

Advanced Payment Models in Spine Surgery

Promoting Value-based Care through Prospective Outcomes Registries

Anthony L. Asher, MD, FAANS, FACS

MACRA Summit

December 2, 2016



Outline

- Given the dual challenges of rapidly escalating healthcare costs and increasingly complex administration of various reimbursement/incentive programs, CMS and other payers have understandably sought to define streamlined, if not uniform solutions for surgical treatment episodes.
- Unfortunately, specialties like neurosurgery don't fit nicely into large pre-defined buckets, due to the extreme heterogeneity of our patient population.

Defining the Problem



**Estimating Cost of Care for Patients With Acute Low Back Pain:
A Retrospective Review of Patient Records**

Lumbar Spondylolisthesis

Patient 1

- 72 year old female with DM, BMI 35
- Symptoms: LBP for 6 months
- Previous therapies : none

Patient 2

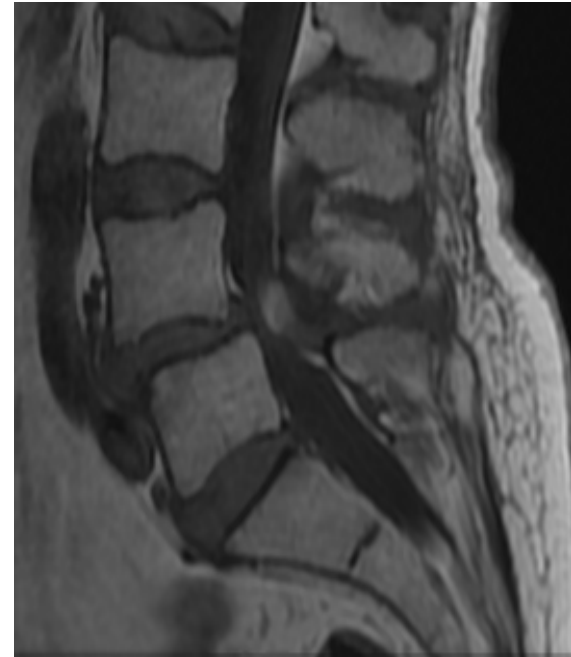
- 45 year old male; no PMH
- Symptoms: LBP, leg weakness, pain (L>R), numbness for 6 months
- Previous therapies: extensive PT, injections

Lumbar Spondylolisthesis

Patient 1

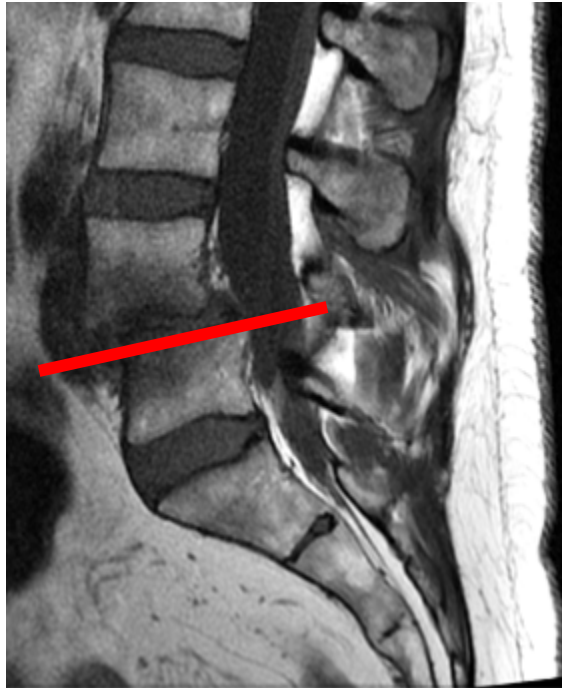


Patient 2



Lumbar Spondylolisthesis

Patient 1

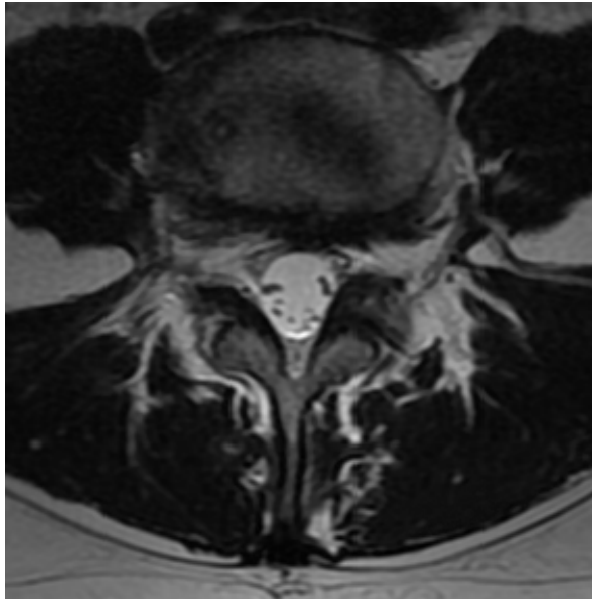


Patient 2

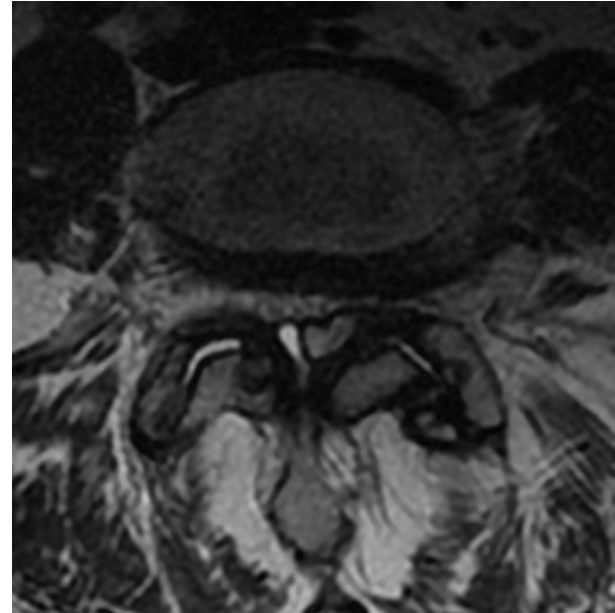


Lumbar Spondylolisthesis

Patient 1



Patient 2



Lumbar Spondylolisthesis

Patient 1

- Treatment options
 - Primary: PT, injections, behavioral modification
 - If refractory to conservative measures and unstable
 - Lumbar fusion without decompression
 - Anterior and/or posterior

Patient 2

- Treatment options
 - Primary: Surgery
 - Lumbar decompression without fusion
 - Lumbar decompression with posterior fusion

