CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Shoulder Arthritis

title: “Shoulder Arthritis” slug: shoulder-arthritis region: shoulder audience: patient mesh_terms: [“Arthroplasty, Replacement, Shoulder”, “Osteoarthritis”, “Humeral Head”, “Arthroplasty, Replacement”, “Shoulder”, “Arthritis, Infectious”, “Arthritis”, “Scapula”] article_count: 267 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: ‘2026-06-13T11:05:32+00:00’ key_articles: - title: “Is there sufficient evidence to support intervention to manage shoulder arthritis?” ref_num: 1 evidence_tier: paper evidence_level: 1 doi: 10.1177/1758573215622385 year: 2016 - title: “Shoulder Arthritis in the Young and Active Patient” ref_num: 2 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.csm.2018.07.001 year: 2018 - title: “Outcome and value of reverse shoulder arthroplasty for treatment of glenohumeral osteoarthritis: a matched cohort” ref_num: 3 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jse.2015.01.005 year: 2015 - title: “Glenohumeral osteoarthritis with intact rotator cuff treated with reverse shoulder arthroplasty: a systematic review” ref_num: 4 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2021.06.010 year: 2021 - title: “Editor’s Spotlight/Take 5: Patients With Mild Osteoarthritis Are Less Likely to Achieve a Clinically Important Improvement in Pain or Function After Anatomic Total Shoulder Arthroplasty” ref_num: 5 evidence_tier: paper doi: 10.1097/corr.0000000000002747 year: 2023 - title: “Identification of threshold pathoanatomic metrics in primary glenohumeral osteoarthritis” ref_num: 6 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2021.03.140 year: 2021 - title: “Western Ontario Osteoarthritis of the Shoulder Index (WOOS) - a validation for use in proximal humerus fractures treated with arthroplasty” ref_num: 7 evidence_tier: paper evidence_level: 4 doi: 10.1186/s12891-023-06578-5 year: 2023 - title: “Towards standardised definitions of shoulder arthroplasty complications: a systematic review of terms and definitions” ref_num: 8 evidence_tier: paper evidence_level: 1 doi: 10.1007/s00402-017-2635-9 year: 2017 - title: “Surface replacement arthroplasty for glenohumeral arthropathy in patients aged younger than fifty years: results after a minimum ten-year follow-up” ref_num: 9 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2014.11.035 year: 2015 - title: “Rapidly destructive arthrosis of the shoulder joints: radiographic, magnetic resonance imaging, and histopathologic findings” ref_num: 10 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jse.2014.10.020 year: 2015 - title: “Shoulder Arthroplasty: Prosthetic Options and Indications” ref_num: 11 evidence_tier: paper evidence_level: 5 doi: 10.5435/00124635-200907000-00002 year: 2009 - title: “Radiological changes in shoulder osteoarthritis and pain sensation correlate with patients’ age” ref_num: 12 evidence_tier: paper evidence_level: 3 doi: 10.1186/s13018-022-03137-x year: 2022 - title: “Quantitative assessment and characterization of glenoid bone loss in a spectrum of patients with glenohumeral osteoarthritis” ref_num: 14 evidence_tier: paper evidence_level: 4 doi: 10.1007/s12306-016-0406-3 year: 2016 - title: “Comprehensive Arthroscopic Management of Shoulder Arthritis” ref_num: 15 evidence_tier: paper evidence_level: 4 doi:

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Overview

- Standardization of outcome assessment following treatment of shoulder arthritis is needed [1].
- Shoulder arthritis is common [2].
- Management strategies for shoulder arthritis, especially in young patients, continue to evolve [2].
- Significant improvements in implant design have occurred for shoulder arthritis management [2].
- Implant longevity remains a concern in more active patients with shoulder arthritis [2].
- Reverse shoulder arthroplasty (RSA) provides optimal outcomes with low complication rates across a short term of follow-up for glenohumeral osteoarthritis with an intact rotator cuff [4].
- Patients with glenohumeral osteoarthritis converted intraoperatively to RSA had outcomes comparable to those who underwent total shoulder arthroplasty [3].
- Patients with mild radiographic signs of arthritis have about sevenfold higher odds of failing to achieve the minimum clinically important difference (MCID) after anatomic total shoulder replacement compared to patients with severe arthritis [5].
- The Western Ontario Osteoarthritis of the Shoulder Index (WOOS) is recommended for continued use in shoulder arthroplasty registries and observational studies [7].
- A clear standardized set of shoulder arthroplasty complication definitions is lacking [8].
- Knowledge of the array of shoulder prostheses currently available and their indications, as well as the use of treatment algorithms, can lead to optimized patient outcomes [11].
- Anatomic total shoulder arthroplasty (ATSA) is the benchmark for surgical treatment of glenohumeral arthritis with an intact cuff [18].
- Reverse total shoulder arthroplasty (RTSA) has gained popularity for rotator cuff arthropathy and other complex indications [18].

