

Opinion Paper

Open Access

Martin S. Karpeh Jr.* and Sarah Bryczkowski

Digital communications and social media use in surgery: how to maximize communication in the digital age

DOI 10.1515/iss-2017-0019

Received March 22, 2017; accepted April 3, 2017; previously published online July 29, 2017

Abstract: Communication among patients, colleagues, and staff in healthcare has changed dramatically in the last decade. Digital technology and social media sites have allowed instantaneous access to information. The potential for information technology to improve access to healthcare, enhance the quality, and lower the cost is significant. Text messaging, tweeting, chatting, and blogging are rapidly replacing e-mail as the preferred means of communication in healthcare. This review will highlight how digital technology is changing the way surgeons communicate with colleagues and patients as well as provide some guidance as to how to avoid some of the pitfalls and problems that this form of communication can bring.

Keywords: digital communication; Facebook; mHealth; text messaging; Twitter.

Introduction

Digital technology is essential for communication across the globe, and it seems that the public's appetite for more is insatiable. Physicians in general have been slow to use digital communication in their practices [1], but that reluctance is now rapidly fading as healthcare systems and the entire industry have made the digital transformation. A recent *Bulletin of the American College of Surgeons* article highlighted the usefulness of Twitter in academic surgery. With platforms like Twitter, surgeons share their

research, stay up to date on other research, network with colleagues, follow tweets during national conferences, and crowd-source ideas [2]. Extrinsic pressure to participate in digital communication comes from competition to reach and inform more patients, industry marketing, and public request for greater transparency. Publications on how to incorporate text messaging, tweeting, digital networking, and blogging into academic surgery are being published with some regularity. Several studies show that ease of Internet access and newer patient portals have led to greater acceptance among physicians [3, 4]. Given the nearly ubiquitous use of social media in daily life combined with a growing younger demographic of physicians in healthcare, one has to at least have a working knowledge of what is out there. This review will highlight some of the common uses of digital technology in surgery as well as provide some guidance as how to avoid some of the problems that this form of communication can bring.

Text messaging

Text messaging is easy and immediate and can be done from almost anywhere provided you have a phone, tablet, iPad, or computer. Since 1992 when the first text message was sent, texting has become commonplace. The ease of use has accelerated texting as a preferred method of communicating for many residents and younger physicians [5]. The Pew Research Center's Internet and American Life Project surveyed 2277 adults ages 18 or older and found that 83% of American adults own cell phones and 73% of them sent and received text messages. The study found that, although the majority of cell phone owners preferred a call when someone needed to reach them, active text messaging users were much more likely to prefer texting to calling. It is not surprising that young adults were by far the heaviest texters and were more likely to prefer texting to talking [6]. With the high percentage of smartphone use among physicians, a recent Canadian study explored the use of text-based messaging for patient-related

*Corresponding author: Martin S. Karpeh Jr., MD, FACS, Department of Surgery, Rutgers New Jersey Medical School, Hackensack University Medical Center, Suite 408, 20 Prospect Avenue, Hackensack, NJ 07601, USA, Phone: +551-996-7952, Fax: +551-996-2021, E-mail: mkarpeh@Hackensackmeridian.org
Sarah Bryczkowski: Department of Surgery, Rutgers New Jersey Medical School, Hackensack University Medical Center, Hackensack, NJ, USA

communications among surgical residents. An online survey was distributed to all 81 general surgery residents at a major Canadian medical school. The survey found that texting was the most common method by which residents communicated routine patient-related information with staff physicians. Eighty-five* percent of the 46 responding residents surveyed felt that texting actually enhanced patient care. One concerning finding was that 11% of those residents did not use password protection on their cell phones, 89% did not have encryption on their phones, and 66% did not know if the hospital had a policy on texting [7]. Professional privacy and concern for the protection of patient-related information has been cited as a major reason digital communication between physician and surgeons has been slow to catch on. It should be noted that many apps do exist for texting over the Internet. One such example is WhatsApp.

