

Overview of the American Joint Replacement Registry and the 2020 Annual Report

www.aaos.org/registries/ajrr

Our Speakers Today



James Huddleston III, MD, FAAOS

AJRR Steering Committee Vice Chair



James Browne, MD, FAAOS

AJRR Steering Committee Member

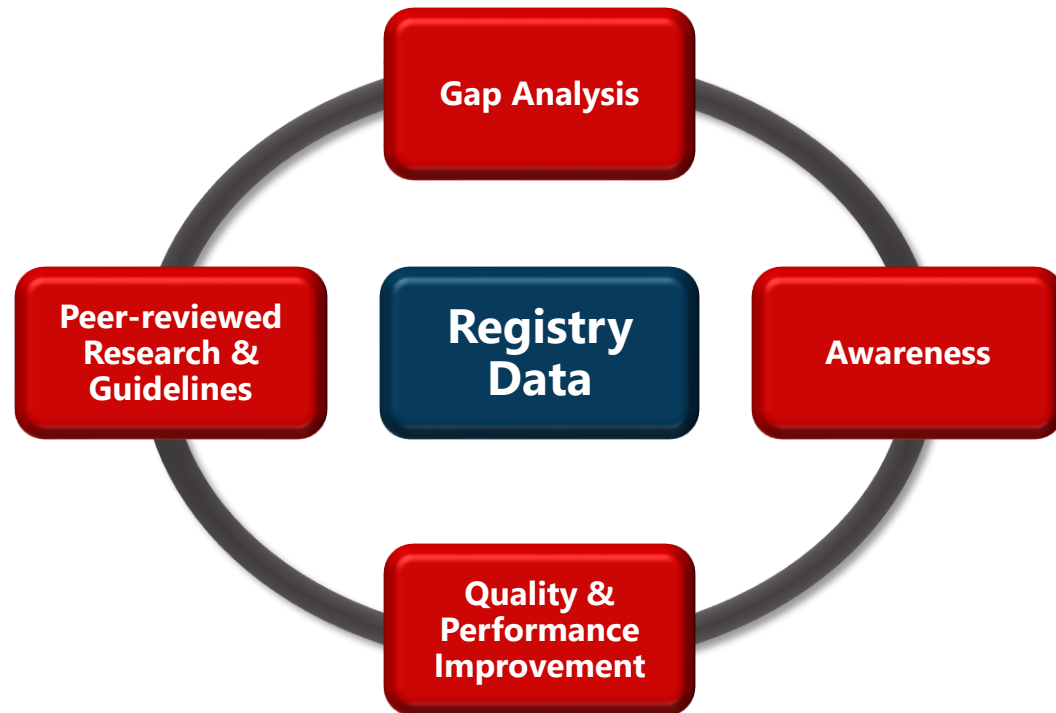
Disclosures: James Huddleston III, MD, FAAOS

- AAOS: Board or committee member
- American Association of Hip and Knee Surgeons: Board or committee member
- Journal of Arthroplasty: Editorial or governing board
- Knee Society: Board or committee member
- No financial conflicts of interest relevant to this presentation

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- AAOS: Member of AJRR Steering Committee
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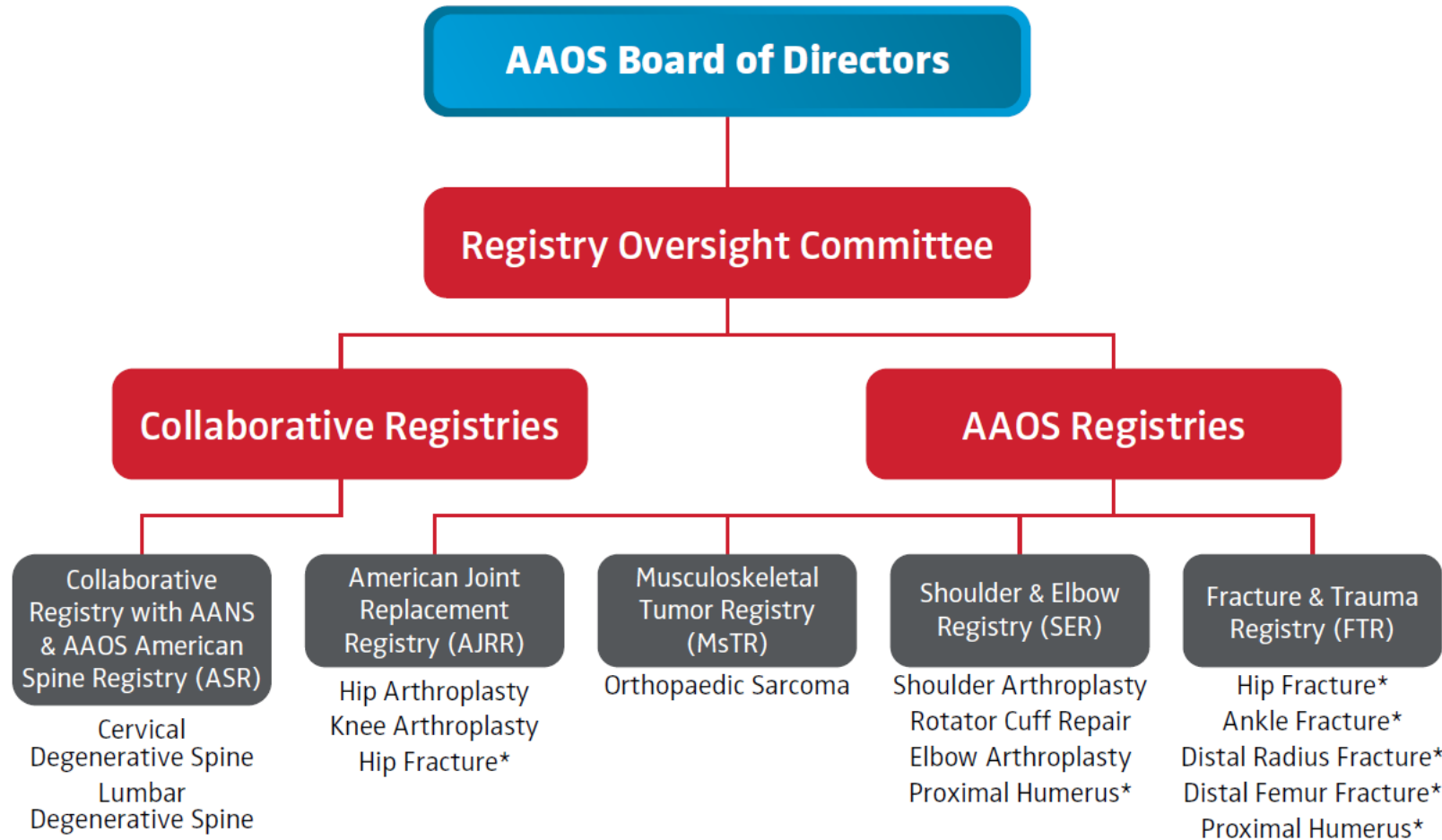
At the Core of Academy Strategy



Registry Effort Goals

- ✓ Collect unique clinical information demonstrating ***real-world practice***
- ✓ Enable ***performance measurement*** by physicians for physicians
- ✓ Facilitate national registry-driven ***quality improvement*** programs
- ✓ Support novel scientific ***research***

