

In 1966, Avedis Donabedian proposed a conceptual model for examining health services and evaluating quality of care. The Donabedian model includes three pillars: structure, process, and outcomes.

Structure represents the physical plant, equipment, and staff available to provide care services. Process includes all the activities in the delivery of care. Outcomes quantify the impact of structure and process on care as evaluated by health outcomes, cost of care, patient satisfaction, and a host of other indicators.

Donabedian's model evolved over the past five decades as greater sources of data became available through the deployment of transactional systems such as electronic medical records (EMR). In addition, advances in computing power and data storage now allow analysis of these data-rich repositories by workers not necessarily trained in traditional IT.

As organizations strive to excel in healthcare's world of declining reimbursements, proliferating risk contracts, and growing consumerism, the Donabedian model provides a guide on how to succeed.

Enterprise Analytics: Data, Insight, Process Change, Repeat

By Barry P. Chaiken, MD, MPH

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**Deming, Berwick, Bataldan,
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"Every system is perfectly designed to get the results it gets." This quote has been alternately attributed to W. Edwards Deming, Don Berwick, Paul Bataldan, and Arthur Jones. Yet though its attribution is disputed, its truth is not.

From Donabedian, we know that outcomes derive from the existing structure and processes that make use of current facilities, equipment, and personnel. While structure change occurs slowly, processes are more agile. The pace and effectiveness of process change depends upon many factors, such as corporate culture, task complexity, and ease of retraining. Deciding to change a process, and determining when and how to do so, is influenced by both subjective opinion and objective data.

In circumstances where objective data is unavailable, expert opinion can substitute for it but never surpass it. For organizations to prosper in our changing healthcare marketplace, they must seek objective data sources, analyze them, and regularly apply them to their processes, thereby fine-tuning those processes to deliver desired outcomes.

More data available

While other industries have expanded their use of data to closely drive processes within their organizations, healthcare has lagged in the use of analytics to deliver patient



care and monitor business services (e.g., finance, human resources). Fortunately, the increase in data from EMRs, disease registries, and transactional systems offers an opportunity to better understand the processes that collectively deliver care as measured by quality, safety, access, patient satisfaction, and cost metrics.

AN ENTERPRISEWIDE APPROACH TO ANALYTICS RECOGNIZES THE INTERDEPENDENCE OF ALL PROCESSES WITHIN A HEALTHCARE ORGANIZATION.

Proper understanding of any complex activity requires an informed grasp of all the processes that, when linked together, make up that activity. For example, the evaluation of knee replacement surgery outcomes requires an understanding of more than the processes followed by the operating team. Processes that impact infection rates, pain management, and other metrics must also be monitored and managed as links in the care delivery chain. Therefore, healthcare organizations must take a broad-based view of the processes that deliver their various outcomes and resist implementing a narrow, incomplete use of analytics to manage their organizations.

Pyramid schema

Achieving exceptional outcomes can be thought of as delivered by a pyramid of interrelated processes inspected and managed using relevant analytical measures. At the bottom of the pyramid are the basic services and their underlying processes that an organization depends upon. These include cleaning services, human resources, finance, and purchasing. Moving up the pyramid, we have clinical service lines and patient care delivery. At the top of the pyramid lie the activities that set the organization's strategic objectives.

Currently, most organizations run analytics on targeted activities. While many organizations recognize that these tracked activities do not run in isolation, they generally have not embraced a broader use of analytics to monitor and improve all of

the organization's processes. Only by implementing an enterprisewide approach to analytics can organizations effectively manage their processes, related activities, and overall healthcare business.

Such an approach begins by offering role-driven dashboards to every staff member. While we know that a CFO requires dashboards to successfully manage the financial health of an organization, the cleaning staff equally needs visualizations to better understand the outcome of their work and the areas that may require improvement. Similarly, clinical staff deserve timely dashboards that offer objective information on their patient outcomes so they can evaluate their care delivery processes and make appropriate changes. For example, surgeons may be concerned about surgical infection rates, while nurse managers may want to monitor compliance with specific treatment protocols (e.g., ambulation post gallbladder surgery) to better identify areas requiring training.

All processes in a healthcare organization are related. While senior staff may monitor readmission rates and lost revenue, the readmission rate also relies on the effectiveness of the cleaning staff, surgeons, and nurses, among many other processes. Examining only a single factor fails to capture all the potential gains provided by a change in process. Only by taking an enterprisewide analytics approach can organizations identify all improvement opportunities.

Insights for improvement

An enterprisewide approach to analytics recognizes the interdependence of all processes within a healthcare organization. It empowers subject matter experts (whether physicians, supply chain managers, or janitors) to monitor processes at the point of delivery and make changes as needed. This form of role-based self-service analytics, which includes a small amount of end user-customized filtering and dashboard segmentation, delivers insights usually unavailable to line workers and their managers.

Healthcare organizations that implement enterprisewide analytics greatly increase their chance to thrive in the shifting healthcare market. These organizations leverage their enormous investment in EMRs by extracting the data and using it to improve their care delivery processes. They utilize various data sources to deliver visualizations that enhance staff assignments by giving useful, actionable information to every employee.

While embracing an enterprisewide analytics approach may take several years to achieve, the potential impact on patient care, clinical outcomes, and cost of care cannot be achieved any other way. Data fuels analytics. Analytics drives process change. Process change enhances outcomes. *

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