

Shoulder & Elbow Registry Improving Orthopaedic Care Through Data

AAOS Shoulder & Elbow Registry Poster Review & Highlights from the 2020 Annual Report

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www.aaos.org/registries/ser

Speaker Introductions

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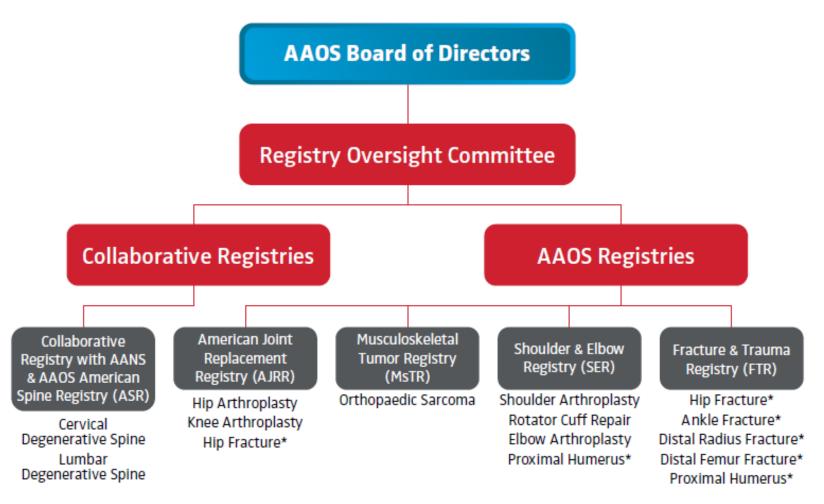


Webinar Agenda

- Shoulder & Elbow Registry overview
- Poster Presentations from SER
 - Trends in the Use of Superior Capsular Reconstruction in the United States using the AAOS Shoulder and Elbow Registry
 - Current Comparative Use of Anatomic and Reverse Shoulder Arthroplasty in the United States
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AAOS Family of Registries







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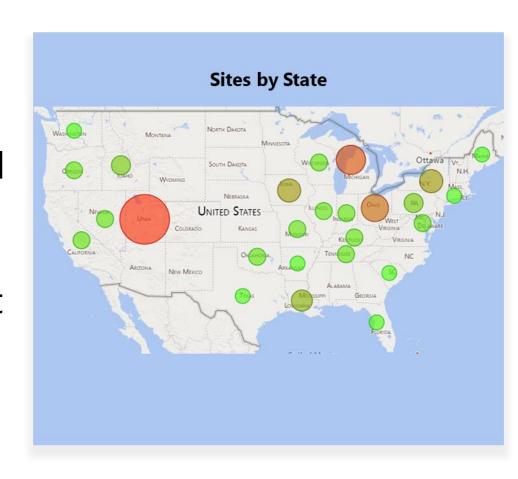
About SER

- Working in collaboration with the specialty societies, the Academy created this Registry to collect shoulder and elbow procedural data across the United States.
- National data allows for establishing survivorship curves, tracking revisions, and improving the quality of patient care.
- Individual data can be accessed and used for performance improvement and quality initiatives on RegistryInsights® for site and surgeon users.



SER Progress

- 136 contracted sites
- Over 17,000
 procedures submitted
 across the US
- Representing over 15,000 unique patient cases



SER Data Element Overview

Procedure

Patient

- · Name, Date of Birth, SSN
- Diagnosis (ICD-10, CPT)
- Gender
- Race/Ethnicity
- Height + Weight/Body Mass Index
- Payer Status

Site of Service

Name and Address (TIN, NPI)

Surgeon

- Name (NPI)
- Trainee

Procedure

- Type (ICD-10, CPT)
- Date of Surgery, Length of Stay
- Surgical Approach
- Surgical Technique
- Laterality
- Implants (Manufacturer, Lot #)
- Anesthesia

Module-specific Procedural Elements

- Shoulder Arthroplasty Module: Includes codes for replacements, revisions, and fractures
- Elbow Arthroplasty Module: Ulnar Nerve Management
- Rotator Cuff Repair Module: Expanded ICD-10 and CPT options for shoulder, including muscle, tendon, and arthroscopy codes

Comorbidities & Complications

- Comorbidities (ICD-10, CPT)
- Height + Weight/Body Mass Index
- Length of Stay
- American Society of Anesthesiologists Score
- Charlson Index
- Operative and Post-operative Complications

