WHITE PAPER

Assessment of quality and total cost of care across individual doctors: Benefits and methodology

Garner's approach to assessment of provider quality and total cost of care

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garner™

Why assess individual doctor performance?

The U.S. healthcare system generates significant economic waste at nearly $1 trillion per year while its quality outcomes are currently 37th on the World Health Organization's rankings. Garner has spent years analyzing data to better understand the causes of poor outcomes and what can be done to improve the results. We found that **individual physician behavior is the most important factor in determining the cost and quality of an episode of care.** Our data shows that in every geography in the country there are significant differences in how doctors practice. These differences create dramatically different health outcomes for patients and different costs for employers and plan sponsors. As an example of the overall impact of doctor selection, our data shows that the top-performing doctors in every geography add three healthy days to their patients' lives each year while simultaneously lowering the total cost of care by 32%.

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Until now, it has been impossible to get clear, accurate data on provider performance. Patients, clinicians and other stakeholders have long complained that existing methodologies are inaccurate, undecipherable and biased against doctors who handle the most challenging cases. To solve these problems, **Garner has created an entirely new approach to physician measurement that provides significantly more accurate and transparent results.** This new holistic approach looks more closely at every decision a physician makes versus relying on standard industry episode groupers. The result is rankings that are much more transparent and trustworthy, enabling better-informed decisions for everyone in the healthcare ecosystem.

This paper covers Garner's methodology for assessing physician performance, including how we assess quality and the total cost of care, how we construct our more than 650 specialty-specific metrics and how we aggregate these metrics to create an overall view on every doctor in the country.

Why previous provider rankings have been inaccurate

Almost as long as there have been data-driven provider rankings, the results have been maligned as untrustworthy and inaccurate. They often vary significantly year by year for the same doctor. Why? Most existing approaches rely on episode groupers (ETGs). These ETGs categorize all claims by disease using complex logic (e.g., which claims are due to knee pain versus chest pain versus stomach pain). This data is then fed into a black box statistical aggregator that outputs the average cost per patient and health outcomes for each doctor and each disease. Unfortunately, these algorithms have many problems: They are very bad at picking up doctors who handle complex cases, they are a total "black box" (even to their creators) and they require many thousands of patients to create statistical significance.

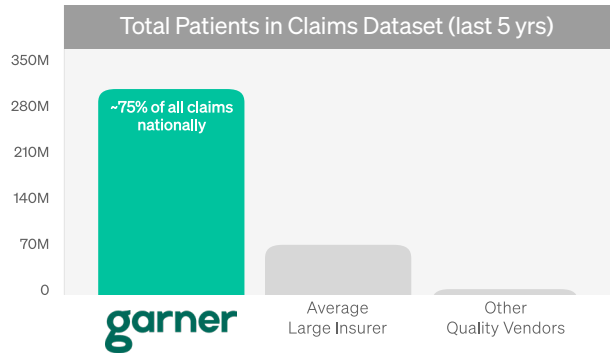
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A better approach to provider analytics

Garner has created an entirely new approach to provider analytics that solves these historical issues. Rather than crunch data through a complex statistical aggregator, we look at each individual decision a doctor makes throughout the patient journey to create what we call a "bottom-up" approach.

Garner's methodology begins with the collection of over 75% of the medical claims data in the United States. This data is sourced from:

- Access to multi-payer claims dataset that covers commercial, Medicare and Medicaid claims
- Unique third-party partnerships
- Employers
- Clearinghouses
- Insurance companies
- All-payer claims databases



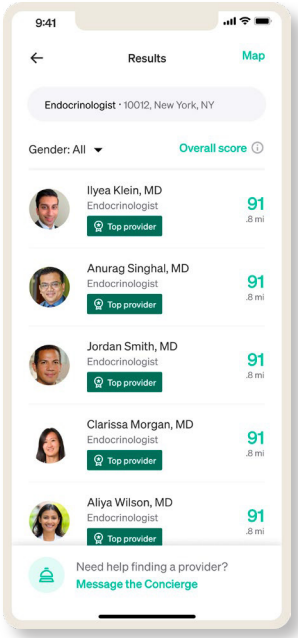
Our historical claims data contains more than **60 billion medical** records representing over **310 million patients**. This historical data is used to contextualize and analyze the new healthcare transparency data to calculate carrier-level procedure pricing for nearly all locations, providers and procedures.

