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# The Emergence and Potential Impact of Medicine 2.0 in the Healthcare Industry

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**THE EMERGENCE AND POTENTIAL IMPACT OF MEDICINE 2.0 IN THE  
HEALTHCARE INDUSTRY**

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# **THE EMERGENCE AND POTENTIAL IMPACT OF MEDICINE 2.0 IN THE HEALTHCARE INDUSTRY**

## **ABSTRACT**

Medicine 2.0 has emerged within healthcare information technology to enable more defined relationships between providers and patients. Physicians, hospitals and patients are using Medicine 2.0 through social networking to maintain their foothold in the evolution of medical technologies. The purpose of this study was to determine potential improvements related to the impact that Medicine 2.0 has on communication and collaboration of healthcare information. Research has shown that Medicine 2.0 has integrated into the healthcare industry and is enabling an increase in communication in healthcare matters. The provider patient relationship is improving by the use of Medicine 2.0 and has positively impacted society so far.

**KEY WORDS:** Medicine 2.0, Health 2.0, Web 2.0, Social Networking, Health Information Technology

## **INTRODUCTION**

The creation of the Internet has greatly influenced how individuals communicate and share information. Internet use among individuals living in the United States (U.S.) has been found to be 74.4% with 252.9 million users (Internet World Stats 2010). Online social networking is the use of web technologies to provide forums for internet users regardless of demographics to communicate and share information (Boyd & Ellison 2007). The use of social networking includes blogging, utilizing MySpace or Facebook pages, and posting videos on YouTube. With the adoption of social networking within private homes amongst a growing number of users, it is important that the healthcare industry utilize it as an economical way of communicating. Intertwined with medical use, social networking allows for physicians to engage in the revolution of collaboration and communication with the most amounts of people for the least amount of money (Giustini 2006).

The most recent medical application on the Web is the emergence of Medicine 2.0. Medicine 2.0 can generally be defined as Web-based services for healthcare consumers,

caregivers, patients, health professionals, and biomedical researchers, which use the Web 2.0 technologies to enable things such as participation and collaboration between user groups as related to healthcare (Gunther 2008). Medical technologies have evolved in recent years allow efficient utilization for physicians to interact with patients and physicians. Before Medicine 2.0, Web 1.0 functioned to access information in documents, by the use of the email and hypertext links on the World Wide Web progressing into Web 2.0 referring to the new ways the internet is used as an interactive tool to use social networking and the use of the Internet to create value through mass participation (McKean, Richards and Wardman 2007; Nature Medicine 2.0 2007). The development of Medicine 2.0 can improve the care of patients and potential reduction in costs for providers if properly utilized amongst such a mass market of patients and physicians.

The purpose of this literature review in Medicine 2.0 was to determine potential improvements within the healthcare industry related to the impact that Medicine 2.0 has on communication and collaboration of healthcare information.

## **METHODOLOGY**

The methodology of this research study was conducted in various stages and identified many key published articles. The stages included defining the search strategy, defining the research topic and identifying relative data to the topic, and assessing the validity of the data retrieved from the searches.

The aim of the search was to retrieve published literature relating to healthcare technology regarding the term “Medicine 2.0” OR “Health 2.0” OR “Web 2.0” AND “collaborative care” OR “hospital” OR “physicians” OR “participation in healthcare online” OR “social networking in healthcare”. To identify articles, electronic databases PubMed, Ebscohost, and Marshall University library’s online journal article databases were used. Google, Google

Scholar, YouTube, eHealth, healthcareblog, Yahoo, and Bing search engines and websites were also investigated.

The literature review yielded a total of 18 relevant articles. The articles were retrieved to define the purpose of the research and were necessary in depicting an accurate conclusion. The conceptual framework guided the research in determining the potential improvements within the healthcare industry in relation to the impact of Medicine 2.0.

The search strategy was limited to articles that were published within the last five years in the English language due to the recent increase in utilization. Original articles, editorials, and reviews were all included, including primary and secondary data. Only full text copies of the articles were reviewed. The literature search was conducted by TS and SZ and was validated by AC.

## **RESULTS**

### *Defining Medicine 2.0*

No absolute definition of Medicine 2.0 exists. Health 2.0 is often interchanged with the term Medicine 2.0. A study completed in 2009, used a systematic literature review of electronic databases (PubMed, Scopus, CINAHL) and “gray” literature on the Internet using the search engines Google, Bing, and Yahoo to find definitions of Health 2.0/ Medicine 2.0, which revealed 1937 articles, 533 scientific databases, and 1404 in gray literature all of which were assessed and unique definitions extracted (Van De Belt 2010). The study concluded that Health 2.0 or Medicine 2.0 has 46 unique definitions with seven recurrent topics: Web 2.0 technology, patients, professionals, social networking, health information and content, collaboration, and change of healthcare (Van De Belt 2010). Furthermore, at the 2007 Health 2.0 Conference, the founders of the conference offered a definition of Health 2.0 as focusing on user-generated

