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Risks and Benefits of Twitter Use by Hematologists / Oncologists in the Era of Digital Medicine

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Abstract

Twitter use by physicians, including those in the hematology – oncology field, is increasing. This microblogging platform provides a means to communicate and collaborate on a global scale. For the oncology professional, an active Twitter presence provides opportunities for continuing medical education, patient engagement and education, personal branding, and reputation management. However, because Twitter is an open, public forum, potential risks such as patient privacy violations, personal information disclosures, professionalism lapses, and time management need to be considered and managed. The authors have summarized the benefits and risks of

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Twitter use by the hematology – oncology physician. In addition, strategies to maximize benefit and minimize risk are discussed, and resources for additional learning are provided.

Keywords

Twitter; Social Media; Health Information; Hematologist – Oncologist; Patient Education; Digital Engagement

Introduction

Twitter is a microblogging platform that allows users to communicate by sharing 140 character messages. Clinicians are attracted to Twitter most often as a means to collaborate and communicate about research, clinical care, and education in order to promote scholarship and disseminate knowledge [1]; [2]. Indeed, an active Twitter presence can not only heighten professional reputation on a global scale, but can also help the physician develop and control his or her own personal brand. However, with these advantages there are also some potential risks that all clinicians need to consider including patient privacy, personal privacy, and professionalism. This article will detail the benefits and risks of Twitter use by the hematology – oncology physician, and will discuss strategies to maximize benefit and minimize risk.

Benefits

Efficient Learning and Professional Collaboration

To those unfamiliar with the platform, Twitter may not appear to be a logical forum to stay abreast of developments in oncology. However, when employed strategically, the user can have personally relevant content delivered to him or her on a continuing basis. For example, the flagship journals of the leading professional societies in cancer medicine are represented on Twitter, along with other prominent cancer, major medical, and scientific journals. By following these Twitter handles, the user will be alerted to new articles, often before the print edition or email alert arrives. A quick skim of a journal's tweets allows the user to either read articles of interest in real time, "like" them as a method of saving for future review, and/or initiate (or participate in) a dialog about a particular subject being reported. Tweeted articles can also be shared via direct message (DM) with commentary (e.g. to collaborators) or sent via email or other methods. The use of visual abstracts by various journals is increasing, and Ibrahim and colleagues found a strong correlation between the use of visual abstracts in tweets and increased readership and uptake of articles [3].

Compared to traditional journal subscriptions, which can be challenging to digest en masse, it is very simple to follow multiple journals on Twitter, including some that may be only of peripheral interest. However, Twitter use need not be limited to publications. Indeed, many medical organizations and institutions regularly tweet out information of interest, such as content from meetings, debates around public policy, and research findings. Other physicians can also bring relevant and interesting content to a user focused on cancer. The use of hashtags (the # sign before a series of letters and/or numbers) is one way for Twitter

users to follow content of shared interest. By following a variety of physicians and other professionals within a specialty as well as personally relevant hashtags, the Twitter user can rely on this robust network to identify potentially interesting articles and opportunities.

Collaborative opportunities of shared learning offer another source of online education. The radiation oncology journal club (#radonc), hosted by @Rad_Nation, and the international urology journal club (#urojc) hosted by @iurojc, are specific examples of groups that meet on Twitter at regularly scheduled intervals to discuss articles and practice patterns. Beyond journal clubs, case-based discussions also occur on Twitter. @TeamHaem is a group that posts a clinical case scenario in an online blog, with subsequent conversation occurring on Twitter. Such opportunities are accessible to anyone with an internet connection, regardless of location or ability to travel, and can be relatively low in data requirements. In addition, these conversations do not necessarily have to happen in real time. The #urojc and @TeamHaem discussions occur over a 48-hour period, allowing input from interested physicians across multiple time zones. Transcripts of Twitter discussions can also be compiled for reading at a later date. In reviewing the first 12 months of the #urojc, Thangasamy and colleagues noted participation from 189 unique users representing 19 countries [4]. Mehta also described how Twitter journal clubs can bridge geographic barriers and bring together a diverse group of participants [5].

With a growing number of oncologists and other healthcare stakeholders actively participating on Twitter, clinicians have an opportunity to grow their professional network by listening to other individuals and groups. While it is possible to limit this network to a particular user group (e.g., to only follow other oncology physicians), the authors feel to do so would not capitalize on the broad user base that comprises the Twitter community. By breaking out of the proverbial “echo chamber” and interacting with others who represent different backgrounds and viewpoints, Twitter can help broaden the worldview (and medical view) of each of us, freely. Many of us within COSMO started working together after meeting online through Twitter, brought together by shared interests [6]; [7]. Some of us have not yet met in person. Tweet-ups, or meeting in real life (IRL) after first meeting on Twitter, create a great opportunity to solidify friendships and strengthen existing and future collaborations.