This objective information on the outcomes of every doctor's patients is analyzed with Garner's unique domain expertise that combines the latest clinical research, healthcare economic findings and a deep understanding of managed care contracting to create over **650 quality and efficiency metrics** that analyze every aspect of each physician's performance and rank their performance across **88 distinct subspecialties**. The output is a breakthrough in the level of detail in provider performance assessments and yields insights that are more transparent, informed and accurate than traditional approaches.

Following is an example of a subset of the metrics we use to understand whether a doctor is treating knee pain well:

- Does the physician unfairly upcode their office bills?
- Was an MRI prescribed at the right time for the patient?
- What is the cost of the MRI?
- Was an unnecessarily expensive anti-inflammatory prescribed versus a more effective generic option?
- Was surgery recommended appropriately for the patient?
- Was there a complication after surgery?

This bottom-up approach means we are more accurate in assessing each doctor, we are not biased against doctors who see the most complex cases and we can share our results in a transparent manner with patients and clinicians alike. For example, on the right we show our recommendations for an endocrinologist. Members can easily understand how doctors rank against their peers and make a confident, well-informed selection.



Garner Health mobile app

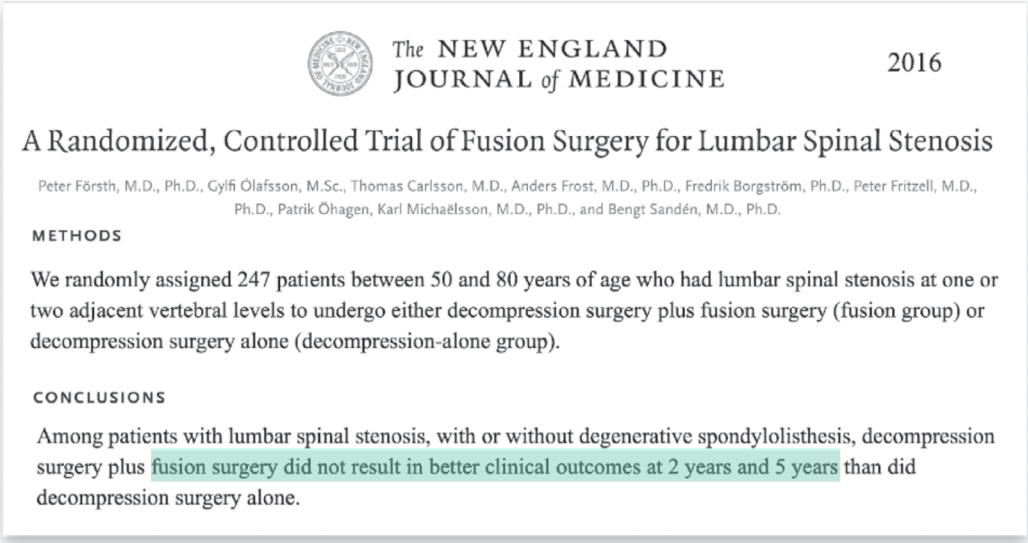
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Physician performance metrics construction

For each of our more than 650 metrics, we follow a simple system to measure physician performance. This process ensures that our results are accurate, unbiased and easy to understand. To illustrate Garner's process, we will look at spinal fusion rates for spinal stenosis as an example that is easy to understand and has a significant impact both on health outcomes and cost.

As background, spinal fusion is the single most costly procedure in the country, costing employers $7.14 per member per month nationally. Not only is this procedure costly, but it also has a material quality of life impact. The average employee is off work for 42 days after surgery and experiences a complication nearly 25% of the time. Based on our database, the leading reason spine doctors perform fusions is to treat spinal stenosis – a narrowing of the nerve canals of the spine that can create severe referred pain in other parts of the body.

What is interesting about the prevalence of spinal fusions in treating spinal stenosis is that there is significant literature that points to this therapy having no clinical benefit over the long term. For example, below is a paper published by Dr. Peter Forsth et al. in The New England Journal of Medicine on this topic. Dr. Forsth and his team randomly assigned patients with spinal stenosis to receive either spinal fusion or much less invasive care. They tracked the pain level of these patients for two and five years after surgery, and determined the patients who received fusion had no better clinical outcomes than those who received much less invasive and less costly care.



The NEW ENGLAND JOURNAL of MEDICINE 2016

A Randomized, Controlled Trial of Fusion Surgery for Lumbar Spinal Stenosis

Peter Försth, M.D., Ph.D., Gylfi Ólafsson, M.Sc., Thomas Carlsson, M.D., Anders Frost, M.D., Ph.D., Fredrik Borgström, Ph.D., Peter Fritzell, M.D., Ph.D., Patrik Öhagen, Karl Michaëlsson, M.D., Ph.D., and Bengt Sandén, M.D., Ph.D.

