

# Safety in Numbers: Hospital Performance on Leapfrog's Surgical Volume Standard Based on Results of the 2019 Leapfrog Hospital Survey

## Report Highlights

- Hospitals and surgeons should perform a minimum volume of a given procedure per year in order to ensure the safest outcomes for their patients
- A higher percentage of hospitals met Leapfrog's minimum volume standards in 2019 than 2018, though most hospitals are still electively performing high-risk procedures without the adequate, ongoing experience to do so
- Rural hospitals particularly struggle to meet Leapfrog's standard, though to their credit, the vast majority choose not to perform these surgeries electively
- A sizeable percentage of hospitals have implemented protocols to monitor for appropriateness, potentially protecting patients from getting unnecessary surgeries

### Where the data comes from

This report uses final hospital data from the 2019 Leapfrog Hospital Survey, the flagship initiative of The Leapfrog Group. Over 2,100 hospitals participated in the 2019 Survey, representing 70% of U.S. hospital beds. The Leapfrog Group is a nonprofit watchdog organization that serves as a voice for health care purchasers, using their collective influence to foster positive change in U.S. health care. For 20 years Leapfrog has been the nation's premier advocate of health care transparency—collecting, analyzing and disseminating data to inform value-based purchasing.

The Leapfrog Group invites all adult general acute care and free-standing pediatric hospitals in the United States to voluntarily report to the annual Leapfrog Hospital Survey; additionally, ambulatory surgery centers (ASCs) are invited to report to the Leapfrog ASC Survey.

The Leapfrog Hospital Survey is developed with guidance from volunteer [Expert Panels](#) and receives scientific guidance from the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine. Quality and safety data by facility collected via the Survey on measures such as maternity care, medication safety, and infection rates is available at [www.leapfroggroup.org/compare](http://www.leapfroggroup.org/compare).

### Introduction

Patients undergoing high-risk surgeries are more likely to suffer complications, harm, or even death when the surgeon and hospital inexperienced at that procedure, according to a substantial body of research. An [analysis](#) by U.S. News examined five common procedures and found 11,000 volume-related deaths might have been prevented over a three year period for those procedures alone. In one low-volume hospital, the analysis showed that patients were 24 times more likely to die from a knee replacement surgery than in the highest-volume facilities.

In 2019, for the second year, Leapfrog publicly reported on hospital performance meeting [minimum volume standards for safety](#) for eight high-risk procedures. The eight surgeries included in the Survey were identified by Leapfrog's [National Inpatient Surgery Expert Panel](#) as procedures for which there is a strong volume-outcome relationship. The Expert Panel relied on [published research and evidence](#) to advise on [minimum hospital and surgeon volume standards](#) for each procedure. For each of the eight high-risk procedures included in the Survey, Leapfrog provides a set of [ICD-10 procedure codes](#) and diagnosis codes for counting patient discharges in order to ensure accurate reporting. Hospitals participating in the voluntary Leapfrog Hospital Survey are asked whether the hospital itself performs a sufficient volume of high-risk procedures each year, and whether the hospital grants privileges only to surgeons meeting the Leapfrog minimum volume standard for each procedure.

### Leapfrog's Minimum Surgical Volume Standard

To fully meet Leapfrog's minimum volume standard for safety, hospitals must meet the minimum hospital volume standard for the procedure in a twelve-month period and ensure that the hospital's process for privileging surgeons includes meeting or exceeding the minimum surgeon volume standard (Table 1). Surgeons may achieve the minimum surgeon volume standard by performing the procedure at multiple hospitals. Striving to meet Leapfrog's standard challenges hospitals to hold themselves accountable for minimum surgical volume standards known to improve the odds of a safer surgery for their patients.

