

# Shoulder Arthroplasty

ORG: S-634 (ISC)

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## Care Planning - Inpatient Admission and Alternatives

### Clinical Indications for Procedure

- Procedure is indicated for **1 or more** of the following: **INNNN**
  - Advanced joint disease, as indicated by **ALL** of the following(2):
    - Positive radiographic findings (eg, shoulder joint destruction, severe joint space narrowing, cystic changes)(1)(3)
    - Nonoperative therapy has been tried and failed (eg, anti-inflammatory medications, physical therapy, analgesics).(11)(12)
    - Replacement needed because of **1 or more** of the following:
      - Disabling pain(2)(3)
      - Functional disability(2)(3)
  - Osteonecrosis of humeral head(1)(4)(13)
  - Massive rotator cuff tear(1)(11)(14)
  - Failed rotator cuff repair(1)(14)(15)
  - Rotator cuff-deficient arthropathy(14)
  - Proximal humerus fracture and **1 or more** of the following:
    - Displaced 3-part or 4-part fracture(16)(17)(18)
    - 3-part or 4-part fracture in osteoporotic bone(16)(17)(18)
    - Fracture dislocation(11)(19)(20)(21)
    - Head split fracture(18)(21)
    - Rotator cuff deficiency(20)(21)
    - Presence of malunion or nonunion(19)(20)
    - Failure of prior open reduction and internal fixation(17)(19)(22)
  - Complex fracture of proximal humerus(1)(11)(20)(22)
  - Reconstruction after tumor resection(1)(5)
  - Part of staged procedure for native shoulder joint infection(6)(23)
  - Replacement (revision) of previous arthroplasty or hemiarthroplasty needed because of **1 or more** of the following(24):
    - Instability of glenoid or humeral components(1)(25)(26)(27)(28)
    - Fracture or mechanical failure of implant (eg, humeral stem loosening)(7)(25)(27)(28)(29)
    - Glenoid erosion from humeral prosthetic component of hemiarthroplasty(1)(30)(31)
    - Rotator cuff insufficiency(25)(26)(27)(28)

- Periprosthetic infection(1)(8)(28)(32)
- Proximal migration of humeral head(7)
- Periprosthetic fracture(33)
- Persistent pain and functional debility nonresponsive to conservative management(7)(24)

## Alternatives to Procedure

- Alternatives include:
  - Nonoperative management, which may include(2):
    - Steroidal and nonsteroidal anti-inflammatory medication(14)(34)
    - Analgesics
    - Flexibility and muscle strengthening exercises
    - Physical therapy(2)(12)
    - Intra-articular steroids(12)
    - Activity modification(34)
  - For proximal humerus fracture:
    - Nonoperative management(16)(21)(35)(36)(37)
    - Open reduction. See Humerus Fracture, Open Reduction [ISC guideline](#).(10)(21)(38)(39)
    - Closed reduction with pin fixation or immobilization with orthosis(20)(39)
    - Hemiarthroplasty. See Shoulder Hemiarthroplasty [ISC guideline](#).(18)(38)(39)(40)
  - Resection arthroplasty(41)
  - Radiation synovectomy
  - Arthroscopic debridement(2)(12)(42)
  - Serial debridement(8)(42)
  - Superior capsule reconstruction(14)(43)(44)(45)
  - Resurfacing of humeral head or glenoid(46)
  - Subacromial balloon spacer(15)
  - Tendon transfer(11)(14)(15)
  - Staged procedure with insertion of an antibiotic-impregnated spacer(47)
  - Osteotomy for malunion
  - For osteonecrosis of humeral head:
    - Humeral head core decompression(13)
    - Humeral head bone grafting(13)
    - Hemiarthroplasty. See Shoulder Hemiarthroplasty [ISC guideline](#).(13)
  - For prosthetic infection:
    - Debridement, antibiotics, and implant retention(48)
    - Staged procedure with insertion of an antibiotic-impregnated spacer(47)(48)
    - Permanent antibiotic spacer(48)(49)
    - Antibiotics(48)

## Operative Status Criteria

### Goal Length of Stay: Ambulatory

**Note: The definition of an ambulatory procedure depends on payer-provider contractual agreement or regulatory language (eg, CMS' Two-Midnight Rule). An ambulatory procedure may include one postoperative overnight stay in a facility; therefore, MCG's ambulatory Goal Length of Stay (GLOS) attainment calculation reports the sum of same-day and next-day postoperative discharges. Depending on various patient and procedural factors, some patients undergoing a procedure with an ambulatory GLOS require inpatient care (eg, medical necessity for hospital-based care across 2 or more postoperative midnights). Some of these factors are described in the Extended Stay section of this guideline.**

- Ambulatory
- Inpatient (eg, medical necessity for hospital-based care across 2 or more postoperative midnights)
- Inpatient (Medicare patient, and specific procedure is on CMS Inpatient Only List)

## Hospitalization

### Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
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1	<ul style="list-style-type: none"> <li>• Social Determinants of Health Assessment</li> <li>• OR to recovery to discharge<sup>[A]</sup></li> <li>• Discharge planning</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hemodynamic stability</b></li> <li>• <b>No evidence of neurologic or vascular compromise</b></li> <li>• <b>No evidence of postoperative or surgical site infection</b></li> <li>• <b>Pain absent or managed</b></li> <li>• <b>Discharge plans and education understood</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Ambulatory or acceptable for next level of care</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Oral hydration<sup>[B]</sup></b></li> <li>• <b>Oral medications or regimen acceptable for next level of care</b></li> <li>• <b>Oral diet or acceptable for next level of care</b></li> </ul>	<ul style="list-style-type: none"> <li>• Physical therapy</li> <li>• Possible sling or shoulder immobilizer</li> </ul>	<ul style="list-style-type: none"> <li>• Prophylactic antibiotics</li> <li>• Multimodal analgesia</li> </ul>
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(1)(50)(51)(52)<sup>[B]</sup>

Recovery Milestones are indicated in **bold**.