WhatsApp

With consumers across the globe embracing mobile communication and concerns surrounding cyber security, digital media tech giants like Apple and Facebook have made secure communication a major priority. WhatsApp, an instant media messaging client launched in 2010, became a subsidiary of Facebook, Inc., in April 2016. WhatsApp is free for download on any smartphone (iPhone, Android, Nokia, Windows, or BlackBerry). It allows users to make phone calls, send and receive text messages, and share video and voice messages and images over the Internet on a highly secure network platform. It has a group text capability to allow the user to share content with up to 256 people at once. The app has grown into one of the most popular applications in use today with more than 1 billion users second only in the number of users to its parent company Facebook. The company recently added end-to-end encryption to all forms of its communication service [8], which means that a third party cannot eavesdrop on any communication between two WhatsApp users using the latest version of the software. Even WhatsApp employees cannot access data content sent across its network. Recent claims of a “backdoor” security loophole were reported by the *Guardian* in January 2017 [9]. WhatsApp has explained that the “loophole” intentionally exists so that if someone changes their phone, and therefore their automatic security key, messages will still send so as not to disrupt service to its 1 billion users. The full explanation from the WhatsApp cofounder Brian Acton can be found on the reddit website [10].

The enhanced security claims and group texting ability have drawn WhatsApp into the healthcare arena.

Numerous publications have appeared in the literature describing adaptations of the software in clinical medicine [11]. Common themes from these studies are ease of use, low cost, ability to securely communicate patient data, a large group, and getting quick feedback. In one study, WhatsApp was used to assess interdepartmental communication between orthopedic residents; they measured residents’ awareness of patient-related information, efficiency of the handoff procedure, and duration of the traditional morning handoff [12]. Residents reported faster and more efficient handoffs with the use of the app. The use of WhatsApp was associated with an improvement in the residents’ overall patient-related awareness and their ability to communicate patient-related information. In another study, WhatsApp was used as a communication method among emergency surgery teams in a London hospital. Forty emergency surgery team members used WhatsApp for 19 weeks. The response times and communication types were compared for the initiators and receivers of communications. Safety events were reported. More than 1100 communication hours covering the details of 636 patients were logged, resulting in 1495 communication events. It is not surprising that the attending initiated the most instruction-given communication, whereas interns asked the largest number of questions ($p < 0.001$). The resident was faster to respond compared to the intern or attending ($p < 0.001$). Participants felt that the app helped to flatten hierarchy among students, residents, and experienced consultants, enabling them to all actively contribute to discussions without intimidation [13]. WhatsApp may have a role in improving clinical decision-making and patient care for clinicians by enhancing the sharing of documents, images, and consultations.

There are downsides to using WhatsApp. These communications are not easily included in the patient’s medical record and identifying patients can be difficult. Other limitations have to do with Internet connectivity issues, lack of adequate follow-up, and incomplete case discussions. Image quality can be variable and there are still concerns related to the risk of breaching patient confidentiality when posting clinical photos on public sites. In spite of the enhanced security of WhatsApp, it remains the physician’s responsibility to protect the patient’s privacy and confidentiality.

Instagram

Instagram is another free, easy-to-use app that was created for photo and video content sharing. Users can

add captions and hashtags to the photos and create a timeline of posted content that can then be commented on by invited users. It is designed for the Android and iOS platforms and is accessible from any web browser on a PC, notebook, or tablet.