- Total shoulder arthroplasty did not provide a clinically important advantage over hemiarthroplasty in terms of patient-reported pain, function, nor adverse effects [23].
- The evidence comparing total shoulder arthroplasty to hemiarthroplasty was of low quality [23].
- Both augmented and standard anatomic total shoulder arthroplasty can provide satisfactory and sustained improvements in patient-reported outcomes in patients with acquired glenoid retroversion due to glenohumeral osteoarthritis [25].

Anatomy & Pathophysiology

- Pathoanatomic metrics with identified threshold values can discriminate glenoid types in shoulders with primary glenohumeral osteoarthritis [6].
- Measurement of humeral subluxation in the glenoid hull plane may be more accurate than measurement in the scapular plane [28].
- Scapular kinematics in patients with shoulder arthroplasty are influenced by the implementation of external loads, but not by the type of load [35].
- Scaption kinematics in reverse shoulder arthroplasty do not change after the sixth postoperative month [36].
- Elliptical and spherical humeral heads show similar obligate glenohumeral translation during axial rotation in total shoulder arthroplasty [38].
- Geometric analysis of the prosthetic shoulder is precise [39].
- Reverse total shoulder arthroplasty (RTSA) shoulders maintain the same anterior and posterior deltoid muscle moment-arm patterns as healthy shoulders but exhibit greater intersubject variation and larger moment-arm magnitudes [42].
- In RTSA, a decreased teres minor length could impair force generation even if the external rotation moment arm is higher than in a normal shoulder [43].
- Reverse total shoulder arthroplasty alters humerothoracic, scapulothoracic, and glenohumeral motion during weighted scaption [44].
- Custom, non-spherical prosthetic heads more accurately replicate head shape, rotational range of motion, and glenohumeral joint kinematics compared with commercially available spherical prosthetic heads when compared to the native humeral head [45].
- The scapulothoracic (ST) contribution to overall shoulder movement is significantly increased in patients with well-functioning reverse total shoulder arthroplasty compared with a healthy shoulder [48].
- Shoulders with rotator cuff tears require considerable compensatory deltoid function to prevent abduction motion loss [52].
- Anatomic total shoulder arthroplasty results in tendon-metal contact and higher tendon contact pressures compared to the native shoulder [53].
- The combination of altered resting scapular posture and restricted scapulothoracic range of motion could prohibit glenohumeral rotation required to reach internal rotation in adduction [55].

- Glenosphere configuration can be modified to increase range of movement in reverse shoulder arthroplasty [56].

Classification

- Pathoanatomic metrics with identified threshold values can be used to discriminate glenoid types in shoulders with primary glenohumeral osteoarthritis [6].
- An anatomic pattern of glenoid bone loss exists for different classes of glenohumeral arthritis [14].
- Shoulders presenting with posterior subluxation (B types) remained posteriorly subluxed over a decade [17].
- Concentric arthritis developed an eccentric pattern 20% of the time over a decade [17].
- A 3-dimensional classification system using combined humeroscapular alignment and glenoid erosion can be applied to describe degenerative glenohumeral arthritis comprehensively [37].
- A small lateral extension and less posterior rotation of the acromion is associated with shoulder osteoarthritis and is present in almost all types and subtypes of glenoid morphology [41].
- Osteoarthritic humeral head morphology varies significantly from normal, characterized by larger spherical diameters [58].
- Osteoarthritic humeral head morphology does not vary as a function of the Walch classification between symmetric and asymmetric glenoids [58].

