Risks Are High at Low-Volume Hospitals

Patients at thousands of hospitals face greater risks from common operations, simply because the surgical teams don't get enough practice.

As many as 11,000 deaths may have been prevented between 2010 and 2012 if patients who went to the lowest-volume fifth of the hospitals had gone to the highest-volume fifth. Getty Images/EyeEm

Like other hospitals in thinly populated areas, Sterling Regional Medical Center does a bit of everything. The 25-bed Colorado hospital has its own heliport, delivers about 200 babies a year and admits more than 1,200 patients for a variety of conditions and procedures. Replacing worn and painful hips and knees is among them. To patients, the surgery may seem perfectly routine.

Joint replacements are anything but routine at hospitals that don't do many of them, a new U.S. News analysis shows. Sterling is among thousands of U.S. medical centers whose patients face a greater risk of death and complications because their surgical teams do too few procedures, even common ones, for doctors, nurses and technicians to maintain their skills.

These large numbers of low-volume hospitals, the analysis found, continue to put patients at higher risk even after three decades of published research have demonstrated that patients are more likely to die or suffer complications when treated by doctors who only occasionally see similar patients rather than by experienced teams at hospitals with more patients and established protocols.

Elective hip and knee replacements are a prime example. Many urban centers routinely do hundreds a year. At Sterling, the three-year total for Medicare inpatients from 2010 through 2012 was 29 hips and 52 knees. And while the death rate for these operations is about 1 in 1,000 nationally, Medicare data in the U.S. News analysis show that the relative risk of death for the hospital's elective knee replacement patients was 24 times the national average and three times the national average for hip replacement patients.

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"You can save your life by picking the right place," says Leah Binder, director of the Leapfrog Group, a consortium of major employers that emphasizes safety in measuring hospital performance.

A calculation by Dr. John Birkmeyer, a surgeon who has produced pioneering research on the effect of patient volume, underscores the point. Using the U.S. News analysis, he determined that as many as 11,000 deaths nationally

might have been prevented from 2010 through 2012 over the three years analyzed if patients who went to the lowest-volume fifth of the hospitals had gone to the highest-volume fifth.

The data Birkmeyer used for his calculations covered only five common procedures and conditions. If a full range of commonplace operations and medical conditions had been included, adds Birkmeyer, executive vice president for enterprise services and the chief academic officer at Dartmouth-Hitchcock Medical Center in Lebanon, New Hampshire, "tens of thousands" of deaths could potentially have been averted.

The U.S. News analysis was conducted as part of a new set of hospital ratings, Best Hospitals for Common Care, to be launched Wednesday. The first set of ratings will evaluate hospital performance in caring for traditional Medicare fee-for-service patients, in five procedures: bypass surgery without valve repair or replacement, elective hip and knee replacement, congestive heart failure and chronic obstructive pulmonary disease. The project's goal is to enable users to see how well their local hospitals care for patients who do not require the highest level of medical expertise and technology.

The analysis, conducted in collaboration with Dr Foster, a London-based global health analytics firm, unearthed low volumes and troubling outcomes at hospitals many times larger than Sterling. At 331-bed Lawnwood Regional Medical Center & Heart Institute in Ft. Pierce, Florida, the relative risk of dying following a hip replacement was nine times the national average. At 316-bed Jersey City Medical Center in New Jersey, the risk for patients who had heart bypass surgery (none involving valve replacement or repair) was four times higher than average.

Representatives from Sterling Regional and the other higher-risk hospitals highlighted in the analysis responded that they could not confirm any of the deaths. It is possible that all of the deaths occurred elsewhere, or at other hospitals, after the patients had been discharged from the facilities where

they received initial care but within 30 days of their original admission. But attributing treatment-related deaths to the hospitals where patients were first admitted and adjusting for differences in each hospital's mix of patients is standard practice in analyzing health data.

Sterling spokeswoman Sara Quale said the hospital declined to comment on the specifics of the analysis because officials could not track the patients in the hospital's records. Lawnwood spokeswoman Ronda Wilburn said the hospital's "30-day post-discharge outcomes are in line with national mortality rates" posted on Medicare's Hospital Compare website. The mortality rates published there, however, reflect overall mortality, not the relative risk of death from low-volume procedures.