This app is being used in many clinical disciplines, particularly those that engage heavily in visual content such as radiology, dermatology, and plastic and reconstructive surgery. Hospitals and a number of government and medical societies are well represented on Instagram but physicians much less so [14]. The World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) use Instagram to educate, to raise public awareness to important health issues, and for health alerts. For example, various image sharing platforms were used to exchange information during the Ebola crisis [15]. The Ebola crisis highlighted how the novel use of photo sharing apps could be used to disseminate information. This experience also raised concerns regarding the spread of misinformation and how image platforms differed in the type of content disseminated. Seltzer et al. compared Instagram and Flickr, an image hosting website, use during the Ebola crisis. Instagram posts were more often coded as jokes or unrelated to the crisis, whereas Flickr images primarily depicted healthcare workers and other professionals providing care and other services. The study concluded that understanding these differences could guide future users who wish to provide targeted education/awareness interventions [15].

Twitter

Founded in 2006, Twitter has become a major means of information exchange worldwide. It is an online news and social networking service that allows users to post messages or “tweets” that are restricted to 140 characters. Any registered user can post tweets. Tweets are public unless a restricted account is created; therefore, anybody with Internet access can read them. Twitter users create unique usernames beginning with the @ symbol, i.e. @SarahB_MD. Twitter users can “follow” other users or accounts. Common Twitter accounts in academic surgery include academic surgeons, residents, societies, and journals [2]. Whenever someone who you follow posts a tweet, it shows up on your Twitter feed. When you post a tweet, it shows up on the Twitter feed of all your followers. If you find a tweet interesting, it can be “Retweeted” to your followers. Retweeting basically reposts the tweet to anybody

following you. Tweets can be directed at individual followers by including their @username.

Topics of interest can be marked with a hashtag (#). Hashtags help categorize conversations and allow them to be searchable. Hashtags are commonly used during national conferences. Articles have been presented and published about the use of conference hashtags such as #ACSCC15 (the American College of Surgeons Clinical Congress) and #2013ASC (the Academic Surgical Congress) [2, 16]. Conference tweeting allows academic surgeons to share and follow tweets in real time. Conference tweeting allows Twitter users to follow discussions during synchronous sessions. A *Bulletin of the American College of Surgeons* article noted an 800% increase in the use of Twitter during the annual clinical congress from 2010 to 2012 using the hashtags #ACSCC10 and #ACSCC12. Given the fast pace of information delivery, Twitter provides a platform to easily keep up on topics of interest from journals, professional societies, mentors, and colleagues. The website provides simple-to-follow video instructions on how to get started and customize Twitter for your needs. The American College of Surgeons has a well-written review of social media for the surgeon that focuses on Twitter for practicing surgeons. Social media outlets like Twitter, Facebook, and LinkedIn have dominated the scientific community as the preferred means of social networking [17].

Facebook

Social media and Internet usage has become an increasingly important means of communication among physicians, scientists, and patients. Facebook remains one of the most popular social media outlets, with more than 1 billion active daily users. The Pew Research Center stated that about 75% of Internet users reported having a Facebook account. With this degree of social media penetration, it is not surprising to see the use of Facebook increasing in healthcare. Facebook allows academic surgeons to connect through groups. Groups can be public, closed, or secret. Public groups are visible and can be joined by anybody. Closed groups can be found by searching but need an administrator to accept new members. Only members can see posts. Secret groups are invitation only and cannot even be found by searching. An example of a popular closed group for surgeons is The International Hernia Collaboration, found at <https://www.facebook.com/groups/herniacollab/>. Facebook and social networks like it actively encourage social interaction, thus opening

the potential for blending one's professional and private lives. Patients and/or their family members may request to be Facebook friends and post a medical question that you feel compelled to answer. One must use the same degree of care and judgment that you would use when responding that you would use if you were to meet in public. Some medical practices have created a Facebook page with the intent of posting medical information, answering questions, or just providing access for nonurgent inquires, thus easing follow-up. In the age of reducing length of stay after surgery, using social media to bridge the communication gap after a patient leaves the hospital may help to alert surgeons earlier to potential postoperative problems. Mobile digital technologies designed to keep patients connected to the healthcare system during the postdischarge period are now coming to market at a phenomenal pace.

