HIMSS E-Health SIG White Paper

The purpose of HIMSS' E-Health Special Interest Group (SIG) White Paper is to promote two important positions. At the request of the HIMSS Advocacy Committee the SIG has developed a body of work "White Paper" in support our definition. Below are the reasons why the HIMSS Advocacy Committee and HIMSS Board should support this definition.

1. The entire healthcare industry should adopt HIMSS' E-Health SIG's definition of E-Health.

   The application of Internet and other related technologies in the healthcare industry to improve the access, efficiency, effectiveness, and quality of clinical and business processes utilized by healthcare organizations, practitioners, patients, and consumers to improve the health status of patients.
   As already published in HIMSS News,Volume 13 Number 7, p. 12. "HIMSS SIG develops proposed e-health definition"

   Currently, a plethora of conflicting, overlapping or distinct E-Health definitions exist in the healthcare industry without any one, standard definition. In addition, despite the demise of the dot-com companies, CIOs, IT vendors, and other health information professionals continue to incorporate E-Health technologies and processes into their strategic plans, such as public websites, private intranets, and physician portals.

   Former HSS HIPAA point-person, Bill Braithwaite, former WEDI chair, Lee Barrett, and E-Health futurist and author, Peter Boland, PhD, are just some of the well-respected industry figures who have expressed support for the definition. Further, because the American Health Information Management Association (AHIMA) understood this need, the association incorporated HIMSS' E-Health SIG's definition into its own E-Health White Paper and continues to use the definition in its eHIM initiatives.

   Therefore, the position of HIMSS' E-Health SIG is that the industry must have one, common definition, to assist its professionals realizes the benefits of E-Health technology and process plans.

2. HIMSS should urgently adopt and be the advocate for its SIG's definition of E-Health.

   Recently, HIMSS undertook a bold effort to be THE healthcare information advocate for critical healthcare issues, such as Patient Safety and the Electronic Health Record. Such issues not only demand HIMSS' strength and prestige to be realized throughout the industry, but they require the application of the Internet and its derived technologies (i.e., E-Health) to succeed! For example, intranets and portals are rapidly becoming the technical cornerstones of provider organization EHRs.

   Given HIMSS recent advocacy efforts and standing, HIMSS cannot afford to miss out on the opportunity to promote and become the advocate of its SIG's definition. Therefore, the position of HIMSS' E-Health SIG is that advocating the SIG's definition of E-Health is a benefit for, and in the best interests of HIMSS.

The E-Health Special Interest Group respectfully request the support of the HIMSS Advocacy Committee and HIMSS Board to; recognize, advocate and promote this definition and the Call to Action elements on behalf of the Health Technology industry.

All the constituencies involved (Provider, Payers, Clinicians and Health Information Technology vendors) must invest and participate to make this technology framework grow with the demand.

The participation includes the following Call to Action elements:

1. Continue research to document findings to share experiences and information. Successes are good – but learning from the "less than successes" is also an integral part of this process.

2. Continue to debate on the evolution of the definition and scope of E-Health. Does it include treatment? Is it only an information tool?

3. Continue to pilot new technologies and programs; assisting to promote solutions for the development of the EHR and Patient Safety improvements

4. Continue to integrate these new internet technologies in the daily workflows

5. Continue to expand the training and familiarity with the E-Health services for patients and providers so that new information and techniques become small, frequent, natural incremental steps rather than investing in a "Big Boom" approach.

6. Use E-Health to improve the delivery of healthcare to those who might be more difficult to reach: the homebound, the migrants, the uninsured and underinsured.

7. Recognize that no single entity will own this technology explosion. However, all who agree to work using consistent standards, common formats and language, will be successful in these new endeavors.

8. Identify ways to charge for the services provided through E-Health, either in overall cost reductions or other mechanisms, such as charging for research and training in information access and usage. However, charges should not be a barrier to receiving care.

In any case, the definition will not restrict the growth of E-Health as driven by the patients, the providers and the payers. The confidence of the patients will be supported by the willingness of providers to move in this direction.

The E-Health Portals will make healthcare and information more accessible with the end goal of improving patient care and the health status of all. "The use of technology to ultimately improve patient outcomes is not going away"[1]

E-Health Defined

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E-Health Defined

Executive Summary

E-health is defined as the application of Internet and other related technologies in the healthcare industry to improve the access, efficiency, effectiveness, and quality of clinical and business processes utilized by healthcare organizations, practitioners, patients, and consumers in an effort to improve the health status of patients. [23]

E-health includes many dimensions:

- Delivery of key information to healthcare partners
- Provision of health information delivery services
- Facilitation of interaction between providers and patients
- Facilitation of the integration of healthcare industry-related business processes
- Both local and remote access to healthcare information
- Support for employers and employees, payers and providers

Within this framework, the overarching goal is to improve the health status of patients.

