

Femur Fracture, Shaft, Open Reduction

ORG: S-470 (ISC)
[Link to Codes](#)

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Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Procedure

- Procedure is indicated for **1 or more** of the following:[NN](#)
 - Femoral shaft fracture(1)(5)(6)
 - Periprosthetic femur fracture(1)(7)(8)
 - Nonunion or malunion of femoral shaft fracture(1)(5)(9)
 - Incomplete fracture with high-risk features (eg, visible fracture line on antiresorptive therapy, malignancy)(10)

Alternatives to Procedure

- Alternatives include(1)(2)(5)(11):[N](#)
 - For infants younger than 6 months: Pavlik harness(5)(6)(13)
 - For young children: spica casting with closed reduction or hip abduction brace(5)(6)(14)(15)
 - Casting(1)
 - For periprosthetic fracture: prosthesis revision arthroplasty or distal femoral replacement(1)(7)(8)(16)
 - For multiple trauma: temporary external fixation (damage control orthopedics)(17)
 - For pathologic fracture: en bloc resection and endoprosthetic reconstruction(1)(3)

Operative Status Criteria

Goal Length of Stay: 2 days postoperative

- Inpatient

Hospitalization

Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
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1	• OR to floor • Social Determinants of Health Assessment • Pediatric Readmission Risk Assessment • Adult Readmission Risk Assessment • Discharge planning	• Clinical Indications met[A]	• Bed rest • Possibly up to chair postoperatively	• IV fluids • IV medications • Diet as tolerated postoperatively	• Possible DVT prophylaxis • Evaluation for non-accidental trauma if indicated[B]	• Perioperative antibiotics • Multimodal analgesia, possible PCA • DVT prophylaxis
2	• Floor • Social Determinants of Health Assessment • Pediatric Readmission Risk Assessment • Adult Readmission Risk Assessment	• Hypotension absent • Tolerates early weight-bearing	• Partial-weight-bearing or full-weight-bearing	• Oral hydration • Oral medications • Advance diet	• Gait training • Possible DVT prophylaxis • Physical therapy	• PCA absent[C] • Antibiotics absent
3	• Social Determinants of Health Assessment • Pediatric Readmission Risk Assessment • Adult Readmission Risk Assessment • Floor to discharge • Complete discharge planning	• Hemodynamic stability • No evidence of postoperative or surgical site infection • Pain absent or managed • Discharge plans and education understood	• Ambulatory or acceptable for next level of care[D]	• Oral hydration[E] • Oral medications or regimen acceptable for next level of care • Oral diet or acceptable for next level of care	• Gait training if needed • Possible DVT prophylaxis • Physical therapy	

(1)(2)(5)(19)(20)(21)**N**

Recovery Milestones are indicated in **bold**.

Goal Length of Stay: 2 days postoperative

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(1)(21):
 - Failure to meet discharge criteria (recovery milestones within final day in Optimal Recovery Course)
 - Expect brief stay extension.
 - Multiple injuries(17)(22)(23)(24)(25)
 - Multiple injuries that often accompany femoral shaft fractures may require complex wound care, monitoring, and care of unstable conditions such as hemorrhage, and may delay intervention for femur fracture.
 - Expect brief to moderate stay extension.
 - Fat embolization(25)(26)
 - Fat embolization can accompany femur fracture and repair.
 - Anticipate evaluation (CT scan chest, brain imaging, possible lung ventilation perfusion scan) for other etiologies of symptoms.
 - Anticipate possible pulmonary edema, need for mechanical ventilation, and ICU transfer.
 - Expect brief to moderate stay extension.
 - Fracture of femur with prior hip or knee replacement(8)
 - Expect brief stay extension.
 - Pathologic fracture(3)
 - Pathologic fractures may require more complex internal fixation operations or wound care.
 - Expect brief stay extension.
 - Open fracture
 - Open fractures may require repeat debridement, delayed closure, skin grafting, and other surgical procedures.
 - Expect brief to moderate stay extension.
 - Compartment syndrome(27)(28)(29)(30)
 - Compartment syndrome may require fasciotomy, delayed wound closure, and skin grafting.
 - Expect brief to moderate stay extension.
 - Active comorbidities
 - Patient with active unstable comorbidities (eg, COPD, anemia, electrolyte disorders) may require continued inpatient care.
 - Expect brief stay extension.
 - Older patient
 - Patient 65 years or older may require acute hospital care.
 - Expect brief stay extension.

See Common Complications and Conditions [ISC](#) for further information.