Digital mobile technology

Mobile digital technologies have made life more convenient and it is clear that patients want to use these technologies to access healthcare and healthcare information. Personal mobile devices that monitor heart rate, caloric intake, body weight, and other vital metrics are extremely popular. A growing number of companies are taking this a step farther by developing digital platforms to enhance the patient experience before, during, and after a surgical procedure. A key feature of this platform is its ability to connect the patient directly to their physician or physician practice. The program will send mobile device and web-based reminders about preoperative or postoperative instructions. Using videos and other illustrative content, clinical information can be delivered directly to the patient's smartphone at a time designated by their provider. One surgical group attempted to reduce the number of postoperative ER visits and complications after thoracic surgery [18]. Using preoperative SMS reminders and having patients actively report on their postoperative progress and symptoms, the group found that the mobile digital program helped to reduce the number of cancellations for procedures and decreased postoperative ER visits. Using this mobile application significantly improved patient's satisfaction. The authors stated that patients were empowered by getting more information about their progress and by having better access to the surgeon's instructions using web-based videos [18]. The average length of stay after most surgical procedures has decreased significantly over the years. Digital mobile technology has the potential to enhance communication

between patients and their surgeon, thus filling the gap from discharge to first postoperative visit. Experience with these devices will grow and one can expect to see data on the impact of enhanced digital communication on readmissions, patient satisfaction, and patient compliance.

Beware

Twitter, Instagram, WhatsApp, and any other forms of social media are public and accessible to anybody with Internet access. Those who embrace social media must do so responsibly. Social media platforms are an effective means to rapidly communicate evidence-based healthcare information among colleagues and to the public. The increased online presence of reputable medical societies, healthcare agencies, and physicians helps serve as a source of truth and an antidote to the legions of misinformation that can easily be disseminated across the web.

A useful post on Elsevier.com by Eric Swirsky highlights five do's and don'ts of digital communication in healthcare. The first is to encrypt your phone and mobile devices. WhatsApp uses sophisticated encryption, but most healthcare systems have and should have a policy governing the use of e-mail and social media sites; consider whether e-mail is an appropriate channel of communication. Empathy and compassion are not easily communicated in a text; some conversations are best done face-to-face or at least by phone. Swirsky warns to be mindful of healthcare literacy gaps as many patients and coworkers vary in their understanding of modern technology. If you encourage the use of e-mail, then you should explain the risks and not assume privacy concerns are understood. Finally, don't hesitate to seek guidance. Most medical centers and major medical societies have published guidelines on the appropriate use of e-mail in patient care [19]. The rapid use of mobile technologies in healthcare is becoming a big deal. A collaboration involving the American Heart Association, the American Medical Association, The DHX Group, and the Health Care Information and Management Systems Society (HIMSS) has formed an alliance to lead the development of guidelines for the evaluation of mobile health applications. In general, if you wouldn't say something in public or in front of your mother or your boss, then don't post it online, tweet about it, or share on any blog or forum. Digital content can last forever.

Digital technologies are now tightly woven into the fabric of modern communication. Social networking, Twitter, and mobile digital technologies are being applied

globally to all aspects of healthcare. Innovation will continue to find new ways to enhance the sharing of new information among physicians, patients, and colleagues. Keeping abreast of safe practices when using social media is not difficult if you apply commonsense rules. The digital world is here to stay; therefore, adopting some of the digital communication tools discussed in this review has the potential to enrich your medical knowledge, improve communication with your patients, and empower your patient to engage more in their own care and ultimately improve patient outcomes.

Author Statement

Research funding: Authors state no funding involved.
Conflict of interest: Authors state no conflict of interest.
Informed consent: Informed consent is not applicable.
Ethical approval: The conducted research is not related to either human or animal use.

Author Contributions

Martin S. Karpeh, Jr.: Conceptualization; Investigation; Writing – original draft. Sarah Bryczkowski: Investigation; Writing – original draft.