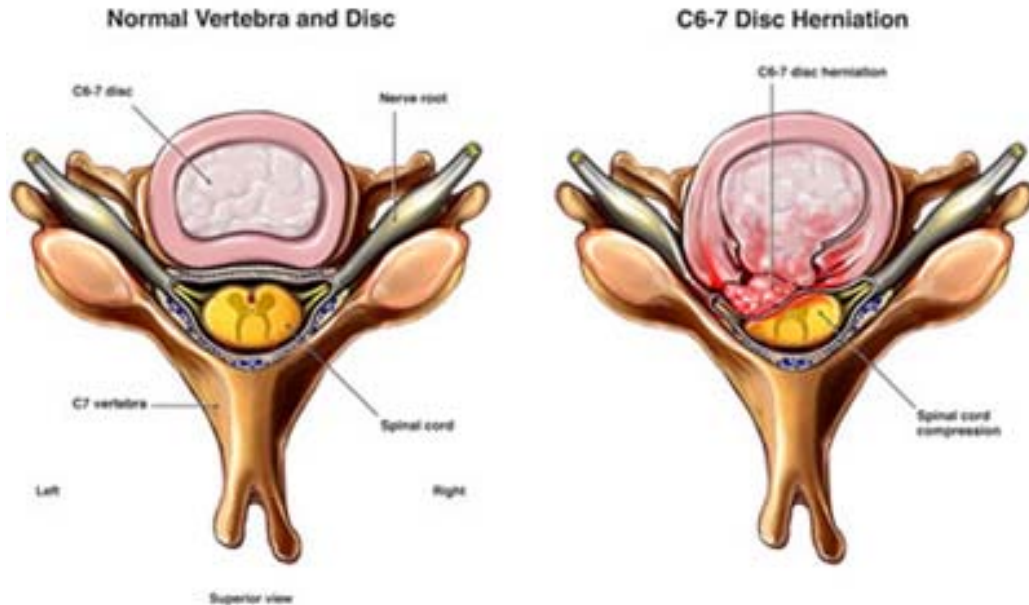
Minimum Standards for Classifying Spine Disorders

- Define three contexts
 - Symptoms
 - Spine pain
 - Neurological symptoms (nerve versus spinal cord)
 - Structural
 - Neural compression
 - Mechanical
 - Patient
 - Co-morbidities
 - Baseline disability



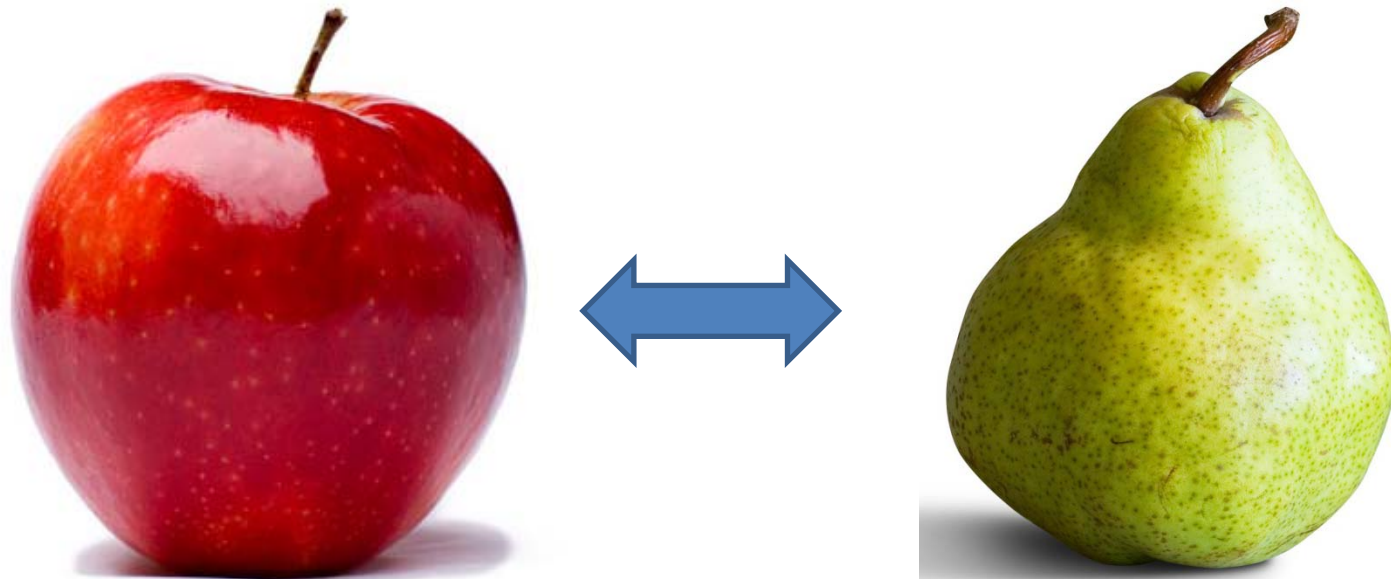
Cervical disc disease

- Presenting symptoms, exam combined with structural pathology define unique treatments, expected outcomes/costs of care









Can't compare providers or treatments
Can't assess treatment or cost effectiveness
Can't make judgments about appropriateness

Current classification schemes do not reflect critical clinical differences

- DRG
 - **460: SPINAL FUSION EXCEPT CERVICAL W/O MCC**
 - 40% of local DRG codes
 - Up to 50 distinct procedures
- ICD-10
 - **M48.06**
 - Lumbar stenosis with neurogenic claudication (M48.06)
 - Lumbar stenosis without neurogenic claudication (M48.06)
 - Lumbar canal stenosis (M48.06)
 - Spinal stenosis of lumbar region with radiculopathy (M48.06)

Payer defined P4P models

- PQRS-never relevant to advanced spine care
- QCDR
 - Recent requests by CMS to “consolidate” (i.e., collapsed into a single measure) or “eliminate” spine-specific measures and replace with a generic PQRS measure
 - Specific example: spine surgeons would be judged with respect to readmission rates based on a denominator that includes diverse surgical procedures
 - Recommendations reflect failure to recognize
 - Spine care contains many distinct clinical processes
 - Measures assess fundamentally different outcomes of care (e.g., disability and pain)
 - Spine surgery represents distinct risk pools

Payer defined P4P models

- CMS-driven episode groups
 - Often fail to recognize critical distinctions in disease classification that impact outcomes of care
- CMS Measures under consideration (MUC)
 - 3 measures developed by MN Community Measurement relevant to spine care that are under consideration for the 2018 MIPS
 - Measurements of pain improvement following spine care
 - Heterogeneous population, no risk adjustment

Summary

- Spine care is complex
- This complexity is highly relevant with respect to the clinical and economic outcomes of care
 - And many stakeholders do not appreciate this fact
- APMs, if they are to incent and reward best care (value), must take this complexity into account
 - Providers need to be meaningfully involved in designing these programs

- *Value-based reforms* are being adopted by most stakeholders to help achieve sustainability of the current U.S. healthcare system

