

Executive Summary

One of the greatest economic and quality-of-care challenges facing the health care system is how we manage chronic care for an aging population. The reality of limited resources and changing demographics means that simply stretching the “sick-care” system further is infeasible. With a country increasingly in need of chronic-illness care, how does our society efficiently address the broad needs of the population?

The answer to this conundrum lies in shifting the model of care from one focused on a dichotomy of distinct public health activities at one end of the spectrum and individual care for people with acute conditions at the other. This new population health management paradigm shifts the locus of control to the individual and supports that person with targeted information specific to each moment in care that he or she faces.

Health care providers and systems can now create this information therapy in a way that balances the needs for mass production and customization to the individual. Innovative health care organizations are implementing strategies for “mass personalization” that effectively support each patient’s self-care and decision-making needs. By bridging the gap between dealing with the individual’s immediate symptoms and managing the population’s long-term health, personalized information prescriptions at each relevant moment in care are restoring balance to chronic care and promising improvements in both costs and outcomes.

Ultimately, these population health strategies balance three levels of care. First, population health uses self-care support to keep a majority of the population in relatively good health for longer, thus avoiding the need for significant action on the part of the in-person delivery system. Second, population health involves care management that employs clinical personnel who can help those with ongoing chronic conditions enhance their self-care skills and decrease the need for acute care. Finally, population health leaves resources available for the intensive management of truly unavoidable sick care that inevitably arise.

Information Therapy (Ix): the **prescription** of specific, evidence-based medical information to a specific patient, caregiver, or consumer at just the right time to help them make a specific health decision or behavior change.



Introduction

In seeking to improve the care for individuals with chronic conditions such as heart disease and diabetes, the initial attempts at “disease management” have generally involved identifying people with a particular chronic disease and taking a more aggressive approach to case management for that condition. The model has created care improvement largely by mimicking the practice of a clinician “managing,” one by one, “patients” who suffered from a singular condition (for example, “diabetics”).

Over time, however, there has been an increased recognition of the opportunity to systematically combine broader population health approaches in the care of people with chronic disease. In many cases, the latter patients cannot be best classified solely as having a distinct disease, but rather multiple, often-related chronic conditions (for example, the increasingly common individual who lives with both diabetes and coronary artery disease). In addition, it has become clear over time that solitary reliance on the hierarchal relationship of caregiver and patient, oriented around disease treatment, not only stressed an expensive and constrained aspect of care delivery but also failed to tap one of the most influential components of chronic care management—active self-management by the individual.

A growing body of research has demonstrated that one of the most influential aspects of chronic care management is the degree to which consumers use carefully targeted health information to manage their conditions. With the right support and infrastructure, this chronic care model has been shown to improve health with the promise of long-term, efficient use of resources.

Appropriately prescribed as well as easily accessible “over-the-counter” patient-oriented clinical information—or information therapy (Ix)—also responds to the growing recognition that a spectrum of care needs to exist throughout any given population. Today’s low utilizers of health care services may become tomorrow’s high utilizers if their current needs are not effectively addressed through expansive but personalized health information that helps them better manage their health.

