

Text Messaging in Healthcare: The Elephant Knocking at the Door

Introduction

In discussions of telemedicine modalities, text messaging, also more technically referred to as SMS for Short Message Service, isn't the elephant in the room, the one everybody's ignoring and afraid to talk about. Text messaging is the elephant at the door, the one everybody knows is trying to get into the room, but nobody's quite sure how it'll fit through the door, how big it is, or what exactly they're going to do with it once it gets through.

Comparatively, the U.S. is behind the rest of the world in terms of text messaging. Research company SNL Kagan (Charlottesville, VA) released a report in 2007 estimating that 84% of the U.S. population—including consumers, business users and people with multiple units—would have mobile phones by the end of 2007, which would surpass 100% by 2013. Yes, that's 'surpass' 100% due to the number of multiple unit owners. Informa Telecoms and Media (London, UK) reported in 2006 that thirty countries had exceeded 100% cell phone penetration in that year.

It is further estimated that 50% of the global population currently owns a mobile phone and 98% of those phones have text messaging capabilities. Here's one more statistic to further drive home the growth of text messaging: According to messaging services provider Acision (Nieuwegein, Netherlands), on New Year's Day, January 1, 2008, 43 billion text messages were sent globally.

Text Messaging Basics

A text message, sometimes called SMS, is a communications protocol that allows mobile telephone users to deliver short text messages to each other. SMS, for Short Message Service, is actually one type of technology standard, although there are alternates such as ANSI CDMA networks, Digital AMPS, satellite and landline networks, and MMS (Multimedia Messaging Service, which includes the sending of images, audio, video, and rich text). And this is where the entire subject of text messaging can become very complicated, because it involves numerous overlapping and competing technology platforms and standards. In the context of this article, text messaging will typically refer to SMS, with its 160-character limitation. However,

in the wider world of mobile technology, MMS and SMS and other platforms are evolving and interacting. In many cases, general users worldwide may refer to text messaging as SMS, but the technology they're referring to is MMS or other platforms.

SMS, from a technological point of view, refers just to sending text that is limited to 160 characters, including spaces. An evolution of SMS is EMS, which stands for Enhanced Messaging Service, and allows mobile phones to send and receive messages with special text formatting like italics, bold, animations, pictures, icons, sound effects and special ring tones.

SMS is generally considered first generation text messaging. NGM, or Next Generation Messaging, is beginning to show up in the marketplace and will undoubtedly solve some of the limitations issues currently found with SMS and MMS, especially as 3G (third generation of mobile phone standards and technology) becomes more commonplace and so-called "smart phones" become ubiquitous.

Why Text Messaging in Healthcare?

In 2007, BJ Fogg, PhD, Director of the Stanford Persuasive Technology Laboratory (Stanford, CA), sponsored a conference called Mobile Persuasion. Its focus was how mobile platforms and technology can be used to change attitudes and behaviors. The results have been published in a book, "Mobile Persuasion: 20 Perspectives of the Future of Behavior Change" (Stanford Captology Media; 2007) that is available via Amazon or directly from the laboratory. Fogg says, "The insight from the conference, at least for me, was that the only thing that really, really works today is texting. Everything else is sort of hypothetical or only works on the handset."

The result of that insight was a Texting4Health Event, that Fogg expects to occur about every two years. One of the presenters for the conference was Janice R. Nall, with the Centers for Disease Control and Prevention's National Center for Health Marketing. Her presentation, "Why CDC Cares About Mobile Health" included twelve attributes of text messaging for healthcare, which were:

- Always on and with you

- Reaches across demographic lines—underserved populations
- Contextual
- Inexpensive to own
- Two-way communications—engagement opportunities
- Emergency alerting tool
- Surveillance tool—not just dissemination or engagement
- Immediacy of action and response
- Measurable results
- Portability
- Geographical positioning
- Text, audio, and video.

Fogg notes that he and his students have identified ten different modes that can be used with texting. He is writing a chapter on the subject for the book to come out of the conference, “Texting4Health” and as a result, declined to divulge all ten. However, he was willing to discuss three of them.

First, says Fogg, “You can broadcast a message out to thousands of people.” He provides the example of a large medical system such as Kaiser, sending a text message to all the men in their system who were in their forties, providing information about a new vitamin they should be taking.

Two, data collection. Because there is possible two-way communication via texting, it can be used to survey patients and ask for information, such as, “What is your heart rate every day at 3:00?”

“Or,” says Fogg, “It can be more group oriented and collaborative, like Twitter, which is a way that people can share short messages with a specific group.”

