

American Spine Registry



A partnership between

American Association of Neurological Surgeons

American Academy of Orthopaedic Surgeons

American Spine Registry: Delivering Value Through Data

A Year in Review

info@americanspineregistry.org

www.americanspineregistry.org

Our Speakers Today

- **Todd J. Albert, MD, FAAOS**
ASR Executive Committee Member
- **Steven D. Glassman, MD, FAAOS**
ASR Executive Committee Co-Chair



Disclosures:

Todd J. Albert, MD, FAAOS

- American Orthopaedic Association: Board or committee member
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- American Spine Registry: Board or committee member
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- No financial conflicts of interest relevant to this presentation

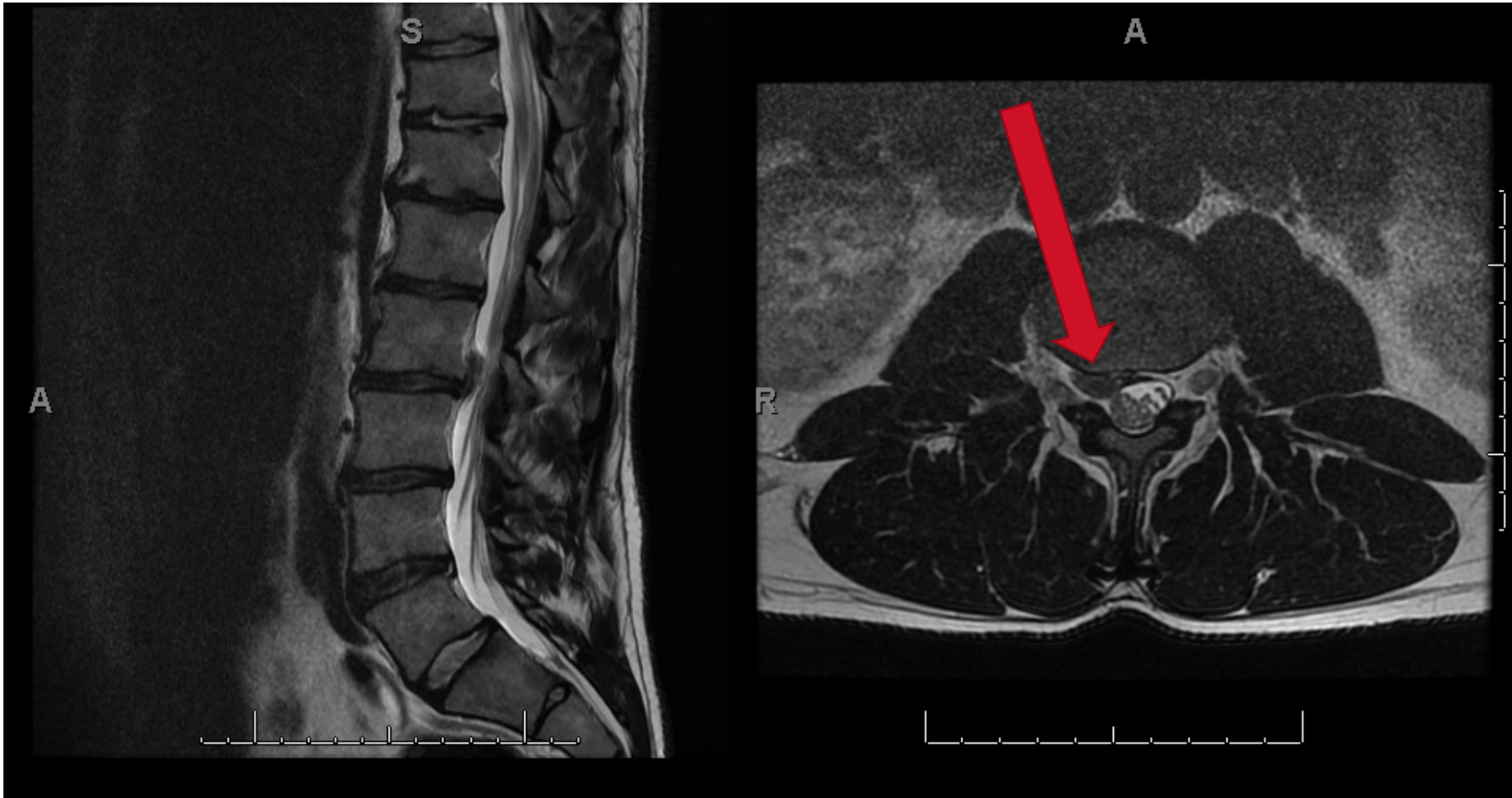


Great Variability in Conditions and Treatment

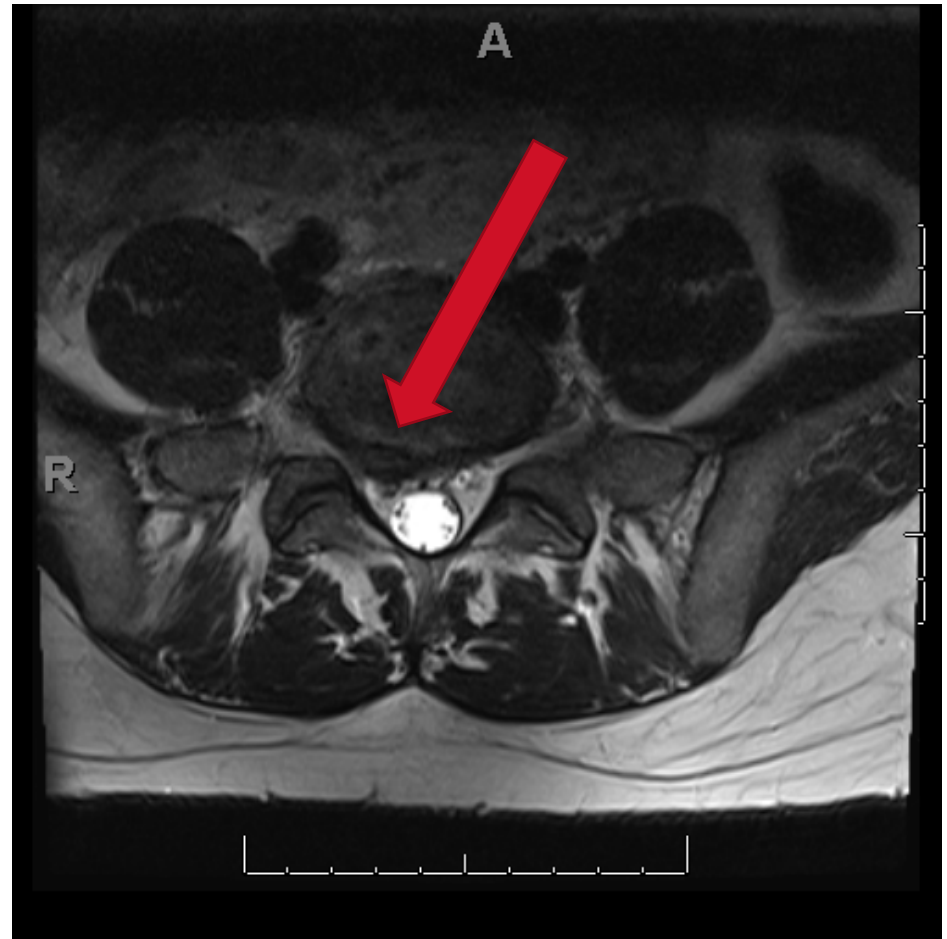
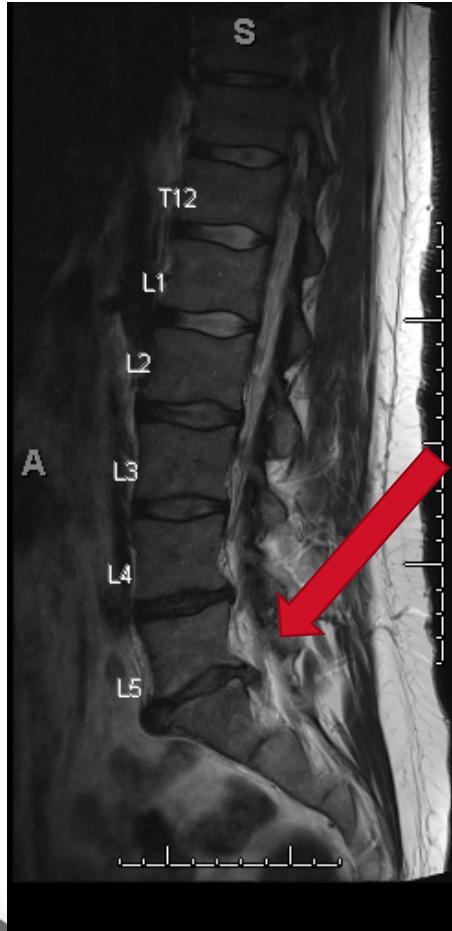
- ‘Spine’ is lumped together as a single entity
- Great heterogeneity in
 - Pathology
 - Patient health status
 - Treatment options
 - Surgical technique
- How to measure quality?
 - Initial efforts antibiotic prophylaxis, surgical site confirmation, infection rates.....