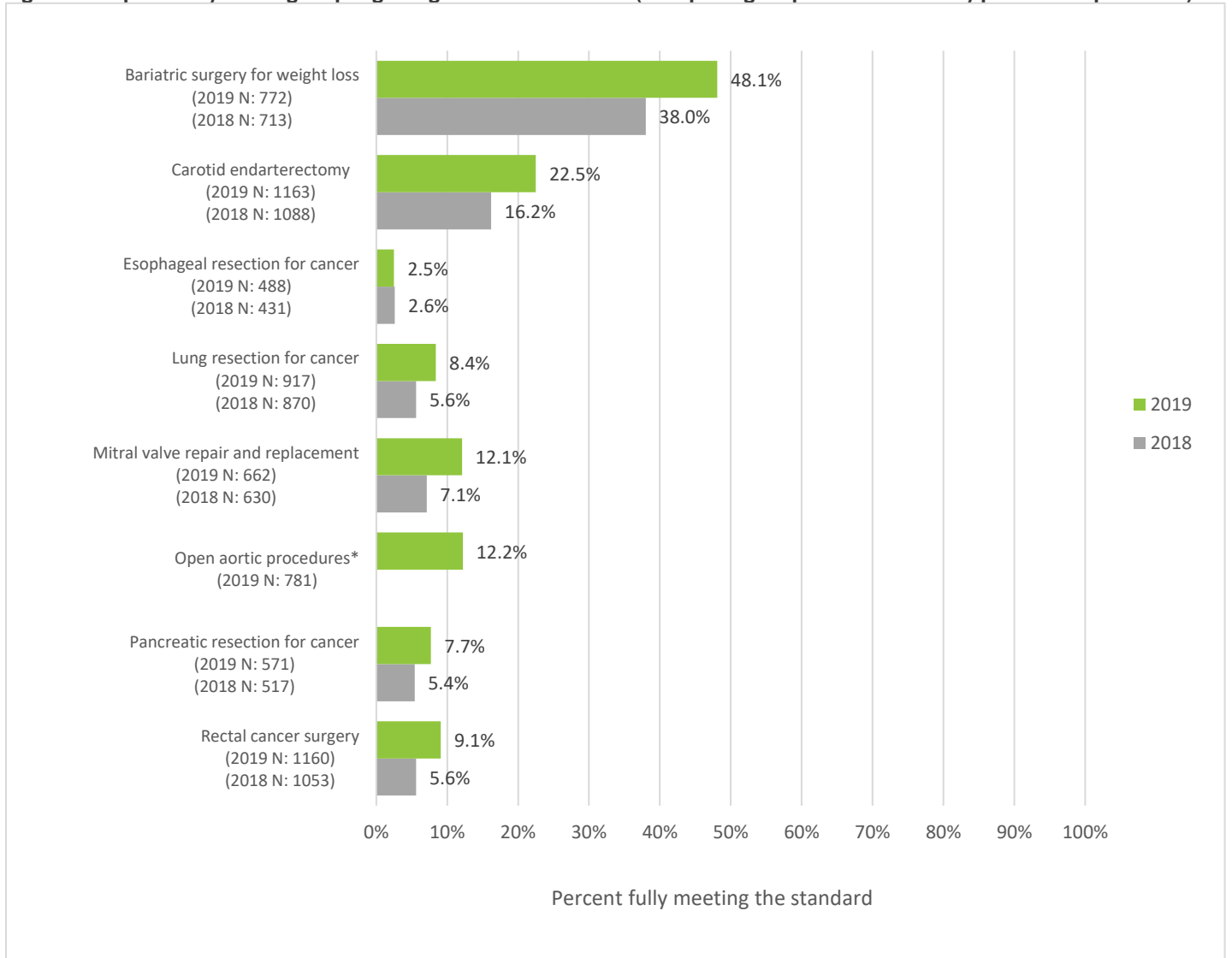
**Table 1: Leapfrog's facility and surgeon privileging volume standards**

Procedure	Minimum annual hospital volume standard	Minimum annual surgeon volume standard for privileging
Bariatric surgery for weight loss	50	20
Carotid endarterectomy	20	10
Esophageal resection for cancer	20	7
Lung resection for cancer	40	15
Open aortic procedures	10	7
Mitral valve repair and replacement	40	20
Pancreatic resection for cancer	20	10
Rectal cancer surgery	16	6

**Surgical Volume Results**

Results of the 2019 Leapfrog Hospital Survey show that hospitals are improving (Figure 1). In almost all cases, a higher percentage of hospitals fully met Leapfrog’s standard in 2019 than in 2018 (meaning the hospital met Leapfrog standards for both the hospital and surgeon privileging volumes). The strongest performance was on bariatric surgery for weight loss, for which nearly half of hospitals fully met Leapfrog’s standard. Despite this improvement however, for all but one procedure, no more than a quarter of hospitals that perform the surgery fully met Leapfrog’s volume standard. And for four procedures, less than 10% of hospitals performing the surgery fully met the standard.

