



I N F O R M A T I O N

t h e r a p y

*The Ix Evidence Base:
Using Information Therapy
to Cross the Quality Chasm*

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Executive Summary

This paper pulls together the empirical evidence that demonstrates how information therapy (Ix) responds to the call to action issued by the Institute of Medicine (IOM). Specifically, self-care, self-management, shared decision making, and other Ix-related initiatives improve patient knowledge, self-efficacy, clinical quality, patient experience with care, and cost-effectiveness. Research demonstrates that the components of information therapy allow patients to:

- Ask better questions of their doctors concerning their health and their illness.
- Have a better understanding of the answers they do receive.
- Form realistic expectations.
- Become more confident in their ability to manage their illness or condition to achieve better health.
- Participate more actively in the treatment and decision-making processes.

A growing body of literature suggests that appropriately prescribed, decision-focused, evidence-based health information can empower consumers and enable them to participate as active partners in their own health care, thereby improving outcomes (Greenfield et al. 1998, Beisecker and Beisecker 1990). Clinicians can help facilitate these improvements in care quality by prescribing targeted information to their patients, particularly when all are supported by a sophisticated information technology infrastructure.

In March 2001 the IOM issued a report that highlights fundamental flaws in today's health care system. In its landmark report *Crossing the Quality Chasm*, the IOM stressed that the gulf between the health care our country provides and that which it could provide exists as a "chasm" rather than merely a "gap." The IOM calls for a redesign of the U.S. health care delivery system around ten rules, virtually all of which can be addressed by the implementation of Ix™ initiatives. As health care organizations strive to improve the quality, cost-effectiveness, and overall patient experience of care, health services research literature suggests that Ix-focused interventions will be a critical strategy in bridging the chasm.



Information Therapy:

The **prescription** of targeted, evidence-based medical information to meet the specific needs of a patient, caregiver, or consumer as part of their process of care.

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“Between the health care we have and the care we could have lies not just a gap, but a chasm.”

-The Institute of Medicine, Crossing the Quality Chasm, March 2001

Introduction

Patients can now gain online access to over 12 million citations for medical articles (Forkner 2003) and millions of health-related Web sites, but we don't know what impact that has on health outcomes. The availability and accessibility of health information can be empowering, but it does not ensure that consumers can find and use the information that can help them make better health decisions. Information therapy (Ix)—the prescription of targeted, tailored, evidence-based health information to a specific individual at just the right time to make a health decision or behavior change—addresses that concern.

Information therapy integrates the concepts of self-care, self-management, shared decision making, patient-centered care, and evidence-based medicine with new information technologies to change the standard delivery of health care. By integrating appropriately prescribed information into the process of care, physicians and other providers can substantially improve performance in many key dimensions of a successful health care delivery system: increased health-oriented knowledge for consumers; active patient participation in one's care experience; cooperation among different

Figure 1: IOM recommendations for Health Care System Redesign—Ten Rules for Quality Improvement

- 1. Care based on continuous healing relationships.** Patients should receive care whenever they need it and in many forms, not just face-to-face visits. This rule implies that the health care system should be responsive at all times (24 hours a day, every day) and that access to care should be provided over the Internet, by telephone, and by other means in addition to face-to-face visits.
- 2. Customization based on patient needs and values.** The system of care should be designed to meet the most common types of needs, but have the capability to respond to individual patient choices and preferences.
- 3. The patient as the source of control.** Patients should be given the necessary information and the opportunity to exercise the degree of control they choose over health care decisions that affect them. The health system should be able to accommodate differences in patient preferences and encourage shared decision making.
- 4. Shared knowledge and the free flow of information.** Patients should have unfettered access to their own medical information and to clinical knowledge. Clinicians and patients should communicate effectively and share information.
- 5. Evidence-based decision making.** Patients should receive care based on the best available scientific knowledge. Care should not vary illogically from clinician to clinician or from place to place.
- 6. Safety as a system property.** Patients should be safe from injury caused by the care system. Reducing risk and ensuring safety require greater attention to systems that help prevent and mitigate errors.
- 7. The need for transparency.** The health care system should make information available to patients and their families that allows them to make informed decisions when selecting a health plan, hospital, or clinical practice, or choosing among alternative treatments. This should include information describing the system's performance on safety, evidence-based practice, and patient satisfaction.
- 8. Anticipation of needs.** The health system should anticipate patient needs, rather than simply reacting to events.
- 9. Continuous decrease in waste.** The health system should not waste resources or patient time.
- 10. Cooperation among clinicians.** Clinicians and institutions should actively collaborate and communicate to ensure an appropriate exchange of information and coordination of care.

Source: IOM 2001



constituencies, departments, and sectors; and enhanced quality of care.

In fact, Ix initiatives respond directly to the challenges posed by the IOM in its *Crossing the Quality Chasm* report (IOM 2001) and the massive gulf it describes between the quality of health care that currently exists and that which we could and should have. In its call to action, the IOM recommends a radical restructuring of the U.S. health care delivery system around the following ten rules that offer a guide on how to reorient the current system to achieve positive change (see Figure 1).

