA, Biaggioni I, American Society of Hypertension Writing Group. Evaluation and treatment of orthostatic hypotension. *Journal of the American Society of Hypertension* 2013 Jul-Aug;7(4):317-324. DOI: 10.1016/j.jash.2013.04.006.
2. Dalal AS, Van Hare GF. Syncope. In: Kliegman RM, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. *Nelson Textbook of Pediatrics*. 21st ed. Philadelphia, PA: Elsevier; 2020:566-571.e1.
3. Fang JC, O'Gara PT. History and physical examination: an evidence-based approach. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. 12th ed. Elsevier; 2022:123-140.

## Footnotes

- A. Concomitant measurements of the heart rate are important to measure to help diagnose subtypes of orthostatic hypotension (eg, the lack of a compensatory increase in heart rate is typical of autonomic failure and an exaggerated tachycardia may be reflective of volume depletion). However, the heart rate is not a component of the definition of orthostatic hypotension which relies upon blood pressure alone.(1)(2)(3)
- B. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

## Pain adequately managed

- Pain adequately managed, as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Patient tolerating oral, sublingual, or transdermal pain regimen, with adequate breakthrough pain management
  - Parenteral pain management regimen appropriate for next level of care

## References

1. Swarm RA, et al. Adult Cancer Pain. NCCN Clinical Practice Guidelines in Oncology [Internet] National Comprehensive Cancer Network (NCCN). v. 2.2022; 2022 Jun Accessed at: <https://www.nccn.org/>. [accessed 2022 Aug 11]
2. Zeltzer LK, Krane EJ, Levy RL. Pediatric pain management. In: Kliegman RM, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. *Nelson Textbook of Pediatrics*. 21st ed. Philadelphia, PA: Elsevier; 2020:469-490.e2.
3. Abdel-Aziz S, Adams MC. Pain. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:701-708.
4. Correll DJ. Perioperative pain management. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. *Principles and Practice of Hospital Medicine*. 2nd ed. New York, NY: McGraw-Hill Education; 2017:313-322.

## Pain and nausea absent or adequately managed

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

## References

1. Swarm RA, et al. Adult Cancer Pain. NCCN Clinical Practice Guidelines in Oncology [Internet] National Comprehensive Cancer Network (NCCN). v. 2.2022; 2022 Jun Accessed at: <https://www.nccn.org/>. [accessed 2022 Aug 11]
2. Zeltzer LK, Krane EJ, Levy RL. Pediatric pain management. In: Kliegman RM, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. Nelson Textbook of Pediatrics. 21st ed. Philadelphia, PA: Elsevier; 2020:469-490.e2.
3. Abdel-Aziz S, Adams MC. Pain. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:701-708.
4. Correll DJ. Perioperative pain management. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:313-322.
5. Gan TJ, et al. Consensus guidelines for the management of postoperative nausea and vomiting. Anesthesia and Analgesia 2014;118(1):85-113. DOI: 10.1213/ANE.0000000000000002.





## Physiologic disorders absent, or status acceptable

- Physiologic disorders absent, or status acceptable, as indicated by **1 or more** of the following(1)(2):
  - Physiologic disorders absent
  - Physiologic disorders controlled, as indicated by **ALL** of the following(3):
    - Glucose less than 250 mg/dL (13.88 mmol/L) or near baseline
    - No hypoglycemia(4)(5)
    - pH normal or at stable baseline(6)(7)
    - Dehydration, volume depletion, vomiting, or anasarca absent or adequately controlled for next level of care(8)

## References

1. Greenbaum LA. Electrolyte and acid-base disorders. In: Kliegman RM, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. Nelson Textbook of Pediatrics. 21st ed. Philadelphia, PA: Elsevier; 2020:389-425.e1.
2. Lapsia VH, Wiener ID. Acid-base disorders. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1943-1951.
3. Hudson MS, McMahan GT. Glycemic emergencies. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1171-1177.
4. Davis SN, Cryer PE. Hypoglycemia. 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; 2022:3129-3135.
5. American Diabetes Association. Standards of medical care in diabetes - 2022. Diabetes Care 2022;45(Supplement 1):S1-S254. (Reaffirmed 2022 Jan)
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## Renal function acceptable

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

## References

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2. Singh AK, Singh AT, Kari J. Acute kidney injury. In: McKean SC, Ross JJ, Dressler DD, Scheurer DB, editors. Principles and Practice of Hospital Medicine. 2nd ed. New York, NY: McGraw-Hill Education; 2017:1952-1960.

