AAOS
American Academy of Orthopaedic Surgeons

Shoulder & Elbow Registry
Improving Orthopaedic Care Through Data

AAOS Shoulder & Elbow Registry
Highlights from the 2022 Annual Report

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Grant E. Garrigues, MD, FAAOS

www.aaos.org/registries/ser

Speaker Introductions

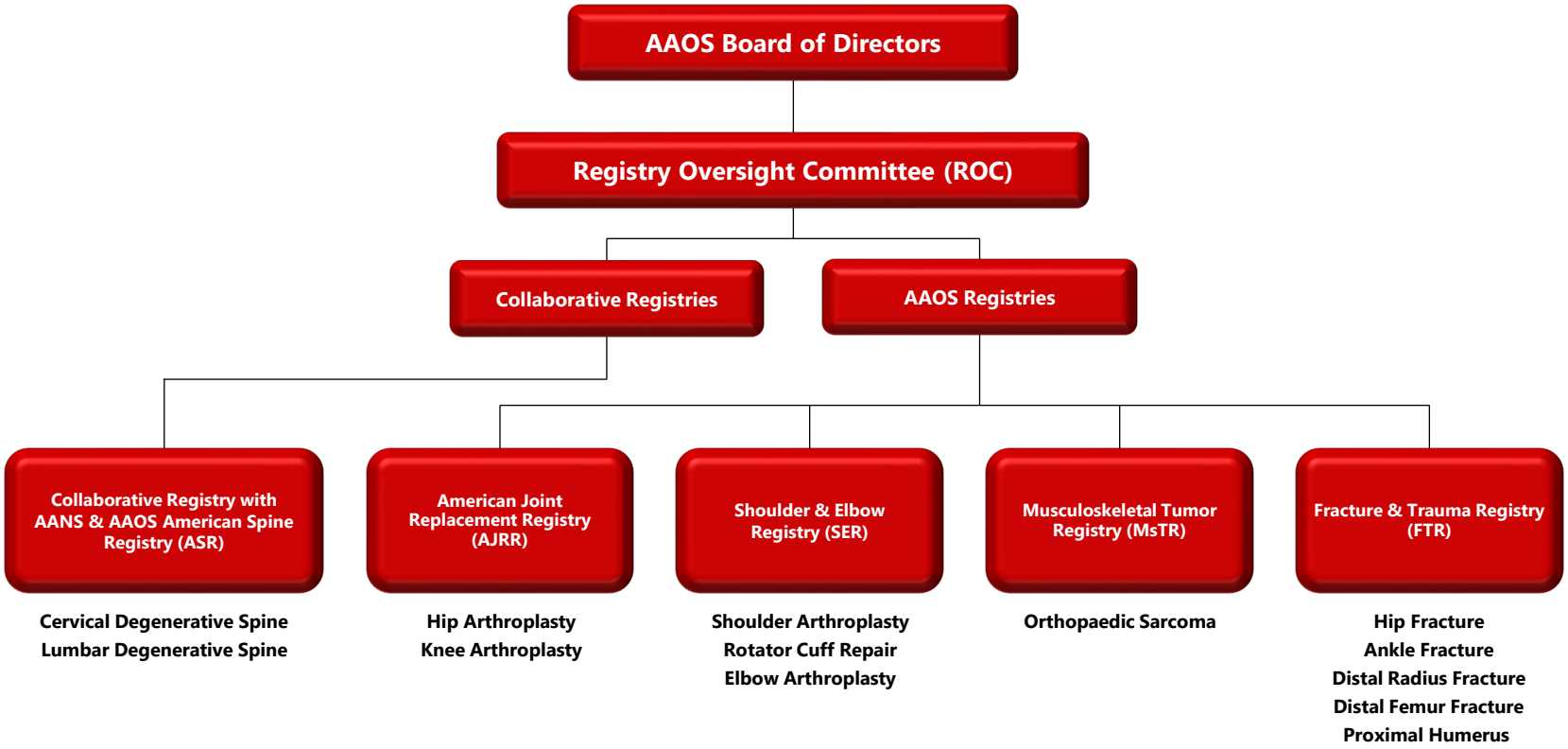
- **Oke A. Anakwenze MD, MBA**
  - Chief of Shoulder Surgery & Associate Profession of Orthopedic Surgery, Duke University Hospital
  - AAOS YP Representative to SER Steering Committee
- **Grant E. Garrigues, MD, FAAOS**
  - Associate Professor & Director of Upper Extremity Research, Rush University/Midwest Orthopaedics at Rush
  - American Shoudler and Elbow Surgeons (ASES) Representative to SER Steering Committee

I (and/or my co-authors) have something to disclose.

All relevant financial relationships have been mitigated.

Detailed disclosure information is available via: AAOS Disclosure Program on the AAOS website at http://www.aaos.org/disclosure

AAOS Family of Registries



SER Steering Committee

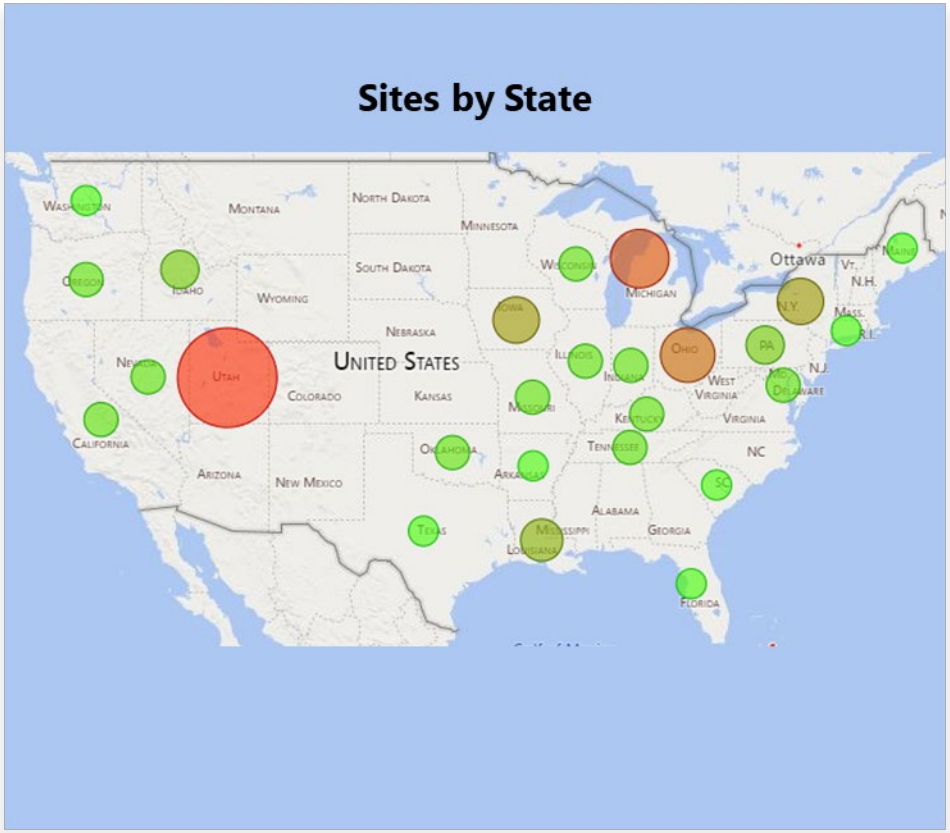
- **Gerald R. Williams Jr., MD, Chair**
  The Rothman Institute
- **Oke A. Anakwenze, MD, MBA**
  Duke University
- **Mark E. Baratz, MD**
  American Society for Surgery of the Hand (**ASSH**) Representative
  Orthopaedic Specialists-UPMC
- **Stephen F. Brockmeier, MD**
  American Orthopaedic Society for Sports Medicine (**AOSSM**) Representative
  University of Virginia
- **Grant E. Garrigues, MD**
  American Shoulder and Elbow Surgeons (**ASES**) Representative
  Midwest Orthopaedics at Rush
- **John E. Kuhn, MD**
  Vanderbilt University Medical Center
- **Ronald A. Navarro, MD**
  Kaiser Permanente South Bay
- **Carolyn M. Hettrich, MD, MPH**
  Brigham and Women's Hospital
- **Joaquin Sanchez-Sotelo, MD**
  Mayo Clinic
- **Richard Seiden, Esq.**
  Public Advisory Board (PAB) Representative
- **Patrick St. Pierre, MD**
  Arthroscopy Association of North America (**AANA**) Representative
  Desert Orthopedic Center
  Eisenhower Health
- **Samuel A. Taylor, MD**
  Hospital for Special Surgery
- **Stephen C. Weber, MD**
  The Johns Hopkins School of Medicine