Twitter also has the ability to break down some traditional communication barriers between professionals and between faculty and trainees. Regardless of academic rank or practice setting, the majority of physicians who are active on Twitter are there to engage and learn. Trainees can interact with professors, academic and community physicians can engage with one another, and physicians across institutions and time zones can come together in an online space to collaborate. As discussed by Pemmaraju et al, with an increasing number of students and trainees online sharing information, the presence of more senior physicians can help promote the accuracy of information shared and can help to model professionalism in this evolving realm. In addition, coming together in the social media space may provide opportunities for virtual mentorship [1].

Research and Meeting Insights

One of the most useful roles for Twitter is the practice of tweeting results and immediate interpretation and/or commentary during national and international medical meetings. Twitter use during medical meetings has been increasing [1]; [8]; [9]; [10]. When organizers set a conference hashtag, interested parties can follow and participate in the meeting discussion, even if they are not in attendance. While many conference organizers have embraced the use of Twitter at their meetings to expand the audience and reach of the presenters, some conferences have been criticized for restrictive Twitter policies. A recent example was the June 2017 American Diabetes Association (ADA) meeting (#ADA2017). A restrictive Twitter policy, which the ADA stated was meant to protect intellectual property and to prevent potential embargo violations, sparked rapid and significant online criticism from those in attendance as well as from Twitter users following the conference proceedings online. A comment sentiment expressed in the online criticism was that scientific information shared at meetings should be readily available to all who are interested [11].

The American Association for Cancer Research updated their social media policy for the April 2017 meeting to allow non-flash photography for non-commercial purposes, and to share information on social media unless presenters label slides or posters “Do Not Post” [12]. However, it may not be realistic in this age of instant information sharing to expect an audience to honor “do not post” requests. At the 2016 ADA meeting, conference attendees were asked to not share embargoed information that was about to be presented. The requests were not effective, and presentation information along with slide images were widely shared. There was a large drop in stock price for one pharmaceutical agent being discussed which may have been related to dissemination of the data through Twitter, and the conference organizers were put in the unfortunate and generally ineffectual situation of sending tweets during the session asking attendees to delete their posts [13].

Some authors posit that widespread sharing of unpublished data could interfere with future publication of those data [14]. Although journal policies may differ, prior social media coverage may not constitute prior publication. Perhaps the best example of this is the Ingelfinger rule, a longstanding policy at the New England Journal of Medicine (NEJM), which states that presentation of data at a national meeting does not constitute prior publication and does not preclude publication [15]. It has since been adapted to a contemporary definition acknowledging the widespread use of social media and now affirms that information presented at meetings and shared on Twitter, including slides, does not jeopardize publication [11]; [16].

Some smaller conferences, such as industry-sponsored focus groups or organizations’ strategic planning meetings, do share confidential and sensitive information. Meeting organizers can explicitly insist that proceedings and shared content remain confidential. In this setting, organizations should ensure that attendee notification regarding the sensitive nature of presentations and social media sharing policy is part of the registration process and is clearly marked at the meeting.

A common component of tweeting meeting content is sharing photographs of slides during a presentation. Slide photography can be distracting to conference attendees [11] and may

shift the focus of the meeting tweeter to capturing the perfect picture rather than absorbing the information. One of us (MAT) has suggested that conference organizers tweet out slides from major presentations during the session, which may help the audience members focus on commentary rather than photography. The authors encourage conference organizers to work towards creating best practices for scientific presentation at meetings taking into account concerns about sharing of unpublished and embargoed information as well as the increasing use of social media for sharing meeting content.

Patient Education

Twitter is a popular platform to an increasing number of cancer-specific online patient communities. It is uniquely suited to foster engagement of patients, providers, scientists, patient advocates, and health policy leaders with similar interests and facilitate an informational support infrastructure online [17]; [18]; [19]; [20]; [21]. These communities allow all who are impacted by a particular disease to share their experiences. Many of the cancer-specific communities on Twitter utilize disease-specific hashtags including breast cancer (#bcsm), gynecologic cancer (#gyncsm), lung cancer (#lcsm) and myeloproliferative neoplasms (#mpnsm) [18]; [22]; [23]; [24]; [25]; [26]. Physicians regularly take part in the discussions within these online communities both during scheduled tweetchats as well as during “off hours”.

Huber et al showed that for prostate cancer, online support groups play an important role in the treatment decision making process and are not simply a neutral source of information [27]. Attai et al demonstrated that for patients participating in the #bcsm tweetchats, breast cancer related knowledge was increased and anxiety was diminished [18]. Given the growth of online cancer-specific communities and the growing impact these communities are having on patient education, physician participation provides patients with the opportunity to communicate directly with thought leaders and researchers. Pemmaraju et al described efforts to improve the quality of information available for a rare blood cancer (blastic plasmacytoid dendritic cell neoplasm) by developing a Twitter community, website, and blog dedicated to the disease [21].