## Respiratory status acceptable

- Respiratory status acceptable, as indicated by **ALL** of the following(1)(2):
  - 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

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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.

## 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)(4):
  - 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(5):
      - 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(6):
    - 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(7):
    - 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(8):
    - 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(6):
    - 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:
    - 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.

## References

1. Social Determinants of Health. [Internet] World Health Organization. Accessed at: [https://www.who.int/social\\_determinants/sdh\\_definition/en/](https://www.who.int/social_determinants/sdh_definition/en/). Updated 2022 [accessed 2022 Apr 20]
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## Stable chest findings

- Stable chest findings over past 24 hours, as indicated by **ALL** of the following(1):
  - Pleural effusion absent or stable for treatment at next level of care(2)
  - No stridor or gross hemoptysis
  - Pneumothorax absent or stable for treatment at next level of care(3)(4)
  - Postoperative changes (if present) stable for next level of care
  - No evidence of new infection or other chest complications

## References

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## Tachycardia absent

- Tachycardia absent, as indicated by **1 or more** of the following(1)(2):
  - Heart rate less than or equal to 100 beats per minute in adult or child 6 years or older
  - Heart rate less than or equal to 115 beats per minute in child 3 to 5 years of age
  - Heart rate less than or equal to 125 beats per minute in child 1 or 2 years of age
  - Heart rate less than or equal to 130 beats per minute in infant 6 to 11 months of age
  - Heart rate less than or equal to 150 beats per minute in infant 3 to 5 months of age
  - Heart rate less than or equal to 160 beats per minute in infant 1 or 2 months of age

## References

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2. Pediatric parameters and equipment. In: Kleinman K, McDaniel L, Molloy M, editors. *The Harriet Lane Handbook: A Manual for Pediatric House Officers*. 22nd ed. 202: Elsevier; 2021:frontpiece tables.

## Tachypnea absent

- Tachypnea absent, as indicated by respiratory rate of **1 or more** of the following(1)(2):
  - Less than or equal to 18 breaths per minute in adult or child 13 years of age or older
  - Less than or equal to 22 breaths per minute in child 6 to 12 years of age
  - Less than or equal to 25 breaths per minute in child 3 to 5 years of age
  - Less than or equal to 30 breaths per minute in child 1 or 2 years of age

- Less than or equal to 40 breaths per minute in infant 6 to 11 months of age
- Less than or equal to 45 breaths per minute in infant 3 to 5 months of age
- Less than or equal to 60 breaths per minute in infant 1 or 2 months of age

## References

1. Braithwaite SA, Wessel AL. Dyspnea. In: Walls RM, editor. Rosen's Emergency Medicine. 10th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:194-201.e2.
2. Pediatric parameters and equipment. In: Kleinman K, McDaniel L, Molloy M, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 22nd ed. 202: Elsevier; 2021:frontpiece tables.

## 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

## References

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## Urinary status acceptable

- Urinary status acceptable, as indicated by **1 or more** of the following(1):
  - Adequate spontaneous voiding (eg, no severe urinary retention)
  - Urinary catheter and management regimen in place that is performable at next level of care

## References

1. Seifter JL. Urinary tract obstruction. 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; 2022:2373-2376.

## Vascular, soft tissue, and wound status acceptable

- Vascular, soft tissue, and wound status acceptable, as indicated by **1 or more** of the following(1)(2)(3)(4)(5):
  - No vascular, soft tissue, or wound problems
  - Status acceptable, as indicated by **ALL** of the following:
    - No significant ischemia
    - No Bacteremia
    - No evidence of compartment syndrome
    - Neuromotor function at baseline or expected level of recovery and appropriate for management at next level of care
    - No new wound dehiscence or hematoma that cannot be managed at next level of care
    - Tissue necrosis absent, or treatment plan appropriate for next level of care
    - Vascular, soft tissue, and wound management appropriate for next level of care

## References

1. Creager MA, Loscalzo J. Arterial diseases of the extremities. 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; 2022:2107-2115.
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