Joseph Scott, CEO of Jersey City Medical Center, acknowledged that the hospital may have had problems with its bypass surgery program during the years evaluated by U.S. News. "We have a different cardiac surgeon today than we did [then]," he says. "While [the findings] may be true between 2010 and 2012, we're always about continuous improvement and making things better."

The first large study showing an indisputable link between low volumes and poorer outcomes appeared in 1979 as a special report in the New England Journal of Medicine. Regardless, large numbers of hospitals continue to do small numbers of procedures. Part of the U.S. News analysis identified every hospital across the nation that operated on or treated fewer than 25 traditional Medicare inpatients from 2010 through 2012 for nearly 20 frequent procedures and conditions.

Among the findings for those ultra-low-volume hospitals:

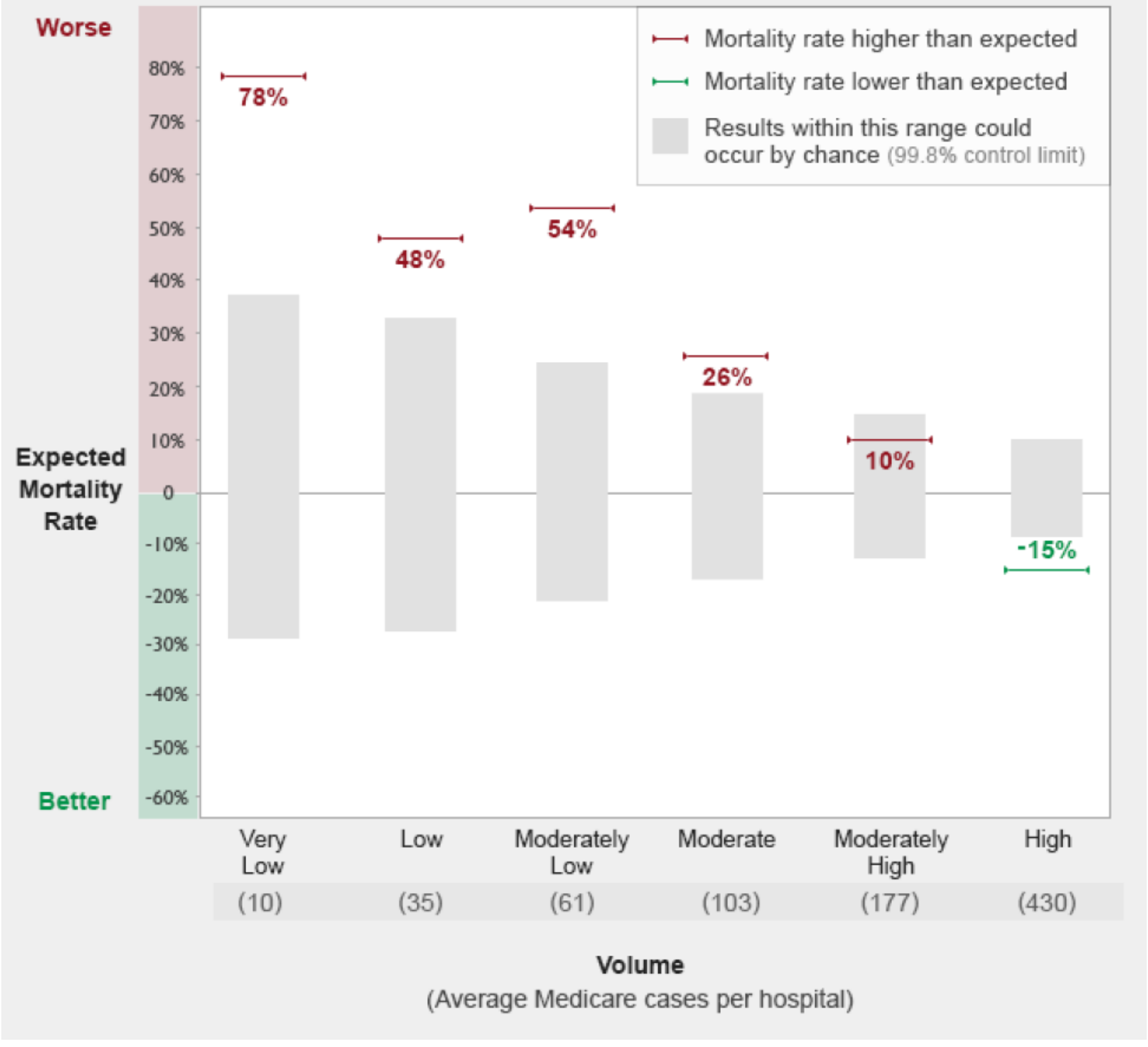
- 1,071 performed 10,686 hip replacements, an average of 3.3 per year per hospital.
- 608 performed 6,707 knee replacements, an average of 3.7 per year.
- 124 performed basic heart bypass surgery on 1,538 patients, an

