Actionable Data Analytics in Oncology: Are We There Yet?

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Abstract

To operate under a new value-based paradigm, oncology providers must develop the capability to aggregate, analyze, measure, and report their value proposition—that is, their outcomes and associated costs. How are oncology providers positioned currently to perform these functions in a manner that is actionable? What is the current state of analytic capabilities in oncology? Are oncology providers prepared?

This line of inquiry was the basis for the 2013 Cancer Center Business Summit annual industry research survey. This article reports on the key findings and implications of the 2013 research survey with regard to data analytic capabilities in the oncology sector.

The essential finding from the study is that only a small number of oncology providers (7%) currently possess the analytic tools and capabilities necessary to satisfy internal and external demands for aggregating and reporting clinical outcome and economic data. However there is an expectation that a majority of oncology providers (60%) will have developed such capabilities within the next 2 years.

Introduction

There is little disagreement as to the urgency to re-evaluate our fragmented and costly health care system and to take steps to cure its ills. Both government and private payers are moving inexorably in this direction through value-based payment redesign. Providers are reorganizing their affairs to address issues of care coordination, operating efficiencies, and cost management across the full continuum of care and to prepare for the assumption of financial risk. The oncology ecosystem, representing some 10% of the overall health care spend,[1] is certainly not exempted from this value-based ambition.

Value in health care can be viewed as health outcomes achieved that matter to patients relative to the costs of achieving those outcomes.[2] To operate under a new value-based paradigm, providers must develop the capability to aggregate, analyze, measure, and report their value proposition—that is, their outcomes and their costs. How are oncology providers positioned to perform these functions—to aggregate, analyze, measure, and report outcome and cost data—in a manner that is actionable? What is the current state of analytic capabilities in oncology? Are oncology providers prepared?

Survey Methodology

The Cancer Center Business Summit in collaboration with Reimbursement Intelligence (Madison, NJ), a managed markets research firm, conducted a study of data analytics in oncology[3] for the 4-month period between June and September of 2013. More than 50 oncology providers responded to either the electronic survey tool or a direct phone interview. Respondents represented a diverse mix of providers and care settings including independent community oncology practices, oncology network–affiliated practices, hospital/academic medical centers, and hospital-affiliated oncology practices. Respondents also varied across job functions, comprising oncologists, oncology practice administrators, hospital service line directors, and health care C-suite executives.

The objective of the research survey was to identify the current state of data capabilities among oncology providers and to understand the impact of data analytics on clinical and economic decision making. The decision to structure data capabilities within a clinical and economic framework reflects the growing link between the quality of clinical care and financial performance of the provider organization: clinical quality is the new finance. This requires deeper data capabilities than electronic medical record keeping or practice management. For purposes of the survey, data capabilities was defined as algorithms, protocols, and databases specifically designed to aggregate, integrate, or analyze data from clinical, financial, operational, supply chain, and/or human resource data feeds. Data capabilities are viewed as distinct from electronic medical record/electronic health record adoption. In other words, electronic medical record/electronic health record adoption did not of itself indicate that a provider had data analytic capabilities.

Respondents were instructed to apply the following definitions in rating the data capabilities of their respective organizations:

- Data aggregation: collecting and then storing units or pieces of data in a central location.
- Data interoperability: connecting two or more different data processes or sources.
- Data analytics: the study or determination of the nature of data relationships.

Survey Findings

Data Capabilities

The study revealed that oncology providers generally lack proficiency in all three core areas of data capabilities: data aggregation, data interoperability, and data analytics. Survey results demonstrated that almost half of oncology providers had no
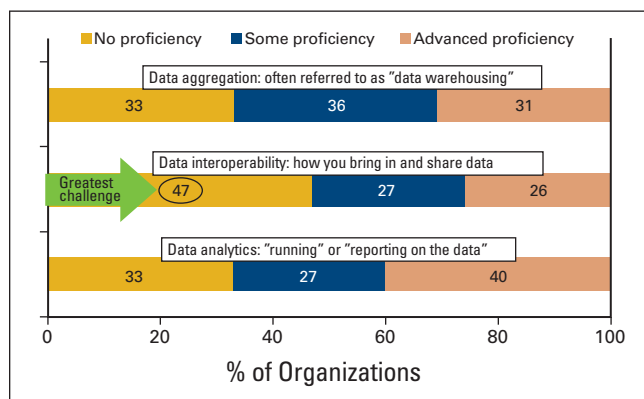
Figure 1. Data capability proficiencies in answer to the question "How advanced is your organization's data capabilities in oncology along each of these segments? Scale of 1 to 5, where 1 = no profiency and 5 = advanced" (n = 85). Graphic by Reimbursement Intelligence, 2013.

reported proficiency in data interoperability, whereas 33% had no reported proficiency in data aggregation and data analytics (Fig 1).