When physicians are present in the online patient communities, they have the opportunity to correct misconceptions in real time and to be seen as approachable resources for guidance and information. Physicians also have an opportunity to reflect their compassion, professionalism, and real passion and expertise in science and the art of healing. Sixty-two percent of the respondents in a survey reported having a high level of trust for information provided by physicians, compared to that provided by the internet at large (24%), or family and friends (19%) [28]. A strong online physician presence can benefit patient knowledge, insight, therapeutic alliance and treatment adherence, among other things. Physicians also benefit from the experience. Koczwara noted that online Twitter discussions sparked additional thoughts regarding newly proposed survivorship categories [29]. In addition, the authors of this paper who participate in online communities report that they find the experience invaluable and learn a great deal from the patients, who are often very open in sharing about their disease experience. Despite these potential benefits, currently Twitter is not sufficient for widespread patient education since a minority of patients use the website.

Even among active Twitter users, the medium may not be ideal for many people to learn about or discuss health issues. In addition, disparities in access to digital platforms and in electronic literacy may limit the usefulness of Twitter and other SM platforms for patient education [30]; [31].

Opportunities for Professional Advancement

Developing an online presence can be thought of as a form of personal branding. Online visibility in a professional capacity may (or may not) result in widespread recognition as a thought leader, which has the potential to impact practice growth, speaking opportunities, collaboration for research and publications, and perhaps even academic advancement [32]. In 2014, Thompson contributed to the online discussion regarding social media activity and academic advancement, and he challenged his readers think of mechanisms by which social media activity could be appropriately evaluated in regards to academic credit [33], [34].

While “publish or perish” in a traditional sense is likely still the norm and reality of academic advancement, this standard may be evolving to become more inclusive of contributions made on social media. For example, in 2016, the Mayo Clinic announced that they would include social media scholarship activities when considering academic advancement, noting that by participating in public debate, physicians have the opportunity to “responsibly influence opinion and help our patients navigate the complexities of healthcare” [35]. Since those early discussions and Mayo Clinic announcement, the actual impact at Mayo or across the country is not yet clear.

Enhance trust in the profession

Physicians who are active in the online space have the opportunity to be identified as a transparent and approachable resource for information. However, when Tao et al evaluated the Twitter accounts of US-based hematologist – oncologists, they found that 79.5% had some form of financial conflict of interest (COI) [36]. DeCamp described some potential dangers of undisclosed physician COI including bias in clinical trial recruitment, as well as implications for trainee, medical student, and patient education [37].

The authors suggest that transparency is of utmost importance among oncology professionals who engage in social media, particularly when it comes to potential COI. Suggestions to increase transparency range from listing (or providing a link to) potential conflicts in one’s Twitter biography to listing disclaimers on specific posts when a potential conflict may be perceived. Twitter users selected as “Featured Voices” for the American Society of Clinical Oncology (ASCO) Annual Meeting have COI information listed on the annual meeting webpage.

Risks

While we believe that the downsides of an online presence are far outweighed by the benefits of digital engagement, the reader should be aware of several potential risks of Twitter use by physicians.

Patient privacy

Among the biggest risks is the disclosure of protected health information (PHI) and the breach of patient confidentiality. Although one might believe a Tweet to be private or well-intentioned, all posts on Twitter are a part of an open, public forum, and anything posted should be considered public and permanent, even if there is an eventual attempt to delete it. An example of such disclosure is alleged to have occurred with the New York Giants player, Jason Pierre-Paul. In 2015, Mr. Pierre-Paul was injured in a fireworks accident and required surgery. The extent of that surgery was disclosed in a tweet by ESPN's Adam Schefter, who posted a photo of the football player's medical record. Someone with access to the medical record of the Giants' player initially disclosed the PHI, which eventually made its way to Mr. Schefter and to Twitter [38]. A tweet such as "I saw a 23 year old pregnant woman with breast cancer today – need treatment advice and suggestions", which we might consider in a setting such as a tumor board to be anonymous, could potentially identify a patient in your practice. A potential workaround is to ask a more generic question, such as "Can anyone direct me to the latest information about breast cancer in pregnancy."

We believe that violation of patient privacy should be a "never event" online. Physicians should also be cautious about posting "insensitive" patient-related tweets that may not violate patient privacy, but may reflect poorly on the physician [39]. It is important to remember that patients as well as their family and friends may follow their physician on social media, and any tweets should be interpreted through that lens.

Personal Privacy and Professionalism

Maintaining personal privacy is an area of concern for many physicians. In Adilman's survey of oncology physicians and trainees, 20% of survey respondents had hesitations about joining a medically geared social media site due to privacy concerns [40]. The American Medical Association suggests that physicians "consider separating personal and professional content online", and Mostaghimi also suggested that physicians keep separate personal and professional accounts [41]; [42]. When using the internet for personal social networking, physicians should use privacy settings and safeguard personal content. Keep in mind, however, that the tenets of professionalism are still expected from the personal version of a physician's tweets. It is important to realize that for a physician on Twitter (or on any online platform), there is little to no privacy to be had. The digital space is a public space, and physicians should conduct themselves in a professional manner online, similar to real-life interactions. That does not mean all posts need to be medically related, but we do not feel there can be true separation of personal and professional self. Recognizing this, the Massachusetts Medical Society recently updated their social media policy, and does not specifically call for a separation of personal and professional content [39]. The Mayo Clinic Center for Social Media has a common sense 12-word policy: "Don't lie, don't pry, don't cheat, can't delete, don't steal, can't reveal" [43].

