

Preference-sensitive surgical procedures for preference-sensitive conditions

Is there opportunity to reduce variation in utilization?

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Preference-sensitive care comprises treatment for medical conditions where options exist, which may have clinical and cost tradeoffs.

Medical conditions with more than one treatment option are termed preference-sensitive conditions. For many preference-sensitive conditions, surgery is one of several treatment options, and in some instances, several types of surgical procedures are available to treat a single condition. Surgical procedures for the subset of preference-sensitive conditions with surgery among their treatment options are termed preference-sensitive surgical procedures (PSSPs). This paper focuses on 15 PSSPs that may be performed to treat certain preference-sensitive conditions that have surgical treatment options.

A patient's choice among treatment options is influenced by many factors, and individual treatment decisions vary significantly. High variation in treatment decisions that is not explained by patient needs or preferences has been reported for prostate cancer, end-stage renal disease, spinal stenosis, diabetes and peripheral arterial disease, cerebral aneurysms, and obesity, all conditions for which surgery is one of several treatment options.¹ According to data from the *Dartmouth Atlas of Healthcare*, a Medicare beneficiary's chance of undergoing cardiovascular, oncologic, orthopedic, and other surgical procedures varies 3-to-10-fold across geographic areas.² This variation can lead to medically unnecessary utilization that results in higher claim costs.

Variation in rates of surgery for preference-sensitive conditions commonly reflects a lack of strong clinical evidence or an unresolved debate about the efficacy of treatments. For example, greater disagreement among surgeons about the effectiveness of a procedure increases the likelihood of its geographic variation.³ However, even in the presence of strong clinical evidence about a treatment, regional variation may result from the inconsistent incorporation of individual patient preferences in surgical decisions.⁴ To address this factor, the use of decision aids has been suggested as one approach to assisting patients in making fully informed decisions and possibly reducing regional variation in care. However, despite

the conceptual appeal decision aids may have for reducing surgical variation, their true effectiveness remains unclear. Studies evaluating these tools have been based on diverse patient populations, heterogeneous methods, and disparate measures of effectiveness. Nevertheless, a 2014 systematic review of 115 controlled studies reported that providing patients with decision aids regarding their health treatment or screening decision improves patient knowledge regarding their options; reduces patients' decisional conflict; increases patients' active role in decision-making; improves accurate risk perceptions of possible benefits and harms among patients; increases the likelihood that patients' choices are more consistent with their informed values; and enhances communication between patients and their clinicians.⁵ Furthermore, a review of 15 studies evaluating the effect of decision aids on use of surgery and regional variation found that many studies reported decreases in population-based surgical procedure rates, and most studies reported increases in rates of less invasive surgical procedures.⁶

Are PSSPs a significant cost contributor for Medicare?

IDENTIFICATION OF PSSPS

There is no industry standard definition or list of PSSPs. A number of studies and health professions' educational curricula has focused on shared decision-making (SDM) in the context of specific preference-sensitive procedures (that include non-surgical procedures) for the evaluation and treatment of preference-sensitive conditions.⁷ However, no comprehensive list of PSSPs has been published. In addition, the contribution of PSSPs to total population costs has not been previously reported.

Our interest was in quantifying the incidence and cost of PSSPs for the Medicare Fee-for-Service (FFS) population and identifying areas of spending that may provide opportunities for reducing medically unnecessary utilization. We reviewed the literature and investigated the 2016 Medicare 5% sample data to identify PSSPs that had significant volume, cost, and/or geographic variation in reported utilization. We identified 15 PSSPs, including both inpatient and outpatient surgical procedures, and list these in Table 1. This list would likely vary for a commercial or Medicaid population.

TABLE 1: PSSPS FOR THE MEDICARE FEE-FOR-SERVICE POPULATION

INPATIENT AND OUTPATIENT PSSP	INPATIENT-ONLY PSSP
ARTHROSCOPY	CORONARY ARTERY BYPASS GRAFT (CABG)
ARTHROPLASTY OTHER THAN HIP/KNEE	HIP REPLACEMENT
BARIATRIC SURGERY	SPINAL FUSION
CARDIAC PACEMAKER/IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR (ICD) IMPLANTATION	
CAROTID ARTERY REVASCLARIZATION	
CHOLECYSTECTOMY	
HYSTERECTOMY	
KNEE REPLACEMENT*	
LAMINECTOMY	
PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (PTCA)	
PERIPHERAL VESSEL REVASCLARIZATION	
TRANSURETHRAL RESECTION OF PROSTATE (TURP)	

*Removed from the hospital Outpatient Prospective Payment System (OPPS) inpatient-only list in CY 2018.

