

The Bigger Picture: Picking the Right Soap Box—Is it Possible to Connect with Different Audience Targets (Practitioners and Patients) from the Same Platform?

Mohammed Ali A. Abbass, MD¹ Hari B. Keshava, MD, MS¹ Conor P. Delaney, MD, PhD²

¹Department of General Surgery, Digestive Disease and Surgery Institute, Cleveland Clinic Foundation, Cleveland, Ohio

²Department of Colorectal Surgery, Digestive Disease and Surgery Institute, Cleveland Clinic Foundation, Cleveland, Ohio

Address for correspondence: Conor P. Delaney, MD, PhD, Department of Colorectal Surgery, Digestive Disease and Surgery Institute, Cleveland Clinic Foundation, 9500 Euclid Avenue, Mail Code A-100, Cleveland, OH 44195 (e-mail: delanec@ccf.org).

Clin Colon Rectal Surg 2017;30:281–290.

Abstract

The use of Internet and social media has skyrocketed in the past decade. It did not take long until physicians realized that they could use social media as a tool for communication with patients and colleagues. Since then use of social media has exploded and the information that has become available for physicians and their patients is remarkable. In addition, because of the immediacy of the platform, messages that are incorrect or not desired can be rapidly promoted, whether deliberately or accidentally. To obtain the best use of social media, the right platform should be chosen, and this varies depending on the group one is trying to reach, and the message or visibility desired. In this article, we review the variety of options available to users.

Keywords

- ▶ surgery
- ▶ platform
- ▶ Facebook
- ▶ YouTube
- ▶ Twitter

Disseminating medical information has changed drastically in the past decade. Computers, the Internet, and smart phones have revolutionized medical communication.^{1,2} This change has occurred in all aspects of medical communication from patient communication to electronic medical records. Physicians not only communicate in person or on the phone but also use email, text messages, chat rooms, and social media (like Twitter or Facebook) to communicate with other health care practitioners, patients, health care groups, and indeed the public at large. The multiple forms of communications, specifically social media, have created several questions ranging from the concern for the Health Insurance Portability and Accountability Act (HIPAA) violations to professional responsibilities from individuals disseminating health care information.² While physicians have started to adapt to social media, there is still significant variability in how they utilize social media. Some physicians use social media to market their own practice and correspond with their patients, while others use it to discuss the latest research or surgical techniques.^{3–5} Recent reports have even shown that social media and telemedicine may help

extend and improve standards of care in remote settings.¹ With the differences in utilizing social media, various hospitals and societies are starting to come up with guidelines and policies regarding using social media.^{2–4}

The use of Internet in health care has sky rocketed and in 2011; 59% of adults looked online for health information with 34% of these individuals having consulted user-generated information via news groups, Web sites, or blogs.⁶ Patients do not have to wait until a physician appointment to get health care information; they can get the information utilizing google, WebMD, and other Web sites. Patients are not only gathering information from traditional methods but are also using tailored user-generated information from the Internet to help gain an understanding and have their questions answered about their health.⁷ Some patients not only expect there to be information from other patients but they often expect their physician to “be connected,” asking to follow-up via email or if they have a Web site, twitter account, or Facebook page they can visit.^{4,5} This is extending now to the establishment of “virtual visits,” and at our institution, patients who travel from a distance may be

Table 1 Type of social media and number of users in 2014

Social media type: number of users
Facebook: 1.3 billion users
Twitter: 280 million active users
YouTube: 1 billion people view YouTube each month
Instagram: 200 million users
LinkedIn: 270 million users

seen for some visits using HIPAA secure video-conferencing software.

There are numerous types of social media from Facebook to Twitter that are being utilized in health care (► **Table 1**). Physicians must be cognizant of the differences between using social media for personal use and professional use. If a physician uses social media for work, questions arise between sending information for a technical, peer-to-peer discussion versus a discussion with a patient. It is also very different to use social media among physicians' friends or family outside of work, where things designed to be funny, political, or just social may not be appropriate for a more professional or work audience. These questions along with the daunting nature of keeping up with many forms of social media can create a challenge when targeting other practitioners as well as patients through the same social media outlet. This article will investigate some of these issues.

Social Media and Health Care

Technological advances in information technology and computer science have revolutionized communication between individuals. Specifically, the development of the World Wide Web (WWW) has allowed for rapid spread of information. In the infancy of the WWW, Web sites were designed with information allowing for people to go to a Web site to view information. In the health care arena, WebMD and UpToDate are prime examples of Web sites that disseminate information for both patients and practitioners, while others may target one or the other. Overtime, this led to the social medial revolution specifically with user-generated information.¹⁻⁵

Web 2.0

In 1999, Darcy DiNucci coined the term "Web 2.0" describing the development of user-generated content in the virtual community of the Internet. This describes an interactive experience in the Internet allowing for an open exchange of information. Users not only read webpage content (Web 1.0), but they are also expected to contribute information and be participants. Some examples of the Web 2.0 include social networks, blogs, Wikipedia pages, Facebook pages, Myspace pages, podcasts, social networking, and YouTube. Specifically, the key features of Web 2.0 include⁸:

- Free classification of information/"Social Tagging."
- Rich user experience.

- User as a contributor.
- Long tail (product is not sold, but on demand with monthly fee or pay per consumption).
- User participation.
- Basic trust.
- Dispersion/Multiple ways to deliver content.

