



# Preference-Sensitive Care

There is unwarranted variation in the practice of medicine and the use of medical resources in the United States. There is underuse of effective care, misuse of preference-sensitive care, and overuse of supply-sensitive care.

Preference-sensitive care comprises treatments that involve significant tradeoffs affecting the patient's quality and/or length of life. Decisions about these interventions – whether to have them or not, which ones to have – ought to reflect patients' personal values and preferences, and ought to be made only after patients have enough information to make an informed choice. Sometimes, as with the options for treating early stage breast cancer, the scientific evidence on the main outcome – survival – is quite good; other times, as with treatment options following prostate cancer, the evidence is much weaker.

The surgical options for the treatment of early stage breast cancer, for example, usually include mastectomy (complete removal of the breast) or lumpectomy ("breast-sparing surgery," a local excision of the tumor). A series of clinical trials have shown that the impact on survival is about the same for both approaches. But the other outcomes are quite different. The consequences for women who choose mastectomy include the loss of the breast and, for some, using a prosthesis or undergoing reconstructive surgery. For women who choose breast-sparing surgery, the consequences can include having radiation and/or chemotherapy and living with the risk of local recurrence, which will require further surgery. Which treatment a woman chooses should depend on her own, rather than her physician's, opinion about these outcomes.

The hypothesis that idiosyncratic practice style explained variations in rates of elective surgery was first advanced in the 1930s by J. Alison Glover, a British pediatrician, whose studies revealed about a ten-fold variation in tonsillectomy rates among school districts. An important aspect of Glover's findings was that the important decision maker on the need for tonsillectomy was a single physician, the school health officer, who routinely examined students for signs of sickness. To the best of his ability given the available data, Glover ruled out the contributions of a number of environmental and illness-related factors to the remarkable variation. His most convincing evidence, however, was the "natural experiment" that occurred with the advent of a new health officer in the Hornsey Borough school district. Within a year, the rates of tonsillectomy in the district dropped by a factor of ten, and remained low for years afterwards. Glover attributed the drop in rates to the change in "medical opinion" embodied in the different practice styles of the two physicians.

## Unwarranted Variation: The Overuse, Underuse, and Misuse of Care

There is unwarranted variation in the practice of medicine and the use of medical resources in the United States. There is underuse of effective care, misuse of preference-sensitive care, and overuse of supply-sensitive care.

- Underuse of most kinds of effective care (such as the use of beta-blockers for people who have had heart attacks and screening of diabetics for early signs of retinal disease) is very common even in hospitals considered among the "best" in the country – including some academic medical centers. The causes of underuse include discontinuity of care (which tends to grow worse when more physicians are involved in the patient's care) and the lack of systems that would facilitate the appropriate use of these services.

- Misuse of preference-sensitive care refers to situations in which there are significant tradeoffs among the available options. Treatment choices should be based on the patient's own values (such as the choice between mastectomy and lumpectomy for early-stage breast cancer); but often they are not. Misuse results from the failure to accurately communicate the risks and benefits of the alternative treatments, and the failure to base the choice of treatment on the patient's values and preferences.

- Overuse of supply-sensitive care is particularly apparent in the management of chronic illness (such as admitting patients with chronic conditions such as diabetes to the hospital, rather than treating them as outpatients). The cause is an overdependence on the acute care sector and a lack of the infrastructure necessary to support the management of chronically ill patients in other settings.

The variations in rates of these kinds of procedures described in the *Dartmouth Atlas of Health Care* suggest that local medical opinion has a strong influence on the choice of treatment. There are striking variations in the proportion of early stage breast cancer patients who undergo lumpectomy. In an early study (1992-93), we found regions in which virtually no Medicare women underwent lumpectomy, but one region in which almost 50% did. Sometimes, adjoining regions had strikingly different rates. For example, in the Elyria, Ohio hospital referral region, 48% of Medicare women had breast-sparing surgery



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for early stage breast cancer, while in Cleveland 23% did and in Columbus less than 12% did.<sup>a</sup>

A common counter-argument to the practice style theory is that patient preferences dominate decision making, and that rates of surgery vary in proportion to variations in preferences. The interpretation would be that 48% of women with early stage cancer in Elyria preferred lumpectomy, while in Columbus only 12% did, and in Rapid City, South Dakota, only 1% did – something that seems inherently unlikely. It seems far more likely that what varied was the opinion of the surgeons these women consulted (a theory that was borne out by an investigative reporter's visit to Rapid City, where she discovered that the surgeon performing virtually all of the breast cancer surgery in the region was a strong advocate of mastectomy, and did not offer his patients the option of lumpectomy.<sup>b</sup>