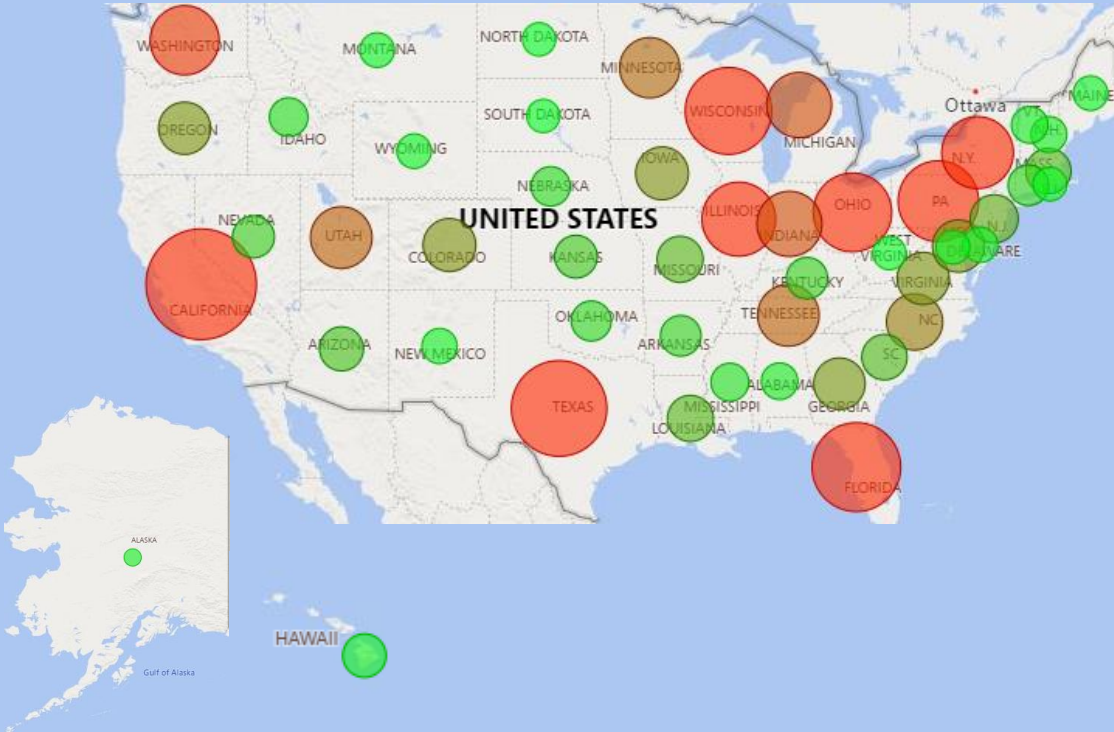
AAOS Family of Registries



**Modules in development*

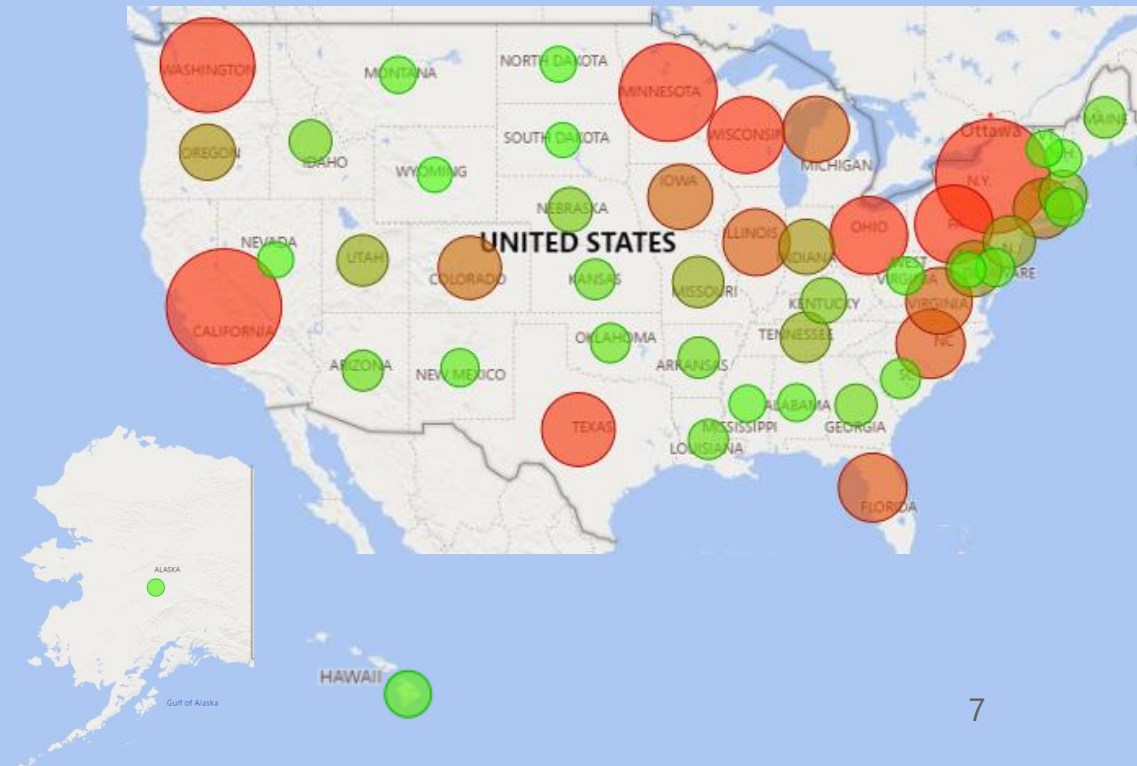
Participation Across the Registries

Sites by State



Over 1,600 participating sites contracted and 12,500 registered surgeons across all 50 states.

Procedures by State

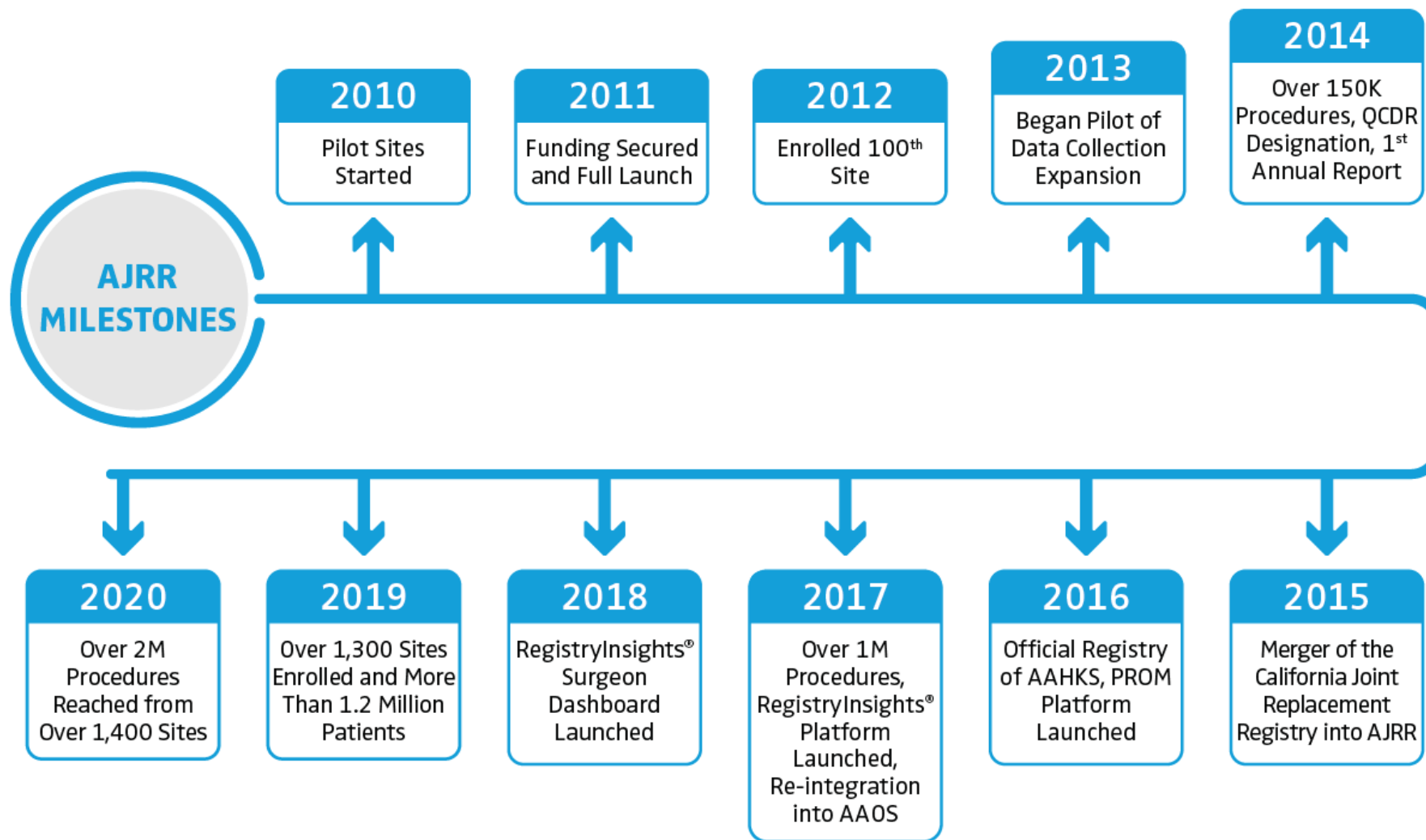


Data representing over 2,300,000 procedures capturing approximately 40% of all US TJA volume annually.

