During this time of transition from fee-for-service (FFS) reimbursement to value-based reimbursement, successful health systems are those that can effectively perform total cost of care (TCOC) analysis. A critical skillset in today’s healthcare environment, TCOC analysis identifies areas of opportunity in a contract between an insurer (or payer) and a health system to provide better care and reduce costs—insight that helps health systems target interventions to reduce cost and improve care.

As the name implies, TCOC is based on the total (100 percent) cost of care a patient receives across all settings and services at an ACO; the total is generated by a population of patients that a payer attributes to the health system. This comprises all care at any facility, from in-network to out-of-network. TCOC can be measured as the product of utilization (volume and intensity of services) multiplied by the cost to the payer of delivering that care. TCOC analysis can highlight areas of variation against established benchmarks as well as identify high-risk patients and care management candidates.

Why Healthcare Total Cost of Care Analysis Is a Necessary Skillset in a Value-Based Industry

Medicare is leading the industry toward more shared risk between health systems and payers. That shift forces organizations to balance FFS and value-based reimbursement. Health systems need TCOC analysis-driven insights to ensure they make the right reimbursement-driven changes at the right time. Move too quickly to a value-based model, and they risk losing revenue now; move too slowly, and they put future revenue at risk.

A strategic, timely reimbursement-driven transition is critical to a health system’s bottom line because, in this time of flux, incentives aren’t always aligned. Proactive programs focused on keeping patients healthy
and out of acute care settings aren’t always reimbursed. As such, those types of programs and interventions will not only add costs to a health system’s bottom line but, if successful, could reduce revenues as well. Margins (“Medicare payments minus ‘allowable costs’ of treating Medicare patients, divided by Medicare payments,” according to Becker’s Hospital Review) are thin, making the reward negligible for choosing an effective alternative to expensive care. In some circumstances, a health system is only awarded $.50 on the dollar for care they avoid.

**Healthcare Organizations’ Big Opportunity**

Thanks to a plethora of data sources, health systems are positioned to make the most of awkward gaps in the transition from FFS to value-based reimbursement. They’re in an ideal spot; they have access to both their own EMR data and payer claims data. Each data type contributes to TCOC analysis:

- The EMR contributes the patient’s medical data within the health system.
- Claims data is broader than an organization’s EMR data because it includes care a patient receives outside of an individual system.

It’s one thing in improvement work to have claims information and know where opportunities lie, but another to have EMR data to support system-level interventions. Together, both types of data can enable better care decisions, which might eliminate waste and point to other opportunities for improvement.

**The Healthcare Total Cost of Care Analysis Toolkit**

Health systems need six basic tools to measure TCOC:

1. **Payer reporting.** When a health system takes on risk from a payer (e.g., Medicare, Medicaid, or a commercial insurer), it will generally receive reporting from the payer. Historically, some health systems haven’t prioritized payer reporting, but now that they’re taking on more risk, they’re looking more closely at it.

   While payer reporting is limited—because it’s based on billing data and therefore not timely—it does contain useful information. It’s typically the final say on performance to contract, such as a cost goal or per member per month (PMPM), because it’s risk adjusted and has been through necessary algorithms to measure overall goals. This information is a key component in understanding how to reduce cost of care in a patient population and will tell an organization whether it’s coming in under its cost goal to share in savings with payer.

   Payer reports can also provide useful benchmarks to help a provider understand how they compare to the market in pricing, utilization, and quality. Performance to market benchmarks can provide insight to organizations on where opportunities lie to reduce costs and improve care.

2. **Claims and membership data.** This also comes from the payer. Claims data is essential to understanding TCOC for a population across the continuum of care (including utilization that occurs outside of the system). It’s a more complete picture of total cost and utilization than an EMR, as patients often get a portion of care outside a system. To address TCOC on a population level, health systems need to understand the total continuum of care and its cost. Claims and membership (which includes who’s active, who has coverage, their medical claims, and pharmacy reports) tells organizations more about the cohort for which they’re taking on risk.
3. **Patient stratification.** Patient stratification (Figure 1) enables targeted interventions. It identifies patients with the highest risk of negative outcomes (e.g., readmission, admission, or ED use) or high cost of care (e.g., multiple chronic conditions). This helps stratify the patient population by identifying candidates that may benefit from care management, or can guide point-of-care decisions for patients at high risk levels.