aspects of Web 2.0 within healthcare but not directly interacting with the mainstream healthcare system (Skiba 2009). Eysenbach (2008) has defined Medicine 2.0 as applications, services, and tools that are Web-based services for healthcare consumers, caregivers, patients, health professionals, and biomedical researchers, that use Web 2.0 technologies and or semantic web and virtual-reality tools, to enable and facilitate specifically social networking, participation, apomediation, collaboration, and openness within and between these user groups. So for this scholar, is a web-based service available for healthcare consumers, caregivers, patients, health professionals and biomedical researchers, used to enable and facilitate specific aspects of the healthcare field amongst a vast array of user groups (Eysenbach 2008). According to Hughes, Joshi, and Wareham (2008) it is specific to a set of Web tools used by providers, patients, and scientists, using principles of open source generation of content by users. These users utilized the power of networks in order to personalize healthcare, collaborate, and promote health education.

#### *The General Concept or Using Medicine 2.0*

The principles of open access, shared intelligence, collaboration, user engagement, and networking are entwined in many definitions of Medicine 2.0. All of these terms lead to a main theme of importance circling around Medicine 2.0 being that of patient empowerment or allowing active participation in healthcare by the use of information and communication technologies. The central idea being the better web information availability, the better informed decisions not only physicians can make, but also citizens can make, allowing patients to become agents of their own healthcare (Hawn 2008).

Medicine 2.0 allows patients collaboration with peers or healthcare professionals, which contributes to the central idea of Medicine 2.0 being that of patient empowerment. Patients using Medicine 2.0 are shown to share connections through chat rooms and email. Today patients are

able to build more sophisticated virtual communities that enable them to share information about treatment and coping while building a personal network of friends (Landro 2006). For example, at Dailystrength.com patients and caregivers dealing with different diseases or health conditions, can join a support community, start a wellness journal, share advice, and even send members a virtual hug (Landro 2006). Also, the internet poses as a wealth of information for patients to access regarding healthcare issues. According to a recent survey conducted in 2008, 37% of participants indicated they had one social networking account, 53% have two accounts, and 9% reported having three social networking accounts (Coyle & Vaughn 2008). Barsky (2006) found that 27% of Internet users read blogs, which was a 58% increase from previous 2004 surveys. Thirty-five percent of other study participants were found to use the internet for healthcare information with the most utilized sites being portals, government sites and nonprofit organizations. Fifty-three percent of these participants conveyed that they shared the information that they accessed on the internet with their physician (Bansil, Keeman, Zlot, & Gilliland 2006). In a different study of patients utilizing three urban ambulatory clinics in Buffalo, New York, 33% of participants were found to use the internet for health information and 22% of those individuals had family and friends assist them in accessing the internet (Dickerson, Reinhart, Feeley, & Bidani 2004).

### *Hospitals and Social Media Networks*

Statistics comparing the utilization rates of different social networks may predict potential behavioral outcomes. As of February, 2010, Facebook had 400 million users, surpassing Yahoo's search engine as number two most popular site in the United States (Owyang 2010). In 2011 this number increased to 500 million (Facebook 2011). Another notable network is Twitter. Twitter allows users to rapidly update their behaviors multiple times throughout the day to communicate

with others following their “tweets.” Tweeting is a progressive social network that has grown by 1,400% in one year with 2.5 million tweets per day in 2009 to 50 million tweets per day equaling to 600 tweets per second (Owyang 2010). In late 2010, it topped MySpace and became the second most popular social media website in the world, declaring almost 100 million users (Social Times 2010).

As of May 2011 Bennett (2011) reported that 965 hospitals were utilizing social networking as a communication tool. Within this group, 486 hospitals had a YouTube channel, 777 hospitals had a Facebook pages, 714 hospitals had a Twitter account and 120 maintained a blog (Bennett 2011). With about 5800 operating hospitals in the US this represents about 12% of the hospital population. While this may appear to be a small number at first glance it is important to note that the growth rate in recent years has been substantial and there is no evidence that it is slowing. In 2009 there were only 367 hospitals (about 6%) using the internet to respond to patient questions or enhance customer service but, by early 2010 this number had increased to 557 hospitals (about 9.5%), (Bowles, 2009; Woods 2009). While the percent of hospitals utilizing the internet may still be relatively small it has increased over 40% within the last two years. Twitter has expanded into the health field with “Twitter For Health.” While this “micro-blog” post is restricted to only 140 characters, Twitter users are able to “follow” others meaning ability to receive frequent and immediate information when a “tweet” is input (Jessen 2008). A list of the top 50 Health “Tweeple,” including physicians, nurses, medical librarians, medicine and health 2.0 educators and advocates, and healthcare entrepreneurs worldwide, was compiled for users to follow to receive immediate information about healthcare (Jessen 2008). Twitter has used the ability to effectively reach millions of people to engage users with one

another along with healthcare professionals on a list compiled based on the Health “Tweeple’s” quality of contributions and overall influence in their field of study.