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

- 140 contracted sites
- Over 20,000 procedures submitted across 40 states
- Representing over 18,000 unique patient cases



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SER Publications

- Current Comparative Use of Anatomic and Reverse Arthroplasty in the United States According to the American Academy of Orthopedic Surgeons (AAOS)
  - Poster presentation at AAOS 2021 Annual Meeting
  - Sanchez-Sotelo J, Garrigues GE, Weber SC, St. Pierre P, Brockmeier SF, Navarro RA, Kuhn JE, Williams GR.
- Off-Label use of Reverse Arthroplasty: The American Academy of Orthopedic Surgeons (AAOS) Shoulder and Elbow Registry (SER)
  - Podium presentation at AAOS 2021 Annual Meeting
  - Kuhn JE, Weber SC, St. Pierre P, Brockmeier SF, Garrigues GE, Navarro RA, Sanchez-Sotelo J, Williams GR.
- Trends in the Use of Superior Capsular Reconstruction in the United States using the AAOS Shouler and Elbow Registry
  - Poster presentation at American Shoulder and Elbow Surgeons 2020 Annual Meeting
  - Brockmeier SF, Garrigues GE, Kuhn JE, Navarro RA, Sanchez-Sotelo J, St. Pierre P, Weber SC, Williams GR.
- Incidence of ATSA vs RTSA in Cuff Intact Osteoarthritis in Males vs Females 70+
  - Podium presentation at International Society of Arthroplasty Registries (ISAR) 2022
  - Navarro RA, Imlay B, Sanchez-Sotelo J, Hettrich C, De A, Weber SC, Anakwenze OA, Brockmeier SF, Garrigues GE, Kuhn JE, St. Pierre P, Taylor SA, Williams GR

- Read more about our publications at aaos.org/registries/publications/

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

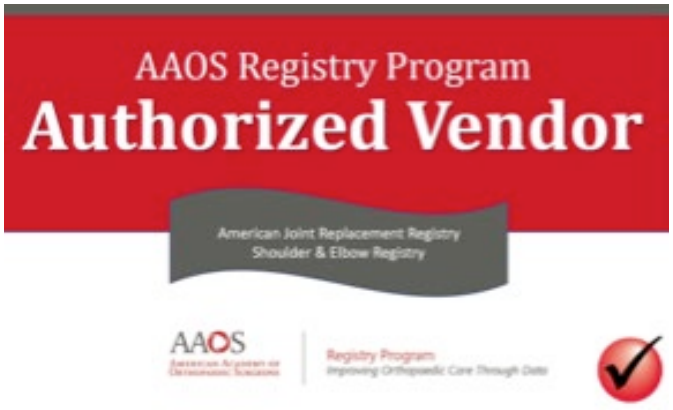
Patient-reported Outcome

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

Three Modules Available

- Shoulder Arthroplasty
- Elbow Arthroplasty
- Rotator Cuff Repair

This page is a summary of the SER data elements and is not all inclusive.



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 Quality Payment Program (QPP) Merit-incentive Based Payment System (MIPS)
- Benefits of QCDR participation:
  - Qualify for MIPS Promoting Interoperability (PI) and Improvement Activities
  - Performance feedback available via the RegistryInsights® dashboards
  - Assistance with MIPS quality measure data submission

Integration of Medicare Data

- Access to **Medicare claims** linked by full identifiers for longitudinal tracking
- Follow outcomes of Registry patients occurring at non-Registry participating institutions
- 2012-2021 Medicare data for all patients represented in the Registry
  - Inpatient claims (148 data elements)
  - Outpatient claims (122 data elements)

Why Do Sites Participate?

Compare your practice to **national performance** benchmarks

Access to on-demand practice specific **reports and dashboards**

Attain certification credits for **ABOS MOC & ABNS CC**

Facilitate site, practice-specific, **payer-incentivized performance improvement** programs such as Aetna IOQ & Blue Distinction

Use for reporting to **quality improvement programs** such as the QPP Merit-based Incentive Payment System (MIPS)

Inform orthopaedic practice & contribute to **orthopaedic advocacy**

Improve the **value of care** delivered to Patients

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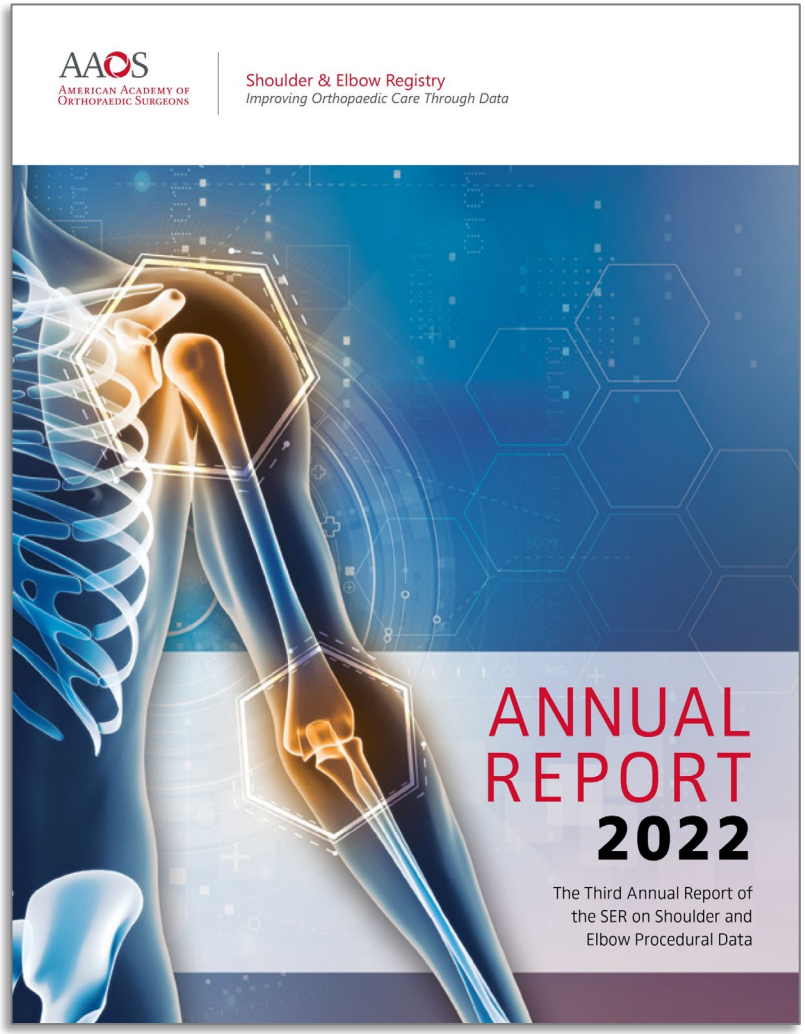
the power of
DATA