IDENTIFICATION OF POTENTIALLY AVOIDABLE PSSPS

Considering the unexplained variation in utilization of PSSPs, it is evident that a portion of PSSPs could be avoided if alternative non-surgical treatments or less invasive surgical procedures were provided instead. However, some PSSPs are not avoidable because of the emergency nature of the clinical presentation of the patient or other characteristics of the

individual case. For purposes of identifying the subset of PSSPs for which a portion could be considered potentially avoidable, we excluded:

- Procedures following an inpatient-to-inpatient hospital transfer
- Inpatient or outpatient procedures immediately following emergency care
- Inpatient procedures performed primarily for the treatment of cancer
- Procedures performed to support other major procedures performed in the same operative session

In each of the clinical circumstances above, we believe it is unlikely that the PSSPs could be avoided. We refer to the subset of PSSPs following the exclusion of the specified procedures as potentially avoidable PSSPs.

INCIDENCE OF PSSPS IN THE MEDICARE FFS POPULATION

Using the 2016 Medicare FFS 5% sample data, we identified all inpatient and outpatient PSSPs using specified Healthcare Common Procedure Coding System (HCPCS) codes; International Classification of Diseases, 10th Revision, Procedure Coding System (ICD-10-PCS) codes; Medicare Severity Diagnosis Related Groups (MS-DRGs); revenue codes; place of service codes; and claim source inpatient admission codes (coding logic available upon request). Table 2 displays the 2016 utilization of PSSPs and potentially avoidable PSSPs in the Medicare 5% sample data based on the defined exclusion criteria.

TABLE 2: 2016 UTILIZATION OF PSSPS AND POTENTIALLY AVOIDABLE PSSPS IN THE MEDICARE 5% SAMPLE

	INPATIENT PSSPS PER 1,000 BENEFICIARIES PER YEAR	PERCENT OF INPATIENT PSSPS THAT ARE POTENTIALLY AVOIDABLE	OUTPATIENT PSSPS PER 1,000 BENEFICIARIES PER YEAR	PERCENT OF OUTPATIENT PSSPS THAT ARE POTENTIALLY AVOIDABLE	TOTAL PSSPS PER 1,000 BENEFICIARIES PER YEAR	PERCENT OF TOTAL PSSPS THAT ARE POTENTIALLY AVOIDABLE
TOTAL	50.91	50%	25.29	99%	76.20	66%
ARTHROSCOPY	0.01	0%	3.93	100%	3.94	99%
ARTHROPLASTY OTHER THAN HIP/KNEE	1.76	89%	1.09	100%	2.84	93%
BARIATRIC SURGERY	0.79	77%	0.01	95%	0.80	77%
CABG	2.37	40%	*	*	2.37	40%
CARDIAC PACEMAKER/ICD IMPLANTATION	3.04	15%	4.73	99%	7.78	66%
CAROTID ARTERY REVASCLARIZATION	1.94	62%	0.27	99%	2.21	66%
CHOLECYSTECTOMY	2.52	11%	2.46	99%	4.99	54%
HIP REPLACEMENT	7.12	68%	*	*	7.12	68%
HYSTERECTOMY	0.64	44%	0.65	100%	1.29	73%
KNEE REPLACEMENT	9.73	97%	*	*	9.73	97%
LAMINECTOMY	2.71	10%	1.99	100%	4.70	48%
PERIPHERAL VESSEL REVASCLARIZATION	8.22	12%	5.78	99%	14.00	48%
PTCA	5.09	11%	3.17	97%	8.26	44%
SPINAL FUSION	4.55	90%	*	*	4.55	90%
TURP	0.41	0%	1.22	99%	1.63	74%

*Most procedure codes are on the hospital OPPS inpatient-only list and not paid by Medicare FFS in the outpatient setting.

Note: Sample included 1,700,819 Medicare beneficiaries.

COST OF POTENTIALLY AVOIDABLE PSSPS

A significant portion of Medicare FFS spending is driven by potentially avoidable PSSPs, approximately 6.4% of total annual allowed Medicare FFS costs as displayed in Table 3.

The PSSP cost includes all facility and professional claims on the day of the surgery for outpatient PSSPs, and all facility and professional claims during the period of hospitalization for inpatient PSSPs.