Some physicians face challenges when trying to apply principles of medical professionalism to their online actions, due to a false perception of anonymity and online disinhibition when posting [44]. DeCamp notes that when a physician asks "Should I post this on social media?", the answer depends primarily on whether or not the content is appropriate for a

physician in a public space, not necessarily whether the content is personal or professional [45]. Greyson additionally noted that some may view a physician's online activity as a proxy for their trustworthiness to manage the responsibilities of patient care [44].

We recommend thinking carefully about posts and their impact before turning to the keyboard. Categories of potentially inappropriate types of tweet content include: sexually explicit material; use of profanity or discriminatory language; misrepresentation of credentials; disparaging remarks about the medical profession, specific health professionals, or institutions; excessive venting of frustrations over specific issues; and descriptions of patients or patient encounters using a negative tone [20]; [46]; [47]; [48]. While inappropriate online behavior has the potential to go "viral", the same is now true for "in real life" behavior in this digital age. For example, at a National Basketball Association game in 2016, a home team fan made an obscene gesture towards an opposing player. The fan was ejected from the game, but the entire exchange was broadcast on national television. Within a few hours, he was identified as a local physician [49]. Whether doctors like it or not, the public expects physicians to be both dedicated clinicians and responsible citizens [50].

It cannot be stressed enough that online postings are public and permanent. Even if a tweet is deleted, it lives online somewhere, and it can be discovered. Because 140 characters is not always a lot of space to make a point, there is potential to be misunderstood, especially to the new user unfamiliar with the platform. When starting out, we recommend taking some time to "lurk" – listen and watch conversations and interactions – before jumping in. Consider tweeting to be similar to a medical procedure and invoke a "pre-tweet pause". In addition, when re-tweeting, consider the source and check links for accuracy. Since there is no fact checker for individual tweets, it is helpful to have some degree of skepticism, both when reading and tweeting. Even with a small number of followers, an inappropriate tweet has the potential to be shared widely and quickly.

There are significant risks involved with inappropriate social media activity. A survey of state licensure boards in 2012 determined that 71% of the boards had held disciplinary proceedings for inappropriate social media activity. These activities included violation of patient confidentiality, inappropriate communication with patients, as well as other infractions. More than half of these proceedings led to restrictions, suspensions, or revocations of licenses [48].

Physicians should understand that even with a disclaimer such as "tweets and opinions are my own" to clarify that they are not speaking for their institution, posts may reflect negatively on one's institution and may have consequences. It is always safest to assume that your institution and leadership are reading any content you put out. In a prominent recent example, a physician posted an anti-vaccination column, resulting in a swift, strongly negative online response. The physician's institution publically refuted his statements and reported that he would be "appropriately disciplined" [51]; [52].

Physicians in the online space are sometimes surprised that their views on specific medical issues are challenged. Be prepared for dissent and respectful discussion; the 'public square' is not a clinical setting, so your position may be well informed but may not be considered

authoritative. Assuming or insisting that your opinions be accepted may put you at risk of appearing arrogant. Evidence of arrogance online is discoverable, shareable and may be detrimental to any malpractice cases, where poor doctor-patient communication may already be an issue [53]; [54].

Twitter does have block and report functions for followers who are being truly abusive. However, actively blocking a large number of followers simply because they disagree with you may prevent you from actively monitoring your online reputation. If a discussion becomes nonproductive or openly hostile, do not engage on the same level or use similar language as an abusive user. Your reputation may be judged not only by clinical acumen but also by composure and demeanor [50].

Fake News / Fake Engagement

Patients are increasingly turning to the internet and social media for medical information [55], but this tendency can be exploited by commercial interests and those pushing a particular biased point of view (e.g. “fake news”). There are a growing number of “bots” (automated “robot” accounts) that disseminate spam content [56]. While it may be tempting, especially when getting started, to simply retweet (RT) a trusted colleague’s posts, it is always recommended to check the link and source for accuracy. A physician’s reputation depends on the content shared and created, and by carefully curating their network on Twitter and other SM platforms, hematology - oncology professionals can combat fake news and disinformation by becoming what one scientist termed a “nerd of trust” [57] – namely, a trustworthy source of information. It is recommended that users take a few minutes to review the profiles of new followers before automatically following back, and certainly review profiles of those unfamiliar to the user prior to RT content. In addition, there are various third party web applications that, when connected with one’s Twitter account, may be used to identify and delete or block fake Twitter users from one’s followers or lists.

With an increasing number of fake and spam accounts, it can also be difficult to filter through the “noise”, or repetitive, irrelevant content. Pemmaraju and Desai both described the challenges of following meeting related tweets due to the practice of purchasing RTs from third parties to increase promotional tweets, as well as posting advertisements which may be disguised as educational tweets [1]; [58]. Both of these practices make it more challenging for physicians to identify the “signal”, or the desired content. The use of specific hashtags can help to improve the signal to noise ratio, and use of the Twitter report and block functions can help to reduce irrelevant content. In a welcome shift, a large pharmaceutical company changed their social media approach at the 2017 ASCO meeting in response to physician complaints in 2016 about excessive promotional tweets. [59].