![High-Risk, High-Cost Group is First Priority](image)

**Developing a Comprehensive Strategy**

Ensuring the sickest, most costly patients are well managed
- Are you able to identify high cost/high need and risking risk patients? (Patient Stratification)
- Can you monitor the return on your engagement efforts? (Care Team Insights)

Leveraging analytics to support a comprehensive primary care strategy
- Are analytics meaningfully underpinning your PCMH work by providing support for the management of broad quality requirements? (Community Care)
- Do you have tools to easily segment and monitor patients based on clinical condition or other variables for focused campaigns? (Precise Patient Registries)
- Do you have tools to engage and manage your employees health? (Catalyst4Health)

Using data to unearth opportunities for systematic improvements
- Do you have the ability to identify variability and areas for improvement at the clinical program level to drive systematic improvement? (Clinical and Operational Apps)
- Are you able to identify the greatest areas for inappropriate utilization? (Patient Harm)

**First priority**

**Required for LT sustainability**

Examples of risk score algorithms include: Hierarchical condition categories (HCCs) from Medicare, Charlson Deyo, and Johns Hopkins ACG®. Risk scores can also be used for risk adjustment, which is a way to normalize utilization metrics for comparison based on the disease burden across different populations.

4. **Scorecards and dashboards.** Utilization and cost analysis tools, such as Key Process Analysis (KPA) or PMPM Analyzer, can be used to track and trend a population’s performance over time and mine for opportunities to improve TCOC performance.

5. **Analyst support.** Scorecards and dashboards can only go so deep and may not answer every question. An analyst who can go a level or two deeper and query the data with more specific clinical questions, as well as perform opportunity analysis, can be extremely valuable and provide more meaningful insights.

6. **EMR data.** EMR data has more in-depth clinical information than claims data, making it a useful supplement to claims data. EMR data also allows has other important information, such as the patient’s primary care provider and scheduling data—both allow organizations to proactively reach out to high-risk patients.
Measuring and Analyzing Total Cost of Care

Some common metrics used in TCOC analyses (most of these metrics are normally calculated as rates per thousand) include:

- Readmissions (all cause and potentially preventable readmissions).
- Hospital outpatient care (such as obstetrics, dialysis, and chemotherapy).
- ED volumes and rates.
- Outpatient surgery volumes and rates.
- Prescriptions.
- Professional and physician services.
- Imaging (particularly, high tech imaging—e.g., CTs and MRIs).
- Durable medical equipment, home health, and hospice.
- Skilled nursing facility, long-term acute care, and inpatient rehabilitation.
- Care management, chronic condition management, and high-risk patient management.
- Quality measures.
- Patient/member satisfaction.
- Network leakage (when insurers don’t limit a patient to one provider and they seek care outside of the system, or outside of network).

Network leakage is a particularly important area in TCOC analysis. Health systems want to keep patients in their network. In-network care allows for standardized communication and a means of sharing patient medical records, enabling better care coordination. This reduces the risk of duplicated tests and procedures (a key to cost savings). Claims data helps measure and analyze leakage by providing the larger picture of patient care, in and outside the health system.

In addition, the health system can better monitor cost to the patient and themselves, and keep revenue within the organization.

Analytics is the Linchpin in Total Cost of Care Analysis

Health systems need to understand how they’re doing and where to target interventions to improve. (Without a targeted approach, they’re attempting to change too much on broad level—to “boil the ocean”—versus making effective change in select areas.)

Analytics give organizations a view of financial performance, utilization, and quality performance. This direction also helps systems decide how to balance their value-based initiatives with FFS.

