

American Spine Registry



A partnership between

American Association of Neurological Surgeons

American Academy of Orthopaedic Surgeons

ASR Introduction

info@americanspineregistry.org

www.americanspineregistry.org

Steven D Glassman, MD – ASR Co-Chair

A Need for Spine Data

- Degenerative spine disease is prevalent and costly.
- In the U.S., the total direct cost of treating low-back pain is estimated at \$100 billion.
- Nationally, more than 1.2 million spinal surgeries are performed each year.
- The fastest-growing types the past decade have been lumbar spinal fusion surgeries (\$60,000 to \$110,000 per procedure).

A Need for Spine Data

SOCIETY COALITION TASK FORCE ON
LUMBAR FUSION

**CMS: We need data that
reflects spine care in
standard clinical practice.**



October 2007

A Need for Spine Data

- Increased use of PROs
- Improved study quality (SPORT)
- Quality Outcomes Database (QOD)

A Need for Spine Data

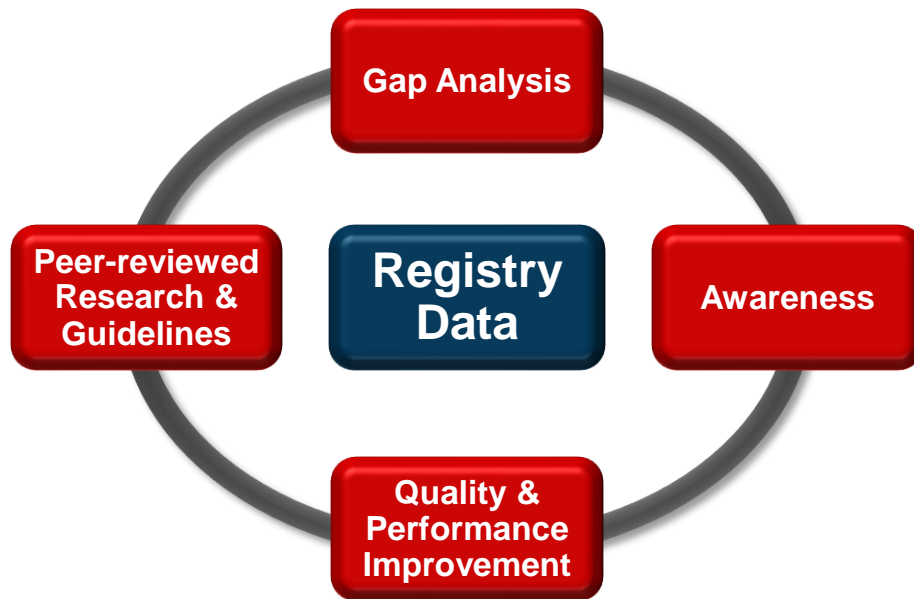
QOD Contribution

Registry Effort Goals

- ✓ Registry platform available across Neurosurgery (Ortho)
- ✓ Standardized collection of **PROs**
- ✓ Improved **diagnostic delineation**
- ✓ Facilitate national registry-driven **quality improvement** programs
- ✓ Support novel scientific **research**

A Need for Spine Data

AJRR Development



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*

A Need for Spine Data

- Potential for AANS/AAOS collaboration
- Spine Surgery: 50% Ortho/50% Neuro
- Complimentary resources



A Need for Spine Data



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American Association of Neurological Surgeons

AAOS
AMERICAN ACADEMY OF
ORTHOPAEDIC SURGEONS

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The American Association of Neurological Surgeons and the American Academy of Orthopaedic Surgeons Join Forces to Create the American Spine Registry

Partnership unites practitioners with commitment to improving quality and delivery of patient care

CHICAGO, Ill. (September 9, 2019)—The [American Association of Neurological Surgeons](#) and the [American Academy of Orthopaedic Surgeons](#) (AAOS) today announced a new partnership, the American Spine Registry (ASR), which will be jointly owned and developed by both organizations. The ASR will transform the Quality Outcomes Database (QOD) Spine Registry, currently the nation's largest spine registry, into a more far-reaching program that encourages the participation of all North American spine surgeons in a shared, quality data platform.

"By combining the unique data science capabilities of the AANS with the operational capabilities of the AAOS Registry Program, the ASR allows both organizations to enhance the reliability, ease-of-use and relevance of national spine data collection efforts and improve patient data use by engaging multiple healthcare stakeholders in this joint effort. Both organizations expect this collaboration will lead to an enhanced data platform that provides aggregated information to improve patient care, advance the science of spine care and address the challenges of an evolving, value-based care delivery system."