Patient-reported Outcome

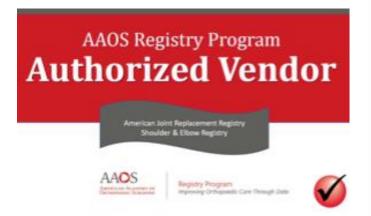
- PROMIS-10 Global
- VR-12
- SANE
- ASES

Three Modules Available

- Shoulder Arthroplasty
- Elbow Arthroplasty
- Rotator Cuff Repair







Decrease Data Collection Burden

- AAOS has partnered with technology vendors to facilitate the data submission process
- Re-use data that already exists in medical record, practice management and PRO systems
- Direct data submission and management can be handled by a technology provider with sites able to fix rejected files



Qualified Clinical Data Registry

- AAOS maintains a QCDR designation
- Specialty society driven participation in the Merit-Incentive Based Payment System (MIPS)
- QCDR provides participants access to Promoting Interoperability (PI) and Quality Payment Program (QPP) credit
- Additional opportunities for alternative reporting for the bundled payment through BPCI-A episodes

Data Reuse Opportunities

Participation in the American Academy of Orthopaedic Surgeons (AAOS) Registry Program offers a wide variety of data reuse opportunities including requirements for quality initiatives and state collaboratives.

- AAOS RegistryInsights® Platform Standard Reports and personalized dashboards
- AAOS RegistryInsights National Benchmarks
- Accreditation Association for Ambulatory Health Care (AAAHC) Advanced Orthopaedic Certification
- Aetna Institutes of Quality (IOQ) Orthopaedic Surgery
- American Board of Neurological Surgery (ABNS) Continuous Certification (CC)
- American Board of Orthopaedic Surgeons (ABOS) Maintenance of Certification (MOC) Program
- BlueCross BlueShield Blue Distinction Specialty Care

- Blue Shield of California waiver of prior authorization
- Bree Collaborative
- CMS Merit-based Incentive Payment System (MIPS) Promoting Interoperability (PI) and Quality Payment Program (QPP)
- Centers for Medicare & Medicaid Services (CMS) Bundled Payments for Care Improvement Advanced (BPCI-A)
- CMS Comprehensive Care for Joint Replacement (CJR) Model
- Cigna Surgical Treatment Support Program
- DNV GL Orthopaedic Center of Excellence
- The Alliance QualityPath
- The Joint Commission Advanced Certification for Total Hip & Knee Replacement
- The Joint Commission Advanced Certification in Spine Surgery (ACSS)



Why Do Sites Participate?



Compare your practice to **national performance** benchmarks



Access to on-demand practice specific quality reports and dashboards



Facilitate tracking and monitoring of **longitudinal** patient outcomes



Facilitate site, practicespecific, payerincentivized performance improvement programs such as Blue Distinction & Centers of Excellence



Qualify for **national distinction programs**such as the Joint
Commission Advanced
Certification & AAAHC



Use for reporting to quality improvement programs such as MIPS, BPCI-A, ABOS MOC & ABNS CC



Early access to surveillance alerts for poorly performing implants



Improve the value of care delivered to Patients

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Trends in the Use of Superior Capsular Reconstruction in the United States using the AAOS Shoulder and Elbow Registry

Brockmeier SF; Garrigues, GE; Kuhn JE; Navarro RA; Sanchez-Sotelo J; St. Pierre P; Weber SC; Williams GR



Background

Superior capsular reconstruction (SCR) has been described as a management option for irreparable rotator cuff tears and over the past seven years has been adopted by many surgeons into their clinical practice.

Purpose

The purpose of this study is to report the frequency and demographic patterns for use of SCR in the US using the AAOS Shoulder and Elbow Registry (AAOS-SER).

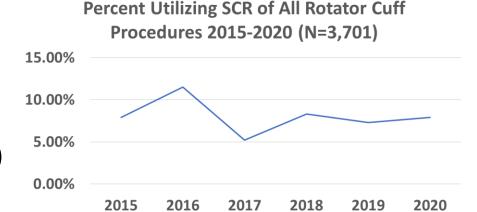


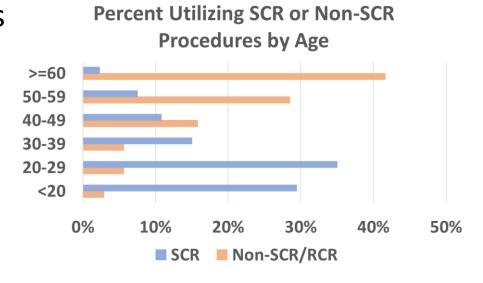
Methods

- All patients treated with a rotator cuff surgery as reported to the rotator cuff module of the AAOS-SER from January 2015 through March 2020 were analyzed.
- Bivariate analyses were performed to compare superior capsular reconstruction (SCR) versus non-SCR (RCR) procedures.
- Bivariate analyses were performed to compare demographic characteristics between the two cohorts.
- Procedural volumes were compared to determine the overall frequency of SCR within the entire cohort of rotator cuff procedures.