References

- [1] Brown J, Ryan C, Harris A. How doctors view and use social media: a national survey. *J Med Internet Res* 2014;16:1–9.
- [2] Ferrada P, Saliburk JW, Bryczkowski SB, et al. The surgeon and social media: Twitter as a tool for practicing surgeons. *Am Coll Surg Bull* 2016;101:19–24.
- [3] Jiang S, Street RL. Factors influencing communication with doctors via the internet: a cross-sectional analysis of 2014 HINTS survey. *Health Commun* 2017;32:180–188.
- [4] Beckjord EB, Finney Rutten L, Squiers L, et al. Use of the internet to communicate with health care providers in the United States: estimates from the 2003 and 2005 Health Information National Trends Surveys (HINTS). *J Med Internet Res* 2007;9:e20.
- [5] Shah DR, Galante JM, Bold RJ, Canter RJ, Martinez SR. Text messaging among residents and faculty in a university general surgery residency program: prevalence, purpose, and patient care. *J Surg Educ* 2013;70:826–34.
- [6] Smith A. Americans and text messaging. Available at: <http://www.pewinternet.org/2011/09/19/americans-and-text-messaging/>. Published 2011.
- [7] Goldfarb J, Kayssi A, Devon K, Rossos PG, Cil TD. Smartphones and patient care. *Surg Innov* 2016;23:305–308.
- [8] Metz C. Forget Apple vs. the FBI: WhatsApp just switched on encryption for a billion people. Available at: <https://www.wired.com/2016/04/forget-apple-vs-fbi-whatsapp-just-switched-encryption-billion-people/>. Published 2016.
- [9] Ganguly M. WhatsApp vulnerability allows snooping on encrypted messages. Available at: <https://www.theguardian.com/technology/2017/jan/13/whatsapp-backdoor-allows-snooping-on-encrypted-messages>. Published 2017.
- [10] Acton B. WhatsApp backdoor allows snooping on encrypted messages. Available at: https://www.reddit.com/r/Android/comments/5nq201/whatsapp_backdoor_allows_snooping_on_encrypted/dce86wa/?st=iy06uhud&sh=526e1451. Published 2017.
- [11] Boulos MNK, Giustini DM, Wheeler S. Instagram and WhatsApp in health and healthcare: an overview. *Future Internet* 2016;8:1–14.
- [12] Khanna V, Sambandam SN, Gul A, Mounasamy V. “WhatsApp”ening in orthopedic care: a concise report from a 300-bedded tertiary care teaching center. *Eur J Orthop Surg Traumatol* 2015;25:821–826.
- [13] Johnston MJ, King D, Arora S, et al. Smartphones let surgeons know WhatsApp: an analysis of communication in emergency surgical teams. *Am J Surg* 2015;209:45–51.
- [14] Ramkumar PN, La T, Fisch E, et al. Integrating social media and anterior cruciate ligament surgery: an analysis of patient, surgeon, and hospital use. *Arthroscopy* 2016;33:579–585.
- [15] Seltzer EK, Jean NS, Kramer-Golinkoff E, Asch DA, Merchant RM. The content of social media’s shared images about Ebola: a retrospective study. *Public Health* 2015;129:1273–1277.
- [16] Cochran DA, Kao LS, Gusani NJ, Suliburk JW, Nwomeh B. Use of Twitter to document the 2013 Academic Surgical Congress. *J Surg Res* 2013;190:36–40.
- [17] Collins K, Shiffman D, Rock J. How are scientists using social media in the workplace? *PLoS One* 2016;11:1–10.
- [18] Simone C, Zeldin R, Safieddine N, Liu J, Chen P. Use of mobile device reminders and web-based modules to improve surgical outcomes. *Chest*. 2015;148:18A.
- [19] Swirsky BES. 5 dos and don’ts of digital communication in healthcare professional values and modern technology can make for strange bedfellows. Available at: <https://www.elsevier.com/connect/5-dos-and-donts-of-digital-communication-in-healthcare>.