Shoulder & Elbow Registry
Third Annual Report

Visit
https://www.aaos.org/registries/publications/ser-annual-report/
to download a copy

Figure 1.1: Cumulative Procedural Volume by Year, 2015-2021 (N=17,617)

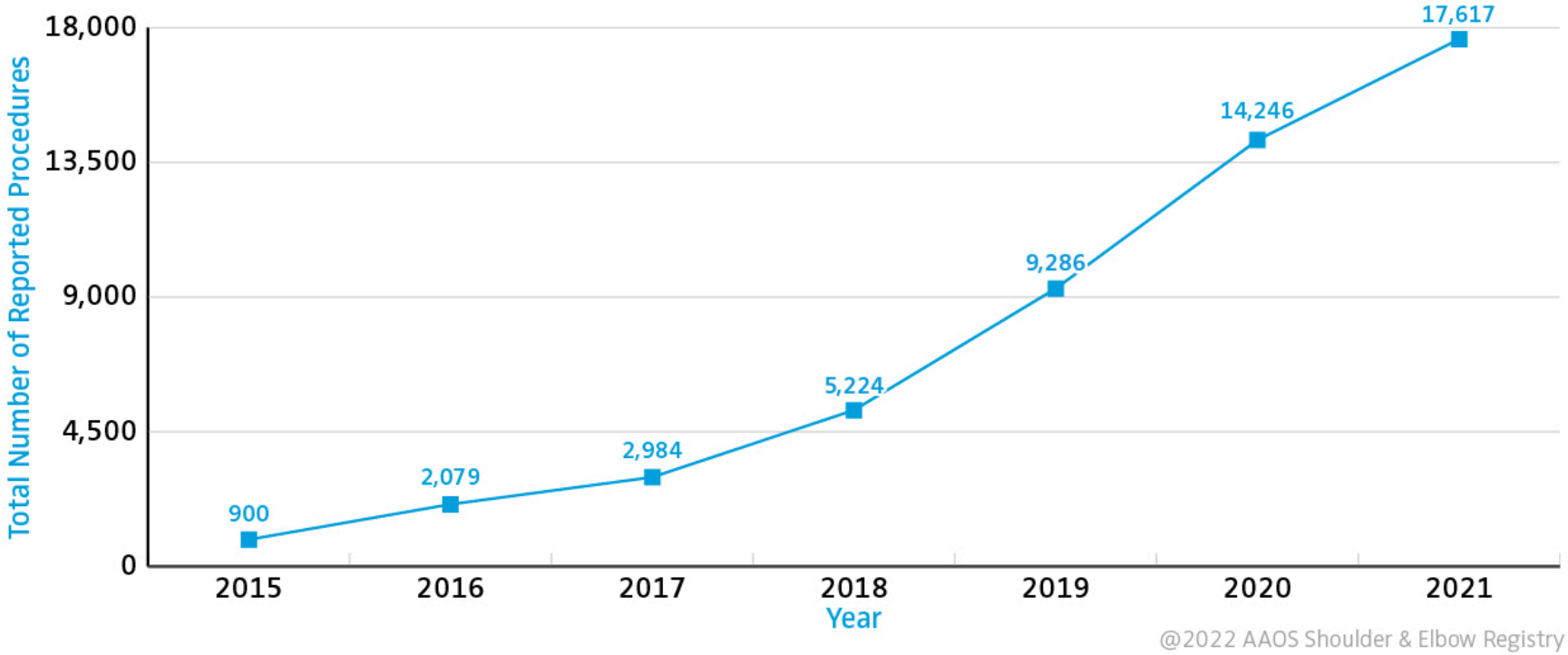


Figure 2.1: Distribution of Shoulder Arthroplasty Procedures, 2015-2021 (N=10,302)