American Joint Replacement Registry



About AJRR



AJRR Steering Committee

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OrthoCarolina
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- **Richard F. Seiden, Esq.**
Public Advisory Board (PAB) Representative
- **James D. Slover, MD, FAAOS, MS**
NYU Langone Health
- **Jeffrey B. Stambough, MD, FAAOS**
University of Arkansas

AJRR Data Element Overview

Two Modules: Hip Arthroplasty & Knee Arthroplasty

Procedure

Patient

- Name, Date of Birth, SSN
- Diagnosis (ICD-9/10, CPT)
- Gender
- Race/Ethnicity
- Height + Weight/BMI
- Payer Status

Site of Service

- Name and Address (TIN, NPI)

Surgeon

- Name (NPI)
- Trainee

Procedure

- Type (ICD-9/10, CPT)
- Date of Surgery, Length of Stay
- Surgical Approach
- Surgical Technique
- Laterality
- Implants (Manufacturer, Lot #)
- Anesthesia

Comorbidities and Complications

- Comorbidities (ICD-9/10, CPT)
- CJR Risk Variables
- Height + Weight/Body Mass Index
- Length of Stay
- American Society of Anesthesiologists Score
- Charlson Index
- Operative and Post-operative Complications

Patient-reported Outcomes

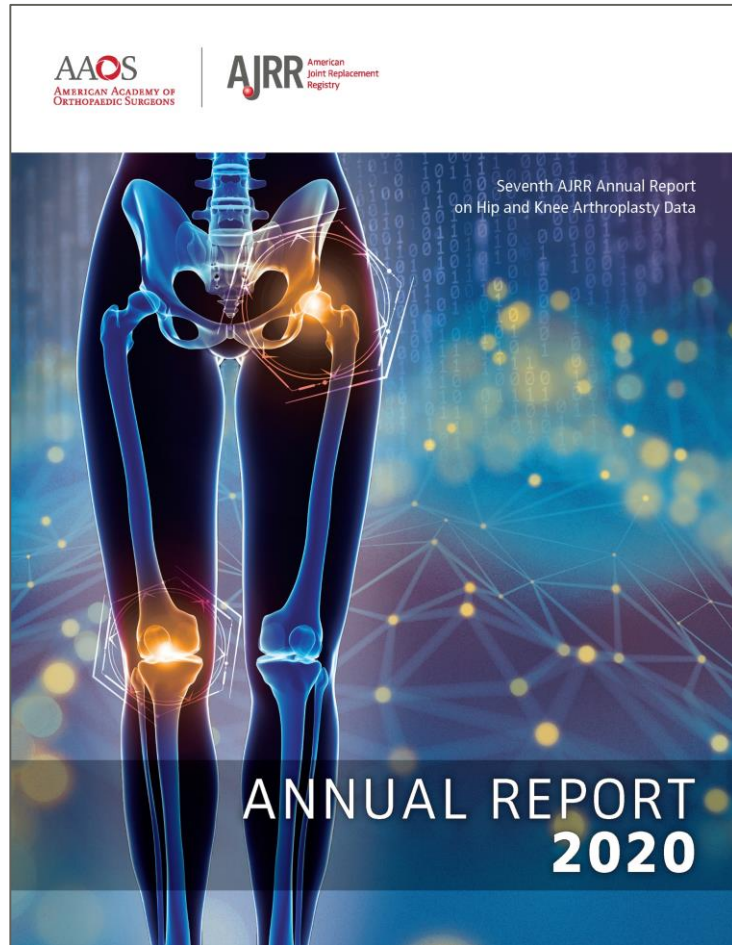
Recommended:

- PROMIS-10 Global
- VR-12
- HOOS Jr. /KOOS, Jr.

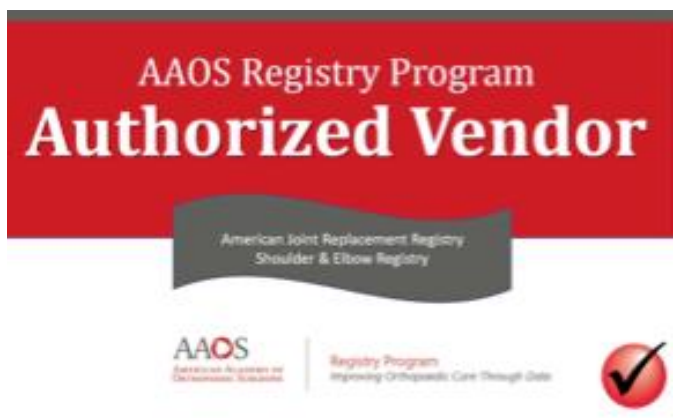
Also Accepted:

- SF-36 v1
- HOOS/KOOS
- Oxford Hip and Knee Scores
- Knee Society Knee Scoring System
- Harris Hip Score
- WOMAC (Modified via HOOS and KOOS)
- SF-12, EQ-5D, WOMAC (only accepting final scores)

Integration of Medicare Data



- Access to **Medicare claims** inclusive of inpatient (148 data elements), outpatient (122 data elements) & National Death Index
- Linked by full identifiers for longitudinal tracking
- 2012-2019 Medicare data for all patients represented in Registry
 - Medicare files
 - National Death Index
 - National Inpatient Sample (NIS) integrated as reference data for representative analyses
 - NPPES dataset incorporated for NPI validation
- Access to custom reports that compare their site to the national Annual Report analyses, show migration trends, etc.



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 for Total Hip & Knee Replacement Certification
- The Joint Commission Advanced Certification in Spine Surgery (ACSS)

Three Ways to Access Data



Custom
Reports



RegistryInsights®
Dashboards



Registry Analytics
Institute®

Custom Reports

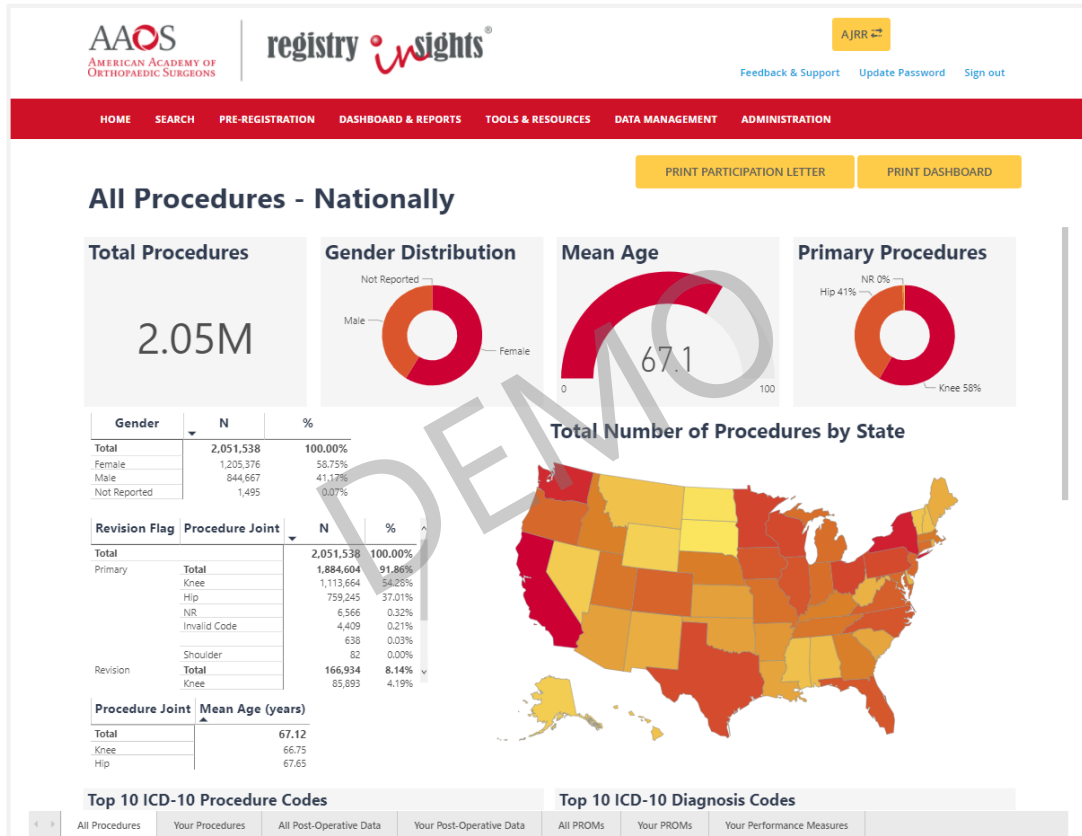


Custom reports created by our analytics team to help understand and package your site data in an actionable format