## Goal Length of Stay: Ambulatory

*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).**

- Inpatient stay (eg, need for hospital-based care beyond postoperative day 1) may be needed for<sup>(53)</sup>:
  - Failure to meet discharge criteria (recovery milestones in Optimal Recovery Course)
    - Expect brief stay extension.
  - Complications of procedure<sup>(54)(55)(56)(57)</sup>
    - Complications include vascular or nerve injury, anterior dislocation, periprosthetic fracture, anesthetic complications, bleeding, and infection.<sup>(1)(58)</sup>
    - Expect brief stay extension.
  - Preoperative injury (eg, fracture, rotator cuff tear, multiple trauma)<sup>(59)</sup>
    - Expect brief stay extension.
  - Active comorbidities that require continued hospital-based treatment or monitoring (eg, COPD, heart failure, chronic kidney disease)<sup>(60)(61)(62)(63)(64)</sup>
    - Patient may be at increased risk for complications.
    - Expect brief stay extension.
  - Revision of previous shoulder arthroplasty (ie, not a primary procedure) in patient age 65 years or older
    - Expect brief stay extension.

See Common Complications and Conditions <sup>[B]</sup> ISC for further information.

## Discharge

### Discharge Planning

- Discharge planning includes<sup>[C]</sup>:
  - Assessment of needs and planning for care, including<sup>(66)(67)</sup>:
    - 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 <sup>[B]</sup> SR for further information.
    - Evaluate and address social determinants of health (eg, housing, food). See Social Determinants of Health Screening Tool <sup>[B]</sup> 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<sup>(68)</sup>:
      - Neurovascular status assessment

- Pain management
- Wound or dressing management
- Early identification of anticipated discharge destination; options include(67)(69):
  - Home; considerations include:
    - Home safety assessment. See Home Safety Assessment [SR](#) for further information.
    - ☐ Patient safe to go home; examples include(70)(71)(72):
      - 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(67)(69)(73):
  - Patient and caregiver education complete.
    - See Teach-Back Tool [SR](#) for further information.
    - See Shoulder Arthroplasty: Patient Education for Clinicians [SR](#) for further information.
  - ☐ Medication reconciliation completion includes(74)(75):
    - 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)(76)
    - 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(77):
    - 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(78)
    - Orthopedic surgeon(79)
    - Rehabilitation therapy services(1)(80)
    - Specialists for management of comorbidities as needed(81)
    - Other
  - Outpatient testing and procedure plans made, which may include:
    - Other
  - Referrals made for assistance or support, which may include:
    - Financial, for follow-up care, medication, and transportation(82)
    - Tobacco use treatment(83)
    - Other
  - Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
    - Immobilizers (eg, braces, splints)(84)
    - Wound care equipment and supplies(85)
    - Other

## Discharge Destination

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

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## Evidence Summary

### Background

A shoulder arthroplasty involves replacement of the ball and socket of the shoulder joint and may be performed as either a traditional anatomic total shoulder arthroplasty (replacement of the head of the humerus "ball" and the cup of the scapula "socket" with mechanical components) or as a reverse total shoulder arthroplasty, wherein the mechanical "socket" is placed into the head of the humerus and the "ball" is attached to the glenoid cup in the shoulder blade. This guideline should be used for total shoulder arthroplasty, reverse total shoulder arthroplasty, and revision shoulder arthroplasty.(1) **(EG 2)**

### Criteria

The evidence for the clinical indications found in this guideline includes 29 published peer reviewed articles, 2 specialty society or other evidence-based guidelines, and 2 book sections.

For advanced joint disease, an orthopedic surgery textbook, a specialty society guideline, and an expert consensus document support shoulder arthroplasty for patients with disabling pain or functional disability when nonoperative therapy has been tried and failed.(1)(2)(3) **(EG 2)**

For osteonecrosis of the humeral head, an orthopedic surgery textbook states that shoulder arthroplasty is a treatment option for end-stage disease.(1) **(EG 2)** A narrative review states that shoulder arthroplasty is often necessary for patients with late-stage posttraumatic avascular necrosis of the humeral head.(4) **(EG 2)**

An orthopedic surgery textbook notes that shoulder arthroplasty is indicated for patients with a nonfunctional rotator cuff (eg, massive rotator cuff tear, failed rotator cuff repair, rotator cuff-deficient arthropathy, proximal humerus fractures with rotator cuff deficiency or malunion). This textbook also recommends total shoulder arthroplasty for complex fractures of the proximal humerus.(1) **(EG 2)** A systematic review and an orthopedic surgery textbook note that total shoulder arthroplasty is an appropriate treatment option for many patients undergoing resection and reconstruction of the proximal humerus due to a malignancy.(1)(5) **(EG 2)**

A systematic review notes that shoulder arthroplasty is an appropriate treatment for patients with an infection of the shoulder, typically as part of a staged procedure.(6) **(EG 2)**

For replacement (revision) of a previous arthroplasty or hemiarthroplasty, a narrative review notes that replacement is indicated for instability of glenoid components, glenoid bone erosion from the humeral prosthetic component of a hemiarthroplasty, mechanical failure, or persistent pain and debility that does not improve with nonoperative management.(7) **(EG 2)** A specialty society guideline and an expert consensus document state that revision of a previous arthroplasty is necessary in the setting of a prosthetic joint infection that has not responded to appropriate antimicrobial therapy or debridement.(8)(9) **(EG 2)** A study of 124 patients (mean age 75 years) with proximal humerus fractures randomized to reverse shoulder arthroplasty or open reduction and internal fixation found that patients undergoing reverse shoulder arthroplasty had better composite pain and function (Constant-Murley) scores at 2-year follow-up (mean difference 13.4 points, 95% confidence interval 6.2 to 20.6, minimal clinically important difference 10 points).(10) **(EG 1)**

### Length of Stay

Analysis of a cohort of 370 consecutive total shoulder arthroplasty patients (mean age 71 years) found that 96% were discharged the day of or the day after surgery.(51) **(EG 2)** Analysis of procedure data for a commercially insured population shows 97% of patients undergoing shoulder arthroplasty were discharged the day of or the day after surgery.(52) **(EG 3)** Analysis of procedure data for a Medicare-insured population shows 90% of patients undergoing shoulder arthroplasty were discharged the day of or the day after surgery.(52) **(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(86); 42 CFR 419.22(87); 42 CFR 422.101(88)