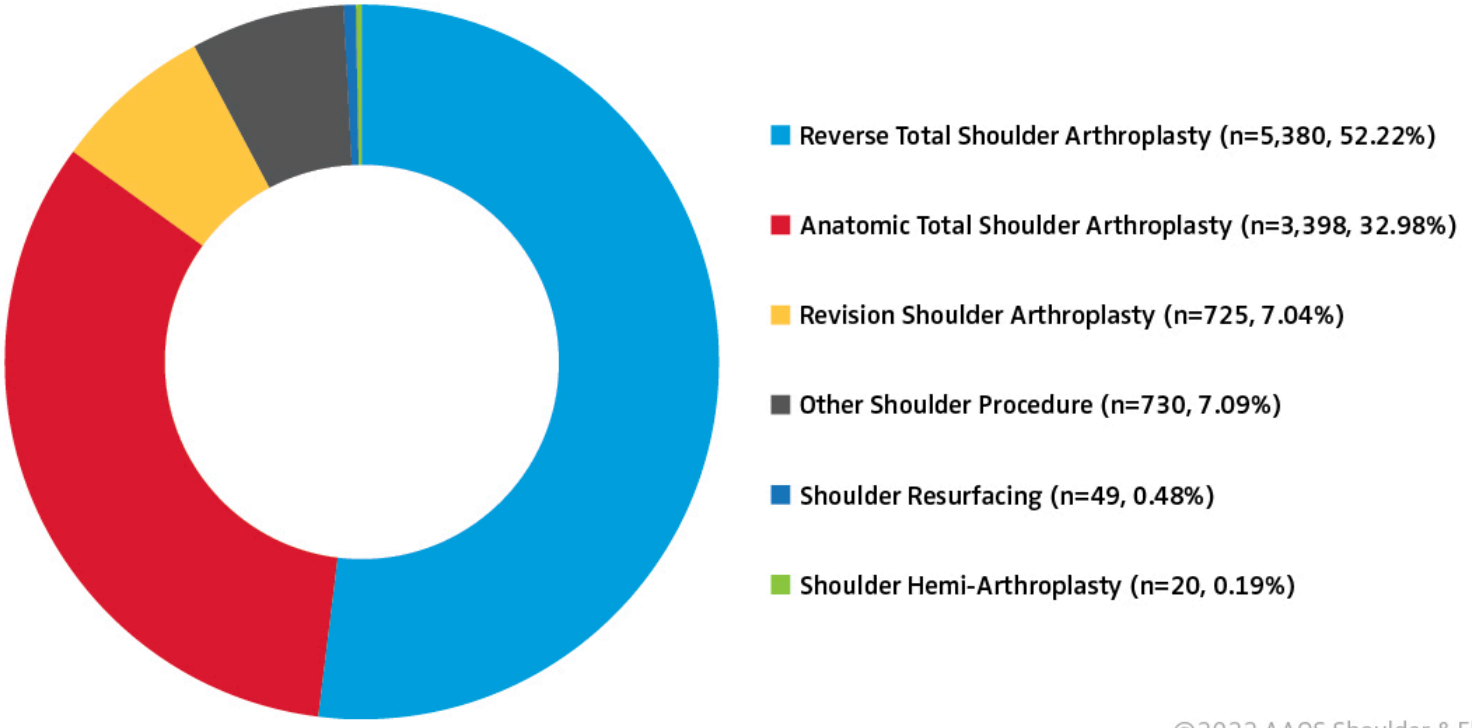


Figure 2.2: Shoulder Arthroplasty Procedures by Age Group, 2015-2021 (N=9,503)

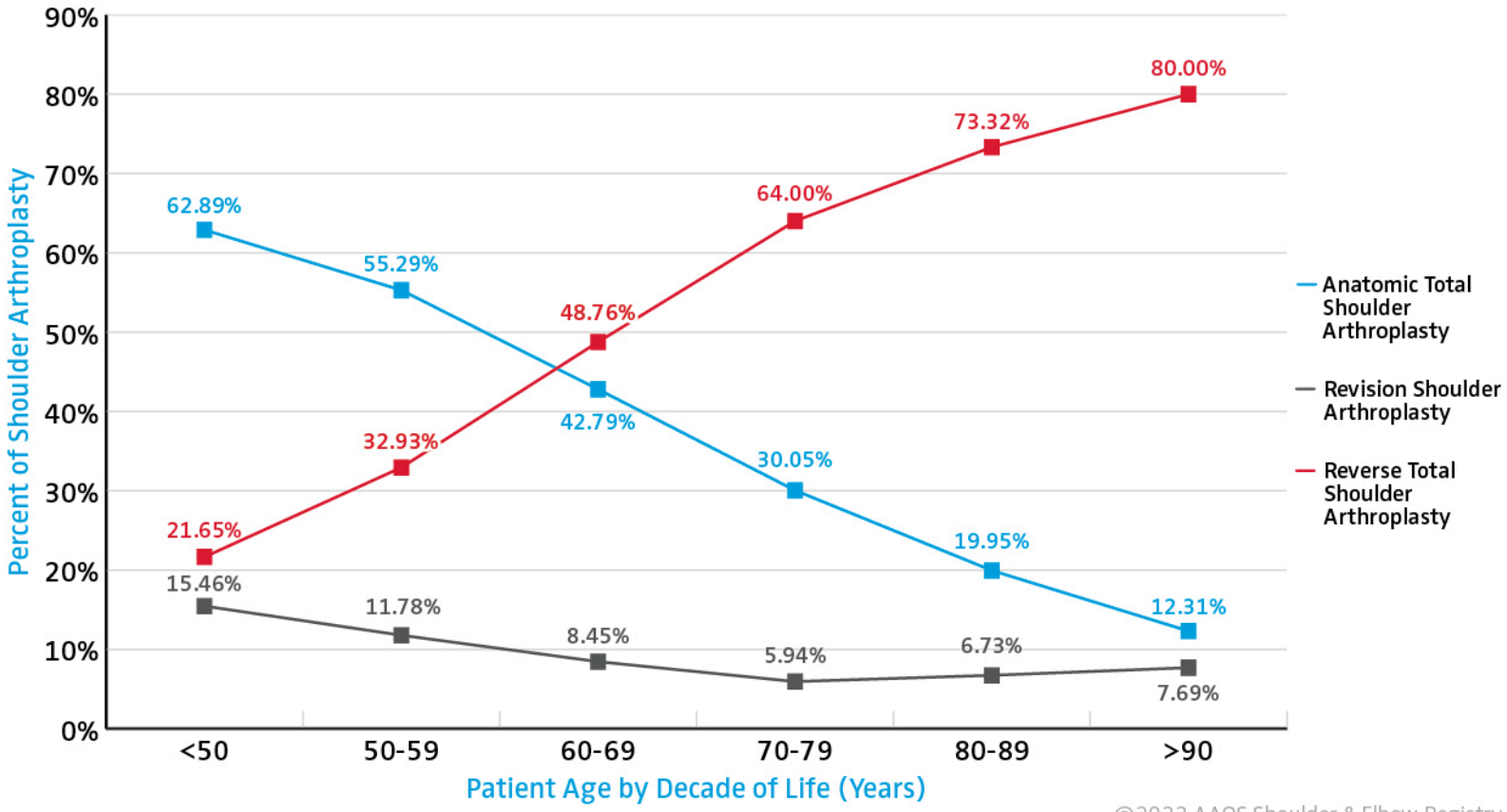


Figure 2.3: Sex Distribution for All Shoulder Arthroplasty Procedures by Age Group, 2015-2021 (N=9,226)