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}}$$



Value Opportunities in Spine Care

- *Spinal Disorders are the 2nd most **common** reason for adult visits to medical provider*
 - LBP is the most common cause of work-related disability in the U.S.
- *Direct costs for Spine Care in the United States exceed \$90 Billion annually*
 - **Total costs may exceed \$200 Billion***
 - Spinal fusion is the most costly O.R. procedure performed in US hospitals (AHRQ)
- *Utilization of common spine procedures has increased 150-600% over the last decade*
- *Estimates are between 10 and 25% of spine care (diagnostic and therapeutic) maneuvers are **unnecessary and ineffective***

Challenges to Value-Based Approaches

- *Quality* remains poorly described
 - Optimal healthcare outcomes for many medical conditions remain undefined from the perspective of *all* relevant stakeholders
 - What would help: more focus on outcomes



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Perspective

Standardizing Patient Outcomes Measurement

Michael E. Porter, Ph.D., M.B.A., Stefan Larsson, M.D., Ph.D., and Thomas H. Lee, M.D.
N Engl J Med 2016; 374:504-506 | February 11, 2016 | DOI: 10.1056/NEJMp1511701

Comments open through February 10, 2016

Challenges to Value-Based Approaches

- Valid *methods* to continuously measure, promote and report safety and quality in healthcare are underdeveloped
 - Administrative datasets are ill-suited to advance quality improvement and science

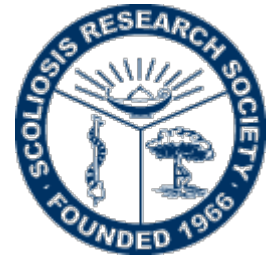


Stakeholder Engagement

Defining Quality



**The Society
of Thoracic
Surgeons**



**NATIONAL
QUALITY FORUM**



**American Board
of Medical Specialties**

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**INSTITUTE FOR
HEALTHCARE
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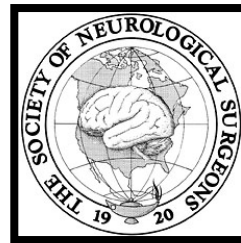
CENTERS for MEDICARE & MEDICAID SERVICES

AAOS **AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS**
AMERICAN ASSOCIATION OF ORTHOPAEDIC SURGEONS

VANDERBILT **THE INSTITUTE FOR MEDICINE AND PUBLIC HEALTH**
EVIDENCE-BASED PRACTICE CENTER



- Robust, novel information systems to measure clinical outcomes of relevance to all healthcare stakeholders
- Launched **3/2012**



Clinical Registry

- *Observational* data collection systems designed to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure
 - *Serves one or more predetermined scientific, clinical, or policy purposes.*
 - *Infrastructure can be adapted to other purposes*



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care • www.ahrq.gov

Clinical Registries are being increasingly used to promote value-based care and medical science

- **Public and Private patient safety initiatives and quality reporting mandates**
 - HHS (Medicare Access and CHIP Reauthorization Act (MACRA))
 - **45-70% of Merit Based Incentive System (MIPS) can be satisfied through registry (QCDR) participation**
 - Private (e.g., BCBS distinction program)
 - Bariatric, orthopedic, cardiovascular and spine registry consortia
- **Board Certification**
 - ABMS MOC programs
- **Specialty society sponsored QI and Public Reporting**
 - AHA: “Get with the Guidelines”
 - STS: Voluntary performance reporting through Consumer Reports
- **Device registries**
 - FDA post-approval analyses
- **Comparative Effectiveness and Patient Centered Outcomes Research**
 - Federal Coordinating Council for Comparative Effectiveness Research
 - PCORI

Unique Aspects of QOD

Relevant Methods and Measures of Outcomes

- Longitudinal follow up
 - Allow for the assessment of the sustainability of treatment effects
- Patient reported outcomes (PRO)
 - Key element in patient-centered care
 - May be more reflective of underlying health status than physician reporting



Diagnostic Classification/Inclusion

Structural Pathology

- Lumbar Disc Herniation
- Lumbar Stenosis
 - Central/Lateral
- Lumbar Spondylolisthesis
- Symptomatic Mechanical Disc Collapse
- Adjacent Segment Disease
- Recurrent Disc Herniation
- Scoliosis

Symptoms

- Back Pain Dominant
 - Acute/Chronic
- Leg Pain Dominant
 - Acute/Chronic
- Back=Leg pain
 - Acute/Chronic
- Neurogenic Claudication



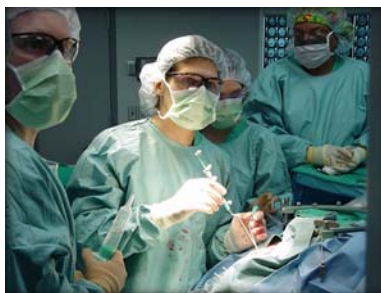
The Spine Journal 11 (2011) 1108–1116



Clinical Study

A diagnostic classification for lumbar spine registry development

Steven D. Glassman, MD^{a,*}, Leah Y. Carreon, MD, MSc^a,
Paul A. Anderson, MD^b, Daniel K. Resnick, MD^c



Reporting-
Safety/Effectiveness

Quality control:
Missing data,
data validation
& auditing

Online Data
Entry

NEUROPOINT
ALLIANCE
est. 2008

Aggregate & site
specific data
analysis

Secure Data Set Transfer



QOD Lumbar Spine Surgery Module:

