Shoulder Arthroscopy

ORG: S-1045 (ISC)
Link to Codes

MCG Health
Inpatient & Surgical Care
30th Edition

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Procedure

- Procedure is indicated for **1 or more** of the following: N N N N N N N N N
  - Rotator cuff injury, as indicated by **1 or more** of the following:
    - Acute full-thickness injury, as indicated by **1 or more** of the following:
      - Massive rotator cuff tear[A](1)(17)(19)(20)
      - New inability to externally rotate arm against resistance(20)(21)
      - Inability to elevate arm on physical examination (ie, pseudoparalysis)(20)
      - Disabling limitation of function in affected arm(1)(19)
    - Acute partial-thickness injury due to trauma refractory to nonoperative therapy (eg, NSAIDs, physical therapy) for at least 3 months(1)(3)(19)(20)(22)
    - Chronic partial-thickness or full-thickness injury that requires repair, as indicated by **ALL** of the following:
      - Symptomatic (ie, pain or significant functional impairment)(1)(2)(3)(19)
      - Lack of sufficient improvement after at least 6 weeks of nonoperative therapy (eg, NSAIDs, physical therapy)(1)(2)(3)(19)(22)
    - Irreparable injury[B] and planned arthroscopic balloon placement(23)(24)(25)
    - Revision of prior rotator cuff repair(26)(27)
  - Impingement (eg, on MRI or other imaging) necessitating acromioplasty, as indicated by **ALL** of the following:
    - Pain or significant functional impairment(1)(2)
    - Symptoms refractory to nonoperative therapy for at least 3 months (eg, NSAID use, physical therapy, corticosteroid injection)(1)(2)
  - Osteoarthritis, as indicated by[C] **ALL** of the following(28):
    - Significant pain or functional impairment(1)(4)(5)
    - Symptoms refractory to at least 3 months of nonoperative treatment (eg, activity modification, NSAIDs, physical therapy, corticosteroid injection)(1)(4)(5)(29)
  - Calcific tendinosis with symptoms (eg, pain, secondary bursitis) refractory to at least 6 months of nonoperative management (eg, corticosteroid injection, physical therapy)(1)(2)(30)
  - Adhesive capsulitis release needed, as indicated by **ALL** of the following:
    - Imaging negative for other shoulder pathology (eg, rotator cuff tear) as cause of symptoms(2)(31)(32)

        - Significant functional impairment or pain refractory to 6 months of nonoperative care (eg, corticosteroid injection, physical therapy, arthrographic distention)(2)(31)(32)(33)
    - Anterior glenohumeral instability (eg, Bankart lesion)[D] and **1 or more** of the following:
        - Dislocation, initial or recurrent(1)(6)(16)(34)(35)
        - Instability (laxity or subluxation) and **1 or more** of the following:
            - Risk factors for recurrent subluxation or dislocation (eg, participation in contact sports, hyperlaxity, bipolar bone loss)[E](34)
            - Failed trial of nonoperative therapy(34)
            - Associated fracture of anteroinferior glenoid or bone loss of humerus (Hill-Sachs lesion)(1)(36)(37)
            - Arthroscopic revision surgery necessary (eg, failed prior Bankart or Latarjet procedure)(6)(38)(39)(40)(41)
- Posterior shoulder instability and **1 or more** of the following(1):
    - Symptoms refractory to at least 6 weeks of nonoperative management (eg, physical therapy)[F](42)(43)(44)(45)(46)
    - Anteromedial impression fracture of the humeral head (reverse Hill-Sachs lesion) with cartilage involvement of 20% or more(47)
    - Recurrent dislocation(42)
- Multidirectional glenohumeral instability refractory to at least 3 months of a comprehensive rehabilitation program(1)(48)
- SLAP tear on imaging with symptoms (eg, pain, limited range of motion) refractory to at least 3 months of nonoperative management (eg, physical therapy, corticosteroid injection, NSAIDs)(1)(44)(49)(50)(51)
- Septic arthritis of shoulder(1)(7)(8)(52)(53)
- Fracture amenable to arthroscopic repair (eg, humeral head fracture, glenoid fracture)(1)(54)
- Acromioclavicular joint separation with complete acromioclavicular or coracoclavicular ligament tear(55)(56)
- Humeral or glenoid avulsion of anterior inferior glenohumeral ligament(57)
- Posterior ossification of glenoid (Bennett lesion or "thrower's shoulder") with pain refractory to nonoperative management (eg, structured rehabilitation)(9)(58)
- Suprascapular nerve entrapment with neuropathic pain or strength deficit unresponsive to nonoperative management (eg, ultrasound-guided aspiration and injection of spinoglenoid cyst)(1)(2)(59)
- Subcoracoid impingement with coracohumeral distance of 6 mm or less and pain refractory to nonoperative therapy (eg, rest, physical therapy, anti-inflammatory medications)(10)
- Biceps tendon impingement or tendinitis requiring tenodesis or tenotomy(1)(11)(60)(61)
- Bursitis or crepitus within scapulothoracic joint (snapping scapula) refractory to 3 or more months of nonoperative treatment (eg, analgesics, physical therapy, corticosteroid injection)(62)
- Tumor resection amenable to arthroscopic approach(63)
- Synovectomy, as indicated for **1 or more** of the following(1):
    - Noninfectious renal arthropathy(64)
    - Pigmented villonodular synovitis (also known as diffuse tenosynovial giant cell tumor)(65)
    - Synovial chondromatosis(66)(67)
    - Rheumatoid arthritis(68)
    - Inflammatory disorder with synovial fluid analysis revealing white blood cell count of 2000/mm^3 (2 x10^9/L) or more with neutrophil percentage of 50% or more(69)
    - Hemophilic joint disease(70)
- Osteonecrosis requiring core decompression(71)
- Arthrodesis required for flail shoulder or end-stage shoulder disease(12)
- Release for internal rotation contracture in brachial plexus birth palsy not responsive to nonoperative management (eg, physical therapy, Botox injections)(72)(73)
- Diagnostic arthroscopy of shoulder, as indicated by **ALL** of the following:
    - Presence of significant signs or symptoms (eg, pain, functional impairment, instability)(22)(57)(74)(75)
    - Diagnosis or extent of injury not clear (eg, after examination, imaging)(22)(57)(74)(75)
    - Nonoperative therapy has been tried and failed (eg, analgesics, rest, physical therapy, anti-inflammatory agents).