Time management

When used appropriately, Twitter can make one more efficient. However, it is very easy to get distracted and waste valuable time. Creating lists (such as “doctors”, “journals”, “organizations”, “news”) and utilizing various organizational platforms such as Tweetdeck or Hootsuite to monitor discreet information streams can make it easier to rapidly skim content. Suggested users to follow when getting started are listed in Table 1, and suggested

resources for additional education are listed in Table 2. The ASCO and the American Society of Hematology (ASH) annual meetings have offered social media sessions which provide the opportunity to learn from and network with seasoned social media users. Set aside a certain amount of time to review posts and engage, but it is not necessary to be online every day. Carefully choose who you want to listen to and engage with, and do not be afraid to unfollow those who clutter your feed with content that does not add value to your experience. Focus on quality over quantity. Overall, physicians are forced to find discipline amidst many distractions from all sorts of media. Twitter avoidance is an ineffective antidote for fear of distraction and lack of discipline.

Concluding Thoughts

Twitter provides many benefits for the practicing hematologist and oncologist, and our opinion is that the value far outweighs any potential risks or downsides. With proper education regarding best practices (along with some good common sense), we feel that the risks can be appropriately managed. It is recommended that when starting, the new user identify experienced colleagues, spend some time “lurking”, and ask for advice if needed. The new user should also familiarize themselves with their own institutional (if available) and professional society social media policies.

As physicians, we have an obligation to stay current in our field, to contribute to the education of other physicians, and to contribute to the education of patients, and an active Twitter presence can help us fulfill many of these obligations.

References

1. Pemmaraju N, Thompson MA, Mesa RA, Desai T. Analysis of the use and impact of Twitter during the American Society of Clinical Oncology Annual Meetings From 2011 to 2016: Focus on advanced metrics and user trends. J Oncol Pract. 2017 Jul; 13(7):e623–e631. Epub 2017 May 17. DOI: 10.1200/JOP.2017.021634 [PubMed: 28514195]
2. Matthews, G. [Accessed 23 June 2017] Missing the forest for the trees. Retrieved from: http://mdigitallife.com/mdlreports/
3. Ibrahim AM, Lillemoe KD, Klingensmith ME, Dimick JB. Visual abstracts to disseminate research on social media: A prospective, case-control crossover study. Ann Surg. 2017 Apr.26 [Epub ahead of print]. doi: 10.1097/SLA.0000000000002277
4. Thangasamy IA, Leveridge M, Davies BJ, Finelli A, Stork B, Woo HH. International urology journal club via Twitter: 12-month experience. Eur Urol. 2014 Jul; 66(1):112–7. DOI: 10.1016/j.eururo.2014.01.034 [PubMed: 24548686]
5. Mehta N, Flickinger T. The Times They are a-changin’: Academia, social media and the JGIM Twitter journal club. J Gen. Intern Med. 2014; 29(10):1317–18. DOI: 10.1007/s11606-014-2976-9 [PubMed: 25092011]
6. Attai DJ, Sedrak MS, Katz MS, et al. Social media in cancer care: highlights, challenges, and opportunities. Future Oncol. 2016; 12(13):1549–52. DOI: 10.2217/fon-2016-0065 [PubMed: 27025657]
7. Sedrak MS, Dizon DS, Anderson PF, et al. The emerging role of professional social media use in oncology. Future Oncol. 2017; 13(15):1281–1285. Epub 2017 Jun 7. DOI: 10.2217/fon-2017-0161 [PubMed: 28589770]
8. Attai DJ, Radford DM, Cowher MS. Tweeting the meeting: Twitter use at the American Society of Breast Surgeons Annual Meeting 2013–2016. Ann Surg Oncol. 2016; 23(10):3418–22. DOI: 10.1245/s10434-016-5406-x [PubMed: 27387677]