**Figure 1: Hospitals fully meeting Leapfrog’s surgical volume standard (N: Reporting hospitals that electively perform the procedure)**

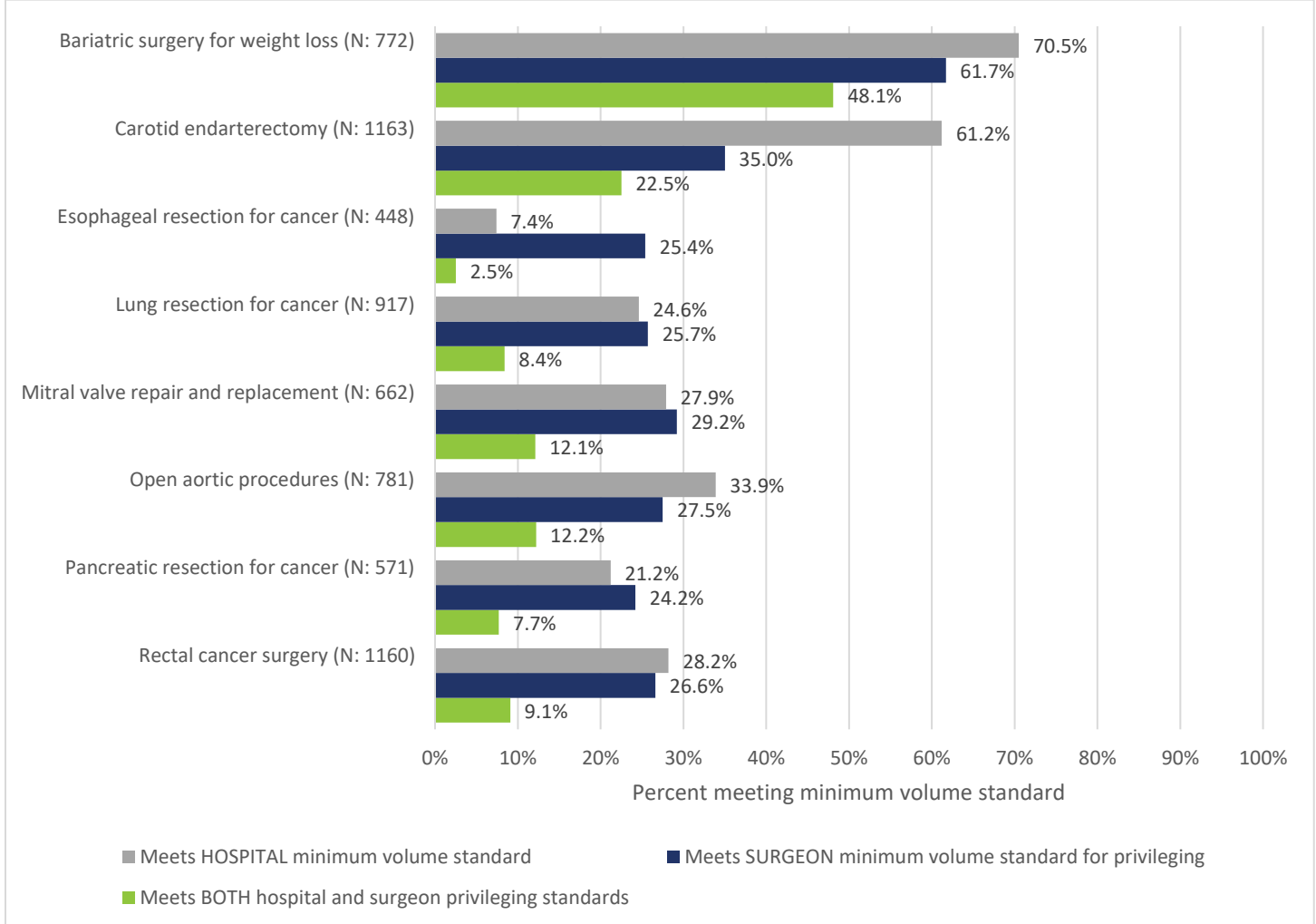


\*Open aortic procedures were redefined in 2019 and therefore cannot be compared year over year