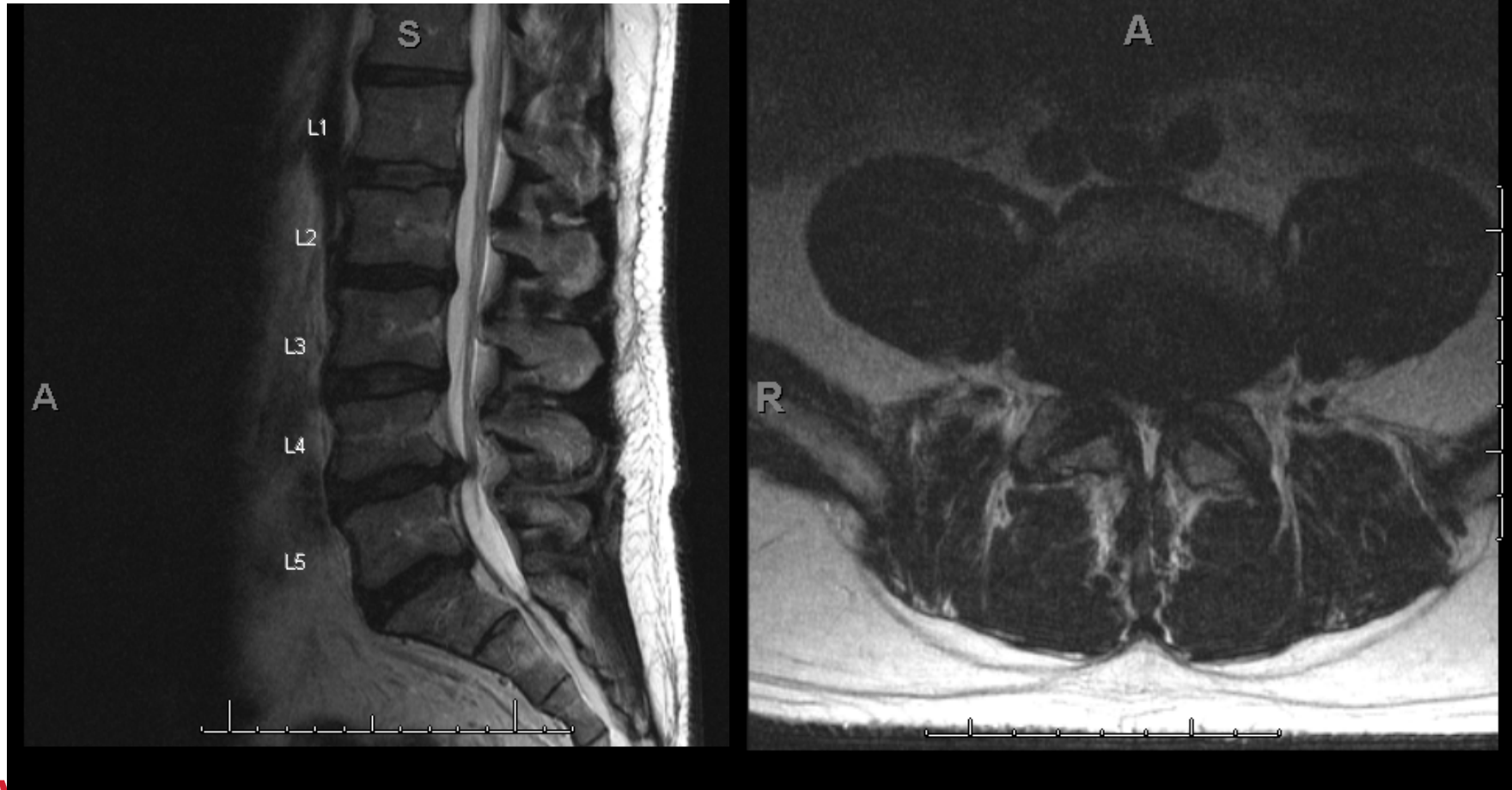
Upper Lumbar Disc Herniation



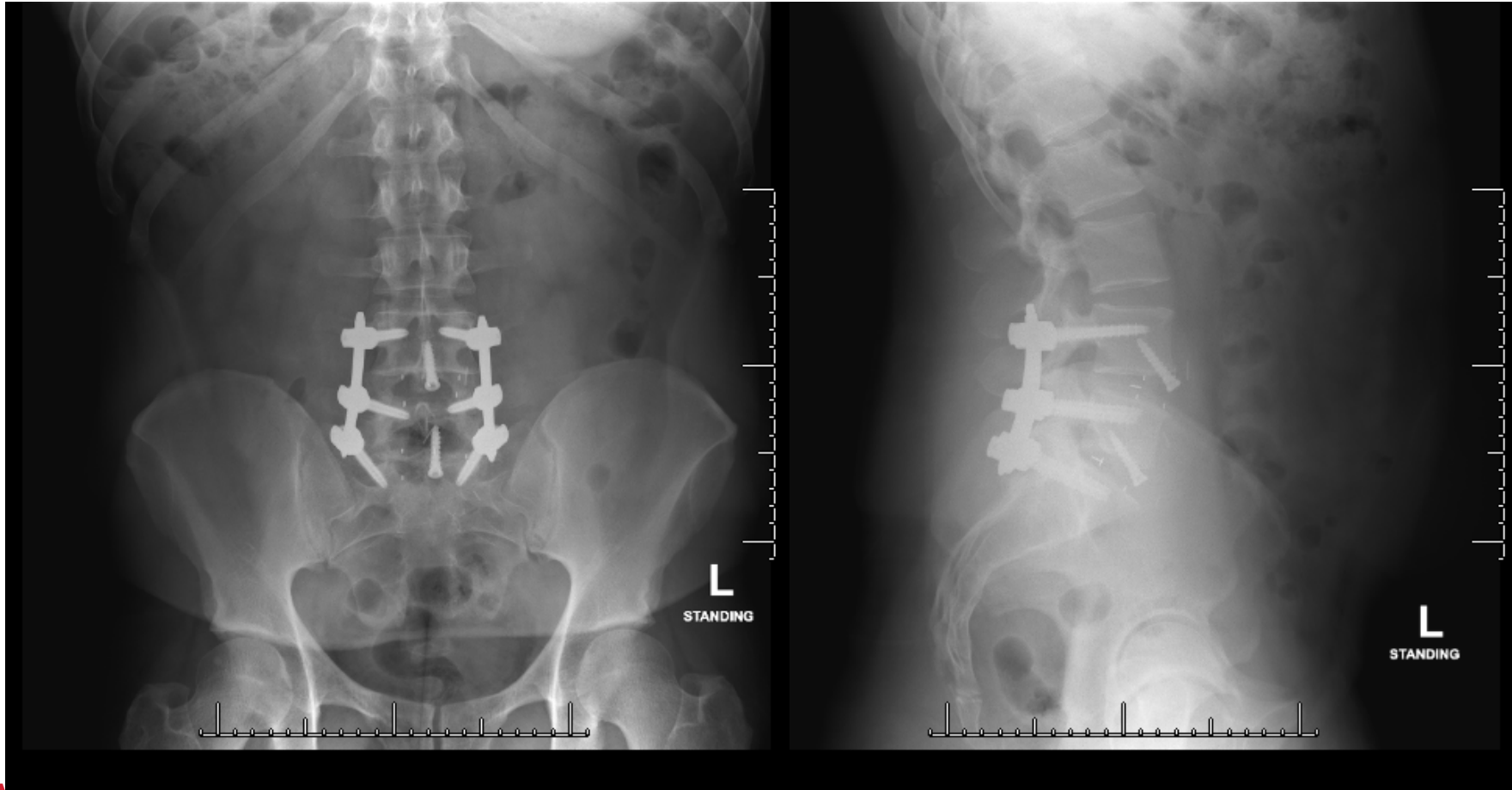
L5-S1 Disc Herniation



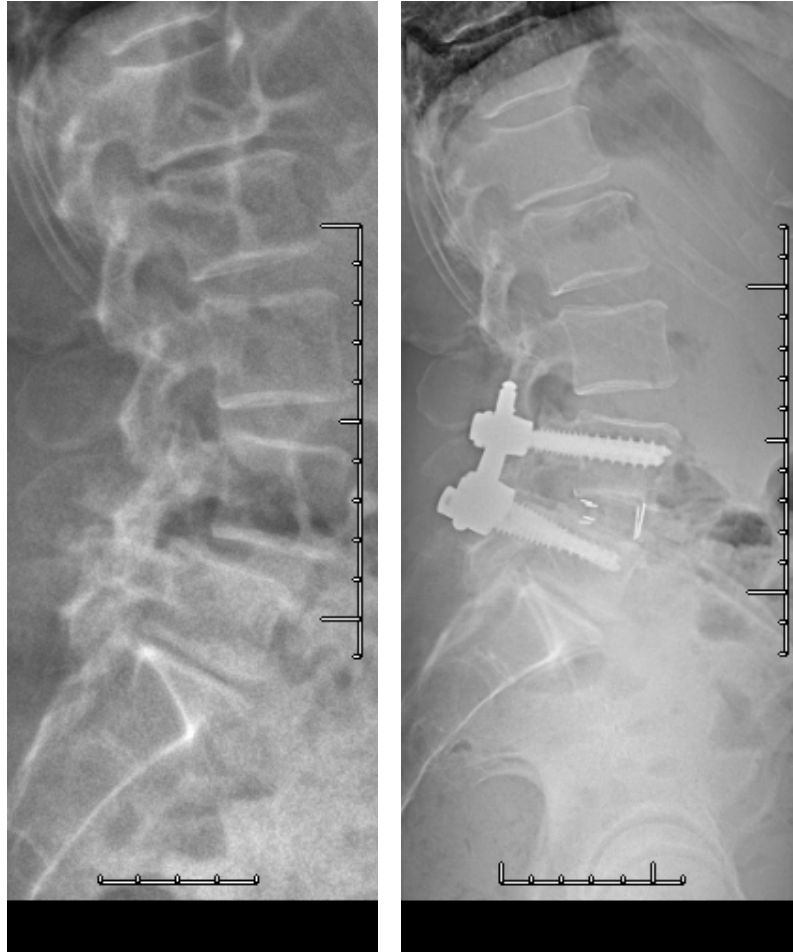
1 Level Lumbar Stenosis



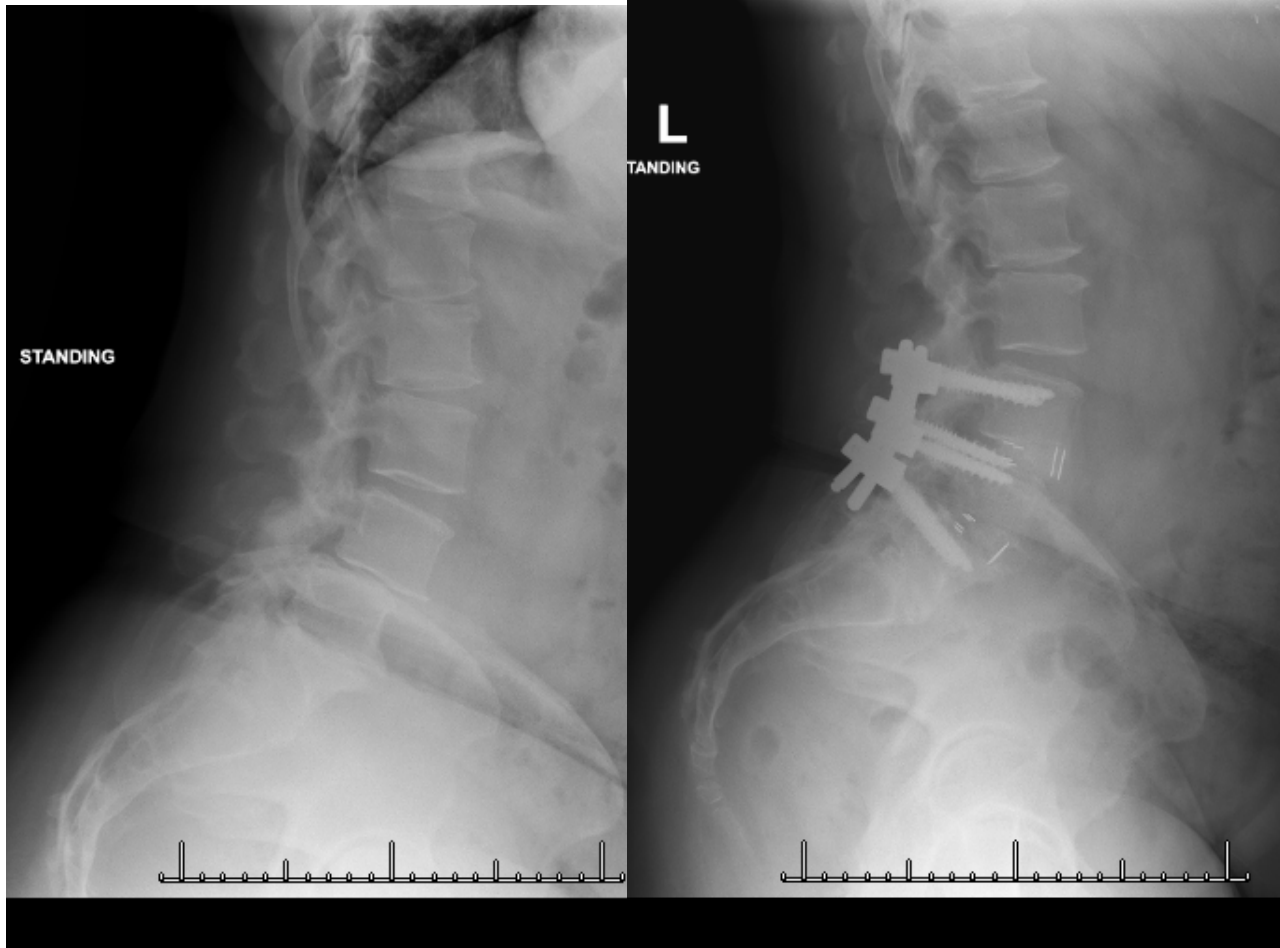
L4-S1 Fusion for Degenerative Disc Disease



1 Level Degenerative Spondylolisthesis



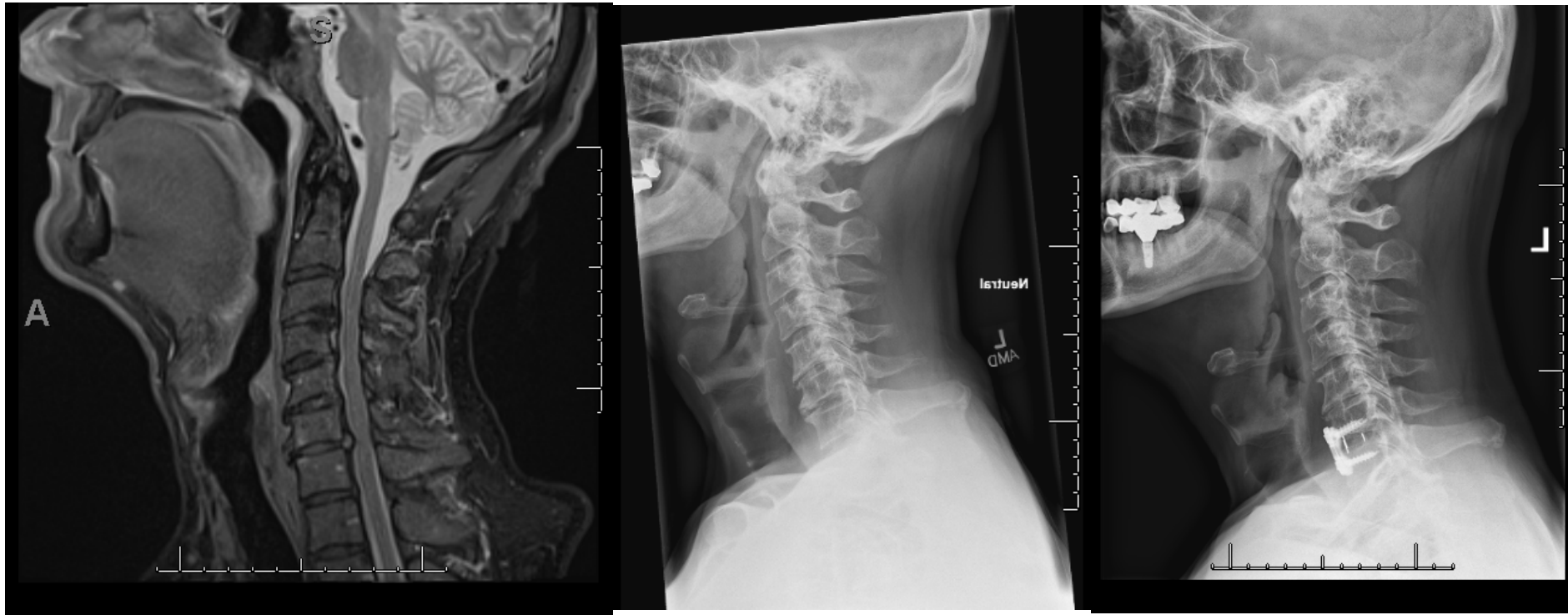
Degenerative Spondylolisthesis



ASR



1 Level Anterior Cervical Discectomy and Fusion



A Partnership Based on the Need for Spine Data

- Degenerative spine disease is one of the ***most prevalent and costly disease states worldwide***
 - LBP is the most common cause of work-related disability in the U.S.
 - In the U.S. alone, the total direct costs for spine care exceed \$100 billion annually
- Utilization of common spine procedures has increased 150-600% over the last decade
 - Lumbar spinal fusion surgeries, which range from \$60,000 to \$110,000 per procedure, have significantly increased in frequency
- Various estimates suggest that between 10 and 25% of spine care (diagnostic and therapeutic) is unnecessary and/or ineffective