"This is a timely and potentially paradigm-shifting partnership," said Anthony M. Vaccaro, MD, FRCPC, neurosurgeon at Carolina Neurosurgery & Spine Associates and past president of AANS and AAOS. "Both AANS and AAOS are highly-regarded surgical specialty societies, both of which have significant scientific and economic interests in spine-related therapies. It is significant that these two societies ultimately chose to embrace the greater potential of what we believe this combined registry represents an enhanced opportunity to improve the quality of spine care."

The ASR, supported by both neurosurgeons and orthopedic surgeons, the AAOS and AANS platform fuels the creation of a consistent, reliable quality data platform for all stakeholders, including physicians, patients, payors, regulatory

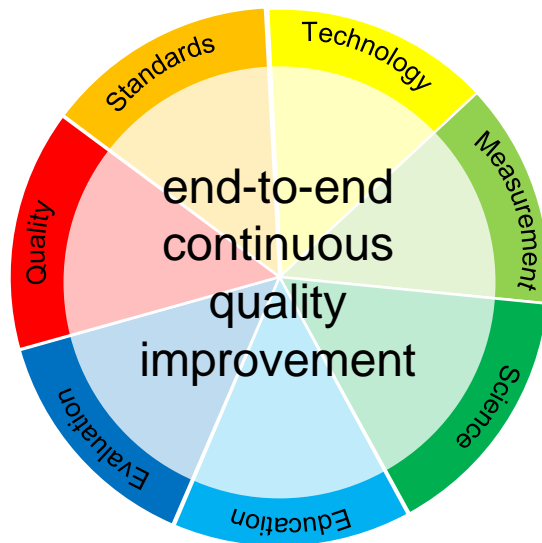


ASR 

AANS/AAOS Collaboration

A Shared Quality Vision

Registries



- Component of a larger quality vision for spine care
- Provide data to inform AANS & AAOS guidelines and test performance measures
- Provide feedback to providers to continuously improve their practice and healthcare outcomes
- Allow AANS & AAOS to define what quality means in a value-based system
- Reduce the reporting burdens on physicians
- Help inform gaps in knowledge or areas for further education

“If you can’t measure it, you can’t improve it” ~ Drucker

Collaborative Approach to Quality Spine Care

- ASR is a **win-win** for **surgeons and stakeholders** across spine
 - QOD sites benefit from lower cost and increased functionality
 - AJRR sites join a spine registry informed by QOD historical expertise
 - Ease of access for sites not participating in any registry
- All Sites benefit from multiple **data re-use opportunities**
- Participation allowed at several **contribution levels (Standard & Vanguard)**
- ASR provides a pathway to more **consistent high-quality spine care**

ASR Surgeon Leadership

ASR Executive Committee (EC)

Neuro

- **Anthony Asher, MD, AANS Co-Chair**
Carolina Neurosurgery & Spine Associates, TJC Expert Panel
- **Kevin Foley, MD**
Semmes Murphey Clinic
- **Jack Knightly, MD**
Atlantic Neurosurgical Specialists
- **Chris Shaffrey, MD**
Duke University

Ortho

- **Steven Glassman, MD, AAOS Co-Chair**
Norton Leatherman Spine Center
- **Todd Albert, MD**
Hospital for Special Surgery
- **Darrel Brodke, MD**
University of Utah
- **David Polly Jr., MD**
University of Minnesota, TJC Expert Panel



**EC provides leadership across the development and implementation of ASR, oversees committees formed, and ensures surgeon representation from AANS and AAOS*

ASR Surgeon Leadership

Data Operations Committee (DOC)*

Neuro

- **Mo Bydon, MD, AANS Co-Chair**
Mayo Clinic
- **Erica Bisson, MD**
University of Utah
- **Paul Park, MD**
University of Michigan
- **John Ratliff, MD**
Stanford University

Ortho

- **Clint Devin, MD, AAOS Co-Chair**
UCHealth – Yampa Valley Medical Center
- **Leah Carreon, MD**
Norton Leatherman Spine Center
- **Elizabeth Norheim, MD**
Kaiser Permanente
- **Kris Radcliff, MD**
Rothman Orthopaedics

**DOC oversees the development of the data specification and data dictionary, monitors data quality and provides strategic oversight on data element updates*

Data Use Committee (DUC)*

Neuro

- **Praveen Mummaneni, MD, AANS Co-Chair**
University of California San Francisco
- **Dom Coric, MD**
Carolina Neurosurgery & Spine Associates
- **Eric Potts, MD**
Goodman Campbell Brain and Spine
- **Mike Wang, MD**
University of Miami, TJC Expert Panel

Ortho

- **Doug Burton, MD, AAOS Co-Chair**
University of Kansas Medical Center
- **Sheeraz Qureshi, MD**
Hospital for Special Surgery
- **Raj Sethi, MD**
Virginia Mason Medical Center
- **Frank Phillips, MD**
Rush University Medical Center