For five out of the eight procedures (bariatric surgery for weight loss, carotid endarterectomy, esophagectomy, lung resection for cancer, and pancreatic resection for cancer), hospitals reporting on surgical volume in both 2018 and 2019 were more likely to fully meet the minimum volume standard than those reporting on it for the first time in 2019. As one example, while 4.7% of hospitals reporting to the Leapfrog Hospital Survey for the first time in 2019 fully met the pancreatic resection for cancer volume standard, 9.7% of hospitals that reported in both 2018 and 2019 fully met the volume standard. This may indicate that reporting to the Leapfrog Hospital Survey prompts hospitals to implement policies to ensure safe volumes, and in doing so helps to protect patients from avoidable harm or death.

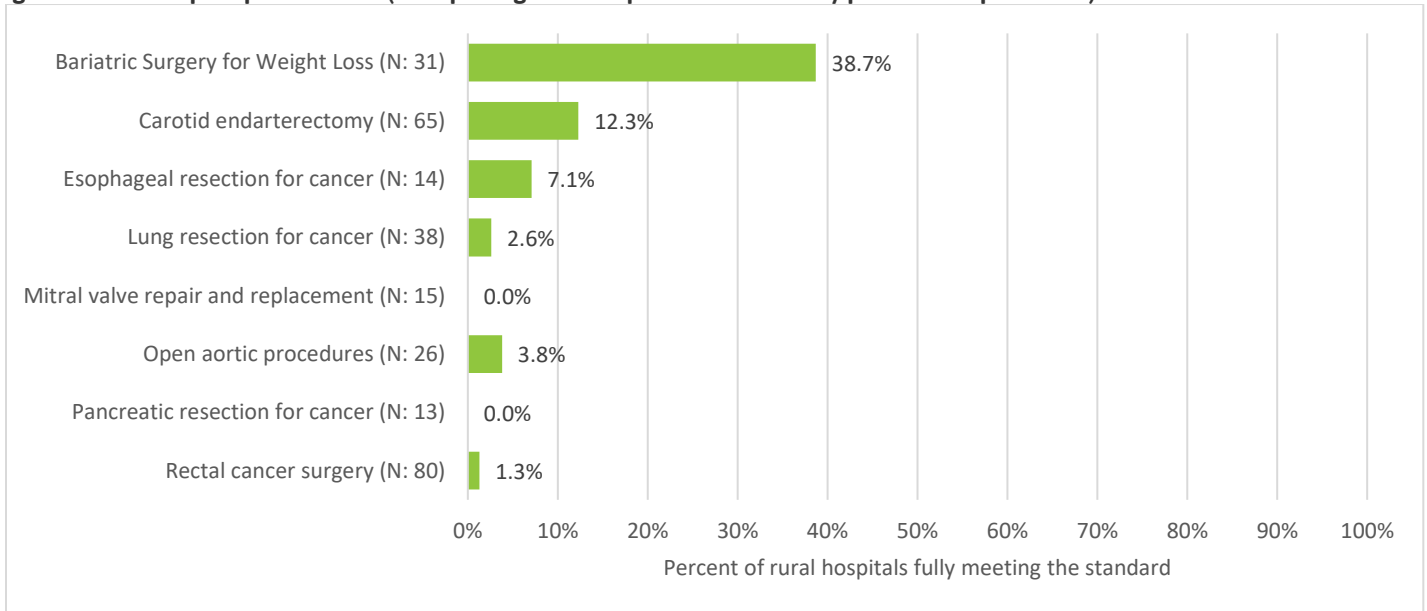
Though most hospitals struggle to implement both the hospital volume and surgeon privileging standards, and therefore do not meet the overall volume standard, many hospitals have implemented at least one component of the standard for each surgery (Figure 2). For example, though only 22.5% of hospitals fully met Leapfrog’s overall volume standard for carotid endarterectomy in 2019, 61.2% of hospitals meet the minimum facility volume standard. For many procedures, about half of hospitals were able to meet one component of Leapfrog’s minimum surgical volume standard.