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

ASR



A Need for Spine Data

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



A Need for Spine Data

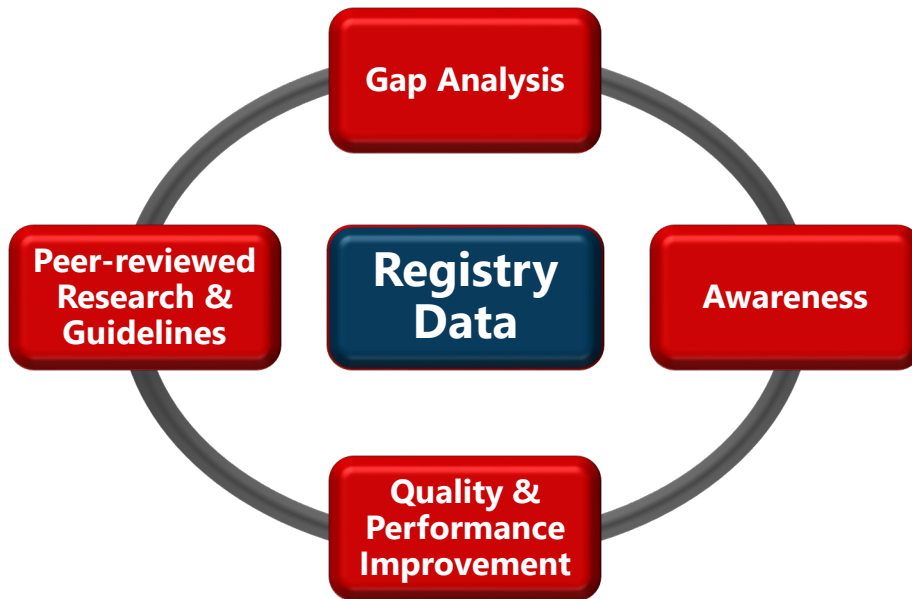
QOD Contribution

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**



The Core 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**

A Need for Spine Data

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

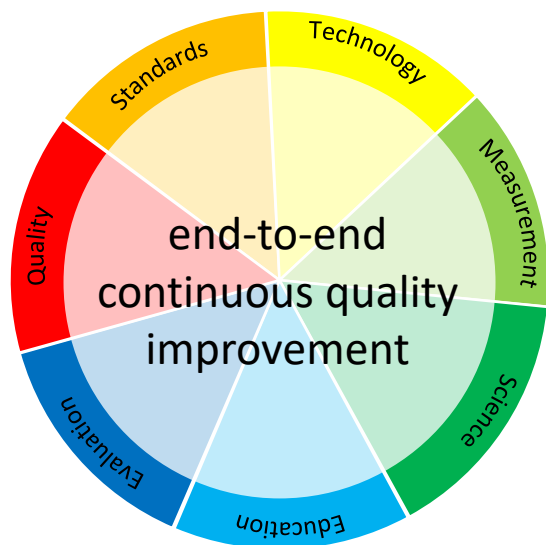


A Need for Spine Data



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**

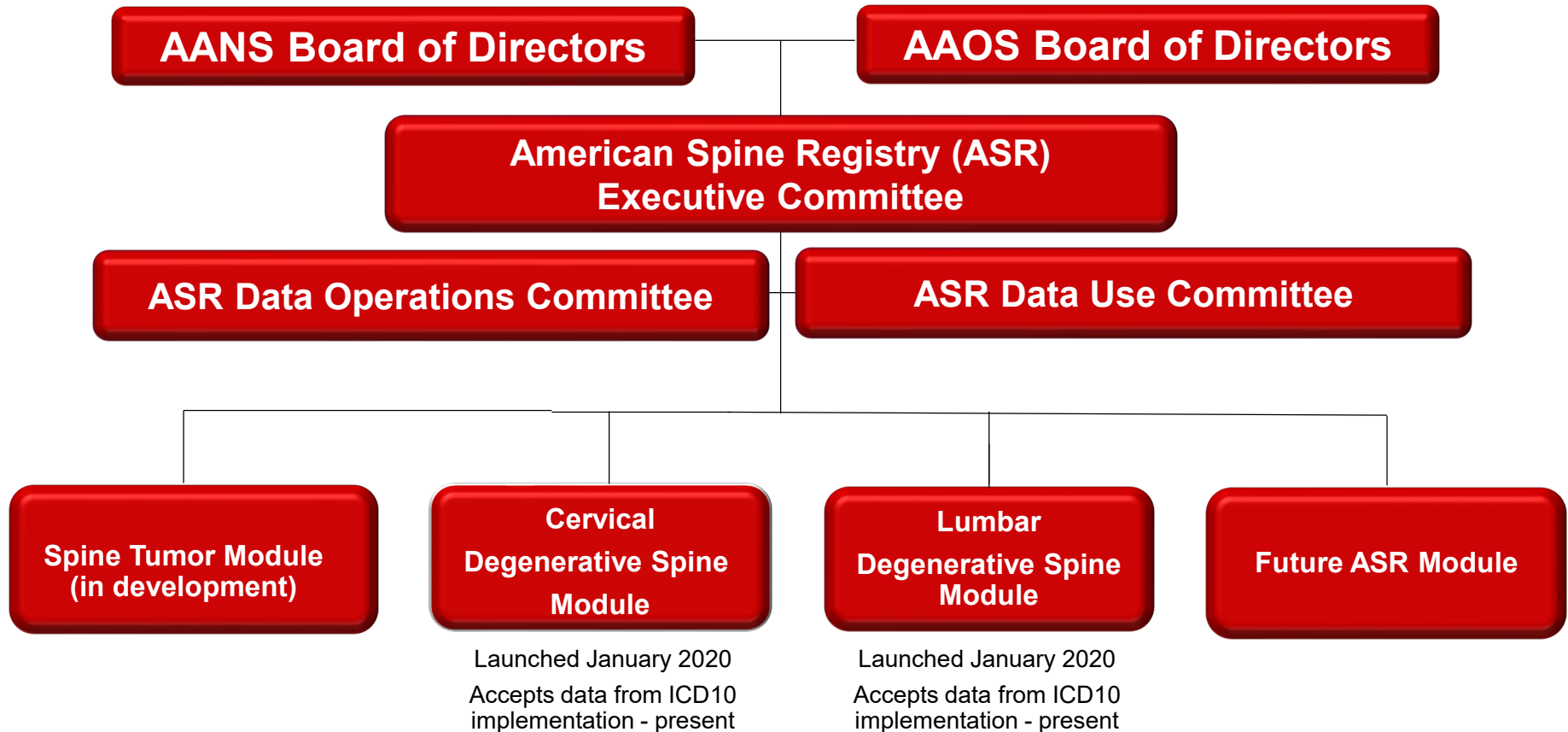


Collaborative Approach to Quality Spine Care

- **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 Governance & Development