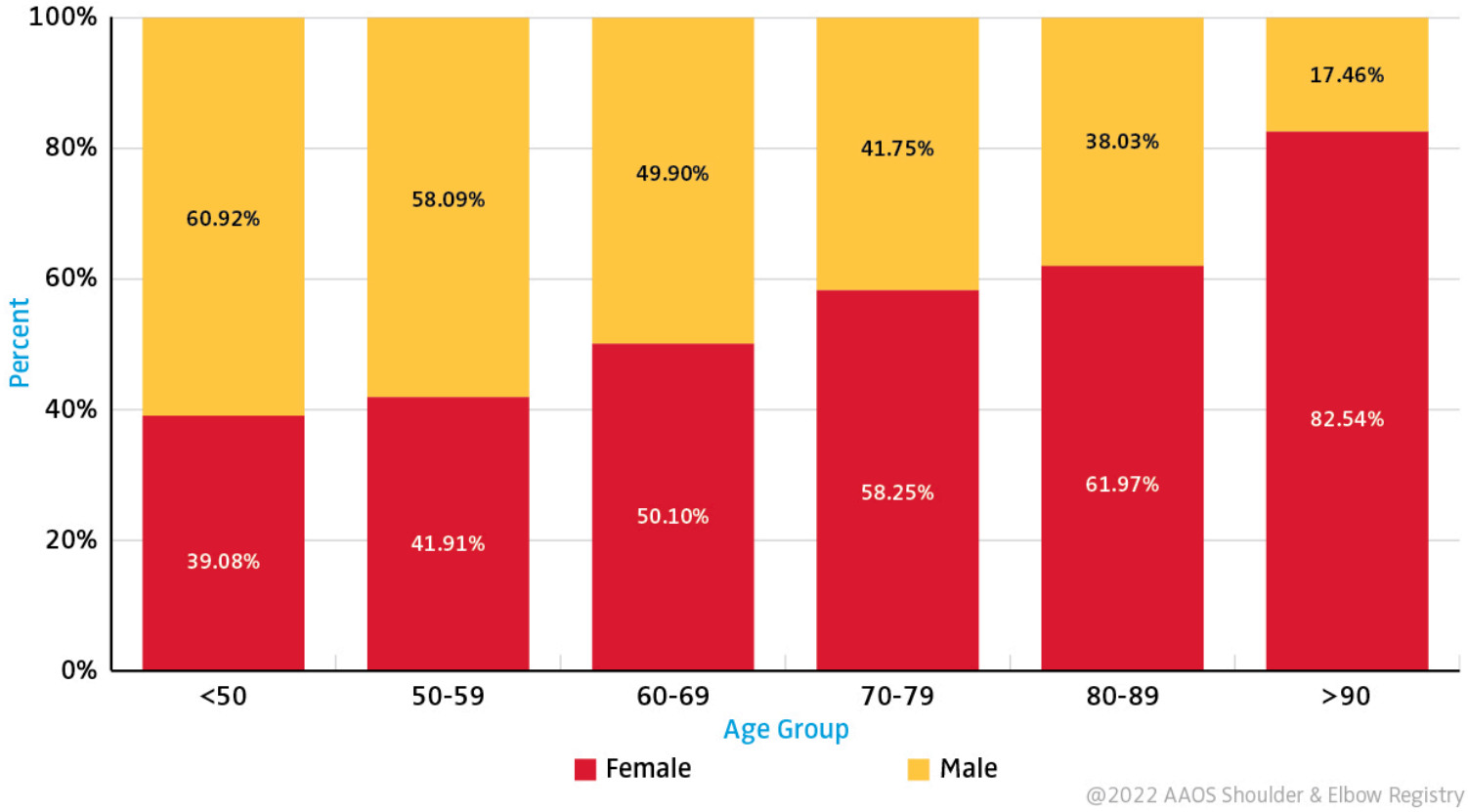


Figure 2.6b: Primary Diagnosis for Reverse Total Shoulder Arthroplasty Procedures, 2015-2021 (N=5,192)

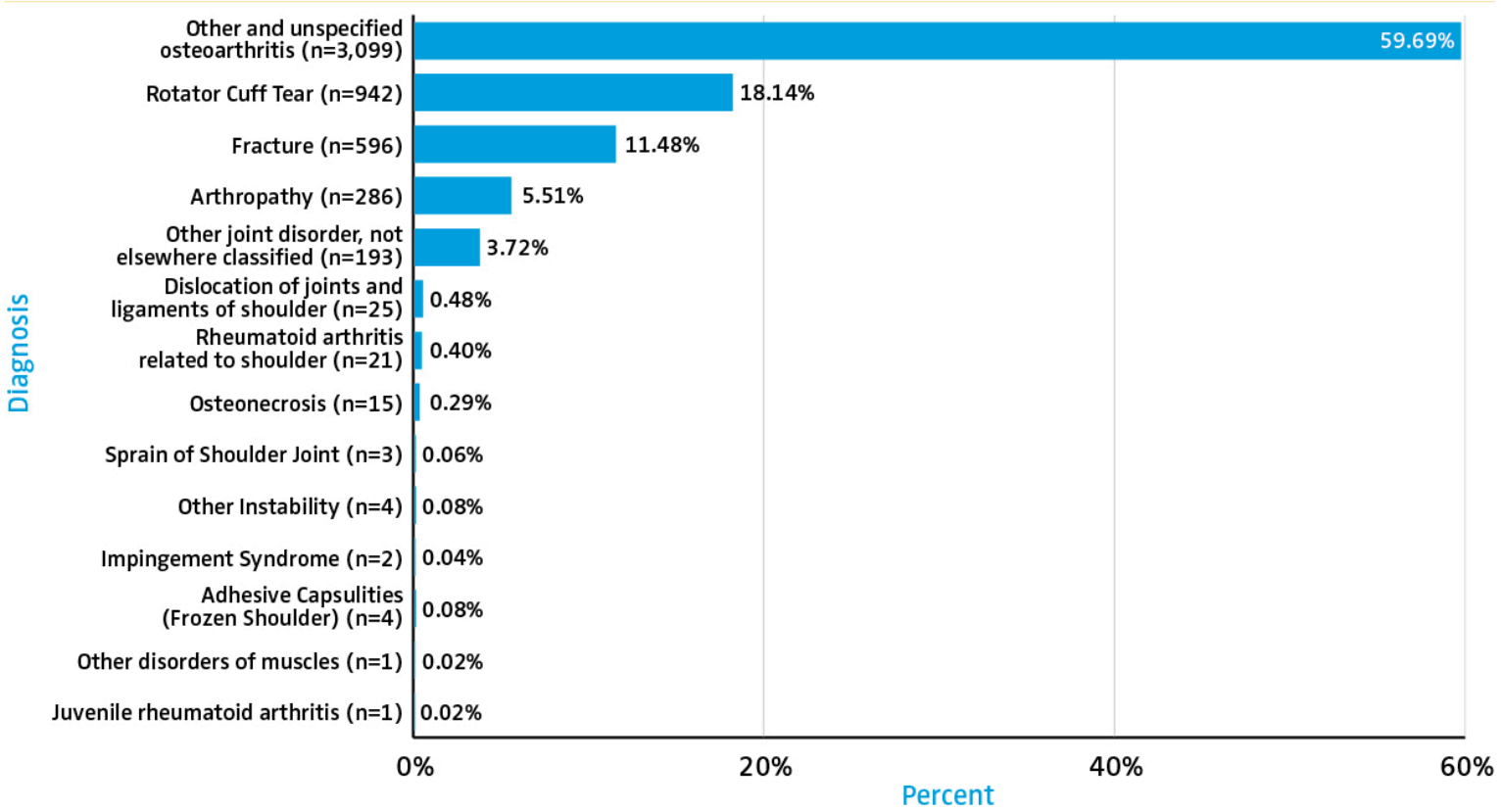
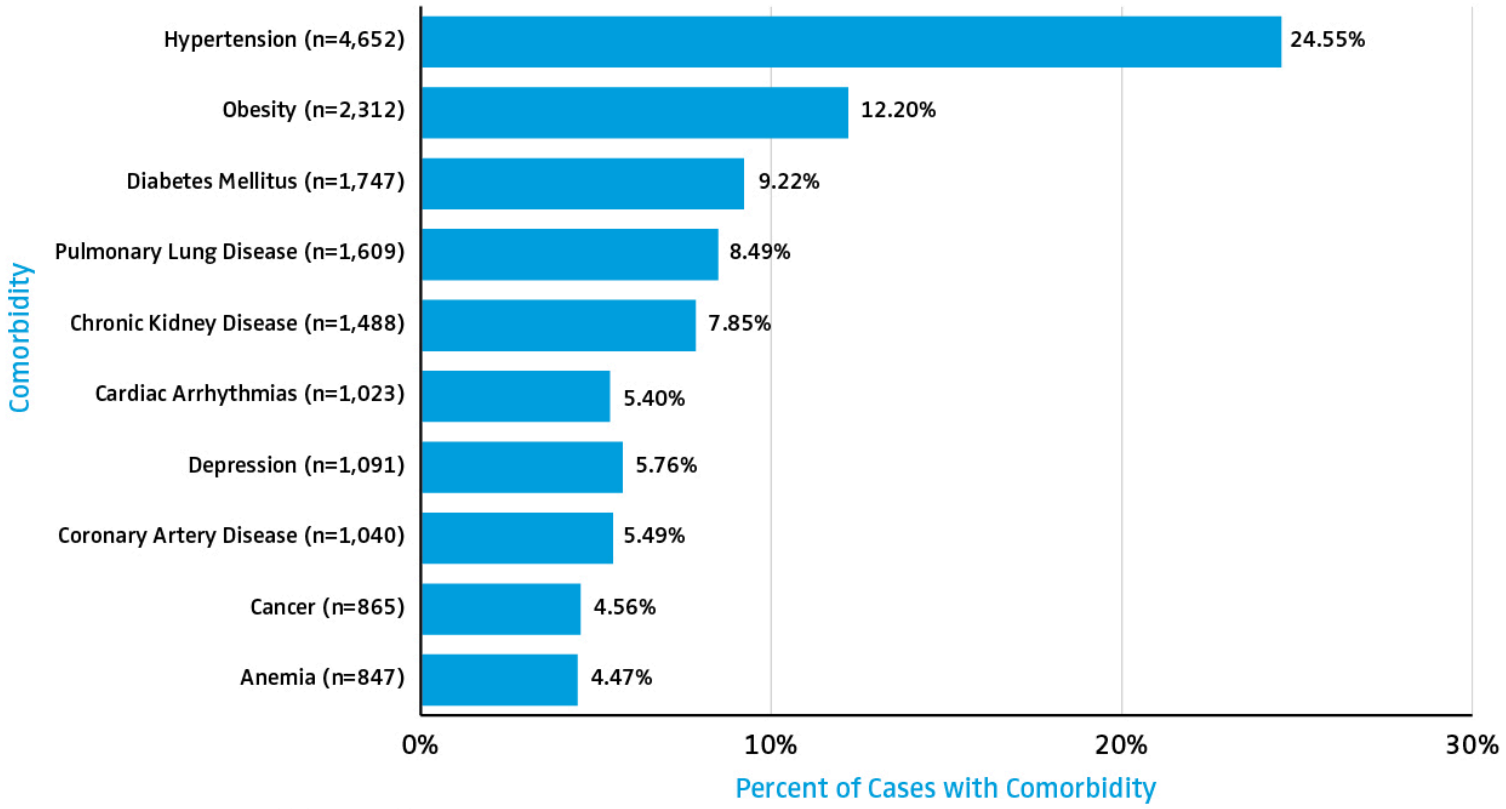