- Of the total cohort of patients reported to the AAOS-SER who underwent rotator cuff surgery (3,701), 8.3% (306) were treated with an SCR procedure.
- While the yearly case volume of SCR procedures increased slightly from 2015 to the present, the annual percentage of the overall cohort did not significantly change over that time period







	Tatal Cabant	CCD	Non CCD/DCD	
	Total Cohort	SCR	Non-SCR/RCR	p-value
	(N=3,701)	(N=306)	(N=3,395)	
Age, mean ± SD	54.5 ± 16.1	29.1 ± 13.3	54.6 ± 14.6	<0.0001
Age	N (%)	N (%)	N (%)	<0.0001
<20	187 (5.1%)	90 (29.4%)	97 (2.9%)	
20-29	298 (8.1%)	107 (35%)	191 (5.6%)	
30-39	237 (6.4%)	46 (15%)	191 (5.6%)	
40-49	569 (15.4%)	33 (10.8%)	536 (15.8%)	
50-59	991 (26.8%)	23 (7.5%)	968 (28.5%)	
>=60	1419 (38.3%)	7 (2.3%)	1412 (41.6%)	
Sex	N (%)	N (%)	N (%)	<0.0001
Female	1358 (36.7%)	70 (22.9%)	1288 (37.9%)	
Male	2343 (63.3%)	236 (77.1%)	2107 (62.1%)	
ВМІ	N (%)	N (%)	N (%)	<0.0001
Underweight	28 (0.8%)	4 (0.7%)	24 (1.3%)	
Normal	681 (18.4%)	118 (16.6%)	563 (38.6%)	
Pre-Obesity	1142 (30.9%)	101 (30.7%)	1041 (33%)	
Obesity Class I	779 (21.1%)	35 (21.9%)	744 (11.4%)	
Obesity Class II	397 (10.7%)	26 (10.9%)	371 (8.5%)	
Obesity Class III	287 (7.8%)	7 (8.3%)	280 (2.3%)	
Unknown/Missing	387 (10.5%)	372 (11%)	15 (4.9%)	
Practice setting	N (%)	N (%)	N (%)	0.247
Major	17 (0.5%)	0 (0%)	17 (0.5%)	
Minor	2030 (54.9%)	168 (54.9%)	1862 (54.9%)	
University	1473 (39.8%)	130 (42.5%)	1343 (39.6%)	
Non-teaching	3 (0.1%)	0 (0%)	3 (0.1%)	
Unknown/Missing	178 (4.8%)	8 (2.6%)	170 (5%)	
Hospital Size	N (%)	N (%)	N (%)	0.1138
Small (<100 beds)	3 (0.1%)	0 (0%)	3 (0.1%)	
Medium (100-399 beds)	355 (9.6%)	23 (7.5%)	332 (9.8%)	
Large (400+)	3165 (85.5%)	275 (89.9%)	2890 (85.1%)	
Unknown/Missing	172 (4.8%)	8 (2.6%)	164 (5%)	
· •				



- The average age of the SCR cohort was 29.1 years compared to 54.6 years in the RCR group, which was statistically significant.
- Approximately 90% of SCR patients were under the age of 50 at the time of their procedure compared to only 30% undergoing RCR. Nearly 65% of the SCR cohort was under the age of 30.
- When compared to the RCR group, SCR was performed significantly more commonly in males and in patients with obesity.
- There were no statistical differences noted in the frequency of SCR when comparing practice setting or hospital size.