Embracing the New Paradigm of Population Health

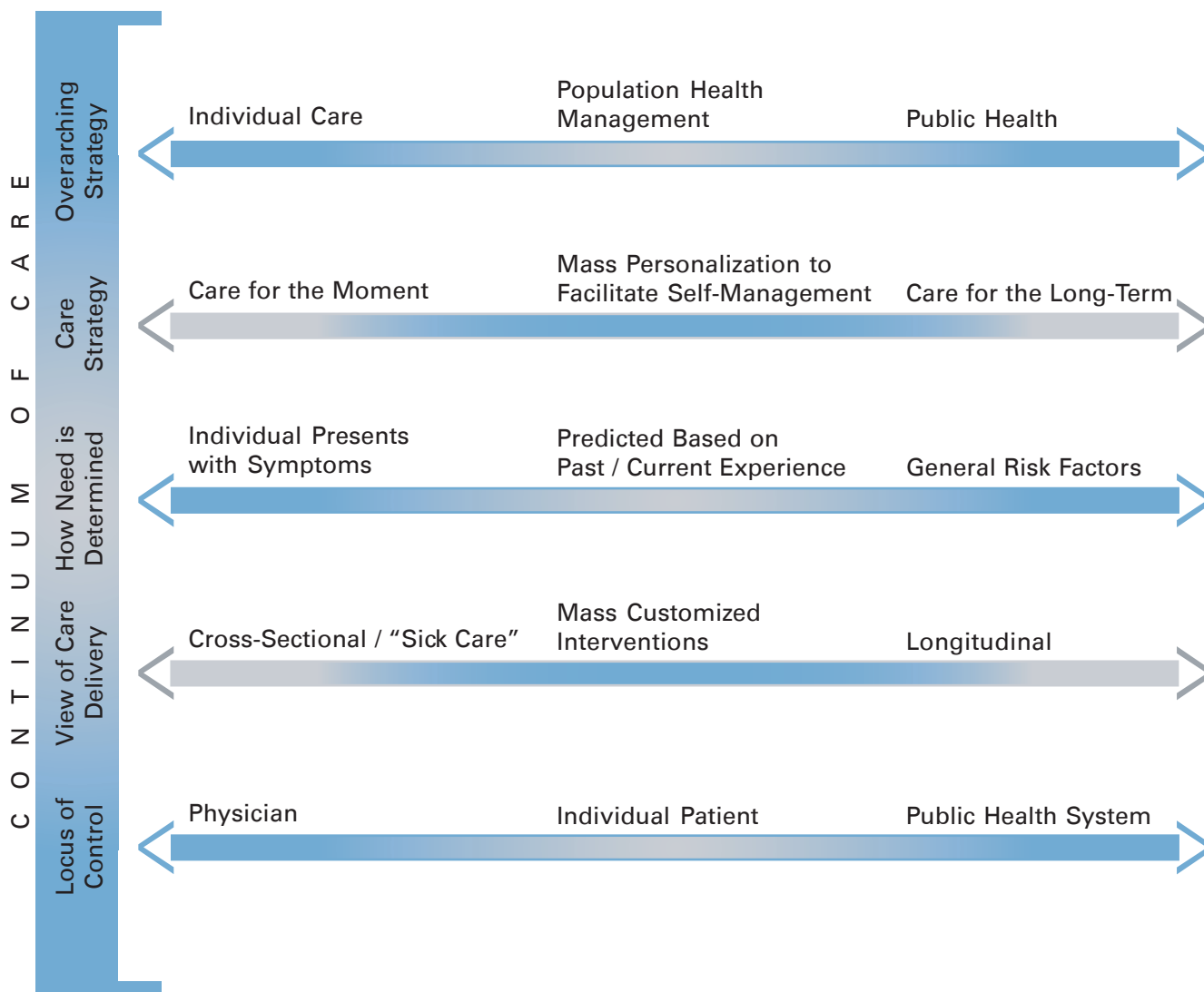
Historically, the U.S. health care delivery system has been designed primarily to deliver “sick care.” The medical/surgical model for care delivery has its rich roots and has evolved out of centuries of confronting and seeking to actively remedy injury and illness. The historical alternative has been the public health model, with its focus on broad preventive interventions to reduce the onset or spread of disease. While both have yielded important successes, an evolving alternative tries to bridge the continuum of care that exists between the two traditional approaches (see Figure 1); drawing on their complementary strengths of personalized care and access to optimal medical expertise with a capacity for meeting broad population- and community-based needs.

Today’s low utilizers of health care services may become tomorrow’s high utilizers if their current needs are not effectively addressed.

The population health model recognizes the value of access to high-tech, specialized “sick-care” for those who need it, but it also seeks strategies for preventing as many people as possible from requiring that level of intervention. Population health draws from the valuable contributions that individual physicians can make at critical decision points and in delivery of acute care and balances them with the sweeping general prevention that organized systems can provide through longitudinal care and public health interventions. Population health envisions a balance of capital investments between institutions and high-tech interventions and equipment on one side, and those focused on information technology and other communication infrastructure on the other side.

This evolving middle ground relies heavily on both the customized approach of cross-sectional care and the breadth of impact necessary through population-based interventions. Many activities can thrive in this middle ground, and most of them rely on linkage of systems of care with individual needs over time.