Introduction

Many people today are using Internet technologies to communicate with others to gather information, research and/or purchase goods and services. One of the most important areas where these activities are occurring is related to healthcare. According to an April 2002Harris Poll, of the 137 million Americans who surf the Internet, more than 60 percent use the resource for health advice. In addition 90% of adults would like to be able to communicate with their physicians on line. Between 1998 and 2002, the number of adults who have looked for health information has climbed from 54 million to 110 million. [15]

The attempt to define E-Health in this format is two fold. First, we wish to demonstrate that E-Health is a realistic and viable concept and advise the healthcare industry at large that E-Health has arrived and will continue to evolve driven by technology and the need of consumers (patients) for health care information and services. Despite the rapid flare-up and demise of the dot.com industry at the end of the 20th century, E-Health is not a flash in the pan. It will not and should not go away. The continuous development of new and innovative techniques and the consumers' (patients') increased desire for access to healthcare information and services will drive this market. Second, we hope to engage both healthcare and technology leaders to continue to challenge and grow the definition of E-Health with the progress of new technologies and increased patient demand.

Background

The explosive growth of the world wide Internet over the last 10 years has exceeded the expectations and imagination of technology industry. [20] The expansion of computer and telecommunications technology across all economic sectors was fueled by the ease of communication, transactions and information gathering through this new medium

[20]. Consumers were intrigued by the ability to gather information from a variety of sources and to make purchases quickly using a variety of shopping tools. Entry into this new world to establish a web site could be achieved by acquiring a domain name and a webpage, at a nominal cost. From chat groups to individual web pages, the sharing of health information also grew rapidly, and often without quality controls. [29]

During this same period, investment in the technical infrastructure for healthcare was increased to meet the new challenges of managed care and financial pressures. Clinicians who had used computers in their academic training demanded the same ease of access to on-line reference materials. As new tools, such as radiology Picture Archive Communications Systems (PACS), laboratory and electronic medical record systems were introduced, physicians expected to have current information available at their fingertips wherever they were – at home, in the office, at the hospital.

During the 1980's electronic commerce, facilitated through electronic data interchange (EDI), had been adopted by the manufacturing and retail industries to improve the timeliness of deliveries and reduce overall cost. Some governmental organizations, such as the Healthcare Finance Administration (HCFA), which became the Center for Medicare and Medicaid Services (CMS), and state and local Departments of Health (DOH) required rapid reporting of events or validation of eligibility using fax or electronic dial-up. With the expansion of the Internet in the 1990's, e-commerce started to attract more interest in the healthcare arena. [29]

Another area of this technology boom was the expansion of wireless technology, which facilitated the immediate access to anyone or the Internet from anywhere. The explosive growth of cell phones, personal digital assistants (PDA's) and other wireless tools from the mid-1990's to the present fueled the need for immediate information. Consumers were becoming increasingly technology literate.

The competing demands for instant access to information and transactions as well as the increased availability of technical equipment supported rapid growth of the information delivered through various web services. Companies such as WebMD, A.D.A.M., Micromedix and others arrived to fill the demand for immediate healthcare information. The federal government assisted by providing funds to the National Library of Medicine to obtain MedlinePlus, KidsHealth and other similar websites.

Some Boundaries

The use of technology to assist in the delivery of quality patient care covers a vast area from biomechanical devices to robotics to the electronic medical record to email. Sometimes, the term "E-health" has been used very loosely to include any electronic healthcare-related activity. To provide better focus, it may be helpful to establish some boundaries around the definition:

1. E-health is not a surrogate for the clinician. It does provide the means to extend the reach of the provider beyond a face-to-face patient encounter, with the advantage of expanding the delivery of limited resources and expertise. For instance, using electronic images and pictures, diagnoses may be made from a remote location, either within or outside the facility.

2. E-health provides delivery of useful medical information via the Internet, kiosks or other electronic means that may facilitate patient education and provider decision-making.

3. E-health facilitates collaboration between providers and other caregivers through file sharing, email and electronic medical record systems.

4. E-health does not replace existing infrastructure applications. Instead, it facilitates those processes to expedite delivery and improve the quality of the services provided both locally and remotely. It operates within the walls of the health facility and across geographic boundaries.

5. E-health is not another name for e-commerce in the healthcare industry. However, the facilitation of business processes among employers, employees, insurers, suppliers, clinicians, patients, administrators and regulators may include examples of E-health.

6. E-health is not the routing hardware or the networking software, but it uses those to deliver the information needed to achieve the primary goal.

7. E-health uses these means, as well as other telecommunications services, to deliver the information and processes necessary for the ultimate outcome of patient care: improved health status.

E-Health Systems Architecture

The infrastructure that supports e-health includes several dimensions [4]

1. Internet: universal access to information and sites with or without predefined security authorizations;

2. Extranet: secure, remote connections between predefined participants. This might have included the e-commerce arena;

3. Intranet: support for a communications infrastructure within the enterprise, which may deliver access to internal and core data systems to all participants in the healthcare delivery process;

4. Core Data Systems: function-based systems that support the key processes of the enterprise. These may be financial, clinical or administrative systems at any of the partners in the e-health arena. Included in this group are systems such as the computerized patient record (CPR), PACS, admission and appointment systems, financial patient accounting systems as well as the internal infrastructure systems.