This white paper presents a strong foundation of evidence for the potential of information therapy based on its primary components (self-care, self-management, shared decision making, patient-centered

care, evidence-based medicine, and integration of new technologies into the process of care). Table 1 outlines the various essential components of information therapy and what IOM rule(s) each component addresses. Relative to the IOM's call for system redesign, Ix strategies facilitate ongoing relationships through multiple care delivery channels (rule 1) and customize treatments to patient needs and values (rule 2) by placing the consumer at the center of the care delivery team (rule 3). These strategies are achieved through shared knowledge and the free flow of information (rule 4) that support evidence-based decision making (rule 5) and help to build safer systems of care (rule 6). Systems that integrate information therapy into care practices facilitate cooperation among clinicians (rule 10), and they proactively address consumer needs (rule 8). These efforts result in a more efficient health care system (rule 9).

Table 1: How the Elements of Information Therapy Address the Recommendations from the Institute of Medicine's *Crossing the Quality Chasm* Report

IOM Recommendations	Elements of Information Therapy					
	Self-Care	Self-Management	Shared Decision Making	Patient-Centered Care	Integration of New Technologies	Evidence-Based Medicine
1. Continuous relationships	X	X	X		XX	
2. Customization based on patient needs & values			XX	X		X
3. Patient as source of control	X	X	X	XX		
4. Shared knowledge & free flow of information	X	X	XX		X	X
5. Evidence-based decision making			X		X	XX
6. Safety as a system property	XX	X			X	X
7. Need for transparency						
8. Anticipation of needs				XX	X	
9. Continuous decrease in waste	X	X			X	
10. Cooperation among clinicians			X	X	XX	

Notes:

1. **Bold XX** indicates the element of information therapy most applicable to that IOM rule.
2. Although information therapy addresses the need for transparency in clinical decision making, the IOM's focus in rule 7 is on comparative performance information. Thus, this rule will not be highlighted in the context of this paper.



Rule 1: Care Based on Continuous Healing Relationships

The shift to patient-oriented health care has challenged health professionals to assess the relationships (or lack thereof) between themselves and consumers and if this new move has established a continuity of care. Sick individuals do indeed require a clinician's care, but the standard face-to-face medical encounter does not stand as the only vehicle for therapeutic exchange between health professionals and patients. Relying solely on clinical face-to-face visits for care contradicts efforts for continuous healing relationships by instead creating delays, bottlenecks, and frustrations for all.

Continuous healing relationships based on patient-centered care can be achieved through new vehicles of care delivery, which include e-mail, phone calls, shared Internet resources, self-care initiatives, and group-oriented visits.

Continuous relationships depend in part on the patient's satisfaction with her or his interactions with the physician and with the health care system, but many consumers are dissatisfied with their current experiences of communication with health professionals (Coulter et al. 1999).

Consumers increasingly not only seek information via the Web but use that information for health care decision making. According to the Pew Internet & American Life Project, 52 million adult Americans (55% of the Internet-user population) have turned to the Internet to seek health information (Fox et al. 2002) and 47% of those who have sought information for themselves say the material affected their decisions about treatment and care. In order for clinicians to build continuous relationships with their patients, they must find ways to integrate this information into the process of care. Continuity of care and relationships has been found to accrue multiple benefits, including improved health outcomes and greater satisfaction for patients and physicians (Gill et al. 2000).

New physician-patient relationships are emerging today that have a consumer orientation. These relationships focus on cultivating and supporting informed, activated patients who engage themselves in partnerships with their physicians (Bodenheimer, Wagner, and Grumbach 2002). The physician-patient paradigm detailed by Bodenheimer involves the idea

of collaborative care, which rests on establishing a synergistic relationship between the patient and physician to enable shared decision making. Under collaborative care, patients are seen and treated as integral partners in the care process, allowing them to work with their doctors to devise care plans that enhance their lives. They gain understanding and confidence in embracing new health behaviors (Ibid.).

Information therapy, in enabling physicians to deliver continual and effective information to the consumer in a timely manner, fosters continuous relationships that can improve patient involvement and satisfaction. Gerber and Eiser (2001) share this view of improved patient-physician relationships through the use of an electronic-medium of information therapy. Delivering targeted, evidence-based health information electronically provides a level of continuous care that traditional, episodic trips to the doctor's office cannot. After reading through the information specific to one's condition or "moment in care," which defines the point along the care continuum for a particular health issue, a patient can then contact his or her physician (via e-mail posting) with specific questions about issues that are still unclear.

Those with the poorest quality in terms of physician-patient relationships were three times more likely to leave the physician's practice over a three-year period as opposed to those with the highest-quality relationships (Safran et al. 2001). Safran et al. found that the quality of a relationship between a patient and physician can significantly predict patient loyalty. This study revealed that the ability of a physician to deliver information needs to a patient, along with other communication characteristics, helped predict a patient's level of loyalty and tendency to change physicians.