Health 2.0/Medicine 2.0

The health care industry has adopted a version of Web 2.0 focused on health. Health 2.0 has been focused on using technology to expedite care coordination between patients, caregivers, medical professionals, and other stakeholders in health. This allows for the combination of health care data and health information in the overall patient experience relying on the use of a "cloud" network and mobile-based technologies.⁹ With the technologies utilized in Health/Medicine 2.0, patients can have greater insight into their ailments giving them control on the information they obtain not only relying on their patient visits to obtain information.^{3,4}

Specific definitions of Medicine 2.0 state, "Medicine 2.0 is the use of a specific set of Web tools (blogs, Podcasts, tagging, search, wikis, etc.) by actors in health care including doctors, patients, and scientists using principles of open source and generation of content by users and the power of networks in order to personalize health care, collaboration, and promote health education." Specifically, five structural themes have been described to aid in the definition of Medicine 2.0: participants, impact on different collaboration and practice, the ability to provide personalized health care, medical education, and methods and tools.¹⁰

Uses of Web 2.0 in Health Care

Recently, there has been an onslaught of technologies commonly associated with Web 2.0 that are being used in various aspects of disseminating health information. The use of social media has exponentially increased in the past decade from 9 to 90% in the age group between 18 and 29 years and from 6 to 65% in the age group from 50 to 64 years.⁴ From podcasts, to Wikis, to Twitter, information is becoming readily available to physicians, nurses, other health professionals, patients, and patient's families. ► **Table 2** illustrates different purposes of Web 2.0, some examples in literature, and the individuals who are using Web 2.0 for that purpose. Thus, social media can be a very cost-effective and efficient way to communicate with many people from different backgrounds, ethnicities, age groups, and geographical locations.

Concerns of Web 2.0 in Health Care

While Health/Medicine 2.0 gives more control to patients, some critics believe there are drawbacks. Four key areas were pointed out as areas of tension between stakeholders with Medicine 2.0¹⁰:

1. *The fields existence*: The definition of Medicine 2.0 and its existence as a legitimate research field is an overarching issue.

Table 2 Purposes of Health 2.0

Purpose	Description	Examples	Users
Staying informed	Used to stay informed of latest developments in a field	Podcasts, search tools, professional communities, Twitter, Web sites	All (medical professionals and public)
Medical education	Used for professional development for doctors, public health promotion for health professionals and general public	Podcasts (i.e., Behind the Knife, TedTalks) can increase “on the move” education. Newscasts and YouTube. Twitter accounts promoting research abstracts (#VisualAbstracts)	All (medical professionals)
Collaboration and practice	To help practitioners find information and make decisions/diagnosis	Google searches can aid with diagnosis, UpToDate	Doctors, nurses
Managing a particular disease	Patients who use search tools to find out information about a particular disease	Patients with chronic diseases (i.e., cancer, inflammatory bowel disease) will join online forums/communities to discuss topics related to the disease	Public
Sharing data for research	Completing patient-reported outcomes and aggregating the data for personal and scientific research	Disease-specific communities for patients with rare conditions; aggregate data on treatments, symptoms, and outcomes to improve their decision-making ability and carry out scientific research such as observational trials	All (medical professionals and public)

Source: Adopted from Wikipedia, Web 2.0.

2. Doctors' concerns with patients' use of Medicine 2.0 even if the information is accurate.
3. Information accuracy and potential risks associated with inaccurate Medicine 2.0 information. No peer-review system.
4. Privacy and ownership issues with general information with Medicine 2.0.

These concerns have been evident numerous times, as wrong health data perpetuate through social media.¹⁰ The continued dialogue regarding the potential link between vaccines and autism is a prime example of how social media can perpetuate a claim that is incorrect. Blogs, online groups, and Twitter accounts continue to spread false truths and give people a platform to reach many people.^{5,11} Even medical officers of major hospital systems have become involved in this debate and have propagated false information—often accidentally by promoting an item they did not know was incorrect. Social media is so fast paced and instantaneous, and it may be very difficult to roll back a false statement (or even one with misspellings—if an incorrect version gets retweeted and re-re-tweeted before the falsehood is corrected). For these reasons, many people do not trust social media to provide accurate information, and it leaves a sense of doubt when it comes to health information and social media.^{5,11}

How Is Health Care Information Disseminated Over Social Media and Who Is the Target?

There are multiple platforms available on social media with a wide range of users on each platform as well as some users on multiple platforms.

Targeting the Health Care Professional and Trainee

The most basic way of using social media to disseminate health information has been to tweet links to journal articles and advertising a free download of article of the month from a specific journal's twitter account (i.e., the *Annals of Surgery* or *Diseases of the Colon and Rectum*). The obvious target is, of course, health care professionals primarily from trainees to practicing staff, and downloads of these articles can be accurately tracked.

One of the new innovative applications of research in social media is “Visual Abstracts” (#VisualAbstracts), which is a new way to deliver research to health care professionals on social media. A visual abstract is a simple image that explains the main outcome from a research article using visual animated images which makes it easier to deliver a certain conclusion from an article. It was created by @AndrewIbrahim from the University of Michigan and *Annals of Surgery*. Due to the feasibility and attractiveness of this idea,

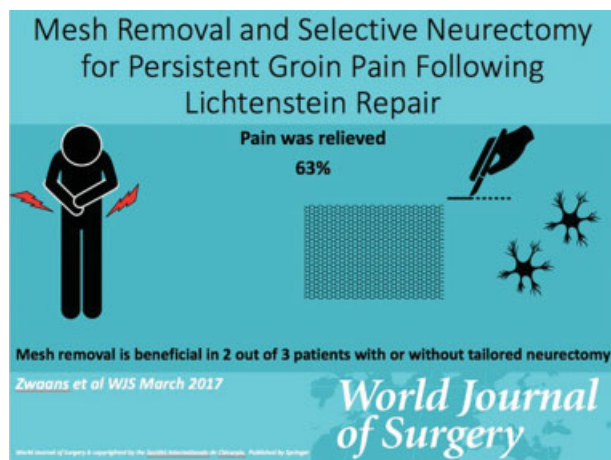


Fig. 1 Visual Abstract published by the *World Journal of Surgery* @WorldJSurg.

multiple journals have adopted this technique, including the *World Journal of Surgery* (@WorldJSurg), the *Diseases of the Colon and Rectum* (@DCRjournal), and many other journals. Twitter has been the main platform where visual abstracts are circulated¹² (► Fig. 1).