**Figure 2: Performance on Leapfrog’s surgical volume standard (N: Reporting hospitals that electively perform the procedure)**



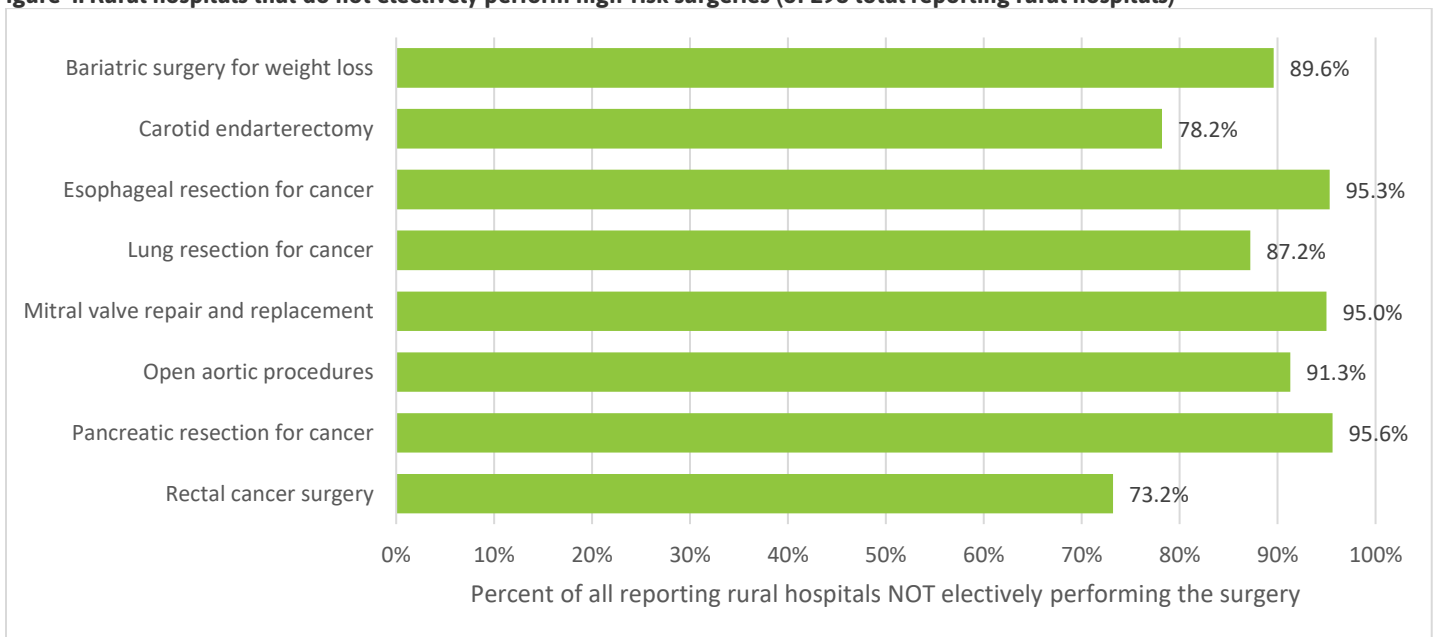
As was the case in 2018, rural hospitals that electively performed these high-risk surgeries were much less likely than other hospitals to meet Leapfrog’s minimum volume standard (Figure 3). For two procedures, mitral valve replacement and pancreatic resection for cancer, zero rural hospitals met the standard.

**Figure 3: Rural hospital performance (N: Reporting rural hospitals that electively perform the procedure)**



To the credit of rural hospitals, most choose not to perform elective procedures for which they have inadequate patient volume (Figure 4). Hospitals that cannot perform a safe volume of procedures should follow the lead of the vast majority of rural hospitals and refer patients to safer options.

**Figure 4: Rural hospitals that do not electively perform high-risk surgeries (of 298 total reporting rural hospitals)**



