Integrating Technology and Disease Management-the Challenges
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By Geoffrey B. Baker

Chronic health conditions such as asthma, diabetes, and heart disease affected the lives and health of 125 million people in the United States in 2000. These conditions also accounted for approximately $510 billion in medical costs. In response, many health plans and large employers have invested in disease management (DM) programs and related care technology to help improve their efforts to target and support intervention for these patients. And, depending on the conditions managed, some plans have experienced reductions in their medical loss ratios and medical expenses.

As DM has matured, lessons learned allow executives at health plans and large employers to offer suggestions for a technology roadmap that optimizes clinical intervention and return on investment: First, a robust medical management process should take place before technology is installed that identifies and targets high-cost patients for intervention. Second, technology deployment should be thoughtful as it requires significant planning, cost, and redesign of workflow processes. Third, technology should support integration of internal care programs with outsourced vendor arrangements. And finally, technology should help lower administrative costs for DM programs and help demonstrate returns on investment and clinical effort.

These suggestions provide some insight into integrating technology into DM programs. But a number of challenges remain.

What Plans Need From DM Technology

According to Randy Jefferson, director of Clinical Services at Wausau Benefits, a third-party administrator, technology for DM programs should: 1) effectively target patients; 2) identify patients early to boost program enrollment; 3) allocate clinical resources efficiently; 4) change patient behavior; 5) gain physician acceptance for DM; and 6) provide near-term return on investment (ROI).

Opinions differ, however, about patient use of Web-based self-help tools and physicians' office use of the Internet. While some DM vendors such as LifeMasters have seen steady increases in patient access to medical information on the Web, most health plans and vendors say that 15 percent or less of patients use the Web for their medical needs.

"Few patients appear willing to share personalized health information about their disease condition over the Internet," says David Krause, senior economic analyst of Accordant Health Services, a DM vendor. "Patients may buy airline tickets and books on the Internet, but other than seeking information out about a disease, few individuals will share important personal data about themselves needed to manage their condition."

On the physician side, many practices do not have Internet access. Consequently, physicians cannot access Web-based patient records and nurse e-mail messages. "We have to stay firmly in the 20th century, relying on phone, fax, and mail to reach most of our providers," says

Richard Cassidy, MD, corporate medical director for Blue Cross and Blue Shield of Florida. "Technology limitations of our providers limit us as well." According to industry officials, there are gaps between what plans need and what vendors can offer in three main areas:

- Greater accuracy for targeting patients with predictive modeling

- Patient registration tools that tailor-with precision-clinical resources to patient intervention needs

- Tools that streamline the evaluation of financial and clinical results in a methodologically and statistically correct manner (for example, to determine if outcomes were different in managed and unmanaged groups)

Challenge #1: Effective Patient Targeting

While predictive modeling methods to identify disease prevalence and cost at the population level appear relatively well advanced, there are conflicting approaches on how to best identify and target patients for intervention. A year ago, several health plans reported high "false-positive" experiences with software known as "predictive modeling." For some plans, the lack of specificity caused nurses to spend considerable time with lower risk patients who did not require the most immediate care.

"The challenge is where to focus, then how to target patient interventions in the most efficient and cost-effective way possible," says John McCreedy with Ingenix, a health information company.

Health plans and vendors are determined to find the right combination of ways to target patients effectively. One promising technology combines predictive modeling with patient risk stratification. The technology uses various methodologies to predict and identify high-cost patients, including clinical rules, episode groupers, and health risk assessments. Once identified, the patient risk stratification software ranks patients in terms of opportunity intervention scores. Nurse care managers then validate these scores by phoning patients and conducting health risk assessments. Following validation, the nurse may enroll the patient, contact the patient's primary care physician, begin intervention efforts, and send education materials.

However, for predictive modeling and patient risk stratification "to be useful, greater sensitivity and specificity are needed in targeting high-cost patients," states Gordon Norman, MD, vice president and medical director for PacifiCare's California operations. With so many patients identified, interventions required, and limited resources, there needs to be high yield to cover the cost of effort.