The use of podcasts to target health care professionals, trainees, and students has also dramatically increased recently, especially with educational podcasts like “Behind the Knife” and the “AIS Channel.” “Behind the Knife” is a very successful podcast which discusses various surgical topics with pioneers in the field of surgery by providing new updated information about surgical diseases. This podcast was started by Dr. Scott Steele along with two general surgery residents out of Madigan Army Medical Center in Tacoma, Washington. It now has tens of thousands of downloads per month, and is an innovative way to deliver medical and educational information using social media. Another podcast that has pioneered providing technical information delivery has been the *Advances in Surgery* (AIS) channel podcast. This channel organizes live conferences from all over the world bringing together prominent figures of the surgical field to discuss new techniques or compare them to current ones. The channel provides live discussions and live surgery podcasting, while carefully managing patient’s privacy and the HIPAA 1996. Some large institutions have implemented similar podcasts to the AIS channel podcast in their weekly schedule like the Cleveland Clinic Foundation in Ohio, where the general surgery residents and staff can join the “Innovations in Surgery” podcast and get an opportunity to learn new developments in the field. This podcast was organized by Dr. Philip Schauer; every week there is a moderator that hosts an expert from the surgical field to discuss certain advancement in surgical technique or to discuss new research in the surgical field. This is a clear way where social media is making a difference in facilitating dissemination of knowledge and thus making a difference in education and medical training.

Targeting Patients

While social media has provided platform to target health care professionals, it has also been a great avenue to target patients. Various forms of social media have been used to increase awareness of diseases like breast cancer, prostate cancer, colon cancer, and inflammatory bowel disease, as well as educate them about novel techniques used to address some of the medical problems that society has paucity of knowledge about. Steele et al discussed how creating videos for filtered and censored topics like sacral neuromodulation for fecal incontinence will help overcome the lack of knowledge problem. This solution has proven effectiveness, but there is a lack of knowledge from the patient’s side due to sensitivities of discussing the problem in public.⁴ YouTube videos made such solutions available to patients without causing social embarrassment, and helped in overcoming this social barrier and introducing available medical treatment to patients⁴ (► Fig. 2).

The availability and accessibility of platforms such as Twitter, Facebook, and YouTube has made it an obvious avenue for specialty-specific societies and organizations to target patients. These organizations have used these platforms to increase awareness about certain conditions in which early detection and treatment would make a difference in outcomes (i.e., breast, prostate, and colorectal cancer). In England, between March and December of 2014, the most frequently tweeted cancers were breast, lung, prostate, and colorectal focusing on screening for these cancers.¹³

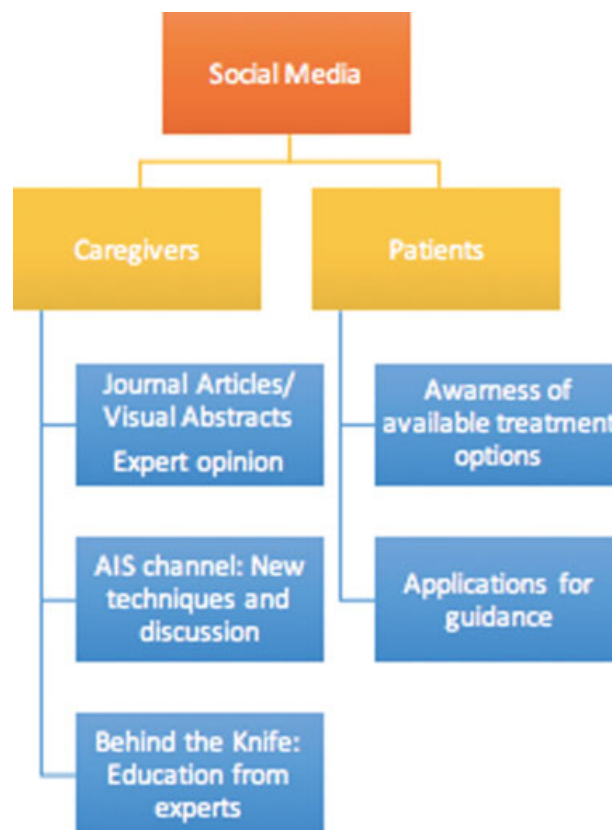


Fig. 2 Social media is available to patients and caregivers in multiple ways.

In Japan, Tsuya et al analyzed tweets by cancer patients and concluded that the most common tweets were about leukemia, uterine/cervical, lung, colon, and stomach cancer with the most common keywords being diagnosis, symptoms, and treatment.¹⁴ This study highlights that patients are constantly seeking information about cancer on social media. Social media has the potential not only to disseminate disease-specific knowledge but also to help with patient's personal health care, as long as the information available on the web is accurate. Cutrona et al aimed to analyze the willingness of patients to use peer-to-peer cancer screening communication, concluding that most patients 42 to 73 years old were willing to promote cancer screening and to use email and electronic communication to do that.¹⁵ This willingness of patients to utilize social media has provided a major resource in easing healthcare-related communication and facilitating patient care. For example, smart phone applications can help patients in taking the oral mechanical preparation before a colonoscopy by giving them specific information. Another application helps patients organize their medication schedule after a thyroidectomy by providing notifications each time they need to take a medication.⁴

One of the problems in social media is that users tend to surround themselves with like-minded individuals. Thus, health care practitioners follow each other, and patients with similar diseases cluster together, often without much overlap. Thus, information may not always flow from doctors to patients, and vice versa. Even Web sites that have patient-education pages and forums tend to have separate interfaces for these two groups, as they have very different needs and interests. Doing both well has been something that few organizations have mastered, and it requires a bit of strategy, such as designating awareness months, using celebrity spokespeople, using human-interest stories likely to "go viral," and other gimmicks that will be discussed further in the remainder of this article.