**DUC oversees the data access policies, reviews submitted hypotheses, informs the platform dashboards and reports, and provides strategic oversight on data dissemination*

ASR Surgeon Leadership

Key Opinion Leader Taskforce* & ASR Surgeon Champion(s)

Neuro

- **John Wilson, MD**
Wake Forest, TJC Expert Panel
- **Adam Kanter, MD**
University of Pittsburgh
- **Michael Steinmetz, MD**
Cleveland Clinic, TJC Expert Panel
- **Michael Groff, MD**
Brigham & Women's Hospital
- **Joseph Cheng, MD**
University of Cincinnati
- **Justin Smith, MD**
University of Virginia
- **Oren Gottfried, MD**
Duke University

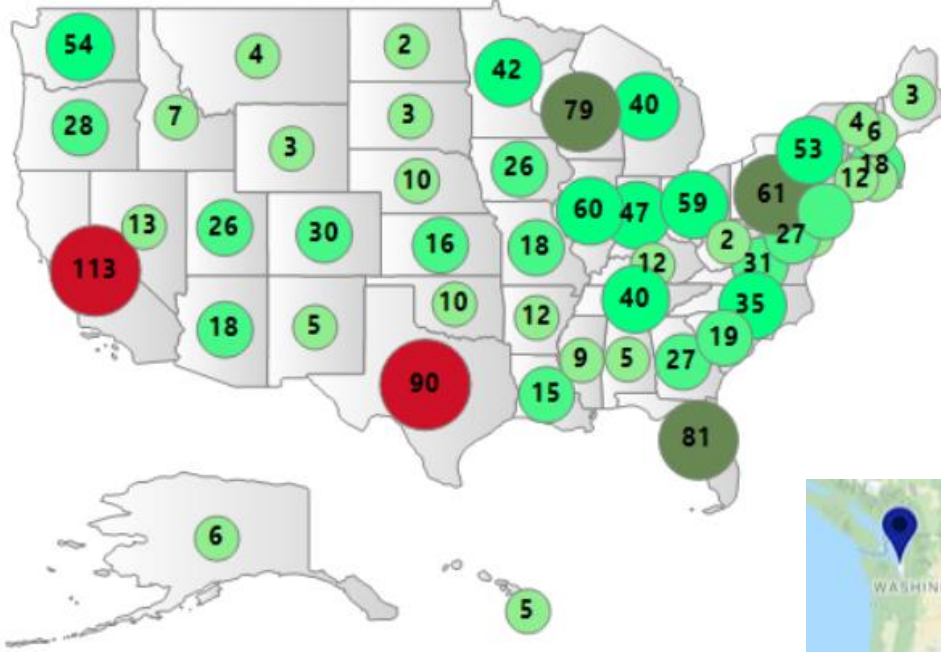
**KOL represents spine surgeon leaders from across the country to inform and provide guidance on ASR development and implementation*

Ortho

- **Jacob Buchowski, MD**
Wash U in St. Louis, TJC Expert Panel
- **Rick Sasso, MD**
University of Indiana, TJC Expert Panel
- **Paul Rubery, MD**
University of Rochester
- **Scott Boden, MD**
Emory University
- **Thomas Mroz, MD**
Cleveland Clinic
- **Jason Savage, MD**
Cleveland Clinic
- **Jeffrey Wang, MD**
USC
- **Zeeshan Sardar, MD**
Columbia University
- **Andrew Pugely, MD**
University of Iowa
- **Eric Truumees, MD**
UT Austin