average of 4.1 per year.

- 254 hospitals performed heart bypass surgery involving valve replacement or repair on 3,203 patients, an average of 4.2 per year.
- 396 hospitals treated 4,626 cases of heart failure, an average of 3.9 per year.
- 558 hospitals treated 7,174 cases of chronic obstructive pulmonary disease, an average of 4.3 per year.

Because a single death more or less would make the calculated odds jump or plummet at these hospitals, U.S. News chose not to display their overall ratings in Best Hospitals for Common Care unless such a hospital had had five or more deaths in a procedure or condition.

Nevertheless, taken together, the risk posed by ultra-low-volume hospitals is unmistakable. In the U.S. News analysis, knee-replacement patients at the hospitals had double the national average death risk, a 25 percent higher rate of readmission because of post-discharge complications. Hip-replacement patients faced a 77 percent higher risk of death and a 25 percent higher risk of readmission.



Katie Sokolosky for USN&WR

To analyze the risks presented by hospitals with volumes high enough to allow them to be individually rated, U.S. News divided all centers that treated at least 25 patients in one or more of the operations and conditions analyzed for the project into five roughly equal bands by volume. Rates of death and complications were then calculated for each band as well as an overall

rating. Hospitals in the lowest-volume quintile for knee replacement, for example, had average total volume of about 43 joints over the three years of analysis and those in the highest-volume quintile an average of 806.

Across all five operations and conditions, nearly 120,000 patients were treated at hospitals in the lowest-volume band – 39,483 for elective hip or knee replacement, 7,898 for cardiac bypass, 36,711 for heart failure patients and 34,181 for COPD.