Figure 2.7: Top 10 Comorbidities for Shoulder Arthroplasty Procedures, 2015-2021



*Each case may belong to multiple comorbidity groups

Table 3.1: Frequency and Age of Rotator Cuff Procedures by Group Type, 2015-2021

Rotator Cuff Procedural Grouping	CPT Code	Frequency	% of Total	Mean Age	SD Age
Arthroscopic Rotator Cuff Repair (N=3,974)	**29827**	**3,974**	–	–	–
w/ Subacromial Decompression	29826	3,096	77.9%	59.61	10.10
w/ Biceps Tenodesis	29828 or 23430	1,622	40.8%	58.89	9.69
w/ Distal Clavicle Excision	29824 or 23120	1,023	25.7%	59.76	9.80
w/ Debridement	29822 or 29823	891	22.4%	60.68	9.93
w/ SLAP Repair (Superior Labrum Anterior and Posterior)	29807	154	3.9%	54.58	11.34
w/ Lysis of Adhesions	29825	46	1.2%	62.20	8.73
w/ Capsulorrhaphy	29806	31	0.8%	51.00	16.77
w/ Bankart Procedure	23455	3	0.1%	52.33	6.66

Table 3.1: Frequency and Age of Rotator Cuff Procedures by Group Type, 2015-2021

Open Rotator Cuff Repair (CPT 23410 or 23412) (N=210)	**23410 or 23412**	**210**	–	–	–
w/ Arthroscopic Debridement	29823 or 29822	112	53.33%	59.82	11.24
w/ Distal Clavicle Excision	23120	60	28.57%	59.85	10.57
w/ Biceps Tenodesis	23430	70	33.33%	57.79	10.24
w/ SLAP Repair	29807	12	5.71%	55.42	9.99
w/ Bankart Procedure	23455	4	1.90%	47.75	15.48
w/ Capsulorrhaphy	29806	3	1.43%	39.67	8.39
w/ Acromioplasty	23130	2	0.95%	58.00	4.24
Open Rotator Cuff Repair w/ Acromioplasty (Reconstruction of Complete Rotator Cuff Avulsion) (N=179)	**23420**	**179**	–	–	–
w/ Distal Clavicle Excision	23120	132	73.74%	60.98	9.90
w/ Arthroscopic Debridement	29824 or 29822	128	71.51%	60.92	9.64
w/ Biceps Tenodesis	23430	25	13.97%	57.68	8.58
w/ SLAP Repair	29807	18	10.06%	58.72	9.69
w/ Capsulorrhaphy	29806	2	1.12%	67.00	12.73

Figure 3.1: Sex Distribution of Rotator Cuff Procedures by Age, 2015-2021 (N=6,724)