METHODS

We randomly assigned 247 patients between 50 and 80 years of age who had lumbar spinal stenosis at one or two adjacent vertebral levels to undergo either decompression surgery plus fusion surgery (fusion group) or decompression surgery alone (decompression-alone group).

CONCLUSIONS

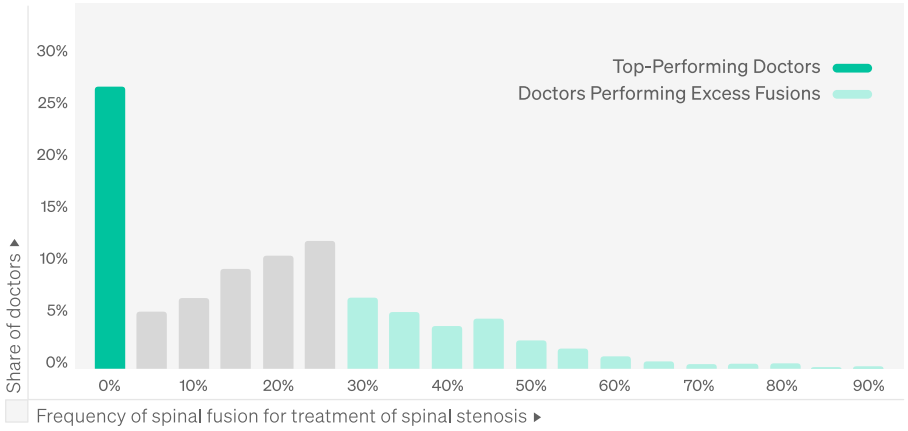
Among patients with lumbar spinal stenosis, with or without degenerative spondylolisthesis, decompression surgery plus fusion surgery did not result in better clinical outcomes at 2 years and 5 years than did decompression surgery alone.

Based on significant evidence to doubt whether spinal fusions do anything to treat spinal stenosis, we turned this into one of our 650+ metrics: "do not treat spinal stenosis with spinal fusion unless there are other clinical issues that warrant a fusion surgery."

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This metric, like all Garner metrics, can be expressed as a ratio composed of a numerator and a denominator. The denominator is the total number of patients to whom the metric applies. In this case, the denominator is all patients who saw a spinal doctor where the diagnosis of spinal stenosis was made and where other more severe conditions were not present (e.g., neurological issues, spinal tumors, major trauma, among others). The numerator is the number of patients who received the care in question. In this case the numerator is the number of patients who received spinal fusion. The ratio of the numerator divided by the denominator is the performance ratio for each doctor. Not surprisingly, individual doctors vary widely in how they perform on spinal fusion rates for spinal stenosis.

Below we show the distribution of doctor performance for this metric. Roughly 25% of doctors have never performed a spinal fusion for spinal stenosis. This is ideal performance. The remaining 75% of doctors have a wide spread of performance, with some doctors performing fusion on more than 80% of patients with stenosis.



How Garner measures provider performance

To assess physician performance, we aggregate more than 650 individual metrics into two categories: quality (i.e., health outcomes) and total cost of care (i.e., the total spending created from the episode of care).

> For a doctor to be recommended to one of our members, they must outperform their local peers in both quality and the total cost of care.

Within quality and total cost of care, we break down physician performance into several subcategories to get a more granular understanding of the areas in which a particular physician excels or underperforms.

Overall Physician Scoring	
Quality	**Total Cost of Care**
✓ Process	✓ Medical Utilization
✓ Outcomes	✓ Pharmacy Utilization
✓ Credentialing	✓ Site of Service
	✓ Cost per Service

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How Garner measures provider quality

To assess the quality of care generated by each physician, Garner analyzes measure three different subcategories: process, outcomes and credentialing.

Process analysis

To achieve a successful health outcome, providers must follow the correct evidence-based process. This means a patient should receive all of the care they need without being subjected to the additional pain and risk of unnecessary testing and procedures. Unfortunately, in our healthcare system where physicians are compensated for every procedure they perform, the care patients receive often falls short of this standard. With the help of Garner's Clinical Advisory Board, we have written a series of metrics that measures which tests and procedures are essential to treat a particular disease and which are not. Doctors are measured both on positive measures (e.g., performing all the tests and procedures that were essential) and negative measures (e.g., avoiding unnecessary tests and procedures). Examples of our process quality measures are detailed below.