Figure 1: Population Health at the Crossroads of the Continuums of Care



Bridging those concepts requires development of “mass-customized” interventions, or what others have called “mass personalization.”¹

Success also involves focusing on leveraging a team concept for necessary care delivery capacity and capabilities. The prepared, proactive practice team is a critical component of the Chronic Care Model (CCM), which has been validated by Ed Wagner and colleagues.^{2,3,4} The CCM involves contacts by multiple professionals in complementary roles over time, each of whom supports the individual with a chronic condition to use acquired knowledge to manage his or her own care.

The CCM and mass personalization fit together to drive a cohesive population care approach, which

provides the foundation for what are emerging as the most successful chronic-disease management strategies. Many of the early efforts of health care systems and independent disease management (DM) companies focused, in retrospect too narrowly, on a single condition or engaged only in care of the disease rather than focusing on the complete health needs of the population they served, many of whom lived with many chronic conditions.

Many care management programs within health plans and provider groups and several DM companies have moved from this silo mentality to increasingly address the more complex needs of the individuals by systematically encompassing a range of interventions across several chronic conditions. In many cases, this

began with issues that came up with two conflicting DM programs—for example, an individual who is qualified for both a diabetes DM program and a coronary artery disease (CAD) DM program. An emerging set of companies—some arising from and uniquely created for this middle ground—have come to recognize this evolution and are designing care management strategies to mass-personalize chronic condition care.

Meeting the Demands of a Diverse Population

Within any given population, a smaller portion will utilize a great deal of health care services, others will consume a moderate amount, and many, often the majority will require little or no interaction with the formal health care delivery system.

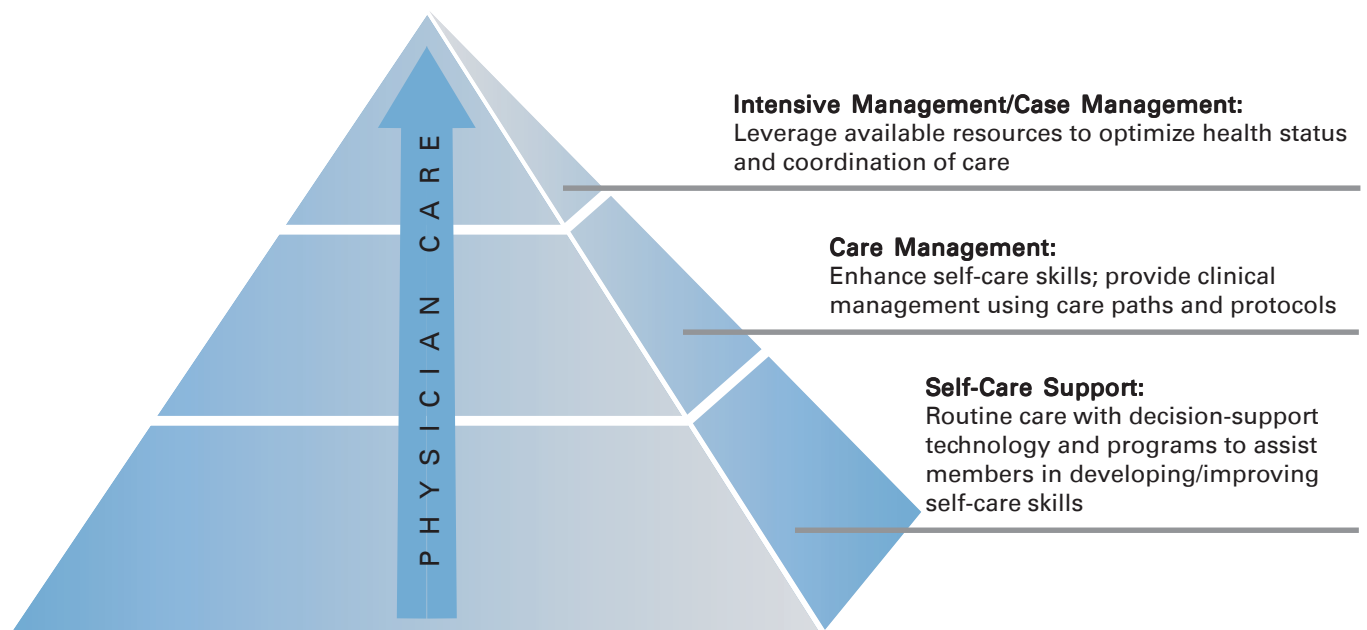
Generally speaking, the current high utilizers are increasingly drawn from recognized populations with chronic conditions. These “sicker” individuals benefit from active case management and the access to first-rate sick-care skills. Medical crises for these chronic conditions force providers to address patients’ health needs with expensive and specialized resources.