**Internet-Only Manual (IOM) Citations:** CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(89); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(90); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(91); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(92)

**Medicare Coverage Determinations:** Medicare Coverage Database(93)

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## References

1. Throckmorton TW. Shoulder and elbow arthroplasty. In: Azar FM, Beaty JH, editors. *Campbell's Operative Orthopaedics*. 14th ed. Philadelphia, PA: Elsevier; 2021:600-655.e8. [ Context Link 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 ]
2. American Academy of Orthopaedic Surgeons. Management of Glenohumeral Joint Osteoarthritis. Evidence-based Clinical Practice Guideline [Internet] American Academy of Orthopaedic Surgeons. 2020 Mar Accessed at: <https://www.aaos.org/>. [created 2009; accessed 2025 Sep 04] [ Context Link 1, 2, 3, 4, 5, 6, 7 ]
3. Le Breton S, et al. A validated algorithm using current literature to judge the appropriateness of anatomic total shoulder arthroplasty utilizing the RAND/UCLA appropriateness method. *Journal of Shoulder and Elbow Surgery* 2022;31(7):e332-e345. DOI: 10.1016/j.jse.2021.12.025. [ Context Link 1, 2, 3, 4 ] View abstract...
4. Ayyash AM, Bui TM, O'Brien MJ, Mulcahey MK. Management of posttraumatic avascular necrosis of the proximal humerus. *Orthopedics* 2021;44(6):367-375. DOI: 10.3928/01477447-20211001-02. [ Context Link 1, 2 ] View abstract...
5. Ferlauto HR, et al. Reverse total shoulder arthroplasty for oncologic reconstruction of the proximal humerus: a systematic review. *Journal of Shoulder and Elbow Surgery* 2021;30(11):Online. DOI: 10.1016/j.jse.2021.06.004. [ Context Link 1, 2 ] View abstract...
6. Jordan RW, Ahmed I, D'Alessandro P, Woodmass JM, MacDonald PB, Malik SS. Shoulder arthroplasty in the management of native shoulder joint infections has a high complication rate and poor functional outcome - a systematic review. *Shoulder and Elbow* 2025;17(1):22-35. DOI: 10.1177/17585732241231758. [ Context Link 1, 2 ] View abstract...
7. Weatherby PJ, Efejuku TA, Somerson JS. Complications after anatomic shoulder arthroplasty: revisiting leading causes of failure. *Orthopedic Clinics of North America* 2021;52(3):269-277. DOI: 10.1016/j.ocl.2021.03.002. [ Context Link 1, 2, 3, 4 ] View abstract...
8. Osmon DR, et al. Diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. *Clinical Infectious Diseases* 2013;56(1):e1-e25. DOI: 10.1093/cid/cis803. (Reaffirmed 2025 Jul) [ Context Link 1, 2, 3 ] View abstract...
9. Garrigues GE, Zmistowski B, Cooper AM, Green A, ICM Shoulder Group. Proceedings from the 2018 International Consensus Meeting on Orthopedic Infections: management of periprosthetic shoulder infection. *Journal of Shoulder and Elbow Surgery* 2019;28(6S):S67-S99. DOI: 10.1016/j.jse.2019.04.015. [ Context Link 1 ] View abstract...
10. Fraser AN, et al. Reverse shoulder arthroplasty is superior to plate fixation at 2 years for displaced proximal humeral fractures in the elderly: a multicenter randomized controlled trial. *Journal of Bone and Joint Surgery. American Volume* 2020;102(6):477-485. DOI: 10.2106/JBJS.19.01071. [ Context Link 1, 2 ] View abstract...
11. Fornaciari P, Jamei-Martel O, Vial P. Trends in shoulder arthroplasty: a narrative review of predominant indications and the most commonly employed implant designs. *Journal of Clinical Medicine* 2025;14(9):DOI: 10.3390/jcm14093186. [ Context Link 1, 2, 3, 4, 5 ] View abstract...
12. Schwarz J, Bao Y, Dean R, Zagaria A, Bell JE, Austin D. Health care resource utilization in the 2 years prior to total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery* 2025;DOI: 10.1016/j.jse.2024.11.033. [ Context Link 1, 2, 3, 4 ] View abstract...
13. Alkhateeb JM, Arafah MA, Tashkandi M, Al Qahtani SM. Surgical treatment of humeral head avascular necrosis in patients with sickle cell disease: a systematic review. *JSES International* 2021;5(3):391-397. DOI: 10.1016/j.jseint.2021.01.011. [ Context Link 1, 2, 3, 4 ] View abstract...
14. Cvetanovich GL, Waterman BR, Verma NN, Romeo AA. Management of the irreparable rotator cuff tear. *Journal of the American Academy of Orthopedic Surgeons* 2019;27(24):909-917. DOI: 10.5435/JAAOS-D-18-00199. [ Context Link 1, 2, 3, 4, 5, 6 ] View abstract...
15. Wellington IJ, et al. Management of failed rotator cuff repairs: a review. *Orthopedic Clinics of North America* 2022;53(4):473-482. DOI: 10.1016/j.ocl.2022.05.002. [ Context Link 1, 2, 3 ] View abstract...
16. Perez EA. Fractures of the shoulder, arm, and forearm. In: Azar FM, Beaty JH, editors. *Campbell's Operative Orthopaedics*. 14th ed. Philadelphia, PA: Elsevier; 2021:3031-3126.e9. [ Context Link 1, 2, 3 ]
17. Penvose IR, Paxton ES. Proximal Humerus Fracture: Fix, Replace, or Let Heal. *Orthopedic Research and Reviews* 2025;In Press:DOI: 10.1016/j.ocl.2025.03.002. [ Context Link 1, 2, 3 ]