Alternatives to Procedure

- Alternatives include:
    - Nonoperative treatment, including(19)(29)(76)(77):
        - Immobilization(2)(42)(45)
        - Physical therapy(1)(3)(15)(20)(21)(78)(79)
        - Home exercise program(42)(78)(80)
        - Anti-inflammatory medications, oral and topical(1)(15)(21)(78)
        - Disease-modifying antirheumatic drugs for rheumatoid arthritis(81)
        - Corticosteroid injections(1)(3)(15)(21)(32)(82)
        - Hyaluronic acid injections(3)
        - Tyrosine kinase inhibitor (eg, pexidartinib) for diffuse tenosynovial giant cell tumor (also known as pigmented villonodular synovitis)(65)

- Chemical synovectomy (eg, rifampicin joint injection)(70)
- Radiosynovectomy for inflammatory arthritis or hemarthrosis(70)
- Ultrasound-guided percutaneous lavage for calcific tendinosis(83)
- Arthrographic distention for adhesive capsulitis(1)(82)
- Arthrotomy for septic arthritis(84)
- Manipulation under anesthesia for adhesive capsulitis or frozen shoulder(32)(33)(82)
- Hemiarthroplasty. See Shoulder Hemiarthroplasty ISC guideline.(4)(5)
- Total or reverse total shoulder arthroplasty. See Shoulder Arthroplasty ISC guideline.(1)(3)(4)(5)(85)
- Open or arthroscopic-assisted open approach for shoulder surgery. See Musculoskeletal Surgery or Procedure GRG GRG. (2)(3)(86)(87)

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
1	• Social Determinants of Health Assessment • OR to recovery room to discharge[G] • Discharge planning	• **Hemodynamic stability** • **Pain absent or managed** • **No evidence of new neurologic impairment** • **No evidence of postoperative or surgical site infection** • **Discharge plans and education understood**	• **Ambulatory or acceptable for next level of care[H]**	• **Oral hydration[I]** • **Oral medications or regimen acceptable for next level of care** • **Oral diet or acceptable for next level of care** • IV fluids, medications for procedure	• Immobilizer or sling	• Multimodal analgesia • Possible tranexamic acid[J]

(1)(2)(90)(91)N

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(92):

- Failure to meet discharge criteria (recovery milestones in Optimal Recovery Course)(93)(94)
  - Expect brief stay extension.
- Septic joint(1)(7)(52)(53)(95)
  - Expect brief stay extension.
- Complications of procedure (eg, air embolism, hematoma, biceps rupture, acromial fracture, axillary nerve injury, deltoid detachment)(1)(96)(97)(98)(99)
  - Expect brief stay extension.

See Common Complications and Conditions ISC for further information.

Discharge

Discharge Planning

- Discharge planning includes[K]:
  - Assessment of needs and planning for care, including(101)(102):
    - 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(103)(104):
      - Neurovascular status assessment
      - Pain management(3)
      - Wound or dressing management
  - Early identification of anticipated discharge destination; options include(102)(105):
    - Home; considerations include:
      - Home safety assessment. See Home Safety Assessment SR for further information.
      - Patient safe to go home; examples include(106)(107)(108):
        - 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(102)(105)(109):
    - Patient and caregiver education complete.
      - See Teach-Back Tool SR for further information.
      - See Shoulder Arthroscopy: Patient Education for Clinicians SR for further information.
    - Medication reconciliation completion includes(110)(111):
      - 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)(112)
      - 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(113):
    - Inpatient care and service providers
    - Primary care provider
    - All post-discharge care and service providers
  - Appointments planned or scheduled, which may include(1):
    - Primary care provider(114)
    - Orthopedic surgeon
    - Rehabilitation therapy services(115)
    - Specialists for management of comorbidities as needed(116)
    - Other
  - Outpatient testing and procedure plans made, which may include:
    - Bone densitometry(117)
    - Other
  - Referrals made for assistance or support, which may include:
    - Financial, for follow-up care, medication, and transportation(118)
    - Self-help or support groups(119)
    - Tobacco use treatment(120)
    - Other
  - Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
    - Immobilizers (eg, braces, splints)(2)(3)(104)
    - Wound care equipment and supplies(121)
    - Other

Discharge Destination

- Post-hospital levels of admission may include:
  - Home.
  - Home healthcare. See Home Care Indications for Admission Section HC in Shoulder Arthroscopy guideline in Home Care.

Evidence Summary

Criteria

The evidence for the clinical indications found in this guideline includes 68 published peer reviewed articles, 1 specialty society or other evidence-based guideline, 1 Cochrane systematic review, and 4 book sections.

For rotator cuff injuries, an orthopedic surgery textbook notes that chronic partial-thickness or full-thickness tears should be treated arthroscopically if nonoperative therapy has failed.(1)(2) **(EG 2)** This textbook notes that arthroscopic treatment is appropriate for acute rotator cuff injuries in young patients or older patients with new inability to rotate the arm externally against resistance.(2) **(EG 2)** A specialty society guideline states that operative treatment of small to medium full-thickness rotator cuff tears results in significant improvement in patient-reported outcomes.(3) **(EG 2)**

For impingement (eg, on MRI or other imaging), osteoarthritis, calcific tendinosis, or adhesive capsulitis that has not responded to nonoperative therapy, an orthopedic surgery textbook supports arthroscopic repair or treatment for patients with significant pain or functional impairment.(1)(2) **(EG 2)** Narrative reviews support arthroscopic management of glenohumeral osteoarthritis for patients who are 50 years of age or younger.(4)(5) **(EG 2)**

For glenohumeral instability, an orthopedic surgery textbook supports arthroscopic repair for anterior instability (eg, Bankart lesion) for dislocation or for high-risk patients.(1) **(EG 2)** An orthopedic surgery textbook supports arthroscopic management for posterior or multidirectional glenohumeral instability or for SLAP tears that are refractory to nonoperative management.(1)(2) **(EG 2)** For unidirectional or multidirectional instability, a narrative review supports arthroscopy as an appropriate treatment option.(6) **(EG 2)**

For septic arthritis of the shoulder, an orthopedic surgery textbook, a systematic review, and a cohort study support arthroscopy for drainage and debridement.(1)(7)(8) **(EG 2)**

For posterior ossification of the glenoid (ie, Bennett lesion or "thrower's shoulder"), subcoracoid impingement refractory to nonoperative management, or biceps tendon impingement or tendinitis, an orthopedic surgery textbook supports arthroscopic treatment.(1)(2) **(EG 2)** A narrative review supports arthroscopic resection of symptomatic posteroinferior glenoid lesions.(9) **(EG 2)** A narrative review supports arthroscopic treatment of subcoracoid impingement if symptoms are refractory to conservative management and there is a

thoracohumeral distance of 6 mm or less on imaging.(10) **(EG 2)** A systematic review supports arthroscopic biceps tenodesis for patients with biceps tendon impingement that fails nonoperative management.(11) **(EG 2)**

For suprascapular nerve entrapment or bursitis or crepitus within the scapulothoracic joint (snapping scapula), an orthopedic surgery textbook supports arthroscopic treatment for cases that are refractory to nonoperative treatment.(1)(2) **(EG 2)**

For flail shoulder or end-stage shoulder disease, a narrative review supports arthroscopy for arthrodesis for patients with end-stage glenohumeral joint disease, including patients with brachial plexus injuries, chronic instability with rotator cuff or deltoid dysfunction, and failed shoulder arthroplasty.(12) **(EG 2)**

A systematic review and meta-analysis of 6 randomized trials (626 patients in total, mean age 66 years) in patients with degenerative rotator cuff tear found that both surgical repair and arthroscopic subacromial decompression resulted in clinically insignificant improvement in outcomes over nonoperative treatment.(13) **(EG 1)** A systematic review and meta-analysis of 8 studies including 1062 patients with rotator cuff disease (excluding full-thickness rotator cuff tears) and painful subacromial impingement found high-certainty evidence that subacromial decompression was not associated with improvement in pain, shoulder function, or health-related quality of life at 1-year follow-up.(14) **(EG 1)** A subspecialty society guideline concludes with moderate-strength evidence that the routine use of acromioplasty as a concomitant treatment for patients with small-sized to medium-sized full-thickness rotator cuff tears is not supported as compared with arthroscopic repair alone.(3) **(EG 2)** Another guideline panel concludes that, in patients with atraumatic shoulder pain for 3 or more months, surgical subacromial decompression has not been shown to improve pain, function, or quality of life and would therefore not be recommended.(15) **(EG 2)**