The second subset of the population includes those who have existing and likely gradually progressing chronic conditions but who are not undergoing or facing imminent acute exacerbations. This group generally requires proactive anticipatory **care** management that includes the use of health care professionals (for example, care managers, pharmacists, health coaches, etc.) to proactively address specific care needs (for example, making sure the individual adheres to a medication regimen, etc.). Much of this can be done effectively through well-designed Ix interventions that complement targeted information prescriptions with direct assistance from care professionals.

Among those who have infrequent interaction with the delivery system, a significant portion could benefit from improved understanding of and support for “healthy behaviors,” including support for weight management, exercise, and tobacco cessation. For this group, the population health focus should be on engaging them in self-care and self-management through mass-customized Ix interventions.

Over time, the natural progression for individuals with or at risk for chronic conditions is to move sequentially up the pyramid. Therefore, the great population health challenge is to do what is necessary to prevent from

Figure 2: Population-Based Care: Managing the Whole Population



that upward migration. The economics of managing the pyramid are compelling, given the great cost savings to be gained from preventing moderate users from becoming intense consumers of expensive services. The larger and more immediate sources of return on investment (ROI) for care and disease management exist in minimizing the need of individuals to require sick-care and to improve the efficiency of high-intensity case management. However, keeping the middle layer from ultimately requiring expensive hospital services (for example, admissions for people with congestive heart failure) has both substantial quality and financial impact.

This population health model suggests a continued evolution and extension of the physician's role. In addition to the more traditional role of addressing and ideally curing a patient's acute health problems, the physician serves as a key member and leader of the evolving health care team, using his or her specialized expertise to help guide a care team of clinician colleagues that is centered on the current and future customized needs of the individual patient. That team may include many health care professionals—some of whom will have considerably more frequent interaction with the consumer—but the physician typically remains the leader who can provide expert guidance and consultation.

Efficient resource allocation in the population health model

For those responsible for resource allocation decisions in the population health model, the challenge often lies in determining where to focus resources and effort. The greatest benefit from resource investment derives from identifying those individuals at greatest risk of progressing up the population pyramid, as well as identifying those likely acute events that are most amenable to prior interventions. That amenability is a combination of the existence of some effective intervention and the consumer's readiness to change.

The process involves three general steps. First, how does the population health manager identify those people at greatest **risk** for requiring acute care? Some conditions have more predictable determinants than others. Substantial advances have recently been made

in the science of predictive modeling to help health plans and other organizations identify with increasing precision those at greatest risk. (For more information on the intersection of Ix and predictive modeling, see the white paper from Healthwise titled, "Predictive Modeling and Information Therapy: Prescribing the Information That Will Help Each Patient Improve Health and Reduce Costs," available at www.healthwise.org.)

Second, once that population has been defined, the next question becomes: Is the predicted event **amenable** to an upstream intervention that will decrease its likelihood of occurrence? For some chronic conditions, substantial research exists to guide health care teams as to the most effective approaches for managing care. Where research gaps exist, the expense of the acute event and/or the frequency of it in the population may still warrant concerted attempts to intervene with considerable resources.

Finally, the identified consumers need to be **ready to change**. For most chronic conditions, successful care management depends to a considerable extent on the system's ability to engage the consumer as an active participant—if he or she has little interest in change, the investment of resources by the delivery system likely will yield little benefit. For a bibliography (including 16 peer-reviewed journal references) of studies that specifically support the self-management aspects of the Chronic Care Model (CCM) for managing chronic conditions, see www.improvingchroniccare.org/resources/bibliography/ccm.html.

Intersection of Ix and the Chronic Care Model

As noted above, the CCM provides an increasingly validated and credible model for addressing the "middle ground" of population health. The CCM's premise is that we need to transform health care "from a system that is essentially reactive—responding mainly when a person is sick—to one that is proactive and focused on keeping a person as healthy as possible."⁵ The critical elements of the CCM are:

- **The community (resources and policies)**—Health systems must take advantage of

community-based programs that enhance chronic care.