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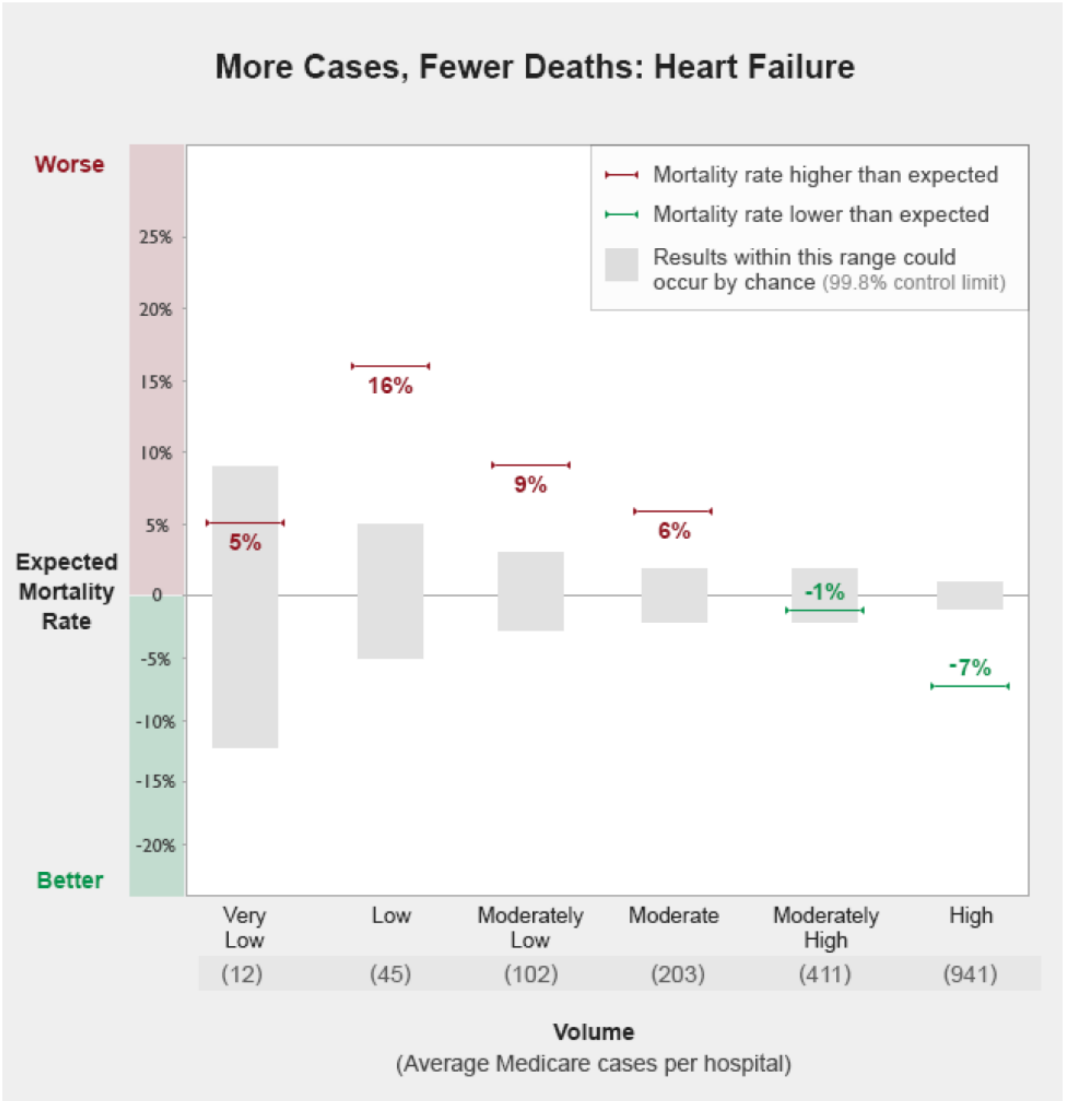
Overall, knee replacement patients who had their surgery in in the lowest-volume centers were nearly 70 percent more likely to die than patients treated at centers in the top quintile. For hip replacement patients, the risk was nearly 50 percent higher. Patients with congestive heart failure and chronic obstructive pulmonary disease had a 20 percent increased risk of

dying.

Few patients ask how many similar cases a hospital, let alone an individual doctor, has treated, says Dr. David Jevsevar, an orthopedic surgeon at Dartmouth-Hitchcock. "Are patients aware that they're going to a hospital that has done three of these [procedures] in the last year?" he asks. "Would they feel differently if they knew?"



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Perhaps not. Most patients, doctors say, feel that the more local the care, the better. Even if other hospitals are just an hour or two away, nearby care is comfortingly familiar. It avoids negotiating with a health insurer and the expense and stress, to the patient and to family members, of out-of-town care.

A study led by Dr. Samuel Finlayson of the University of Utah bears this out, showing that nearly one-fifth of patients would choose to have surgery at a local hospital with a death rate of 18 percent rather than drive two hours to a regional hospital with a death rate of 3 percent.

Besides, most of the time nothing goes wrong. But if there is a problem, good options may be few. "We can't always predict very well who's going to get into trouble," says Dr. Steven Nissen, chief of cardiology at the Cleveland Clinic. "If you're in a local institution with limited experience and things go wrong, there's no going back."

While death is the ultimate poor outcome, low-volume care has other hazards. Patients at low-volume hospitals need to come back more often after joint replacement for revision surgery due to deep infection or mechanical failure, for example. One-year revision rates are nearly 20 percent higher among knee patients and 20 percent higher for hip patients operated on at the lowest-volume fifth of rated hospitals, the U.S. analysis found.

"If you don't do something very often and it's complicated, you're not going to do it as well as someone who makes their living doing it," says anesthesiologist Dr. Peter Pronovost, director of the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine.