5. E-Mail: exchange of information between two or more partners using some combination of the internet/extranet/intranet. This may be considered to be an application using the architecture. However, it has become an essential reason for adoption of the e-health framework by caregivers and patients.

6. Telecommunications: the physical and technical layer that enables the connections and interchange of information through various media: wireless, fiber, cable, satellite, and other new and emerging means. Voice and email are

interchangeable on some of the new devices. Recording, storing and transmitting this information falls within the boundaries of E-Health.

7. Hardware: computers, pagers, personal digital assistants (PDA's), PC tablets telephones, servers and other hardware provide the physical support for this infrastructure.

The relatively seamless interaction of these layers permits the exchange of information and transactions that provides the environment for E-health. The rapid development of new technologies is also reflected in the adoption of many tools, often significantly less expensive than the prior generation.

E-Health Constituency

The community served by E-Health is broad and varied. It includes clinical providers at all levels and locations: single physician offices, large practices, hospitals and universities. Nurses are another important provider set in this view, as are allied health personnel who provide care and treatment in a variety of settings, both clinical and remote. Support personnel, including administrators and ancillary services may also participate in this environment. Insurers and employers are active members of the E-Health activities, as are employees who need to verify their coverage or reimbursement status. Patients of all ages, nationalities and geography are also part of the E-Health constituency. Technologists for various arenas are also participants: clinical engineering, information technology and telecommunications as well as medical students and researchers.

In 2002, there were several studies [19] done to examine who is the constituency for E-Health. The users were primarily women performing health information searches. The top four disease conditions researched were cancer, obesity, hypertension and diabetes. About 70% of the study respondents indicated that on-line health information influenced treatment decisions. The Gartner Group reported that personal health records will depend on patient-entered information. [14]

The easy availability of information and communication between patient and provider, patient and payer, provider and referred provider, clinician to clinician and so forth, provide an environment conducive to improved communications, smoother workflow and, perhaps, better quality patient care leading to better outcomes.

Internal Relationships

One emerging use of the E-Health technologies is in the growth and expansion of the local intranet facilities. While this communication vehicle may be used internally to the facility, this technology provides the "baby-steps" needed to build the strong dependence and comfort with the basic browser tools.

The use of an intranet portal can place a portfolio of end-user functions within a simple, familiar browser wrapping such as Microsoft Internet Explorer. Finding the "killer app," or the reason sine qua non for the intranet, may be as simple as establishing effective tools such as telephone directory, shuttle bus schedules and daily news items. These elements attract the regular, repeated user because they are part of the everyday

routine. The convenience helps to ease the user to try other functions, such as clinical applications, order entry and chart review. With the convenience of analytical tools, subsequent use of information for reporting or analysis becomes simpler as well.

Because of the browser familiarity, Intranet access might be simpler than other applications for the casual or non-technical employee. Delivered through a personal computer or a touch-screen kiosk, a well-designed end-user interface might lead the employee to seek out additional information, build skills or provide patient care in a more informed manner.

E-Relationships

Another useful way of reviewing E-health initiatives and processes is from an electronic relationships standpoint. Using business and healthcare eCommerce literature, the following table provides a useful framework to review 12 unique E-Relationships with respect to health and healthcare.

	Business	Provider	Consumer (Patient)	Government	Employee
Business	B2B	B2P	B2C	B2G	B2E
Provider		P2P	P2C	P2G	
Consumer (Patient)			C2C	C2G	
Government				G2G	
Employee				G2E	

Business to Business (B2B). B2B relationships have traditionally been conducted by a combination of methods: telephone, fax, or paper instructions mailed or express mailed to communicate the nature of a business interaction. The hard-copy transactions in some cases evolved into the e-commerce arena. However, restrictions on standards for transmissions between partners limited participation to larger enterprises. With the evolution of the new internet-based environment, this relationship has expanded to include a variety of reciprocal connections including:

1. Insurer to Insurer which coordinates information about a patient or patient's family to provide appropriate coverage;

2. Employer to Insurer who share information concerning coverage, employees, payment and educational materials;

3. Insurer to Healthcare Facility which exchange information concerning treatment, diagnosis, coverage and payment;

4. Supplier to Healthcare Facility who provides product information and pricing and facilitates electronic ordering and payment.

Anthem Blue Cross and Blue Shield (www.anthem.com) provides Employer to Insurer and Insurer to Healthcare Facility information exchange. Pfizer Pharmaceuticals (www.pfizer.com/business) provides product, pricing, ordering and tracking information for interaction with healthcare customers/facilities. Web MD Office (www.webmdenvoy.com/files/office/) supports various payer transactions, simplifying the administrative functions provided in private medical practices.

B2B examples are:

- www.anthem.com
- www.pfizer.com/business
- www.webmdenvoy.com/files/office

KEY ISSUES WITH RESPECT TO B2B E-Relationship: Quality of content, security of personal health information.

Business to Provider (B2P). B2P E-health efforts to date have been focused on the marketing and reimbursement areas. These include relationships between the businesses such as insurers or pharmaceutical suppliers. Both Anthem Blue Cross and Blue Shield and Pfizer provide useful activity on their sites. Large purchasers of healthcare services could set up a relationship with a provider or group of providers to enable better and more timely information exchange.