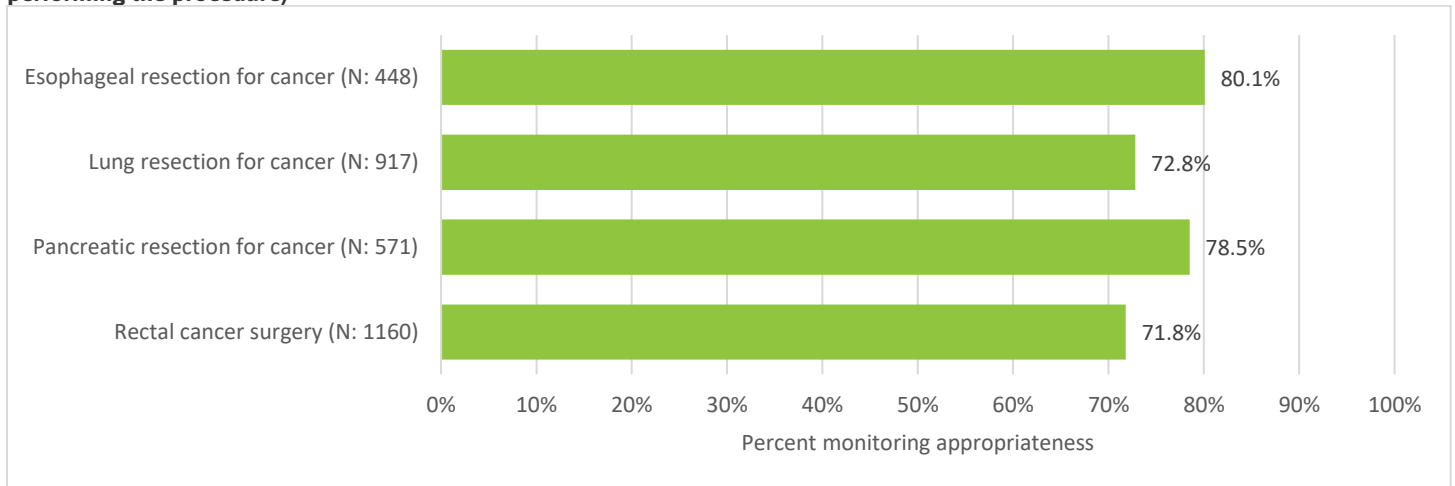
### Surgical Appropriateness

As illustrated above, Leapfrog expects that hospitals that electively perform high-risk surgical procedures will meet minimum volume standards for patient safety. At the same time, it is critical that hospitals not perform procedures when the procedure is not appropriate for the patient. In that vein, Leapfrog asks hospitals to report on practices that help to ensure surgical appropriateness. For cancer procedures (lung resection for cancer, esophageal resection for cancer, pancreatic resection for cancer, rectal cancer surgery), hospitals must have a multidisciplinary tumor board that prospectively reviews cancer cases and/or have national accreditation from the American College of Surgeons (for rectal cancer surgery only). For the other high-risk procedures (carotid endarterectomy, mitral valve repair and replacement, open aortic procedures, bariatric surgery for weight loss), hospitals are asked to report on their implementation of a hospital-wide policy which includes processes aimed at monitoring surgical necessity and preventing overuse of surgical procedures. These processes could include establishing an appropriateness protocol that uses the latest evidence and clinical guidelines or soliciting input from surgeons.