TABLE 3: 2016 COST OF POTENTIALLY AVOIDABLE PSSPS IN THE MEDICARE 5% SAMPLE

	AVERAGE ALLOWED COST PER POTENTIALLY AVOIDABLE PSSP		PER MEMBER PER YEAR (PMPY) CONTRIBUTION OF POTENTIALLY AVOIDABLE PSSPS			% OF TOTAL MEDICARE FFS ALLOWED PMPY CONTRIBUTED BY POTENTIALLY AVOIDABLE PSSPS
	INPATIENT	OUTPATIENT	INPATIENT	OUTPATIENT	TOTAL	
TOTAL			\$592.20	\$227.16	\$819.36	6.39%
ARTHROSCOPY	N/A	\$3,092	N/A	\$12.12	\$12.12	0.09%
ARTHROPLASTY OTHER THAN HIP/KNEE	\$20,171	\$6,044	\$31.56	\$6.48	\$38.04	0.30%
BARIATRIC SURGERY	\$18,675	\$8,513	\$11.28	\$0.12	\$11.40	0.09%
CABG	\$41,010	*	\$39.00	*	\$39.00	0.30%
CARDIAC PACEMAKER/ICD IMPLANTATION	\$29,737	\$17,478	\$13.92	\$82.08	\$96.00	0.75%
CAROTID ARTERY REVASCULARIZATION	\$12,172	\$2,447	\$14.52	\$0.60	\$15.12	0.12%
CHOLECYSTECTOMY	\$17,293	\$5,040	\$4.92	\$12.24	\$17.16	0.13%
HIP REPLACEMENT	\$19,655	*	\$95.52	*	\$95.52	0.75%
HYSTERECTOMY	\$11,835	\$8,365	\$3.36	\$5.40	\$8.76	0.07%
KNEE REPLACEMENT	\$19,162	*	\$180.72	*	\$180.72	1.41%
LAMINECTOMY	\$17,050	\$7,971	\$4.56	\$15.72	\$20.28	0.16%
PERIPHERAL VESSEL REVASCULARIZATION	\$23,783	\$8,841	\$24.00	\$50.52	\$74.52	0.58%
PTCA	\$20,639	\$11,882	\$11.04	\$36.48	\$47.52	0.37%
SPINAL FUSION	\$38,466	*	\$157.80	*	\$157.80	1.23%
TURP	N/A	\$4,506	N/A	\$5.40	\$5.40	0.04%

*Most procedure codes are on the hospital OPSS inpatient-only list and not paid by Medicare FFS in the outpatient setting.

Note: Total PMPY for the study population was \$12,786.48.

What is a feasible reduction to expect for potentially avoidable PSSPs?

Only a portion of PSSPs can be reduced, although the literature provides no evidence for the amount of reduction that is feasible and clinically appropriate across PSSPs.

Nevertheless, the potential for cost savings from avoiding some PSSPs is likely related to an organization's current PSSP rates compared to the rates of others. The opportunity to achieve cost savings can be identified by the organization's relative performance that reflects differences that are unexplained by patient need. For example, knee osteoarthritis and back pain due to disc herniation can be treated with analgesics, physical therapy, or surgery. In 2015, the 10th and 90th percentile state-specific rates of inpatient back surgeries per 1,000 Medicare FFS beneficiaries compared to the national average were 0.65 and 1.36, while the corresponding values for knee replacement were 0.80 and 1.39.⁸ This means that five states performed 35% or fewer back surgeries and 20% or fewer knee replacements than the national average, while five states performed 36% and 39% more back surgeries and knee replacements, respectively, than the national average. Similarly, symptoms of coronary artery disease can be managed with several treatment modalities, including

medications or coronary artery revascularization procedures, including coronary artery bypass grafting (CABG). The 10th and 90th percentiles of state-specific rates of CABG surgery per 1,000 beneficiaries compared to the national average were 0.68 and 1.35, respectively. Note that the CABG surgery example percentile values are ratios relative to the national average for the PSSP, not actual state performance rates. The state geographic variation in rates of inpatient procedures between the 10th and 90th percentiles is significant, reflecting a large amount of regional practice variation. We are using the 10th and 90th percentiles as the illustrative boundaries because they are not at the extremes of state performance.

SDM, characterized as a linchpin of patient-centered care, provides patients with a balanced review of conservative and invasive treatment options, and its greatest impact is expected to be on the treatment of preference-sensitive conditions.⁹ Studies of orthopedic and other conditions for which surgery is an option have shown that greater patient involvement in the decision-making process leads to increased knowledge, more accurate risk perception, greater likelihood of receiving care aligned with patient values, and higher patient satisfaction with the outcome of treatment procedures.^{10,11,12} Moreover, studies demonstrate the potential for wider adoption of SDM to reduce

healthcare costs because as many as 20% of patients who participate in SDM typically choose less invasive surgical options and more conservative treatment than do patients who do not use decision aids.¹³ While few studies have specifically measured the effects of the use of decision aids on the rates of surgery and healthcare costs, the introduction of decision aids at Group Health for hip and knee osteoarthritis was associated with 26% fewer hip replacement surgeries, 38% fewer knee replacements, and 12% to 21% lower costs over six months.¹⁴