Clinical Presentation

- Shoulder arthritis is a common condition [2].
- Management strategies for shoulder arthritis, particularly in young and active patients, continue to evolve with improvements in implant design, although longevity remains a concern for more active patients [2].
- Patients with mild radiographic signs of arthritis have approximately sevenfold higher odds of failing to achieve the minimum clinically important difference (MCID) after anatomic total shoulder replacement compared to patients with severe arthritis [5].
- Pathoanatomic metrics with identified threshold values can be used to discriminate glenoid types in shoulders with primary glenohumeral osteoarthritis [6].
- Increased age is the main determinant of radiological changes in shoulder osteoarthritis as well as pain [12].
- Rapidly destructive arthrosis of the shoulder joints should be considered in the differential diagnosis of elderly women with insidious shoulder pain [10].
- Shoulders presenting with posterior subluxation (B types) remained posteriorly subluxed, while concentric arthritis developed an eccentric pattern 20% of the time over a decade [17].
- Arthritic B2 glenoids are common, and their maximal erosion is usually posteroinferior [49].

- F-18-FDG PET/CT effectively differentiates septic shoulder arthritis from varying stages of osteoarthritis [21].

Investigations

- Standardization of outcome assessment is needed following treatment of shoulder arthritis [1].
- Pathoanatomic metrics with identified threshold values can discriminate glenoid types in shoulders with primary glenohumeral osteoarthritis [6].
- Rapidly destructive arthrosis should be considered in the differential diagnosis of elderly women with insidious shoulder pain [10].
- Increased age is the main determinant of radiological changes in shoulder osteoarthritis [12].
- Increased age is the main determinant of pain in shoulder osteoarthritis [12].
- There is an anatomic pattern of glenoid bone loss for different classes of glenohumeral arthritis [14].
- F-18-FDG PET/CT effectively differentiates septic shoulder arthritis from varying stages of osteoarthritis [21].
- In healthy/nonosteoarthritic shoulders, increased glenoid retroversion is associated with decreased anterior glenoid offset [32].
- Additional research is required to document the clinical value of new technologies to patients with glenohumeral arthritis [33].
- MRI offers a more precise method of determining glenoid version compared with x-ray imaging for preoperative osseous imaging in total shoulder arthroplasty [57].
- The critical shoulder angle is an effective radiographic parameter associated with rotator cuff tears and osteoarthritis [62].
- Three-dimensional CT reconstruction allows for reliable evaluation of the scapulohumeral relationship in osteoarthritic shoulders [63].
- Osteoarthritic shoulders exhibit significant posterior translation of the humeral head compared to nonpathologic controls [63].
- Posterior translation of the humeral head in osteoarthritic shoulders supports the pathomechanism of glenoid component loosening [63].
- A quantitative method exists to determine the rate of medial migration of the humeral head on plain radiographs after shoulder arthroplasty [66].
- This method for determining medial migration of the humeral head is inexpensive, practical, and reproducible [66].
- Cystic disease in the glenoid did not affect functional outcome after total shoulder arthroplasty with minimum 5-year follow-up [67].
- Cystic disease in the glenoid did not affect the presence of radiographic glenoid loosening after total shoulder arthroplasty with minimum 5-year follow-up [67].

- Three significantly differently oriented posterior erosion patterns (posterior-superior, posterior-central, and posterior-inferior) were distinguished in shoulders demonstrating posterior wear on axillary imaging [68].