- Original Site Distribution

- **84 Contracted QOD Sites**

- 34 US States

- 120 Hospitals

- 6 new sites in activation

- **>950 Surgeons**

- Neurosurgeon/Orthopedic

- **Distribution:**

- 45% Academic

- 55% Private Practice

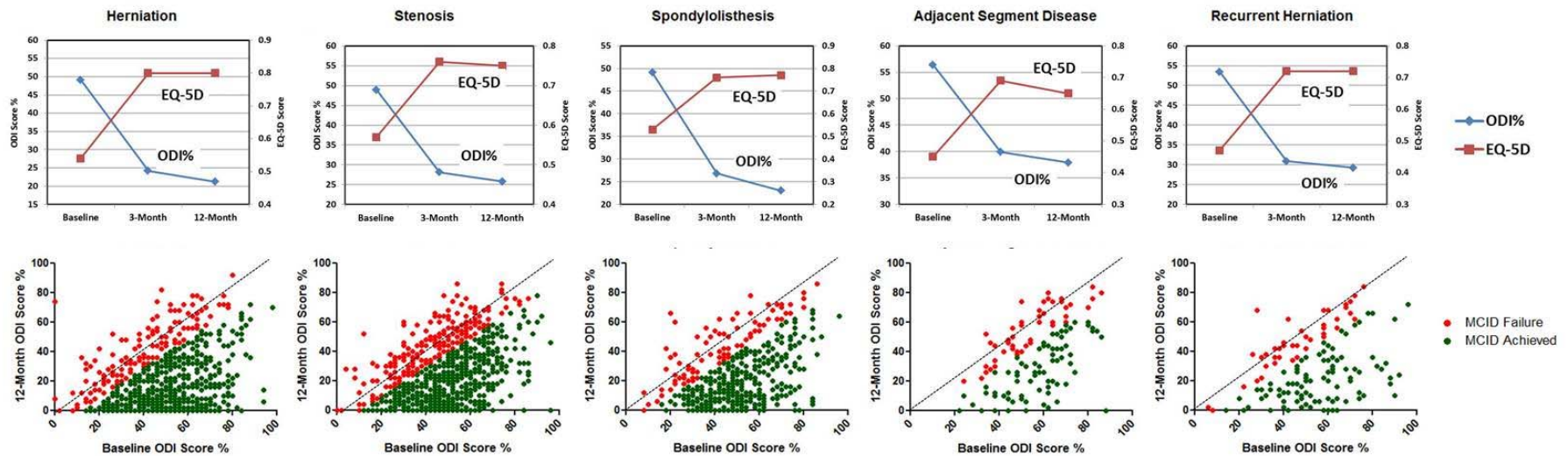
- **Accrual (6/2016)**

- 25,000 patients

- 34,000 total spine



Disease Specific Outcomes

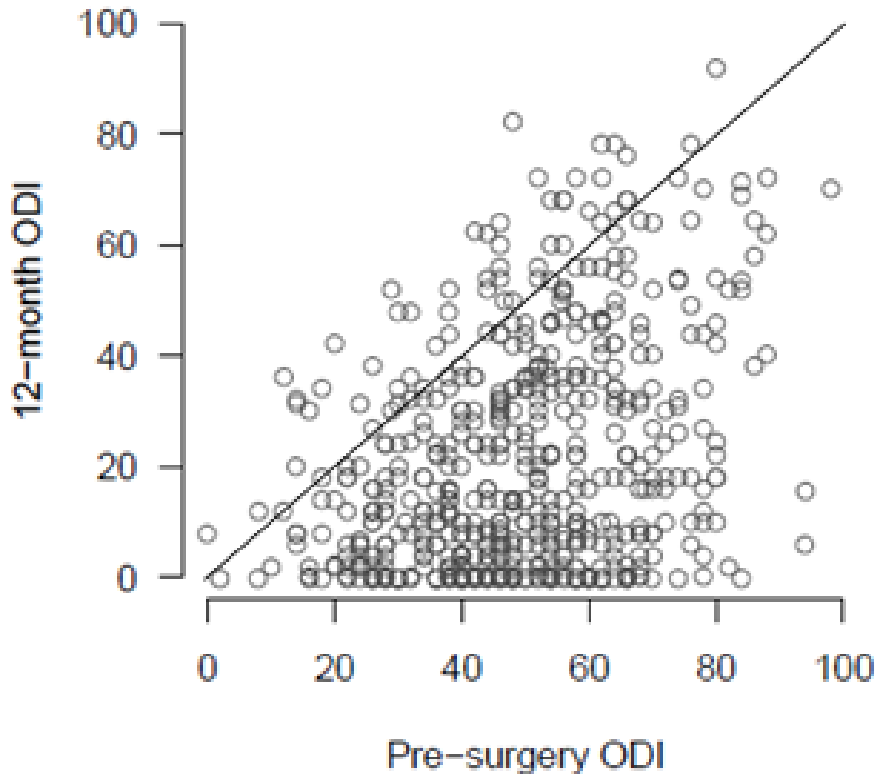


“Average” outcomes do not reflect the tremendous variability in response at the individual patient level

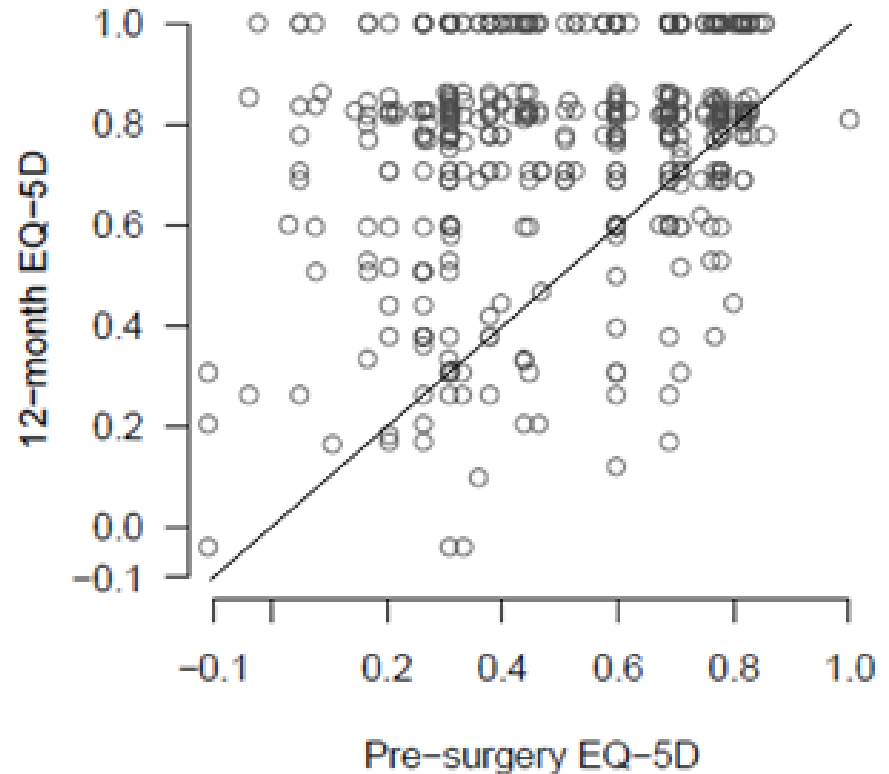
There is Significant Variation in Effectiveness of Care at the individual patient level

What factors are driving outcomes at the individual patient level?

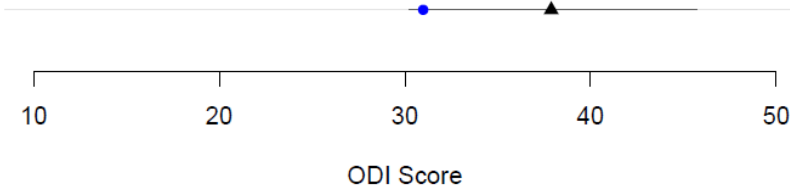
Oswestry Disability Index



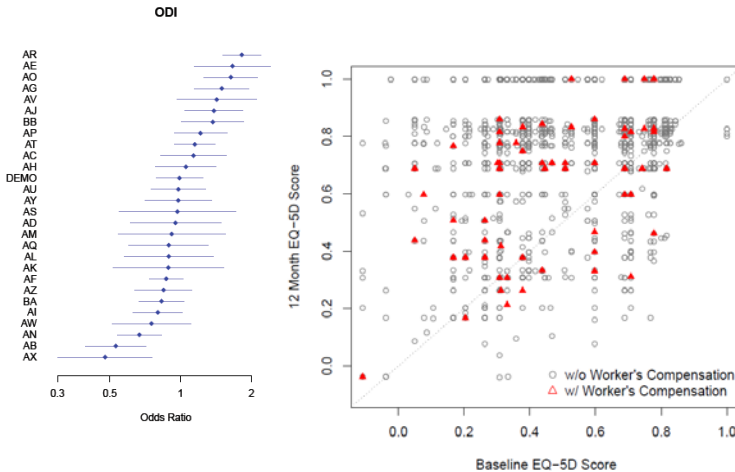
Euroqual Quality of Life



Improving Value by Understanding Variation in Outcomes



Variation  **Value**



- ✓ Improve outcomes by understanding variation
- ✓ Conduct interventions and practice innovations for meaningful change in outcomes