It is possible that use of SDM that leads to a patient's choice of a less invasive treatment at one point in time may simply result in delaying the PSSP until a later time. Thus, the SDM-related short-term observed reductions in utilization and cost may not persist over the long term, especially for certain conditions like joint replacement. For example, about 7.5 years after diagnosis of knee osteoarthritis, patients who had intra-articular hyaluronic acid injections delayed total knee replacement for about 220 days.¹⁵ In the Group Health study of decision aids for hip and knee osteoarthritis previously cited, a review of records over a historical period showed that the large majority of patients who chose to undergo elective knee and hip replacement procedures did so within the first 180 days after an orthopedic visit, the length of the study period. However, given the natural history of arthritis and the short follow-up period, the authors could not exclude the possibility that the use of decision aids only delayed the joint replacement surgery because patients may have later reversed their decision. Nevertheless, a delay in joint replacement surgery could benefit some patients by reducing the need for future repeat operations resulting from prosthesis failure.¹⁶

A recent review of studies published between 1990 and 2015 about SDM and the choice of elective surgery found variable effects of SDM on treatment preference.¹⁷ While numerous studies showed a decrease in choice of surgery with the use of SDM (for example, a 26% to 38% reduction in patients choosing joint replacement surgery and a 22% reduction in patients choosing discectomy surgery), a number of other studies indicated a lack of significant difference in treatment choice with use of SDM. Other studies have identified challenges to widespread SDM implementation, including physicians' concerns over an increased time commitment for SDM and their

prioritization of paid activities; surgeons' beliefs they are already using SDM; clinicians lack of knowledge about how to conduct SDM; a provider's bias toward medical or surgical treatment based on the physician's specialty; and established clinic workflow patterns.^{18,19} Lastly, a recent Cochrane review concluded that it is uncertain whether any interventions for increasing the use of SDM by healthcare professionals are effective because the certainty of the evidence is low.²⁰ Based on the totality of these findings, the impact of the use of SDM on the utilization of PSSPs is likely to vary across preference-sensitive conditions and physicians' practices.

More recently, based on the first 12 months of experience with an employer-sponsored Center of Excellence (CoE) program that steers members toward demonstrated, high-quality systems that prioritize quality, efficiency, and appropriate utilization, 15% of patients referred for total joint replacement did not proceed with surgery.²¹ Similarly, 30% to 50% of candidates for spine surgery referred and reviewed by a CoE in the program were counseled against surgery and provided with an alternative plan of care. SDM may also increase the percentage of patients choosing less invasive and costly surgical alternatives for treatment of preference-sensitive conditions, such as the selection of percutaneous transluminal coronary angioplasty (PTCA) instead of CABG for coronary revascularization.

Lastly, for patients who elect to undergo a PSSP, a shift of the procedure from the inpatient to the outpatient setting, when feasible and clinically appropriate, may lead to cost savings. For example, in 2018, Medicare removed total knee replacement from the OPPI inpatient-only list and set an outpatient facility payment for the PSSP that is about 14% less than the inpatient prospective payment system (IPPS) payment for patients without major complications or comorbidities (the surgeon's payment is the same, regardless of the site-of-service). For other PSSPs that were performed and paid by Medicare in both settings in 2016, the outpatient per-procedure cost, including professional services, is generally 30% to 50% of the cost of the procedure in the inpatient setting, as displayed in Table 3 on page 3.

Conclusion

Reducing utilization of potentially avoidable PSSPs through patients' choices of less invasive treatment options for preference-sensitive conditions provides an opportunity for cost savings. The potentially avoidable surgeries for the 15 PSSPs included in this analysis contribute 6.4% of the total annual FFS costs for the beneficiaries represented in the Medicare 5% sample data. The potential magnitude of the cost savings from changes in PSSP utilization likely depends upon the organization's current rates of PSSPs in comparison to similar organizations, as there is currently substantial geographic variation in these rates that is not explained by patient needs or preferences. As a first step, Medicare Advantage plans and accountable care organizations (ACOs) should evaluate the incidence and costs associated with PSSPs for their populations and examine regional differences in surgery rates. Comparing rates among regions should, at a minimum, incorporate demographic adjustment for differences in age, sex, and race, and possibly include adjustment for the prevalence of chronic conditions. We plan to develop demographically adjusted benchmarks for utilization of these PSSPs in the Medicare FFS population, which organizations can use to benchmark their performance and identify targets for feasible reductions in potentially avoidable PSSPs.



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Endnotes

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