A meta-analysis of 6 studies, encompassing 348 patients (mean age 23.7 years) with first-time anterior shoulder dislocation due to glenohumeral instability randomized to surgical labrum stabilization (78% arthroscopic) or nonoperative joint immobilization with subsequent physical therapy, found that patients undergoing surgical repair had less recurrent instability over both short-term (6 studies, 348 patients; 6.5% vs 44% at 2 to 3 years, risk ratio (RR) 0.15, 95% confidence interval (CI) 0.08 to 0.27) and long-term (3 studies, 171 patients; 15% vs 65% at 5 to 12 years, RR 0.23, 95% CI 0.14 to 0.39) follow-up.(16) **(EG 1)** In the same study, the need for subsequent surgery was also lower after surgical repair over both short-term (5 studies, 272 patients; 4.5% vs 25.2%, RR 0.19, 95% CI 0.09 to 0.43) and long-term (3 studies, 171 patients; 5.8% vs 40.7%, RR 0.17, 95% CI 0.07 to 0.39) follow-up.(16) **(EG 1)**

Length of Stay

Analysis of procedure data for a commercially insured pediatric population shows 99% of patients undergoing shoulder arthroscopy were discharged the day of or the day after surgery.(90) **(EG 3)** Analysis of procedure data for a commercially insured adult population shows 99% of patients undergoing shoulder arthroscopy were discharged the day of or the day after surgery.(90) **(EG 3)** Analysis of procedure data for a Medicare-insured population shows 99% of patients undergoing shoulder arthroscopy were discharged the day of or the day after surgery.(90) **(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(122); 42 CFR 419.22(123); 42 CFR 422.101(124)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(125); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(126); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(127); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(128)

Medicare Coverage Determinations: Medicare Coverage Database(129)

References

1. Phillips BB, Brolin TJ. Arthroscopy of the upper extremity. In: Azar FM, Beaty JH, editors. Campbell's Operative Orthopaedics. 14th ed. Philadelphia, PA: Elsevier; 2021:2663-2755.e10. [Context Link 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39]
2. Miller RH III, Azar FM, Throckmorton TW. Shoulder and elbow injuries. In: Azar FM, Beaty JH, editors. Campbell's Operative Orthopaedics. 14th ed. Philadelphia, PA: Elsevier; 2021:2374-2425.e8. [Context Link 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18]
3. American Academy of Orthopaedic Surgeons. Management of Rotator Cuff Injuries. Evidence-Based Clinical Practice Guidelines [Internet] American Academy of Orthopaedic Surgeons. 2025 Accessed at: https://www.orthoguidelines.org/. [accessed 2025 Sep 04] [Context Link 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]
4. Colasanti CA, Lin CC, Simovitch RW, Virk MS, Zuckerman JD. International consensus statement on the management of glenohumeral arthritis in patients = 50 years old. Journal of Shoulder and Elbow Surgery 2023;32(7):e329-e342. DOI: 10.1016/j.jse.2023.01.009. [Context Link 1, 2, 3, 4, 5, 6] View abstract...
5. Carver DC, Brolin TJ. Arthroscopic management of glenohumeral arthritis. Orthopedic Clinics of North America 2019;50(4):521-528. DOI: 10.1016/j.ocl.2019.05.007. [Context Link 1, 2, 3, 4, 5] View abstract...
6. Friedman LGM, Lafosse L, Garrigues GE. Global perspectives on management of shoulder instability: decision making and treatment. Orthopedic Clinics of North America 2020;51(2):241-258. DOI: 10.1016/j.ocl.2019.11.008. [Context Link 1, 2, 3] View abstract...
7. 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, 3] View abstract...
8. Upfill-Brown A, et al. Lower risk of revision surgery after arthroscopic versus open irrigation and debridement for shoulder septic arthritis. Journal of the American Academy of Orthopedic Surgeons 2022;30(23):e1504-e1514. DOI: 10.5435/JAAOS-D-22-00428. [Context Link 1, 2] View abstract...
9. Vo AM, Rogers KM, Bonner KF. Arthroscopic resection of symptomatic Bennett lesions. Arthroscopy Techniques 2019;8(12):e1463-e1467. DOI: 10.1016/j.eats.2019.07.031. [Context Link 1, 2] View abstract...
10. McKernan MJ, Schickendantz MS, Frangiamore SJ. Diagnosis and management of subcoracoid impingement. Journal of the American Academy of Orthopedic Surgeons 2021;29(3):100-107. DOI: 10.5435/JAAOS-D-20-00008. [Context Link 1, 2] View abstract...
11. Hurley DJ, Hurley ET, Pauzenberger L, Lim Fat D, Mullett H. Open compared with arthroscopic biceps tenodesis: a systematic review. Journal of Bone and Joint Surgery Reviews 2019;7(5):e4. DOI: 10.2106/JBJS.RVW.18.00086. [Context Link 1, 2] View abstract...
12. Abboud JA, Cronin KJ. Shoulder arthrodesis. Journal of the American Academy of Orthopedic Surgeons 2022;30(16):e1066-e1075. DOI: 10.5435/JAAOS-D-21-00667. [Context Link 1, 2] View abstract...
13. Schemitsch C, et al. Surgical repair versus conservative treatment and subacromial decompression for the treatment of rotator cuff tears: a meta-analysis of randomized trials. Bone and Joint Journal 2019;101-B(9):1100-1106. DOI: 10.1302/0301-620X.101B9.BJJ-2018-1591.R1. [Context Link 1] View abstract...
14. Karjalainen TV, et al. Subacromial decompression surgery for rotator cuff disease. Cochrane Database of Systematic Reviews 2019, Issue 1. Art. No.: CD005619. DOI: 10.1002/14651858.CD005619.pub3. [Context Link 1] View abstract...
15. Vandvik PO, et al. Subacromial decompression surgery for adults with shoulder pain: a clinical practice guideline. British Medical Journal 2019;364:l294. DOI: 10.1136/bmj.l294. [Context Link 1, 2, 3, 4] View abstract...
16. Alkhatib N, Abdullah ASA, AlNouri M, Ahmad Alzobi OZ, Alkaramany E, Ishibashi Y. Short- and long-term outcomes in Bankart repair vs. conservative treatment for first-time anterior shoulder dislocation: a systematic review and meta-analysis of randomized controlled trials. Journal of Shoulder and Elbow Surgery 2022;31(8):1751-1762. DOI: 10.1016/j.jse.2022.02.032. [Context Link 1, 2, 3, 4] View abstract...
17. Guadagno K, Srikumaran U, Huish EG, Best MJ. Massive rotator cuff tears: algorithmic approach to surgical treatment. Annals of Joint 2023;8:38. DOI: 10.21037/aoj-23-7. [Context Link 1, 2] View abstract...
18. Schumaier A, et al. Defining massive rotator cuff tears: a Delphi consensus study. Journal of Shoulder and Elbow Surgery 2020;29(4):674-680. DOI: 10.1016/j.jse.2019.10.024. [Context Link 1] View abstract...
19. Moran TE, Werner BC. Surgery and rotator cuff disease: a review of the natural history, indications, and outcomes of nonoperative and operative treatment of rotator cuff tears. Clinics in Sports Medicine 2023;42(1):1-24. DOI: 10.1016/j.csm.2022.08.001. [Context Link 1, 2, 3, 4, 5, 6, 7] View abstract...
20. Keener JD, Patterson BM, Orvets N, Chamberlain AM. Degenerative rotator cuff tears: refining surgical indications based on natural history data. Journal of the American Academy of Orthopedic Surgeons 2019;27(5):156-165. DOI: 10.5435/JAAOS-D-17-00480. [Context Link 1, 2, 3, 4, 5, 6] View abstract...
21. Jain NB, Khazzam MS. Degenerative rotator-cuff disorders. New England Journal of Medicine 2024;391(21):2027-2034. DOI: 10.1056/NEJMcp1909797. [Context Link 1, 2, 3, 4] View abstract...
22. Bi AS, Morgan AM, O'Brien M, Waterman BR, Strauss EJ, Golant A. Partial-thickness rotator cuff tears: current concepts. Journal of Bone and Joint Surgery Reviews 2024;12(8):Online. DOI: 10.2106/JBJS.RVW.24.00063. [Context Link 1, 2, 3, 4] View abstract...
23. Berk AN, et al. Outcomes of subacromial balloon spacer implantation for irreparable rotator cuff tears: a systematic review and meta-analysis. Journal of Shoulder and Elbow Surgery 2023;32(10):2180-2191. DOI: 10.1016/j.jse.2023.04.016. [Context Link 1, 2] View abstract...
24. Kunze KN, et al. High rate of clinically meaningful achievement in outcomes after subacromial balloon spacer implantation for massive irreparable rotator cuff tears: a systematic review and meta-analysis. American Journal of Sports Medicine 2024;52(1):286-294. DOI: 10.1177/03635465231155916. [Context Link 1] View abstract...
25. Levy KH, et al. Subacromial balloon spacer implantation is a promising alternative for patients with massive irreparable rotator cuff tears: a systematic review. Arthroscopy 2024;40(1):162-173.e2. DOI: 10.1016/j.arthro.2023.05.028. [Context Link 1] View abstract...