- **The health system (organization of health care)**—The system must create policies and organizations that allow best practices to flourish.
- **Self-management support**—The model relies on a collaborative approach between individuals and their clinicians.
- **Delivery system design**—Basic changes in the delivery system are required rather than simply adding new interventions to the existing framework.
- **Decision support**—Evidence-based information is required to guide clinicians' and individuals' patient-care decision making.
- **Clinical information systems (CIS)**—CIS can be used both in helping to remind

people of the need for critical care elements and to measure treatment success.

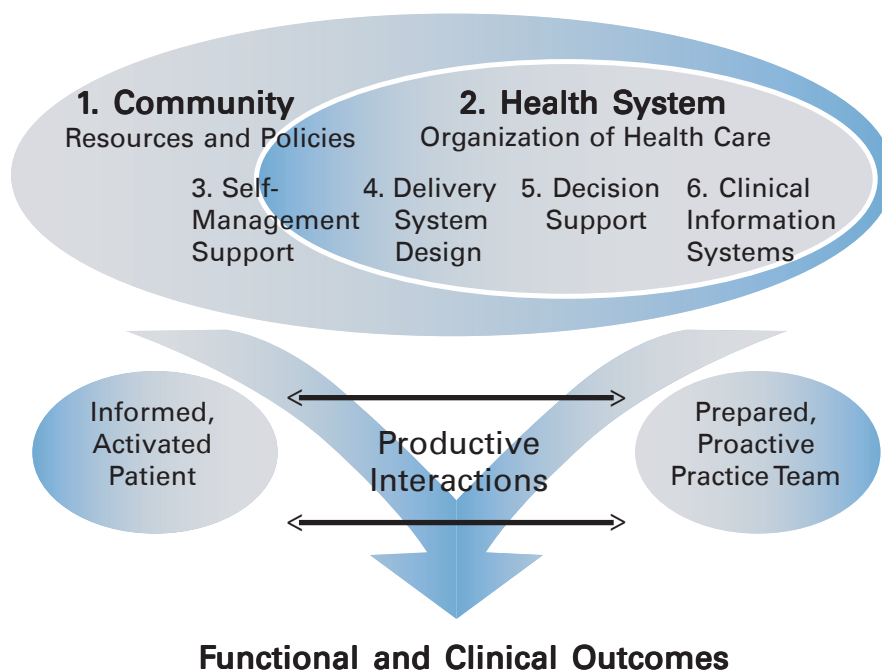
These elements interact and function to support:

- Prepared and proactive practice teams.
- Activated and informed patients.

The intersection of the CCM with the Ix approach is clear. Without targeted information prescribed to the individual at the right moment in care, consumers cannot be effectively engaged as partners in active care management. That decision support becomes a critical factor in supporting ongoing involvement. In addition, the clinical information systems element specifies several Ix-related elements, such as:

- Providing timely reminders to providers and patients.
- Facilitating individual patient care planning.

Figure 3: Overview of the Chronic Care Model*



*Reprinted with permission from the American College of Physicians (ACP). Figure from Wagner EH. Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness? *Effective Clinical Practice* 1998; 1:2–4. The ACP is not responsible for the accuracy of the translation.

- Sharing information with patients and providers to coordinate care.

For managing chronic conditions, an effective approach needs to involve at least three components. First, the approach must be durable over long periods of time when the individual (or patient) has little in-person human contact. The individual's connection to the delivery system can certainly be enhanced by "virtual" contact, information prescriptions, and other forms of information exchange.

Second, the approach needs to be effective in the translation and dissemination of evidence and knowledge from the system to the individual. This not only requires an appropriate cataloging, structuring, and targeting of evidence-based information, but also translating it into a format that is both understandable and actionable by a population with a broad range of backgrounds and needs.

Finally, an effective chronic-care management approach needs to link to individual readiness to change. Different people respond to different methods at different times. The approach needs to be capable of pre-activation of the individual before the instances when more focused contact within the health care delivery system are required (because that may be too late). This requires that the right information be prescribed in a timely way at the right moment in care. By pre-activating the patient, we can leverage the expensive act of that individual coming into the clinical office, thus maximizing the efficiency of the rest of the system.