Treatment

- Management strategies for shoulder arthritis, particularly in young patients, continue to evolve with significant improvements in implant design, although longevity remains a concern in more active patients [2].
- Nonoperative modalities should be utilized before surgical options for shoulder osteoarthritis, particularly for patients with moderate-to-mild disease [16].
- Surgical treatments like arthroplasty are considered effective for severe cases of shoulder osteoarthritis [16].
- Anatomic total shoulder arthroplasty (ATSA) is the benchmark for surgical treatment of glenohumeral arthritis with an intact rotator cuff [18].
- Reverse total shoulder arthroplasty (RTSA) has gained popularity for rotator cuff arthropathy and other complex indications [18].
- Knowledge of the array of shoulder prostheses currently available, their indications, and the use of treatment algorithms can lead to optimized patient outcomes [11].
- The Comprehensive Arthroscopic Management (CAM) procedure is recommended as a systematic, inclusive approach to the array of pathologies encountered in early glenohumeral arthritis [15].
- Surface replacement arthroplasty (CSRA) provides good long-term symptomatic and functional results in 81.6% of patients aged younger than 50 years with glenohumeral arthropathy [9].
- Total shoulder arthroplasty (TSA) is superior to hemiarthroplasty for treating end-stage glenohumeral arthritis refractory to conservative treatment in patients aged 30 to 50 years, resulting in greater cost savings, fewer revision procedures, and greater quality-adjusted life years (QALYs) gained [64].
- Patients with glenohumeral osteoarthritis converted intraoperatively to reverse shoulder arthroplasty (RSA) had outcomes comparable to those who underwent total shoulder arthroplasty [3].
- Reverse shoulder arthroplasty provides optimal outcomes with low complication rates across a short term of follow-up for glenohumeral osteoarthritis with an intact rotator cuff [4].
- Both augmented and standard anatomic total shoulder arthroplasty can provide satisfactory and sustained improvements in patient-reported outcomes in patients with acquired glenoid retroversion due to glenohumeral osteoarthritis [25].
- Patients undergoing total shoulder arthroplasty with an asymmetric (augmented) glenoid component for osteoarthritis achieve satisfactory mid-term pain relief and improvement in function, although instability is not always corrected [51].
- There was no clinically or statistically significant difference in Oxford Shoulder Score results between groups with and without glenoid cementation in total shoulder arthroplasty for degenerative arthritis [29].

- A polyethylene glenoid with a fluted peg demonstrates significant improvement in patient-reported outcomes at 1 and 2 years post-surgery [27].
- Patients with mild radiographic signs of arthritis have about sevenfold higher odds of failing to achieve the minimum clinically important difference (MCID) after anatomic total shoulder replacement compared to patients with severe arthritis [5].
- The PROMIS Global-10 has limited utility in the evaluation of patients with shoulder arthritis both preoperatively and after total shoulder arthroplasty [34].
- The Western Ontario Osteoarthritis of the Shoulder Index (WOOS) is recommended for continued use in shoulder arthroplasty registries and observational studies [7].
- A clear standardized set of shoulder arthroplasty complication definitions is lacking [8].
- There is a need for standardization of outcome assessment following treatment of shoulder arthritis [1].

Complications

- Longevity of shoulder arthritis implants remains a concern in more active patients [2].
- Total shoulder arthroplasty is associated with high mid-term complication rates due to instability and loosening in B2 glenoids [46].
- Cementless glenoid components are associated with complications such as radiolucent lines, component loosening, and polyethylene wear [26].
- Reverse shoulder arthroplasty provides optimal outcomes with low complication rates across a short term of follow-up for glenohumeral osteoarthritis with an intact rotator cuff [4].
- No case of glenoid loosening occurred at 3 years' follow-up with revision arthroplasty using a hip-inspired computer-assisted design/computer-assisted manufacturing implant for glenoid-deficient shoulders [20].
- Carcinomatous arthritis should be considered when the clinical history is long, symptomatology is atypical, response to treatment is lacking, and X-ray suggests a destructive process [31].
- Physicians and orthopedic surgeons should consider gouty shoulder arthritis when severe erosion is present in patients with a history of gout [61].

Recovery

- Standardization of outcome assessment is needed following treatment of shoulder arthritis [1].
- Implant longevity remains a concern in more active patients with shoulder arthritis [2].
- Patients with glenohumeral osteoarthritis converted intraoperatively to reverse shoulder arthroplasty (RSA) had outcomes comparable to those who underwent total shoulder arthroplasty (TSA) [3].
- Primary anatomic total shoulder arthroplasty (aTSA) and reverse total shoulder arthroplasty (rTSA) patients with osteoarthritis and an intact rotator cuff with no previous history of shoulder surgery had similar clinical and radiographic outcomes at a mean of 41 months follow-up [22].