Discussion

- SCR has gained popularity in the US since 2015, accounting for approximately 8% of all AAOS-SER rotator cuff procedures
- Future registry data will be essential to follow comparative patient reported outcomes for this procedure and to monitor complications and revision rates of SCR, specifically in this very young patient cohort



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Current Comparative Use of Anatomic and Reverse Shoulder Arthroplasty in the United States The AAOS Shoulder and Elbow Registry (AAOS SER)

Sanchez-Sotelo J, Garrigues GE, Weber SC, St. Pierre P, Brockmeier SF, Navarro RA, Kuhn JE, Williams GR



Background

Most published studies on the utilization of anatomic total shoulder arthroplasty (TSA) and reverse shoulder arthroplasty (TSA) have gathered data from large academic institutions. Data collected and analyzed by nationwide registries provide a more accurate snapshot of the current comparative use of TSA and RSA

Purpose

The purpose of this study was to analyze TSA and RSA procedures reported to the AAOS Shoulder and Elbow Registry (SER) over the last five years.

Methods

- January 2015 to March 2020
- 4,155 shoulder arthroplasties reported to AAOS SER
 - Anatomic total shoulder arthroplasty (TSA) 1,538
 - Reverse shoulder arthroplasty (RSA) 2,617
- Stratified by three main diagnosis
 - Cuff-tear arthropathy (CTA) / functionally irreparable rotator cuff tear (FIRCT)
 - Primary osteoarthritis (OA)
 - Proximal humerus fracture (PHFx)
- Further stratification by age, gender, BMI, Charlson Comorbidity Index (CCI), US region and hospital bed count
- Bivariate analyses



- RSA represents 63% of shoulder arthroplasties reported to AAOS SER
 - CTA / FIRCT 98% RSA vs2% hemiarthroplasty
 - OA 54% RSA vs 46%TSA
 - PHFx 93% RSA vs 7% hemiarthroplasty
- Male:female ratios were 57/43 for TSA vs 40/60 for RSA

- 35% patients under 60year-old received RSA
- No major differences amongst
 - United States regions
 - Different size institutions
- 25% of patients receiving shoulder arthroplasty were class II or III obese
- 25% of patients receiving shoulder arthroplasty ha CCI > 2



	Reverse Shoulder Arthroplasty	Total Shoulder Arthroplasty (N=1,538)		
	(N=2,617)			
Sex	N (%)	N (%)		
Female	1,569 (59.95%)	656 (42.65%)		
Male	1,048 (40.05%)	882 (57.35%)		
Age	N (%)	N (%)		
<50	29 (1.11%)	82 (5.33%)		
50-59	170 (6.50%)	287 (18.66%)		
60-69	754 (28.81%)	567 (36.87%)		
70-79	1,213 (46.35%)	485 (31.53%)		
80-89	429 (16.39%)	115 (7.48%)		
>90	22 (0.84%)	2 (0.13%)		
Region	N (%)	N (%)		
Midwest	483 (18.46%)	221 (14.37%)		
Northeast	1,463 (55.90%)	857 (55.72%)		
South	519 (19.83%)	360 (23.41%)		
West	152 (5.81%)	100 (6.50%)		
вмі	N (%)	N (%)		
Underweight	134 (5.12%)	87 (5.66%)		
Normal	406 (15.51%)	191 (12.42%)		
Pre-Obesity	792 (30.26%)	463 (30.10%)		
Obesity Class I	643 (24.57%)	382 (24.84%)		
Obesity Class II	310 (11.85%)	197 (12.81%)		
Obesity Class III	332 (12.69%)	218 (14.17%)		
Charlson Comorbidity Index (CCI)	N (%)	N (%)		
No Comorbidities	1,959 (74.86%)	1,329 (86.41%)		
1	402 (15.36%)	140 (9.10%)		
2	166 (6.34%)	45 (2.93%)		
3+	90 (3.44%)	24 (1.56%)		
Institution Size (Bed count)	N (%)	N (%)		
Small (1-99)	194 (7.51%)	112 (7.50%)		
Medium (100-399)	256 (9.91%)	203 (13.60%)		
Large (400+)	1,896 (73.43%)	1,091 (73.07%)		
Unknown	236 (9.14%)	87 (5.83%)		
Diagnosis	N (%)	N (%)		
Osteoarthritis	1,595 (60.95%)	1,384 (89.99%)		
Cuff tear arthopathy/irreparable cuff	527 (20.14%)	13 (0.85%)		
Fracture	252 (9.63%)	19 (1.24%)		
Other diagnoses	243 (9.29%)	122 (7.94%)		



Discussion

- RSA represented 63% of the shoulder arthroplasties reported to the AAOS SER in the United States over the last 5 years
- RSA has replaced hemiarthroplasty for most of the procedures performed for fracture or cuff-deficient shoulders
- RSA represented 35% of the shoulder arthroplasties performed under the age of 60
- Relative utilization of TSA and RSA seems to be similar across regions and institutions.
- A relatively large proportion of shoulders reported to the AAOS SER were performed in patients with obesity and substantial comorbidities.