The question is whether, in usual practice, the physician's recommended course of treatment corresponds reasonably closely to the patient's informed preference. Experimental evidence that physicians' opinions and patients' preferences about treatment might not be well correlated comes from clinical trials of shared decision making, aided by patient decision aids. Shared decision making is the process of interacting with the patient to help him or her "make informed, values-based choices among two or more medically reasonable alternatives, and patient decision aids are standardized, evidence-based tools designed to facilitate that process."<sup>c</sup>

Patient decision aids are designed to provide:

- High-quality, up-to-date information about the condition, including risks and benefits of available options and, if appropriate, a discussion of the limits of scientific knowledge about outcomes.
- Values clarification to help patients sort out their values and preferences.
- Guidance or coaching in deliberation, designed to improve the patient's involvement in the decision process.

Clinical trials of patient decision aids have now been completed for a number of conditions that involve discretionary surgery. They include the choice between lumpectomy and mastectomy for early stage breast cancer; the choice between invasive cardiac treatment or more conservative medical management for chest pain due to coronary artery disease; and the choice between surgery and conservative management for patients with back pain due to disc disease. The trials show that, compared to a control group, patients who use decision aids are better informed about the risks, benefits and clinical uncertainties associated with the treatment options available to them. Moreover, the choices patients make in the shared decision making environ-

ment (aided by patient decision aids) are "better" decisions; they more closely reflect the patient's own individual values.

*The most important finding, however, was the striking contrast between need for surgery as defined by physicians and need as defined by patient preferences.*

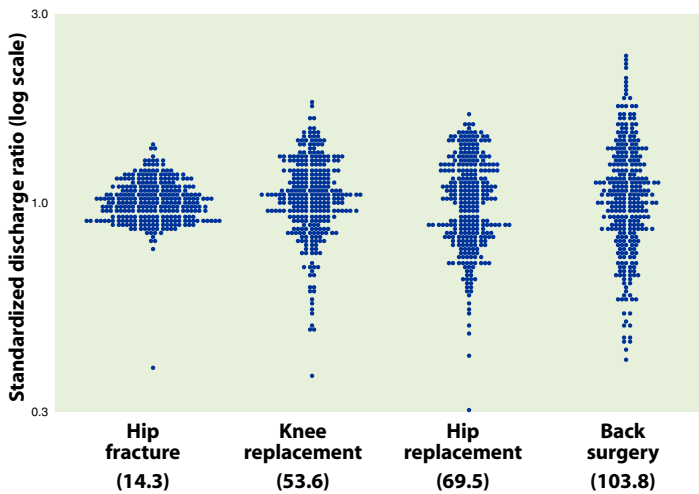
Finally, most clinical trials show a net reduction in demand for the more invasive surgical options, an outcome of particular importance for the health care economy. This point deserves amplification. In "usual practice," where physicians presumably base their judgment on clinical evidence, the supply of patients whose levels of illness make them clinically appropriate candidates for surgical intervention may well exceed the amount of surgery actually being done in a given region. A recent study by Hawker and her colleagues in Canada<sup>d</sup> speaks to this point. The researchers conducted a population-based interview study to screen for patients with knee pain. The patients were then examined by physicians and given X-ray examinations to define a patient population that would benefit from knee surgery. The number of patients in need (defined as clinically appropriate for surgery) exceeded the rate of surgery for the corresponding age and sex groups by a factor of more than ten. *The most important finding, however, was the striking contrast between need for surgery as defined by physicians and need as defined by patient preferences.* When these patients were interviewed concerning their preference for treatment, only 14% indicated a preference for surgery; the vast majority wanted conservative treatment.

### Variations in Common Surgical Procedures That Reflect the Failure to Base Choice of Treatment of Patients' Preferences

There are situations in which patients' preferences and those of their surgeons are essentially the same (and in which the utilization of services is largely determined by illness rate). One example is hip fracture. People who have broken their hips are in a great deal of pain, and they seek medical attention; the situation can be accurately diagnosed in virtually all situations, and surgical repair is the universally accepted approach to the problem. There is, consequently, very little variation in rates of hip fracture repair, and what variation exists appears to reflect regional differences in the incidence of hip fractures (in a portion of the South from Texas to the Carolinas, hip fractures are more common than elsewhere in the country).

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By contrast, rates of knee replacement, hip replacement, and back surgery all vary remarkably, reflecting the fact that there is far less consensus among physicians about when to do these procedures, who needs them, and how effective they are in addressing the problems they are intended to solve.