Avoids unnecessary echocardiograms for asymptomatic patients

Following recommendations from the American Society of Echocardiography and in consultation with physician experts, we have determined clinical guidelines for cases that do not merit initial or repeat echocardiography. Examples of the clinical guidelines we utilize include no echocardiograms for perioperative/preoperative patient assessment without evidence of heart disease, no stress echocardiograms in asymptomatic patients at low risk for heart disease and no repeat echocardiograms for trace valvular regurgitation. After identifying cases of unnecessary echocardiography, we attribute the cases to physicians and calculate physician-level rates of unnecessary echocardiography.

Avoids excessive opioid usage

Opioids are prescribed frequently and unnecessarily, ultimately increasing patients' risk of dependency significantly (Brummett et. al. 2017). Based on existing research, we define two specific types of questionable opioid usage: opioid prescriptions for non-cancer chronic pain (Busse et. al. 2018, Deyo et. al. 2008) and initial post-surgical opioid prescriptions that exceed the suggested starting opioid dose, such as a starting opioid prescription of greater than 20 doses for arthroscopic ACL repair (Center for Opioid Research and Education). We use these guidelines to calculate provider rates of questionable opioid usage.

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Outcomes analysis

In addition to measuring the process physicians use to treat patients, we also look at the end result of the episode of care. We measure the outcomes that patients experience and look at complication rates from surgical procedures, mortality rates from serious conditions and surgeries, and revision surgery rates. In each case, we carefully adjust for the differences in the patient panels between doctors to prevent a bias in negatively assessing providers who treat sicker or more difficult-to-manage populations. Below is an example of one of our outcomes.

Surgeon-level, risk-adjusted complication rates for spinal fusion surgery

Recent research shows that variation in surgical complication rates is driven both by choice of hospital and by choice of surgeon, with choice of surgeon driving the majority of the variation (Xu et. al. 2016, Martin et. al. 2013). Accordingly, our complication rate metrics incorporate both hospital and surgeon performance. Our process begins by calculating risk-adjusted complication rates for each hospital following a methodology adapted from the process created by Yale's Center for Outcomes Research & Evaluation (CORE) and used by CMS for its hospital quality ratings. Our list of complication events is determined in collaboration with expert physicians and leverages methodologies from CMS and ProPublica.

Credentialing analysis

As part of Garner's process to ensure high-quality care, all recommended physicians are credentialed, licensed in the state in which they are practicing and have not received any major sanctions.

How Garner measures total cost of care

To assess the total cost of care generated by each physician, Garner measures four subcategories: medical utilization, pharmacy utilization, site of service and procedure cost.

Medical analysis

To date, much of the focus within health care has been on lowering per-procedure costs (e.g., MRI cost, knee surgery cost, among others). This perspective ignores the single biggest variable in determining the costs that employers face: excessive utilization of wasteful services. To determine excessive utilization, Garner looks at high-cost procedures that are of uncertain or questionable clinical value in treating a particular disease. In addition to the spinal fusion rates for spinal stenosis discussed above, examples of these metrics include avoiding percutaneous coronary intervention for stable patients and avoiding cement vertebroplasty.

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Avoids percutaneous coronary intervention (PCI) for stable patients

While research shows that PCI for stable coronary artery disease provides no clinical benefit over medication therapy, this finding has not been widely adopted by practicing physicians (Stergiopoulos and Brown 2012, Boden et. al. 2007). By looking at historical practice patterns and adjusting for small sample sizes, we estimate provider-level rates of PCI for stable coronary artery disease and identify providers with high rates of unnecessary PCI.

Avoids cement vertebroplasty

Significant research, including a recent broad review of clinical trials, shows that cement vertebroplasty has no higher clinical benefit than a placebo while significantly increasing the risk of serious adverse clinical events for patients (Buchbinder et. al. 2018, Miller et. al. 2011). We use statistical analysis to calculate a provider's rate of cement vertebroplasty for vertebral fractures based on their past behavior.

Pharmacy analysis

Pharmacy spend now accounts for nearly 15% of overall employer health plan spend and is the single fastest-growing component. Unfortunately, given the significant opacity and complexity associated with pharmacy benefits, drug rebates and drug coupons, it is increasingly challenging to know when a high-cost branded drug is actually required clinically. We have created dozens of pharmacy metrics, including the example below, that determine when each drug should be used and when it adds superfluous cost.