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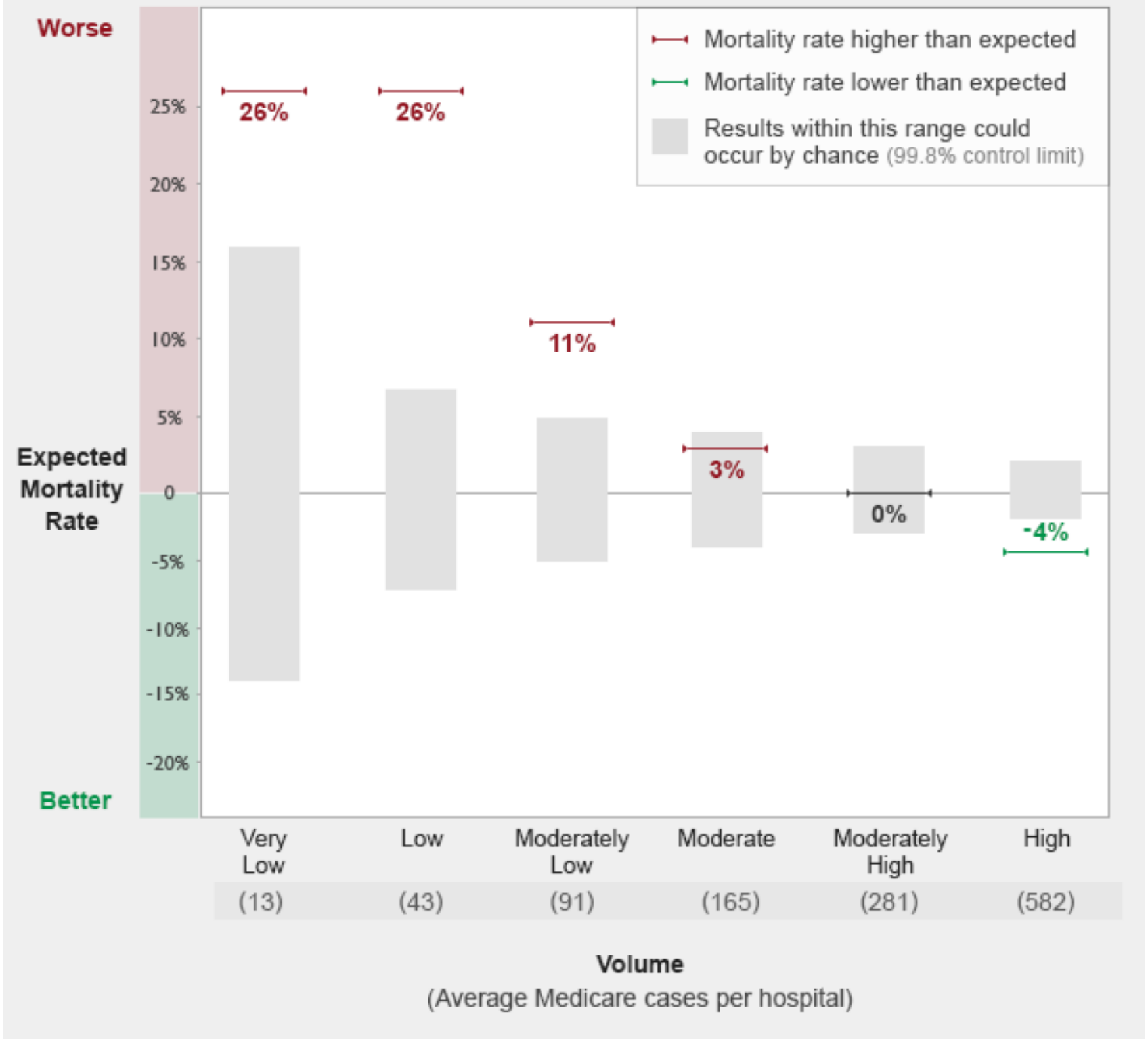
He recalls a case involving a woman who had had a diseased portion of her esophagus inexpertly removed at a hospital that does only one or two esophagectomies a year. She was transferred to Johns Hopkins, but it was too late to save her. Studies have shown that mortality for the procedure is significantly lower for patients treated in hospitals that perform as few as a

dozen a year. Less than two miles away, Pronovost says, were two hospitals that each averaged about 40 a year.

"She was butchered," he says. "There's no other word for it. Yet when I asked whether the patient was told that she was at higher risk [because of the hospital's low volume], the answer was 'No.'"