Custom reports can include site specific metrics and shape continuous improvements to the canned dashboards provided

Aggregated reports for every metric across all data submitted including procedural, post-operative and PROMs data can be provided at your site level

RegistryInsights® Dashboards



On-demand practice specific dashboards



Compare your practice to national performance benchmarks



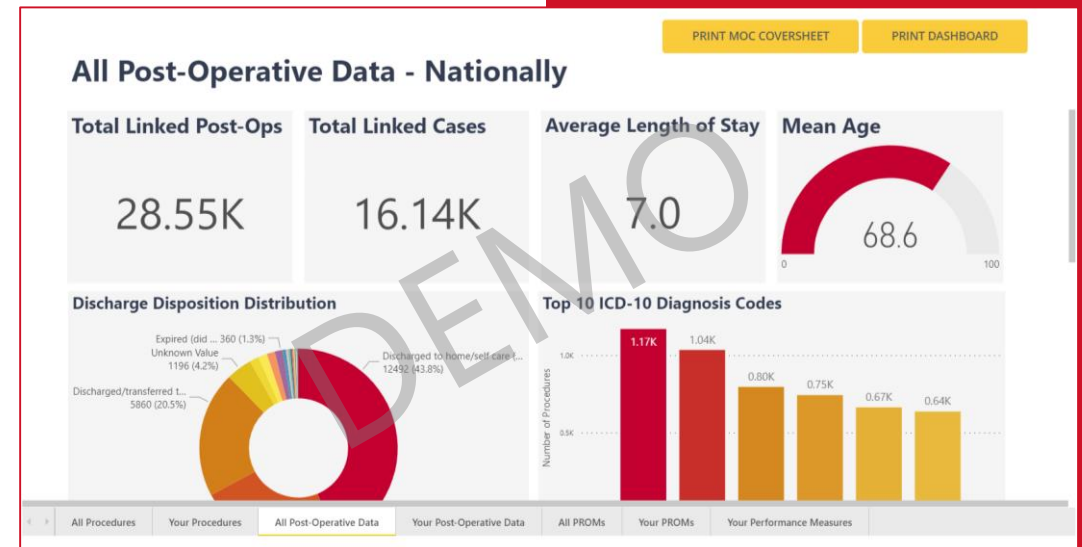
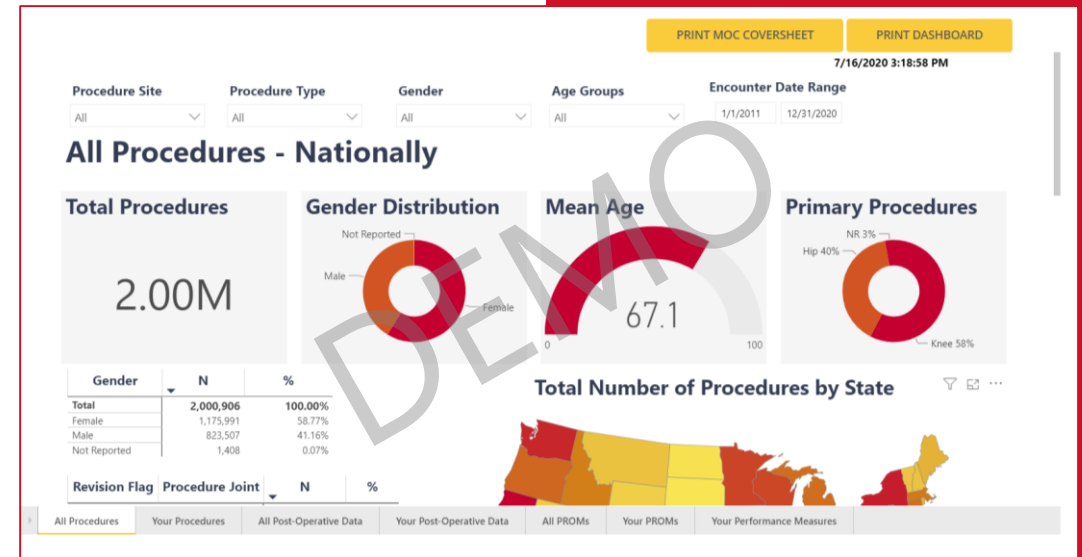
Unlimited surgeon accounts with access to system, site, and surgeon level dashboards



Surgeon Dashboards

Authorized Surgeon Users

- View their procedural, post-operative and PROM data
- National benchmarks for comparison measures
- Request custom reports
- Submit data for quality initiatives (e.g., ABOS MOC, QPP, BPCI-A)



PROM Management

AAOS AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS | registry insights

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HOME | SEARCH | PRE-REGISTRATION | DASHBOARD & REPORTS | TOOLS & RESOURCES | DATA MANAGEMENT | ADMINISTRATION

HOME / REPORTS

Procedure Reports | Patient Reported Outcomes Reports

Count of Components by Type

Count of Procedures by ICD-10 Procedure Codes

Count of Procedures by CPT Procedure Codes

Procedures With Component Information (ICD-10)

Shoulder Procedures Submitted to SER (ICD-10)

Count of Procedures By Surgeon

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UNET Community | Feedback & Support | Sign out

HOME | SEARCH | PRE-REGISTRATION | DASHBOARD & REPORTS | TOOLS & RESOURCES | DATA MANAGEMENT | ADMINISTRATION

HOME / REPORTS / PROM PATIENT STATUS REPORT

Entries 10 Results 1-10 of 120

ACCOUNT ID	HOSPITAL/ASC NAME	PATIENT ID	PATIENT LAST NAME	PATIENT FIRST NAME	PATIENT DATE OF BIRTH	PATIENT EMAIL ADDRESS	PATIENT PHONE TYPE	PATIENT PHONE NUMBER	PROCEDURE	LATERALITY	PLANNED SURGERY DATE	SURGEON NPI
1041062	SER Test Hospital 1	PRP30258	ataAOS	johnny	1/1/1980				Shoulder Arthroplasty	Left	1/24/2019	
1041062	SER Test Hospital 1	PRP30258	ataAOS	johnny	1/1/1980				Shoulder Arthroplasty	Left	1/24/2019	
1041061	SER Test Hospital 5	PRP30261	Bobby	Ricky	7/16/2019				Rotator Cuff Repair	Left	2/28/2019	1619012200
1041061	SER Test Hospital 5	PRP30261	Bobby	Ricky	7/16/2019				Rotator Cuff Repair	Right	2/28/2019	1619012200
1041062	SER Test Hospital 1	PRP30246	Brown	Charlie	1/1/1980				Shoulder Arthroplasty	Left	1/20/2019	
1041062	SER Test Hospital 1	PRP30246	Brown	Charlie	1/1/1980				Shoulder Arthroplasty	Left	1/20/2019	
1041062	SER Test Hospital 1	PRP30235	butkus	dick	1/1/1980				Shoulder Arthroplasty	Left	1/20/2019	

PRE-REGISTRATION FORM | PRE-REGISTRATION UPLOAD

This form allows AJRR Users to pre-register patients prior to surgery for pre-operative, patient-reported outcome measures (PROMs) data collection. Once the form has been submitted, a patient pre-operative case will be added to the Registry. The pre-registration process permits users to collect PROMs from patients via the AJRR platform through the patient kiosk or through manual entry of a patients' PROMs responses into the platform if collected by paper or clinician/surrogate administration.