Building a National Presence

AJRR Sites by State



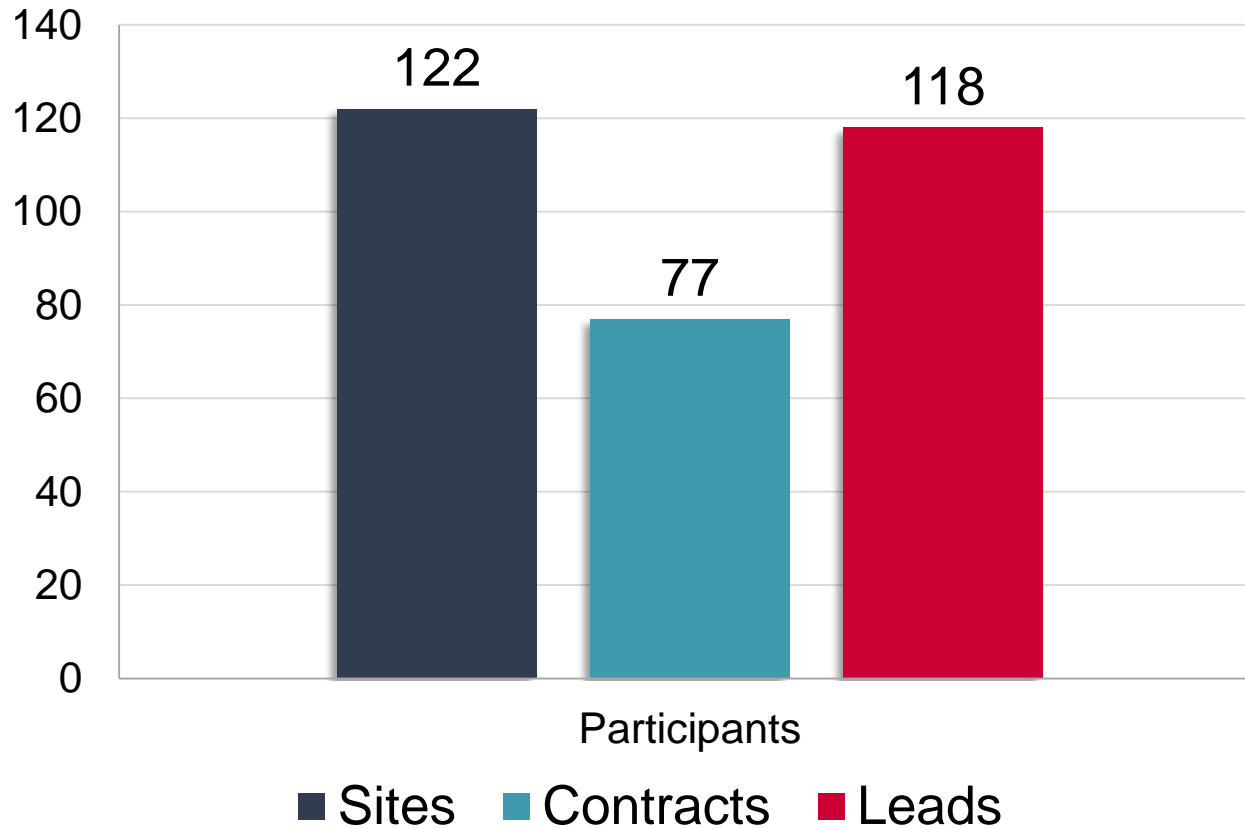
AAOS Registries have over 1,600 participating sites contracted and 11,700 registered surgeons across all 50 states.