18. Minarro JC, Sanchez-Sotelo J. Reverse shoulder arthroplasty for proximal humerus fractures: a review of current evidence. *Current Reviews in Musculoskeletal Medicine* 2024;17(10):393-401. DOI: 10.1007/s12178-024-09919-6. [ Context Link 1, 2, 3, 4 ] View abstract...
19. Dittman LE, Esper R, Sperling JW, Morrey ME, Barlow JD, Sanchez-Sotelo J. Complications after reverse shoulder arthroplasty for proximal humerus nonunion. *Journal of Shoulder and Elbow Surgery* 2024;Online. DOI: 10.1016/j.jse.2024.05.020. [ Context Link 1, 2, 3 ] View abstract...
20. Schiffman CJ, Cohn MR, Austin LS, Namdari S. Reverse shoulder arthroplasty to treat proximal humerus fracture sequelae: a review. *Journal of the American Academy of Orthopedic Surgeons* 2024;32(15):681-691. DOI: 10.5435/JAAOS-D-23-00740. [ Context Link 1, 2, 3, 4, 5 ] View abstract...
21. Hao KA, et al. Factors influencing surgical management of proximal humerus fractures: do shoulder and trauma surgeons differ? *Journal of Shoulder and Elbow Surgery* 2022;31(6):e259-e269. DOI: 10.1016/j.jse.2021.11.016. [ Context Link 1, 2, 3, 4, 5 ] View abstract...
22. Davey MS, et al. Management options for proximal humerus fractures - A systematic review & network meta-analysis of randomized control trials. *Injury* 2022;53(2):244-249. DOI: 10.1016/j.injury.2021.12.022. [ Context Link 1, 2 ] View abstract...
23. Kriechling P, Bouaicha S, Andronic O, Uckay I, Bock D, Wieser K. Limited improvement and high rate of complication in patients undergoing reverse total shoulder arthroplasty for previous native shoulder infection. *Journal of Shoulder and Elbow Surgery* 2021;30(1):34-39. DOI: 10.1016/j.jse.2020.04.048. [ Context Link 1 ] View abstract...
24. Harrison AK, Knudsen ML, Braman JP. Hemiarthroplasty and total shoulder arthroplasty conversion to reverse total shoulder arthroplasty. *Current Reviews in Musculoskeletal Medicine* 2020;13(4):501-508. DOI: 10.1007/s12178-020-09649-5. [ Context Link 1, 2 ] View abstract...
25. Hays C. Current role of reverse total shoulder arthroplasty in the management of glenohumeral osteoarthritis. *Orthopedic Clinics of North America* 2024;55(4):489-502. DOI: 10.1016/j.ocl.2024.05.001. [ Context Link 1, 2, 3 ] View abstract...
26. Hao KA, et al. Quantifying success after first revision reverse total shoulder arthroplasty: the minimal clinically important difference, substantial clinical benefit, and patient acceptable symptomatic state. *Journal of Shoulder and Elbow Surgery* 2023;32(10):e516-e527. DOI: 10.1016/j.jse.2023.03.032. [ Context Link 1, 2 ] View abstract...
27. Buchanan TR, et al. Defining the tipping point for revision reverse shoulder arthroplasty. *Shoulder and Elbow* 2024;17585732241263753. DOI: 10.1177/17585732241263753. [ Context Link 1, 2, 3 ] View abstract...
28. Lauck BJ, et al. Why do primary anatomic total shoulder arthroplasties fail today? A systematic review and meta-analysis. *Journal of Shoulder and Elbow Surgery* 2025;DOI: 10.1016/j.jse.2025.02.057. [ Context Link 1, 2, 3, 4 ] View abstract...
29. Layuno-Matos JG, Hutchinson A, Karadimas T, Frankle MA. Revision for humeral stem loosening: a systematic review. *Journal of Shoulder and Elbow Surgery* 2024;DOI: 10.1016/j.jse.2024.08.053. [ Context Link 1 ] View abstract...
30. Sheth MM, et al. Revision of failed hemiarthroplasty for painful glenoid arthrosis to anatomic total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery* 2018;27(10):1884-1890. DOI: 10.1016/j.jse.2018.03.018. [ Context Link 1 ] View abstract...
31. Smith AF, Frankle MA, Cronin KJ. Maximizing implant stability in the face of glenoid bone stock deficiency. *Orthopedic Clinics of North America* 2024;55(1):101-111. DOI: 10.1016/j.ocl.2023.05.011. [ Context Link 1 ] View abstract...
32. Hansen PY, et al. Outcomes following revision reverse shoulder arthroplasty for infection. *Journal of Shoulder and Elbow Surgery* 2024;Online. DOI: 10.1016/j.jse.2024.02.031. [ Context Link 1 ] View abstract...
33. Tansey PJ, Yetter TR, Somerson JS. Operative and nonoperative treatment of periprosthetic humerus fractures after shoulder arthroplasty: a systematic review and meta-analysis. *Journal of Shoulder and Elbow Surgery* 2024;Online. DOI: 10.1016/j.jse.2024.04.009. [ Context Link 1 ] View abstract...
34. Yamamoto N, et al. Non-operative management of shoulder osteoarthritis: Current concepts. *Journal of ISAKOS : Joint Disorders & Orthopaedic Sports Medicine* 2023;8(5):289-295. DOI: 10.1016/j.jisako.2023.06.002. [ Context Link 1, 2 ] View abstract...
35. Handoll HH, Elliott J, Thillemann TM, Aluko P, Brorson S. Interventions for treating proximal humeral fractures in adults. *Cochrane Database of Systematic Reviews* 2022, Issue 6. Art. No.: CD000434. DOI: 10.1002/14651858.CD000434.pub5. [ Context Link 1 ] View abstract...
36. Lopiz Y, et al. Long-term outcomes of reverse shoulder arthroplasty versus nonoperative treatment for 3- or 4-part proximal humerus fractures in elderly patients: results from a prior randomized clinical trial. *Journal of Shoulder and Elbow Surgery* 2025;34(6):1463-1470. DOI: 10.1016/j.jse.2024.09.032. [ Context Link 1 ] View abstract...
37. Miquel J, et al. Reverse shoulder arthroplasty or nothing for patients with displaced proximal humeral fractures: a randomized controlled trial. *Journal of Shoulder and Elbow Surgery* 2024;33(10):2187-2195. DOI: 10.1016/j.jse.2024.02.023. [ Context Link 1 ] View abstract...
38. Shi BY, et al. Increasing rate of shoulder arthroplasty for geriatric proximal humerus fractures in the United States, 2010-2019. *Journal of Shoulder and Elbow Arthroplasty* 2022;6:Online. DOI: 10.1177/24715492221137186. [ Context Link 1, 2 ] View abstract...
39. Lapner P, et al. Management of proximal humeral fractures in adults: a systematic review and meta-analysis. *Journal of Orthopaedic Trauma* 2023;37(2):e80-e88. DOI: 10.1097/BOT.0000000000002494. [ Context Link 1, 2, 3 ] View abstract...
40. Watts AC, et al. Superior functional outcome following reverse shoulder arthroplasty compared to hemiarthroplasty for displaced three- and four-part fractures in patients 65 and older: results from a prospective multicenter randomized controlled trial - The shoulder hemiarthroplasty or reverse polarity arthroplasty (SHerPA) trial. *Journal of Shoulder and Elbow Surgery* 2024;33(11):2335-2344. DOI: 10.1016/j.jse.2024.05.016. [ Context Link 1 ] View abstract...
41. George DA, Volpin A, Scarponi S, Haddad FS, Romano CL. Does exchange arthroplasty of an infected shoulder prosthesis provide better eradication rate and better functional outcome, compared to a permanent spacer or resection arthroplasty? a systematic review. *BMC Musculoskeletal Disorders* 2016;17:52. DOI: 10.1186/s12891-016-0901-6. [ Context Link 1 ] View abstract...
42. Acosta-Olivo C, Vilchez-Cavazos F, Blazquez-Saldana J, Villarreal-Villarreal G, Pena-Martinez V, Simental-Mendia M. Comparison of open arthrotomy versus arthroscopic surgery for the treatment of septic arthritis in adults: a systematic review and meta-analysis. *International Orthopaedics* 2021;45(8):1947-1959. DOI: 10.1007/s00264-021-05056-8. [ Context Link 1, 2 ] View abstract...