With approximately three billion mobile phones in use worldwide, accessibility is one of the primary reasons text messaging is beginning to garner so much attention in healthcare. Fogg notes, “Texting is, other than voice, the way to send data across a network. As great as the Internet and Web pages are, what’s really happening is mobile and the only thing you can really do with mobile is texting, so you have this huge capability. Mobile matters because the phones are always with us, so we can use them in different contexts in our lives, whether we’re waiting for a bus or we’re shopping or making decisions—do I buy this pasta or this rice? Which is healthier? They’re very personal devices. It’s the most personal technology we have.”

Applications

Jonathan Linkous, CEO of the American Telemedicine Association (Washington, DC), notes that, “There are a lot of different uses of text messaging in many different contexts right now.” He notes that one is for it to be a part of regular home telemonitoring. Patients sign onto a service every day and answer specific questions about their

health. “Sometimes,” says Linkous, “that is teamed up with taking vital signs and sometimes there are applications that use cell phones for people to ask questions of the physician—text messaging as an interactive activity. There are also types of text messaging where a physician will e-mail or text message a patient with laboratory test results.”

To-date, however, the types of health-related text messaging applications are typically non-clinical. Linkous says, “We are seeing clinical applications being demonstrated right now, but it’s not coming into widespread use. Yes, it is being demonstrated, both in terms of monitoring patients on a regular basis as well as providing information. It’s being explored in terms of use in clinical diagnostics using branch-tree logic, but we’re still a few years away from that.”

What follows are profiles of three companies that utilize text messaging successfully in a healthcare setting: Internet Sexuality Information Services, Inc. (ISIS); Intelecare Compliance Solutions, Inc.; Smile Reminder.

COMPANIES OR ORGANIZATIONS MENTIONED IN THIS ARTICLE

Acision

www.acision.com

American Telemedicine Association

www.atmeda.org

Centers for Disease Control and Prevention National Center for Health Marketing

www.cdc.gov/healthmarketing/

Epocrates, Inc.

www.epocrates.com

Informa Telecoms and Media

www.informatm.com

Intelecare Compliance Solutions, Inc.

www.intelecare.com

Internet Sexuality Information Services, Inc.

www.isis-inc.org

Smile Reminder

www.smilereminder.com

SNL Kagan

www.snk.com

Stanford Persuasive Technology Laboratory

<http://captology.stanford.edu>

Internet Sexuality Information Services, Inc. (ISIS, Oakland, California)

ISIS is a nonprofit company based in Oakland, California that works both nationally and internationally to use technology and new media for sexual health promotion and disease prevention. In 2006 they developed a text messaging project called SexInfo that was implemented for urban use in San Francisco via a partnership with the San Francisco Department of Public Health (SFDPH). The program was designed to provide sexual advice to young people via text messages.

The telephone numbers for the program were posted on billboards in the area. The user—typically between the age of 12 and 24—sends the message “sexinfo” to one of two phone numbers set up by the health department. Users receive a response within a couple minutes asking them to clarify their question by way of a menu of options. Typical questions involve what you should do if a condom breaks or how you know if you have a sexually transmitted disease. The entire process takes only minutes and typically ends with a phone number the user can call for further assistance.

A TEXTING VOCABULARY

Because text messaging and SMS have a 160-character limitation, text message users have developed a vocabulary all its own to keep messages brief. It doesn't take much exposure to it to get a handle on it, but it becomes obvious pretty quickly that it could create confusion among users, who may have personal variations as well. Here is a sampling of typical text vocabulary.

2 = To or Too
c = see
ez = easy
b4 = before
2nite = tonight
brb = be right back
ttyl = Talk To You Later
btw = by the way
lol = laugh out loud
k = okay
w8 = wait
ty = thank you
r = Are
u = You
imo = in my opinion

Do u gt it? EZ if u no how. TTYL.

Deb Levine, MA, Executive Director of ISIS, says, “In the first quarter of usage we had 4,500 inquiries, 2,500 which led to further information, resources and referrals. We ran a marketing campaign in San Francisco that included bus shelters, billboards, business cards handed out in local high schools, events and radio public service announcements. During that period we also worked with SFDPH to evaluate the project.”

Levine is careful to note that SexInfo is an information and referral service. “I would not provide diagnoses over text messaging. All the people and focus groups have considered it a private and accessible way for them to receive sexual health information and referrals.”

This age group in particular is heavy text messaging and mobile phone users. Levine says, “Close to 93% of young people have mobile devices. They have them with them and on all the time. When we talk to young people they consider it to be private, much more private than looking at a computer screen in the library where someone can look over their shoulders, and/or going to talk to a trusted adult, where they're concerned about being judged. The other thing is that once they get back the referrals and contact information, they immediately dial a clinic and make an appointment or ask a question or are led to a website by their mobile device where they can look and get more than 160 characters that they can get on their phone.”