Information therapy helps achieve many of the key CCM attributes:

- Informed, activated patient/consumer
- Prepared, proactive practice team
- Ongoing, productive interaction (how to create linkages)

Application of Specific Strategies

Building on the CCM principles, Ix applications are one of the primary mechanisms for making an individual "informed and activated." Ix strategies also are the

segue to a "prepared, proactive practice team." In short, information prescriptions comprise a major portion of the tangible goods or services exchanged between patients, practice teams, and the systems in which they receive and deliver care.

Consider the example of medication adherence for someone with CAD trying to prevent an acute event. In a traditional model, a physician might make the medication prescription, but a significant portion of chronic disease medication prescriptions either never get filled or are not used as prescribed. A linked Ix has been shown to improve both patient understanding and adherence of desirable interventions. The Kaiser Permanente Care Management Institute (CMI) conducted a thorough review of diabetes care management throughout its eight regions. One of the key strategies CMI employed was to examine higher performers relative to lower performers, categorize differences in the care management programs, and identify what factors were associated with superior performance. (The performance was based on an index of measures reflecting diabetes care.) One of the top differentiators of performance was whether the local program actively supported personalized care planning, a combination of assessing individual needs and personalizing a plan for managing chronic conditions. Kaiser's study reiterates what Bodenheimer et al found in a review published in *JAMA* in 2002: Of 20 studies that included self-management components, 19 improved quality of care, based on some combination of process and outcome measures.⁶

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Mass personalization

Personalization of information, however, does not mean that Kaiser should or even can create eight million unique sets of information, one for each of its members. This is where the concept of "mass personalization" becomes critically important. Even with all the unique characteristics of its diverse membership, there are many commonalities in the members' information, activation, and decision-making needs. Kaiser

recognizes that it needs to strike a balance from the extreme of “one size fits all” to unique information for each member.

For example, Kaiser is creating “after-visit summaries” that ultimately will follow every in-clinic encounter and hospital admission. Kaiser will take educational materials targeted to a member’s specific moment in care and then customize that information using the input of the practice team (either the hospital or the medical office). The goal is to facilitate a smooth transition in locus of control from the provider to the individual member (and the family) by providing him or her with accessible, usable, and personalized information.

These after-visit summaries serve other purposes, as well. They provide documentation of what communication transpired and what the joint expectations are between visits. In addition, after-visit summaries provide a tool to help members’ families by assisting the support system that is needed to manage chronic-care issues and prepare for upcoming visits.

These after-visit summaries can easily be built into care processes. When members leave the hospital or clinic, they typically pick up prescriptions for medication, so there’s no reason why information prescriptions cannot be added to that discharge process.

Although there are obvious efficiencies to be gained from electronic after-visit summaries, Kaiser has seen this work in paper-based format as well. For example, an 84-year-old with several chronic conditions—who does not use computers—takes her paper-based after-visit summaries (with all their educational materials and personalized notes from her primary care physician) and compiles them in a notebook. That notebook becomes her own personal health record, and she shares it with the family that helps her to manage her own chronic care on an ongoing basis.

Building continuity of care

All of these efforts specifically respond to the Institute of Medicine’s (IOM) call for greater continuity of care. In its landmark 2001 report, *Crossing the Quality Chasm*, the first of the IOM’s ten recommendations for system redesign is for “care based on continuous

healing relationships.”⁷ (It should be noted that empirical evidence supports the value of information therapy in responding directly to virtually all of IOM’s 10 recommendations; for more detail, see “The Ix Evidence Base: Using Information Therapy to Cross the Quality Chasm,” available at www.informationtherapy.org/rs_white_papers.html.)

Information therapy provides a critical bridge between the expensive resources consumed within health care institutions and the day-to-day management of chronic disease.

Particularly in the context of improving population care and chronic-disease management, information therapy provides a critical bridge between the expensive resources consumed within health care institutions, such as acute care hospitals and even the medical office, and the day-to-day management of chronic disease. Patients with one or more chronic conditions live with their health 24/7, and more than 99% of that time typically transpires during normal activities of daily living, not within the traditional health care system of doctor’s office visits and hospital admissions. Just based on pure arithmetic, the person with chronic disease must be the one responsible for his or her care almost all of the time, yet most health care delivery systems provide insufficient tools and support to ensure access to the right information at the right time. Information therapy can change that entire paradigm not only because it enhances self-care but because it maximizes the utility of the resources consumed when the person does enter the traditional health care setting.