Supplemental Material: The article (DOI: 10.1515/iss-2017-0019) offers reviewer assessments as supplementary material.

Reviewer Assessment

Open Access

Martin S. Karpeh Jr.* and Sarah Bryczkowski

Digital communications and social media use in surgery: how to maximize communication in the digital age

DOI 10.1515/iss-2017-0019

Received March 22, 2017; accepted April 3, 2017

*Corresponding author: **Martin S. Karpeh Jr.**, MD, FACS, Department of Surgery, Rutgers New Jersey Medical School, Hackensack University Medical Center, Suite 408, 20 Prospect Avenue, Hackensack, NJ 07601, USA, Phone: +551-996-7952, Fax: +551-996-2021, E-mail: mkarpeh@Hackensackmeridian.org

Reviewers' Comments to Original Submission

Reviewer 1: anonymous

Mar 24, 2017

Reviewer Recommendation Term:	Accept
Overall Reviewer Manuscript Rating:	75
Custom Review Questions	Response
Is the subject area appropriate for you?	4
Does the title clearly reflect the paper's content?	4
Does the abstract clearly reflect the paper's content?	4
Do the keywords clearly reflect the paper's content?	4
Does the introduction present the problem clearly?	4
Are the results/conclusions justified?	4
How comprehensive and up-to-date is the subject matter presented?	4
How adequate is the data presentation?	N/A
Are units and terminology used correctly?	N/A
Is the number of cases adequate?	N/A
Are the experimental methods/clinical studies adequate?	N/A
Is the length appropriate in relation to the content?	4
Does the reader get new insights from the article?	4
Please rate the practical significance.	4
Please rate the accuracy of methods.	N/A
Please rate the statistical evaluation and quality control.	N/A
Please rate the appropriateness of the figures and tables.	N/A
Please rate the appropriateness of the references.	4
Please evaluate the writing style and use of language.	5 - High/Yes
Please judge the overall scientific quality of the manuscript.	4
Are you willing to review the revision of this manuscript?	Yes

Comments to Authors:

This is a nice presentation of the actual and future aspects of digital communication within health care. The authors are to be congratulated for highlighting the relevant issues. Additionally, the manuscript points out, that all users of these technologies should be aware of the possibilities of misuse.

Reviewer 2: anonymous

Apr 01, 2017

Reviewer Recommendation Term:	Accept
Overall Reviewer Manuscript Rating:	80
Custom Review Questions	Response
Is the subject area appropriate for you?	5 - High/Yes
Does the title clearly reflect the paper's content?	4
Does the abstract clearly reflect the paper's content?	4
Do the keywords clearly reflect the paper's content?	3
Does the introduction present the problem clearly?	3
Are the results/conclusions justified?	4
How comprehensive and up-to-date is the subject matter presented?	5 - High/Yes
How adequate is the data presentation?	N/A
Are units and terminology used correctly?	N/A
Is the number of cases adequate?	N/A
Are the experimental methods/clinical studies adequate?	N/A
Is the length appropriate in relation to the content?	5 - High/Yes
Does the reader get new insights from the article?	5 - High/Yes
Please rate the practical significance.	4
Please rate the accuracy of methods.	N/A
Please rate the statistical evaluation and quality control.	N/A
Please rate the appropriateness of the figures and tables.	N/A
Please rate the appropriateness of the references.	3
Please evaluate the writing style and use of language.	4
Please judge the overall scientific quality of the manuscript.	4
Are you willing to review the revision of this manuscript?	Yes

Comments to Authors:

This article is a good illustration and overview of using digital communication and social media in modern surgery. Many important aspects are named. The importance of using social media will increase in the next years, reflecting the recent development of the last 20 years. Applying social media platforms will be unavoidable for the younger generation of physicians and patients. In this paper, the authors reflect all important platforms but also don't forget to mention the risks of using patients data in the world wide web, e.g. encryption and safety issues of personal data.