Rule 2: Customization Based on Patient Needs and Values

Physicians are becoming increasingly aware of the importance of patients' values in health care decision making, recognizing that in addition to scientifically sound evidence, the "correct" choice for a treatment plan depends on the personal views of the patient. Those personal views often involve specific feelings about the risks and benefits of a particular choice in care (O'Connor et al. 1998). Information therapy involves the effective use of information technology to deliver appropriate health information to the right



person (customized and tailored information) at the right time (moment in care).

Traditional patient education materials can be helpful but are not used to their full potential for several reasons. First, this information offers a general overview of a condition or illness and is not targeted to an individual's particular moment in care and own personal situation. The patient then has to make an effort to understand the information's relevancy and figure out how to apply it to make a decision regarding a treatment plan. In addition, generic compilations of information can be disengaging and can possibly disinterest the consumer in becoming actively involved in one's own health care experience and the decision-making process. Lastly, printed materials can quickly become outdated and irrelevant while online information prescriptions can be constantly updated and supported by the latest evidence in health care and scientific study.

Information therapy can play out in many ways. Typically, a patient's encounter in the doctor's office has many opportunities for information triggers built into it. These information triggers, such as diagnostic (e.g., ICD) and procedural (e.g., CPT) codes, are already collected and organized within an administrative or medical information system. The information triggers can connect the individual to his

or her moment in care. These information triggers and moments in care can automatically generate a menu of information prescriptions from which a clinician can choose. The physician or medical system can then send or provide the consumer with information that is evidence-based, peer-reviewed, and targeted to that individual (Kemper and Mettler 2002).

Research suggests that targeting information to individuals directly impacts health outcomes. A sample of patients (78 people with Type 2 diabetes) was randomized into two groups: a diabetes network (D-Net) active lives intervention program and an Internet-based information-only program. The research team wanted to assess the effects of tailored information to individuals based on their needs. The network intervention group received goal-setting strategies, personalized feedback, tailored health information, and had access to an online personal coach that could help orient the consumer to the best resources that would fit one's needs, preferences, and condition. Participants receiving personalized feedback and tailored health information reported a moderate increase in both walking and moderate-to-vigorous intensity physical activity; those receiving information from a generalized Internet-based resource had an increase in depressive symptomatology (McKay et al. 2001).

Table 2: Conclusions of a Review of Randomized, Controlled Trials of the Effectiveness of Self-Management Training in Type 2 Diabetes

Effectiveness of Interventions
➤ In the short term (less than six months), knowledge levels, self-monitoring of blood glucose (SMBG) skills, and self-reported dietary habits improve.
➤ In the short term, improvements in glycemic control, knowledge, and diet are more readily demonstrated than improvements in weight and physical activity levels.
➤ Weight loss can be demonstrated with repetitive interventions or with short-term follow up.
➤ Physical activity levels are variably affected by interventions.
➤ Interventions with regular reinforcement are more effective than one-time or short-term education.
➤ Interventions that involve patient participation and collaboration seem to produce somewhat more favorable effects on glycemic control, weight loss, and lipid profiles than didactic ones.

Source: Norris et al. 2001



Educational programs geared around the self-management of asthma have also been found to improve outcomes, including health care practices, lung function, and feelings of control (Guevara et al. 2003). Receiving information is not enough; the patient must learn how this information applies to one's condition and lifestyle so as to better improve one's health status.

In a study constructed to test the effectiveness of tailored information to alter patient's behavior regarding the intake of fat, fruits, and vegetables, Brug et al. found that computer-tailored feedback had a significantly greater impact on fat reduction and fruit and vegetable intake than did general information. The online personalized information contained nutrition education information relevant to the individual's personal dietary habits as well as one's personal be-

liefs about healthy eating (Brug et al. 1998). This study also gauged the responsiveness of the participants to personalized information (see Table 3). The data reveals the effects of personalized messages; one is more apt to read, keep, and discuss health materials personally addressed to an individual as opposed to generic information. Whereas 85% of those receiving tailored, personalized feedback saved their health information, only 80% of those in the generic group did the same. More significantly, 71% of participants in the tailored information group discussed their information with others (as opposed to only 45% in the other group), indicating greater participation and engagement in one's health care experience. All categories of behavior change and outcomes were statistically significant in terms of improvement among those receiving tailored, personalized information and feedback.

Table 3: Participants' Reactions to and the Subjective Impact of Tailored Information (percentage yes measured)

	Tailored Feedback (n = 426)	General Information (n = 220)
Have you read the letter?	99	93**
Have you saved the letter?	85	80
Have you discussed the letter with others?	71	45**
As a result of the nutrition information:		
Have you changed your opinion about your diet?	62	26**
Have you changed your diet?	56	19**
Have you increased your fat intake?	20	13*
Have you increased your vegetable intake?	29	18**
Do you intend to change your diet?	69	46**

* = Significant difference, $p < 0.05$
 ** = Significant difference, $p < 0.01$

Source: Brug et al. 1998



Rule 3: The Patient as the Source of Control

Many consumers no longer fit the traditional and outdated mold of passive observer in one's health care experience. A patient-centered, consumerist model of health care delivery has emerged in which patients and doctors become partners in managing care (Forkner-Dunn 2003). Research also suggests that engaging consumers as active participants improves the quality of care in many ways.