Social Media: Cancer Talk

Breast Cancer

Breast cancer is one of the most common cancers among women in the United States.¹⁶ Early detection of breast cancer by screening mammography has been repeatedly shown to decrease breast cancer mortality.^{17,18} Since the use of social media has increased substantially during the past decade,⁴ it was only a matter of time until both patients and physicians started using social media for communication about breast cancer.

Breast cancer awareness month has been used to increase awareness about the disease, early screening, and detection. Not only has the spread of information been a vital part of breast cancer awareness month, but increasing funding for breast cancer has been a major benefit of having this month and using social media. Facebook has been vital in breast cancer organizations in increasing funding of mammograms for women in need rather than education or discussion of treatment options.¹⁹

Celebrities also influence social media and society trends. This became evident when Angelina Jolie disclosed her DNA status of being a *BRCA* gene carrier. She underwent bilateral prophylactic mastectomies which became a commonly discussed topic on the Internet and over social media. Staudig et al compared the sociodemographic data of patients seeking genetic counseling before and after Angelina Jolie's disclosure. They concluded that after the disclosure, patients seeking genetic counseling were younger females with higher education than those before the disclosure.²⁰

Although Facebook is the most commonly used social network with 1.15 billion active monthly users,²¹ it appears that actually Twitter is the most common researched social network in the medical field and specifically with breast cancer. Attai et al analyzed tweets and looked at patient-reported outcomes, and concluded that Twitter increased breast cancer patient's knowledge about cancer and helped in their psychosocial support by decreasing the anxiety related to the diagnosis.²² Rosencrantz et al¹⁹ analyzed tweets about mammography and concluded that patients tweet personal experiences, humor, and positive reflections with encouragement to others to undergo the exam. This obviously has the potential to increase positive feedback about an exam that a lot of patients have anxiety about. Kim et al tried to predict tweeting behavior about breast cancer on social network.²³ They found that most retweeted tweets belonged to twitter users with most followers, higher level of personal influence, close relationships, and similarities with other users. Also, messages with positive emotions were also more likely to be retweeted than others.²³

While there is ample data showing Twitter is an effective tool for breast cancer awareness, YouTube is also important when targeting younger audiences about breast cancer. Bottorff et al analyzed the effects of YouTube videos on youth specifically focusing on the awareness of the effects of smoking on breast cancer.²⁴ Specifically, they tailored gender-directed YouTube messages to young females and males regarding smoking and breast cancer with the goal of increasing awareness of the effects of smoking on premenopausal women and the correlation with breast cancer. They concluded that social media did hold the potential of being a cost-effective tool that will help with health promotion and cancer prevention because of the response they received from participants where most of the girls agreed that they were not too young to be educated about breast cancer and most males also found the idea very informative and that they would share it with their friends and family.

Prostate Cancer

Prostate cancer is the second most common cancer in men based on the Center of Disease Control and Prevention (CDC) in 2016 after skin cancer.²⁵ In 2006, the Movember foundation was established as a global charity to help men become ambassadors of their own health.²⁶ Turkbey and Rosenkrantz have published multiple studies based on Twitter and attempted to analyze the tweets about prostate cancer and see if they align with the campaign objectives. They realized that while studying the 2013 Movember in Canada, the tweets

about non-health-related topic were significantly more than the tweets that were health related.²⁷ They validated this study by analyzing those tweets and they noted that 34% of the November 2013 tweets were about fundraising, 26% identified as if the campaign was a mustache contest rather than a charity, 18% making a change to men's health, 9% used masculine metaphors and/or imagery, and 4% talked about women as mustache supporters.²⁸

Contrary to the results seen with breast cancer awareness, a content analysis of YouTube videos related to prostate cancer videos aided with increased awareness and information dissemination. When these videos were analyzed, 45% of the videos were uploaded by consumers and 30% by government and medical professionals.²⁵ Also, 78% of those videos were to provide information, 51% had discussions about prostate cancer, and 26% were about prostate-specific antigen testing and routine screening. This data analysis showed that not all information disseminated under such titles is health or disease related. The goals of increased awareness and increasing fundraising dedicated toward research is what most of the video owners claim when posting videos.

To ensure the authenticity of information published and distributed on social media, some societies like the Society of Abdominal Radiology's Prostate Cancer Disease Focus Panel created a Twitter account "@SAR_ProstateDFP," which aims to share updated information and evidence about prostate cancer by experts in the field.²⁷ Bravo and Hoffman-Goetz have attempted to analyze all the tweets in November 2013 from the United States, Canada, and the United Kingdom and concluded that those campaigns sparked some conversations about prostate and testicular cancer that potentially can be beneficial and can raise awareness, but most of those conversations were non-health related.²⁶

Colorectal Cancer

Colorectal cancer is the second leading cause of cancer death in the United States (CDC 2013). Interestingly, in 2015, Kobayashi and Smith proposed that there is a correlation between low cancer literacy and information seeking with cancer fatalism.²⁹ Due to the popularity of social media and increase in life expectancy (reaching 50 years above), it can be a good vehicle to target an older patient population. Laranjo et al realized that social media networks have a positive effect on health behavior.³⁰ Using social media to increase awareness can be a low cost and accessible way to increase awareness and reduce cancer-related fatalism. Several organizations have targeted this area to increase colorectal screening, from gastroenterology groups, the American Cancer Society, and patient advocacy groups. These include hashtags such as #GetScreened, #80by18, #ColonCancerAwareness, #ColorectalCancerAwareness, #WhatsUpYourButt, #DressInBlueDay, and many more.