Another form of B2P relationships is the delivery of training and education. Healthstream (www.healthstream.com) provides on-line courses for continuing medical education credit (CME) by delivering courses whenever and wherever the provider chooses. Medscape (www.medscape.com), provides tools to track availability and completion of CME coursework, saving the clinician precious time in maintaining professional credentials. To assure that training meets the highest standards, the Accreditation Council for Continuing Medical Education (ACCME, www.accme.org/) provides standards and approvals for continuing education, both traditional classroom and electronically delivered.

B2P examples are:

- www.healthstream.com
- www.medscape.com
- www.accme.org/

KEY ISSUES WITH RESPECT TO B2P E-Relationship: Timeliness of information, quality of content, security of personal health information, limited electronic information maintained by small provider, information transmission standards might vary by payer.

Business to Consumer/Patient (B2C). Numerous different services and business models characterize B2C E-health initiatives, but all are focused on directly marketing and interacting with the consumer/patient. These commercial consumer health sites often obtain revenue from advertisements and other means, such as by serving as entry points to other areas or sites that sell products and services and may offer additional benefits such as the ability to store a personal medical record online in a protected site.

For example, www.rx.com provides visitors to the site with a large array of drug related content and links to prescription drug services. An increasing number of web sites sell prescription medications and non-prescription drugs and related products to patients on-line. Laura Gatland, writing in Web MD's "Focus on Health," [8] notes that the proliferation of internet prescriptions is sounding alarm bells for doctors, pharmacists and health authorities nationwide because of a lack of standards, even illegal practices, at some Web sites.[8] In 1999, the National Association of Boards of Pharmacy (NABP) began certifying web sites that dispense medications via the Verified Internet Pharmacy

Practice Site (VIPPS) seal. NABP's seal means that a site has appropriate federal and state licensing to operate a pharmacy and adheres to CIPPS criteria for professional conduct, such as compliance with a recognized quality assurance policy, security of prescription orders, and consultation between patients and pharmacists.

In addition to sites that sell pharmaceuticals, commercial avenues for patient's to store their own personal health records on-line are available, as well. For a nominal monthly fee, PersonalMD (www.personalmd.com) provides the consumer with the ability to maintain their own health records on-line including medication reminders as well as instructions on what combinations to avoid.

B2C Examples Sites:

- www.drugstore.com
- www.E-Healthinsurance.com
- www.rx.com
- www.webmd.com
- www.personalmd.com

KEY ISSUES WITH RESPECT TO B2C E-Relationship: Quality of content, security of personal health information, legal practices.

Business to Government (B2G). Compliance with governmental regulations makes this relationship a necessary, but sometimes uncomfortable one. From regulatory reporting and review to distribution of new policies and procedures, the Internet facilitates this exchange of information. In addition, the validation of secure information such as social security numbers and alien status can be performed through these exchanges. While this has been an evolving area, new tools have been provided at the federal, state and local levels, to facilitate this information exchange. The Food and Drug Administration (www.fda.org) tracks applications and test reporting electronically to ensure process integrity. To provide fairness in the purchase bidding process, both the New York City (www.nyc.gov/html/cityrecord/) and New York State (www.ogs.state.ny.us) have developed web sites to permit publication and filing of bids for services. The U.S. Center for Medicare and Medicaid Services (cms.hhs.gov/) also provides information and assists in follow-ups through its web site.

Examples:

- www.fda.org
- www.nyc.gov/html/cityrecord/
- www.ogs.state.ny.us/
- cms.hhs.gov/

KEY ISSUES WITH RESPECT TO B2G E-Relationship: Demand for more electronic services to improve the information exchange, need for standards for information exchange across all levels of government.

Business to Employee (B2E). Employers, usually via organizational intranets, are beginning to incorporate a number of different E-health processes such as health insurance plan maintenance, claims processing and links to participating provider organization's appointment and scheduling portals when available. For instance, the DoD's TRICARE On-Line (www.tricareonline.com) provides DoD employees with health related content, on-line health plan maintenance, appointment scheduling capability as well as pharmacy refill capability. Within the healthcare industry, integrated delivery

systems or multi-hospital systems often self-insure their employees and guarantee healthcare services to them. These type organizations may use their in-house human resource applications such as PeopleSoft and Lawson to provide similar health related transaction services.

With healthcare costs consuming an ever larger portion of employee compensation packages, pressure for employers to find ways to manage their cost exposure will continue making B2E healthcare portals an ever increasing necessity. The Leapfrog Group (www.leapfrog.org), a self-organized group of more than 100 Fortune 1000 companies, hopes to drive purchasing decisions by informing and educating employees, mandating comparative healthcare provider ratings and using substantial incentives to drive quality and cost in positive directions. James Holincheck writing for Gartner Research suggests that by 2004, 30% of Fortune 1000 companies will adopt healthcare cost management tools.[19] Most likely, these healthcare cost management tools will utilize B2E healthcare portals to that end.