A surge in chronic diseases among Americans has led to an explosion of disease management programs. Research involving these programs has begun to highlight the importance of self-management education for consumers. Self-management education focuses on providing patients with the necessary skills to manage their own chronic conditions. As a result, individuals have experienced decreased symptoms, improved physical activity, and significantly less need for medical treatment (Holman and Lorig 2000). Lorig, Mazonson, and Holman (1993) found that, after taking a six-week, peer-led self-management program, arthritis patients reported less pain and 43% fewer outpatient visits. These improved outcomes translate into significant cost savings for hospitals and clinics, as well as for the health delivery system on a whole. Bopp and Minder (2003) found that the mortality odds decreased (by 7.2% for men and 6% for women) for each additional year of health-based information given. Coulter et al. (1999) found that breast cancer patients suffer less depression and anxiety if they are involved in the consultation process for a treatment plan.

A study conducted by Bodenheimer, Lorig, Holman, and Grumbach (2002) found that participatory decision making occurred in only a quarter of all visits to primary care physicians, despite its proven value. O'Connor et al found that decision aids, when compared with usual care, help improve the average knowledge score for options and outcomes regarding treatment (O'Connor et al. 1999). The huge benefit of decision aids derives from their ability to enable patients to receive better information regarding their care, options, and possible outcomes so that they can truly make informed decisions regarding their care. Patients can in turn consider and communicate the personal value they place on benefits versus potential drawbacks of a particular treatment option. This enhanced involvement of the consumer in the decision and treatment process supports the notion of self-efficacy, or the personal estimate of an individual and

one's own ability to succeed or reach a particular goal. The Mayo Clinic found that Web-based health information can help improve feelings of self-efficacy. In a survey designed to measure the effectiveness of their online health-based site, 12,838 users responded, 92% of which reported an increased confidence in the ability to take better care of themselves. Sixty-eight percent of respondents claimed that the site had increased their knowledge to make a positive lifestyle change, and 82% claimed an increased confidence in having the ability to make such lifestyle changes. One of the survey respondents commented, "I am very pleased with (this Web site). It has provided me with very up-to-date and vital information that has helped me change for the better the lifestyle and nutritional values for my entire family" (Mayo Clinic 2004).

An increased desire for personal involvement in one's care can best be evidenced by the growing literature on patient-centered care. Efforts have grown to develop health informatics that are able to assess consumers' needs for information and integrate those preferences into medical information systems (Eysenbach 2000). Software designed to assist users in clarifying their preferences and values in care decisions in addition to the use of computer-based

How Decision Aids Affected Quality of Decisions

- Increased knowledge scores by 19 points out of 100 (95% confidence interval 13 to 24).
- Improved the proportion of patients with realistic perceptions of the chances of benefits and harms by 40% (10% to 90%).
- Lowered decisional conflict (uncertainty) related to feeling uninformed by 9 points out of 100 (6 to 12).
- Reduced the proportion of patients who are passive in decision making by 30% (10% to 50%).
- Reduced the proportion of people who remain undecided after counseling by 57% (30% to 70%).
- Improved agreement between what a patient values and which option is chosen.

Source: O'Connor et al. 2003



decision aids can help patients make informed choices and help professionals tailor interventions appropriately.

Studies reveal that increased agency felt by the patient and empowerment lead to increased patients' satisfaction levels with their care. In a study conducted by Manhattan Research (2002), the areas of lowest satisfaction with the current state of available health information include content reviewed by consumers with a condition, content that helps them communicate with their doctors, content reviewed by medical experts, and a source that lays out all of their options (comprehensive sources of health information).