Multiple large efforts in the field of colorectal surgery have been dedicated toward social media and social media analysis. Some of the most popular twitter accounts in the colorectal surgery field are @researchactive by Dr. Richard Brady, @swexner by Dr. Steven Wexner, and @juliomayol by Dr. Julio Mayol of Madrid. These accounts are platforms for

discussions about new innovations in colorectal surgery, current topics in colorectal surgery, and of course colorectal cancer by using the hashtag #colorectalsurgery. As an evidence of how influential social media and certain hashtags can be, @researchgate retweeted a graph that analyzes data of tweets/retweets of the #colorectalsurgery over 9 days' period showcasing a total of 18,000 retweets by 461 different users.³¹ This graph shows the network of 461 twitter users that tweeted some tweets that contained "Colorectal" and "Surgery" at the same time. The line shows the relationship between the tweets and the large number of connectivity and publicity behind the hashtag (► Fig. 3). In other words, this means that any message that usually has this hashtag is going to be widely adopted and retweeted. This is an example that highlights the publicity that can be provided by social media which will always facilitate spreading any message. Similarly, a group of gastroenterologists tried to standardize use of hashtags related to gastroenterology, to maximize the impact for common topics, rather than users making up their own hashtag and potentially missing some information on the topic.³² The Society of University Surgeons' Social and Legislative Committee put together a manuscript that made the case that social media was a necessary component of surgical practice to tap into the power of this type of messaging.³³

Social Media Talk: Bridging the Gap between Physicians and Patients

As mentioned earlier, social media is made of multiple platforms with a plethora of target audiences from patients to practitioners. Each platform has its strengths and weaknesses and the choice of which platform to use depends on the target audience and the message (► Fig. 3). Social media sites include those owned either by caregivers, government or nonprofit organizations, patients, or even celebrities. Information posted by these users is mainly targeted to patients providing disease-specific content. There is a strong belief that social media has helped bridge a significant gap between physicians and patients by covering a variety of topics and reinforcing ideas that may even not be mentioned during the very limited physician office visit.

Social media has provided an asset to connect with patients about various issues from cancer awareness to addressing emotional needs and many other aspects of patients care. Currently, patients can watch videos that discuss certain procedures such as the oral preparation before a colonoscopy, which can answer many of their questions and minimize confusion and thus avoids aborting colonoscopies due to incomplete preparation.

A very notable achievement with social media is providing patients with solutions for problems that they would feel embarrassed in addressing with anyone else and sometimes even with their physician and an example of this is Dr. Steele's example of the fecal incontinence video.⁴ Patients do not usually discuss problems like fecal incontinence with their friends or families out of embarrassment; thus, the knowledge base is usually very poor about what options are

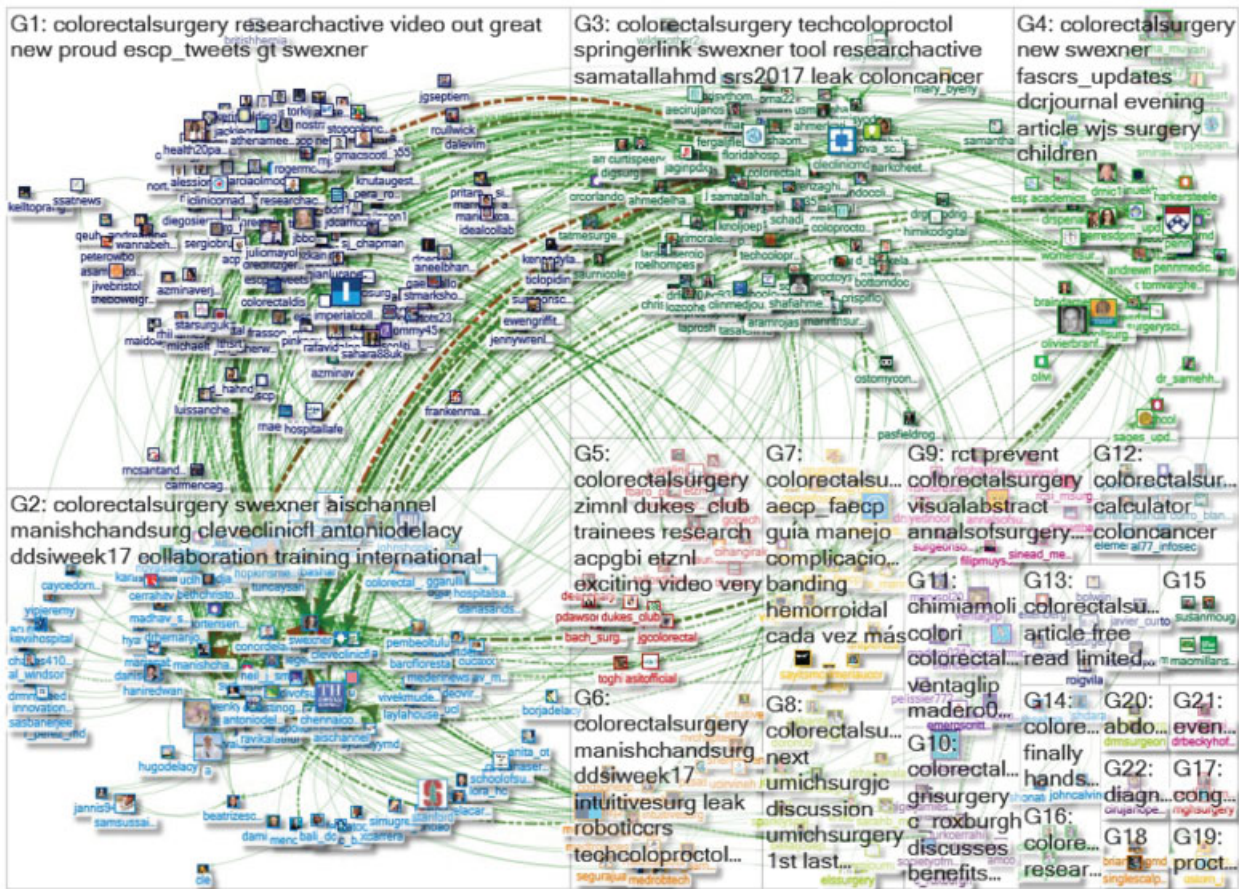


Fig. 3 Twitter NodeXL SNA Map and Report of the number of users of the hashtag “#colorectalsurgery” for Sunday; February 26, 2017, at 19:41 UTC.

available. Having online videos that discuss the disease process and what options could be available to patients will help overcome the social embarrassment and provide a better knowledge base with no distress involved. Several patients have sent private messages to society-maintained Web sites or accounts to try and get more information. Bridging the gap between physicians and patients is clearly one of the most important advantages of social media in health care. Reaching out with medical information about diseases to young and healthy patients will help with decreasing stress and confusion about symptoms, hopefully increasing the frequency of early diagnosis and improving treatment outcomes (► Fig. 4).