43. Eppler MB, et al. Superior capsular reconstruction of the shoulder. *Arthroscopy* 2021;37(6):1708-1710. DOI: 10.1016/j.arthro.2021.04.001. [ Context Link 1 ] View abstract...
44. Werthel JD, et al. Superior capsular reconstruction - A systematic review and meta-analysis. *Orthopaedics & Traumatology, Surgery & Research : OTSR* 2021;107(8S):Online. DOI: 10.1016/j.otsr.2021.103072. [ Context Link 1 ] View abstract...
45. Baek CH, Lim C, Kim JG, Kim BT, Kim SJ. Efficacy of reverse shoulder arthroplasty compared with superior capsular reconstruction in patients with posterosuperior irreparable rotator cuff tears without arthritis: a propensity score matching study. *Archives of Orthopaedic and Trauma Surgery* 2025;145(1):231. DOI: 10.1007/s00402-025-05861-5. [ Context Link 1 ] View abstract...
46. Chillemi C, Paglialonga C, De Giorgi G, Proietti R, Carli S, Damo M. Outcome and revision rate of uncemented humeral head resurfacing: Mid-term follow-up study. *World Journal of Orthopedics* 2021;12(6):403-411. DOI: 10.5312/wjo.v12.i6.403. [ Context Link 1 ] View abstract...
47. Ruditsky A, McBeth Z, Curry EJ, Cusano A, Galvin JW, Li X. One versus 2-stage revision for shoulder arthroplasty infections: a systematic review and analysis of treatment selection bias. *Journal of Bone and Joint Surgery Reviews* 2021;9(9):Online. DOI: 10.2106/JBJS.RVW.20.00219. [ Context Link 1, 2 ] View abstract...
48. Nazzal EM, et al. Shoulder Periprosthetic Joint Infection: Principles of Prevention, Diagnosis, and Treatment. *Journal of Bone and Joint Surgery. American Volume* 2024;106(23):2265-2275. DOI: 10.2106/JBJS.23.01073. [ Context Link 1, 2, 3, 4 ] View abstract...
49. Patrick M, Vincent HK, Farmer KW, King JJ, Struk AM, Wright TW. Management of infected shoulder arthroplasty: a comparison of treatment strategies. *Journal of Shoulder and Elbow Surgery* 2019;28(9):1658-1665. DOI: 10.1016/j.jse.2019.03.001. [ Context Link 1 ] View abstract...
50. Park C, Blevins KM, Paul AV, Long JS, Meyer LE, Anakwenze OA. Perioperative management in shoulder arthroplasty: a review of current practice. *Orthopedic Clinics of North America* 2022;53(4):483-490. DOI: 10.1016/j.ocl.2022.05.003. [ Context Link 1 ] View abstract...
51. Cannon D, Lewis S, Garcia J, Watkins A, Rodriguez H, Levy JC. A Comparison of patient same day discharge (SDD) selection following shoulder arthroplasty before and after the COVID-19 pandemic. *Seminars in Arthroplasty* 2022;32(3):559-563. DOI: 10.1053/j.sart.2022.02.011. [ Context Link 1, 2 ] View abstract...
52. Proprietary health insurance data sources (2023-2024); and Medicare 5% Standard Analytical File (2022-2023). [ Context Link 1, 2, 3 ]
53. Premier PINC AI™ Healthcare Database (PHD), 01/01/2023-12/31/2024. Premier, Inc. [ Context Link 1 ]
54. Hawkes D, Brookes-Fazakerley S, Robinson S, Bhalai V. Intraoperative and early postoperative complications of reverse shoulder arthroplasty: A current concepts review. *Journal of Orthopaedics* 2023;35:120-125. DOI: 10.1016/j.jor.2022.11.012. [ Context Link 1 ] View abstract...
55. Vajapey SP, Contreras ES, Cvetanovich GL, Neviasser AS. Neurologic complications in primary anatomic and reverse total shoulder arthroplasty: A review. *Journal of Clinical Orthopaedics and Trauma* 2021;20:Online. DOI: 10.1016/j.jcot.2021.06.005. [ Context Link 1 ] View abstract...
56. Patel MS, Daher M, Fuller DA, Abboud JA. Incidence, risk factors, prevention, and management of peripheral nerve injuries following shoulder arthroplasty. *Orthopedic Clinics of North America* 2022;53(2):205-213. DOI: 10.1016/j.ocl.2021.11.006. [ Context Link 1 ] View abstract...
57. Ling K, Smolev E, Tantone RP, Komatsu DE, Wang ED. Smoking is an independent risk factor for complications in outpatient total shoulder arthroplasty. *JSES International* 2023;7(6):2461-2466. DOI: 10.1016/j.jseint.2023.07.009. [ Context Link 1 ] View abstract...
58. Leape CP, Donaldson ST, Haislup BD, Wright MA, Murthi AM. Predicting successful outpatient total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery* 2023;32(7):1357-1363. DOI: 10.1016/j.jse.2023.02.131. [ Context Link 1 ] View abstract...
59. Boubekri AM, et al. Reverse shoulder arthroplasty for proximal humerus fractures and reverse shoulder arthroplasty for elective indications should have separate Current Procedural Terminology (CPT) codes. *Journal of Shoulder and Elbow Surgery* 2025;34(5):1340-1346. DOI: 10.1016/j.jse.2024.08.037. [ Context Link 1 ] View abstract...
60. Wideman M, Throckmorton TW. The impact of policy changes to outpatient total shoulder arthroplasty on patients, surgeons, and hospitals. *Journal of Shoulder and Elbow Surgery* 2025;34(1):244-249. DOI: 10.1016/j.jse.2024.08.003. [ Context Link 1 ] View abstract...
61. Amirian B, et al. A nationwide analysis on the effects of chronic obstructive pulmonary disease following primary total shoulder arthroplasty for glenohumeral osteoarthritis. *Shoulder and Elbow* 2022;14(3):278-285. DOI: 10.1177/1758573221993828. [ Context Link 1 ] View abstract...
62. Burns KA, Robbins LM, LeMarr AR, Fortune K, Morton DJ, Wilson ML. Modifiable risk factors increase length of stay and 90-day cost of care after shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery* 2022;31(1):2-7. DOI: 10.1016/j.jse.2021.08.010. [ Context Link 1 ] View abstract...
63. Brandner GT, Guareschi AS, Eichinger JK, Friedman RJ. Impact of opioid dependence on outcomes following total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery* 2024;33(1):82-89. DOI: 10.1016/j.jse.2023.05.040. [ Context Link 1 ] View abstract...
64. Cox RM, Hendy BA, Gutman MJ, Sherman M, Abboud JA, Namdari S. Utilization of comorbidity indices to predict discharge destination and complications following total shoulder arthroplasty. *Shoulder and Elbow* 2023;15(3):274-282. DOI: 10.1177/17585732211049726. [ Context Link 1 ] View abstract...
65. Hudson T. The role of social determinates of health in discharge practices. *Nursing Clinics of North America* 2021;56(3):369-378. DOI: 10.1016/j.cnur.2021.04.004. [ Context Link 1 ] View abstract...
66. Chovanec KA, Arsene C, Beck A, Zachrich K, Liedel B, Wolff-Elliott J. Association of discharge disposition with outcomes. *Population Health Management* 2021;24(1):116-121. DOI: 10.1089/pop.2019.0176. [ Context Link 1 ] View abstract...
67. Centers for Medicare and Medicaid Services. "Condition of participation: Discharge planning." 42 CFR Pt. 482.43 Washington, DC 2025 Jan 01 [accessed 2025 Jul 22] Accessed at: <https://www.ecfr.gov/>. [ Context Link 1, 2, 3 ]
68. Filson R. Musculoskeletal trauma and orthopedic surgery. In: Harding MM, Kwong J, Hagler D, Reinisch C, editors. *Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems*. 12th ed. St. Louis, MO: Mosby; 2023:1638-1672. [ Context Link 1 ]
69. Targeted care planning and care transitions. In: Perez R, editor. *CMSA's Integrated Case Management*. 2nd ed. Springer Publishing Company LLC; 2023:178-189. [ Context Link 1, 2 ]
70. Elements of Excellence in Transitions of Care (TOC). TOC Checklist [Internet] National Transitions of Care Coalition. 2006 Accessed at: <https://www.ntocc.org/> [accessed 2025 Sep 16] [ Context Link 1 ]