"That's why at Tufts Health Plan, we are focused on the top 1 percent of members who drive 30 percent of the plan's cost," says Jeffrey Levin-Scherz, MD, vice president and corporate medical director. "Our predictive metrics are focused on identifying patients with avoidable hospital admissions. Preventing acute exacerbations has high value for the employer, plan, and member."

Given these concerns, vendors have upgraded their software to improve patient targeting, registry, and intervention. These upgrades recognize the need to match clinical resources more

efficiently to the patient's health condition. Information technology companies such as MEDecision, McKesson, Landacorp, Ingenix, MEDSTAT, and MEDAI, and DM vendors such as American Healthways, Status One, LifeMasters, Accordant, and QMed have made significant advances in care planning, data interfaces, and user navigation.

Challenge #2: Integrating Data with Nurse Workflow and Care Management

When launching a DM program, most agree that operational execution poses a significant challenge. "Plans need to manage risk at five levels: patient, physician, condition (population), care program, and information technology," states David Schutt, MD, of the MEDSTAT Group. "There are many moving parts in DM programs involving multiple stakeholders," adds Victor Villagra, MD, past president of the Disease Management Association of America. "There is a need to more tightly connect the participants and data points, and a need to integrate in-house care programs with outside DM vendors to ensure the highest degree of effectiveness." Many plans are combining data from multiple sources to coordinate better patient care among wellness, demand, disease, case, and utilization management programs. The goal is to deliver patient-centric record capability that all clinical stakeholders can access. This includes, in some cases, appropriate access by patients and community physicians. Many plans see this as a tremendous benefit, since nurses can coordinate care for patients with co-morbid conditions across several intervention programs.

Much of the care information technology available to health plans today is focused on improving workflow and nurse productivity and supporting patient-physician communication. At one level, companies such as Quovadx are focused on automating process and nurse workflow, and integrating data for access by multiple departments. Other companies such as McKesson, MEDecision, Landacorp, and StatusOne have developed modular applications that integrate care planning with patient risk stratification, intake, and retrospective physician decision support. These applications automate communication with providers and patients and generate care plans and patient action lists. In addition, vendors and plans recognize the value of changing patient behavior, particularly for chronic conditions, such as diabetes, that require changes in lifestyle to stay healthy. Many of these applications allow for highly personalized patient education. For example, health plan or DM vendor nurses can now automate the process of mailing, faxing, or e-mailing relevant educational materials based on evidence-based medicine to large patient populations.

One recent technology to emerge is physician and patient alert systems. These systems help prevent adverse events such as hospital admissions, and reduce errors affecting patient safety, particularly for medications. Pioneered by companies such as Active Health Management and Resolution Health, the alerts use clinical rules from evidence-based medicine and search prescription, lab, and claims data to notify physicians and nurses of medical errors in a patient's care plan.Vendors have made strides in improving these population-based alert systems. Earlier versions burdened providers and saddled nurse case managers with too many alerts that did not merit investigation. Today, thresholds triggered by condition severity and clinical algorithms allow nurses to manage greater caseloads. Several plans are now investing in alert technology triggered by clinical algorithms.

Challenge #3: Demonstrating Return on Investment

Most in the industry agree that the days of unsubstantiated care improvements and savings are gone. Many plans and large employers are focused on the problem of substantiating savings

with credible return on investment (ROI) calculations. Despite vendor savings guarantees of 10 to 30 percent for DM results, few companies have experienced savings this great.

"The industry is still harmed by rogue vendors who target unsophisticated plans and employers with faux saving propositions and faux ROI results," states Al Lewis, executive director of the Disease Management Purchasing Consortium.