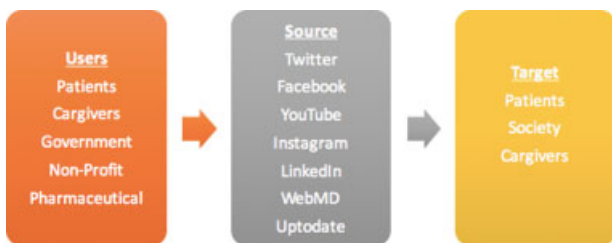


Fig. 4 The process from users to target.

Understanding Social Media: Has Awareness Always Increased?

There is no doubt how effective social media is in all aspects of society and especially in the health care industry. Some of the influencers discussed previously even believe this is a revolution of information exchange. Although we are still at very early stages to be able to quantify any change or whether awareness has truly increased, there have definitely been some noticeable differences. One example is the Angelina Jolie effect which was social media driven, targeted for genetic screening for a younger subset of patients providing a substantial change in breast cancer diagnosis.²⁰ Another way to objectively track the effect of social media is by following impressions made on each status or tweet and by increasing online journal site visits after a Tweet. For example, the #colorectalsurgery elicited more than 18,000 retweets by 461 users in 9 days. Additionally, Hawkins et al realized that a Twitter forum can increase overall journal Web site visits by 25% and can increase unique visitors to the Web site by 20%.⁹

There are different kinds of users on social media and each group of users aims for different outcomes out of their messages. A recent study by Bravo and Hoffman-Goetz analyzed the Movember campaign objectives in Canada

This document was downloaded for personal use only. Unauthorized distribution is strictly prohibited.

concluding that most of the triggered conversations were non–health related.²⁸ While there is ample information on how social media has increased awareness, the need for information control by health care providers is necessary to help screen information dissemination.

Can the Same Platform Be Used to Target Multiple Audiences?

Social media has allowed another mechanism for active information exchange between health care practitioners. In a 2015 study of colorectal surgeons in the United Kingdom, 37% of the participants in the study had a LinkedIn account versus only 3% with a Twitter account.⁶ Another study by Loeb et al attempted to analyze social media involvement among urology residents, and they noted that there was an increase in social media involvement in the age group younger than 40 years.¹⁰ Other studies replicated this analysis on family medicine physicians and plastic surgeons, and found the same conclusion in both.^{8,34} Another study on vascular surgeons in the United Kingdom noted that younger surgeons are more likely to have Twitter accounts as compared with older surgeons who tend to have LinkedIn accounts. They noted that medical professionals/trainees tend to use Facebook less as they come closer to graduation.³⁵ Another study which targeted emergency medicine residents concluded that most young trainees tend to have Facebook and YouTube accounts when compared with older faculty who have Twitter and LinkedIn accounts.³⁶

Using social media among health care providers has unveiled some unique issues. Thackeray et al analyzed 1,351,823 tweets finding that twitter is being used mostly as one way of communication which just presents data.³⁷ Two-way communication can actually create the dialog of communication we need in this age, which will not only increase the influence of social media but may also help ease some of the negative psychosocial effects of chronic diseases. Nevertheless, there are obvious limitations for social media which include the duplicate messages that patients can get from different sources which sometimes might carry contradictory information, in addition to the lack of a screening mechanism for the inaccurate nonacademic information which is widely available.

Interestingly, social media has also helped researchers to improve recruitment for randomized controlled trial with good examples being the Army of Women Program, Consano for research funding, and Emilys Entourage for Cystic Fibrosis research.^{38–40} Another clear example of how social media improves patient care is the international hernia collaboration which was started in New York by Dr. Brian Jacobs; this is a closed group and only surgeons may join. This platform discusses difficult cases and ignites discussion about approaches better used to serve the patient while respecting patient privacy and HIPAA.⁴¹ Surgeons often post CT scans and images of hernias and complicated cases and use the input and the discussion between surgeons who are pioneers in the field.

Social Media and Surgical Training and Education

Multiple online journal clubs have been created with valid CME (Continuing Medical Education) credit available such as the International General Surgery Journal Club (#IGSJC), the Eastern Association for the Surgery of Trauma journal club (#EASTjc), and the Student Audit and Research in Surgery journal club (#STARSurgUK).⁵ Those online journal clubs offer genuine educational opportunities, with evidence-based discussion which will assist in educating practicing surgeons and those in training.

Social media outlets have been a good resource for cost-effective research platforms. These outlets make it easy to reach targeted population in a highly responsive manner and help create solid ground for collaborations.¹¹ A very good example of this is the Student Audit and Research in Surgery (STARSurg) network and the GlobalSurg Network. The GlobalSurg Network facilitated an international project looking at 10,000 patients undergoing emergency laparotomy, a project which included 1,000 collaborators from 58 countries.⁴²

Social media is now being used to reach out to residents aiding in surgical education. YouTube provides a good source for video content in preparation for surgery by trainees.⁴³ In a survey, 90% of the respondents used videos as a main source for preparation, and of those, 86% used YouTube. This is a definite example of social media being a major contributor into improving the education of trainees, and hopefully indirectly improving patient care. The issue of education is covered further in another article in this issue of the journal. Most social media platforms can be used for multiple purposes (including education). Some social media platforms such as podcasts, YouTube/Vimeo and other videos, and Twitter can be used as one-way communication which makes useful for publishing articles under the goal of delivery. Other sites can be used for two-way discussion including Twitter and Facebook, where more important discussion and analysis of information from multiple sources is needed—like the International Hernia Collaboration.