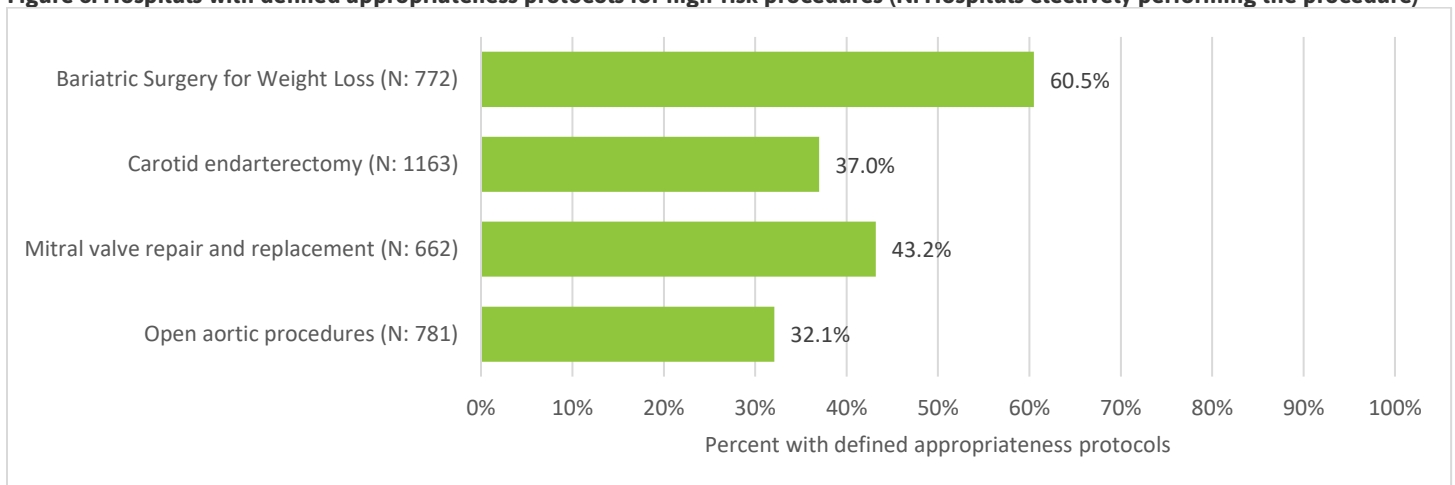
**Appropriateness Results**

2019 Leapfrog Hospital Survey results show that hospitals are more likely to have in place protocols to ensure appropriateness for cancer procedures (Figure 5) than the other high-risk procedures evaluated on the Survey (Figure 6), with over 70% of reporting hospitals indicating they have these protocols in place for cancer surgeries. For the other high-risk procedures however, hospitals have significant strides to make in adopting appropriateness protocols.

**Figure 5: Hospitals monitoring appropriateness for cancer surgeries via a multidisciplinary tumor board (N: Hospitals electively performing the procedure)**

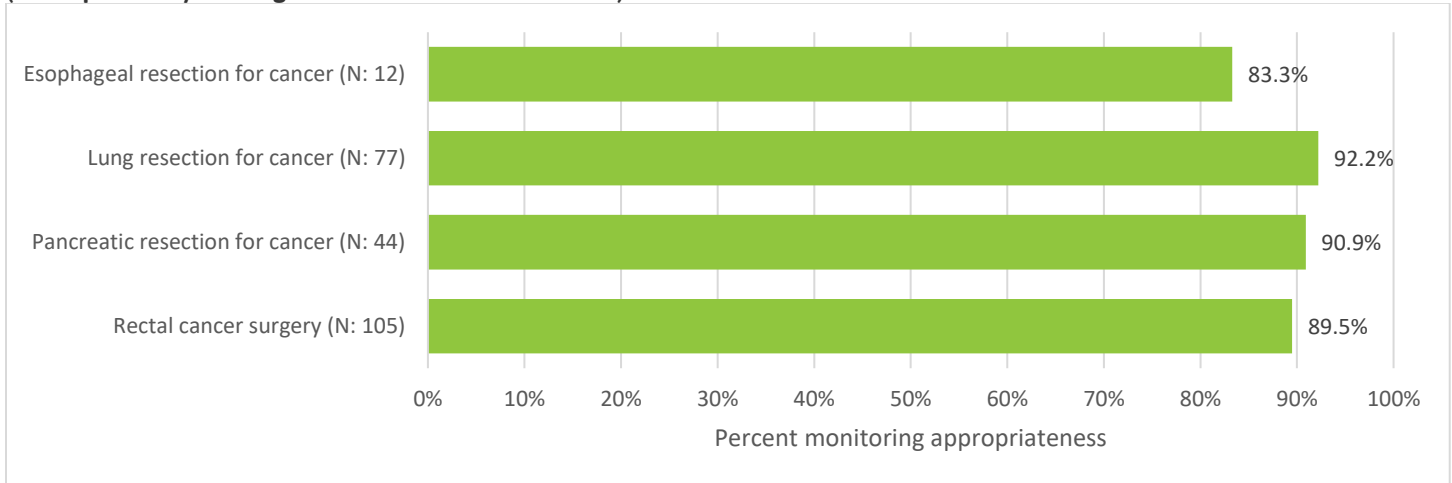


**Figure 6: Hospitals with defined appropriateness protocols for high-risk procedures (N: Hospitals electively performing the procedure)**