One oncology service line director stated, "Providers sit on a lot of data, and they need to capture it and analyze it. Once they start to export it—to payers and to patients—that's hugely valuable."

Only 7% of respondents reported that they currently had full system performance-reporting capabilities, but 60% of respondents expect to have advanced data capabilities allowing for full system performance reporting 2 years from now. To achieve this goal, providers will need improved information technology capabilities, capital funding, and skilled personnel.

Oncology providers identified several components of the full continuum of oncology care for which the collection of data was difficult, including emergency room services, hospitalizations, palliative care, and the total cost of care. Moving forward, oncology providers will require a more holistic approach to measure and analyze the total cost of care by specific tumor type.

Insurers are beginning to explore payment redesign in the form of payment per episode of care or payment bundles. To participate in such alternate payment methodologies, oncology providers must gain proficiency in data capabilities. They must become able to measure and benchmark data across tumor type and document the associated cost of care to document their value proposition.

Priorities for Economic Data Collection

Respondents identified their top five economic or cost data tracking priorities as chemotherapy drug costs, total drug costs, patient cost share, total cost of care, and supportive care drug costs. The study indicated that economic data tracking seems to be driven by internal operational requirements to increase efficiency of care delivery and are not necessarily driven by external third-party data requirements (Fig 2). Respondents reported concerns regarding the growing patient cost share burden resulting from payers increasing use of specialty tiers, co-insurance, and higher deductibles. Not only can this shift in patient out-of-pocket costs influence the patient and his/her family's treatment decisions, but 84% of US physicians surveyed in 2009 indicated patients' out-of-pocket costs influenced therapy choice.[4]

Priorities for Clinical Data Collection

With regard to clinical data collection, respondents reported that the top five data sets collected and tracked were patient satisfaction scores, Quality Oncology Practice Initiative adherence, cancer registry, and adverse events. With the exception of adverse events and unlike economic data collection priorities, the other clinical measures are primarily driven by external/third-party reporting requirements. And the top priorities for clinical data collection today are more process-oriented measures than they are outcome measures.

Clinical data collection was spread broadly, with 12 categories of data collected by more than 20% of respondents, whereas
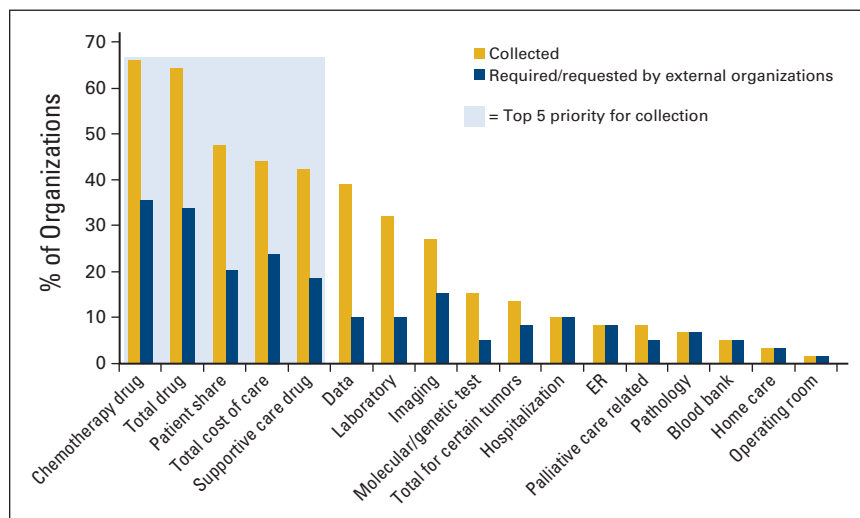
Figure 2. Priorities for economic data collection in answer to the questions "What economic data in oncology are you tracking?" and "What economic data in oncology are you tracking as requested/required by external organizations?" (n = 58). Graphic by Reimbursement Intelligence, 2013. ER, emergency room.
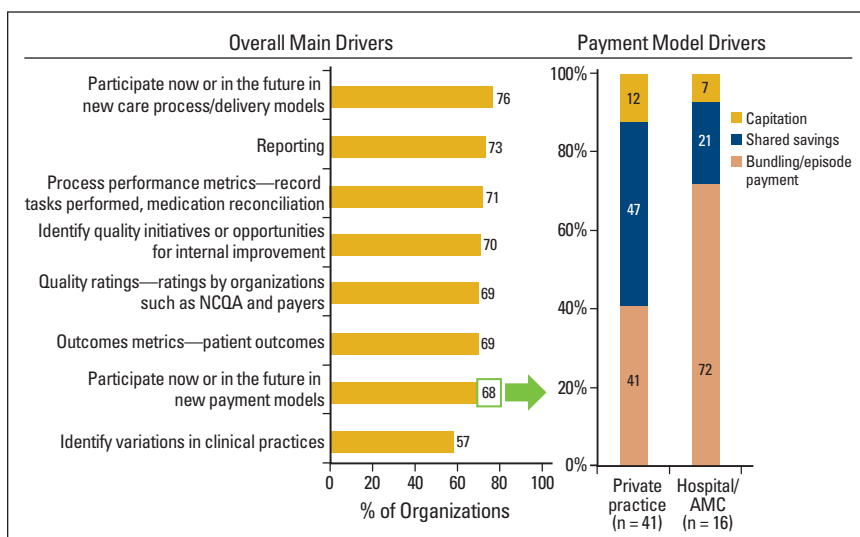
Figure 3. Drivers for developing data capabilities in answer to the questions "What are the main reasons/drivers for having oncology data capabilities within your organization?" and "Which of the following payment redesign methodologies is a top driver: capitation, shared savings, or bundling/episode payment?" (n = 57). AMC, academic medical center; NCQA, National Committee on Quality Assurance.