QoD Sites by State

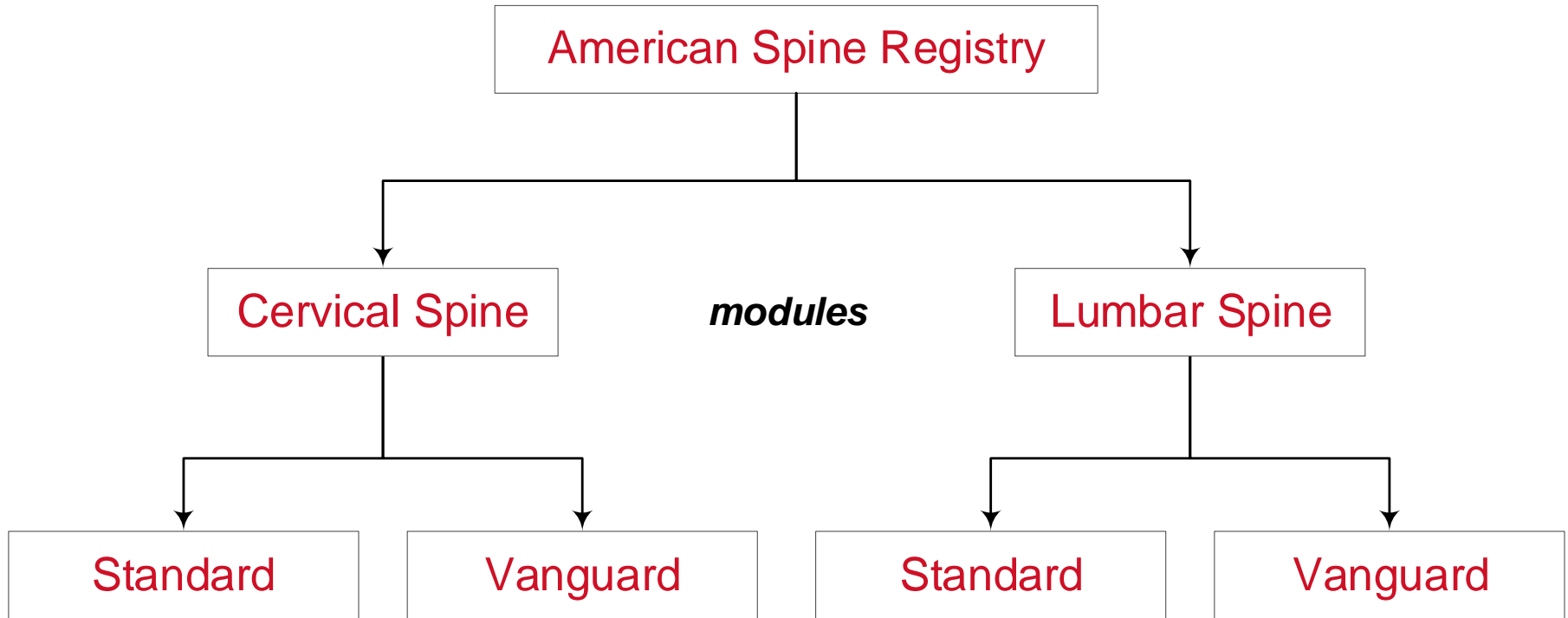


QOD sites are largely unique from AAOS sites and combined allow for broader adoption across the US spine surgery market.

ASR Participant Overview



ASR Initial Module Framework



***Vanguard sites: operative form for procedural / diagnostic detail
1 yr. rather than 3 mo. PROM follow-up**

ASR Data Element Overview

Two Modules : Cervical / Lumbar

Procedure

Patient

- Name (Last, First)
- Date of Birth
- Social Security Number
- Diagnosis (ICD-9/10)*
- Gender
- Race/Ethnicity

Site of Service

- Name and Address (TIN/NPI)

Surgeon

- Name (NPI)

Procedure

- Type (ICD-9/10, CPT)*
- Date of Surgery
- Spinal Approach
- Implants and Grafts

Post-Operative / Comorbidities

- Comorbidities (ICD-9/10, CPT)
- Height + Weight/Body Mass Index
- Length of Stay
- American Society of Anesthesiologists Score
- Operative and Post-operative Complications
- Secondary Surgical Procedures
- Anticoagulation

Patient-reported Outcomes*

Recommended

- Numeric Rating Scale (NRS)
- PROMIS Physical Function **or** Oswestry Disability Index (ODI) / Neck Disability Index (NDI)
- PROMIS-10 Global **or** VR-12

Additional Options Accepted

- PROMIS Emotional Distress – Depression
- PROMIS Emotional Distress – Anxiety
- PROMIS Pain Interference
- PROMIS-29 / PROMIS-CAT
- EQ-5D

Primary Symptoms (Check ALL that apply)		
Back Pain <input type="checkbox"/>	Cauda equina <input type="checkbox"/>	
Leg Pain <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both	Motor weakness <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both	
Neurogenic Claudication <input type="checkbox"/>		
Neural Compression (Check ALL that apply)		
None <input type="checkbox"/>	Foraminal <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both	
Central <input type="checkbox"/>	Lateral recess <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both	
Recurrent compression <input type="checkbox"/>	Far Lateral <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both	
Structural Pathology (Check ALL that apply)		
None <input type="checkbox"/>	Pseudarthrosis <input type="checkbox"/>	Kyphosis / Flatback <input type="checkbox"/>
Disc Herniation <input type="checkbox"/>	Scoliosis <input type="checkbox"/>	Fracture <input type="checkbox"/>
Stenosis <input type="checkbox"/>	Adjacent Segment <input type="checkbox"/>	Tumor <input type="checkbox"/>
Disc space collapse <input type="checkbox"/>	Spondylolisthesis/Instability <input type="checkbox"/>	Infection <input type="checkbox"/>

Approach	Anterior/Oblique <input type="checkbox"/>	Transposoa <input type="checkbox"/>	Posterior <input type="checkbox"/>
Minimally Invasive	Tubular <input type="checkbox"/>	Endoscopic <input type="checkbox"/>	Mini-Open <input type="checkbox"/> Percutaneous screw <input type="checkbox"/>
Supplemental Technique	Microscope <input type="checkbox"/>	Navigated <input type="checkbox"/>	Robotic <input type="checkbox"/>
This is part of a multi-stage procedure <input type="checkbox"/>			