Over 200 sites already participating since Jan 2020 launch



ASR Surgeon Leadership

ASR Executive Committee (EC)

Neuro

- **Anthony Asher, MD, AANS Co-Chair**
Carolina Neurosurgery & Spine Associates
- **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



**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)*

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

Neuro

- **Mo Bydon, MD, AANS Co-Chair**
Mayo Clinic
- **Erica Bisson, MD, MPH**
University of Utah
- **Paul Park, MD**
University of Michigan
- **John Ratliff, MD**
Stanford University
- **Michael Steinmetz, MD**
Cleveland Clinic
- **Luis Tumialan, MD**
Barrow Brain & Spine

Ortho

- **Clint Devin, MD, AAOS Co-Chair**
UCHealth – Yampa Valley Medical Center
- **Leah Carreon, MD**
Norton Leatherman Spine Center
- **Elizabeth Norheim, MD**
Kaiser Permanente
- **Zeeshan Sardar, MD**
Columbia University
- **Wellington Hsu, MD**
Northwestern University
- **Andrew Pugely, MD**
University of Iowa

Data Use Committee (DUC)*

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

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
- **Kai-Ming Fu, MD**
Weill Cornell Medicine

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
- **Alpesh Patel, MD**
Northwestern Medicine
- **S. Tim Yoon, MD**
Emory University

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 Groff, MD**
Brigham & Women's Hospital
- **Joseph Cheng, MD**
University of Cincinnati
- **Justin Smith, MD**
University of Virginia
- **Oren Gottfried, MD**
Duke University

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
- **Eric Truumees, MD**
UT Austin
- **Kris Radcliff, MD**
Rothman Institute
- **Frank Phillips, MD**
Rush University

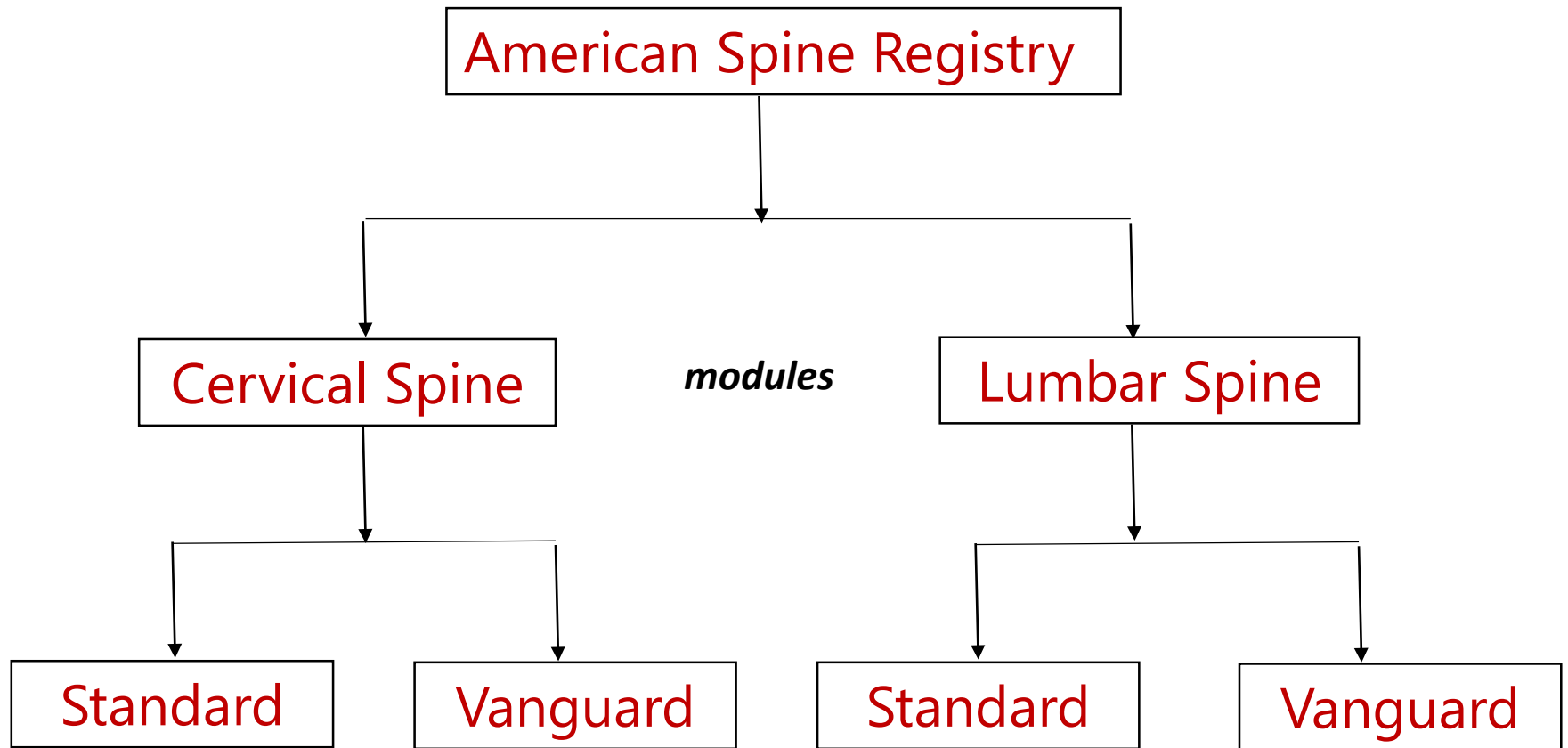
**KOL represents spine surgeon leaders from across the country to inform and provide guidance on ASR development and implementation*

Young Physician Committee

- Young Physician Committee (YPC) is directed at surgeons in early practice
- Educational materials and opportunities in *registry science*
- Equal representation of ortho and neuro
- Erica Bisson, MD and Wellington Hsu, MD as Co-Chairs