Discharge

Discharge Planning

- Discharge planning includes[F]:
 - Assessment of needs and planning for care, including(32)(33):
 - 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.
 - Evaluate and address patient or caregiver preferences as indicated.
 - Identify skilled services needed at next level of care, with specific attention to(34):
 - Cast or immobilizer care(1)
 - Neurovascular status assessment
 - Pain management(35)
 - Wound or dressing management(36)
 - Early identification of anticipated discharge destination; options include(33)(37):
 - Home; considerations include:
 - Home safety assessment. See Home Safety Assessment [SR](#) for further information.
 - ☐ Patient safe to go home; examples include(38)(39)(40):
 - 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(33)(37)(41):
 - Patient and caregiver education complete.
 - See Teach-Back Tool [SR](#) for further information.
 - See Femur Fracture, Shaft, Open Reduction: Patient Education for Clinicians [SR](#) for further information.
- ☐ Medication reconciliation completion includes(42)(43):
 - 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)(44)
 - 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(45):
 - Inpatient care and service providers
 - Primary care provider
 - All post-discharge care and service providers
- Appointments planned or scheduled, which may include:
 - Primary care provider(46)
 - Orthopedic surgeon(1)
 - Rehabilitation therapy services(47)(48)
 - Specialists for management of comorbidities as needed(1)
 - Other
- Outpatient testing and procedure plans made, which may include:
 - Bone densitometry(34)
 - Other
- Referrals made for assistance or support, which may include:
 - Financial, for follow-up care, medication, and transportation(49)
 - Tobacco use treatment(50)
 - Vocational rehabilitation(34)
 - Other
- Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
 - Ambulation devices (eg, cane, crutches, walker)(51)
 - Immobilizers (eg, braces, splints)(1)
 - Wound care equipment and supplies(52)
 - Other

Discharge Destination

- Post-hospital levels of admission may include:
 - Home.
 - Home healthcare. See Home Care Indications for Admission Section [HC](#) in Femur Fracture guideline in Home Care.
 - Recovery facility care. See Recovery Facility Care Indications for Admission Section [RFC](#) in Femur Fracture guideline in Recovery Facility Care.

Evidence Summary

Criteria

The evidence for the clinical indications found in this guideline includes 7 published peer reviewed articles and 3 book sections.

For femoral shaft fracture, an orthopedic surgery textbook and a skeletal trauma textbook support early total care, including open reduction within the first 24 to 36 hours.(1)(2) **(EG 2)** For metastatic lesions that cause pathologic fracture of the femoral shaft, a review article supports open reduction to improve pain and mobility.(3) **(EG 2)**

For periprosthetic femur fracture or nonunion or malunion of a femoral shaft fracture, a skeletal trauma textbook and a narrative review support open reduction to provide stabilization.(2)(4) **(EG 2)**

Alternatives

For young children with uncomplicated fractures, immediate closed reduction and spica casting may be sufficient.(5)(6)(11) **(EG 2)** Skeletal traction may be used as a preliminary phase to other definitive methods of femoral shaft management.(1)(12) **(EG 2)**

Length of Stay

A study of 63 pediatric patients (mean age 8.1 years) with isolated femoral shaft fractures found a mean length of stay of 1.8 days.(20) **(EG 2)** A study including 35 children (mean age 5.3 years) with an isolated closed femoral shaft fracture treated with intramedullary fixation found an average length of stay of 1.7 days.(19) **(EG 2)** Analysis of national hospital discharge data for a pediatric population shows 65% of hospitalized patients with fracture of the shaft of the femur undergoing the principal procedure of open reduction were discharged in 2 days or less.(21) **(EG 3)** Analysis of national hospital discharge data shows 23% of hospitalized adult patients with fracture of the shaft of the femur undergoing the principal procedure of open reduction were discharged in 2 days or less.(21) **(EG 3)**

Rationale

Use of this MCG care guideline helps the clinician identify, for a given procedure, which patient-specific factors and clinical conditions are appropriate for that procedure. The evidence-based clinical criteria assist the clinician in the decision to appropriately perform a procedure, evaluating whether the potential benefits of a procedure outweigh the potential risks. For Medicare enrollees, surgical MCG care guidelines also identify which procedures CMS has designated as inpatient only.

Use of these evidence-based clinical criteria to support decision making around the need for a given procedure is of benefit to the patient, as all procedures come with inherent risk that must be balanced by anticipated clinical benefit. Utilizing evidence-based clinical criteria enables a more accurate and patient-specific decision-making process. In addition, the use of evidence-based guidelines can help reduce unwarranted variation in care, such as divergent clinical thresholds to perform a procedure for clinically similar patients that vary across geographic regions, between facilities, and among individual clinicians.