Webinar Agenda

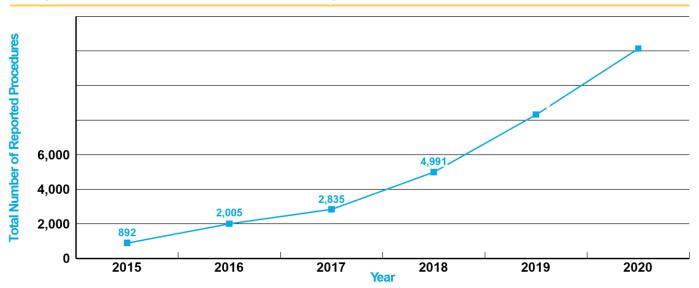
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Overall Results

- 12,139 submitted procedures dating 1/1/2015 12/31/2020
- 177 submitting surgeons
- 112 participating facilities
- 71% of the patients reported are white, including Hispanic

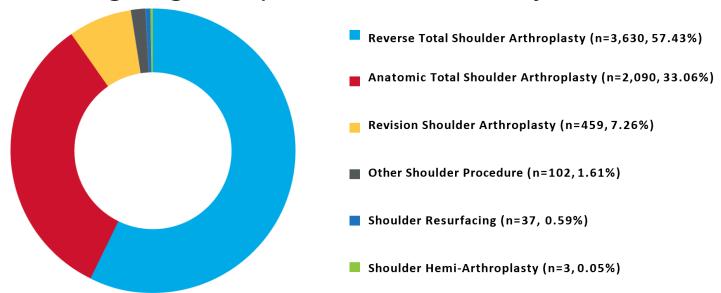
Figure 1.1 Cumulative Procedural Volume by Year, 2015-2020 (N=12,139)





Shoulder Arthroplasty

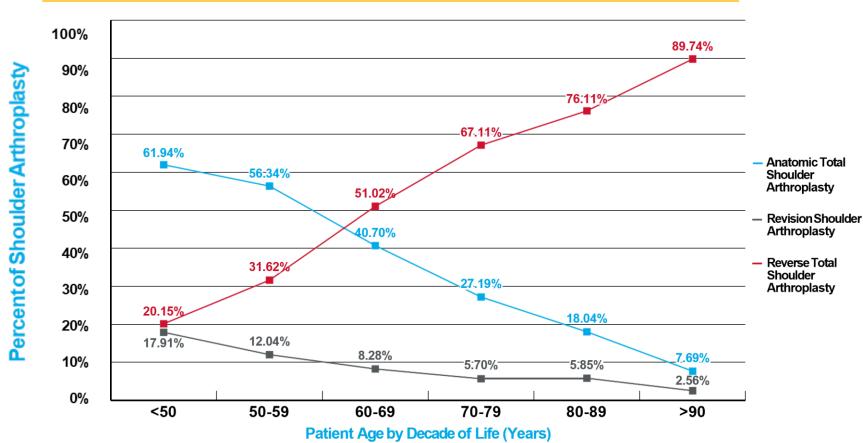
- 6,321 shoulder arthroplasty procedures submitted dating 2015-2020
 - Most were rTSA(57.43%)
 - Average age of patients was 69.82 years





Shoulder Arthroplasty

Figure 2.2 Shoulder Arthroplasty Procedures by Age Group, 2015-2020 (N=6,179)