Examples of B2E:

- www.tricareonline.com (access only for employees)
- www.att.com/resourcecenter (AT&T's employee intranet (access only for employees)
- www.humana.com (Humana's Emphesys product, allows employers using Humana plan to manage their health benefits, claims, etc.)

KEY ISSUE(S) WITH RESPECT TO B2E E-Relationship: Employers increasing provision of health information, to include making comparative health provider ratings available to its employees, may significantly influence future purchase decision dynamics; accuracy and validity of employer provided health information.

Provider to Provider (P2P). The exchange of information between providers in the paper world required the location of information, copying, collating and delivery. To facilitate care in a referral, the primary care provider might share limited information by telephone. Then, the referred physician would need to collect the information again. By making this information available electronically, the exchange could be more complete and require less manual intervention, saving time and potentially improving the quality of care. While some of this exchange is being done through site communication, much is performed within an intranet structure to ensure confidentiality and data integrity. The Computerized Physician Order Entry (CPOE) initiatives are examples of the developments in this area.

KEY ISSUES WITH RESPECT TO P2P E-Relationship: Demand for more electronic services to improve the information exchange, need for standards for information exchange, patient privacy and maintenance of information.

Provider to Consumer/Patient (P2C). Writing for Gartner Research, Thomas Handler, MD, Michael Davis and Barry Hieb, MD, suggest that by the end of 2003, more than 20 percent of patients will select physicians based in part on their ability to support patient/provider e-mail/messaging. They further suggest that by the end of 2005, fewer than 40 percent of physicians will be actively using patient/provider e-mail/messaging as

part of their practice workflow.[14] To be sure there are a number of provider to patient interactions that, arguably, may not require a full office visit; for instance answering simple questions, requests for refills, negative test results, etc. However, reimbursement for such provider-patient encounters is presently not uniformly in place. In addition, some providers may be hesitant to provide these E-health services until legal liability for electronic provider to patient encounters is more clearly understood. Meanwhile, companies like MyDocOnline (www.mydoconline.com) and Eppointmentsplus (www.eppointmentsplus.com) provide a portal based means of facilitating provider to patient interactions to include electonic interaction regarding appointments, billing questions, administrative questions, medical questions, phone message tracking and, in the case of MyDocOnline, even accomplish an on-line office visit.

Examples of P2C:

- www.mydoconline.com
- www.eppointmentplus.com

KEY ISSUES WITH RESPECT TO P2C E-Relationship: Reimbusement for provider-patient e-encounters, perceptions by providers of increased legal liability exposure and the potential to "be swamped by patient e-mail."

Provider to Government and Regulators (P2G) Reimbursement, licensure and compliance with regulations are some areas in which the providers and the government interact. From regulatory reporting and review to distribution of new policies and procedures, the Internet could facilitate this exchange of information if the provider has sufficient electronic sophistication and infrastructure. In addition, the validation of secure information such as social security numbers and alien status can be performed through these exchanges. While this has been an evolving area, new tools have been provided at the federal, state and local levels, to facilitate this information exchange.

Examples:

- www.fda.org — U.S. Food and Drug Administration
- www.jcaho.org — Joint Commission for Accreditation of Healthcare Organizations
- http://cms.hhs.gov/ — U.S. Center for Medicare and Medicaid Services

KEY ISSUES WITH RESPECT TO P2G E-Relationship: Demand for more electronic services to improve the information exchange, provider technology investment, standards for information exchange across all levels of government, patient privacy and information security.

Consumer/Patient to Consumer/Patient (C2C). Among the many positives that the internet has brought 21st century humanity, probably the most beneficial has been the incredibly empowering ability for people to self-organize around common causes, issues and areas of interest.[0] With the advent of electronic support groups formerly isolated patients could find others with similar predicaments, share stories and provide support and encouragement.

Sites like the Association of Cancer Resources Online (www.acor.org) and iVillage (www.ivillage.com) provide a virtual place for patients to chat with one another or post messages on electronic message boards. Rather than providing static content, electronic support groups exist as virtual discussion areas for sharing ideas among patients and their family regarding specific health problems and provide a source of mutual support among people afflicted with similar health problems. These support group sites tend to be free of charge and very popular. A few may be moderated by a health professional but most are freewheeling discussion groups with few rules about the exchange of ideas or advice provided other than staying on topic. People can anonymously join a sizeable online community to share personal information to a depth that is unprecedented in the face-to-face world. For people with depression or parents of children with ADHD, the friendships they form in these support groups often become pivotal in their social network. Specialized groups offer support for almost every type of mental disorder (e.g. trichotillomania) or life circumstance (such as divorce), as well as support for friends and family. Some email discussion lists and newsgroups, such as alt.support.depression on America OnLine (www.aol.com), claim to have tens of thousands of monthly users (Salem, Bogat & Reid, 1997). [22]

Examples

- www.ivillage.com
- www.aol.com
- http://www.acor.org/

KEY ISSUES WITH RESPECT TO C2C E-Relationship: Empowers patients, allows them to compare treatment plans, providers, etc. Reimbursements for provider moderated chat/advice. Need for monitoring by qualified clinicians to minimize the impact of rumor and limit the impact of misinformation being dispersed to large groups quickly.