ASR Initial Module Framework



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

ASR



ASR Clinical Data Elements

Two Modules Available: Cervical & Lumbar

Demographics

Patient

- Name (Last, First)
- Date of Birth
- Social Security Number
- Diagnosis (ICD-10)*
- Gender
- Race/Ethnicity
- Comorbidities (ICD-10)
- COVID-19 as prior diagnosis
- Height + Weight/Body Mass Index

Site of Service

- Name and Address (TIN/NPI)

Surgeon

- Name (NPI)

Procedure

- Type (ICD-10, CPT)*
- Date of Surgery
- Spinal Approach
- **Implants and Grafts (manufacturer/lot#, UDI)**
- Length of Stay
- American Society of Anesthesiologists Score
- Anticoagulation

Post-Operative/Complications

- Operative and Post-operative Complications
- Secondary Surgical Procedures

**Vanguard sites utilize an operative form for additional procedural & diagnosis detail*



ASR PRO Data Elements

Patient-reported Outcomes*

Recommended

- PROMIS-10 Global **or** VR-12
- PROMIS Physical Function **or** Oswestry Disability Index (ODI) 2.1/Neck Disability Index (NDI)
- Numeric Rating Scale (NRS)

Additional Options Accepted

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

**Vanguard sites pursue longer PROMs post-operative follow-up (min 1 year) compared to standard sites (min 90 days)*

**Sites can utilize their existing PROMs collection mechanism or utilize ASR's no cost PROM tool*



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"/>		Kyphosis / Flatback <input type="checkbox"/>		
Disc Herniation <input type="checkbox"/>		Scoliosis <input type="checkbox"/>		
Stenosis <input type="checkbox"/>		Adjacent Segment <input type="checkbox"/>		
Disc space collapse <input type="checkbox"/>		Spondylolisthesis/Instability <input type="checkbox"/>		
		Fracture <input type="checkbox"/>		
		Tumor <input type="checkbox"/>		
		Infection <input type="checkbox"/>		
Approach				
Anterior/Oblique <input type="checkbox"/>		Transposas <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"/>	Cage <input type="checkbox"/>	PLF <input type="checkbox"/> TLIF <input type="checkbox"/>	Revision Decompression <input type="checkbox"/>
	Laminectomy <input type="checkbox"/>	Plate <input type="checkbox"/>	ALIF <input type="checkbox"/> LLIF <input type="checkbox"/>	Revision Instrumentation <input type="checkbox"/>
	Discectomy <input type="checkbox"/>	Other <input type="checkbox"/> , sp	Facet/Lamina <input type="checkbox"/>	Revision Fusion <input type="checkbox"/>
L2	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L2-L3	Foraminotomy <input type="checkbox"/>	Cage <input type="checkbox"/>	PLF <input type="checkbox"/> TLIF <input type="checkbox"/>	Revision Decompression <input type="checkbox"/>
	Laminectomy <input type="checkbox"/>	Plate <input type="checkbox"/>	ALIF <input type="checkbox"/> LLIF <input type="checkbox"/>	Revision Instrumentation <input type="checkbox"/>
	Discectomy <input type="checkbox"/>	Other <input type="checkbox"/> , sp	Facet/Lamina <input type="checkbox"/>	Revision Fusion <input type="checkbox"/>
L3	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L3-L4	Foraminotomy <input type="checkbox"/>	Cage <input type="checkbox"/>	PLF <input type="checkbox"/> TLIF <input type="checkbox"/>	Revision Decompression <input type="checkbox"/>
	Laminectomy <input type="checkbox"/>	Plate <input type="checkbox"/>	ALIF <input type="checkbox"/> LLIF <input type="checkbox"/>	Revision Instrumentation <input type="checkbox"/>
	Discectomy <input type="checkbox"/>	Other <input type="checkbox"/> , sp	Facet/Lamina <input type="checkbox"/>	Revision Fusion <input type="checkbox"/>
L4	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L4-L5	Foraminotomy <input type="checkbox"/>	Cage <input type="checkbox"/>	PLF <input type="checkbox"/> TLIF <input type="checkbox"/>	Revision Decompression <input type="checkbox"/>
	Laminectomy <input type="checkbox"/>	Plate <input type="checkbox"/>	ALIF <input type="checkbox"/> LLIF <input type="checkbox"/>	Revision Instrumentation <input type="checkbox"/>
	Discectomy <input type="checkbox"/>	Other <input type="checkbox"/> , sp	Facet/Lamina <input type="checkbox"/>	Revision Fusion <input type="checkbox"/>
L5	Corpectomy <input type="checkbox"/>	Screw <input type="checkbox"/>		
L5-S1	Foraminotomy <input type="checkbox"/>	Cage <input type="checkbox"/>	PLF <input type="checkbox"/> TLIF <input type="checkbox"/>	Revision Decompression <input type="checkbox"/>
	Laminectomy <input type="checkbox"/>	Plate <input type="checkbox"/>	ALIF <input type="checkbox"/> LLIF <input type="checkbox"/>	Revision Instrumentation <input type="checkbox"/>
	Discectomy <input type="checkbox"/>	Other <input type="checkbox"/> , sp	Facet/Lamina <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"/>	Local autograft <input type="checkbox"/>	Bone Marrow Aspirate <input type="checkbox"/>	
	Cancellos Allograft <input type="checkbox"/>	Structural Allograft <input type="checkbox"/>	DBM <input type="checkbox"/>	
	BMP <input type="checkbox"/>	Stem cells <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

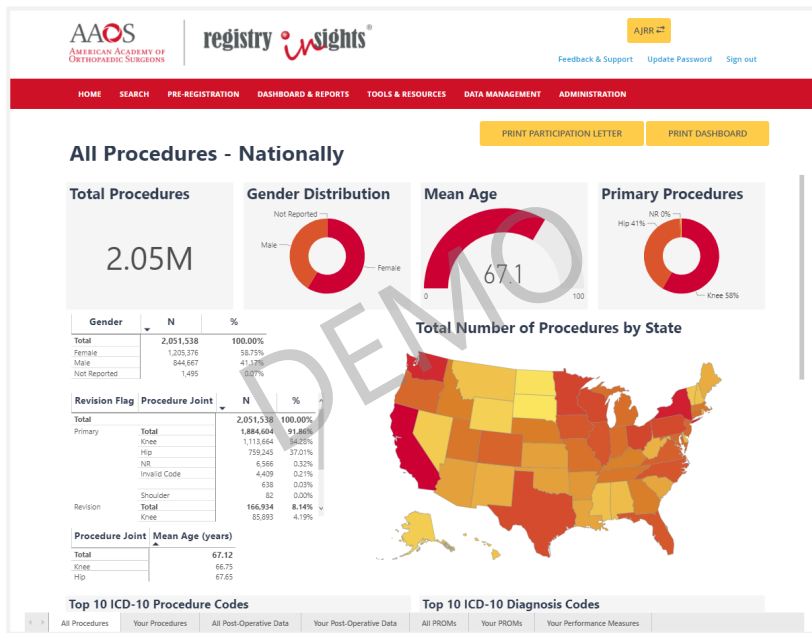
- Optional operative forms used to capture information found in the brief op notes in discrete form
- Completed by the circulating nurse or surgeon during closure to populate op note and registry needs
- Being updated to populate as a smartform that contributes data to multiple areas
- Data will inform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

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
 - NPPES dataset incorporated for NPI validation
- Access to custom reports that compare their site to the national Annual Report analyses, show migration trends, etc.