The goal is to find the key levers to pull in a patient population to be successful in shared risk contracts. Analytics and the enterprise data warehouse (EDW) play key roles in identifying the best opportunities to impact TCOC in a health system’s population (clinical opportunity analysis)—whether the opportunities involve clinical processes, cost, patient safety, network leakage, or member opportunities (e.g., identifying those in need of care management). In most cases, success means reducing TCOC or beating expected cost targets while improving the quality of care delivered across the population.
Because multiple data sources are critical to TCOC analysis, the EDW is an indispensable tool. It synthesizes and integrates available data sources (including claims data, membership data, payer reports, internal EMR data, and clinical operations input) to find the high-value levers. For example, to help an organization target high ED usage, the EDW can integrate different data sources to examine different potential causes and opportunities as to why patients are accessing the ED so frequently. The organization may find that many patients in the population don’t see a primary care provider, to whom they might otherwise turn (instead of the costlier ED) for non-emergency care. By integrating other data sources, subsequent analysis may find that those primary care providers may be overscheduled and access to appointments is the real issue. The health system can then target an intervention to increase patient–physician interaction.

Clinical opportunity analytics serves several important functions in TCOC:

- Focuses on clinical areas with high spend and high variation. The starting point for these analyses can be vertical (e.g., aggregating payments into high-level buckets, such as clinical service lines/specialties or claim type) and horizontal (e.g., services that cut across the organization, such as labs, readmissions, network leakage, or drug costs).
- Searches for the drivers of cost—categories of utilization and/or utilization rates with high cost and high variation.
- Drill down to homogeneous (comparable) patient populations by segmenting on variables like severity, diagnoses, and/or procedures.
- Examine (risk adjusted) variation by facility, clinic, and/or physician.

It is best to approach these types of analyses in an iterative manner. Follow the steps listed above and do a first pass analysis to identify areas of opportunity. Next, present those findings to health system operational and clinical leaders and get their input on where to drill into specific areas of interest and refine the analysis. Finally, quantify the opportunities in terms of estimated cost savings and their impact on TCOC performance. These financial estimates can be complicated (because they should estimate not only costs avoided, but also estimated revenue loss and impact on contractual performance.) They shouldn't, however, be a barrier to an organization determining their biggest levers to impact TCOC.

How to Develop a Strategy to Reduce Total Cost of Care

One way organizations can develop a strategy for TCOC-driven outcomes improvement is to create a driver diagram. Figure 2 (below) shows the relationship between the overall goal, key outcome measures, opportunity areas, and tactics/interventions. The diagram lists key processes:

- Define the overall goal (e.g., reduce TCOC or lower PMPM to a targeted cost).
- Using EMR and claims data, identify opportunity areas—those with the biggest impact on reducing TCOC.
- Decide where the organization will focus and how (which tactics and interventions to apply).
- Define key outcome measures to track.
- Define key process measures.
To successfully apply TCOC analysis, a health system needs organizational governance—meaning a leadership group that’s accountable for the work. Under this leadership, the organization needs an analytics workgroup that identifies opportunities and tracks measures, and an operations workgroup that identifies tactics for a successful TCOC contract (and is responsible for implementing the tactics).

**Healthcare Total Cost of Care Analysis—The Key to Success in Value-Based Reimbursement**

Value-based reimbursement is the likely path forward in healthcare, but while the future of the regulatory landscape remains uncertain, balancing FFS and value-based reimbursement is the key to survival. TCOC analysis can help healthcare organizations find and maintain stability. Using the TCOC analysis toolkit outlined in this article, the power of an EDW, skilled analysts, strong predictive capabilities, and organizational leadership that drives and sustains TCOC analysis, health systems will be poised for success in this time of change.

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**Figure 2: An Example of a Driver Diagram for Total Cost-of-Care-Driven Outcomes Improvement Strategy**

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About the Author

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Gregg Teeter joined Health Catalyst in April 2015 as Manager of Clinical Analysis. Prior to coming to Health Catalyst, he spent the past twelve years working for HealthPartners and Park Nicollet Health Services in a variety of analytic and leadership positions. Gregg has B.S. in Public Health and Statistics from the University of Minnesota and an MBA from the University of St. Thomas.
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