Sorting out signal from noise

Multivariate analyses

- Analyzing the combined contribution of patient variables to specific outcomes
 - Determine expected benchmarks of care (to facilitate QI)
 - **Develop predictive models of patient experience**
 - Facilitate informed decision making
 - Help optimize care for patient subpopulations

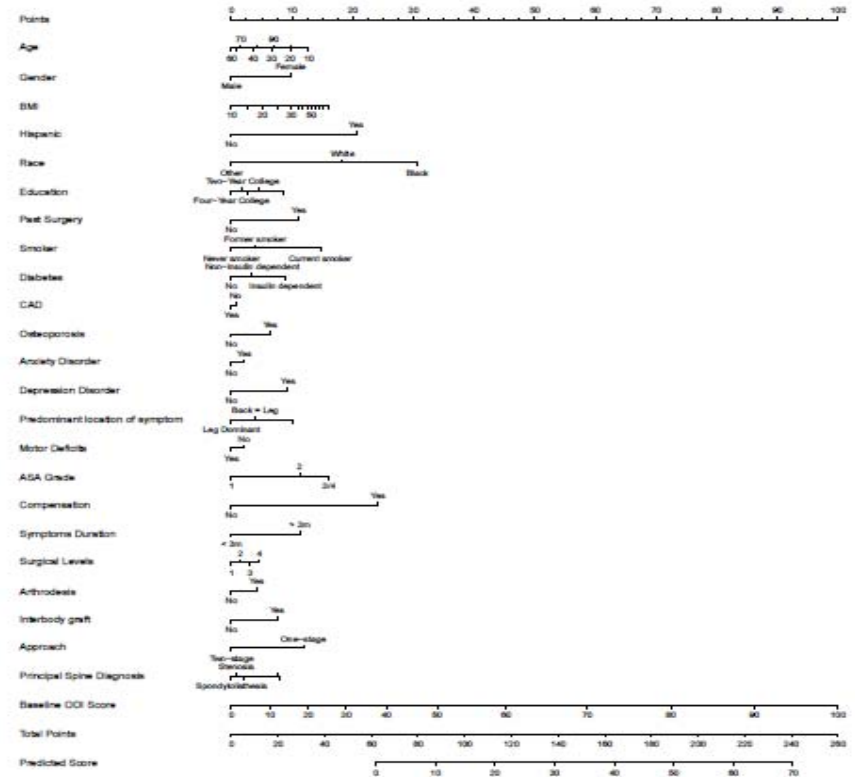
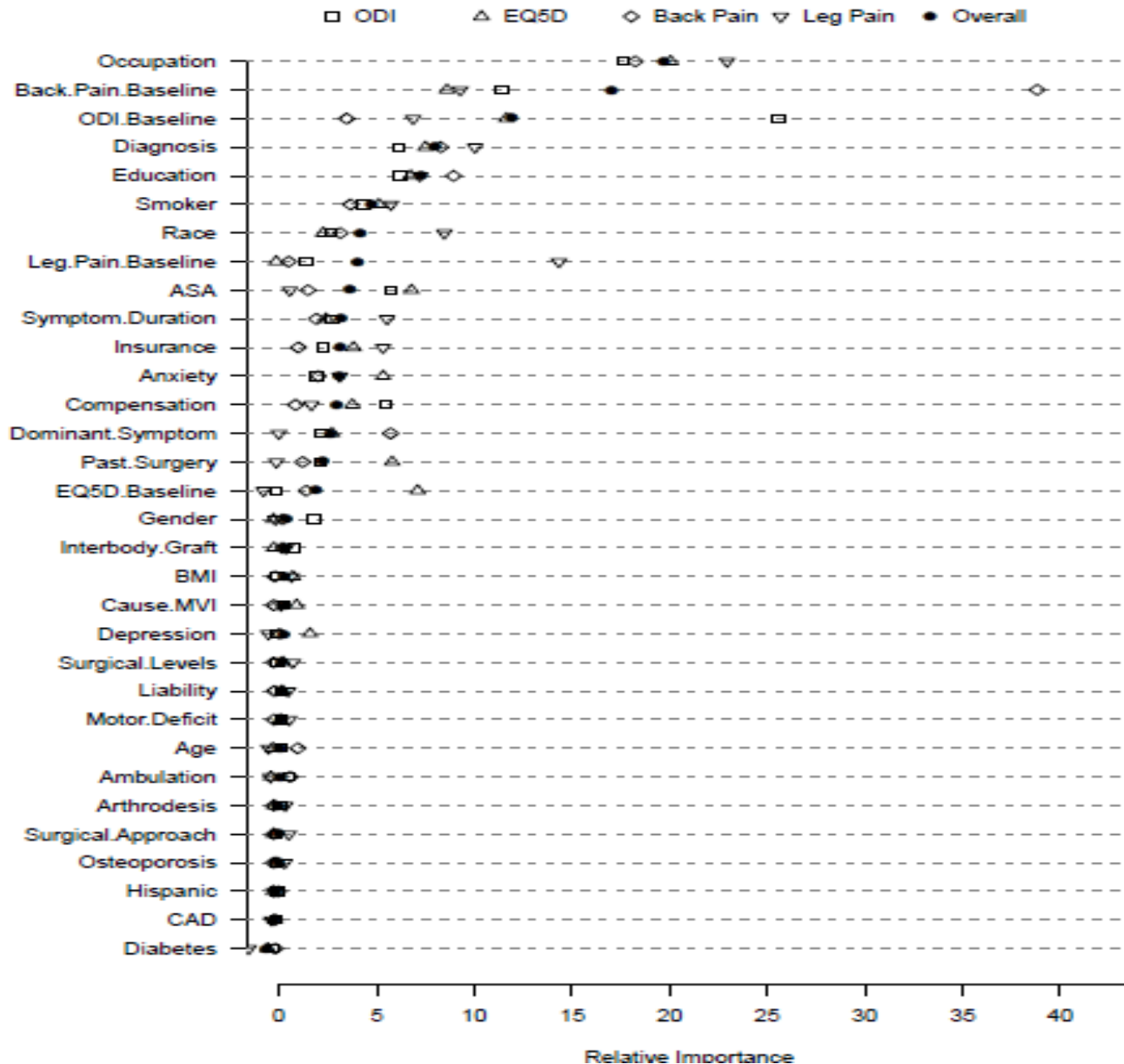
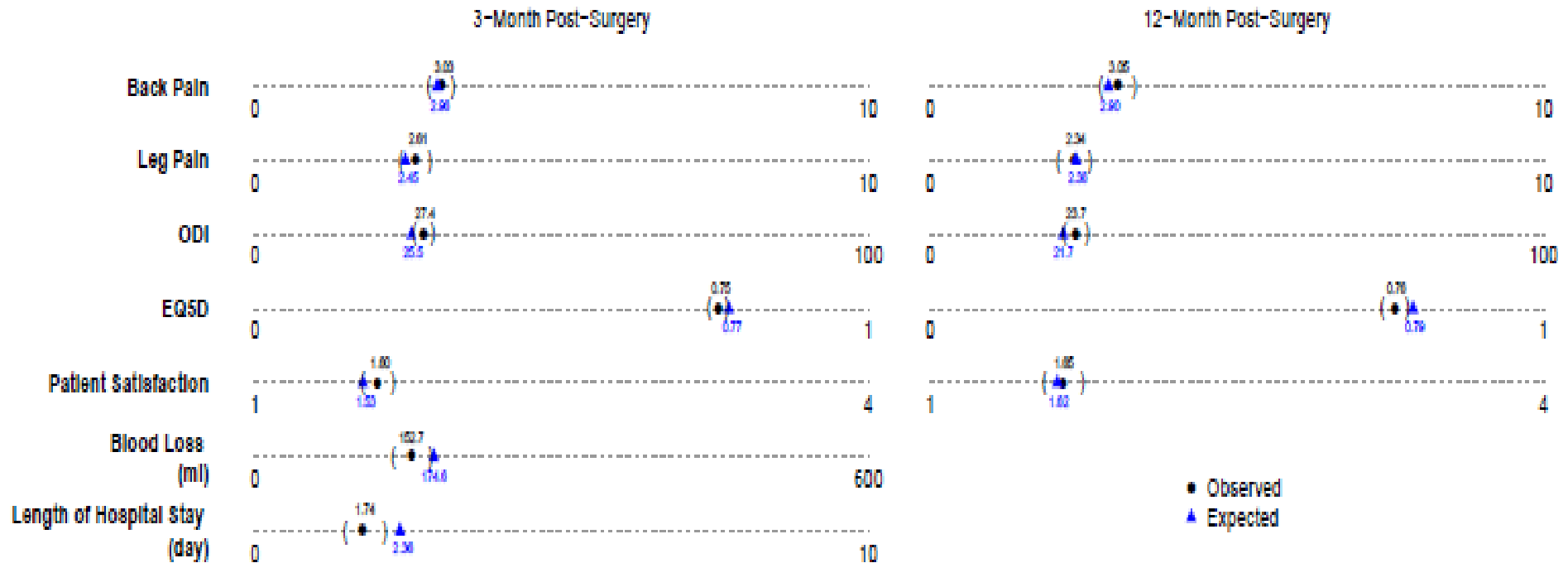