**Figure 1. Rates of four orthopedic procedures among Medicare enrollees in 306 hospital referral regions (2002-03)**

This figure profiles the pattern of variation among hospital referral regions of four orthopedic procedures: hip fracture repair; knee and hip replacement; and back surgery. Each dot represents one of the 306 HRRs. The rates are expressed as the ratio to the U.S. average (plotted on a log scale). The numbers in parentheses are the systematic components of variation (SCV), measures that allow comparisons of variation among procedures with different mean rates. The numerator is the number of patients with the indicated procedure; the denominator is the number of enrollees in traditional Medicare living in the regions.

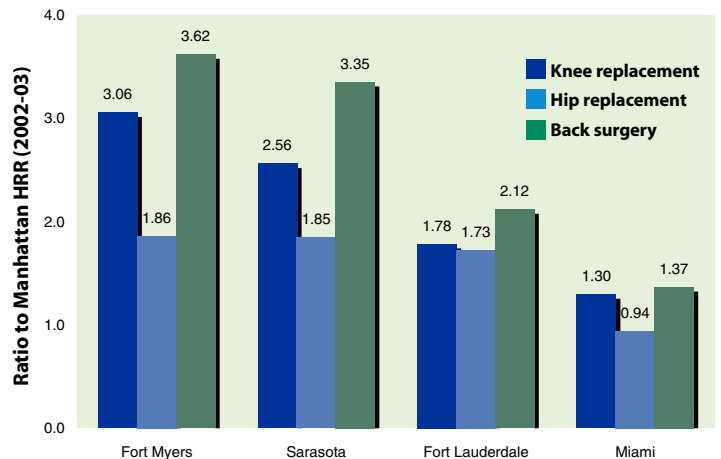
We measure the degree of variation of these procedures in Figure 1 to illustrate the difference between situations where there is little uncertainty about the right thing to do (hip fracture repair) and those in which there is considerable disagreement (knee replacement and hip replacement). Knee replacement and hip replacement are almost four and five times more variable than hip fracture repair, respectively. Back surgery is more than seven times more variable than hip fracture repair.

There are sometimes remarkable differences among neighboring regions. One example is the pattern of surgical rates in four south Florida communities. Figure 2 compares the rates of surgery in Miami, Fort Lauderdale, Fort Myers and Sarasota to rates in Manhattan (which was chosen for comparison because rates there are relatively low). In 2002-03, the rate of knee surgery in Fort Myers was three times higher than the rate in Manhattan. The rate in Sarasota was about 2.6 times higher, and the rate in Fort Lauderdale was about 1.8 times higher. Among these same communities, the rates of hip replacement were 86%, 85%, and 73% higher than the rate in Manhattan, and back surgery rates

were more than three times higher in Fort Myers and Sarasota, and two times higher in Fort Lauderdale, than in Manhattan.

By contrast, the rates in Miami were much closer to those of Manhattan than to the other south Florida medical communities. Hip replacement rates were 6% lower in Miami than in Manhattan, while the rate of knee surgery was 30% higher and the rate of back surgery was 37% higher. In theory, the differences among these communities in rates of knee and hip replacement and back surgery could reflect differences in patient preferences about treatment, or the incidence of osteoarthritis and/or herniated discs. In light of the evidence, this seems unlikely. Moreover, there is no epidemiologic evidence that illness or informed patient preferences vary as sharply according to the boundaries of health care markets as does surgery. It seems very unlikely that differences in illness rates and/or patient preferences could account for rates of knee, hip and back surgery in Fort Myers being twice what they are in Miami, or for the peculiar distributions of orthopedic procedures that favor back surgery over knee replacement (as in Sarasota) or knee replacement over hip replacement (as in Fort Myers).

These “surgical signatures” – the pattern of rates of particular kinds of surgery that vary from community to community – are based on the propensity of local surgeons to specialize in a particular subset of the surgical workload in their specialty and in the workforce’s ability to find candidates that meet clinical appropriateness criteria.



**Figure 2. Surgical signatures of four Florida hospital referral regions compared to the Manhattan HRR (2002-03)**

This figure profiles the rates of knee replacement, hip replacement and back surgery among four south Florida medical communities. The rates are expressed as a ratio to the rate of Manhattan. For example, compared to Manhattan, the rate of knee replacement in Fort Myers is 3.06 times greater. The rates are age, sex and race adjusted.