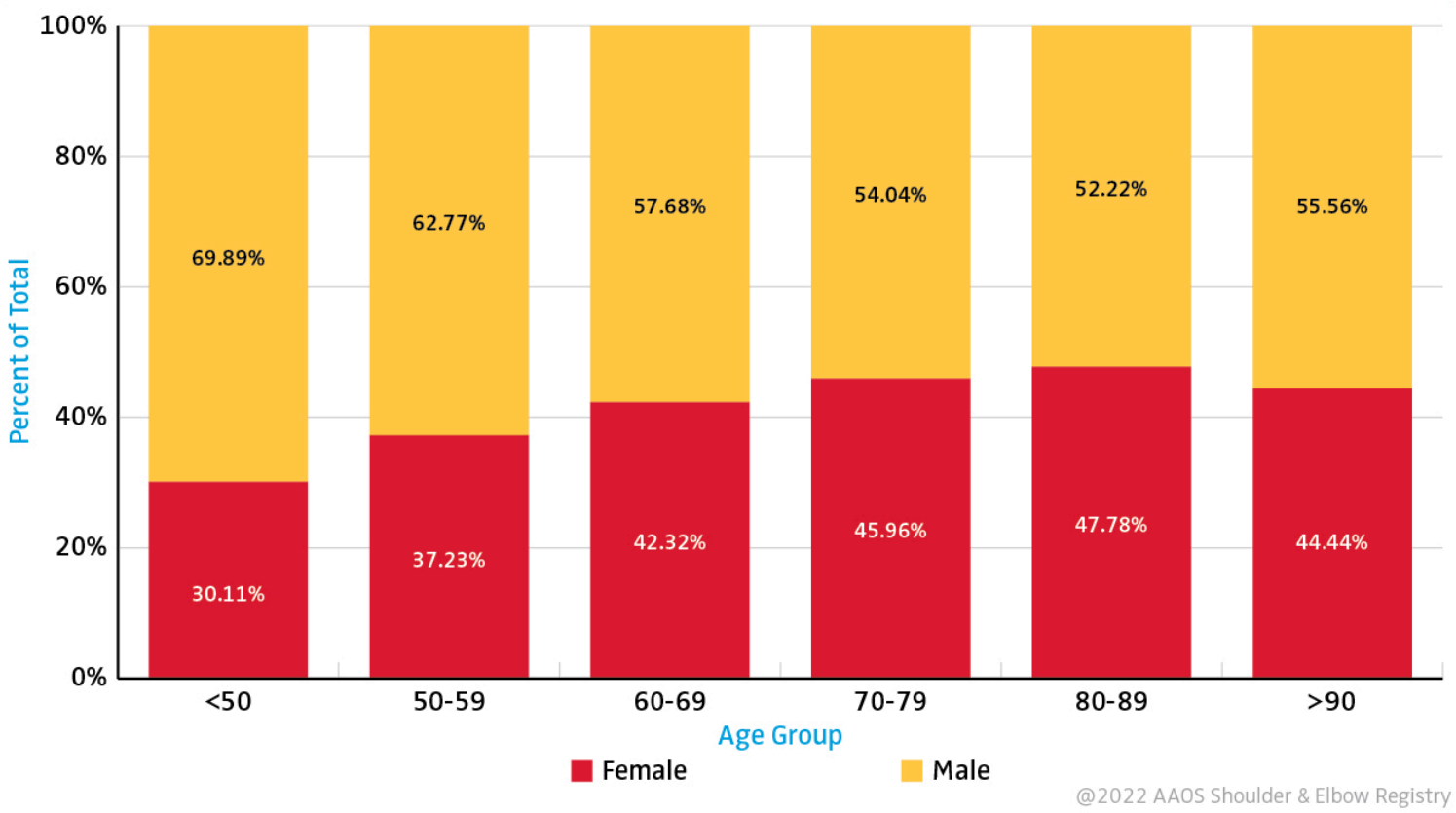


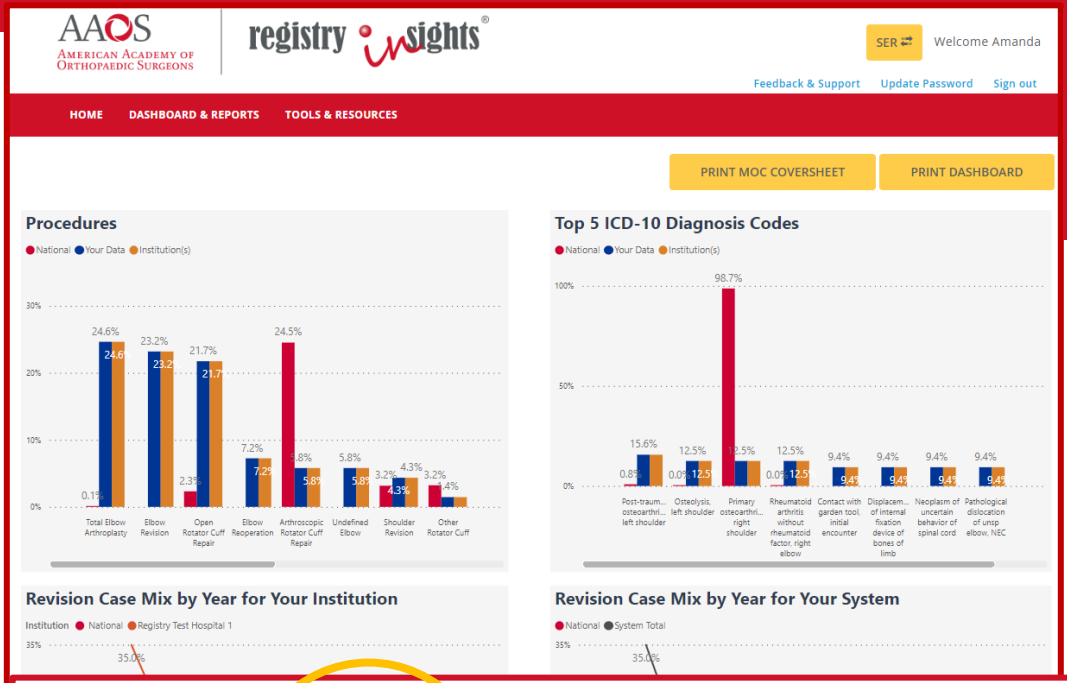
Table 2.1: Reverse and Anatomic Total Shoulder Arthroplasty Linked Revision Rates, 2015-2021 (N=8,778)

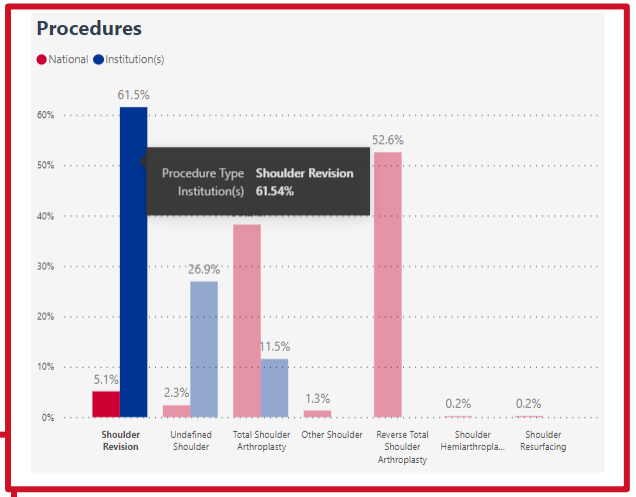
Procedure	Number of Primaries	Number of Linked Revisions	Linked Revision Rate %
Reverse Total Shoulder Arthroplasty	5,380	40	0.74%
Anatomic Total Shoulder Arthroplasty	3,398	22	0.65%