9. Wilkinson SE, Basto MY, Perovic G, Lawrentschuk N, Murphy DG. The social media revolution is changing the conference experience: Analytics and trends from eight international meetings. BJU Int. 2015; 115(5):839–46. DOI: 10.1111/bju.12910 [PubMed: 25130687]
10. Tomlinson S, Haas M, Skaugset LM, et al. Using Twitter to increase content dissemination and control educational content with presenter initiated and generated live educational tweets (PIGLETs). Med Teach. 2017 Jul; 39(7):768–772. DOI: 10.1080/0142159X.2017.1317727 [PubMed: 28449610]
11. Fiore, K. [Accessed 23 June 2017] Experts: Restrictive sharing policies have no place at medical meetings. Jun 14, 2017. Retrieved from: https://www.medpagetoday.com/PublicHealthPolicy/GeneralProfessionalIssues/66040
12. Buck, R. [Accessed 22 June 2017] New AACR social media policies for scientific meetings strive for balance. Mar 16, 2017. Retrieved from: http://blog.aacr.org/new-aacr-social-media-policies-for-scientific-meetings-strive-to-balance-the-needs-of-presenters-and-audiences-2/
13. Cortez, M. [Accessed 24 June 2017] Can a bunch of doctors keep an $8 billion secret? Not on Twitter. Journal of Medicine. Jun 15, 2016. Retrieved from: https://www.ncnp.org/journal-of-medicine/1767-can-a-bunch-of-doctors-keep-an-8-billion-secret-not-on-twitter.html
14. Groves T. Tweeting and rule breaking at conferences. BMJ. 2016; 27:i3556. 353. doi: 10.1136/bmj.i3556
15. Relman AS. The Ingelfinger rule. NEJM. 1981; 305:824–6. DOI: 10.1056/NEJM198110013051408 [PubMed: 7266634]
16. [Accessed 3 July 2017] NEJM editorial policies. Retrieved from: http://www.nejm.org/page/about-nejm/editorial-policies
17. Chung JE. Social networking in online support groups for health: How online social networking benefits Patients. J Health Commun. 2014; 19(6):639–59. DOI: 10.1080/10810730.2012.757396 [PubMed: 23557148]
18. Attai DJ, Cowher MS, Al-Hamadani M, et al. 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(7):e188.doi: 10.2196/jmir.472 [PubMed: 26228234]
19. Sedrak MS, Cohen RB, Merchant RM, Schapira MM. Cancer communication in the social media age. JAMA Oncol. 2016; 2(6):822–3. DOI: 10.1001/jamaoncol.2015.5475 [PubMed: 26940041]
20. Lewis MA, Dicker AP. Social media and oncology: The past, present, and future of electronic communication between physician and patient. Semin Oncol. 2015 Oct; 42(5):764–71. DOI: 10.1053/j.seminoncol.2015.07.005 [PubMed: 26433557]
21. Pemmaraju N, Gupta V, Thompson MA, Lane AA. Social media and internet resources for patients with blastic plasmacytoid dendritic dell neoplasm (BPDCN). Curr Hematol Malig Rep. 2016 Dec; 11(6):462–67. DOI: 10.1007/s11899-016-0340-3 [PubMed: 27492117]
22. Katz MS, Utengen A, Anderson PF, et al. Disease-specific hashtags for online communication about cancer care. JAMA Oncol. 2016; 2(3):392–4. DOI: 10.1001/jamaoncol.2015.3960 [PubMed: 26539640]
23. [Accessed 2 July 2017] Cancer tag ontology. Retrieved from: https://www.symplur.com/healthcare-hashtags/ontology/cancer/
24. Thompson, MA., Katz, MS., Utengen, A. [Accessed 2 July 2017] Introducing hematology tag ontology. May 8, 2017. Retrieved from: https://www.symplur.com/blog/introducing-hematology-tag-ontology/
25. Pemmaraju N, Gupta V, Mesa R, Thompson MA. Social media and myeloproliferative neoplasms (MPN) - Focus on Twitter and the development of a disease-specific community: #MPNSM. Curr Hematol Malig Rep. 2015; 10(4):413–420. DOI: 10.1007/s11899-015-0287-9 [PubMed: 26411990]
26. Pemmaraju N, Gupta V, Mesa R, Thompson MA. Social media and myeloproliferative neoplasms (MPN): Analysis of advanced metrics from the first year of a new Twitter community: #MPNSM. Curr Hematol Malig Rep. 2016; 11(6):456–61. DOI: 10.1007/s11899-016-0341-2 [PubMed: 27492118]