Consumer to Government (C2G) The consumer, or patient, requires access to healthcare information on an "as needed" basis. Personal or family medical emergencies occur quickly and often require rapid decision-making. On-line information sources can help meet this need. In addition, with limited reimbursement, information regarding the availability of medications, treatments and alternatives is also offered by some government sites.

Others like the Missouri Department of Health & Senior Services provide a wealth of public health information to include a 2002 Consumer's Guide to **Hospital Surgery Volume**, community health data profiles, and a consumer's guide to managed care. [24]

Other useful sites include:

- www.floridacaptialnews.com/legistature/stories/020221bioterrorism.html
- www.health.state.mo.us
- www.fda.org
- http://medlineplus.gov
- www.healthfinder.gov

KEY ISSUES WITH RESPECT TO C2G E-Relationship: Medical and technical sophistication of the patient or patient family to access and understand the information that is available. Sometimes a hotline or other verbal interaction is

needed to clarify issues raised by the materials. For example, if a patient misspelled a disease and became upset by what was found, incorrectly, there might be negative consequences.

Government to Government (G2G). With the tragic events of 9/11/2001 as a backdrop, the need to find a means to more effectively share health related information has never been more imperative. National disaster preparedness, homeland defense, and public health initiatives, all have as critical success factors, the need to more effectively share health information. Information on potential outbreaks, pathogen and toxin exposures all beg for E-health solution sets to facilitate a secure means of conducting these activities. HIMSS' own National Preparedness & Response (NPR) task force is calling for the development of a National Health Information Infrastructure (NHII) that would provide a secure means for local health providers and state and national health officials to integrate their E-health collaborative efforts as a means of preparing State's and the Nation for the threat of biological, chemical or nuclear terrorism. [16]. Presently there are numerous state level initiatives such as Kentucky's Health Alert Network Web Resource Center and Florida's Merlin Disease Reporting System in conjunction with the National Center for Disease Control (CDC).

Examples

- publichealth.state.ky.us/bioterrorism.htm
- www.nyc.gov and click on "Public Safety"
- www.cdc.gov

KEY ISSUES WITH RESPECT TO G2G E-Relationship: Standardized data sets to share information horizontally across the spectrum of healthcare delivery organizations; funding for the NHII;, Incentives to encourage vendors and government organizations to work towards common solutions.

Government to Employee (G2E). There are a number of government sites that provide health related information to employees, particularly in the context of public, occupational and bioenvironmental health. The Occupational Safety and Health Administration (www.ohsa.gov) offers free access to a variety of health related content to include health information on pathogen and chemical exposures as well as information on such behavioral topics as workplace violence. The Centers for Disease Control (www.cdc.gov) provide employees concerned about various workplace exposures with survey data on employees that have potentially been exposed to specific agents across a variety of industries and business types. The Environmental Protection Agency (www.epa.gov) has an entire web section devoted to human health including drinking water advisories, occupational health and children's health. In short, numerous government agencies through their research programs and normal data collection processes possess a host of information that employees seek.

Examples

- www.ohsa.gov
- www.cdc.gov
- www.epa.gov

KEY ISSUES WITH RESPECT TO G2E E-Relationship: Empowers and informs employees.

Implications for E-health

While "caveat emptor" may be an appropriate message for those hoping to find a bargain in the electronic marketplace, it is not suitable for those participating in E-health. Interstate communication, quality of equipment and clinical practice using electronic tools raise important legal, quality and security issues. The Health Insurance Portability and Accountability Act (HIPAA) of 1996 establishes standards for the exchange of information and rules on security and confidentiality, as well as dates for compliance. [17] However, it does not address the issue of information content and quality.

Legal

The development of the Internet has opened many opportunities for healthcare professionals and consumers. This fast-paced method of mass communication and information retrieval has exceeded subsequent development in the law. Very little statutory or case law authority exists for e-health today. Furthermore, serious legal issues must be considered when using the Internet for health and medical information dissemination.

First, the area of telE-Health has raised legal concerns regarding the practice of healthcare professionals, such as physicians and nurse practitioners, through electronic dissemination of healthcare information. As a result, new legal issues have emerged pertaining to interstate licensure. A practitioner may call upon other healthcare professionals, perhaps in a different state, for their medical expertise. Patient x-rays, lab work, and other medical information may be shared between practitioners via the Internet. However, traditional understanding is that healthcare practitioners may not practice in states where they are not licensed. Today, much consideration has been given to allowing the interstate practice of medicine where telE-Health may be used in a sensible manner to benefit the patient and improve health care [9].

Second, major legal challenges have emerged regarding how to protect the privacy of individuals disclosing personal, sensitive, and identifiable health information. One may argue there is no greater liability risk than the unauthorized revelation of medical information without proper individual consent. Many states have adopted legislation protecting the confidentiality of medical information of its citizens. Federal law has also put forward comparable but limited contextual protection through the Centers for Medicare and Medicaid Services. Stringent new confidentiality requirements are being developed as part of the regulations under the federal Health Insurance Portability and Accountability Act of 1996 to protect individual privacy and the unauthorized disclosure of privileged information. In addition, sponsors of health-related websites need to take extraordinary steps to protect consumer confidentiality. One way to accomplish this is to have prominently displayed privacy policies posted on their websites [9,18].