Social Media and Patients: What Are They Looking for?

In a research done by Pew Research Center, the authors identified that one in five patients will seek the Internet to find people who have similar health complaints to them, and this number approaches one to four in patients with chronic illness.⁴⁴

A study from Mayo Clinic analyzed reducing patient anxiety, by creating a set of videos with the goal of pre-operative education and patient counseling. They noted that those videos reduced anxiety in patients, showing the importance of social media and Internet not only in the aspects of disease diagnosis and treatment but also in focusing on the emotional health of patients after the disease.⁴⁵

Social media has provided an easy access to abundant amount of health information for patients seeking

information about screening, diagnosis, treatment, and side effects. In addition, some groups went beyond the specific disease problem and started groups like “Journeying beyond Breast Cancer” which focuses on patients’ life and experience after treatment and what obstacles and challenges they face even after the disease has been addressed and treated.⁴⁶

Social Media and Physicians: What Is the Goal?

Social media provides a good resource for residents and medical students, and it also provides a good source of education for physicians in practice. From visual abstracts to journal articles, evidence-based information is being heavily circulated on social media in a cost-effective manner which has made accessibility much easier. Not only has evidenced-based medicine become more popular on social media, but personal physician and patient experiences regarding rare disease processes have blossomed with certain hashtags created on twitter or Instagram for physicians and patients to track and gain knowledge about these diseases. One example of this is the “Spontaneous Coronary Artery Dissection,” for which more than 1,000 survivors of this rare disease have connected on Facebook. This page has been a good avenue to present multiple research articles and develop information which is beneficial for both patients and physicians. From this group, they were also able to launch research projects on spontaneous coronary artery dissection.⁴⁷

Twitter appears to be a strong platform to disseminate data and to voice opinions, while Facebook seems to be a more appropriate platform to have discussions and share personal experiences. YouTube, Vimeo, and other video sites are a great place for educational videos, while Instagram seems to be used less commonly as a place for one-way communication where a user can have a statement or a picture with some commentary posted.

The various social media platforms serve different purposes with the overall goal of connecting physicians, caregivers, and patients. While there is no single best social media platform, an increasing number of publications show that these various platforms can be effective in disseminating information. As we move forward in this Health 2.0 generation, the way we share scientific information will continue to change just as quickly as the social media platforms themselves.

References

- 1 Leow JJ, Pozo ME, Groen RS, Kushner AL. Social media in low-resource settings: a role for Twitter and Facebook in global surgery? *Surgery* 2012;151(06):767–769
- 2 Murphy DG, Loeb S, Basto MY, et al. Engaging responsibly with social media: the BJUI guidelines. *BJU Int* 2014;114(01):9–11
- 3 Walsh K. Social media and surgery: an alternative view. *Surgery* 2016;159(03):978
- 4 Steele SR, Arshad S, Bush R, et al; Society of University Surgeons’ Social and Legislative Committee. Social media is a necessary component of surgery practice. *Surgery* 2015;158(03):857–862
- 5 Wexner SD, Petrucci AM, Brady RR, Ennis-O’Connor M, Fitzgerald JE, Mayol J. Social media in colorectal surgery. *Colorectal Dis* 2017;19(02):105–114
- 6 Ferguson C, Inglis SC, Newton PJ, Cripps PJ, MacDonald PS, Davidson PM. Social media: a tool to spread information: a case study analysis of twitter conversation at the Cardiac Society of Australia & New Zealand 61st annual scientific meeting 2013. *Collegian* 2014;21(02):89–93
- 7 Lumpkins CY, Mabachi N, Lee J, Pacheco C, Greiner KA, Geana M. A prescription for internet access: appealing to middle-aged and older racial and ethnic minorities through social network sites to combat colorectal cancer. *Health Commun* 2017;32(07):916–920
- 8 Klee D, Covey C, Zhong L. Social media beliefs and usage among family medicine residents and practicing family physicians. *Fam Med* 2015;47(03):222–226
- 9 Hawkins CM, Hillman BJ, Carlos RC, Rawson JV, Haines R, Duszak R Jr. The impact of social media on readership of a peer-reviewed medical journal. *J Am Coll Radiol* 2014;11(11):1038–1043
- 10 Loeb S, Bayne CE, Frey C, et al; American Urological Association Social Media Work Group. Use of social media in urology: data from the American Urological Association (AUA). *BJU Int* 2014;113(06):993–998
- 11 Khatiri C, Chapman SJ, Glasbey J, et al; STARSurg Committee. Social media and internet driven study recruitment: evaluating a new model for promoting collaborator engagement and participation. *PLoS One* 2015;10(03):e0118899
- 12 Zwaans WA, Perquin CW, Loos MJ, Roumen RM, Scheltinga MR. Mesh removal and selective neurectomy for persistent groin pain following Lichtenstein repair. *World J Surg* 2017;41(03):701–712
- 13 Crannell WC, Clark E, Jones C, James TA, Moore J. A pattern-matched Twitter analysis of US cancer-patient sentiments. *J Surg Res* 2016;206(02):536–542
- 14 Tsuya A, Sugawara Y, Tanaka A, Narimatsu H. Do cancer patients tweet? Examining the twitter use of cancer patients in Japan. *J Med Internet Res* 2014;16(05):e137
- 15 Cutrona SL, Roblin DW, Wagner JL, et al. Adult willingness to use email and social media for peer-to-peer cancer screening communication: quantitative interview study. *JMIR Res Protoc* 2013;2(02):e52
- 16 U.S. Breast Cancer Statistics. Available at: http://www.breastcancer.org/symptoms/understand_bc/statistics. Updated 2017. Accessed February 26, 2017
- 17 Feig SA. Screening mammography benefit controversies: sorting the evidence. *Radiol Clin North Am* 2014;52(03):455–480
- 18 Løberg M, Lousdal ML, Bretthauer M, Kalager M. Benefits and harms of mammography screening. *Breast Cancer Res* 2015;17:63
- 19 Rosenkrantz AB, Labib A, Pysarenko K, Prabhu V. What do patients tweet about their mammography experience? *Acad Radiol* 2016;23(11):1367–1371
- 20 Staudigl C, Pfeiler G, Hrauda K, et al. Changes of socio-demographic data of clients seeking genetic counseling for hereditary breast and ovarian cancer due to the “Angelina Jolie Effect”. *BMC Cancer* 2016;16:436
- 21 Abramson K, Keefe B, Chou WY. Communicating about cancer through Facebook: a qualitative analysis of a breast cancer awareness page. *J Health Commun* 2015;20(02):237–243
- 22 Attai DJ, Cowher MS, Al-Hamadani M, Schoger JM, Staley AC, Landercasper J. Twitter social media is an effective tool for breast cancer patient education and support: patient-reported outcomes by survey. *J Med Internet Res* 2015;17(07):e188
- 23 Kim E, Hou J, Han JY, Himelboim I. Predicting retweeting behavior on breast cancer social networks: network and content characteristics. *J Health Commun* 2016;21(04):479–486
- 24 Bottorff JL, Struik LL, Bissell LJ, Graham R, Stevens J, Richardson CG. A social media approach to inform youth about breast cancer and smoking: an exploratory descriptive study. *Collegian* 2014;21(02):159–168