27. Huber J, Maatz P, Muck T, et al. The effect of an online support group on patients' treatment decisions for localized prostate cancer: An online survey. Urol Oncol. 2017; 35(2):37.e19–37.e28. DOI: 10.1016/j.urolonc.2016.09.010
28. Hesse BW, Nelson DE, Kreps G, et al. Trust and sources of health information: The impact of the internet and its implications for health care providers: Findings from the first health information national trends survey. Arch Intern Med. 2005; 165(22):2618–24. DOI: 10.1001/archinte.165.22.2618 [PubMed: 16344419]
29. Koczwara, B. [Accessed 2 July 2017] Developing a survivorship taxonomy that puts people first. Jun 26, 2017. Retrieved from: https://connection.asco.org/blogs/developing-survivorship-taxonomy-puts-people-first
30. Levine DM, Lipsitz SR, Linder JA. Trends in seniors' use of digital health technology in the United States, 2011–2014. JAMA. 2016; 316(5):538–40. DOI: 10.1001/jama.2016.9124 [PubMed: 27483069]
31. Silver MP. Patient perspectives on online health information and communication with doctors: A qualitative study of patients 50 years old and over. J Med Internet Res. 2015; 17(1):e19.doi: 10.2196/jmir.3588 [PubMed: 25586865]
32. Pennell, NA. [Accessed 4 July 2017] The draw of social media for oncology professionals. Apr 19, 2016. Retrieved from: http://connection.asco.org/blogs/draw-social-media-oncology-professionals
33. Thompson, MA. [Accessed 28 June 2017] Are we ready for "Academic promotions should consider social media"?. Oct 14, 2014. https://connection.asco.org/blogs/are-we-ready-"academic-promotions-should-consider-social-media"
34. Scalpel, S. [Accessed 2 July 2017] Academic promotions should consider social media. Oct 14, 2014. Retrieved from: http://www.kevinmd.com/blog/2014/10/academic-promotions-consider-social-media.html
35. Cabrera, D. [Accessed 28 June 2017] Mayo Clinic includes social media scholarship activities in academic advancement. May 25, 2016. Retrieved from: https://socialmedia.mayoclinic.org/2016/05/25/mayo-clinic-includes-social-media-scholarship-activities-in-academic-advancement/
36. Tao DL, Boothby A, McLouth J, Prasad V. Financial conflicts of interest among hematologist-oncologists on Twitter. JAMA Intern Med. 2017; 177(3):425–7. DOI: 10.1001/jamainternmed.2016.8467 [PubMed: 28114456]
37. DeCamp M. Physicians, social media, and conflict of interest. J Gen Intern Med. 2013; 28(2):299–303. DOI: 10.1007/s11606-012-2251-x [PubMed: 23129160]
38. Samadi, D. [Accessed 30 June 2017] Tweet revealing Giants' Jason Pierre-Paul hand injury may have violated HIPAA law. New York Daily News. Jul 9, 2015. http://www.nydailynews.com/life-style/health/tweet-jason-pierre-paul-injury-hipaa-violation-article-1.2286240
39. MMS physicians' guide to Social Media. [Accessed 23 June 2017] Massachusetts Medical Society. Retrieved from: http://www.massmed.org/Governance-and-Leadership/Committees,-Task-Forces-and-Sections/MMS-Physicians--Guide-to-Social-Media-(pdf)/
40. Adilman R, Rajmohan Y, Brooks E, et al. Social media use among physicians and trainees: results of a national medical oncology survey. J Oncol Pract. 2016; 12(1):79–80. e52–60. DOI: 10.1200/JOP.2015.006429 [PubMed: 26443837]
41. American Medical Association Opinion 9.124 – Professionalism in the use of social media. AMA J Ethics. 2015; 17(5):432–4. [Accessed 24 June 2017] Retrieved from: http://journalofethics.ama-assn.org/2015/05/coet1-1505.html.
42. Mostaghimi A, Crotty BH. Professionalism in the digital age. Ann Intern Med. 2011; 154(8):560–2. DOI: 10.7326/0003-4819-154-8-201104190-00008 [PubMed: 21502653]
43. Timimi, F. [Accessed 3 July 2017] A 12-word social media policy. Apr 5, 2012. Retrieved from: https://socialmedia.mayoclinic.org/2012/04/05/a-twelve-word-social-media-policy/
44. Greysen SR, Kind T, Chretien KC. Online professionalism and the mirror of social media. J Gen Intern Med. 2010; 25(11):1227–9. DOI: 10.1007/s11606-010-1447-1 [PubMed: 20632121]
45. DeCamp M, Koenig TW, Chisolm MS. Social media and physicians' online identity crisis. JAMA. 2013; 310(6):581–2. DOI: 10.1001/jama.2013.8238 [PubMed: 23942675]