26. MacLean IS, Brockmeier SF. Failed and revision rotator cuff repair. Clinics in Sports Medicine 2023;42(1):141-155. DOI: 10.1016/j.csm.2022.08.006. [Context Link 1] View abstract...
27. Brochin RL, Zastrow R, Hussey-Andersen L, Parsons BO, Cagle PJ. Revision rotator cuff repair: a systematic review. Journal of Shoulder and Elbow Surgery 2020;29(3):624-633. DOI: 10.1016/j.jse.2019.06.023. [Context Link 1] View abstract...
28. 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]
29. Farrell G, Watson L, Devan H. Current evidence for nonpharmacological interventions and criteria for surgical management of persistent acromioclavicular joint osteoarthritis: A systematic review. Shoulder and Elbow 2019;11(6):395-410. DOI: 10.1177/1758573219840673. [Context Link 1, 2, 3] View abstract...
30. Bechay J, Lawrence C, Namdari S. Calcific tendinopathy of the rotator cuff: a review of operative versus nonoperative management. Physician and Sportsmedicine 2020;1-6. DOI: 10.1080/00913847.2019.1710617. [Context Link 1] View abstract...
31. Barlow J, Mundy AC, Jones GL. Stiff shoulder. In: Miller MD, Thompson SR, editors. DeLee, Drez & Miller's Orthopaedic Sports Medicine. 5th ed. Philadelphia, PA: Elsevier; 2020:579-591.e2. [Context Link 1, 2]
32. Rupani N, Gwilym SE, BESS Frozen Shoulder Working Group. British Elbow and Shoulder Society patient care pathway: Frozen shoulder. Shoulder and Elbow 2025;17585732251335955. DOI: 10.1177/17585732251335955. [Context Link 1, 2, 3, 4] View abstract...
33. Redler LH, Dennis ER. Treatment of adhesive capsulitis of the shoulder. Journal of the American Academy of Orthopedic Surgeons 2019;27(12):e544-e554. DOI: 10.5435/JAAOS-D-17-00606. [Context Link 1, 2] View abstract...
34. Marcaccio SE, Kaarre J, Steuer F, Herman ZJ, Lin A. Anterior glenohumeral instability: clinical anatomy, clinical evaluation, imaging, nonoperative and operative management, and postoperative rehabilitation. Journal of Bone and Joint Surgery. American Volume 2025;107(1):81-92. DOI: 10.2106/JBJS.24.00340. [Context Link 1, 2, 3, 4, 5] View abstract...
35. Abdel Khalik H, Lameire DL, Leroux T, Bhandari M, Khan M. Arthroscopic stabilization surgery for first-time anterior shoulder dislocations: a systematic review and meta-analysis. Journal of Shoulder and Elbow Surgery 2024;33(8):1858-1872. DOI: 10.1016/j.jse.2024.01.037. [Context Link 1] View abstract...
36. Ahmed AF, et al. Higher return to sport and lower revision rates when performing arthroscopic Bankart repair with remplissage for anterior shoulder instability with a Hill-Sachs lesion: a meta-analysis. Journal of Shoulder and Elbow Surgery 2024;33(8):1836-1846. DOI: 10.1016/j.jse.2024.01.045. [Context Link 1] View abstract...
37. Weisberg Z, Cole W, Rumps MV, Vopat B, Mulcahey MK. Bony Bankart lesion: diagnosis, management, and outcomes. Journal of Bone and Joint Surgery Reviews 2024;12(5):Online. DOI: 10.2106/JBJS.RVW.23.00200. [Context Link 1] View abstract...
38. Waterman BR, Leroux T, Frank RM, Romeo AA. The evaluation and management of the failed primary arthroscopic Bankart repair. Journal of the American Academy of Orthopedic Surgeons 2020;28(15):607-616. DOI: 10.5435/JAAOS-D-17-00077. [Context Link 1] View abstract...
39. Karpyshyn J, Ma J, Wong I. Current evidence and techniques for arthroscopic bone augmentation. Clinics in Sports Medicine 2024;43(4):661-682. DOI: 10.1016/j.csm.2024.03.023. [Context Link 1] View abstract...
40. Sarna N, Dhillon J, Maguire JA, Scillia AJ, Kraeutler MJ. Surgical options and clinical outcomes following a failed Latarjet procedure: a systematic review. Journal of Shoulder and Elbow Surgery 2024;33(12):2850-2858. DOI: 10.1016/j.jse.2024.07.031. [Context Link 1] View abstract...
41. Arner JW, Ruzbarsky JJ, Bradley JP, Provencher MT. Management of complex and revision anterior shoulder instability. Arthroscopy 2022;38(5):1396-1397. DOI: 10.1016/j.arthro.2022.03.009. [Context Link 1] View abstract...
42. Hurley ET, et al. Posterior shoulder instability, part I-diagnosis, nonoperative management, and labral repair for posterior shoulder instability-an international expert Delphi consensus statement. Arthroscopy 2025;41(2):166-180.e11. DOI: 10.1016/j.arthro.2024.04.035. [Context Link 1, 2, 3, 4, 5] View abstract...
43. Ralph JE, et al. Outcomes of arthroscopic stabilization for posterior shoulder instability: a systematic review. Journal of Shoulder and Elbow Surgery 2024;Online. DOI: 10.1016/j.jse.2024.04.006. [Context Link 1] View abstract...
44. Sheean AJ, Kibler WB, Conway J, Bradley JP. Posterior labral injury and glenohumeral instability in overhead athletes: current concepts for diagnosis and management. Journal of the American Academy of Orthopedic Surgeons 2020;28(15):628-637. DOI: 10.5435/JAAOS-D-19-00535. [Context Link 1, 2] View abstract...
45. Kay J, Heyworth BE, Milewski MD, Kramer DE. Pediatric and adolescent shoulder instability. Current Reviews in Musculoskeletal Medicine 2023;16(7):263-273. DOI: 10.1007/s12178-023-09837-z. [Context Link 1, 2] View abstract...
46. Garret J, Gunst S, Gauci MO. Posterior shoulder instability. Orthopaedics & Traumatology, Surgery & Research : OTSR 2025;111(1S):104061. DOI: 10.1016/j.otsr.2024.104061. [Context Link 1] View abstract...
47. van der List JP, Glover MA, Mason TW, Parikh N, Waterman BR. Low recurrence of instability and satisfying patient-reported outcomes following various surgical treatments of reverse Hill-Sachs lesions in the setting of posterior instability: a systematic review. Arthroscopy 2024;40(7):2083-2095. DOI: 10.1016/j.arthro.2023.12.012. [Context Link 1] View abstract...
48. Hippensteel KJ, Uppstrom TJ, Rodeo SA, Warren RF. Comprehensive review of multidirectional instability of the shoulder. Journal of the American Academy of Orthopedic Surgeons 2023;31(16):871-880. DOI: 10.5435/JAAOS-D-22-00983. [Context Link 1] View abstract...
49. Ernat JJ, Yheulon CG, Shaha JS. Arthroscopic repair of 270- and 360-degree glenoid labrum tears: a systematic review. Arthroscopy 2020;36(1):307-317. DOI: 10.1016/j.arthro.2019.07.027. [Context Link 1] View abstract...
50. Sullivan S, Hutchinson I, Curry EJ, Marinko L, Li X. Surgical management of type II superior labrum anterior posterior lesions: a review of outcomes and prognostic indicators. Physician and Sportsmedicine 2019;47(4):375-386. DOI: 10.1080/00913847.2019.1607601. [Context Link 1] View abstract...