Level	Decompression	Implants	Fusion	Revision Status
L1	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L1-L2	Foraminotomy <input type="checkbox"/> Laminectomy <input type="checkbox"/> Discectomy <input type="checkbox"/>	Cage <input type="checkbox"/> Plate <input type="checkbox"/> Other <input type="checkbox"/> , sp	PLF <input type="checkbox"/> TLIF <input type="checkbox"/> ALIF <input type="checkbox"/> LLIF <input type="checkbox"/> Facet/Lamina <input type="checkbox"/>	Revision Decompression <input type="checkbox"/> Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>
L2	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L2-L3	Foraminotomy <input type="checkbox"/> Laminectomy <input type="checkbox"/> Discectomy <input type="checkbox"/>	Cage <input type="checkbox"/> Plate <input type="checkbox"/> Other <input type="checkbox"/> , sp	PLF <input type="checkbox"/> TLIF <input type="checkbox"/> ALIF <input type="checkbox"/> LLIF <input type="checkbox"/> Facet/Lamina <input type="checkbox"/>	Revision Decompression <input type="checkbox"/> Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>
L3	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L3-L4	Foraminotomy <input type="checkbox"/> Laminectomy <input type="checkbox"/> Discectomy <input type="checkbox"/>	Cage <input type="checkbox"/> Plate <input type="checkbox"/> Other <input type="checkbox"/> , sp	PLF <input type="checkbox"/> TLIF <input type="checkbox"/> ALIF <input type="checkbox"/> LLIF <input type="checkbox"/> Facet/Lamina <input type="checkbox"/>	Revision Decompression <input type="checkbox"/> Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>
L4	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L4-L5	Foraminotomy <input type="checkbox"/> Laminectomy <input type="checkbox"/> Discectomy <input type="checkbox"/>	Cage <input type="checkbox"/> Plate <input type="checkbox"/> Other <input type="checkbox"/> , sp	PLF <input type="checkbox"/> TLIF <input type="checkbox"/> ALIF <input type="checkbox"/> LLIF <input type="checkbox"/> Facet/Lamina <input type="checkbox"/>	Revision Decompression <input type="checkbox"/> Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>
L5	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L5-S1	Foraminotomy <input type="checkbox"/> Laminectomy <input type="checkbox"/> Discectomy <input type="checkbox"/>	Cage <input type="checkbox"/> Plate <input type="checkbox"/> Other <input type="checkbox"/> , sp	PLF <input type="checkbox"/> TLIF <input type="checkbox"/> ALIF <input type="checkbox"/> LLIF <input type="checkbox"/> Facet/Lamina <input type="checkbox"/>	Revision Decompression <input type="checkbox"/> Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>
S1	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
Pelvis	S2AI <input type="checkbox"/>	Iliac Bolts <input type="checkbox"/>		Revision Instrumentation <input type="checkbox"/> Revision Fusion <input type="checkbox"/>

Graft Material	Iliac Crest <input type="checkbox"/> Cancellous Allograft <input type="checkbox"/> BMP <input type="checkbox"/>	Local autograft <input type="checkbox"/> Structural Allograft <input type="checkbox"/> Stem cells <input type="checkbox"/>	Bone Marrow Aspirate <input type="checkbox"/> DBM <input type="checkbox"/> Other <input type="checkbox"/> , specify
Neuromonitoring	None <input type="checkbox"/>	EMG <input type="checkbox"/> MEP <input type="checkbox"/>	SSEP <input type="checkbox"/>
Complications	None <input type="checkbox"/>	Durotomy <input type="checkbox"/>	Implant-related <input type="checkbox"/> Neurologic <input type="checkbox"/> Other <input type="checkbox"/> , specify

ASR Operative Forms

- Optional operative forms used to capture information found in the brief op notes in discrete form
- Completed by the circulating nurse or surgeon during closure to populate op note and registry needs
- Being updated to populate in EPIC as a smartform that pulls data from multiple areas
- Data will inform coding, valuation and advocacy in spine care by providing more detail than currently captured via CPT / ICD coding

Patient-reported Outcome Measures

- PROMs Collection Method
 - Paper or electronic
- Submission Intervals:
 - Baseline (pre-operative)
 - Follow up at 90 days (three months post-operative)
 - One-year post-operative follow up
 - Requirement for Vanguard sites, but recommended for all participating sites
 - Sites may submit PROMs at any of the intervals below in addition to their mandatory intervals.

Collection Interval	Definition
Baseline/Pre-operative	Within 90 days prior to the procedure
90 Days/3 Months	+/- 4 Weeks
6 Months	+/- 4 Weeks
12 Months	+/- 2 Months

PROM Management

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	SG
1041062	SER Test Hospital 1	PRP30258	atAAOS	johnny	1/1/1980								
1041062	SER Test Hospital 1	PRP30258	atAAOS	johnny	1/1/1980								
1041061	SER Test Hospital 5	PRP30261	Bobby	Ricky	7/16/2019								
1041061	SER Test Hospital 5	PRP30261	Bobby	Ricky	7/16/2019				Rotator Cuff Repair	Right	2/28/2019	1619012200	CI
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		

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:

Surgeon:

Paper Info:

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.