- 25 Basch CH, Menafro A, Mongiovi J, Hillyer GC, Basch CE. A content analysis of YouTube videos related to prostate cancer. *Am J Mens Health* 2016. pii: 1557988316671459. [Epub ahead of print]
- 26 Bravo CA, Hoffman-Goetz L. Social media and men's health: a content analysis of twitter conversations during the 2013 Movember campaigns in the United States, Canada, and the United Kingdom. *Am J Mens Health* 2015. pii: 1557988315617826. [Epub ahead of print]
- 27 Turkbey B, Rosenkrantz AB. Engaging and educating patients in prostate imaging via social media. *Abdom Radiol (NY)* 2016;41(05):798
- 28 Bravo CA, Hoffman-Goetz L. Tweeting about prostate and testicular cancers: do twitter conversations and the 2013 Movember Canada campaign objectives align? *J Cancer Educ* 2016;31(02):236–243
- 29 Kobayashi LC, Smith SG. Cancer fatalism, literacy, and cancer information seeking in the American public. *Health Educ Behav* 2016;43(04):461–470
- 30 Laranjo L, Arguel A, Neves AL, et al. The influence of social networking sites on health behavior change: a systematic review and meta-analysis. *J Am Med Inform Assoc* 2015;22(01):243–256
- 31 #colorectalsurgery twitter NodeXL SNA map and report. Available at: <https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=96969>. Updated 2017. Accessed February 26, 2017
- 32 Chiang AL, Vartabedian B, Spiegel B. Harnessing the Hashtag: a standard approach to GI dialogue on social media. *Am J Gastroenterol* 2016;111(08):1082–1084
- 33 Steele SR, Arshad S, Bush R, et al. Social media is a necessary component of surgery practice. *Surgery* 2015;158(03):857–862
- 34 McEvenue G, Copeland A, Devon KM, Semple JL. How social are we? A cross-sectional study of the website presence and social media activity of Canadian plastic surgeons. *Aesthet Surg J* 2016;36(09):1079–1084
- 35 Freedman RA, Viswanath K, Vaz-Luis I, Keating NL. Learning from social media: utilizing advanced data extraction techniques to understand barriers to breast cancer treatment. *Breast Cancer Res Treat* 2016;158(02):395–405
- 36 Perales MA, Drake EK, Pemmaraju N, Wood WA. Social media and the adolescent and young adult (AYA) patient with cancer. *Curr Hematol Malig Rep* 2016;11(06):449–455
- 37 Thackeray R, Burton SH, Giraud-Carrier C, Rollins S, Draper CR. Using Twitter for breast cancer prevention: an analysis of breast cancer awareness month. *BMC Cancer* 2013;13:508
- 38 Army of Women. Available at: <https://www.armyofwomen.org>. Updated 2016. Accessed July 20, 2016
- 39 Consano. Available at: <https://www.consano.org>. Updated 2016. Accessed July 20, 2016
- 40 Emily's Entourage. Available at: <http://www.emilysentourage.org>. Updated 2016. Accessed July 20, 2016
- 41 Jacob B. Revolutionizing surgery through worldwide collaboration. Available at: <http://www.facebookstories.com/stories/99818/international-hernia-collaboration>. Updated 2016. Accessed October 17, 2016
- 42 GlobalSurg Collaborative. Mortality of emergency abdominal surgery in high-, middle- and low-income countries. *Br J Surg* 2016;103(08):971–988
- 43 Lawrence C. The making of modern surgery. *Lancet* 2009;374(9695):1055–1056
- 44 Pew Research Center—Health Fact Sheet. Available at: <http://www.pewinternet.org/fact-sheets/health-fact-sheet>. Updated 2016. Accessed July 20, 2016
- 45 O'Connor MI, Brennan K, Kazmerchak S, Pratt J. YouTube videos to create a “virtual hospital experience” for hip and knee replacement patients to decrease preoperative anxiety: a randomized trial. *Interact J Med Res* 2016;5(02):e10
- 46 Ennis-O'Connor M. Journeying beyond breast cancer. Available at: <https://journeyingbeyondbreastcancer.com>. Updated 2016. Accessed July 20, 2016
- 47 Inspire, the SCAD Ladies Stand Up. Stories of Patient Empowerment. Mayo Clinic. Available at: <http://www.mayo.edu/research/documents/scad-ladies-stand-up/doc-20113993>. Updated 2016. Accessed July 20, 2016