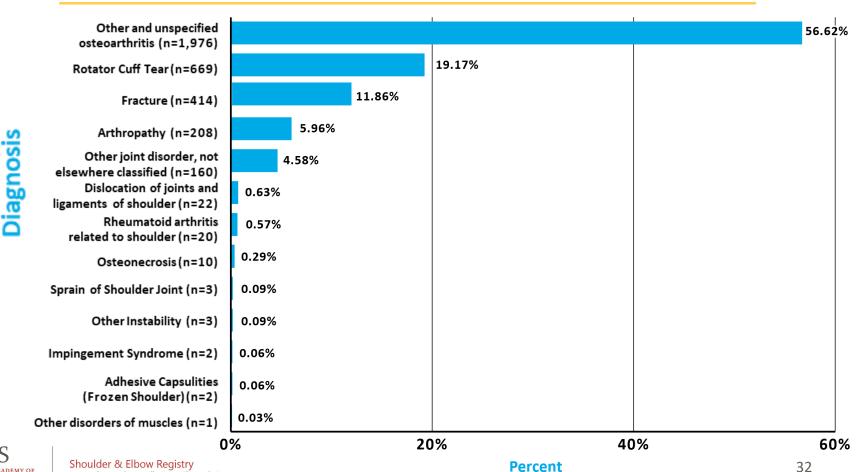




Shoulder Arthroplasty

Improving Orthopaedic Care Through Data

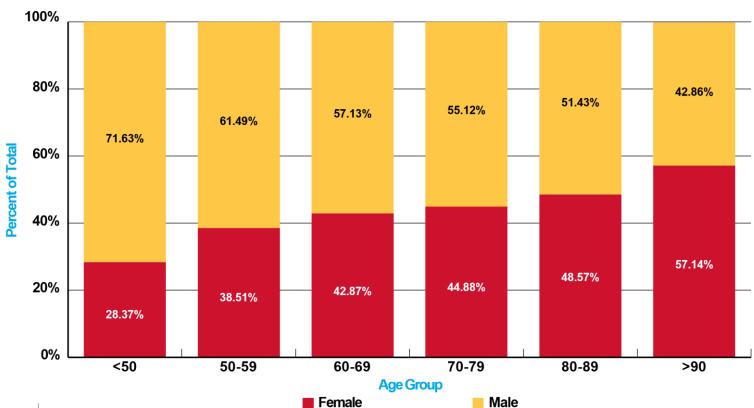
Figure 2.6b Primary Diagnosis of Reverse Total Shoulder Arthroplasty Procedures, 2015-2020 (N=3,490)



Rotator Cuff Repair

• 5,430 rotator cuff repair procedures submitted







Rotator Cuff Repair

Rotator Cuff Procedural Grouping	CPT Code	Frequency	% of Total	Mean Age	SD Age
Arthroscopic Rotator Cuff Repair (N=3,087)	29827	3087	-	-	-
w/ Subacromial Decompression	29826	2441	79 1%	5960	1009
w/ Biceps Tenodesis	29828 or23430	1278	414%	5908	9 75
w/ Distal Clavicle Excision	29824 or23120	668	216%	5969	9 9 0
w/ Debridement	29822 or29823	650	211%	6109	9 6 6
w/ SLAP Repair (Superior Labrum Anterior and Posterior)	29807	63	2 0%	5216	1026
w/ Lysis of Adhesions	29825	45	15%	62 60	8 3 8
w/ Capsulorrhaphy	29806	26	0 8%	5012	1904
w/ Bankart Procedure	23455	3	0 1%	5233	6 6 6
Open Rotator Cuff Repair (CPT 23410 or 23412) (N=93)	23410 or 23412	93	-	-	-
w/ Arthroscopic Debridement	29823 or29822	39	4194%	5564	1312
w/ Distal Clavicle Excision	23120	32	3441%	5878	1048
w/ Biceps Tenodesis	23430	25	26 88%	5760	1099
w/ SLAP Repair	29807	8	8 60%	5275	1071
w/ Bankart Procedure	23455	3	3 23%	46 67	1877
w/ Capsulorrhaphy	29806	2	2 15%	3700	9 9 0
w/ Acromioplasty	23130	1	1 08%	6100	_
Open Rotator Cuff Repair w/ Acromioplasty (Reconstruction of Complete Rotator Cuff Avulsion) (N=169)	23420	169	-	-	-
w/ Distal Clavicle Excision	23120	129	76 33%	6109	991
w/ Arthroscopic Debridement	29824 or29822	122	72 19%	6125	9 65
w/ Biceps Tenodesis	23430	22	13 02%	5845	8 28
w/ SLAP Repair	29807	17	10 06%	5976	8 8 9
w/ Capsulorrhaphy	29806	2	1 18%	6700	1273





Shoulder & Elbow Registry Improving Orthopaedic Care Through Data



Questions?

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www.aaos.org/registries/ser

Contact the AAOS Registry Program

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Registry Analytics Institute: Registry Analytics Institute@aaos.org

Phone: (847) 292-0530

Business Hours: Monday through Friday, 8 a.m. to 4 p.m. Central Time



Webinar Recordings

- Recordings and slide decks from past webinars can be found on <u>this page</u> of the AAOS website.
- If you would like to view a recording of a webinar held before October 2020, please visit learn.aaos.org.





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Thank You!

RegistryInfo@aaos.org

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