Third, sponsors of health-related websites must take precautions to limit liability. To restrict liability, websites should display disclaimers in the form of user agreements. These user agreements should be extensive and concise, and should attempt to cover every plausible risk for liability. E-health websites often use mandatory arbitration clauses in their user agreements in an attempt to minimize liability. This approach compels consumers to give up their right to initiate litigation, leaving them with inadequate protection and few resources. In addition, sponsors of health-related websites must disclose the limitations of the information provided on their site. Health information obtained by the consumer is intended to elicit discussion and communication

between the consumer and the primary care physician before a consumer initiates self-treatment or alters an existing treatment regimen. Furthermore, specific policies and procedures should be in place to provide guidance to both consumers and sponsors [6].

Last, the growing popularity of Internet pharmacies has raised new legal concerns. Many Internet pharmacies run lawful business operations that require a consultation from a licensed healthcare practitioner and a prescription for any medication. However, numerous Internet pharmacies bypass both the face-to-face interaction with a licensed healthcare practitioner and the need for a prescription for medication distribution. These illegal websites make it easy for consumers to purchase medications without a proper advisory and put consumers at an increased risk for purchasing contaminated or counterfeit medications, the wrong or outdated medications, the incorrect dose of a medication, or subjecting them to dangerous or lethal drug reactions or interactions. Furthermore, these illicit Internet pharmacies do not properly warn consumers of the serious side effects associated with taking unnecessary medication, especially antibiotics. [6, 7, 23]

The interest in obtaining unprescribed antibiotics from the Internet reached its peak shortly after the September 11th terrorist attacks, which threatened some of our communities with the anthrax bacteria. Frightened consumers flocked to Internet pharmacies to purchase Cipro, an antibiotic found to successfully treat some forms and cases of anthrax, without a prescription or proper diagnosis. What the average consumer may not know is that the random and unnecessary use of antibiotics such as Cipro could speed the development of drug-resistant organisms, rendering the antibiotic useless and treatment of illness unsuccessful. Consumers must be wary of putting themselves at risk for adverse side effects or allergic reactions from taking unnecessary and unprescribed medications [6].

Safety

Health information, products, and services have the potential to both improve health and cause harm. Organizations and individuals that provide health information on the Internet have an obligation to be trustworthy, protect users' privacy, and adhere to standards for best practices for on-line commerce and professional services in health care.

Today, con artists are using the Internet to defraud consumers in a variety of clever ways. Fortunately, law enforcement is on the "cyber-case" by setting up databases, which are able to compile consumer complaints. In addition to putting many of these "dot con artists" out of business, the Federal Trade Commission, the nation's primary consumer protection agency, wants to educate consumers on how not to get caught in Internet scams, especially when it comes to their health and well being [25].

The Federal Trade Commission offers these tips to Internet health consumers [6]:

> 1. Be wary of extravagant claims about performance or treatment potential. Get all promises in writing and review them carefully before making a payment or signing a contract.
>
> 2. Read the fine print and all relevant Internet links. Fraudulent promoters sometimes bury the disclosures that they are wary of sharing by putting them in very small, fine print or in a location where you are unlikely to find them.

3. Look for a privacy policy. If you do not see one or if you do not understand it, seriously consider taking your interests elsewhere.

4. Be skeptical of any company or organization that does not state its name, street address, and telephone number. Web sites should have some form of feedback or contact information available. Check the site out with the local Better Business Bureau or consumer protection office.

5. Always consult a healthcare professional before altering any current treatment regimen or buying a "cure all" product that claims to treat a wide range of ailments or offers quick cures and easy solutions to serious illnesses.

With the high-speed communication methods available, the absence of effective safeguards will quickly diminish the credibility of the Internet and e-healthcare. Regaining the trust of a disenchanted population is significantly more difficult than developing new technologies for healthcare delivery with supportive participants.

QUALITY

The quality of healthcare delivery in a standard, "brick and mortar" environment is demonstrated by the application of controls and measures to insure that the best standard of care practices are employed, that all staff is well trained and that the delivery of services are the best possible by the institution.

In e-health, quality measures are also needed that address the various areas of healthcare delivery. Initially, there were concerns a considerable portion of Internet-delivered health information could be inaccurate, invalid, misleading, or fraudulent, and consequently pose a threat to public health. In the area of information and education, some efforts have been made to improve the quality and consistency of information.