71. Medical-surgical nursing. In: Hinkle JL, Cheever KH, Overbaugh KJ, editors. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 15th ed. Wolters Kluwer; 2022:33-55. [ Context Link 1 ]
72. Transition of care. In: Gillingham DC, editor. *Foundations of Case Management*. Blue Bayou Press; 2021:137-144. [ Context Link 1 ]
73. Becker C, et al. Interventions to improve communication at hospital discharge and rates of readmission: a systematic review and meta-analysis. *JAMA Network Open* 2021;4(8):e2119346. DOI: 10.1001/jamanetworkopen.2021.19346. [ Context Link 1 ] View abstract...
74. The nursing process in drug therapy and patient safety. In: Tucker RG, editor. *Karch's Focus on Nursing Pharmacology*. 9th ed. Wolters Kluwer; 2023:47-57. [ Context Link 1 ]
75. Adverse drug reactions and medication errors. In: Burchum JR, Rosenthal LD, editors. *Lehne's Pharmacology for Nursing Care*. 12th ed. Elsevier; 2025:64-75. [ Context Link 1 ]
76. Safe medication preparation. In: Perry AG, Potter PA, Ostendorf WR, Laplante N, editors. *Clinical Nursing Skills and Techniques*. 11th ed. Elsevier; 2025:586-607. [ Context Link 1 ]
77. The case manager's roles, functions, and activities. In: Gillingham DC, editor. *Foundations of Case Management*. Blue Bayou Press; 2021:9-14. [ Context Link 1 ]
78. Anderson TS, Ayanian JZ, Herzig SJ, Souza J, Landon BE. Gaps in primary care follow-up after hospital discharge among Medicare beneficiaries. *Journal of the American Geriatrics Society* 2025;DOI: 10.1111/jgs.19496. [ Context Link 1 ] View abstract...
79. Management of patients with musculoskeletal trauma. In: Hinkle JL, Cheever KH, Overbaugh KJ, editors. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 15th ed. Wolters Kluwer; 2022:1152-1205. [ Context Link 1 ]
80. The intervention. In: Dutton M, editor. *Dutton's Orthopaedic Examination, Evaluation, and Intervention*. 6th ed. McGraw-Hill Education; 2023:343-368. [ Context Link 1 ]
81. MacDermid JC. Optimizing outcomes: concepts of patient preference, health literacy, and adherence to treatment. In: Skirven TM, Osterman AL, Fedorczyk JM, Amadio PC, Felder SB, Shin EK, editors. *Rehabilitation of the Hand and Upper Extremity*. 7th ed. Philadelphia, PA: Elsevier; 2021:1470-1477. [ Context Link 1 ]
82. Bragg-Underwood T. Family health. In: Nies MA, editor. *Community/Public Health Nursing*. 8th ed. Elsevier; 2024:404-427. [ Context Link 1 ]
83. Harding MM. Substance use disorders in acute care. In: Harding MM, Kwong J, Hagler D, Reinisch C, editors. *Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems*. 12th ed. St. Louis, MO: Mosby; 2023:162-178. [ Context Link 1 ]
84. Musculoskeletal care plans. In: Gulanick M, Myers JL, Bowman-Woodall C, editors. *Nursing Care Plans*. 11th ed. Elsevier; 2025:595-640. [ Context Link 1 ]
85. Management of patients with dermatologic disorders. In: Hinkle JL, Cheever KH, Overbaugh KJ, editors. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 15th ed. Wolters Kluwer; 2022:1815-1864. [ Context Link 1 ]
86. Centers for Medicare and Medicaid Services. "Admissions." 42 CFR 412.3 Washington, DC 2025 Jul [accessed 2025 Jul 22] Accessed at: <https://www.ecfr.gov/current/title-42/chapter-IV/subchapter-B/part-412>. [ Context Link 1 ]
87. Centers for Medicare and Medicaid Services. "Hospital services excluded from payment under the hospital outpatient prospective payment system." 42 CFR 419.22 Washington, DC 2023 Jul [accessed 2025 Jul 22] Accessed at: <https://www.ecfr.gov/>. [ Context Link 1 ]
88. Centers for Medicare and Medicaid Services. "Requirements relating to basic benefits." 42 CFR 422.101 Washington, DC 2025 Jun 03 [accessed 2025 Jul 23] Accessed at: <https://www.ecfr.gov/>. [ Context Link 1 ]
89. Centers for Medicare and Medicaid Services. Medicare Benefit Policy Manual. Chapter 1 - Inpatient Hospital Services Covered Under Part A Rev. 10892 [Internet] Centers for Medicare and Medicaid Services. 2021 Aug Accessed at: <https://www.cms.gov/manuals/>. [accessed 2025 Sep 09] [ Context Link 1 ]
90. Centers for Medicare and Medicaid Services. Medicare Benefit Policy Manual. Chapter 6 - Hospital Services Covered Under Part B Rev. 12425 [Internet] Centers for Medicare and Medicaid Services. 2023 Dec Accessed at: <http://www.cms.gov/manuals/>. [accessed 2025 Sep 09] [ Context Link 1 ]
91. Centers for Medicare and Medicaid Services. Medicare Benefit Policy Manual. Chapter 15 - Covered Medical and Other Health Services Rev. 13108 [Internet] Centers for Medicare and Medicaid Services. 2025 Apr 11 Accessed at: <https://www.cms.gov/manuals/>. [accessed 2025 Sep 09] [ Context Link 1 ]
92. Centers for Medicare and Medicaid Services. Medicare Program Integrity Manual. Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment Rev. 10365 [Internet] Centers for Medicare and Medicaid Services. 2020 Oct 02 Accessed at: <https://www.cms.gov/medicare/regulations-guidance/manuals/internet-only-manuals-ioms>. [accessed 2025 Sep 09] [ Context Link 1 ]
93. Medicare Coverage Database. [Internet] Centers for Medicare and Medicaid Services. Accessed at: <https://www.cms.gov/medicare-coverage-database/search.aspx?> Updated 2025 [accessed 2025 Oct 23] [ Context Link 1 ]