51. Patino JM. Superior labral anterior and posterior (SLAP) lesions of the long bicep insertion on the glenoid: management in athletes. International Orthopaedics 2022;46(6):1351-1360. DOI: 10.1007/s00264-022-05385-2. [Context Link 1] View abstract...
52. Spaans AJ, Donders CML, Bessems JHJMG, van Bergen CJA. Aspiration or arthrotomy for paediatric septic arthritis of the shoulder and elbow: a systematic review. EFORT Open Reviews 2021;6(8):651-657. DOI: 10.1302/2058-5241.6.200122. [Context Link 1, 2] View abstract...
53. Li Y, et al. Descriptive epidemiology of upper extremity septic arthritis in children-review of a retrospective multicenter database. Journal of Pediatric Orthopedics 2023;43(1):46-50. DOI: 10.1097/BPO.0000000000002266. [Context Link 1, 2] View abstract...
54. Su F, Tangtiphaiboontana J, Kandemir U. Management of greater tuberosity fracture dislocations of the shoulder. JSES Reviews, Reports, and Techniques 2024;4(3):578-587. DOI: 10.1016/j.xrrt.2023.07.007. [Context Link 1] View abstract...
55. Aliberti GM, Kraeutler MJ, Trojan JD, Mulcahey MK. Horizontal instability of the acromioclavicular joint: A systematic review. American Journal of Sports Medicine 2020;48(2):504-510. DOI: 10.1177/0363546519831013. [Context Link 1] View abstract...
56. Pill SG, et al. Systematic review of the treatment of acromioclavicular joint disruption comparing number of tunnels and graft type. Journal of Shoulder and Elbow Surgery 2020;29(7S):S92-S100. DOI: 10.1016/j.jse.2020.04.008. [Context Link 1] View abstract...
57. O'Reilly OC, Andrews KA, Siparsky PN. Understanding the glenoid avulsion of the glenohumeral ligaments as a cause of shoulder instability: surgical and postsurgical management. Arthroscopy Techniques 2019;8(10):e1153-e1158. DOI: 10.1016/j.eats.2019.06.001. [Context Link 1, 2, 3] View abstract...
58. Freehill MT, Mannava S, Higgins LD, Ladermann A, Stone AV. Thrower's exostosis of the shoulder: a systematic review with a novel classification. Orthopaedic Journal of Sports Medicine 2020;8(7):Online. DOI: 10.1177/2325967120932101. [Context Link 1] View abstract...
59. Strauss EJ, Kingery MT, Klein D, Manjunath AK. The evaluation and management of suprascapular neuropathy. Journal of the American Academy of Orthopedic Surgeons 2020;28(15):617-627. DOI: 10.5435/JAAOS-D-19-00526. [Context Link 1] View abstract...
60. Belk JW, Kraeutler MJ, Houck DA, Chrisman AN, Scillia AJ, McCarty EC. Biceps tenodesis versus tenotomy: a systematic review and meta-analysis of level I randomized controlled trials. Journal of Shoulder and Elbow Surgery 2021;30(5):951-960. DOI: 10.1016/j.jse.2020.11.012. [Context Link 1] View abstract...
61. Frantz TL, et al. Biceps tenodesis for superior labrum anterior-posterior tear in the overhead athlete: a systematic review. American Journal of Sports Medicine 2021;49(2):522-528. DOI: 10.1177/0363546520921177. [Context Link 1] View abstract...
62. Baldawi H, et al. Diagnosis and treatment of snapping scapula syndrome: a scoping review. Sports Health 2022;14(3):389-396. DOI: 10.1177/19417381211029211. [Context Link 1] View abstract...
63. Ge SM, Marwan Y, Abduljabbar FH, Morelli M, Turcotte RE. Arthroscopic management of intra- and juxta-articular osteoid osteoma of the upper extremity: a systematic review of the literature. European Journal of Orthopaedic Surgery and Traumatology 2020;30(8):1333-1344. DOI: 10.1007/s00590-020-02710-6. [Context Link 1] View abstract...
64. Coleman SH, Madsen M, Di Carlo EF, Sullivan JF, Wickiewicz TL. Arthroscopic synovectomy for the management of shoulder arthropathy in chronic renal dialysis patients. Journal of Shoulder and Elbow Surgery 2003;12(2):144-147. DOI: 10.1067/mse.2003.30. [Context Link 1] View abstract...
65. Stacchiotti S, et al. Best clinical management of tenosynovial giant cell tumour (TGCT): A consensus paper from the community of experts. Cancer Treatment Reviews 2023;112:Online. DOI: 10.1016/j.ctrv.2022.102491. [Context Link 1, 2] View abstract...
66. Guo B, et al. Clinical outcomes of arthroscopic treatment for shoulder synovial chondromatosis: a case series. Journal of Shoulder and Elbow Surgery 2025;DOI: 10.1016/j.jse.2025.03.014. [Context Link 1] View abstract...
67. Park JP, Marwan Y, Alfayez SM, Burman ML, Martineau PA. Arthroscopic management of synovial chondromatosis of the shoulder: a systematic review of literature. Shoulder and Elbow 2022;14(1 Suppl):5-15. DOI: 10.1177/1758573220977205. [Context Link 1] View abstract...
68. Arner JW, Ruzbarsky JJ, Millett PJ. Comprehensive arthroscopic management of shoulder arthritis. Arthroscopy 2022;38(4):1035-1036. DOI: 10.1016/j.arthro.2022.01.033. [Context Link 1] View abstract...
69. Deane KD, Pisetsky DS. Laboratory testing in the rheumatic diseases. In: Goldman L, Cooney KA, editors. Goldman-Cecil Medicine. 27th ed. Elsevier; 2024:1712-1716.e1. [Context Link 1]
70. Rodriguez-Merchan EC. Synovitis in hemophilia: preventing, detecting, and treating joint bleeds. Expert Review of Hematology 2023;1-10. DOI: 10.1080/17474086.2023.2209717. [Context Link 1, 2, 3] View abstract...
71. Le Coz P, Herve A, Thomazeau H. Surgical treatments of atraumatic avascular necrosis of the shoulder. Morphologie 2021;105(349):155-161. DOI: 10.1016/j.morpho.2021.02.007. [Context Link 1] View abstract...
72. Ramirez R, Modrak M, Pathak N, Rose Hill EJ, Lattanza L. Arthroscopic subscapularis release and external rotation tendon transfer for brachial plexus birth palsy: surgical technique. Sports Medicine and Arthroscopy Review 2025;33(1):2-6. DOI: 10.1097/JSA.0000000000000416. [Context Link 1] View abstract...
73. Massamba Vuvu T, Dorniol M, Le Nen D, Thepaut M, Brochard S, Pons C. Effect of arthroscopic shoulder release on shoulder mobility and bone deformity following brachial plexus birth injury: a systematic review and meta-analysis. Journal of Shoulder and Elbow Surgery 2021;30(10):2428-2437. DOI: 10.1016/j.jse.2020.12.021. [Context Link 1] View abstract...
74. Akgun D, et al. Diagnostic arthroscopy for detection of periprosthetic infection in painful shoulder arthroplasty. Arthroscopy 2019;35(9):2571-2577. DOI: 10.1016/j.arthro.2019.03.058. [Context Link 1, 2] View abstract...
75. Spagna G, Endell D, Scheibel M, Moroder P. Benefits and limitations of diagnostic shoulder arthroscopy for painful anatomical shoulder arthroplasty investigation. JSES Reviews, Reports, and Techniques 2025;In Press, Journal Pre-proof:DOI: 10.1016/j.xrrt.2025.06.011. [Context Link 1, 2]
76. Forsythe B, et al. Efficacy of arthroscopic surgery in the management of adhesive capsulitis: a systematic review and network meta-analysis of randomized controlled trials. Arthroscopy 202;37(7):2281-2297. DOI: 10.1016/j.arthro.2020.09.041. [Context Link 1] View abstract...