As shown in Figure 4, Ix applications can provide the appropriate preparation so that the limited time in the clinic is optimized for both patient and clinician. With patients well prepped for the in-person encounter, they can use the visit time to discuss specific questions that apply to their personalized needs rather than addressing generic questions. That Ix visit prep can

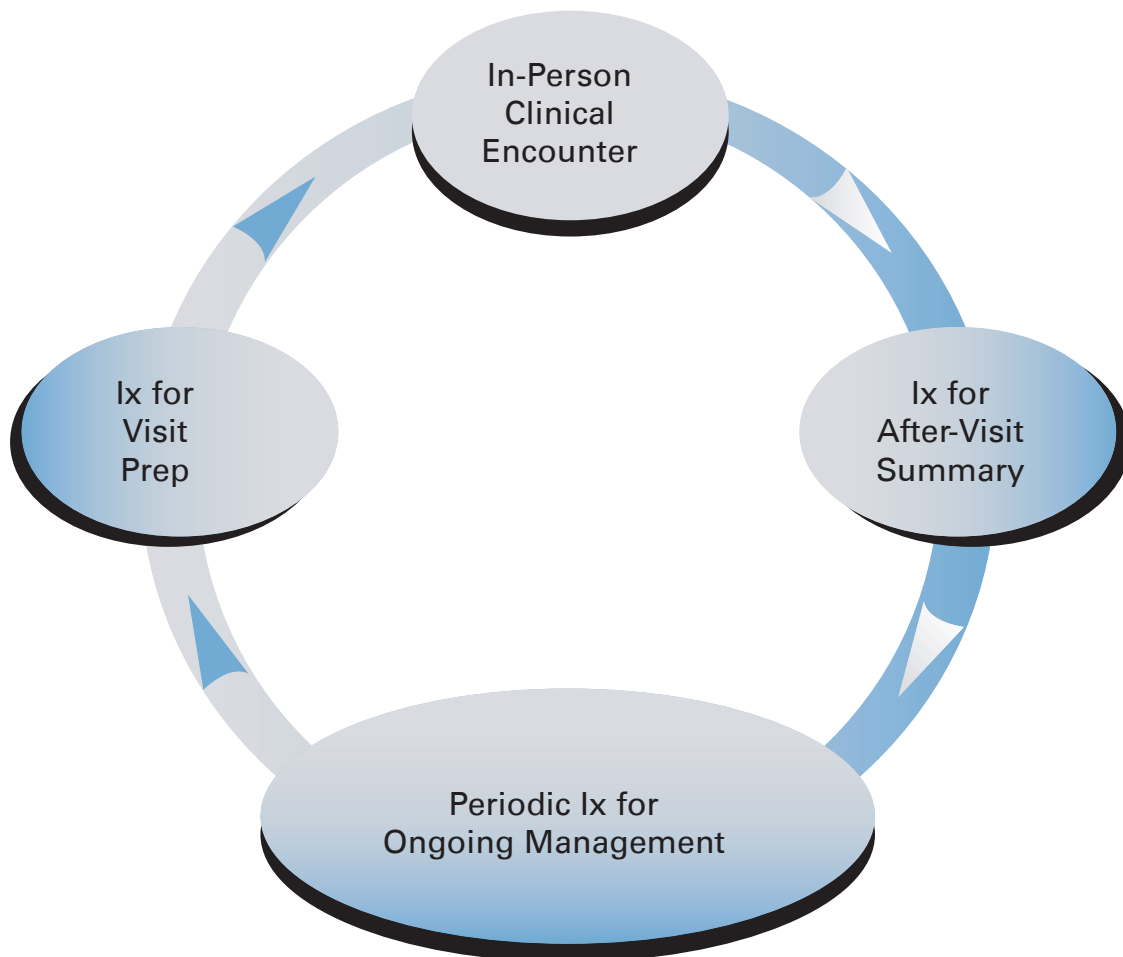
also be a tool for pre-activation, enhancing the level of dialogue and the ability to discuss specific actionable steps that will allow for effective chronic-care management.