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(53); 42 CFR 419.22(54); 42 CFR 422.101(55)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(56); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(57); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(58); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(59)

Medicare Coverage Determinations: Medicare Coverage Database(60)

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Footnotes

[A] See Clinical Indications for Procedure in this guideline. [A in Context Link 1]

[B] Children younger than 3 years with a femur fracture may need evaluation for abuse.(11)(18) [B in Context Link 1]

[C] Use Multimodal analgesia or individual analgesic agent as indicated. [C in Context Link 1]

[D] Patient is weight-bearing or near baseline activity for age and development. [D in Context Link 1]

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

[F] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(31) [F in Context Link 1]

Definitions

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):
 - Acute kidney injury (ie, rise in serum creatinine 2 or more times baseline value within past 7 days)(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)
 - Infection complicated by bacteremia or hypotension(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)
 - New need for dialysis(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)[A][B](1)(4)(5)(6)
 - Two or more emergency department visits and/or inpatient admissions within previous 6 months(1)(7)

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Footnotes

- A. 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).(4)
- B. 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.(5) This model includes 5 characteristic features: exhaustion (energy level), weakness (hand grip strength), slowness (gait speed), physical inactivity (falls), and weight loss. (5)(6) The presence of 3 or more of these deficits indicates the presence of frailty.(5)(6) Frailty as deficit accumulation considers findings in multiple domains (eg, cognitive, physical, nutritional, laboratory) and high-risk comorbidities.(5)(6) In this model, the degree of frailty is quantified by the number of indicative items present.(5)

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

1. Schrager DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
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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. Schrager DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
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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.

Multimodal analgesia

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

References

1. D'Souza RS, Johnson RL. Regional and multimodal treatments of perioperative pain. In: Benzon H, editor. Practical Management of Pain. 6th ed. Philadelphia, PA 19103-2899: Elsevier; 2023:355-373.e8.
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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

- 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)
- 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.

Pediatric Readmission Risk Assessment

- Risk of readmission is increased by presence (upon admission or during hospital stay) of **1 or more** of the following(1):
 - Infection complicated by bacteremia or hypotension(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)
 - Presence of complex chronic condition (eg, cerebral palsy, congenital malformations, muscular dystrophy, cystic fibrosis, autoimmune disease, malignancy, genetic disorder)^[A](1)(3)(4)
 - Potential barriers to postdischarge clinical care (eg, unstable home environment, ability of caregivers to adhere to treatment plan unclear, impaired access to care or medication, active substance abuse in patient or caregiver)(1)(4)
 - Inpatient admission within previous 6 months(5)
 - Two or more emergency department visits within previous 6 months(1)(4)(6)

References

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- Feinstein JA, Hall M, Davidson A, Feudtner C. Pediatric complex chronic condition system version 3. *JAMA Network Open* 2024;7(7):Online. DOI: 10.1001/jamanetworkopen.2024.20579.
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Footnotes

- A complex chronic condition is any medical condition that is expected to last at least 12 months (unless death intervenes) and to involve either several different organ systems or one organ system severely enough to require specialty pediatric care.(2)

Social Determinants of Health Assessment

- Risk of poor health outcomes may be increased by the presence of **1 or more** of the following social determinants of health(1)(2)(3):
 - Housing insecurity, as indicated by **1 or more** of the following:

