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TOP 10 BI APPLICATIONS FOR CLINICAL HEALTHCARE

Tidal Wave of Demand for Clinical Quality Information

For a clinician, it seems as if virtually every player in the healthcare field is demanding information on performance, quality, safety, efficiency, effectiveness and of course, costs. Patients are armed with clinical performance information from the web, and they want more from their physicians. Purchasers want statistics on what providers did, how they did it, when they did it, how much it cost and so on. Quality standards organizations want this same type of information from health plans, as well as from hospitals and clinic practices. Government agencies want data on the populations you serve, for what conditions, when, why, who, how. Everybody wants something!

Alternatives to Meeting this Demand

There are essentially three alternative responses to meeting this information demand:

- **Defensive Response**. You can defend the traditional way of practicing medicine based on years of experience, qualifications, general perceptions about the effectiveness of the care you provide, etc. And be crushed.
- **Passive Response**. You can grudgingly comply with the information demands. And spend hours, days, and weeks dredging through systems for information, and then more time reconciling differences between these different systems. And end up finding yourself being hounded an insatiable requestor.
- **Offensive Response**. You can take a proactive approach, and beat the information requestors to the punch. Plus, you can use this information internally to drive improvements back into your operations and possibly even surpass the expectations of the requestors. How good would it feel to ask the requestor why they are only demanding a certain level of quality, when you already have beaten it?

The difference between being crushed, being hounded or being in the driver seat depends on a number of management and clinical decisions regarding people, processes, approaches, clinical methods, policies, technologies, etc. One tool that can help with all of these decisions is business intelligence.

Evidence-Based Business Decision Making

Business intelligence is the commercial equivalent of evidence-based clinical decision-making. Similar to the way you use clinical evidence to support diagnoses, to develop care plans and to evaluate outcomes for patients, businesspeople use financial and operational evidence to support decisions, to develop plans and monitor the progress of their businesses.

Your bank uses customer intelligence to market their products and services to you. Manufacturers use production, purchasing and quality intelligence to decide what to produce, and how best to produce it. Retailers use sales intelligence to decide where to locate new stores, how to staff them cost-effectively, and what products to stock in each.

The clinical setting has financial and operational evidence to support business decisions, develop business plans, and evaluate business performance as well. Some examples include the need to:

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- Understand who you are caring for (patients),
- What care to focus on (critical patient conditions),
- Who is providing that care and when (staffing, scheduling),
- Where care is being provided (access, outreach),
- And how effective and efficient that care is (performance, quality, cost-effectiveness, etc.).

In addition, you already have information to involve the patient in their own care, to support innovation in the science of healthcare, and to take advantage of the cumulative effect teams can have on improving clinical quality.

The difference that business intelligence makes is in the systematic consolidation of data from various sources, and the organization of that data for use in making business decisions. As you can imagine, this data is comprised of millions of bits of information spread across a number of systems (e.g. encounters, labs, claims, billing, etc.). Business intelligence extracts data from these systems and brings it into a centralized, secure, historical repository, which is organized for business users to slice, dice, and sort and sum it efficiently in order to support business decisions.

With that kind of organized business evidence, you can confront the tidal wave of demands for information. The first step is to determine what business intelligence applications (i.e. uses of the data) are most appropriate for your organization and particular situation.

Top 10 BI Applications for Clinical Healthcare

In my work on business intelligence strategy and application development projects, I have interviewed over 200 Executives, Physicians, Clinicians, Administrators, Researchers, Informaticians, Instructors, Analysts and many others. These people work in clinical practice networks, hospitals, health plans, specialty clinics, government agencies, research labs and a host of other settings. Their issues are the front-line issues for which BI applications can make the most difference.

From these interviews and an extensive review of the literature as it relates to applying business intelligence in the healthcare field, I have cataloged dozens of potential applications (uses) of business evidence to support clinical quality improvement. Some are large, some are small, but all share one common trait. They all measure the quality of your organization (albeit from different angles) as well as measuring the efforts being put into improving it, and the impact of those improvements.

Each capsule below describes the application from a high level, including the data needed to support it, the key uses of the application, and how it can be used to get ahead of the quality information demand wave.

Patient Registry. By far, the best BI application for healthcare is the patient registry. These types of repositories are not new. The first one, the Tumor Registry, has been in use for almost four decades. What is new is the explosion of potential uses for a registry. Processes such as chronic care management, disease management programs, case management, quality measurement and patient volume analysis are but a few potential uses. Encounter, lab, claim, and other data (some manually collected) are used for three key purposes: 1) to analyze patient population trends and patterns, 2) to give clinicians a timeline of an individual patient's illness and the care provided, and 3) to support patient reminder programs by phone, email, etc. Many of the beacons of the clinical healthcare industry use sophisticated registries for

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quality and performance improvement, as well as to support strategic decisions such as clinic location analysis, disease center justification, etc.