The Health on the Net (HON) Foundation (www.hon.ch) based in Switzerland is a not-for-profit organizations whose mission is to guide laypersons or non-medical users and medical practitioners to useful and reliable online medical and health information. In addition, HON attempts to set ethical standards for health related web site developers. Many health related websites display the HONCode to signify to browsers that its site adheres to the HON Code of Conduct. If any individual users come across dubious quality on a site that carries the HONCode, they can send an e-mail to HON. If the particular site in question does not satisfactorily respond HON will delete the site's registration from the HONcode index.[16]

Additionally the National Association of Boards of Pharmacy (NABP) began certifying web sites that dispense medications via the Verified Internet Pharmacy Practice Site (VIPPS) seal. NABP's seal means that a site has appropriate federal and state licensing to operate a pharmacy and adheres to CIPPS criteria for professional conduct, such as compliance with a recognized quality assurance policy, security of prescription orders, and consultation between patients and pharmacists.

Mitretek Systems (www.mitretek.org), supported by the Agency for Healthcare Research and Quality (AHRQ),assembled a Health Summit Working Group that developed seven criteria for use in evaluating the quality of health information provided on the Internet. These criteria are intended as a resource for consumers seeking health-related

information on the Internet and should aid in evaluating information to determine whether it is usable and credible [17]:

1. Credibility: Credibility includes the source, author(s), and sponsors, currency of information, relevance and utility of information, and editorial review process for the information.

2. Content: Content must be accurate, complete, and provide an appropriate disclaimer.

3. Disclosure: Disclosure includes informing the user of the purpose of the website, as well as any profiling or collection of personal information associated with using the website.

4. Links: Internet links are evaluated according to their relevance to the primary website's focus, content, and back linkages.

5. Design: Website design consists of accessibility, logical organization (navigability), and the provision of an internal search capacity.

6. Interactivity: Interactivity includes establishment of a feedback mechanism and channel for exchange of information among users.

7. Caveats: Caveats take into account the clarification of whether the website function is to market products and services or to act as a primary information content provider.

As the concept of e-health expands beyond information gathering and education, other quality issues arise:

1. Completeness: Methods should be employed to ensure that all elements of the transmission have occurred successfully or some indication that the transmission was interrupted. For example, incomplete or interrupted delivery of a cat-scan series could lead to a potential misdiagnosis of a patient's condition.

2. Confidentiality: Procedures for validation that the information sent was identified properly and received only by the authorized party which have been implemented for fax technology are applicable in this domain.

3. Security: Protections against eavesdropping, such as encryption, secure services, firewalls, virtual private networks and other related techniques are necessary. In addition, validation methods to ensure that the receiver of information is authorized to accept it are essential. Proper disposal of information should also be considered in this framework.

4. Timeliness: In healthcare, time is frequently "of the essence." The immediate delivery of information may be necessary to facilitate quality patient care. As e-health expands beyond general information lookup and more elements of the healthcare delivery continuum become interconnected, the dimension of time becomes an integral part of the patient treatment process.

5. Accuracy: While HON, URAC and other groups have started to monitor general healthcare information on the Internet, clinical healthcare partners must ensure that all transmissions include the most accurate patient-specific information available. Clearly defined inter-facility processes and quality checks are required for the success of this element.

6. Retrieval: Delivery of information to a recipient only means the transmission has made it to the clinician's virtual front door. Only after acceptance and acknowledgement by the intended recipient, can the transmission be considered complete.

7. Comprehension: While a layperson may be challenged by the terminology of Gray's Anatomy, other tools available on the Internet might make the teaching task easier. In a similar way, the transmission of clinical information between providers or instructions between physician and patient need to be understood by the recipient before the exchange is successful.

Conclusion and a Call to Action

E-Health is emerging as a complex effort to deliver complex and coordinated health care services in a simple manner. To continue the early successes of this endeavor, all the constituencies involved must invest and participate to make this technology framework grow with the demand.

The participation includes the following elements:

1. Continue research to document findings to share experiences and information. Successes are good – but learning from the "less than successes" is also an integral part of this process.

2. Continue to debate on the evolution of the definition and scope of E-Health. Does it include treatment? Is it only an information tool?

3. Continue to pilot new technologies and programs; to assisting to promote solutions for the development of the EHR and Patient Safety improvements

4. Continue to integrate these new internet technologies in the daily workflows

5. Continue to expand the training and familiarity with the E-Health services for patients and providers so that new information and techniques become small, frequent, natural incremental steps rather than investing in a "Big Boom" approach.

6. Use E-Health to improve the delivery of healthcare to those who might be more difficult to reach: the homebound, the migrants, the uninsured and underinsured.

7. Recognize that no single entity will own this technology explosion. However, all who agree to work using consistent standards, common formats and language, will be successful in these new endeavors.

8. Identify ways to charge for the services provided through E-Health, either in overall cost reductions or other mechanisms, such as charging for research and training in information access and usage. However, charges should not be a barrier to receiving care.

In any case, the definition will not restrict the growth of E-Health as driven by the patients, the providers and the payers. The confidence of the patients will be supported by the willingness of providers to move in this direction.

Publish, Interact, Transact, Integrate and Transform – these are the steps that will reinforce the movement towards a more robust and expansive E-Health model.

The E-Health Portals should make healthcare and information more accessible with the end goal of improving patient care and the health status of all. "The use of technology to ultimately improve patient outcomes is not going away." [1]

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