Published in final edited form as:

Curr Hematol Malig Rep. 2015 December ; 10(4): 405–412. doi:10.1007/s11899-015-0286-x.

Social Media and the Practicing Hematologist: Twitter 101 for the Busy Healthcare Provider

Michael A. Thompson, MD, PhD¹, Navneet S. Majhail, MD, MS², William A. Wood, MD³, Miguel-Angel Perales, MD⁴, and Mélanie Chaboissier⁵

¹ Michael A. Thompson, MD, PhD, Medical Director, Early Phase Cancer Research Program, Co-PI, Aurora NCI Community Oncology Research Program (NCORP), Aurora Research Institute, Aurora Health Care, 960 N. 12th St., Room 3144, Milwaukee, WI 53233, 414-219-4763, Research FAX: 414-778-4349, Doximity e-FAX: 888-416-9872, Michael.A.Thompson@aurora.org

² Navneet Majhail, MD, MS, Director, Blood & Marrow Transplant Program, Cleveland Clinic, 9500 Euclid Ave, R35, Cleveland, OH 44195, Phone: 216-444-2199, Fax: 216-444-9464, majhain@ccf.org

³ William A Wood, MD, MPH, Bone Marrow and Stem Cell Transplantation Program, The University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center, Physicians Office Building, 170 Manning Drive, 3rd Floor, Chapel Hill, NC 27516, Phone: 919-843-6517, Fax: 919-966-7748, wawood@med.unc.edu

⁴ Miguel-Angel Perales, M.D., Adult Bone Marrow Transplantation Service, Department of Medicine, Memorial Sloan Kettering Cancer Center, 1275 York Avenue, Box 298, New York, NY 10065, peralesm@mskcc.org, Fax: 212-717-3500, Phone: 212-639-8682

⁵ Mélanie Chaboissier, Communication Coordinator, EBMT Executive Office, C/ Rosselló 140, 1^o-1^a, 08036, Barcelona, Spain, Tel: (+34) 93-453-8570, Fax: (+34) 93-451-9583, melanie.chaboissier@ebmt.org

Abstract

Social media is a relatively new form of media that includes social networks for communication dissemination and interaction. Patients, physicians, and other users are active on social media including the microblogging platform Twitter. Many online resources are available to facilitate joining and adding to online conversations. Social media can be used for professional uses, therefore we include anecdotes of physicians starting on and implementing social media successfully despite the limits of time in busy practices. Various applications demonstrating the utility of social media are explored. These include case discussions, patient groups, research collaborations, medical education and crowdsourcing/crowdfunding. Social media is integrating

Conflict of Interest

Michael A. Thompson, William A. Wood, Miguel-Angel Perales, and Mélanie Chaboissier each declare no potential conflicts of interest.

Navneet S. Majhail reports personal fees and serves on Anthem's National Transplant Center Accreditation Panel.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

into the professional workflow for some individuals and hematology/oncology societies. The potential for improving hematology care and research is just starting to be explored.

Keywords

Social media; Twitter; Facebook; communication; hematology; crowdfunding

What is social media?

Social media is a form of media.¹ Media is used to communicate. Communication is at the core of what we do – with patients, with colleagues and with the public. The use of social media in hematology seemed to substantially increase at the American Society of Hematology (ASH) 2014 (#ASH14) meeting as well as at the 2015 Annual BMT Tandem Meetings (#BMTTandem15) and 41st Annual Meeting of the European Society for Blood and Marrow Transplantation (#EBMT15). Describing social media in a manuscript can be similar to giving a didactic lecture on “how to ride a bike;” that is, it is far easier and more fun to do the activity than explain or read about the mechanisms. To ease into the more esoteric aspects, the authors will first describe briefly how we became interested in social media and the role social media is playing for hematology. While social media is media,¹ there are differences between social versus traditional media. Social media is faster, permanent (archived), interactive and searchable, and its impact often amplifies beyond the initial “broadcast” audience. There are many platforms on social media, a few will be reviewed here with emphasis on Twitter.

How the authors got started in social media

Navneet Majhail, MD, MS (@BldCancerDoc) was “toying about” with social media and “took the plunge” before the American Society of Hematology (ASH) 2014 Annual Meeting. His blog post, “@BldCancerDoc, Or How I Learned to Stop Worrying and Love Twitter,” describes how he became hooked.² He also wrote about his dual role of in real life and digital presence on Twitter in the European Group for Blood and Marrow Transplantation (EBMT) newsletter.³ One of many quotable notes: “If you can take care of transplant patients, you can easily use Twitter!”

Miguel Perales, MD (@DrMiguelPerales), a medical oncologist who specializes in stem cell transplantation, joined Twitter about 2 years ago, inspired by one of his colleagues, Anas Younes, MD (@DrAnasYounes). By following several colleagues active in social media, including Robert Miller, MD (@rsm2800), and Michael Thompson, MD, PhD (@mtmdphd), Dr. Perales uses the platform to stay up to date, share information, and interact with colleagues and others. He has led efforts to enhance the Twitter presence of the American Society for Blood and Marrow Transplantation (@ASBMT) and the Blood and Marrow Transplantation Clinical Trials Network (@BMTCTN), and also chairs the Sub-Committee on Web-Based Learning of the ASBMT and the Digital Education Working Group of ASH.