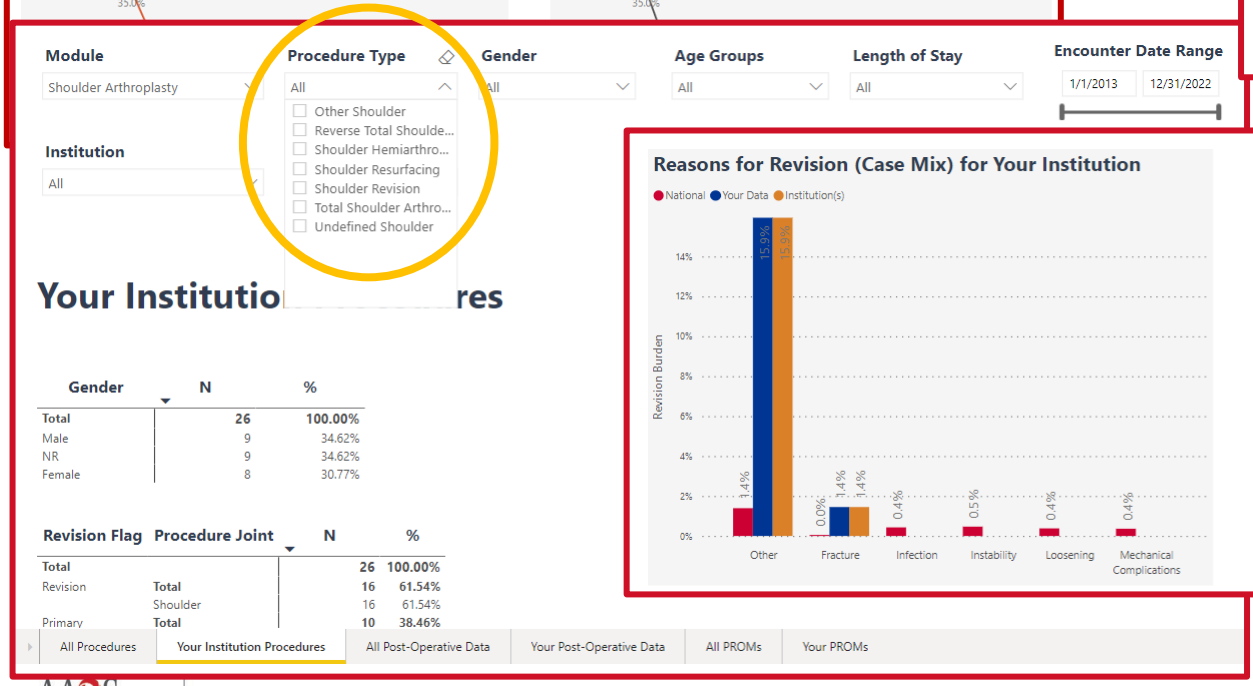
Table 4.1: Distribution of Cases with Patient-Reported Outcome Measure (PROM) Submissions for Shoulder Procedures, 2015-2021 (N=527)

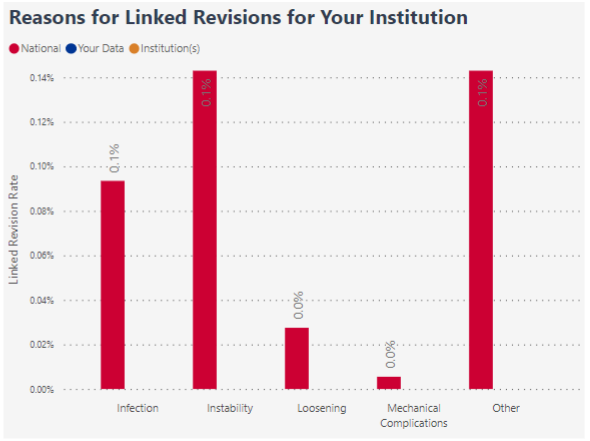
Patient-Reported Outcome Measure	Number of Cases with a Preoperative PROM	Number of Cases with a Postoperative PROM	Number of Cases with a Linked Postoperative PROM	Percent of Cases with a Linked PROM
PROMIS-10 (Patient-Reported Outcomes Measurement Information System 10)	134	133	133	99.3%
VR-12 (Veterans Rand 12-item Health Survey)	403	402	402	99.8%
ASES (American Shoulder and Elbow Surgeons Score)	224	85	44	19.6%
SANE (Single Assessment Numeric Evaluation)	195	80	38	19.5%

Recent Updates





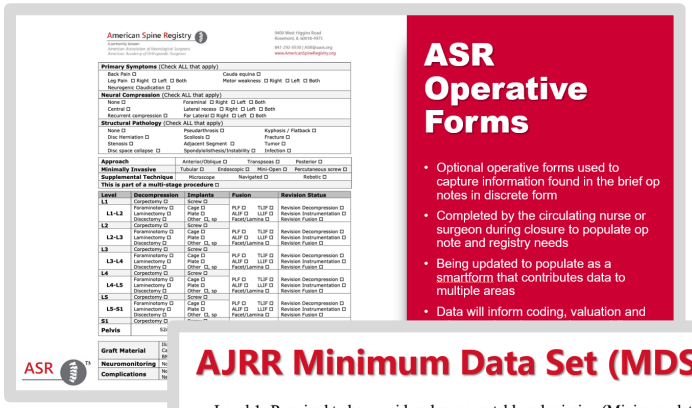


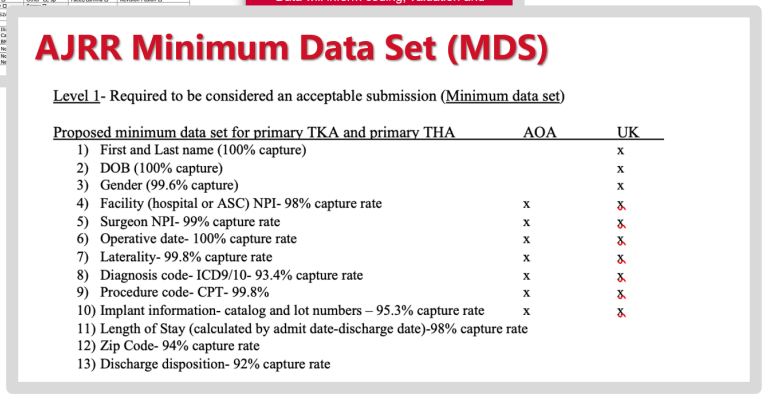


What's Next?

Scaling & Improving Data Capture and Quality

- Identifying Best formats to query and accept data
  - Aligning with standard
  - Varying formats across health technology
- Additional tools and resources to capture necessary data
  - Establishing a minimum data set
  - Operative Forms to capture data in non-discrete fields





AJRR Minimum Data Set (MDS)

Level 1- Required to be considered an acceptable submission (Minimum data set)

Proposed minimum data set for primary TKA and primary THA	AOA	UK
1) First and Last name (100% capture)		x
2) DOB (100% capture)		x
3) Gender (99.6% capture)		x
4) Facility (hospital or ASC) NPI- 98% capture rate	x	x
5) Surgeon NPI- 99% capture rate	x	x
6) Operative date- 100% capture rate	x	x
7) Laterality- 99.8% capture rate	x	x
8) Diagnosis code- ICD9/10- 93.4% capture rate	x	x
9) Procedure code- CPT- 99.8%	x	x
10) Implant information- catalog and lot numbers – 95.3% capture rate	x	x
11) Length of Stay (calculated by admit date-discharge date)-98% capture rate		
12) Zip Code- 94% capture rate		
13) Discharge disposition- 92% capture rate		

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Questions?

RegistryInfo@aaos.org

www.aaos.org/registries/ser

Contact the AAOS Registry Program

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Thank You!

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