- Reverse shoulder arthroplasty provides optimal outcomes with low complication rates across a short term of follow-up for glenohumeral osteoarthritis with an intact rotator cuff [4].
- Surface replacement arthroplasty provides good long-term symptomatic and functional results in the treatment of glenohumeral arthropathy in patients aged younger than 50 years in 81.6% of the patients [9].
- Revision arthroplasty with a hip-inspired computer-assisted design/computer-assisted manufacturing implant for glenoid-deficient shoulders resulted in significant improvement in pain and clinical scores at 3 years' follow-up, with no case of glenoid loosening [20].
- Total shoulder arthroplasty with a cementless glenoid component resulted in significant functional improvement but was associated with complications such as radiolucent lines, component loosening, and polyethylene wear [26].
- A polyethylene glenoid with a fluted peg demonstrated significant improvement in patient-reported outcomes at 1 and 2 years post-surgery across a large multicenter cohort of 1,270 individual patients from eleven centers [27].
- Surgeons may consider using reverse arthroplasty in cases of primary shoulder arthritis with a critical shoulder angle of 35 degrees or greater [30].
- Total shoulder arthroplasty with a mini-glenoid component can offer adequate pain relief and functional results at 2-year follow-up in the setting of glenoid bone loss or severe retroversion [59].
- Although significant strength improvement from baseline was observed at 2 years after shoulder arthroplasty, subscapularis strength returned to normal in only a minority of patients [60].
- There is a substantive subgroup with continuing pain and a high rate of glenoid bone erosion after 10 years following humeral head replacement for the treatment of osteoarthritis [69].
- The PROMIS Global-10 has limited utility in the evaluation of patients with shoulder arthritis both preoperatively and after total shoulder arthroplasty [34].

Key Evidence

- [L1] The present review highlights the need for standardization of outcome assessment following treatment of shoulder arthritis. (10.1177/1758573215622385)
- [L5] Shoulder arthritis is common, and management strategies, especially in young patients, continue to evolve with significant improvements in implant design, though longevity remains a concern in more active patients. (10.1016/j.csm.2018.07.001)
- [L3] Patients with glenohumeral osteoarthritis converted intraoperatively to RSA had outcomes comparable to those who underwent total shoulder arthroplasty. (10.1016/j.jse.2015.01.005)
- [L4] Reverse shoulder arthroplasty provides optimal outcomes with low complication rates across a short term of follow-up for glenohumeral osteoarthritis with an intact rotator cuff. (10.1016/j.jse.2021.06.010)
- [Paper] Patients with mild radiographic signs of arthritis have about sevenfold higher odds of failing to achieve the minimum clinically important difference (MCID) after anatomic total shoulder replacement compared to patients with severe arthritis. (10.1097/corr.0000000000002747)

- [L4] Pathoanatomic metrics with the identified threshold values can be used to discriminate glenoid types in shoulders with primary glenohumeral osteoarthritis. (10.1016/j.jse.2021.03.140)
- [L4] The authors recommend the continued use of WOOS in shoulder arthroplasty registries and observational studies. (10.1186/s12891-023-06578-5)
- [L1] A clear standardised set of shoulder arthroplasty complication definitions is lacking. (10.1007/s00402-017-2635-9)
- [L4] CSRA provides good long-term symptomatic and functional results in the treatment of glenohumeral arthropathy in patients aged younger than 50 years in 81.6% of the patients. (10.1016/j.jse.2014.11.035)
- [L4] This condition should be considered in the differential diagnosis of elderly women with insidious shoulder pain. (10.1016/j.jse.2014.10.020)
- [L5] Knowledge of the array of shoulder prostheses currently available and the indications for each, as well as the use of treatment algorithms, can lead to optimized patient outcomes. (10.5435/00124635-200907000-00002)
- [L3] This study shows that increased age is the main determinant of radiological changes in shoulder OA, as well as pain. (10.1186/s13018-022-03137-x)
- [L4] These data demonstrate an anatomic pattern of glenoid bone loss for different classes of glenohumeral arthritis. (10.1007/s12306-016-0406-3)
- [L4] The authors recommend a systematic, inclusive approach to the array of pathologies encountered in the setting of early glenohumeral arthritis: the Comprehensive Arthroscopic Management (CAM) procedure. (10.1016/j.arthro.2022.01.033)
- [L5] The article provides an overview of available treatments for shoulder osteoarthritis, noting that nonoperative modalities should be utilized before surgical options, particularly for patients with moderate-to-mild disease, while surgical treatments like arthroplasty are considered effective for severe cases. (10.1155/2013/370231)
- [L4] Shoulders presenting with posterior subluxation (B types) remained posteriorly subluxed, while concentric arthritis developed an eccentric pattern 20% of the time. (10.1016/j.jse.2020.05.021)
- [L4] At 3 years' follow-up, pain and clinical scores improved significantly and no case of glenoid loosening occurred. (10.1016/j.jse.2013.05.004)
- [L3] F-18-FDG PET/CT effectively differentiates septic shoulder arthritis from varying stages of osteoarthritis. (10.1016/j.jse.2025.01.047)
- [L3] At a mean of 41 month follow-up, primary aTSA and rTSA patients with OA and an intact rotator cuff with no previous history of shoulder surgery had similar clinical and radiographic outcomes. (10.5435/jaaos-d-22-00014)
- [L1] Total shoulder arthroplasty did not provide a clinically important advantage over hemiarthroplasty in terms of patient-reported pain, function, nor adverse effects; however, the evidence on this topic was of low quality. (10.1097/corr.0000000000001523)
- [L3] Both augmented and standard anatomic total shoulder arthroplasty can provide satisfactory and sustained improvements in patient-reported outcomes in patients with acquired glenoid retroversion due to glenohumeral osteoarthritis. (10.1016/j.jse.2021.12.016)