77. Kukkonen J, et al. Operative versus conservative treatment of small, nontraumatic supraspinatus tears in patients older than 55 years: over 5-year follow-up of a randomized controlled trial. Journal of Shoulder and Elbow Surgery 2021;30(11):2455-2464. DOI: 10.1016/j.jse.2021.03.133. [Context Link 1] View abstract...

78. Karjalainen TV, Jain NB, Heikkinen J, Johnston RV, Page CM, Buchbinder R. Surgery for rotator cuff tears. Cochrane Database of Systematic Reviews 2019, Issue 12. Art. No.: CD013502. DOI: 10.1002/14651858.CD013502. [Context Link 1, 2, 3] View abstract...

79. Pieters L, et al. An update of systematic reviews examining the effectiveness of conservative physiotherapy interventions for subacromial shoulder pain. Journal of Orthopaedic and Sports Physical Therapy 2019;1-33. DOI: 10.2519/jospt.2020.8498. [Context Link 1] View abstract...

80. Petersson AH, Bjornsson Hallgren HC, Adolfsson LE, Holmgren TM. No need for subacromial decompression in responders to specific exercise treatment: a 10-year follow-up of a randomized controlled trial. Journal of Shoulder and Elbow Surgery 2025;34(6):e477-e487. DOI: 10.1016/j.jse.2024.10.027. [Context Link 1] View abstract...

81. Smolen JS, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2022 update. Annals of the Rheumatic Diseases 2023;82(1):3-18. DOI: 10.1136/ard-2022-223356. (Reaffirmed 2025 May) [Context Link 1] View abstract...

82. Rex SS, et al. Effectiveness of interventions for the management of primary frozen shoulder : a systematic review of randomized trials. Bone and Joint Open 2021;2(9):773-784. DOI: 10.1302/2633-1462.29.BJO-2021-0060.R1. [Context Link 1, 2, 3] View abstract...

83. Dumoulin N, et al. Factors associated with clinical improvement and the disappearance of calcifications after ultrasound-guided percutaneous lavage of rotator cuff calcific tendinopathy: a post hoc analysis of a randomized controlled trial. American Journal of Sports Medicine 2021;49(4):883-891. DOI: 10.1177/0363546521992359. [Context Link 1] View abstract...

84. Nudelman BM, Piple AS, Ferkel RD. Arthroscopy is at least as effective as arthrotomy for treatment of septic arthritis in adults: a systematic review of large and intermediate Jjints. American Journal of Sports Medicine 2025;3635465241285878. DOI: 10.1177/03635465241285878. [Context Link 1] View abstract...

85. Lopez R, et al. Early postoperative pain is similar after arthroscopic rotator cuff repair vs. short-stay shoulder arthroplasty: a prospective study. Journal of Shoulder and Elbow Surgery 2025;34(5):1199-1207. DOI: 10.1016/j.jse.2024.08.031. [Context Link 1] View abstract...

86. Haratian A, et al. Open stabilization procedures of the shoulder in the athlete: indications, techniques, and outcomes. Open Access Journal of Sports Medicine 2021;12:159-169. DOI: 10.2147/OAJSM.S321883. [Context Link 1] View abstract...

87. Sacolick DA, Williams RR, Wu SJ, Kraeutler MJ, McCulloch PC. Surgical treatment of anterior glenohumeral instability: a historical review. Journal of Shoulder and Elbow Surgery 2024;33(12):2766-2779. DOI: 10.1016/j.jse.2024.07.029. [Context Link 1] View abstract...