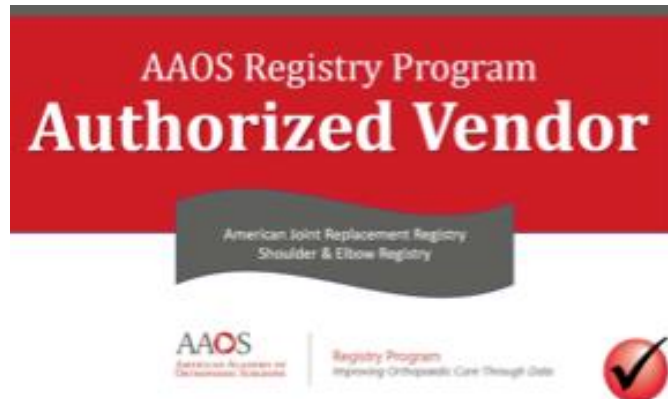
Social Security*:

Not Available

Email:

PROM submission can occur via existing site systems/technology, via manual upload, or through the ASR PROM solution

Decrease Data Collection Burden



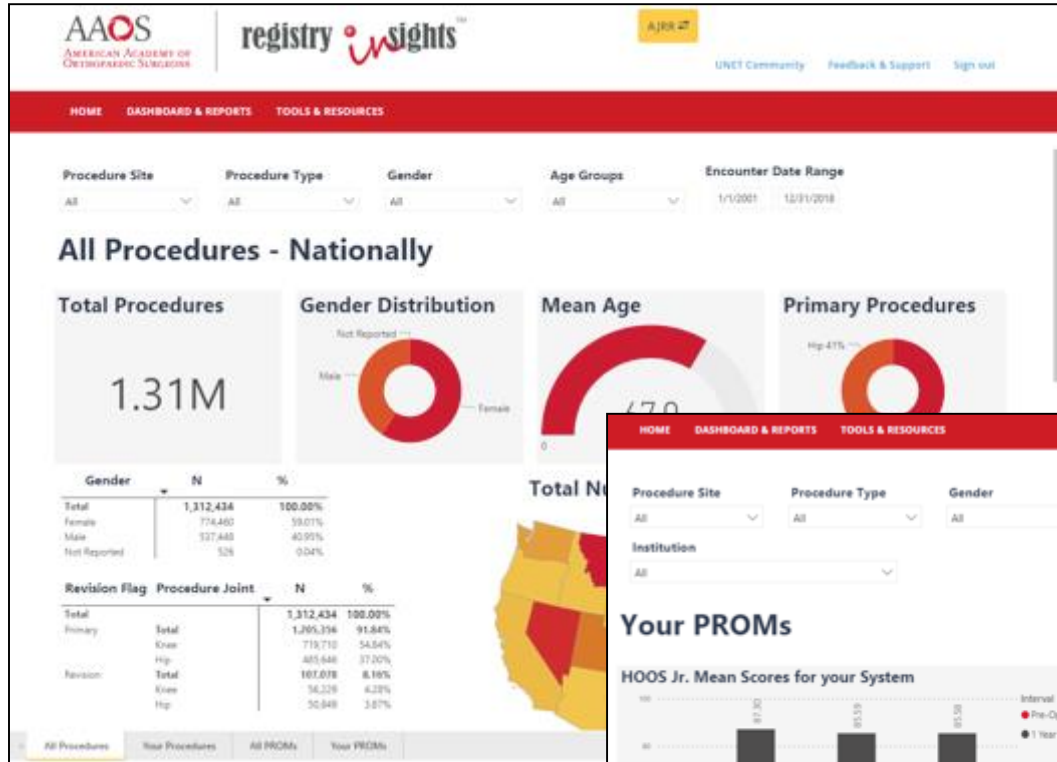
- ASR has partnered with over 45 technology vendors to facilitate the data submission process
- Re-use data that already exists in medical record, practice management and PRO systems
- Direct data submission and management can be handled by a technology provider with sites able to fix rejected files



