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Quality and Outcomes in Spine Surgery

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In 1964, when the Supreme Court Justice Potter Stewart was asked to describe his test for obscenity, he stated, "I know it when I see it."[1] Similarly, do all of us recognize quality work among our spine peers? Unfortunately, quality in spinal surgery has proven to be difficult to define and measure, and efforts to quantify peers' perceptions have been met with frustration.

The definition of quality depends, to a great extent, upon the perspective of the observer. For example, a patient may define quality as a reduction in pain or an improvement in performance. A surgeon may define quality as a high arthrodesis or low infection rate. A hospital system may equate quality with a high-volume, high-margin practice. A health care insurer may define a quality spine program as one that treats the most patients at the lowest cost. Thus, a comprehensive definition of quality in spine practice should combine all of these measures. A quality spine practice may be defined as one in which patients have access to safe and effective treatments that are cost-effective relative to their outcomes.

Beginning in the early 2000s, the Dartmouth Atlas (dartmouthatlas.org) revealed large discrepancies in the rate of performance of lumbar fusion across communities. This heterogeneous care was promoted as evidence that lumbar fusion was being overperformed as there were no measurable differences in health status between low-incidence and high-incidence regions. Unfortunately, important socioeconomic differences between the regions, differences in access to care, and limitations of the administrative datasets used were not really discussed (eg, the Atlas notes that Manhattan is one of the lowest utilization areas for lumbar fusion because of reliance on Medicare data). "Quality Improvement" became the rallying cry for government and private payer efforts to reign in what they perceived as rampant overuse of spinal fusion. To define differences in patient outcomes, numerous outcome measures were proposed.

Historically, patient satisfaction measures were as health care aimed to be patient-centric. These measures reported how "happy" the patient was with their interaction with the health care system. An example of these measures is shown in Tables 1 and 2. These are patient satisfaction scores that I received from 2 personal clinics. For both clinics, I am the only provider, I work with the same nurse practitioner, and I see the "same" patient population at each clinic. Table 1 shows my results at 1 clinic, and Table 2 shows those same measures at the other clinic. The results are drastically different—so different, in fact, that if there was any statistical validity to these measures, I would be up to 6 SDs different from myself and therefore should not exist!

Parenthetically, around this same period, one of my partners was cited by our hospital as the most improved clinician based on these quality scores. At our faculty meeting, I asked him what he had done to improve his scores, and he said he had done nothing—he was totally mystified. The improvement was based on random effects.

As the evolution of quality metrics resulted in scoring patient experience measures, organized spine surgery pushed for the use of functional outcome measures that were relevant to the patients and procedures being evaluated. In 2010, a group of us hosted a federally funded conference with multiple stakeholders to discuss which measures should be used by whom and for which patients. A rough outline of the North American Spine Society Spine Registry was created, and this draft became the model for multiple regional, national, and international registries designed to measure the patient outcomes as objectively as possible. The dominant registry in North America currently is the American Spine Registry, which utilizes largely the same outcome measures proposed back in 2010. The measures used in the registry are largely "legacy" measures, or outcome measures, that have proven useful in previous studies and have been thought to be relatively valid, reliable, and responsive for the population of patients treated for spinal disorders.

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Table 1. Physician rating scores for Donald K. Resnick, MD, at clinic A.

Item ID	Item Text	Avatar Factor	Current *N*	Current Mean	Current Top Box	Previous Top Box
2429	My doctor showed concern and sensitivity to my needs.	Physician care	15	96.7	93.3%	94.4%
2815	My doctor answered my questions about my health.	Physician care	15	96.7	93.3%	94.4%
2816	I was given the chance by my doctor to provide input to decisions about my health care.	Physician care	16	93.8	87.5%	89.5%
2817	I received the right amount of attention from my doctor.	Physician care	16	93.8	87.5%	89.5%
2818	My doctor explained my illness or treatment in a way I could understand.	Physician care	15	98.3	93.3%	94.4%
2855	I was satisfied with the way my doctor treated my pain.	Physician care	12	85.4	75.0%	80.0%
5560	I would recommend this physician to family and friends.	Key results	16	96.9	93.8%	94.7%

Table 2. Physician rating scores for Donald K. Resnick, MD, at clinic B.

Item ID	Item Text	Avatar Factor	Current *N*	Current Mean	Current Top Box	Previous Top Box
2429	My doctor showed concern and sensitivity to my needs.	Physician care	15	83.3	66.7%	61.1%
2815	My doctor answered my questions about my health.	Physician care	14	91.1	85.7%	70.6%
2816	I was given the chance by my doctor to provide input to decisions about my health care.	Physician care	15	90.0	80.0%	68.8%
2817	I received the right amount of attention from my doctor.	Physician care	15	83.3	73.3%	61.1%
2818	My doctor explained my illness or treatment in a way I could understand.	Physician care	14	94.6	85.7%	58.8%
2855	I was satisfied with the way my doctor treated my pain.	Physician care	13	90.4	84.6%	68.8%.
5560	I would recommend this physician to family and friends.	Key results	14	85.7	78.6%	70.6%

However, these measures are not perfect, and further efforts are appropriate to try and improve the validity, reliability, and responsiveness of outcome measures going forward. Efforts focusing on leveraging computer adaptive measures to improve patient participation and ease the reporting burden (such as the patient-reported outcomes measurement information system) are a great step forward. Additional work to use outcome measurements to refine patient selection criteria for interventions can provide useful and high-impact information. Finally, appreciation of the patients' perspectives on the relative importance of these measures will add color to our interpretation of results.

In summary, we've come quite a long way, but we still have a ways to go. While we may know the quality (like obscenity) when we see it, we need to do better in terms of measuring it.

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