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In the case of knee and hip replacement, the surgical rates in most regions are generated by clinical decisions made by small groups of orthopedic surgeons. Orthopedic surgeons have many options regarding the clinical conditions in which they can subspecialize, including trauma, sports medicine, carpal tunnel syndrome and knee, hip and back conditions. In Fort Myers, surgical workloads are oriented toward knee and back surgery; and in Sarasota, back surgery is done more frequently than knee and hip replacements.

If it were simply a question of the per-capita supply of surgeons, then regions with more surgeons per capita should have higher

rates of surgery for common conditions such as osteoarthritis of the knee and hip. But, in fact, there is very little association between the supply of orthopedic surgeons and the rates of hip, knee and back surgery. For example, although the per capita supply of orthopedic surgeons varies more than 4.7-fold among regions, there is no relationship between the supply of orthopedic surgeons and rates of knee replacement, and there is little relationship between per capita supplies of surgeons and rates of hip replacement (Figure 3).

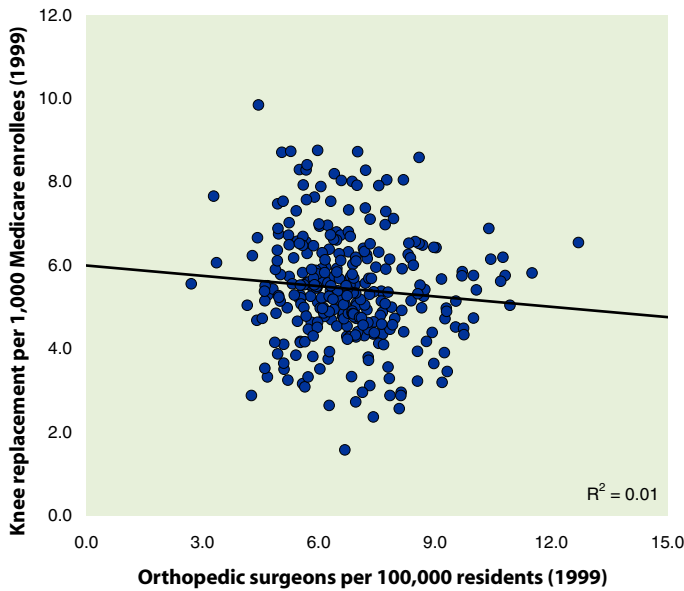


Figure 3a. Knee replacement

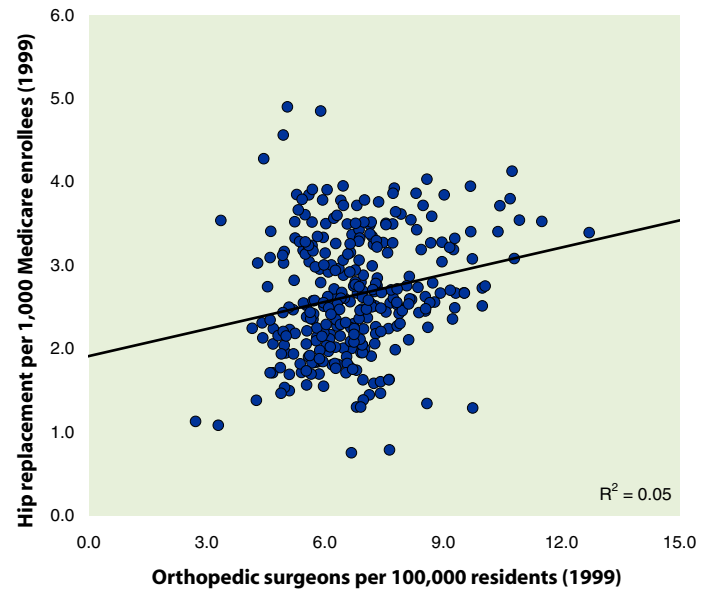


Figure 3b. Hip replacement

Figure 3. Association between supply of orthopedic surgeons and rates of orthopedic surgery (1999)



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## Is More Better?

The vast majority of conditions and treatments resemble knee and back surgery, rather than hip fracture repair (Table 1). Changing the practice of medicine so that treatment choices reflect patients' preferences has the potential to radically change the consumption and quality of health care.

The "right rate" of a given procedure should be based on the choices made by informed patients, with information about, but not dominated by, their physicians' opinions. Shared decision making, supported by decision aids, would help to establish valid measures of the actual demand for a given treatment option.