PART 1: Patient demographic details

Please complete all applicable required and optional fields of the patient demographic section. Note: Email is conditionally required, however if you are administering assessments via email you must provide a patient email or the system will not be able to send the email to the patient.

If the Patient Social Security Number (SSN) is not available, please select the 'Not Available' option next to the Social Security field. Please note that the Registry also accepts the last 4 digits of the SSN. Patient SSN assists the Registry with achieving its mission through the ability to track longitudinal device information.

PART 2: Pre-Operative Case Information

Please complete all applicable required and optional fields of the pre-operative case section. Case information is required for all cases to be added to the Registry. Please note that all case data requested pertains to future procedures.

Planned Proc Date

Procedure Site

Shoulder

Elbow

Institution

Surgeon

Payer Info

SUBMIT

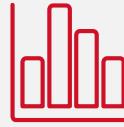
Social Security*
 Not Available
 Email

Registry Analytics Institute®

- The goal of the AAOS Registry Analytics Institute is to provide a resource to the scientific community to further understand and improve orthopaedic and musculoskeletal care by making data available to examine outcomes related to orthopaedics.
 - The Institute provides clinicians and clinician-scientists the opportunity to submit proposals for analytic insight that are contained within its various registries.
 - Selected awardees receive statistical support, data analyses, and potential monetary support

To learn more: www.aaos.org/registryanalyticsinstitute

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, practice-specific, **payer-incentivized 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

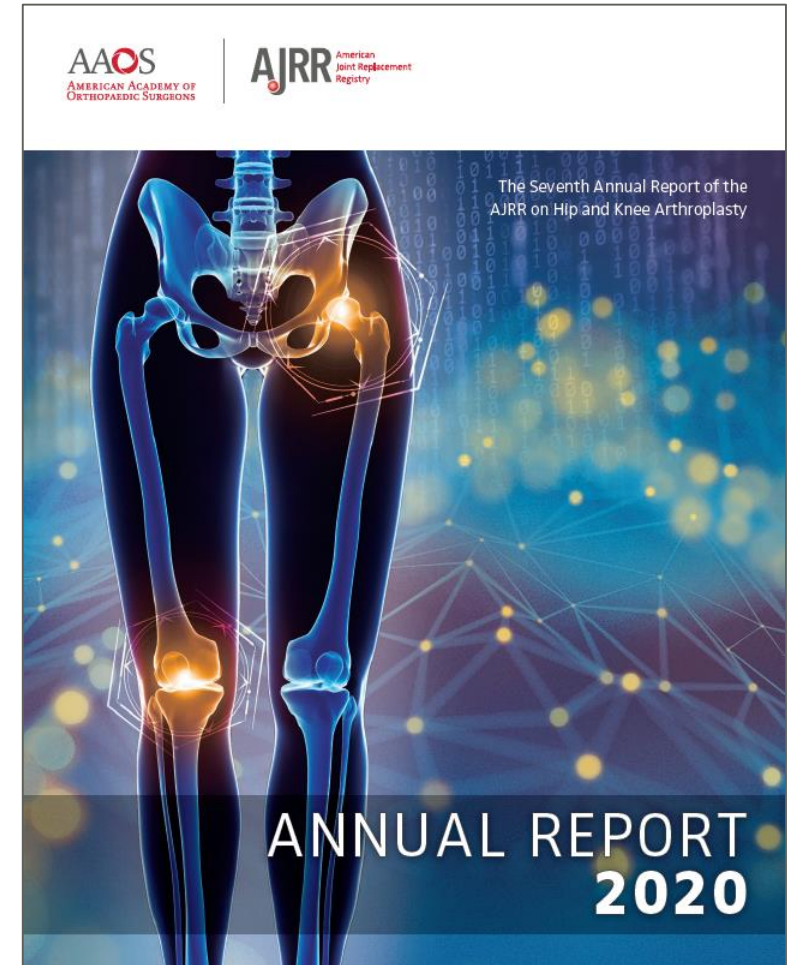
2020 AJRR Annual Report Introduction & Highlights

2020 AJRR Annual Report

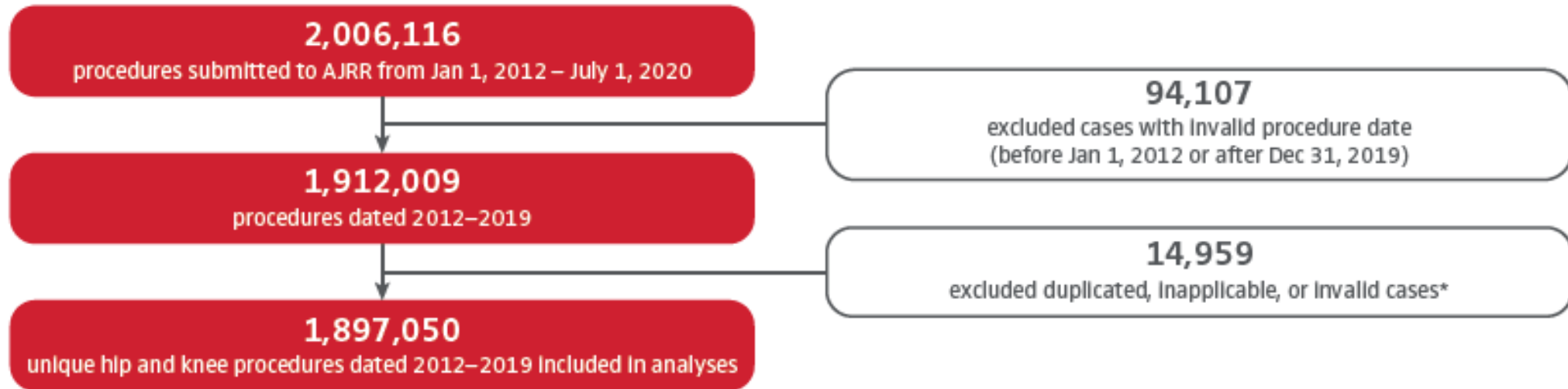
- Summary Statistics
 - Procedure, institution, and patient distributions
- Data Completeness
- Hip Arthroplasty
- Knee Arthroplasty
- Revision Procedures
- Implant Utilization and Survivorship
- Patient Reported Outcome Measures (PROMs)

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2019 Annual Report Supplement: www.aaos.org/registries/publications