In addition to volume growing the depth and breadth of sophistication is expanding. For example, in 2009 the Henry Ford Hospital used Twitter to connect with 1900 individuals to respond to questions in real time during brain surgery (Squazzo, 2010). Children’s Mercy Hospital in Missouri began a program where up-to-date information about surgery progress was uploaded to Twitter. The surgeon reports, in twitter, eased much of the anxiety of the worried families (Parker-Pope, 2009)

### *Physicians and Medicine 2.0*

Physicians are using social networking through Medicine 2.0 to engage their patients in deeper more reliable relationships. Patients are using networks to rate physicians, discuss their diagnosis, search information about symptoms, find physicians, share experiences, seek second opinions and become more knowledgeable of their condition. One patient, of who was diagnosed with ALS (Lou Gehrig’s Disease), used a social networking site to find treatment on the web site “Patients Like Me” (Gupta 2008). The website allows information to be accessed by anyone who goes on the site and allows patients to find how they’re doing relative to the rest of the world, disease progression, what treatments are they relative to others with the same condition and is their dose higher or lower (Gupta 2008). This particular patient sought out treatment specifications from other users and found that 16 ALS patients benefited from using the drug Lithium. About 2,800 people using the web site in the ALS community link now use the drug and have used their collective wisdom to push for a conventional clinical trial that may have otherwise taken years (Gupta 2008).

Not surprisingly the number of websites devoted specifically to health practitioners is growing both in volume and number of participants. Sermo, a social network exclusively for medical providers, was founded in 2006 and have grown to 111,000 members by 2009 and now boasts a membership of 115,000 providers in 68 specialties in all 50 states where physicians share, exchange observations, medical diagnosis and where physicians get help with everything from patient care to practice management in a confidential environment (Sermo 2010) . Physicians have used Sermon in the ER to gather input to decide how to treat acute cases (Kane, Fishma, Gallagher and Glaser, 2009). While Sermo may currently be the largest website it certainly is not the only one. Medscape claims a user population close to 100,000 physicians and while many discussion topics focus on medical practices and procedures there is a substantial amount of chat transmitted through the site (Morrison 2009).

## **DISCUSSION**

As Web 2.0 has transformed the medical industry and medicine, it has changed the relationship between patient and providers. Multimedia tools are becoming increasingly valued in medical schools and hospitals. In the past years, Web 2.0 has been put in the spotlight by several physicians and medical librarians emphasizing the excellent impact it has made in clinical practice (Boulos, Maramba and Wheeler 2006).

The means for communication within the medical field is paramount and is not only expanding rapidly throughout the patient population; it is also covering the professional providers in their communication and publication methods. Social networking and the use of Medicine 2.0 is a positively effective means of communication in the modern day world. With the increasing number of users seeking information and with such vast improvements in technology, Medicine 2.0 has created a portal for technology accessible users to engage in and

benefit from. This concurs with Lagu (2010) who describes that the main advantage of social networks for healthcare professionals is to enhance the ability to facilitate communication among professionals— physician can post problem and have numerous pieces of feedback within a short time frame.

Several positive repercussions of Medicine 2.0 have developed including: increased speed of pace of research, better network coverage and speed, lower accessibility costs and an overall relationship improvement within healthcare. Patients seek information on the web to self diagnose and gain knowledge of their conditions.

Technology is becoming a vital means of communication with studies showing the preference of use. A society of technology savvy individuals has evolved in most recent years due to the development and accessibility of information. Web users are able to access any information to find relevant medical information when they need it. In an age of technological dependence, it is essential physicians communicate in a way patients are most engaged and readily available (Hawn., 2009). Medicine 2.0 consumes less time to input data to be viewed by physicians than seeing the millions of people who can access the information all at the same time. Medical data and transparent information on social networking sights are relevant due to the frequency of information updating. Physicians around the world can connect to websites and social networks to compare medical knowledge and diagnosis to leave less room for error in judgment. The Airwide Solutions report has proven today's society is less conventional ways of voice communication and converting their wants into their needs with textual data. Data searches have increased as technology is more available.

A few drawbacks from utilizing Medicine 2.0 and getting the full use are accessibility and pricing. While cost has decreased for physicians to provide information on the internet to be

read rather than on the telephone to be heard and patients not feeling the necessity to see the doctor for information that can be found on the web, accessibility costs becomes a factor. Technology is not inexpensive and is only useful to those who can connect to the multimedia websites. Privacy becomes an issue when sensitive material gets extracted from the internet about personal health matters. An issue of validity is a common subject with patients using blogs or social networking sites not knowing the exact origin of the information. The ALS patient that used “Patients Like Me” to seek treatment was able to improve the speed of treatment and treated herself. This in particular situation had positive outcomes, but there are possibilities of medication mixing or mistreatment through insufficient online information.

## **CONCLUSION**

Medicine 2.0 is able to offer potential improvement in healthcare and a reduction of costs in the healthcare market. Medicine 2.0 is a set of proven innovative technology that improves the quality of care, expands medical knowledge, and allows better communication and collaboration between not only patients, but also providers with other providers and providers and their patients. Overall, a wealth of knowledge is overwhelmingly advantageous for patients, hospitals and physicians alike in relational matters and specific medical knowledge.

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