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## Footnotes

[A] See Ambulatory Surgery Discharge and Complications: Common Complications and Conditions  ISC for further information. [ A in Context Link 1 ]

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

[C] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(65) [ C in Context Link 1 ]

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# Definitions

## 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. Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Ramgopal S, Sepanski RJ, Martin-Gill C. Empirically derived age-based vital signs for children in the out-of-hospital setting. *Annals of Emergency Medicine* 2023;81(4):402-412. DOI: 10.1016/j.annemergmed.2022.09.019.

## Hypotension absent

- Hypotension absent,<sup>[A]</sup> 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<sup>[A](1)</sup>
    - Mean arterial pressure<sup>[B]</sup> greater than or equal to 70 mm Hg  MAP Calculator<sup>[A](1)(2)</sup>
    - 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<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 100 mm Hg in child 6 to 12 years of age<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 95 mm Hg in child 3 to 5 years of age<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 90 mm Hg in child 1 or 2 years of age<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 80 mm Hg in infant 6 to 11 months of age<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 70 mm Hg in infant 3 to 5 months of age<sup>[A](3)</sup>
    - Systolic blood pressure greater than or equal to 65 mm Hg in infant 1 or 2 months of age<sup>[A](3)</sup>
    - Blood pressure at patient's baseline (eg, healthy child with low systolic blood pressure), at intentional therapeutic goal, or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)

## References

1. Schriger DL. Approach to the patient with abnormal vital signs. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:32-35.
2. Puskarich MA, Jones AE. Shock. In: Walls RM, editor. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Elsevier; 2023:34-41.e1.
3. Anderson CC, Kapoor S, Mark TE. Pediatric parameters and equipment. In: Anderson CC, Kapoor S, Mark TE, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 23rd ed. Elsevier; 2024:i-iii.

## Footnotes

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

## 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.
2. George S, Johns M. Review of nonopioid multimodal analgesia for surgical and trauma patients. American Journal of Health-System Pharmacy 2020;77(24):2052-2063. DOI: 10.1093/ajhp/zxaa301.
3. Finnerup NB. Nonnarcotic methods of pain management. New England Journal of Medicine 2019;380(25):2440-2448. DOI: 10.1056/NEJMra1807061.

## 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, et al., editors. Nelson Textbook of Pediatrics. 22nd ed. Elsevier; 2025:592-599.
3. Fang JC, O'Gara PT. History and physical examination: an evidence-based approach. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Elsevier; 2022:123-140.