The lack of accountability makes Pronovost fume. "Who's responsible for this?" he says. "Is it the physician? The hospital? State regulators? The [hospital-accrediting body] Joint Commission? Where's the accountability for informing people?"



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Dr. Mark Chassin, president and CEO of the Joint Commission, the not-for-profit organization that accredits hospitals and other health care institutions, agrees that many studies, including his own, have shown a relationship between low volumes and worse outcomes. But he balks at using accreditation to discourage low-volume hospitals or surgeons from doing

procedures. "I don't think thresholds or minimum requirements will change things for the better," he says. "It will reduce supply and indiscriminately remove both good and bad performers. That's not a prescription for improvement."

The Joint Commission's stance, says Chassin, is to leave it to individual hospitals to assure that their physicians provide high quality care. "What we've urged, and what we require, is that all hospital clinical departments set up criteria for credentialing of physicians or surgeons and take into account how well they do – track their performance" he says.

The absence of firmer measures carries consequences, says Dr. Robert Wachter, author of "The Digital Doctor: Hope, Hype and Harm at the Dawn of Medicine's Computer Age" and chief of medical service and chief of the division of hospital medicine at UCSF Medical Center in San Francisco. "In the U.S., we've traditionally propped up [low-volume] hospitals because we've felt that every city that wants a hospital should have one. These [U.S. News] data indicate that this isn't a benign choice."

Over the decades, other studies have extended the findings beyond hospitals to individual surgeons, demonstrating the Carnegie Hall principle: The more they practice, the better they do. In some procedures, such as aortic-valve replacement, says Dartmouth's Birkmeyer, physician volume is a better yardstick of performance than hospital volume.

Yet hospitals with few cases and marginally or inexperienced physicians often "discourage doctors from sending patients to other facilities," says the Cleveland Clinic's Nissen. "I frequently encounter patients who come in for a second opinion, and they'll often be pretty open about being discouraged from going somewhere else." Hospitals often depend on big-ticket procedures like heart bypass surgery and joint replacement for financial survival. A Blue Cross-Blue Shield report published in January showed that the typical joint replacement procedure is billed at more than $30,000.

In its ratings, Leapfrog has pioneered reporting of volume-based proficiency standards for certain surgeries—the number required for a doctor, surgical team and hospital to keep skills sharp. "The average hospital does about 400 heart cases per year, and typically those hospitals would have an average of two or three surgeons," says Birkmeyer, who helped draw up the Leapfrog standards. "It would be reasonable to say that you'd want surgeons who did at least 100 [heart] cases a year and hospitals, depending on where you want to draw the line, that do 200 or 300 cases a year."

The relationship between higher volume and better outcomes is strong but not absolute or even a straight line. Although the risk of dying at one hospital may be far higher than at another, a patient's risk may still be low. Some low-volume centers, moreover, consistently do well; some high-volume centers do not. And some high-volume centers may operate on people who don't need surgery, says Dr. Kevin Bozic, chairman of surgery and professor of orthopedic surgery at the University of Texas in Austin. Even if such a center is highly proficient, any surgery exposes patients to risks, so someone having an unneeded operation is automatically in a higher-risk category.

Evaluation of hospital care, say Bozic and other researchers, should include volume along with other factors, preferably information derived from outcomes data like rates of deaths and complications. U.S. News has designed Best Hospitals, Best Children's Hospitals and the new Best Hospitals for Common Care around that principle. But the relationship between low volume and poor outcomes is easily strong enough to raise questions about seeking care at a hospital where few patients in a procedure or condition of interest are treated.

The current massive consolidation of larger and smaller hospitals may winnow out some low-volume hospitals. "Thousands of hospitals may close, many of them smaller," says Wachter. "Some of them are already living on the edge." He believes the casualties are likely to be driven more by economics than quality. They could include both high-mortality hospitals

and excellent small hospitals with a couple of dozen beds that he knows from visits in states like Iowa and South Dakota, "God bless them," says Wachter of the small strivers. "They're doing the best they can."

Putting the onus on patients to identify riskier healthcare settings may be asking too much, says Wachter. Perhaps, he says, centers that only do a few heart bypasses, hip replacements or other procedures a year should carry a "black-box warning" on their web pages and elsewhere, as risky medications do – a statement that provides information but leaves it to patients to decide what to do with it.