**Table 1**

Clinical condition	Treatment options	Trade-offs among alternatives
<b>Hip fracture</b>	Surgical repair	No alternatives
<b>Colorectal cancer</b>	Colectomy	No alternatives
<b>Chronic cholecystitis</b> (intermittent abdominal pain from gallstones)	Watchful waiting	Avoids surgery, but carries a risk of a later serious attack (acute cholecystitis) and the need for urgent, open surgery
	Cholecystectomy (usually laparoscopic rather than open surgery)	Very effective, but there are small risks of serious complications
<b>Chronic stable angina</b> (chest pain or other symptoms from coronary artery disease)	Medical treatment	Avoids the downsides of interventions, but is less effective at improving symptoms and some patients have shorter survival
	Angioplasty	Lower procedure risks than surgery, but symptom relief is not as long lasting
	Bypass surgery	Effective and durable in relieving symptoms, but there are significant risks of mortality and disability, including stroke
<b>Hip osteoarthritis</b>	Medical treatment	Low risk, but not very effective in relieving symptoms
	Hip replacement	Very effective, but there are modest risks of mortality and complications, as well as a long recovery period
<b>Claudication</b> (exertional leg pain from peripheral vascular disease)	Medical treatment, exercise	Low risk, but only modestly effective
	Angioplasty	Effective at improving symptoms, but there are risks of complications and subsequent interventions are often necessary
	Bypass surgery	Very effective and durable, but there are significant risks of complications and death
<b>Carotid stenosis</b> (stroke risk from narrowing of carotid artery)	Aspirin	Lower short-term risks, but higher risks of stroke over the long term
	Carotid endarterectomy	Reduces overall stroke risks, but there are significant risks of mortality and of perioperative stroke
<b>Herniated disc or spinal stenosis</b> (causing back pain or other symptoms)	Medical treatment, chiropractic, other	Symptoms often resolve without surgery, but might not
	Back surgery	Frequently relieves symptoms, but has complication risks and is not always effective
<b>Early-stage prostate cancer</b>	Watchful waiting	Many prostate cancers never progress to affect quality of life or survival, but some do
	Radiation (conventional or implant seeds)	Shrinks or eliminates cancer in the prostate, but there are risks of side effects
	Radical prostatectomy	Removes prostate cancer entirely, but there are substantial risks of incontinence and impotence





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There is evidence that the amount of care that would be demanded under shared decision making might be substantially less than is currently being provided. One example, in the early 1990s, was the implementation of a decision aid designed to help patients decide between watchful waiting and surgery for their enlarged prostates was introduced in the urologic clinics in two pre-paid group practices, Kaiser Permanente in Denver and Group Health Cooperative in Seattle. After the implementation of shared decision making, the population-based rates of prostatectomy fell 40%, providing a measure of demand when patients are informed and involved in the choice of treatment. (Rates in the control group, Group Health Cooperative's Tacoma site, did not change.) The rate that resulted from shared decision making was at the extreme low end of the national distribution, suggesting that the rates of prostate surgery in most regions of the United States might substantially exceed the amount that informed patients actually want.<sup>e</sup>

It is not clear, however, what the steady state demand for discretionary surgery would be over time if shared decision making were fully implemented in primary care as well as specialty practice. We know relatively little about these possibilities, since shared decision making supported by patient decision aids has not yet been systematically implemented, even in pre-paid group practices such as Kaiser Permanente.

What it is safe to conclude, however, is that current patterns of practice do not reflect demand based on patient preferences, and that geographic variations in rates of surgery that reflect physician practice style will persist until patients are actively involved in the decision process and there are incentives for physicians to adopt shared decision making.

### Sources:

- <sup>a</sup> Wennberg JE, Cooper MM, et al, eds. *The Dartmouth Atlas of Health Care in the United States*. American Hospital Publishing, Inc., Chicago IL, 1996, p. 128-9.
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- <sup>c</sup> O'Connor AM, Llewellyn-Thomas HA, Flood AB. "Modifying Unwarranted Variations In Health Care: Shared Decision Making Using Patient Decision Aids." *Health Aff (Millwood)*. 2004 Suppl. Web Exclusive: VAR63-72. October 7, 2004.
- <sup>d</sup> Hawker GA et al. "Determining the need for hip and knee arthroplasty: The role of clinical severity and patients' preferences". *Medical Care*. 2001; 39(3):206-16.
- <sup>e</sup> Wennberg JE, Cooper MM, et al, eds. *The Quality of Medical Care in the United States: The Dartmouth Atlas of Health Care 1999*. American Hospital Publishing, Inc., Chicago IL, 1999, p. 224-7.

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