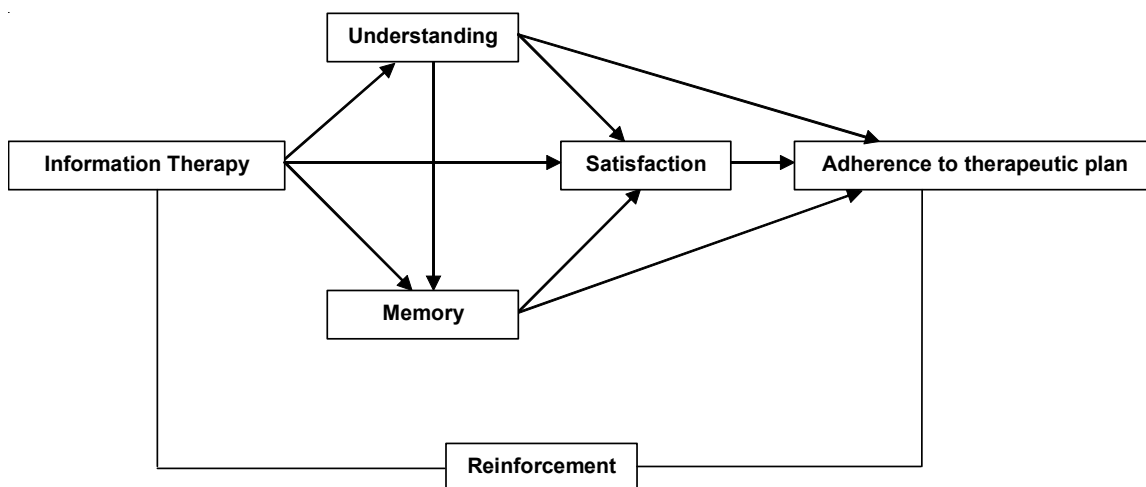
These results point to the opportunity of information therapy to help improve consumer satisfaction in these areas. Delivering high-quality, evidence-based information that is constantly reviewed and updated by health professionals and is written in a way that is comprehensive and clear to consumers helps individuals further understand their illness or medical condition. This higher level of understanding further allows consumers to actively participate in their care, which has been shown to improve overall satisfaction. O'Connor et al. (1998) found that when patients participate in medical decisions, they are more satisfied with their medical care. In addition, patients who are found to have good control of their

disease and symptoms are more likely to be satisfied with their interactions with their physicians (Wasson 2002).

One other important aspect of integrating Ix strategies into the care process is the potential to increase the level of continued adherence to a treatment plan. Research has shown that consumers feel more personally committed to their care when they take more responsibility in making personal clinical decisions by empowering them with appropriate and effective information. O'Connor et al. (1998) found that involving patients in medical decisions leads to increased adherence to medical regimens as well as greater psychological well-being and health. Greater personal ownership and adherence can help ensure better outcomes by reducing the likelihood of disrupting or abandoning effective treatment.

The model below for adherence has been adapted from one proposed by O'Connor et al. (1999). Information therapy, through the application of a better understanding and recall of the critical aspects surrounding one's illness or condition, can lead to greater patient satisfaction and, ultimately, a greater adherence to a prescribed treatment plan. This plan is meant to underscore the importance of patient involvement in one's care and a greater sense of personal responsibility for one's health status and

Figure 2: Information Adherence Model



Source: O'Connor et al. 1999



progress. Some may argue that the proposed adherence model may run counter to the concept of collaborative care and shared decision making. However, information therapy, in supporting increased agency between a patient and physician and improved communication, actually supports the concept of shared decision making.

In collaborative care and self-management education, the emphasis shifts toward the patients as responsible self-care givers while still appropriating a significant responsibility to the physicians to inform, involve, and assist patients with managing their conditions. When a patient and a physician arrive at a clinical decision together, patients choose to honor and follow their treatment plan, giving support for the shared decision. Information therapy applications can help patients attain a healthy balance between self-reliance and seeking professional help for health information and consultation, and can also help balance the responsiveness to consumers with demand management. This concept strays away from the idea of compliance, which has more negative connotations and in essence delivers a message of acquiescence or giving in to doctor demands. The notion of adherence underscores feelings of active partnership.

Tailored information linked to updated reminders for preventive care efforts (screening, for example) can improve rates of preventive screenings. Bastani et al. (1999) found that risk notification letters paired with appropriate information effectively improved mammography rates. In the twelve-month interval following the intervention, 58% of the control group and 65% of the intervention group had obtained a screening mammogram. A study conducted by Jaarsma et al. (1999) revealed that education and support by a nurse in a hospital setting and at home significantly increased self-care behavior in patients with heart failure.

Bodenheimer, Wagner, and Grumbach (2002), in their study and development of a chronic care model, found that good outcomes could be associated with those patients who routinely receive assessments, support for self-management, and follow up. Wagner's chronic care model focuses on the active participation of informed and motivated consumers who work collaboratively with a health care team that maintains a strong patient-oriented component. In their extensive review, Bodenheimer, Wagner, and Grumbach (2002) found that in 32 of 39 studies,

interventions based on chronic care model components improved at least one process or outcome measure for people with diabetes. When they assessed whether chronic care model interventions can reduce costs, 18 of 27 studies concerned with three examples of chronic conditions (congestive heart failure, asthma, and diabetes) demonstrated reduced health care costs or lower use of health care services.

Bodenheimer, Lorig, Holman, and Grumbach (2002) found that patient education programs teaching self-management skills are more effective than information-only patient education in improving clinical outcomes. Of 46 studies measuring the effect of patient education on patient knowledge and performance of technical skills in diabetes care, the CDC review found 33 studies to show a positive impact. Collaborative education produced more favorable results than didactic approaches (Ibid.).

Rule 4: Shared Knowledge and the Free Flow of Information

A free flow of information for individuals translates into unrestricted access to health information that can help one become better educated about a particular condition, disease, process, treatment option, or health system component. To improve relationships between consumers and providers, an easy stream of dialogue and communication must exist.