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



ASR



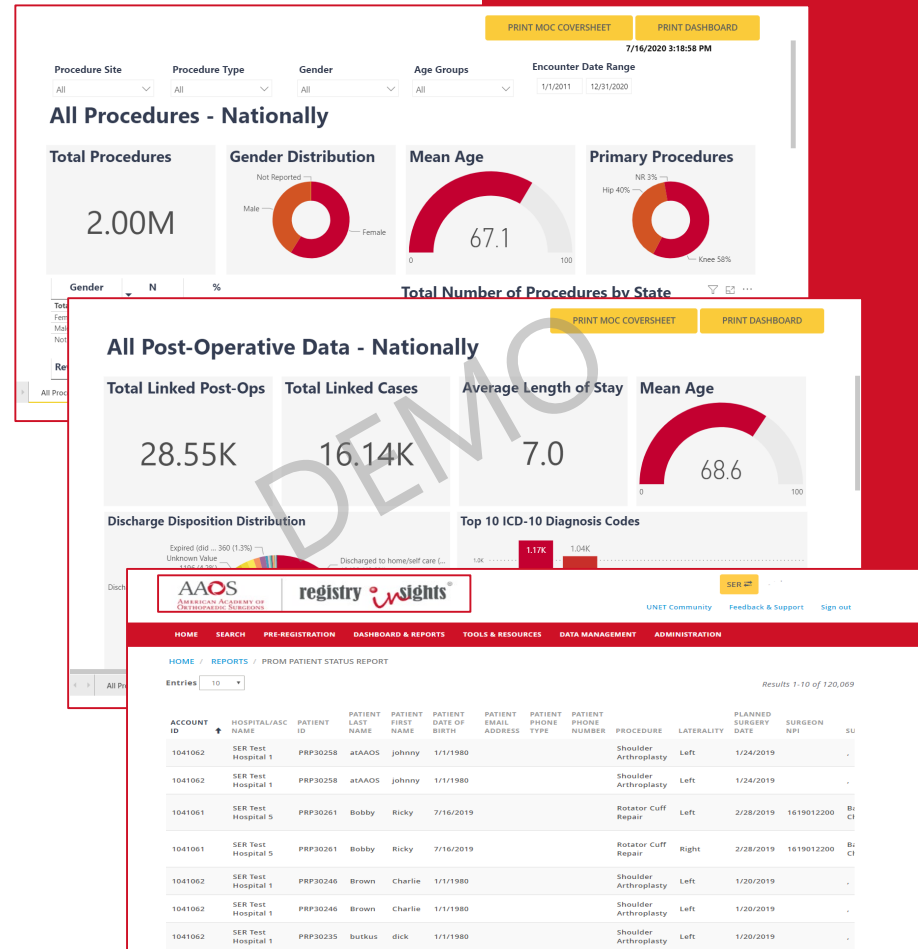
Clinical Management

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

- Pre-register patients for PROM protocols
- Select PROM assessments to be delivered via email
- Utilize platform in kiosk mode in clinic
- Monitor completion, linked PROMs, and patients reaching MCID



The Value of Data

ASR is primarily a Quality Improvement effort

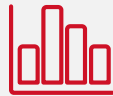
- Sites access and **export their own data** via the portal
- ASR serves as a **backbone** for advanced research efforts
- Sites (other partners) request **ASR analysis** of their data
- Access is tiered based on **site contribution**
- ASR may undertake internal **Registry driven projects**



Delivering Value for AANS & AAOS Spine Surgeons



On-demand practice and surgeon specific dashboards



Comparison to national performance benchmarks



Monitor longitudinal patient outcomes
(Medicare data)



Maintenance of Certification credit
(ABOS and ABNS)



Qualify for national distinction programs
(Aetna, AAAHC, Blue Distinction, DNV, **TJC**)



CMS quality improvement programs
(MIPS & BPCI-A)



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

ASR



ACSS Performance Measures

Measure Name	Description	Denominator	Numerator
Surgical Site Infection Rates	Patients with a post-operative surgical site infection identified within 90 days after the primary procedure.	All primary cervical and lumbar degenerative spine cases submitted to ASR.	Spine cases with documented surgical site infection within 90 days of the primary procedure.
New Neurological Deficits	Patients with new neurological deficits present within 90 days after the primary procedure.	All primary cervical and lumbar degenerative spine cases submitted to ASR.	Spine cases with new unexpected neurologic deficit with focus motor strength that is a 3/5 or worse.
Unplanned Return Visit to the OR	Patients who had an unplanned return to the OR within 90 days of the primary procedure.	All primary cervical and lumbar degenerative spine cases submitted to ASR that are not multi-stage procedures.	Spine cases that are not multi-stage procedures, with unplanned return visits to the operating room.

ACSS Performance Measures, continued

Measure Name	Description
Pre-operative and Post-operative Patient Reported Outcomes (PROs)	<p>Proportion of patients submitted to ASR who completed the general health and spine specific functional status assessments: 90 days prior to surgery and 90 days post-operatively.</p> <p>ASR accepts the following assessments: <i>General Health Assessments: PROMIS-10, VR-12, PROMIS Physical Function, PROMIS-CAT, PROMIS-29, PROMIS Pain Interference, PROMIS Emotional Distress - Depression, PROMIS Emotional Distress - Anxiety, EQ-5D</i> <i>Spine Specific Functional Assessments: ODI, NDI, Numeric Rating Scale</i></p>



ASR Progress

ASR is a work in progress:

Areas of Strong Early Achievement

- Engagement with Regulators and Payers
- Buy-in from major Health Systems
- Capability to collect granular data at scale



ASR Progress

ASR is a work in progress:

Challenges of Spine Registry Development

- Complexity of Spine Data at all levels
- Need for focused IT involvement to build data feed
- We don't know what we don't know



American Spine Registry ™

A partnership between

American Association of Neurological Surgeons

American Academy of Orthopaedic Surgeons



Thank You

Info@AmericanSpineRegistry.org

www.americanspineregistry.org

Improving spine care through **data.**