Figure 20: Nomogram calculating predicted 3m ODI score. For each predictor, read the points assigned on the 0-100 scale and add these points. Read the result on the "Total Points" scale and then read the corresponding predictions below it.

Drivers of Outcome



Site-Specific, Risk-adjusted Benchmarks for Patient Reported Outcomes and Utilization



Baseline Variables

Web-based predictive model calculator

Age (years)

BMI

Gender

- Male
- Female

Ethnicity

- Hispanic or Latino
- Not Hispanic or Latino

Race

- White
- Black
- Other

Level of Education

- Less than High School
- High School Diploma
- Two-Year College Degree
- Four-Year College Degree
- Post-College

Major Surgery in the Past Year

- Yes
- No

Smoking Status

- Current every day
- Current some day
- Former
- Never

Insurance Payer

- Medicare
- Private
- Others

Diabetes

- No
- Yes, Type I
- Yes, Type II - Insulin dependent
- Yes, Type II- Non-insulin dependent

Coronary Artery Disease

- Yes
- No

Osteoporosis

- Yes
- No

Anxiety Disorder

- Yes
- No

Depression Disorder

- Yes
- No

Predominant Location of Symptom

- Back Pain
- Leg Pain
- Back Pain = Leg Pain

Did the Patient Have Any Motor Deficits

- Yes
- No

ASA Grade

- 1
- 2
- 3
- 4
- 5

Duration of Longest Standing Spine Symptoms (Months)

- Less Than 3 Months
- Greater Than 3 Months

Principal Spine Diagnosis

- Symptomatic Lumbar Disc Herniation
- Symptomatic Recurrent Lumbar Disc Herniation
- Lumbar Spondylolisthesis
- Lumbar Stenosis
- Lumbar Adjacent Segment Disease
- Symptomatic Mechanical Disc Collapse

Surgical Levels

- 1
- 2
- 3
- 4

Arthrodesis

- Yes
- No

Interbody Graft

- Yes
- No

Surgical Approach

- Posterior Approach
- Anterior Alone

Workers Compensation Claim

- Yes
- No

Liability or Disability Insurance Claim

- Yes
- No

Was your Spinal Injury Caused by a Motor Vehicle Injury

- Yes
- No

Ambulation

- Independent
- With an assist device

Type of Occupation

- Sedentary
- Light
- Medium
- Heavy
- Disability
- Retired
- Others

Baseline ODI [0, 100]

Baseline EQ5D [-0.11, 1.00]

Baseline VAS-Back Pain [0, 10]

Baseline VAS-Leg Pain [0, 10]

Meaningful Improvement of ODI (optional)

Baseline Variables

Web-based predictive model calculator

Age (years)

Diabetes
 No
 Yes, Type I

Principal Spine Diagnosis
 Symptomatic Lumbar Disc Herniation
 Symptomatic Recurrent Lumbar Disc

Type of Occupation
 Sedentary
 Light

BMI

A 35-year old white non-smoker male with BMI-30, lumbar disc herniation, higher education and sedentary job.