- [L4] The study evaluated midterm clinical and radiographic outcomes of a cementless glenoid component, noting significant functional improvement but highlighting complications such as radiolucent lines, component loosening, and PE wear. (10.1016/j.jse.2012.07.005)
- [L4] The study establishes a benchmark for early clinical value of new glenoid components by demonstrating significant improvement in patient-reported outcomes at 1 and 2 years post-surgery across a large multicenter cohort. (10.1007/s00264-018-4213-3)
- [L4] Measurement in the glenoid hull plane may be more accurate than in the scapular plane. (10.1016/j.jse.2017.01.027)
- [L3] There was no clinically or statistically significant difference in the Oxford Shoulder Score results between the two groups. (10.1016/j.jse.2013.08.022)
- [L3] These data suggest that surgeons may consider using reverse arthroplasty in cases of primary shoulder arthritis with a critical shoulder angle of 35 degrees or greater. (10.1016/j.jse.2021.08.003)
- [Case_report] Carcinomatous arthritis should be considered, even in the absence of any history of cancer, when the clinical history is long, symptomatology is atypical, response to treatment is lacking and X-ray suggests a destructive process. (10.1016/j.otsr.2009.03.019)
- [L4] In healthy/nonosteoarthritic shoulders, an increased glenoid retroversion is associated with a decreased anterior glenoid offset. (10.1016/j.jse.2023.09.031)
- [L4] Additional research is required to document the clinical value of these new technologies to patients with glenohumeral arthritis. (10.2106/jbjs.20.01853)
- [L3] The Global-10 appears to have limited utility in the evaluation of patients with shoulder arthritis both preoperatively and after TSA. (10.1016/j.jse.2020.10.021)
- [L4] Scapular kinematics of patients with shoulder arthroplasty was influenced by implementation of external loads, but not by the type of load. (10.1016/j.clinbiomech.2012.04.009)
- [L4] Scaption kinematics of reverse shoulder arthroplasty do not change after the sixth postoperative month. (10.1016/j.clinbiomech.2018.07.005)
- [L3] The 3D classification system using combined humeroscapular alignment and glenoid erosion can be applied to describe the disease comprehensively. (10.1177/23259671221110512)
- [L5] A gained understanding of the consequences of implant head shape in TSA may guide future surgical implant choice for better recreation of native shoulder kinematics and potentially improved patient outcomes. (10.1186/s12891-023-06273-5)
- [L2] Geometric analysis of the prosthetic shoulder is precise. (10.1007/s00402-012-1580-x)
- [L3] A small lateral extension and less posterior rotation of the acromion is associated with shoulder osteoarthritis and is present in almost all types and subtypes of glenoid morphology. (10.1016/j.jse.2021.01.018)
- [L5] RTSA shoulders maintain the same anterior and posterior deltoid muscle moment-arm patterns as healthy shoulders but show much greater intersubject variation and larger moment-arm magnitudes. (10.1016/j.jse.2015.09.015)