- | |
|---|
| <p style="text-align: center;">Patients Need Information to:</p> <ul style="list-style-type: none">➤ Understand what is wrong.➤ Gain a realistic idea of their prognosis.➤ Make the most of clinical visits and consultations.➤ Understand the processes and likely outcomes of possible treatment plans.➤ Assist in self-care.➤ Learn about available services and sources of help.➤ Help others understand.➤ Legitimize seeking help and concerns.➤ Learn preventive techniques and behaviors.➤ Identify further helpful information.➤ Identify best health care providers and services. |
|---|

Source: Coulter et al. 1999



The current delivery system conceptualizes and treats information as retrospective, passive, compartmentalized, and reserved for the use of qualified health professionals. To improve health care, information dissemination must become more prospective, interactive, integrated, continuous, technologically linked, and available to all. By improving the sharing and management of knowledge and information, health care providers can help reduce administrative costs, enhance patient care, and build strong relationships with patients.

Information therapy extends the value of patient education. The efficiency offered by today's technology enables information therapy to "shift the value proposition of patient education from secondary to mission-critical" (Kemper and Mettler 2002). For information prescriptions to be effective, the content must be tailored to specific individuals and meet their needs to enable better health decisions, behavior changes, and support disease or self-management. Consumer-centered education also reaches beyond traditional medical topics and expands to include other areas of concern, such as community support resources. California's *Network of Care* system, developed by Trilogy Integrated Resources, uses a type of information therapy for individuals, by delivering information to consumers on a community level. Individuals can learn more about health outcomes and illnesses with up-to-date, evidence-based information, and they can also equip themselves with available community resources and supportive tools.

In typical health care encounters today, information transfer involves considerable information being "dumped" on a patient during a clinical visit, and patients understand and retain little of what clinicians convey to them. In a comprehensive review, Eiser (1982) found that patients remember less than half of the information conveyed to them just five minutes after the clinical visit. Depending exclusively on oral communication generally does not achieve desired outcomes. In other words, the right information may be available, but it is given in the wrong way and at the wrong time.

Rule 5: Evidence-Based Decision Making

Evidence-based decision making involves the process of making health-related choices based on information available from finding, reviewing, and using the most recent research findings on a particular subject,

according to an established hierarchy of quality (see Figure 3). The integration of the best research evidence with clinical expertise and patient values allows for the optimization of care with improved outcomes and quality (Kemper and Mettler 2002). However, the health care system as it exists today does not effectively use evidence-based medicine at its fullest potential.

Currently, health care delivery and treatment schemes continue to be based on the individual physician providing care as opposed to basing decisions on the intersection between the current science and a patient's preferences. Evidence-based medicine de-emphasizes intuition, small-sample, or anecdotal observations (Ibid.).

Evidence-based information therapy and the use of electronic technology can increasingly benefit evidence-based decision making by giving consumers and clinicians fast, efficient, and effective access to the most up-to-date, valid, and relevant health information at the right time and in the right format. As Jadad's (2000) research indicates, information therapy and the use of the Internet can become a powerful tool to facilitate the generation, synthesis, dissemination, and exchange of research evidence. The synergy between collaborative care efforts, patient-centered health care delivery, and the use of evidence-based health information can help people make informed decisions about their health behaviors and treatment options by "preparing, maintaining, and ensuring the accessibility of rigorous, systematic and up-to-date reviews (and where possible, meta-analyses) of the benefits and risks of health care interventions" (Ibid.).

Figure 3: Quality of Evidence Hierarchy

- I. Evidence obtained from at least one properly randomized controlled trial.
- II. Evidence obtained from well-designed controlled trials without randomization.
- III. Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.
- IV. Evidence obtained from multiple time series with or without the intervention.
- V. Opinions of respected authorities, based on clinical experience; descriptive studies and case reports; or reports of expert committees.

Source: Kemper and Mettler 2003



Organizations have increasingly integrated the use of evidence-based guidelines in care. For example, the National Guideline Clearinghouse, an Internet-based public resource, offers access to evidence-based clinical practice guidelines and allows comparisons of recommendations produced by different organizations in North America. In addition, the Canadian Medical Association's CPG Infobase provides free access to evidence-based guidelines produced in Canada (Ibid.). Information therapy allows physicians and consumers to evaluate the current treatment options available for a particular condition and make an informed choice while at the same time consider personal values, needs, and specific circumstances.

Rule 6: Safety as a System Property

In seeking medical care, patients are entrusting their lives and well-being with the health care system and with their providers. Thus, a substantial responsibility exists to deliver high-quality care and to ensure that necessary precautions exist to prevent and mitigate errors that could harm individuals. Safety should be a top priority for the system as a whole, yet studies have shown that current practices and systems falter in certain areas of safety.