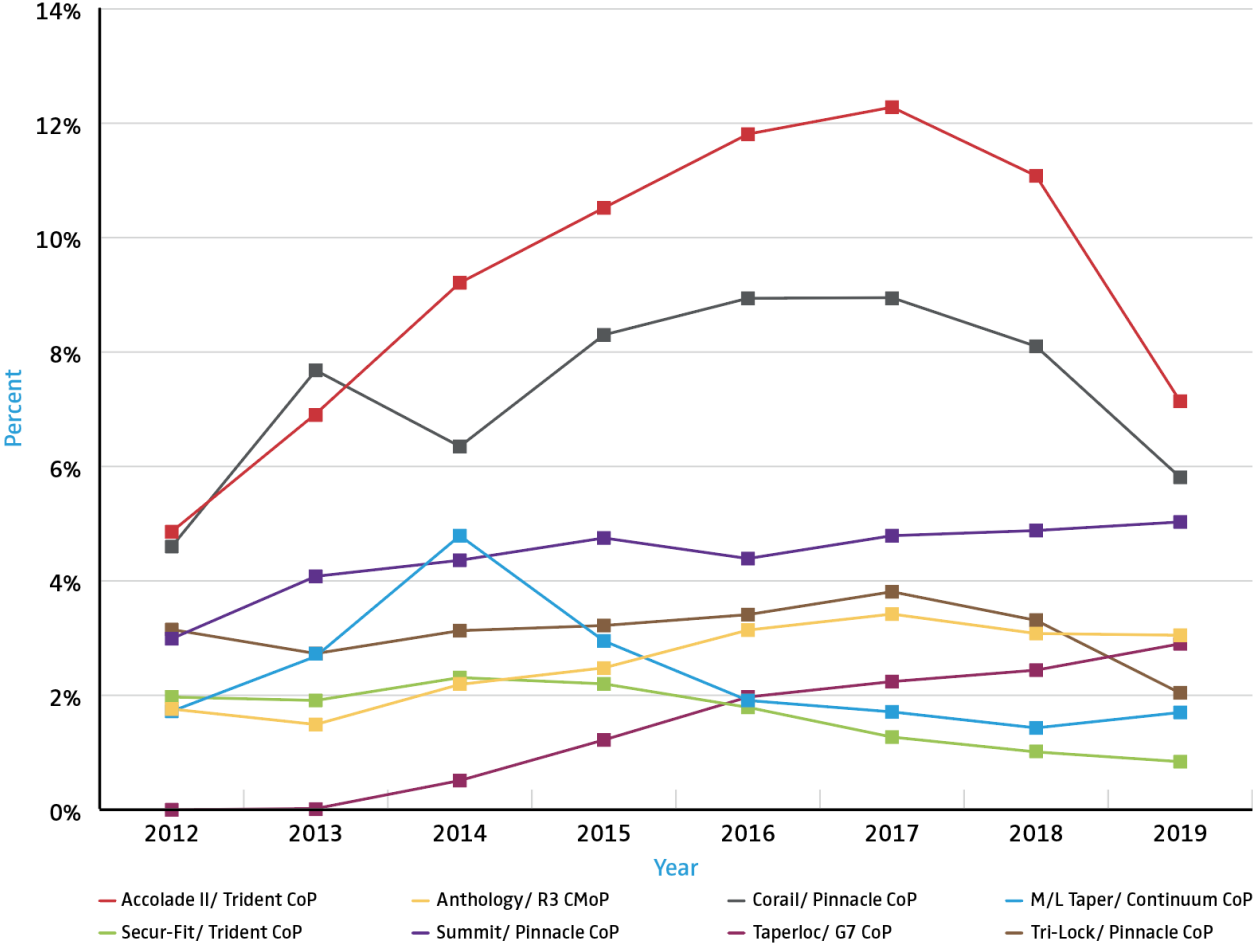
AJRR Annual Report Overview



- Data submitted to AJRR across all 50 states and the District of Columbia
- Supplementary datasets utilized where appropriate for descriptive and longitudinal analysis
 - Medicare inpatient and outpatient claims data
 - American Hospital Association (AHA) survey data

Implant Utilization

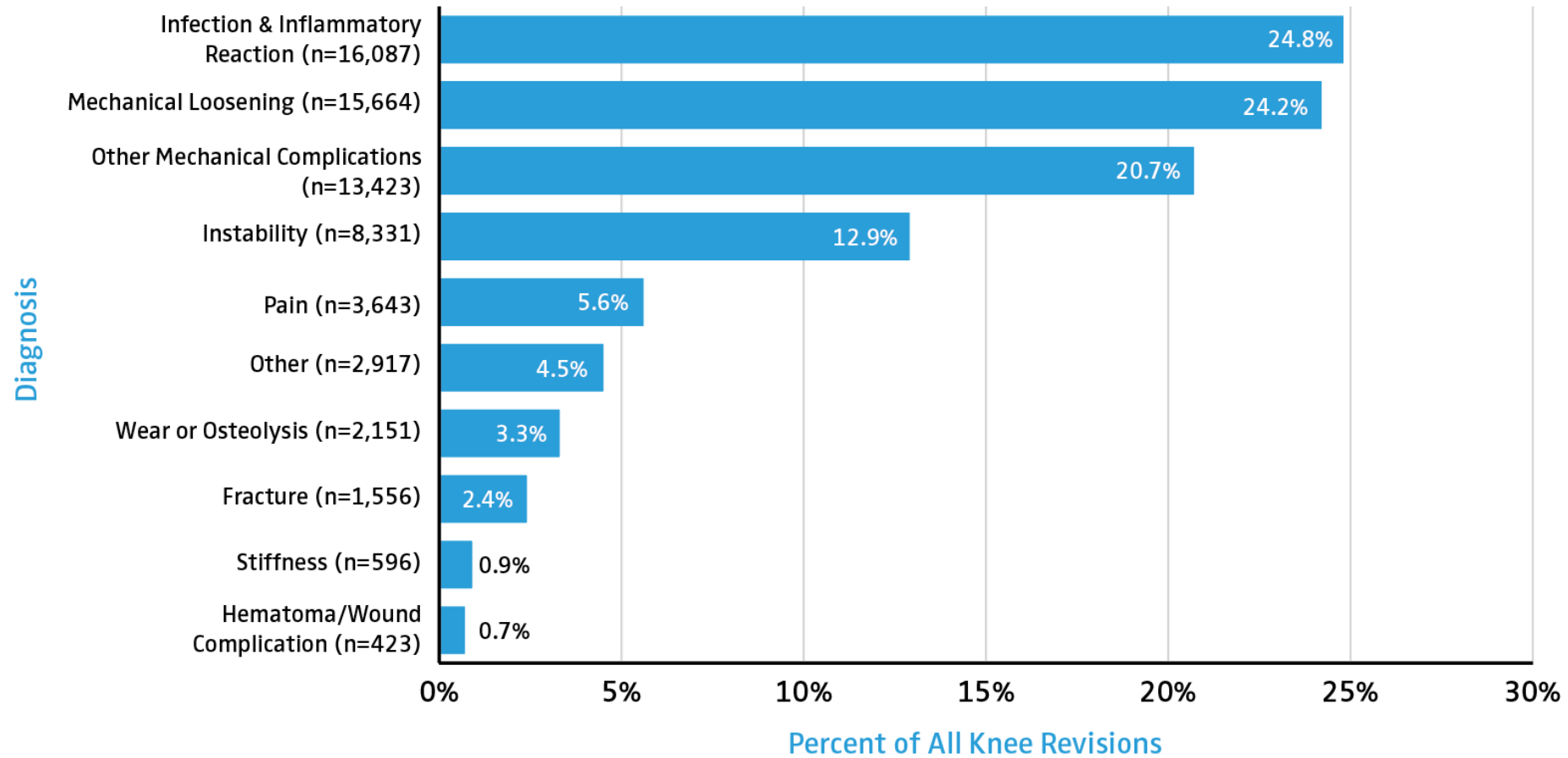
Figure 2.25: Elective Primary Total Hip Arthroplasty Stem/Shell Component Combinations by Year, 2012-2019 (N=482,808)



	2012	2013	2014	2015	2016	2017	2018	2019
Total N	12,750	26,646	47,476	65,113	84,446	90,604	84,094	71,679