Baseline ODI 44; Patient is planned for a single-level discectomy

Gender
 Male
 Female

Ethnicity
 Hispanic or Latino
 Not Hispanic or Latino

Race
 White
 Black
 Other

Level of Education
 Less than High School
 High School Diploma
 Two-Year College Degree
 Four-Year College Degree
 Post-College

Major Surgery in the Past Year
 Yes
 No

Smoking Status
 Current every day
 Current some day
 Former
 Never

Insurance Payer
 Medicare
 Private
 Others

No
Anxiety Disorder

Yes
 No
Depression Disorder

Yes
 No

Predominant Location of Symptom
 Back Pain
 Leg Pain
 Back Pain = Leg Pain

Did the Patient Have Any Motor Deficits
 Yes
 No

ASA Grade
 1
 2
 3
 4
 5

Duration of Longest Standing Spine Symptoms (Months)
 Less Than 3 Months
 Greater Than 3 Months

2
 3
 4

Arthrodesis
 Yes
 No

Interbody Graft
 Yes
 No

Surgical Approach
 Posterior Approach
 Anterior Alone

Workers Compensation Claim
 Yes
 No

Liability or Disability Insurance Claim
 Yes
 No

Was your Spinal Injury Caused by a Motor Vehicle Injury
 Yes
 No

Ambulation
 Independent
 With an assist device

Baseline EQ5D [-0.11, 1.00]

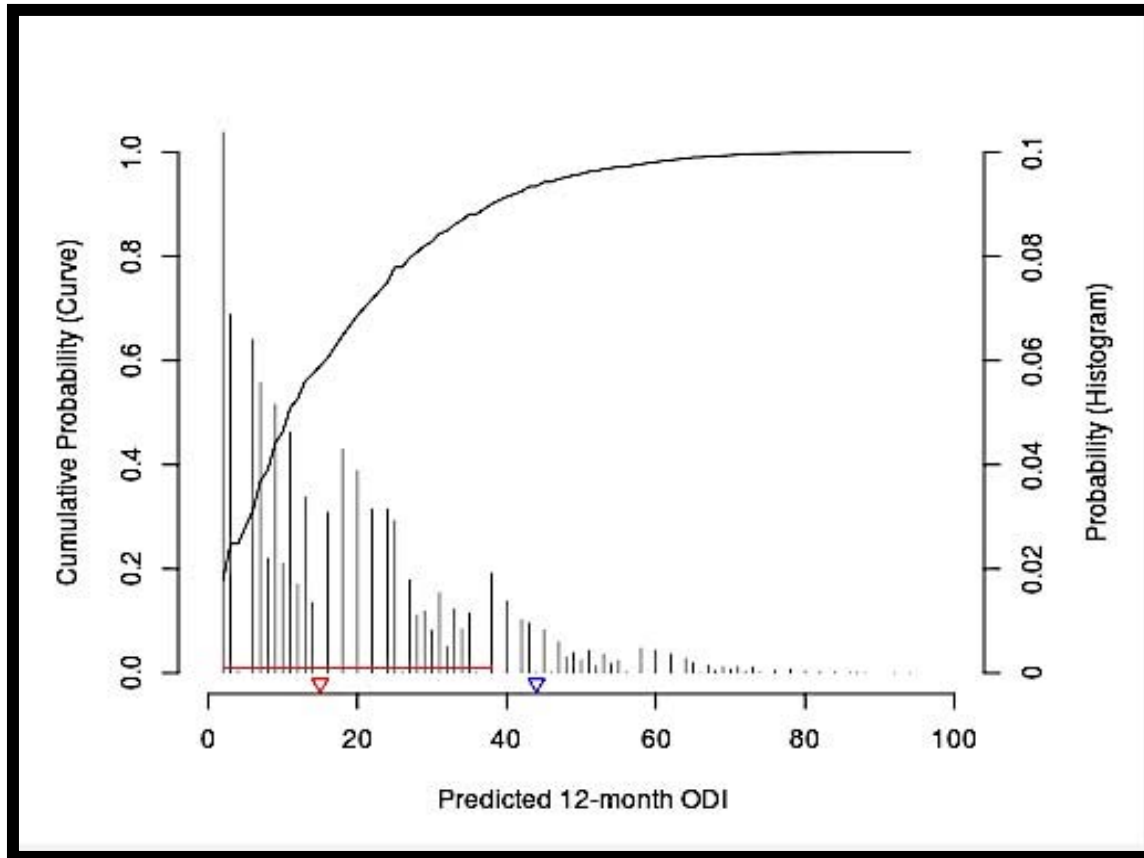
Baseline VAS-Back Pain [0, 10]

Baseline VAS-Leg Pain [0, 10]

Meaningful Improvement of ODI (optional)

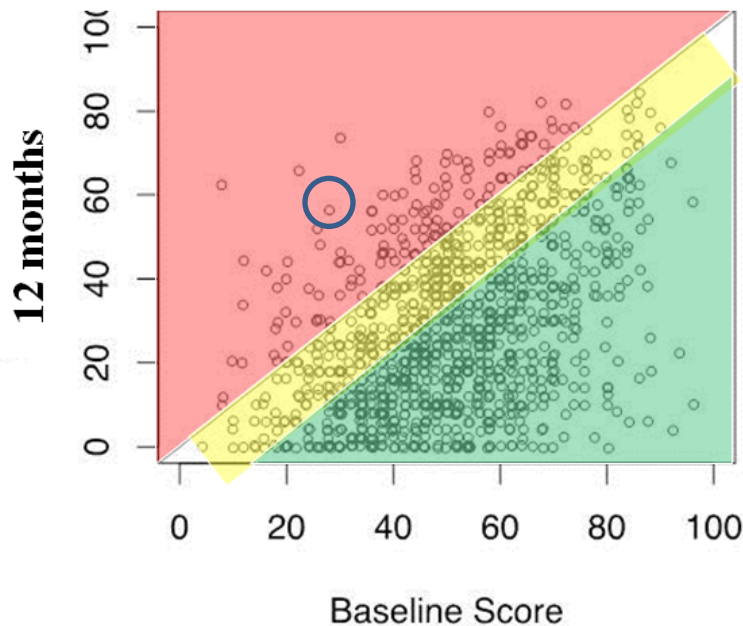
PREDICT

Individualized Outcome (PRO) Probability Graphs



- **Patient's baseline ODI: 44 (blue triangle)**
- **The estimated probability of this patient achieving**
 - **ODI (15): 50%. (mean predicted outcome)**
 - **SCB for ODI (25) : 78%**
 - **MCID for ODI (31): 85%**
- **The probability of patient getting *worse* is 10 %**

Prevent ineffective care before it occurs-or modify correctable factors with evidence-based decision support



Using the Evidence to Promote Quality

The IHI/NPA Re-admission/LOS project

- Institute for Healthcare Improvement (IHI-Cambridge, MA)
 - Worldwide leader in health and healthcare improvement
 - Partnership with NPA/VIMPH/Leading healthcare centers
 - Supported by an NREF grant
- Nine month pilot project focused on re-admission and LOS following elective lumbar spine surgery
 - CNSA/CMC, Vanderbilt, Semmes-Murphey, Atlantic Neurosurgical, Goodman-Campbell, Barrow Neurological Institute, University of Utah, (UVA, UCSF)



AAPM&R/NPA Joint Spine Registry Project

Launch: First Quarter 2017

- The primary purpose of the registry is to:
 - Proactively define and promote quality in comprehensive spine care
- Secondary objectives:
 - Assist physicians by providing both confidential physician and practice level data on practice patterns and quality metric performance, in the context of national or regional benchmarks.
 - Support comparative effectiveness studies on both a national/society advocacy level and, a local facility level for local market negotiation

Short-Term Objectives of value-based, patient-centric spine care

- Responsible solutions need to be developed to re-align incentives and allow for application of advanced techniques to those populations who are most likely to derive substantial benefit.
 - “Intelligent” bundled services
 - Stakeholder cooperation; well-defined objectives
 - **Advanced data capture**
 - Allow for a more deliberate and informed evolution of programs that can move the needle in spine care

Proposal for Spine Care Value-Care Incentive Programs

- Develop basic bundled services around well defined sub-components spine care
 - Must involve a dialogue between providers (hospitals and physicians) and payers (employers, employer representatives, private and public insurance) about the natural history of spinal diseases, expected outcomes of care, risks (to the patient, providers of services and payers) and methods to advance education about treatment options.