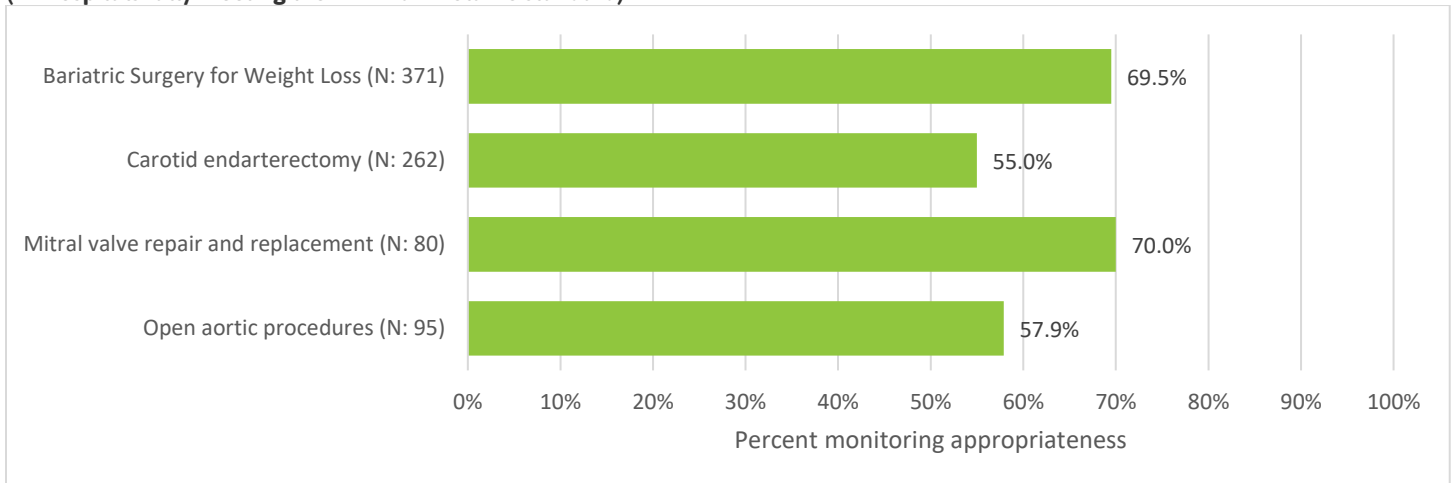


Encouragingly, hospitals that fully meet Leapfrog’s volume standard are also likely to have appropriateness criteria in place (Figures 7 and 8). This may imply that hospitals are not performing inappropriate surgeries in an aim to meet Leapfrog’s minimum volume standard. For many procedures, more than two-thirds of hospitals that fully meet the volume standard also have appropriateness protocol in place to prevent surgeries from being performed on patients who may not need them.

**Figure 7: Hospitals fully meeting Leapfrog’s minimum volume standard and monitoring appropriateness for cancer procedures (N: Hospitals fully meeting the minimum volume standard)**



**Figure 8: Hospitals fully meeting Leapfrog’s minimum volume standard and monitoring appropriateness for high-risk procedures (N: Hospitals fully meeting the minimum volume standard)**





### How to Use this Information

While progress has been made, far too many hospitals are performing surgeries too infrequently to be deemed safe for patients. Abundant evidence suggests that for certain procedures, patients can save their lives by choosing a hospital and a surgeon with adequate, ongoing experience performing that surgery and as well as a hospital that protects against unnecessary surgery. Thanks to hospitals that voluntarily submit data to the Leapfrog Hospital Survey, that information [is available](#). Unfortunately, many hospitals still decline to report this information; for those facilities, nothing is known about the frequency with which the hospital and surgeon perform the procedures and patients are unable to discern the safety of that facility based on its procedure volume.

Hospitals should implement policies to ensure safe volumes. If they cannot achieve a minimum volume for safety, they should not electively perform that procedure. Physicians should be willing to have a conversation with their patients about facility or surgeon alternatives that will improve the patient's odds of a better outcome.

Employers can help. They can make employees aware of the Leapfrog Hospital Survey results and help them to identify a facility that meets Leapfrog's minimum volume standards for safety. Furthermore, employers and health plans can use the data to structure contracts, tiered networks, and value-based payment arrangements that reward hospitals, ACOs, and other providers for meeting these standards. Value strategies can also incentivize improvement, for instance by tying incentives or penalties to public reporting to the Leapfrog Hospital Survey, implementation of an appropriateness standard, progress toward achievement of volume standards, and meeting the standard for procedures performed.

Please visit [www.leapfroggroup.org/ratings-reports/inpatient-surgery](http://www.leapfroggroup.org/ratings-reports/inpatient-surgery) to learn more.