Revision Procedures

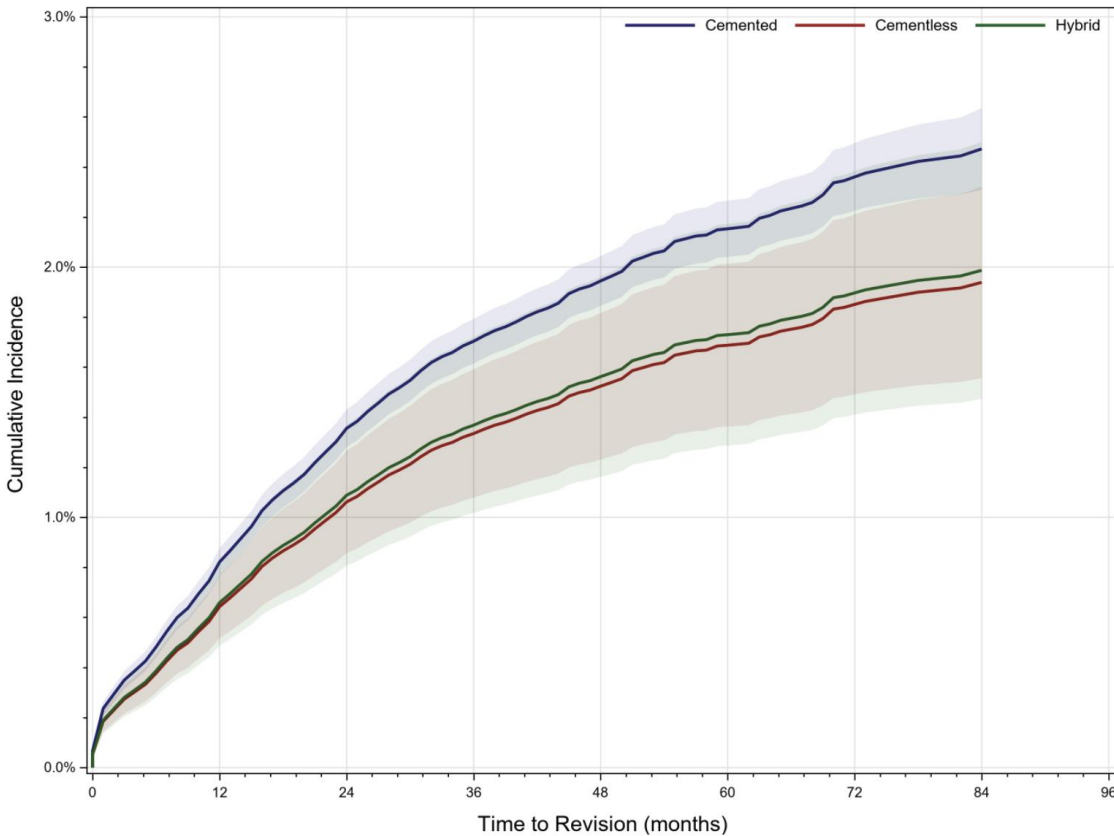
Figure 3.24: Distribution of Diagnosis Associated with All Knee Revisions, 2012-2019 (N=64,791)



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Cumulative Percent Revision Figures

Figure 3.12: Cumulative Percent Revision for Cemented Versus Cementless Fixation for a Primary Total Knee Arthroplasty for Males <65 Years of Age Diagnosed with Primary Osteoarthritis as Submitted Only to AJRR, 2012-2019



Number at Risk (months)	0-12	13-24	25-36	37-48	49-60	61-72	73-84	85-96	Total
Cementless	2,287	2,070	1,884	1,468	781	513	283	116	9,402
Cemented	12,386	15,043	18,628	17,685	14,801	10,633	6,132	2,751	98,059
Hybrid	406	610	726	731	549	593	354	137	4,106
Total	15,079	17,723	21,238	19,884	16,131	11,739	6,769	3,004	111,567

Age Adjusted Hazard Ratio (95% CI)
 Cementless vs. Cemented: 0.782 (0.641, 0.954) $p=0.0152$
 Hybrid vs. Cemented: 0.802 (0.617, 1.041) $p=0.0978$

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Patient Reported Outcome Measures

Table 2.5/2.6: Change Between Preoperative and 1-Year Postoperative PROM Scores After Elective Primary Hip Arthroplasty and Knee Arthroplasty, 2012-2019

Patient-Reported Outcome Measure (PROM)	PROM Component	Patients with Preoperative Score	Patients with Linked Postoperative Score	Response Rate, Percentage of Patients Who Completed a Preoperative and 1-Year Score	Patients with Meaningful Improvement*
HOOS, JR. (Hip disability and Osteoarthritis Outcome Score)	Score	24,749	5,769	23.3%	92.5%
PROMIS-10 (Patient-Reported Outcomes Measurement Information System 10)	Mental T	16,525	3,978	24.1%	38.6%
	Physical T	16,525	3,978	24.1%	67.5%
VR-12 (The Veterans RAND 12 Item Health Survey)	Mental Health Component	11,898	3,265	27.4%	40.0%
	Physical Health Component	11,754	3,271	27.8%	80.5%

*Meaningful improvement was calculated by minimal clinical important difference (MCID). MCID was determined to be a positive change score of half the pooled standard deviation.

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Patient-Reported Outcome Measure (PROM)	PROM Component	Patients with Preoperative Score	Patients with Linked Postoperative Score	Response Rate, Percentage of Patients Who Completed a Preoperative and 1-Year Score	Patients with Meaningful Improvement*
KOOS, JR. (Knee injury and Osteoarthritis Outcome Score, Junior)	Score	41,976	10,290	24.5%	88.0%
PROMIS-10 (Patient-Reported Outcomes Measurement Information System 10)	Mental T	29,164	7,421	25.5%	32.7%
	Physical T	29,164	7,421	25.5%	67.5%
VR-12 (The Veterans RAND 12 Item Health Survey)	Mental Health Component	18,219	5,058	27.8%	33.9%
	Physical Health Component	18,016	5,065	28.1%	75.0%

*Meaningful improvement was calculated by minimal clinical important difference (MCID). MCID was determined to be a positive change score of half the pooled standard deviation.

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2019 AJRR Annual Report Supplement

- AJRR Representativeness Analysis compared to NIS Data for THA and TKA
 - Procedure volume
 - Patient Demographics
 - Geographic representation
- Device Specific Cumulative Percent Revision Curves
 - Most commonly used Hip and Knee constructs

Download the 2020 Annual Report and 2019 Annual Report Supplement: www.aaos.org/registries/publications

ANNUAL REPORT 2019

Sixth AJRR Annual Report
on Hip and Knee Arthroplasty Data

AJRR Representativeness (NIS Comparison)

Figure 1.2 Proportion of TJA Patients by Age Groups, Comparison Between NIS and AAOS-AJRR, 2012-2018