there are only eight economic categories collected by more than 20%. Many of these clinical metrics are ones that are more often tied to pay for performance such as adherence to pathways, card coordination, emergency room visits, and hospitalization rates. This confirms the link between clinical and economic performance in provider organizations and that data capabilities are important to capturing the opportunity in new payment models.

Drivers for Developing Data Capabilities

Oncology providers' development of data capabilities was reported to be driven by several factors, including the participation in future new care/delivery models (76%), process performance metrics (71%), quality ratings and outcomes metrics (69%), and participation in future or current payment models (68%).

For those looking at payment models, there were differences by site of care with hospitals and academic medical centers expressing interest in bundling/episode-of-care payment models whereas private practices preferred shared-savings models (Fig 3).

Early-stage initiatives in episode-of-care/price bundling payments tend to be associated with inpatient surgical or intervention (eg, bone marrow transplant, breast surgery, complex/rare cancer surgeries) or high fixed-cost outpatient radiation procedures; thus hospitals seemed more willing to consider the risk of an episode-of-care pricing model for these select services, whereas community oncology practices have tended toward a shared-savings approach to a more comprehensive scope of covered services with an initial shared-savings approach offering a lower-risk threshold and potential to benefit from the upside of reducing the cost of oncology care.

Barriers to Developing Data Capabilities

The study revealed four key issues that serve as barriers to advancement of data capabilities, including lack of staffing or skill set among existing staff, silos across the organization (lack of transparency), lack of care coordination, and poor internal communications.

Respondents indicated a shortage in personnel skilled in the systems and analytic skills necessary to take command of developing robust data proficiency. Organizational restructuring to eliminate departmental silos and organizational thinking along lines of service must take place before meaningful data capabilities can be assembled. Respondents also reported a continuing insensitivity to care coordination and routine disciplined communications of data as barriers to developing data capabilities. Organizational commitment and persistence at the highest level will be required to develop full data capabilities in oncology.

Future Considerations

Oncology provider data capabilities can be expected to improve markedly in the next 2 years to meet both internal operational and external data reporting needs in support of a value-based agenda. New care delivery models, as well as alternate payment methodologies, will demand more data accountability in the form of documentation of quality, outcomes, and cost metrics. Alternate payment methodologies in oncology can be expected to take the form of tumor-specific payment per episode or price bundles. And oncology providers simply cannot accurately price services without proficiency on data analytics.

The optimal data analytic systems will track both an inpatient and outpatient view of costs, operational data (time in, time out) tied to revenue cycle management, oral and intravenous drug usage by stage of disease, adherence to pathways, and readmission data. The effort should result in improved care coordination, patient throughput, and metrics to define optimal care processes.

Action items for oncology providers to consider in pursuit of a value-based agenda include:

- organizing around the patient/customer and the need (eg, clinically integrated oncology network) to provide full care cycle for the patient's condition;
- developing an enabling information technology and analytic platform that follows patients across service sites, aggregates data around patients, provides common data definitions, gives a comprehensive view of data, makes the medical record accessible to all caregivers, stores templates for each medical condition, and has easy-to-extract information;
- measuring outcomes and cost for every patient by incorporating outcomes into process of care in real time thereby allowing providers to track progress as they interact with patients (today there is virtually no accurate information on the cost of the full cycle of care for patients condition);
- moving to bundled payments for the care cycles such as full care cycle for acute conditions and overall care for chronic conditions for a period of time (eg, 1 year); and
- integrating care delivery systems by defining scope of services, concentrating volume in fewer locations, choosing the right location for the location of a service line, and integrating patient care across locations.

Achieving these goals will require an investment in talent and technologies by oncology organizations. Some of the talent and technology will be positioned in-house. But some will be outsourced to service organizations that have already assembled the talent and technologies for delivering advanced data analytics in oncology.

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