88. Belk JW, McCarty EC, Houck DA, Dragoo JL, Savoie FH, Thon SG. Tranexamic acid use in knee and shoulder arthroscopy leads to improved outcomes and fewer hemarthrosis-related complications: a systematic review of level I and II studies. Arthroscopy 2021;37(4):1323-1333. DOI: 10.1016/j.arthro.2020.11.051. [Context Link 1] View abstract...

89. Goldstein K, Jones C, Kay J, Shin J, de Sa D. Tranexamic acid administration in arthroscopic surgery is a safe adjunct to decrease postoperative pain and swelling: a systematic review and meta-analysis. Arthroscopy 2022;38(4):1366-1377.e9. DOI: 10.1016/j.arthro.2021.10.001. [Context Link 1] View abstract...

90. Proprietary health insurance data sources (2023-2024); and Medicare 5% Standard Analytical File (2022-2023). [Context Link 1, 2, 3, 4]

91. Toma O, Persoons B, Pogatzki-Zahn E, Van de Velde M, Joshi GP, PROSPECT Working Group collaborators. PROSPECT guideline for rotator cuff repair surgery: systematic review and procedure-specific postoperative pain management recommendations. Anaesthesia 2019;74(10):1320-1331. DOI: 10.1111/anae.14796. [Context Link 1] View abstract...

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

93. Cablay KJ, et al. Total intravenous anesthesia with propofol reduces discharge times compared with inhaled general anesthesia in shoulder arthroscopy: a randomized controlled trial. Journal of Bone and Joint Surgery. American Volume 2024;106(13):1154-1161. DOI: 10.2106/JBJS.23.00954. [Context Link 1] View abstract...

94. Tropf JG, Hoyt BW, Nelson SY, Rabin SE, Tucker CJ. Effect of surgery setting for outpatient shoulder procedures on early postoperative complications in a military population. Journal of Shoulder and Elbow Surgery 2024;Online. DOI: 10.1016/j.jse.2024.04.028. [Context Link 1] View abstract...

95. Voss A, Pfeifer CG, Kerschbaum M, Rupp M, Angele P, Alt V. Post-operative septic arthritis after arthroscopy: modern diagnostic and therapeutic concepts. Knee Surgery, Sports Traumatology, Arthroscopy 2021;29(10):3149-3158. DOI: 10.1007/s00167-021-06525-8. [Context Link 1] View abstract...

96. Dart SE, Anderson GR, Miller MD, Werner BC. Vascular complications in sports surgery: diagnosis and management. Sports Medicine and Arthroscopy Review 2022;30(1):63-75. DOI: 10.1097/JSA.0000000000000343. [Context Link 1] View abstract...

97. Leland DP, et al. Neurological complications following arthroscopic and related sports surgery: prevention, work-up, and treatment. Sports Medicine and Arthroscopy Review 2022;30(1):Online. DOI: 10.1097/JSA.0000000000000322. [Context Link 1] View abstract...

98. Nammour M, Desai B, Warren M, Sisco-Wise L. Anterior interosseous nerve palsy after shoulder arthroscopy treated with surgical decompression: a case series and systematic review of the literature. Hand (N Y) 2021;16(2):201-209. DOI: 10.1177/1558944719851192. [Context Link 1] View abstract...

99. Liu SH, Cerri-Droz P, Loyst RA, Komatsu DE, Wang ED. Shoulder arthroscopy in elderly patients: malnutrition and early postoperative outcomes. JSES International 2024;8(1):41-46. DOI: 10.1016/j.jseint.2023.08.023. [Context Link 1] View abstract...

100. 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...

101. 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...

102. 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]
103. Management of patients with musculoskeletal disorders. In: Hinkle JL, Cheever KH, Overbaugh KJ, editors. Brunner & Suddarth's Textbook of Medical-Surgical Nursing. 15th ed. Wolters Kluwer; 2022:1113-1151. [Context Link 1]
104. 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, 2]
105. 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]
106. 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]
107. 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]
108. Transition of care. In: Gillingham DC, editor. Foundations of Case Management. Blue Bayou Press; 2021:137-144. [Context Link 1]
109. 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...
110. 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]
111. 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]
112. 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]
113. 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]
114. 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...
115. The intervention. In: Dutton M, editor. Dutton's Orthopaedic Examination, Evaluation, and Intervention. 6th ed. McGraw-Hill Education; 2023:343-368. [Context Link 1]
116. 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]
117. Walsh C. Assessment: musculoskeletal system. 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; 2023:1622-1637. [Context Link 1]
118. Bragg-Underwood T. Family health. In: Nies MA, editor. Community/Public Health Nursing. 8th ed. Elsevier; 2024:404-427. [Context Link 1]
119. Snyder JS, Sump CA. Psychosocial support for the patient. In: Snyder JS, Sump CA, editors. Swearingen's All-in-One Nursing Care Planning Resource. 6th ed. Elsevier; 2024:97-105. [Context Link 1]
120. 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]
121. 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]
122. 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]
123. 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]
124. 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]
125. 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]
126. 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]
127. 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]
128. 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]
129. 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]

Footnotes

[A] Full-thickness tears may be classified based on their size. The Cofield classification describes massive rotator cuff tears as tears greater than 5 cm measured from anterior to posterior or medial to lateral.(1)(17) A consensus of surgeons define a massive rotator cuff tear as a retraction of the tendons to the glenoid rim in either the coronal or axial plane or a tear with 67% or more of the greater tuberosity exposed measured in the sagittal plane.(18) Two narrative reviews support early surgical intervention for full-thickness tears greater than 15 mm.(19)(20) [A in Context Link 1]

[B] A massive tear (tear of greater than 5 cm or complete tear of 2 or more tendons), poor tissue quality, muscular atrophy, or fatty infiltration may render the injury irreparable.(1)(23) [B in Context Link 1]

[C] Arthroscopic procedures to treat glenohumeral arthritis may include synovectomy, capsular release, axillary nerve release or neurolysis, humeral osteoplasty, osteophyte resection, microfracture, osteochondral allograft, biological resurfacing, loose body removal, subacromial decompression, or biceps tenodesis.(4)(28) Arthroscopic procedures to treat acromioclavicular joint osteoarthritis include distal clavicle resection.(1)(29) [C in Context Link 1]

[D] A meta-analysis of 6 studies, encompassing 348 patients with first-time anterior shoulder dislocation due to glenohumeral instability randomized to surgical repair (78% arthroscopic) or nonoperative care, found that patients undergoing surgical repair were almost 7 times less likely to have recurrent shoulder instability and were 5 times less likely to require subsequent shoulder surgery over 2 to 3 years of follow-up.(16) [D in Context Link 1]

[E] A narrative review states that a trial of nonoperative management of instability is usually most appropriate for low-demand patients, such as elderly individuals or patients not participating (currently or likely in the future) in contact sports.(34) For a patient who participates in high-risk sports, the decision concerning a trial of nonoperative treatment necessitates consideration of individual patient preferences. A second event after nonoperative treatment carries the risk of worse outcomes compared with surgical treatment after the first event.(34) [E in Context Link 1]

[F] A Delphi consensus of 71 international sports and shoulder surgeons agree with strong consensus that, if a patient is undergoing nonoperative management for posterior shoulder instability, a minimum trial of 6 to 8 weeks should be tried before undergoing surgical fixation unless there is an interim dislocation.(42) [F in Context Link 1]