Digging deeper into the question of how to calculate an ROI for a DM program reveals a complex issue. "What are we looking to achieve and what constitutes a reasonable return on investment?" asks Jane Murray, COO at QMed, a DM cardiac service and medical device vendor. Another challenge is having all parties agree on ROI in a methodically correct manner. Calculating DM ROI over time can involve hundreds of permutations known as "confounding factors." Tom Wilson, an epidemiologist and independent consultant, points out ways these factors can either overstate ROI or complicate the calculation:

- ROI variation by disease condition and payback period

- Medical cost increases in the first six months as patients receive additional preventive care and medications

- Turnover in health plan annual enrollment (typically 20 percent)

- ROI savings measured in terms of patient months versus member months

- Changes in benefit design

- Increases in provider fees over which DM vendors have little control

Another problem has been the under-investment by some health plans in the personnel and resources needed to study the clinical and cost effectiveness of DM and other care programs. With some exceptions, epidemiological studies have been expensive and time consuming to perform.The problem with demonstrating ROI may be solved soon. Many DM vendors, health plans, and trade organizations are working diligently on more standard definitions for ROI. This effort should improve pre- and post-baseline financial comparisons. Several experts believe the ROI arguments of today will evolve into arguments over outcomes in clinical and economic value.

Closing the Gap

With so many dollars and patient outcomes at stake, considerable work lies ahead for health plans in integrating care technology with existing systems. DM technology now exists to integrate data from multiple sources, refine patient intervention efforts, reduce time to answer, facilitate physician communication, and help educate patients. While DM technology has further to advance to address accurate patient targeting and the evaluation of ROI and clinical intervention, based on their track record so far, vendors will close this gap within the next two years. HP

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SIDEBAR:

The Market

According to Al Lewis, executive director of the Disease Management Purchasing Consortium, total revenues for more than 50 DM vendors serving health plans and large employers climbed to $485 million in 2001. Annual revenue growth of 20-30 percent for DM vendors is expected through 2005. However, the number of DM program vendors may decrease with the market shakedown predicted within the next five years. More than 15 sizeable software companies serve the DM market.

DM Program Requirement	DM Process	Sample of Principal Vendors
Groupers	Risk adjusters, clinical episodes	Ingenix, The MEDSTAT Group, MEDecision, Symmetry Health Data Systems, DxCg, 3M Health Information Systems
Clinical Rules Algorithms Data Integration	Clinical rules to create measures and standards of care for claims, prescription data	Active Health Management (Rx, claims, lab results), Resolution Health (Rx, lab, claims), US Quality Algorithms (USQA), MEDSTAT, MEDecision, McKesson Health Solutions, Quovadx
Predictive Modeling	Identify disease prevalence, and risk stratify high-cost patients	MEDAI, Medical Scientists, Ingenix, MEDecision, Landacorp, Integrated Healthcare Information Services (IHCIS), MEDSTAT,SAS Institute
Patient Intake and Care Planning	Health Risk Assessments to qualify patient and determine intervention strategy. Automated workflow management, care plan generation, patient–centric record, alerts, compliance tracking, education, and physician and patient communication.	Active Health Management, Quovadx, MEDecision, McKesson, Landacorp, Click4Care, FutureHealth, Pfizer Health Solutions, Haelan Group, Quality Metrics
Population Management	Alerts, compliance, and safety	Active Health Management, Resolution Health, StatusOne
Decision-Support Systems	Outcomes measurement and evaluation, disease prevalence, patient	MEDSTAT, ViPS, McKesson, Ingenix,

	and provider profiling	MEDecision, IHCIS, Landacorp, USQA, AdvanceMed
Pharmacy/DM	DM pharmacoeconomic evaluation	Pharmetrics
Patient-Centric Record/ Educational Fulfillment	Fulfills patient self-management with relevant education materials.	Caresteps (American Healthways), Resolution Health, WellMed, FutureHealth, Active Health Management
Evidence-based Medicine Content	Development, implementation, tracking	MEDSTAT, Zynx, EBM Solutions, Agency for Healthcare Research & Quality (National Guideline Clearinghouse), Mayo Clinic
Retrospective ROI and Outcomes Evaluation	Epidemiological analysis	Disease Management Purchasing Consortium, MEDSTAT, McKesson, MEDecision, Trajectory
DM Benchmarks	Standards of care benchmarks	Pharmetrics, MEDSTAT, Ingenix
DM Full Service Vendor	Clinical intervention and technology platform	American Healthways, CorSolutions, Accordant, Matria, Qmed, LifeMasters, StatusOne