Integration of Medicare Data

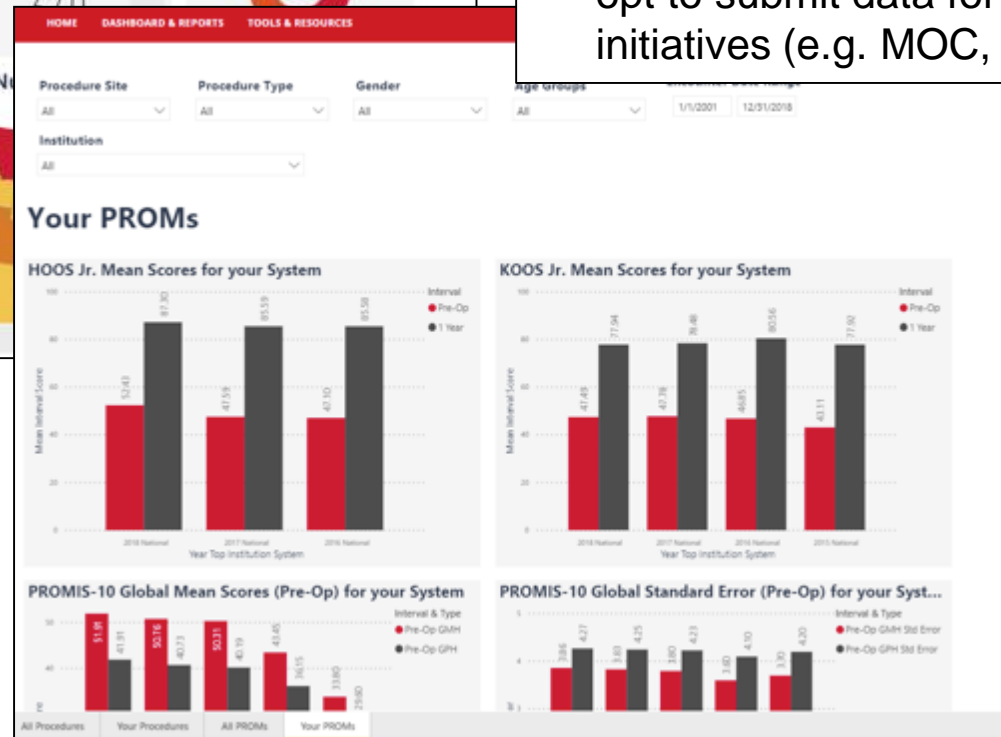
- Access to **Medicare claims** inclusive of inpatient (148 data elements), outpatient (122 data elements) & National Death Index
- Linked by full identifiers for longitudinal tracking
- 2012-2019 Medicare data for all patients represented in Registry with quarterly updates
 - Medicare files ~ 1 year delayed
 - National Death Index ~ 2 years delayed
 - National Inpatient Sample (NIS) integrated as reference data for representative analyses
 - NPES dataset incorporated for NPI validation
- Access to custom reports that compare their site to the national Annual Report analyses, show migration trends, etc.

Site & Surgeon Feedback



Site admins & Surgeons have accounts where they are able to:

- see their procedural, post-operative and PROM data
- compare themselves to national benchmarks
- request custom reports
- opt to submit data for quality initiatives (e.g. MOC, QPP)



Research Opportunities

ASR is primarily a Quality Improvement effort

- Sites access and **export their own data** via the portal
- ASR serves as a **backbone** for advanced research efforts
- Sites (other partners) request **ASR analysis** of their data
- Access is tiered based on **site contribution**
- ASR may undertake internal **Registry driven projects**

Why Do Sites Participate?

- Comparison to national performance benchmarks
- On-demand practice and surgeon specific quality reports and dashboards
- Monitor longitudinal patient outcomes
- Maintenance of Certification credit (ABOS and ABNS)
- Participation in payer-incentivized performance improvement programs
- Qualify for national distinction programs
- CMS quality improvement programs (MIPS & BPCI-A)
- Surveillance alerts for poorly performing implants
- **Improve the value of care delivered to patients**

Data Reuse Opportunities

Confirmed ROI for participants include:

- ABOS and ABNS Maintenance of Certification (MOC) Programs
- Aetna Institutes of Quality (IOQ) Orthopaedic Surgery
- BlueCross BlueShield Blue Distinction Specialty Care
- Centers for Medicare & Medicaid Services (CMS) Merit-based Incentive Payment System (MIPS) Quality Payment Program (QPP)
- CMS Bundled Payments for Care Improvement Advanced (BPCI-A)
- CMS MIPS Promoting Interoperability (PI)
- DNV GL Orthopaedic Center of Excellence
- TJC basic certification in spine, developing Advanced Certification in Spine Surgery (ACSS)

For more information visit: www.americanspineregistry.org/data-reuse-opportunities/

Unique Capabilities

- ASR provides the first ever national database to longitudinally track **implant survivorship** in spine patients, focused on:
 - Using data to inform spine practice through **actionable feedback** to care teams
 - Learning from **patient reported outcomes** alongside clinical outcomes and implant survivorship
 - **Improving coding** and documentation for spine procedures
 - Providing a resource for **device surveillance** and monitoring for early implant failures
 - Historical data goes back to ICD-10 implementation (late 2015, early 2016)

Limitations

- Do not yet have a deformity module, only basic deformity coverage in existing modules
- No tumor module yet
- Have not started radiographic imaging collection
- US based only currently

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Questions?

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Improving spine care through **data.**