The IOM found that adverse health care events and medical errors serve as one of the leading causes of death and injury in the United States (IOM 2000). In a survey conducted by the Harvard School of Public Health and the Henry J. Kaiser Family Foundation, three in ten survey participants reported that they had seen an error that caused serious harm to patients outside of their families in the past year (Blendon et al. 2002). In its alarming report, "To Err is Human," the Institute of Medicine (2000) estimates that between 44,000 and 98,000 patients die each year because of medical mistakes, far more than those killed annually by automobile accidents. Poor disease control, exacerbated conditions, and unnecessary complications abound because of a lack of proper management and effective treatment for health conditions (Rothman and Wagner 2003).

Nearly 80% of what a doctor relies on to make an accurate diagnosis and recommendation for a treatment plan comes from the information found in an individual's medical record. Alarming, information in medical records is often inaccurate, incomplete, unavailable, or incorrect leading to higher rates of unnecessary medical errors (Savard 2003).

Moreover, consumers do not have just one medical record but frequently have multiple ones, each for a separate department. When consumers move or change plans, their paper charts are not routinely transferred.

As of now, there is little data that points to the effectiveness of information therapy components that help improve and build safety into the care delivery process. However, information therapy helps to respond to the call for improved patient safety in health care for several reasons. With the current infrastructures of health information (Internet with unfettered access to sometimes unregulated information), the likelihood of delivering the wrong information to a person at the right time can be just as likely as finding the right information for the right person at the right time. Ix strategies to implement evidence-based information through the use of triggers help sift through all of the available health information to arrive at information prescriptions that enable the recipient to play a more proactive role in preventing errors and promoting safety.

Systems of care can also be made vastly safer through the implementation of a seamless system in which each individual has one electronic record that is shared across departments and physicians and promotes continuity of care. Integrating this electronic history with the information that consumers and clinicians need to make decisions provides a systematic way to build safety into the care delivery process.

Rule 7: Need for Transparency

Although information therapy addresses the need for transparency in clinical decision making, the IOM's focus in rule 7 is on comparative performance information. Thus, the rule will not be highlighted in the context of this paper.

Rule 8: Anticipation of Needs

Customizing health information according to an individual's needs, preferences, values, and expectations requires a detailed analysis of each patient and the development of tailored information portals. The collection of such data allows for effective anticipation of future needs, thus decreasing ineffective or wasteful care. Anticipatory health care, as opposed to reactionary care, allows for greater prevention of illness and disease and also enhances the quality of health services available to consumers.



Today's health care system does not anticipate patient needs enough and as a result, preparations for such needs fall short. Worth et al. (2000) conducted an in-depth ethnographic study that focuses on patients' extensive informational needs, the difficulties of hospital staff in meeting those, and the unavoidable "information gap" that emerges in the post-discharge period. The study reveals a strong need for a more effective information exchange to allow for greater anticipation of needs. In an interview, a patient lamented that "I probably did not ask the right questions. But I think, what is the right question? . . . When I got home and started to think about things, the lack of the fact that I didn't ask questions but at the same time, I didn't know what I was supposed to be asking" (Worth 2000).

The use of proactive patient education has been found to improve outcomes and improve the process of care. A critical analysis conducted by Renders et al. (2001) found that a centrally organized computerized database system to make arrangements for follow up, tracking of patient appointments, and the generation of reminders could be connected with improvements in process measures. Once established, automated secure messaging systems fueled by specific patient information can deliver, document, and update a prevention reminder message custom-designed for each individual patient (Kemper and Mettler 2002).

Information therapy also engages the patient in preparation before one's clinical visit. Pre-visit information prescriptions that help one prepare for and anticipate details of a medical appointment can lead directly to improved decisions, better outcomes, and more satisfied patients (Ibid.). These preparatory information prescriptions can be customized from a standard format through an online scheduling system in a physician's office.

Rule 9: Continuous Decrease in Waste

Escalating health care costs have cut deep into the ability of the health care system to deliver quality services and results, as hospital and clinic budgets have declined or leveled off. Increased spending does not guarantee higher quality of care (Fisher et al. 2003); excess and inefficient spending can actually lessen the quality of health care delivery. In a RAND study, the quality of health care was found to be suboptimal approximately 50% of the time (McGlynn

et al. 2003). Higher costs can be linked to a waste and abuse of resources available.

Information therapy offers an opportunity for immense cost savings, particularly through a reduction in unnecessary clinical visits and services. Of 15 studies to measure the impact of adult asthma self-management education on health care utilization and costs, eight found a significant decrease in hospital or ER use (Bodenheimer, Wagner, and Grumbach 2002). Costs can also be reduced in terms of treatment costs and acute episodes.

Information therapy helps to promote and encourage preventive measures for health, thereby decreasing the risk for acute needs. A seven-week chronic disease self-management study found fewer hospitalizations over a six-month period when compared to a control program. This resulted in a six-month net savings of approximately \$750 per patient. A lower rate of doctor and ER visits continued at the two-year mark (Bodenheimer, Wagner, and Grumbach 2002). Information therapy, a strong support for decision aids, can help reduce the prevalence of more aggressive and more costly medical treatments. O'Connor et al. (2003) found that decision aids consistently reduced the likelihood of patients deciding to undergo more aggressive surgical or medical treatments and instead favor more conservative options, such as watchful waiting. Cost savings within health care delivery become especially important, particularly as reimbursement incentives become more aligned to the goals of care delivery.