- Individual or caregiver's current living situation is **1 or more** of the following(4):
 - Does not have own housing (eg, staying in a hotel, shelter, or with others)
 - Has own housing (eg, house, apartment), but at risk of losing it in the future (ie, behind on rent or mortgage)
 - Has own housing (eg, house, apartment), but has lived in 3 or more places in past year
- Current housing has **1 or more** of the following:
 - Electrical appliances (eg, stove, refrigerator) not working or unavailable
 - Insufficient heating or cooling
 - Insufficient ventilation
 - Lead paint or pipes
 - Mold
 - Pests (eg, bugs) or rodents
 - Smoke detectors not working or unavailable
- Food insecurity, as indicated by **1 or more** of the following(5):
 - In the past year, individual or caregiver ran out of food and did not have money to buy more food.
 - In the past year, individual or caregiver worried that they would run out of food before they received money to buy more food.
- Insufficient transportation, as indicated by **1 or more** of the following(6):
 - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of transportation.
 - In the past year, individual or caregiver missed nonmedical activities, work, or could not get things needed for daily living due to lack of transportation.
- Insufficient utilities, as indicated by **1 or more** of the following(7):
 - Utilities (eg, electricity, water, gas, or oil) are currently shut off or unavailable.
 - In the past year, electric, water, gas, or oil company threatened to shut off services.
- Personal safety risk, as indicated by **2 or more** of the following(5):
 - Individual is sometimes or frequently physically hurt by another person (including family member).
 - Individual is sometimes or frequently insulted or talked down to by another person (including family member).
 - Individual is sometimes or frequently threatened with physical harm by another person (including family member).
 - Individual is sometimes or frequently screamed or cursed at by another person (including family member).
- Insufficient dependent care, as indicated by **1 or more** of the following:
 - In the past year, individual or caregiver was unable to work due to lack of dependent care.
 - In the past year, individual or caregiver was unable to work more (additional) hours due to lack of dependent care.
 - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of dependent care.
 - In the past year, individual or caregiver missed nonmedical activities (eg, school, church, social activity) due to lack of dependent care.
- Depression risk, as indicated by **ALL** of the following(8):
 - In the past 2 weeks, individual had little interest or pleasure in normal activities on at least several days.
 - In the past 2 weeks, individual felt down, depressed, or hopeless on at least several days.

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Tachycardia 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.

Codes

ICD-10 Diagnosis: M80.051A, M80.052A, M80.059A, M80.851A, M80.852A, M80.859A, M84.351A, M84.352A, M84.353A, M84.451A, M84.452A, M84.453A, M84.551A, M84.552A, M84.553A, M84.651A, M84.652A, M84.653A, M84.750A, M84.751A, M84.752A, M84.753A, M84.754A, M84.755A, M84.756A, M84.757A, M84.758A, M84.759A, S72.301A, S72.301B, S72.301C, S72.302A, S72.302B, S72.302C, S72.309A, S72.309B, S72.309C, S72.321A, S72.321B, S72.321C, S72.322A, S72.322B, S72.322C, S72.323A, S72.323B, S72.323C, S72.324A, S72.324B, S72.324C, S72.325A, S72.325B, S72.325C, S72.326A, S72.326B, S72.326C, S72.331A, S72.331B, S72.331C, S72.332A, S72.332B, S72.332C, S72.333A, S72.333B, S72.333C, S72.334A, S72.334B, S72.334C, S72.335A, S72.335B, S72.335C, S72.336A, S72.336B, S72.336C, S72.341A, S72.341B, S72.341C, S72.342A, S72.342B, S72.342C, S72.343A, S72.343B, S72.343C, S72.344A, S72.344B, S72.344C, S72.345A, S72.345B, S72.345C, S72.346A, S72.346B, S72.346C, S72.351A, S72.351B, S72.351C, S72.352A, S72.352B, S72.352C, S72.353A, S72.353B, S72.353C, S72.354A, S72.354B, S72.354C, S72.355A, S72.355B, S72.355C, S72.356A, S72.356B, S72.356C, S72.361A, S72.361B, S72.361C, S72.362A, S72.362B, S72.362C, S72.363A, S72.363B, S72.363C, S72.364A, S72.364B, S72.364C, S72.365A, S72.365B, S72.365C, S72.366A, S72.366B, S72.366C, S72.391A, S72.391B, S72.391C, S72.392A, S72.392B, S72.392C, S72.399A, S72.399B, S72.399C [Hide]

ICD-10 Procedure: 0QS804Z, 0QS805Z, 0QS806Z, 0QS80BZ, 0QS80CZ, 0QS80DZ, 0QS80ZZ, 0QS834Z, 0QS835Z, 0QS836Z, 0QS83BZ, 0QS83CZ, 0QS83DZ, 0QS83ZZ, 0QS844Z, 0QS845Z, 0QS846Z, 0QS84BZ, 0QS84CZ, 0QS84DZ, 0QS84ZZ, 0QS904Z, 0QS905Z, 0QS906Z, 0QS90BZ, 0QS90CZ, 0QS90DZ, 0QS90ZZ, 0QS934Z, 0QS935Z, 0QS936Z, 0QS93BZ, 0QS93CZ, 0QS93DZ, 0QS93ZZ, 0QS944Z, 0QS945Z, 0QS946Z, 0QS94BZ, 0QS94CZ, 0QS94DZ, 0QS94ZZ, XNSE0GA, XNSF0GA [Hide]

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