Prescription rate for Duexis

Duexis is one of many combination drugs on the market today that creates significant excess cost without value. Duexis is a simple combination of ibuprofen and pepcid, both of which are cheap over-the-counter drugs. Yet, Duexis is a branded drug that cost employers more than $100 million in 2019. Garner looks at which doctors prescribe this drug as one of many indicators of unnecessary branded drug costs.

Site analysis

As medical technology advances, more care can be conducted safely in less invasive settings. Many surgeries that previously needed to be performed in an acute inpatient setting now can be performed safely in an acute outpatient setting; many procedures that used to be performed in an acute outpatient setting can be performed safely in an ambulatory surgery center or doctor's office. Less acute settings carry significantly lower costs and have lower rates of infection and complication than more acute settings. Therefore, we assess where doctors routinely perform their high-volume procedures and determine whether a more efficient setting is available. A good example of this is the site of service for colonoscopies.

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Colonoscopy site of service costs

Research suggests there is no appreciable quality difference between colonoscopies performed at different types of sites of service (Ranasinghe et. al. 2016), while Garner's data shows that site of service fees can easily double the cost of a colonoscopy with no benefit to the patient. We additionally find no evidence that providers adjust their sites of service in response to patient risk. Our methodology attributes site of service fees to physicians and identifies physicians whose colonoscopy costs are significantly higher at no benefit to the patient.

Procedure analysis

While controlling utilization is the most important part of managing healthcare costs, it also is important to factor in the per-procedure cost of services. And while physician bills only account for a small portion of healthcare spending nationally, physicians determine where their patients go for all other types of care, including labs, imaging and surgical facilities. Collectively, these bills account for 84% of total healthcare costs. Using our deep claims data, Garner looks at where each doctor refers for various services and what those services typically cost on a per-procedure basis. Collectively, this gives us a very good read on the likely cost per procedure associated with seeing a particular physician.

Physician fee-for-service

We measure physician fee-for-service by comparing the rates physicians have negotiated with commercial insurance companies. We look into specialty-specific utilization patterns to determine which procedure codes are billed more and less frequently to inform our analysis. Physicians with low fee-for-service are ranked more favorably than those who are expensive.

Facility per-procedure cost

We determine where doctors most commonly perform procedures, which is often only a subset of the facilities at which they have admitting privileges. We then compare facility-negotiated rates for key procedures to determine which facilities will be cost-effective. All else equal, physicians who practice at a low fee-for-service cost facility are considered to be lower cost.

Usage of freestanding versus hospital imaging

Despite no discernible difference in quality, nearly 50% of all routine imaging is performed in an acute care facility because doctors are generally encouraged by their hospital system to refer their patients internally. Unfortunately, hospital-based imaging on average costs 3.7 times more than freestanding imaging centers for the same procedure. As such, Garner measures which doctors routinely use freestanding facilities and which use hospital-based imaging.

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How Garner shares accurate and detailed doctor performance data

Garner uses its methodology to help solve core issues in the healthcare system by reducing inefficient, outdated or improper care and improving employee health outcomes. This is manifested through two offerings.

Garner's employee benefit

Garner offers a simple plan addition that utilizes data science combined with incentive accounts to drive employees to receive care from the best-performing doctors in their health plan network. Garner's benefit delivers improved quality and guaranteed savings for any plan without changing networks or carriers and without cost shifting.

Garner DataPro recommendation platform

Garner DataPro is a provider recommendation platform that serves referrals based on the most detailed and accurate provider performance and directory data in the industry. The platform recommends providers whose performance is proven to improve health outcomes and lower total cost of care. Garner manages directory data with a rigorous application of data science and AI to achieve a new industry standard of 94% accuracy and consistently deliver transparent, reliable and actionable care recommendations.

ABOUT GARNER

Garner Health Technology, Inc. is transforming the healthcare economy through innovations that enable patients to receive high-quality and affordable care. Garner offers a benefit program that uses a new approach to data science and incentive accounts to help employees find and see the best doctors in their communities, and Garner DataPro, a provider recommendation platform that serves referrals based on the most detailed and accurate provider performance and directory data in the industry. Garner's offerings make use of its data set of over 75% of the medical claims data in the United States to objectively examine patient outcomes based on more than 650 specialty-specific quality and efficiency measures. By analyzing millions of healthcare journeys across 88 distinct medical specialties, Garner sets a new industry standard in delivering reliable, actionable referrals and navigating patients to the highest-quality providers. For more information, visit www.garnerhealth.com

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