An Ix after-visit summary (AVS) offers the opportunity to “bank” the value that the physician or other clinician provides during the in-person encounter. Whereas we know that the average patient remembers less than half of the information shared by the physician during a typical visit,⁸ an AVS can chronicle and reinforce the key educational information that needs to be retained from the visit. The AVS also can serve to chart the course for ongoing self-management that will need to take place prior to the next in-person encounter with the system.

Between in-person encounters, information can be both prescribed by clinicians and sought by patients periodically and systematically. The “virtual” contact with the delivery system not only offers specific reminders (for example, to improve adherence or prompt seeking a follow-up test) and educational support to enhance self-efficacy, but it also provides a connection that assures consumers that they are not alone in managing their conditions. All of these factors have been shown to be critical ingredients in long-term management of chronic illness.

This continuous cycle of care builds on the growing understanding of adult learning. The ongoing, personalized provision of targeted information specific to individual moments in care represents a

Figure 4: Information Therapy Promotes Continuous Cycle of Care



transformation in the model of care. It means a departure from cross-sectional, episodic, and often generic impersonalized interactions characterized by information asymmetry to ongoing, longitudinal care improvement facilitated by appropriately dosed and easily accessible evidence-based health information.

Coda: Ix Value in Health Care

The evidence is clear that using health information to engage consumers in their own health management is absolutely essential to achieving the clinical goals of effective chronic-care management, but the benefits are more far-reaching than that. Returning to the population pyramid presented in Figure 2, it becomes clear that the economic benefits are potentially just as profound. Systems of care can achieve effective population care by using comparatively low-cost interventions broadly to prevent migration of today's low utilizers into tomorrow's high utilizers. By effectively mass-personalizing the right information at the right time, health care organizations can efficiently manage resources, as well. Importantly, net value will be increased even if the absolute costs of care are not decreased (for example, more value for the money spent), and evidence is growing that use of care and disease management is decreasing the trend of cost increases for those with chronic conditions.

The value proposition stretches even further because this transformation in the model of care delivery coincides with a changing culture of consumer expectations. In the shifting environment, a chorus is growing with a mantra of "whatever I want, whenever I need it." Those health systems that fail to meet this evolving consumer demand face a serious potential opportunity cost. One can only expect that this set of consumer expectations will continue to grow in the years ahead.

Similarly, consumer expectation for being able to access personal health information electronically is advancing. Consumers will become increasingly intolerant of systems that do not come up with strategies to leverage and value the consumers' and their clinicians' time with increasing effectiveness. Consumers will expect their providers to be able to access health information in real time without wasted time—their time. When they do, consumers will expect that their own personal health data will be something that can be readily interpretable and leveraged by their providers as well as by themselves. Achieving this last goal will be substantially facilitated by increased access to and facility with using information therapy.

ENDNOTES

¹ Christopherson G (2004). *Ix Solutions Every Day: Person-Centered Care Via My HealtheVet/HealthePeople*. Presentation delivered Sept. 27, 2004, at the 2004 Information Therapy Conference. Available online: http://www.informationtherapy.org/conf_mat04/Christopherson_PPT.pdf.

² Wagner EH, et al. (1996). Improving outcomes in chronic illness. *Managed Care Quarterly*, 4(2): 12–25.

³ Wagner EH, et al. (1996). Organizing care for patients with chronic illness. *Milbank Quarterly*, 74(4): 511–544. Also available online: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10157259&dopt=Abstract.

⁴ Calkins E, et al. (1999). *New Ways to Care for Older People: Building Systems Based on Evidence*. New York: Springer.

⁵ Improving Chronic Illness Care. *The Chronic Care Model*. Available online: <http://www.improvingchroniccare.org/change/index.html>. Accessed Dec. 3, 2004.

⁶ Bodenheimer T, et al. (2002). Improving primary care for patients with chronic illness: The chronic care model, Part 2. *JAMA*, 288(15): 1909–1914.

⁷ Institute of Medicine (2001). *Crossing the Quality Chasm*. Washington, DC: National Academy Press.

⁸ Eiser JR, ed. (1982). *Social Psychology and Behavioral Medicine*. Chichester: John Wiley and Sons.