The program costs approximately \$2,500 a month to run in San Francisco. Text messaging is charged to individual users' accounts, which may be per message or unlimited, depending on their mobile device service plans. ISIS has also replicated the program for Washington, DC, where it is called RealTalk, and they have also set it up for Planned Parenthood for Orange County and San Bernadino, California.

Levine says, “The U.S. has been very slow on the uptake with mobile devices. In Africa and Asia the infiltration of mobile devices is much harder than it is here. There's a program in Nigeria where they have actually integrated text messaging into a multimedia curriculum that they're using in the schools. We need to do that in the U.S. as well. We need a multimedia sex education curriculum that teachers accept, that parents accept, and that young people will use because it's culturally appropriate.”

Intelecare Compliance Solutions, Inc. (New Haven, Connecticut)

Intelecare Compliance Solutions' focus is to increase medical adherence for patients and caregivers through several different reminder and notification modalities: e-mail and mobile phone, either via text messages or voice messages. Kevin J. Aniskovich, Intelecare's CEO, says, “We've decided to tackle that with a personalized notification communication system that empowers patients and caregivers to create and manage their own set of reminders. Those

reminders can be anything from taking your medication on a daily basis, to refilling that prescription, to keeping doctor appointments, to checking and monitoring your vital statistics.”

In the future, Aniskovich indicates they are looking at applications for the iPhone or the Motorola Razor, as well as “things like desktop widgets—little applications that run on your computer local to your machine that will tap into a server somewhere.”

Aniskovich notes that studies have indicated that 84% of people cite forgetfulness as the reason for non-adherence. “You’ve got to ask yourself why. Did they really forget or is there something else there?”

To that end, he notes Intelecare attempts to see the patient with a “360 degree view. It’s never just one thing. If the person is a caregiver, maybe their life is just too busy and they can’t balance everything. So it’s important for us to enable a reminder and communication system that can blend into an individual’s life without having them adapt to something else. For some people it’s text messaging, for others it’s voice or e-mail.”

Intelecare is careful to make sure their service is like the typical web-based user experience, which provides a high level of user-control. “Folks will be able to register and opt in and opt out and create reminders and do everything they would be able to do in front of a desktop computer on their mobile device. We think that’s an important step.”

Intelecare has approximately three million unique users and sends out more than five million reminders daily, a blend of e-mail, text messages and voice. Aniskovich notes that text messaging has begun to creep up in terms of usage. “When we began, text messaging was 3% of our entire population, now it’s 15%.”

Intelecare deals primarily with insurance companies—both life and health insurers—and large employers, pharmacies and non-profit organizations. For basic programs for the end-user, the service is free. Intelecare also offers a tier of user programs with varying subscription rates. Aniskovich says, “We make money through our business and industry relationships, so we license our back-end technology to third parties in a private label fashion.” He cites a dental practice client that has Intelecare’s product and services integrated into their website. “They pay us a flat fee and that includes an unlimited number of users and an unlimited number of reminders.”

Aniskovich notes that physicians haven’t been particularly responsive to their service, but that from their focus groups, patients have indicated they like the fact that Intelecare is a third party. “They’re suspicious of pharma, of the insurers. What’s to happen if the data mining they do comes up with the fact they weren’t compliant? Will they increase your rates or drop you? The fact we don’t engage the doctors right now, or any other provider, is the reason we’ve had so many people using our services.”

PRACTICE MAKES PERFECT

Prior to the beginning of the Text4Health Event, BJ Fogg offered a free, optional workshop called Introduction to Text Messaging. Basically Fogg encouraged people to pull out their phones and start texting each other, walking them through it. He indicated that approximately 50% of the conference attendees came to that workshop, an indication that many of them just didn’t know much about text messaging.

Fogg says, “What should healthcare providers be doing? They should learn texting. Text their students and their kids. Learn to text. Try Twitter. Try Google SMS. There is probably a handful of services they should try. Sign up for some health message alert system so they can start seeing the possibilities. Once they understand there’s this channel, I think they’re going to see the links between what’s out there and what they can do with it.”

Smile Reminder (Lehi, Utah)

Like Intelecare, Smile Reminder focuses on patient reminders using text messaging and e-mail. Their clients are typically physician and dentist offices. In addition to reminders about appointments, they also offer birthday greetings, newsletters, reminders and group messages for special promotions. Carey Van Orden, Smile Reminder’s Marketing Director, says, “We don’t integrate with the practice software. We analyze the practice software, find out if their patients have a device like e-mail or cell phone, and we send the reminders. Surveys are performed the same way and it’s completely customizable.”

Smile Reminder’s clients pay a subscription fee, which is currently \$249 per year. “That covers everything,” says Van Orden, “with unlimited support, so anything you need, any help like customizing your messages or your newsletters or your surveys, any tech support and unlimited messaging so you can send as many as you want, whether it’s reminders or quarterly reports or newsletters or whatever.” She says, however, that at the moment text messaging is used only for appointment reminders.