46. Chretien KC, Farnan JM, Greysen SR, Kind T. To friend or not to friend? Social networking and faculty perceptions of online professionalism. Acad Med. 2011; 86(12):1545–50. DOI: 10.1097/ACM.0b013e3182356128 [PubMed: 22030752]
47. Farnan JM, Sulmasy LS, Worster BK, Chaudhry HJ, Rhyne JA, Arora VM. Online medical professionalism: Patient and public relationships: Policy statement from the American College of Physicians and the Federation of State Medical Boards. Ann Intern Med. 2013; 158(8):620–7. DOI: 10.7326/0003-4819-158-8-201304160-00100 [PubMed: 23579867]
48. Greysen SR, Chretien KC, Kind T, Young A, Gross CP. Physician violations of online professionalism and disciplinary actions: A national survey of state medical boards. JAMA. 2012; 307(11):1141–2. DOI: 10.1001/jama.2012.330 [PubMed: 22436951]
49. Tannenwald, J., Wood, S. [Accessed 2 July 2017] Ejected 76ers fan who flipped off OKC's Russell Westbrook? A local doctor. The Inquirer Daily News. Oct 27, 2016. Retrieved from: http://www.philly.com/philly/blogs/pattisonave/Idiot-76ers-fan-flips-off-Russell-Westbrook-gets-ejected-and-called-out-on-ESPN.html
50. Chandratilake M, McAleer S, Gibson J, Roff S. Medical professionalism: what does the public think? Clin Med (Lond.). 2010; 10(4):364–9. [PubMed: 20849011]
51. Boodman, E. [Accessed 26 June 2017] Doctor's anti-vaccine claims ignite PR firestorm for Cleveland Clinic. Jan 7, 2017. Retrieved from: https://www.statnews.com/2017/01/07/anti-vaccine-claims-cleveland-clinic/
52. Wadman, M. [Accessed 26 June 2017] Cleveland Clinic will discipline doctor who wrote antivaccination column. Jan 9, 2017. Retrieved from: http://www.sciencemag.org/news/2017/01/cleveland-clinic-will-discipline-doctor-who-wrote-antivaccination-column
53. Levinson W, Roter DL, Mulooly JP, Dull VT, Frankel RM. Physician-patient communication. The relationship with malpractice claims among primary care physicians and surgeons. JAMA. 1997; 277(7):553–9. [PubMed: 9032162]
54. Hannawa AF, Shigemoto Y, Little TD. Medical errors: Disclosure styles, interpersonal forgiveness, and outcomes. Soc Sci Med. 2016; 156:29–38. DOI: 10.1016/j.socscimed.2016.03.026 [PubMed: 27017088]
55. Van de Belt TH, Engelen LJ, Berben SA, Teerenstra S, Samsom M, Schoonhoven L. Internet and social media for health-related information and communication in health care: Preferences of the Dutch general population. J Med Internet Res. 2013; 15(10):e220.doi: 10.2196/jmir.2607 [PubMed: 24088272]
56. Grajales FJ III, Sheps S, Ho K, Novak-Lauscher H, Eysenbach G. Social media: a review and tutorial of applications in medicine and healthcare. J Med Internet Res. 2014; 16(2):e:13.doi: 10.2196/jmir.2912 [PubMed: 24518354]
57. McClain CR. Practices and promises of Facebook for science outreach: Becoming a "Nerd of Trust". PLoS Biol. 15(6):e2002020.
58. Desai T, Shariff A, Shariff A, Kats M, Fang X, Christiano C, Ferris M. Tweeting the meeting: An in-depth analysis of Twitter activity at Kidney Week 2011. PLoS One. 2012; 7(7):e40253.doi: 10.1371/journal.pone.0040253 [PubMed: 22792254]
59. [Accessed 18 July 2017] Being a better social media citizen at the 2017 ASCO annual meeting. Retrieved from: https://www.astrazeneca.com/media-centre/articles/2017/being-a-better-social-media-citizen-at-the-2017-asco-annual-meeting-25052017.html

Table 1

Suggested Twitter Users to Follow

Name	Twitter Handle
Organizations	
American Society of Clinical Oncology	@ASCO
American Society of Hematology	@ASH_Hematology
American Society of Blood and Marrow Transplantation	@ASBMT
American Association for Cancer Research	@AACR
European Society for Blood and Marrow Transplantation	@TheEBMT
European Hematology Society	@EHA_Hematology
Journals	
Journal of Clinical Oncology	@JCO_ASCO
Journal of Oncology Practice	@JOP_ASCO
Journal of Global Oncology	@JGO_ASCO
Blood Journal	@BloodJournal
New England Journal of Medicine	@NEJM
Authors	
Patricia Anderson	@pfanderson
Deanna Attai	@DrAttai
Don Dizon	@drdonsdizon
Michael Fisch	@fischmd
Matthew Katz	@subatomicdoc
Jennifer Kesselheim	@DrKesselheim
Merry Jennifer Markham	@DrMarkham
Nathan Pennell	@n8pennell
Mina Sedrak	@MinaSedrakMD
Michael Thompson	@mtmdphd
Audun Utengen	@audvin
Other Physicians of Interest	
Clifford Hudis	@CliffordHudis
Bruce Johnson	@ASCOPres
Navneet Majhail	@BldCancerDoc
Robert Miller	@rsm2800
Robert Orlowski	@Myeloma_Doc
Naveen Pemmaraju	@doctorpemm
Miguel Perales	@DrMiguelPerales
Richard Schilsky	@rschilsky
Anas Younas	@DrAnasYounas

Table 2

Online Resources for Additional Education

Title	Author / Date	Link
10 Tips for Use of Social Media	ASCO	http://ow.ly/54dP30dqcjq
7 tips to avoid HIPAA violations in social media	Ekrem (6/6/11)	http://ow.ly/TPfzJ
Getting Started in Social Media – What to Do Before You Join	Katz (4/28/14)	http://ow.ly/PqH230dqtpk
Twitter 101: Signing Up – A Tutorial for Oncologists	Katz (5/4/14)	http://ow.ly/XUDw30dqtrw
Twitter 102: Account Settings – A Tutorial for Oncologists	Katz (5/4/14)	http://ow.ly/PTmz30dqttg
Twitter 103: Trolls, Malware & Spam – A Tutorial for Oncologists	Katz (5/4/14)	http://ow.ly/yLCD30dqtuW
Social Media and the Practicing Hematologist: Twitter 101 for the Busy Healthcare Provider	Thompson (10/09/15)	http://ow.ly/ThcxT
Why Do We Need Twitter? For Health Professionals In Oncology, Hematology & SCT	Majhail (3/23/15)	http://ow.ly/fwV430dqcmq
Scientists in the Twitterverse	Savage (7/16/2015)	http://ow.ly/TTTc30dI1sr