## Footnotes

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

## 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.

## References

1. Scanlon A, Reinisch C. Social determinants of health. In: Harding MM, Kwong J, Hagler D, Reinisch C, editors. *Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems*. 12th ed. St. Louis, MO: Mosby; 2023:18-20.
2. Billioux A, Verlander K, Anthony S, Alley D. Standardized Screening for Health-Related Social Needs in Clinical Settings: the Accountable Health Communities Screening Tool. [Internet] National Academy of Sciences. 2017 May Accessed at: <https://nam.edu/>. [accessed 2025 Sep 12]
3. Addressing social determinants of health. In: Perez R, editor. *CMSA's Integrated Case Management*. 2nd ed. Springer Publishing Company LLC; 2023:62-75.
4. Sandel M, et al. Unstable housing and caregiver and child health in renter families. *Pediatrics* 2018;14(2):e20172199. DOI: 10.1542/peds.2017-2199.
5. Children's HealthWatch Survey. Screening Instrument [Internet] Children's HealthWatch. 2024 Feb 13 Accessed at: <https://childrenshealthwatch.org/>. [accessed 2025 Mar 31]
6. PRAPARE®: Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences Screening Tool. 2.0 [Internet] Association of Asian Pacific Community Health Organizations (AAPCHO) and National Association of Community Health Centers (NACHC). 2025 Accessed at: <https://prapare.org/the-prapare-screening-tool/>. [accessed 2025 Sep 08]
7. Cook JT, et al. A brief indicator of household energy security: associations with food security, child health, and child development in US infants and toddlers. *Pediatrics* 2008;122(4):e867-75. DOI: 10.1542/peds.2008-0286.
8. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Medical Care* 2003;41(11):1284-92. DOI: 10.1097/01.MLR.0000093487.78664.3C.

## Tachycardia absent

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

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## Codes

**ICD-10 Diagnosis:** M05.011, M05.012, M05.019, M05.611, M05.612, M05.619, M05.711, M05.712, M05.719, M05.811, M05.812, M05.819, M06.011, M06.012, M06.019, M12.511, M12.512, M12.519, M12.811, M12.812, M12.819, M12.9, M13.111, M13.112, M13.119, M19.011, M19.012, M19.019, M19.111, M19.112, M19.119, M19.211, M19.212, M19.219, M80.011A, M80.012A, M80.019A, M80.811A, M80.812A, M80.819A, M84.311A, M84.312A, M84.319A, M84.411A, M84.412A, M84.419A, M84.511A, M84.512A, M84.519A, M84.611A, M84.612A, M84.619A, M87.011, M87.012, M87.019, M87.021, M87.022, M87.029, M87.121, M87.122, M87.129, M87.221, M87.222, M87.229, M87.321, M87.322, M87.329, M87.821, M87.822, M87.829, M90.511, M90.512, M90.519, M96.621, M96.622, M96.629, M97.31XA, M97.32XA, S42.001A, S42.001B, S42.002A, S42.002B, S42.009A, S42.009B, S42.031A, S42.031B, S42.032A, S42.032B, S42.033A, S42.033B, S42.034A, S42.034B, S42.035A, S42.035B, S42.036A, S42.036B, S42.121A, S42.121B, S42.122A, S42.122B, S42.123A, S42.123B, S42.124A, S42.124B, S42.125A, S42.125B, S42.126A, S42.126B, S42.131A, S42.131B, S42.132A, S42.132B, S42.133A, S42.133B, S42.134A, S42.134B, S42.135A, S42.135B, S42.136A, S42.136B, S42.141A, S42.141B, S42.142A, S42.142B, S42.143A, S42.143B, S42.144A, S42.144B, S42.145A, S42.145B, S42.146A, S42.146B, S42.151A, S42.151B, S42.152A, S42.152B, S42.153A, S42.153B, S42.154A, S42.154B, S42.155A, S42.155B, S42.156A, S42.156B, S42.201A, S42.201B, S42.202A, S42.202B, S42.209A, S42.209B, S42.211A, S42.211B, S42.212A, S42.212B, S42.213A, S42.213B, S42.214A, S42.214B, S42.215A, S42.215B, S42.216A, S42.216B, S42.221A, S42.221B, S42.222A, S42.222B, S42.223A, S42.223B, S42.224A, S42.224B, S42.225A, S42.225B, S42.226A, S42.226B, S42.231A, S42.231B, S42.232A, S42.232B, S42.239A, S42.239B, S42.241A, S42.241B, S42.242A, S42.242B, S42.249A, S42.249B, S42.251A, S42.251B, S42.252A, S42.252B, S42.253A, S42.253B, S42.254A, S42.254B, S42.255A, S42.255B, S42.256A, S42.256B, S42.261A, S42.261B, S42.262A, S42.262B, S42.263A, S42.263B, S42.264A, S42.264B, S42.265A, S42.265B, S42.266A, S42.266B, S42.271A, S42.272A, S42.279A, S42.291A, S42.291B, S42.292A, S42.292B, S42.293A, S42.293B, S42.294A, S42.294B, S42.295A, S42.295B, S42.296A, S42.296B, S42.90XA, S42.90XB, S42.91XA, S42.91XB, S42.92XA, S42.92XB, S49.001A, S49.002A, S49.009A, S49.011A, S49.012A, S49.019A, S49.021A, S49.022A, S49.029A, S49.031A, S49.032A, S49.039A, S49.041A, S49.042A, S49.049A, S49.091A, S49.092A, S49.099A, T84.018A, T84.028A, T84.038A, T84.058A, T84.098A, T84.110A, T84.111A, T84.120A, T84.121A, T84.190A, T84.191A, T84.318A, T84.328A, T84.398A, T84.410A, T84.418A, T84.420A, T84.428A, T84.490A, T84.498A, T84.84XA, T84.89XA, T84.9XXA [Hide]

**ICD-10 Procedure:** 0RRJ008, 0RRJ00Z, 0RRJ07Z, 0RRJ0J8, 0RRJ0JZ, 0RRJ0KZ, 0RRK008, 0RRK00Z, 0RRK07Z, 0RRK0J8, 0RRK0JZ, 0RRK0KZ

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