Priority Conditions Scoreboard. In Crossing the Quality Chasm, the Institute of Medicine laid out a list of fifteen Priority Conditions (e.g. diabetes, asthma, hypertension, etc.), and admonished the healthcare industry to organize around those conditions. Many are chronic conditions, requiring continued (vs. episodic) attention, so care activities and data points extend over time. In addition, they are trending up. An executive scoreboard on the organization's patients, processes, staffing, activities, and results around these priority conditions is essential to success in managing this trend.

Recognition / Pay for Performance Reporting. In quality circles, there is a famous quote by a factory foreman "What was outstanding performance five years ago, today doesn't even make the grade." Recognitions and pay for performance contracts are fast becoming the norm for influencing quality improvements in clinical healthcare. Eventually, however, these improvements will become the price of admission, and still higher levels will be expected. Data is needed on services performed, timeliness, interventions provided, clinical outcomes, and their effect on improved patient functionality. This information is then analyzed by payers for its effect on the worker productivity, lack of absenteeism, among other measures. Clinical organizations can use these measures internally to judge the effectiveness of their own results and the processes that produced those results. The monetary incentives can be plowed back into further quality improvements to stay ahead of the curve, and the recognition can be used for marketing purposes.

Quality Accreditation Reporting Support. The measures developed by quality accreditation organizations such as the NCQA are becoming standards adopted by other industry accreditation bodies as well. Therefore, either directly or indirectly, your performance is likely to be judged using these measures. The qualification requirements are complex and require extraction, reconciliation, and auditing of data from a number of internal systems, such as claims, encounters, labs, etc.

Care Team Data Support. Care teams are used in a number of industries to take advantage of the diverse talents and perspectives of their members, and achieve better performance than an individual could achieve alone. Nowhere are teams more important than in patient care. But nowhere are teams more fragmented in terms of the information they have to do their work. From a business intelligence perspective, teams need to measure their own performance, outcomes, and efficiency, as well as compare those measures with other teams in the same organization. In addition, new clinical and operational methods from other organizations can be evaluated and "imported" using evidence gleaned from medical literature and other sources.

Research Hypothesis Discovery. Researchers and Mentors are constantly on the lookout for scientifically interesting patterns and trends in the clinical environment, in order to identify potentially fruitful studies. Often, the problem is not finding hypotheses to test, but narrowing the list of candidate hypotheses. Data from clinical experience, especially the diagnosis-treatment-outcome relationship can help target studies based on what is actually happening in the real world. This can make the process of developing abstracts, manuscripts and funding requests faster and easier.

Access and Outreach Planning Support. Even the best clinical care in the world is of no use if patients cannot access it. Analysis of historical data for trends and patterns in patient volumes, patient demographics, conditions treated, and surveys of access problems can be

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used in decisions on how to make clinical care more reachable, more convenient, and potentially more affordable. This is a relatively new area of analysis for healthcare organizations, which can be used to differentiate your organization from others.

Waste Reduction and Cost Effectiveness Analysis. Decision-makers outside your organization are right now making judgments about your organization on what constitutes "waste" and "unnecessary cost." Using historical data from your clinic management and accounting systems on cycle times, labor utilization, supplies utilization, procedures employed and medications prescribed, as well as their costs, you can find and correct wasteful activities yourself, and potentially even market this as an advantage.

Staffing & Scheduling Analysis. Having the right clinicians in the right place at the right time is a basic need. Having the business evidence to support staffing and scheduling decisions, such as patient census data, patient flow patterns, etc. is not always basic. This can lead to potentially overstaffing, understaffing, or mis-staffing your operations. Labor costs are one of the largest expenses for most healthcare organizations. Getting this right is essential to your bottom line, as well as to making sure care is safe, effective, efficient, and patient-centered.

Patient Education Statistics. A seemingly small application using business intelligence is the use of patient care (diagnoses, treatments, care plans) correlated with patient outcomes (lab results, functionality measures, etc.) in order to educate individual patients. This application was first described to me by a Diabetes Care Team as a graph with two trend lines, one for care (input), the other for outcome (result). They found that their patients have really embraced such a simple idea, and consequently took greater control of their illness and ownership of their own care, leading to better outcomes.

Proactively Using the Business Evidence You Own

The demand for quality information is not going to go away. In fact, it will only intensify. Taking a proactive, offensive approach to gathering, organizing and accessing your business intelligence, your operational and financial evidence, is one of the best ways to meet this rising demand. Policy, capital, organizational and cultural transformations are also necessary. Hopefully, the descriptions above will give you some ideas of the potential of healthcare quality-focused business intelligence applications that are relevant to your organization and situation.

Thanks for reading.

Scott Wanless *-*
Scott is a member of Greenbrier & Russel's Business Intelligence Practice, which is a business and technology consulting and training firm. He has over 20 years of experience in business intelligence strategic planning, business intelligence application development, IT and business goals alignment, and financial analysis across numerous industries including healthcare, laboratory research, insurance, lending, manufacturing, retail and state government. Scott can be reached at swanless@gr.com.