Clinician satisfaction can be affected by being reimbursed for services that they feel provide value to their patients. Several studies are currently underway to examine possible reimbursement strategies for electronic communication with patients. Blue Shield of California announced last year a move to reimburse clinicians for online consultations after a study commissioned by the insurer found that the plan could actually save more than \$1.92 a month per member by using online consultations (Broder 2003). Medem, an online patient-physician communications company, is pushing with the American Medical Association to develop a CPT code for online consultations. The evolution of these efforts will increase the likelihood that clinicians will be paid for efficient care.

Informed decision making can also be seen as a way to avoid liability and reduce the prevalence of



malpractice suits. Notkin (1994) suggests that better informed patients who receive appropriate and effective health information about their condition, care, and treatment may be less likely to pursue tort liability against physicians. He argues that many malpractice suits arise because of patients' misunderstandings of recommended courses of treatment, the benefits, and the potential risks involved. An information prescription sent to the consumer before any treatment regimen was administered can serve as a source of documentation that patients were clearly informed of the benefits and risks of that treatment in advance of taking action.

Rule 10: Cooperation Among Clinicians

In a health system that is trying to make a move to a more patient-centered, continuous framework, cooperation among health professionals becomes critical for delivering more effective care. Teams of clinicians across departments and disciplines need to be established so that the focus is on the patient instead of on the particular treatment or medical problem. Collaborative care does not just require cooperation between patients and physicians but among doctors themselves so that teamwork is reinforced.

Today's health care system continues to be quite fragmented, which in turn negatively influences how physicians work together. Although more clinical care centers are making efforts to create interdisciplinary teams of clinicians, not enough are doing so, and the delivery of medical care can still become territorial among individual physicians.

Information therapy, by its very nature, facilitates cooperation among clinicians. As shared decision making and self-management increase along with increased electronic communication, clinicians have a much more systematic way to communicate with each other about a common patient's care. Information therapy naturally leaves a trail of information behind that allows each clinician to know what transpired between the patient and other clinicians in past encounters. In addition to improved natural cooperation, elements of information therapy can lead to greater clinician satisfaction.

Conclusion—Where Do We Go From Here?

Information therapy allows consumers to ask their clinicians better questions concerning their health and illness, have a better understanding of the answers they do receive, form realistic expectations, become more confident in their ability to manage their illness or condition to achieve better health, and participate more actively in the treatment and decision-making processes. New technologies enable targeting of personal health information to factors that are related to health behavior, such as socioeconomic status, self-efficacy beliefs, outcome expectations, and access to care. Past research has found that personalized communications are viewed as more relevant and credible, better remembered, and are more effective in influencing health behavior than general mass health messages (Skinner et al. 1999).

A personalized health care system that delivers targeted, tailored information should be constructed with the following key elements:

- Dynamic, integrated personal health information infrastructure based on the individual's health profile information that can easily be obtained from and linked to one's electronic medical record.
- Extensive and automatic use of a consumer health content knowledgebase that is backed by medical experts.
- Health information that is updated frequently.
- Health information that is linked to an individual's specific moment in care.

This white paper presents a starting point for the evidence that supports the benefits of information therapy. In reality, none of the interventions discussed in this paper tap into the full potential of information therapy because none of them integrates all of its critical components. In the future, direct outcomes research that evaluates the full potential of information therapy is needed as well. These studies will necessarily include multiple research designs; while randomized trials are needed, some of the greatest innovation in information therapy takes place in uncontrolled care settings where randomization is not an option. Health care leaders also need to educate the public in order to generate a growing consumer demand for information therapy



implementation. As the Foundation for Accountability (2003) argues, “transformation will only occur with sustained pressure from an informed public that can recognize safe, high-quality care and demand it from its elected officials, employers, doctors, and insurers.”

System wide changes need to occur as well in order to make information a standard in health care delivery. To achieve this, a strong business case behind information therapy needs to be demonstrated to the key players in the field: health plans, hospitals, and clinics. With any new initiative or undertaking, businesses want to see the bottom line; in other words, how can this new product or service improve my production? Proponents of information therapy will need to reveal how information therapy can attract and keep patients, control costs, and improve the quality of care delivered.

Contact us

To obtain information about these Center for Information Therapy resources:

- White paper: *The Business Case for Information Therapy*, by Donald W. Kemper
- Book: *Information Therapy: Prescribed Information as a Reimbursable Medical Service*, by Donald W. Kemper and Molly Mettler
- 2005: Information Therapy Conference, September 21-23, 2005, Park City, Utah
- To see examples of new information therapy innovations read the 2004 Ix Conference Report

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