- [L5] Even if TM external rotation moment arm is higher in RTSA than in a normal shoulder, the decreased length could impair its force generation. (10.1016/j.jse.2014.08.019)
- [L5] This commentary highlights that reverse total shoulder arthroplasty alters humerothoracic, scapulothoracic, and glenohumeral motion during weighted scaption, emphasizing the need to integrate biomechanical studies, computer modeling, and dynamic clinical evaluations to develop a roadmap for precision rTSA. (10.1097/corr.0000000000002383)
- [L5] The custom, non-spherical prosthetic head more accurately replicated the head shape, rotational range of motion, and glenohumeral joint kinematics than the commercially available, spherical prosthetic head compared with the native humeral head. (10.1016/j.jse.2013.01.002)
- [L5] Total shoulder arthroplasty may have reasonable short-term results but is associated with high mid-term complication rates due to instability and loosening in B2 glenoids. (10.1016/j.jse.2013.06.017)
- [L4] The ST contribution to overall shoulder movement is significantly increased in patients with an rTSA compared with a healthy shoulder. (10.1016/j.jse.2024.12.018)
- [L4] Arthritic B2 glenoids are common, and their maximal erosion is usually posteroinferior. (10.1016/j.jse.2015.01.007)
- [L4] Patients undergoing total shoulder arthroplasty with an asymmetric glenoid component for osteoarthritis achieve satisfactory mid-term pain relief and improvement in function; however, instability is not always corrected. (10.1007/s11999-007-0104-4)
- [L5] Shoulders with rotator cuff tears require considerable compensatory deltoid function to prevent abduction motion loss. (10.1177/0363546518768276)
- [L5] Anatomic total shoulder arthroplasty results in tendon-metal contact and higher tendon contact pressures compared to the native shoulder. (10.1016/j.jse.2018.04.017)
- [L4] The combination of altered resting scapular posture and restricted scapulothoracic range of motion could prohibit glenohumeral rotation required to reach internal rotation in adduction. (10.1016/j.jse.2022.10.009)
- [L5] Glenosphere configuration can be modified to increase range of movement in reverse shoulder arthroplasty. (10.1302/0301-620x.100b9.bjj-2018-0264.r1)
- [L3] MRI is useful for preoperative osseous imaging for total shoulder arthroplasty because it offers a more precise method of determining glenoid version compared with x-ray imaging. (10.1016/j.jse.2012.10.036)
- [L4] Osteoarthritic humeral head morphology varies significantly from normal, with larger spherical diameters, but does not vary as a function of the Walch classification between symmetric and asymmetric glenoids. (10.1016/j.jse.2015.08.047)
- [L4] At 2-year follow-up, total shoulder arthroplasty with a mini-glenoid component can offer adequate pain relief and functional results in the setting of glenoid bone loss or severe retroversion. (10.1016/j.jse.2015.12.010)
- [L4] Although significant strength improvement from baseline was observed at 2 years after shoulder arthroplasty, subscapularis strength returned to normal in only a minority of patients. (10.1016/j.jse.2014.06.042)

- [Case_report] Physicians and orthopedic surgeons should consider gouty shoulder arthritis when severe erosion is present in patients with a history of gout. (10.1186/s12891-021-04217-5)
- [L4] The CSA is an effective radiographic parameter that is associated with rotator cuff tears and osteoarthritis. (10.1136/jisakos-2018-000255)
- [L4] The study demonstrates that 3D CT reconstruction allows for reliable evaluation of the scapulohumeral relationship, revealing significant posterior translation of the humeral head in osteoarthritic shoulders compared to nonpathologic controls, which supports the pathomechanism of glenoid component loosening. (10.1016/j.jse.2016.02.035)
- [L2] Treatment of end-stage glenohumeral arthritis refractory to conservative treatment in patients 30 to 50 years old in the United States with TSA, instead of hemiarthroplasty, would result in greater cost savings, avoid a substantial number of revision procedures, and result in greater years of satisfactory or excellent patient outcomes and greater QALYs gained. (10.1007/s11999-016-4991-0)
- [L3] This is an inexpensive, practical, and reproducible method that can be used to determine the rate of medial migration of the humeral head on plain radiographs after shoulder arthroplasty. (10.1016/j.jse.2010.03.010)
- [L3] Cystic disease did not affect functional outcome or the presence of radiographic glenoid loosening. (10.1016/j.jse.2017.10.035)
- [L4] Three significantly differently oriented wear patterns (posterior-superior, posterior-central, and posterior-inferior) were distinguished in shoulders demonstrating posterior wear on axillary imaging. (10.1016/j.jse.2021.04.028)
- [L4] However, there is a substantive subgroup with continuing pain and a high rate of glenoid bone erosion after 10 years. (10.1016/j.jse.2017.10.017)

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