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

[H] Patient is ambulatory or near baseline activity for age and development. [H in Context Link 1]

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

[J] Tranexamic acid administration has been associated with fewer hemarthrosis-related complications.(88)(89) [J in Context Link 1]

[K] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(100) [K in Context Link 1]

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,[A] as indicated by **1 or more** of the following:
  - Hypotension absent in adult patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure greater than or equal to 90 mm Hg[A](1)
    - Mean arterial pressure[B] greater than or equal to 70 mm Hg MAP Calculator[A](1)(2)
    - Blood pressure at patient's baseline (eg, healthy adult with low systolic blood pressure), at intentional therapeutic goal (eg, patient with heart failure), or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)
  - Hypotension absent in pediatric patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure greater than or equal to 110 mm Hg in child 13 to 17 years of age[A](3)
    - Systolic blood pressure greater than or equal to 100 mm Hg in child 6 to 12 years of age[A](3)
    - Systolic blood pressure greater than or equal to 95 mm Hg in child 3 to 5 years of age[A](3)
    - Systolic blood pressure greater than or equal to 90 mm Hg in child 1 or 2 years of age[A](3)
    - Systolic blood pressure greater than or equal to 80 mm Hg in infant 6 to 11 months of age[A](3)
    - Systolic blood pressure greater than or equal to 70 mm Hg in infant 3 to 5 months of age[A](3)
    - Systolic blood pressure greater than or equal to 65 mm Hg in infant 1 or 2 months of age[A](3)
    - Blood pressure at patient's baseline (eg, healthy child with low systolic blood pressure), at intentional therapeutic goal, or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)

References

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

Footnotes

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

B. The mean arterial pressure (MAP) takes into account both SBP and DBP readings.

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,[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

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[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: M00.011, M00.012, M00.019, M00.811, M00.812, M00.819, M00.9, M12.211, M12.212, M12.219, M12.511, M12.512, M12.519, M12.811, M12.812, M12.819, M13.811, M13.812, M13.819, M19.011, M19.012, M19.019, M19.111, M19.112, M19.119, M19.211, M19.212, M19.219, M24.011, M24.012, M24.019, M24.111, M24.112, M24.119, M24.211, M24.212, M24.219, M24.411, M24.412, M24.419, M24.511, M24.512, M24.519, M24.611, M24.612, M24.619, M24.811, M24.812, M24.819, M25.311, M25.312, M25.319, M25.511, M25.512, M25.519, M25.611, M25.612, M25.619, M25.711, M25.712, M25.719, M25.811, M25.812, M25.819, M65.811, M65.812, M65.819, M66.311, M66.312, M66.319, M66.321, M66.322, M66.329, M66.811, M66.812, M66.819, M66.821, M66.822, M66.829, M67.813, M67.814, M67.819, M67.911, M67.912, M67.919, M67.921, M67.922, M67.929, M75.00, M75.01, M75.02, M75.100, M75.101, M75.102, M75.110, M75.111, M75.112, M75.120, M75.121, M75.122, M75.20, M75.21, M75.22, M75.30, M75.31, M75.32, M75.40, M75.41, M75.42, M75.50, M75.51, M75.52, M75.80, M75.81, M75.82, M75.90, M75.91, M75.92, M89.311, M89.312, M89.319, M89.511, M89.512, M89.519, M89.8X1, M94.211, M94.212, M94.219, M94.8X1, S42.141A, S42.142A, S42.143A, S42.251A, S42.252A, S42.253A, S42.291A, S42.292A, S42.293A, S43.001A, S43.002A, S43.003A, S43.004A, S43.005A, S43.006A, S43.011A, S43.012A, S43.013A, S43.014A, S43.015A, S43.016A, S43.021A, S43.022A, S43.023A, S43.024A, S43.025A, S43.026A, S43.081A, S43.082A, S43.083A, S43.084A, S43.085A, S43.086A, S43.101A, S43.102A, S43.109A, S43.121A, S43.122A, S43.129A, S43.401A, S43.402A, S43.409A, S43.421A, S43.422A, S43.429A, S43.431A, S43.432A, S43.439A, S43.491A, S43.492A, S43.499A, S43.50XA, S43.51XA, S43.52XA, S43.80XA, S43.81XA, S43.82XA, S46.001A, S46.002A, S46.009A, S46.011A, S46.012A, S46.019A, S46.021A, S46.022A, S46.029A, S46.091A, S46.092A, S46.099A,

S46.101A, S46.102A, S46.109A, S46.111A, S46.112A, S46.119A, S46.191A, S46.192A, S46.199A, S46.211A, S46.212A, S46.219A, S46.811A, S46.812A, S46.819A, S46.911A, S46.912A, S46.919A, S49.80XA, S49.81XA, S49.82XA [Hide]

ICD-10 Procedure: 0KN74ZZ, 0KN84ZZ, 0LB14ZZ, 0LB24ZZ, 0LM14ZZ, 0LM24ZZ, 0LN14ZZ, 0LN24ZZ, 0LN34ZZ, 0LN44ZZ, 0LQ14ZZ, 0LQ24ZZ, 0LQ34ZZ, 0LQ44ZZ, 0LS34ZZ, 0LS44ZZ, 0LU14KZ, 0LU24KZ, 0MB14ZZ, 0MB24ZZ, 0MD14ZZ, 0MD24ZZ, 0MN14ZZ, 0MN24ZZ, 0MT14ZZ, 0MT24ZZ, 0MT94ZZ, 0MTB4ZZ, 0PB54ZX, 0PB64ZX, 0PB94ZZ, 0PBB4ZZ, 0PBC4ZX, 0PBD4ZX, 0PS744Z, 0PS844Z, 0R9J40Z, 0R9J4ZX, 0R9J4ZZ, 0R9K40Z, 0R9K4ZX, 0R9K4ZZ, 0RBG4ZZ, 0RBH4ZZ, 0RBJ4ZX, 0RBJ4ZZ, 0RBK4ZX, 0RBK4ZZ, 0RCG4ZZ, 0RCH4ZZ, 0RCJ4ZZ, 0RCK4ZZ, 0RJJ4ZZ, 0RJK4ZZ, 0RNG4ZZ, 0RNH4ZZ, 0RNJ4ZZ, 0RNK4ZZ, 0RPJ40Z, 0RPJ44Z, 0RPJ4JZ, 0RPK40Z, 0RPK44Z, 0RPK4JZ, 0RQG4ZZ, 0RQH4ZZ, 0RQJ4ZZ, 0RQK4ZZ, 0RUG47Z, 0RUG4JZ, 0RUG4KZ, 0RUH47Z, 0RUH4JZ, 0RUH4KZ, 0RUJ47Z, 0RUJ4JZ, 0RUJ4KZ, 0RUK47Z, 0RUK4JZ, 0RUK4KZ, 0RWJ40Z, 0RWJ4JZ, 0RWK40Z, 0RWK4JZ [Hide]

CPT®: 29805, 29806, 29807, 29819, 29820, 29821, 29822, 29823, 29824, 29825, 29826, 29827, 29828, 29999

Last Update: 1/25/2026 6:16:04 AM
Build Number: 30.0.2026012500524.025256