Proposal for Spine Care Value-Care Incentive Programs

- Advanced Data
 - Use unique and specialty specific measures of outcomes for their specific patient populations
 - Encourage cooperative registry programs with groups like AAPMR (being launched in 2017) to compare the impact of surgical and non-surgical spine therapies in parallel and in tandem

Proposal for Spine Care Value-Care Incentive Programs

- Advanced data
 - Expansion of existing registry platforms
 - Predictive analytics
 - Essential element of any APM
 - Understand care variability (regional, national)
 - Understand risk-adjusted care benchmarks and define national improvement priorities
 - Understand which combination of symptoms, anatomical patterns, demographics and outcomes more precisely and meaningfully define comparable patient groups for the basis of creating informed, episode-based care models

Proposal for Spine Care Value-Care Incentive Programs

- Advanced data
 - Expansion of existing registry platforms
 - Use advanced definitions of patient groups along with outcomes data, medical evidence and transparent, open-community peer review to advance appropriate use systems for the most costly forms of care
 - Combine robust outcomes data with cost data (not readily available) to allow for determinations of true value
 - Essential in the development of advanced capitated models



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THE **LEAPFROG** GROUP

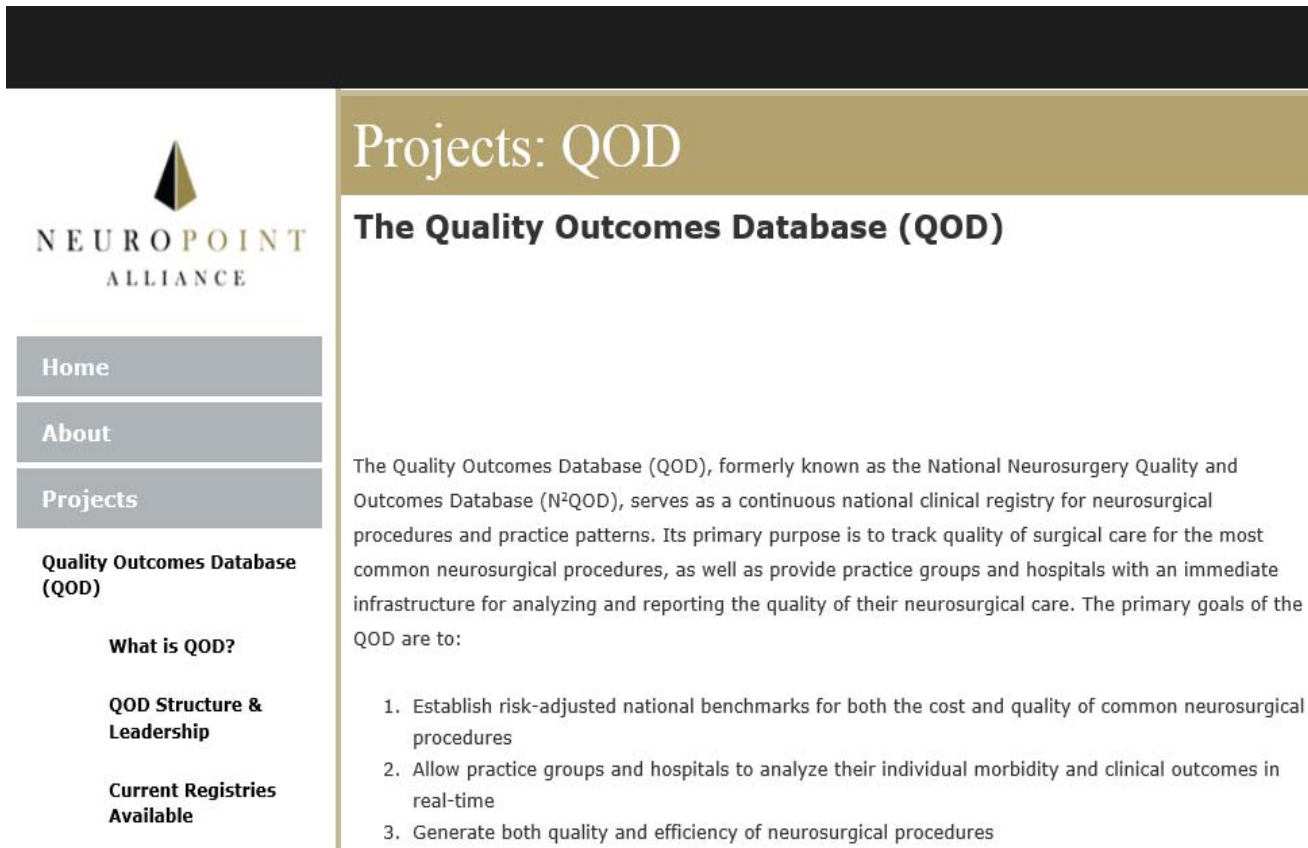
Informing Choices. Rewarding Excellence.
Getting Health Care Right.




CMS
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<http://www.neuropoint.org/>



The screenshot shows the NeuroPoint Alliance website. The header is dark grey. Below it is a gold banner with the text 'Projects: QOD'. The main content area is white. On the left is a navigation menu with 'Home', 'About', and 'Projects' (highlighted). Below the menu is the 'Quality Outcomes Database (QOD)' section, which includes a sub-section 'What is QOD?' and a list of three goals.


NEUROPOINT
ALLIANCE

Home
About
Projects

Quality Outcomes Database (QOD)

What is QOD?

QOD Structure & Leadership

Current Registries Available

Projects: QOD

The Quality Outcomes Database (QOD)

The Quality Outcomes Database (QOD), formerly known as the National Neurosurgery Quality and Outcomes Database (N²QOD), serves as a continuous national clinical registry for neurosurgical procedures and practice patterns. Its primary purpose is to track quality of surgical care for the most common neurosurgical procedures, as well as provide practice groups and hospitals with an immediate infrastructure for analyzing and reporting the quality of their neurosurgical care. The primary goals of the QOD are to:

1. Establish risk-adjusted national benchmarks for both the cost and quality of common neurosurgical procedures
2. Allow practice groups and hospitals to analyze their individual morbidity and clinical outcomes in real-time
3. Generate both quality and efficiency of neurosurgical procedures

asher@cnsa.com