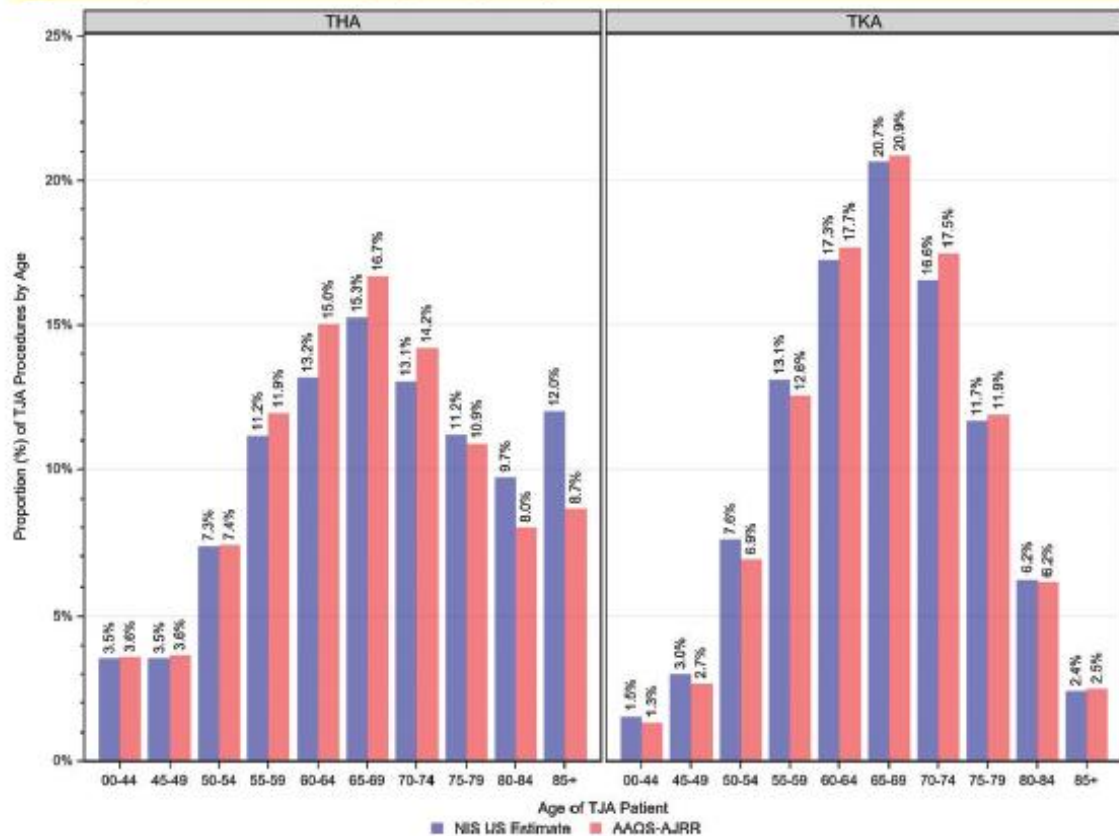
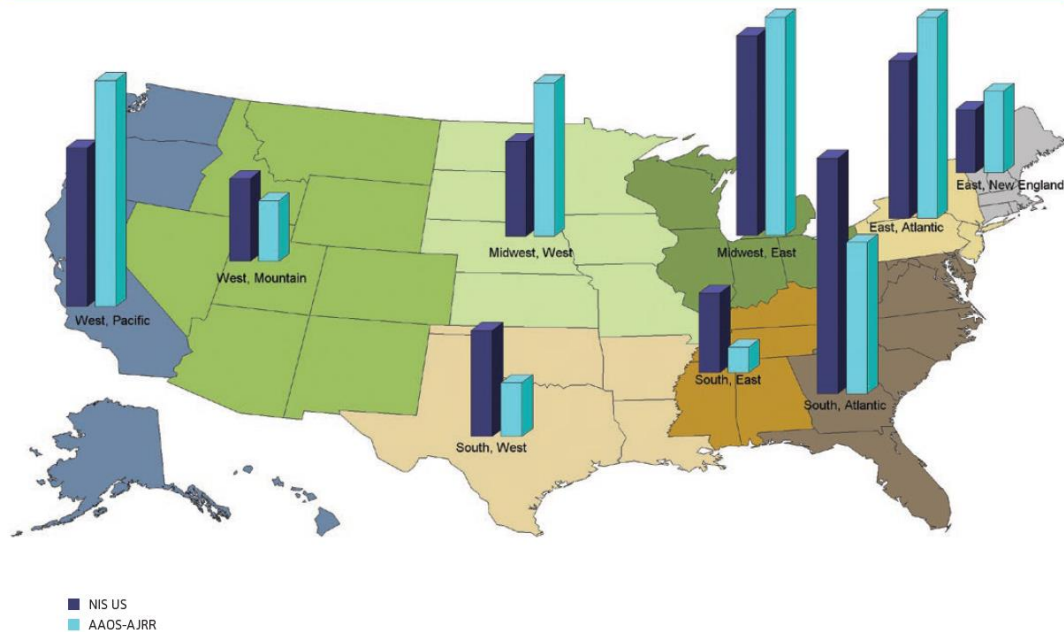
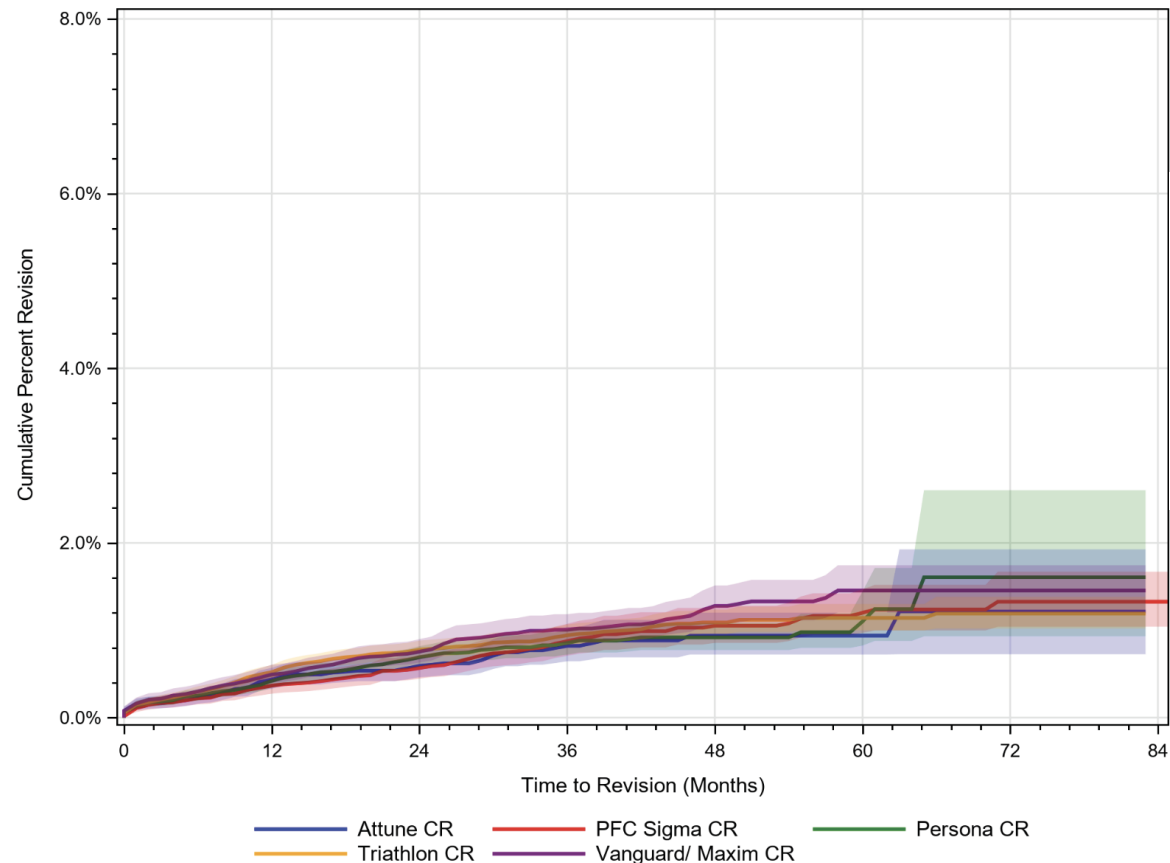


Figure 1.3 Proportion of THA Procedures by U.S. Census Division, Comparison Between NIS and AAOS-AJRR, 2012-2018



Device-Specific Cumulative Percent Revision Curves

Figure 3.16: Five Most Commonly Used Constructs: Cruciate Retaining Fixed Bearing Tibial Baseplate Designs for Primary Total Knee Arthroplasty in Patients ≥ 65 Years of Age for All Causes for Revision, 2012-2018



Group Name	Total	Failure Events	Not Failed	Competing Events (Death)	Percent Without Event
Vanguard/ Maxim CR	19,106	169	18,690	247	99.1%
Triathlon CR	37,356	287	36,657	412	99.2%
PFC Sigma CR	13,845	110	13,492	243	99.2%
Persona CR	23,788	160	23,440	188	99.3%
Attune CR	12,826	82	12,661	83	99.4%
Total	106,921	808	104,940	1,173	99.2%

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Contact the AAOS Registry Program

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Custom Analytics: RegistryAnalytics@aaos.org

Registry Analytics Institute: RegistryAnalyticsInstitute@aaos.org

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Improving orthopaedic
care through **data.**

Questions?

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www.aaos.org/registries

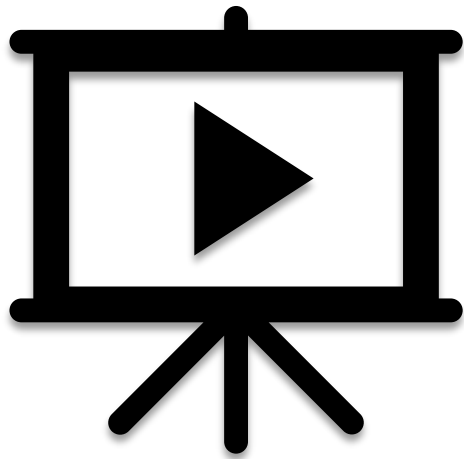
Improving orthopaedic
care through **data.**

Thank You

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Webinar Recordings



- Recordings and slide decks from past webinars can be found on [this page](#) of the AAOS website.
- If you would like to view a recording of a webinar held before October 2020, please visit [learn.aaos.org](https://www.aaos.org/learn).

Reference Slides

Participation Fee

- Single institution, 1-year licensing fee **\$3,750**
- **\$750** 1x configuration fee
- Includes Access to:
 - ✓ AAOS RegistryInsights® Platform standard reports and personalized dashboards
 - ✓ AAOS RegistryInsights national benchmarks
 - ✓ PRO Platform for survey collection
 - ✓ Ongoing support
 - ✓ Inclusion in User Group Network (Unet)