Smile Reminder notes studies indicating a 30% increase in appointments when appointment reminder services are utilized. She says, “Text messaging can be very effective because it’s immediate, versus e-mail, which can be delayed depending on how tied to the computer the patient is. We also do appointment confirmation using text messaging. The patient can just reply to the text message and it’ll just show up on the physician’s computer that the patient has confirmed.”

Physician-Based Text Messaging—Epocrates, Inc.

Epocrates, Inc. (San Mateo, CA) was founded in 1999 with the intention of providing medical information to physicians via what at the time was primarily the Palm Pilot, although now various other companies such as Blackberry and the iPhone have entered the PDA market in a major way. Epocrates boasts that more than one in four physicians in the U.S. are active users of their products with half a million subscribers.

Jeff Tangney, Executive Vice President of Sales and Marketing, says, "We write the content, edit it in some cases, we license-in content and edit it, or modify it to work via a mobile device, but yes, we are a content provider."

And it's important to point out, Epocrates does not use SMS. Tangney says, "It really comes down to the richness of the information and the ability to quickly get to the answer you need. We haven't been able to work it out for those phones ("dumb phones" versus "smart phones") yet, but we're really excited because there is a lot of technological progress happening out there."

Primarily Epocrates uses SMS for when a mobile user, such as a Blackberry user, wants to utilize their software. Epocrates will send them a link via SMS they can use to download software. Tangney says, "We've created our own messaging services that we call DocAlerts, which really functions like SMS, but it's done on our own standard, which has been very popular with our doctors."

DocAlerts is free to Epocrates' physician or clinician clients. Epocrates sends out over two million DocAlerts per month to their user base. Tangney says, "It is a personalized news service for clinicians, so if you're a cardiologist you'll get alerts from the American College of Cardiology, and FDA MedWatch and the New England Journal, and cardiology articles and so on."

Epocrates has a staff of editors culling the latest, most important alerts on varying topics. Tangney says, "When a physician gets one of these alerts and it's just a short message on their mobile screen, they can elect to get more information about it, which leads to an e-mail they will get in their inbox, which lead to a link they can follow back to a site where they can get more information, or they can reply back to the e-mail and request more information. That feedback loop helps inform our editors."

Although DocAlerts is essentially SMS, it allows up to 1,000 characters per message, unlike SMS. Tangney says, "For what we wanted to do, SMS didn't fit very well. There were a couple of limitations. We did look at SMS for these alerts when we first got into it, and size was one limitation. The other limitation was simply the costs, the fact that carriers have wireless data plans that still charge ten cents per text message on top of that. That's a business model that limits the number of text messages you send and receive. We have a 1,000-character limit on the message the

doctors can send and receive and we use most of those characters. With a 1,000 characters you can give a brief summary of what the new study said, but you can request an e-mail with more information. To try and do that with 160 characters would be pretty difficult."

What Do You Do With The Elephant?

The ATA is actively considering the development of standards for text messaging in healthcare, although no publication date has been announced. ATA's Linkous says, "It's an area of interest and concern and we have looked into it. We have members who are involved in providing these services right now. We're really in the nascent stage of text messaging in medicine, although it's rapidly coming into play. That's why we're looking at it right now."

A number of researchers and companies are investigating potential text messaging applications, such as using the cell phone as a glucometer for diabetes monitoring. But primarily it is being used as an educational and informational modality, as well as in weight management programs and smoking cessation intervention. Although these are very interesting, they will undoubtedly face a number of hurdles in terms of user adoption. Stanford's Fogg says, "Anything regarding persuasive technology has to be designed so users don't reject it. There's always that Big Brother Factor, but there's also what one of my students called The Little Sister Factor—nagging. We get that a lot with computers now. People really understand how much their computer does that—update your software, register for this, do that, do this—it's constantly nagging you. When you move to the mobile handset, our tolerance for nagging is going to go way, way down. We're just not going to tolerate bad user experiences on the mobile handset. We do that on the computer to a degree, but the mobile phone is really personal. We look at it as part of ourselves and in general we're not going to allow that kind of behavior."

Still, healthcare text messaging's primary limitations appear to be innovation and imagination. As the technology evolves and so-called smart phones and other 3G devices become commonplace, medical practitioners—and patients—will adopt texting as a useful application.

Epocrates' Tangney notes that one of the significant aspects of texting, both for physicians and patients, is mobility and the mobile lifestyle. "A doctor is fundamentally a mobile professional. To be a doctor today is to go from one exam room to the next, to rounds at a hospital, then to a clinic. You go where the patients are, which is not always right in front of your desk. It's to be a mobile professional and still work in an information-intensive industry where everything is about your access to information."

—Mark Terry