Dr. Thompson (@mtmdphd) first got involved with social media when Michael Fisch, MD, MPH (@fischmd), gave a talk on the subject at the MDACC Community Clinical Oncology Program (CCOP) Annual Meeting in Houston after the “Arab Spring” uprisings in the Middle East in 2011. Dr. Fisch then mentored him on using Twitter, and the two have since shared ideas on the use of social media. Dr. Thompson’s first “Tweetup” was at the American Society of Clinical Oncology (ASCO) 2011 meeting, where he met other interested “tweeps” (i.e. Twitter users) and started increasing his social media interactions and presence, eventually joining the ASCO Integrated Media and Technology Committee and working with ASCO staff on ASCO Connection blogs. After hearing from visionaries such as Dave deBronkart (@ePatientDave) and Wendy Sue Swanson, MD (@SeattleMamaDoc), at the Mayo/Ragan Social Media Conference in October 2011, he started interacting more, an example of which occurred at the ASCO 2012 Annual Meeting where he and early Twitter users Drs. Younes and Miller discussed the topic, “Using Social Media in Oncology for Education and Patient Engagement.”⁴

William Wood, MD, MPH (@WoodBD) is an Assistant Professor at the University of North Carolina in the division of hematology/oncology. For several years he has written a column for *HemOnc Today*, and through that experience learned the benefits of using a medium of informal conversation to connect with individuals from many different backgrounds about topics relevant to his clinical practice and research. He later discovered that Twitter has the same capabilities, except in a mode that involves shorter pieces of information at a time, a wider audience and a robust, almost real-time back-and-forth discussion. He has found that information learned and shared on Twitter is very relevant to his academic life, making it a useful source of continuous learning and a helpful way to make connections with others. His experience with online clinical case sharing has several parallels to traditional and social media platforms. Online clinical case sharing platforms allow him to engage in rapid and robust exchange of ideas, and to learn from others with different backgrounds and perspectives than his own.

Anatomy of a Tweet and Twitter 101

Anatomy of a Tweet

Twitter is a microblogging social media tool that is optimized for use on a mobile platform (e.g., iOS or Android), although it can be easily accessed through a desktop computer device. The application is fairly intuitive and has a minimalist interface. Figure 1 shows the typical steps involved in composing a “tweet,” which cannot exceed 140 characters (including spaces). Followers of the individual composing the message can view and “retweet” or “favorite” the tweet, which in turn can be retweeted or favorited by their followers, and so on – giving the opportunity for the original tweet to receive wide and quick dissemination through several “impressions” (similar to signal transduction amplification in biology).

The components of a tweet are shown in Figure 2. Given the limited number of characters allowed, acronyms and emoticons are frequently used and grammar may need to be compromised to convey your message. “Hashtags” (e.g., #cancer, #ASCO15, #bmstm) are used to identify specific terms and facilitate search and curation of information. One

oncology hashtag organization scheme is the “Cancer Tag Ontology (CTO)” developed by Matthew Katz, MD (@subatomicdoc), and colleagues.⁵ Other Twitter users can be identified by the “@” symbol or their Twitter “handle” (e.g., @BldCancerDoc, @mtmdphd, @Mohty_EBMT). If an internet link is included, Twitter can automatically shorten it in order to save characters. Alternatively, another website (e.g., goo.gl, bitly.com, tinyurl.com, ow.ly) can be used to shorten the link. By using sites such as these, users can archive links and also obtain metrics and the number of users who accessed a link through the original poster. This is another way you can measure the impact of tweets. Tweets can include website thumbnails, photographs and/or videos. Common abbreviations that may accompany a tweet include RT (retweet – when a follower re-posts a tweet on his/her own profile), MT (modified tweet – when a follower alters a tweet before posting it on his/her profile) and HT (hat tip/heard through – when a follower acknowledges the source and includes the Twitter identification of the original composer of the tweet).

Twitter 101

As Dr. Bryan Vartabedian (@Doctor_V) noted in his blog 33 Charts: “While newbie public physicians need to be educated, there are great resources available...”.⁶ A few helpful references⁷⁻¹⁸ for getting started are provided in Table 1.

Additional contextual commentary is provided in “Social Media Starter Kit and Managing Your Digital Reputation”¹⁹ by Drs. Jeffrey Geske and Farris Timimi.

Twitter for Professional Use

Dr. Vartabedian also remarked: “We’ve reached a point where social media is now part of the professional workflow.”⁶ There is an ever increasing menu of social medial platforms available today. However, Twitter has some advantages that make it preferable for professional use among health care providers. The interface of the mobile application is intuitive and simple to use, information is presented in smaller bites and can be processed quickly, it offers greater control over content, and it allows for rapid dissemination of information. Twitter gives users flexibility in determining their level of participation, which can range from being a passive consumer to the other end of the spectrum where an individual can be an active creator of content.

Some examples of how Twitter can be used for professional purposes include:

- *Obtaining information on latest research:* Most major medical journals have a Twitter presence and routinely post information on release of new issues, prepublished articles and other related content such as blogs. Journals may have their own Twitter username (e.g., @NEJM, @TheLancet, @nature) or they may post under the Twitter username of the parent professional society (e.g., @ASCO, @ASH_hematology). Hashtags may also be used to identify articles published by specific journals (e.g., #bloodjournal, #JCO). In addition, several non-peer reviewed journals/medical news periodicals share information and content on Twitter (e.g., @ASCOPost, @ASHClinicalNews, @HemOncToday).

– *Obtaining information relevant to the profession:* Professional health care organizations largely have Twitter accounts, which are used to disseminate information about educational opportunities, practice, policy, advocacy and professional news. Organizations may have more than one Twitter account to highlight different aspects of their mission and work (e.g., @ASH_hematology and @ASHClinicalNews, @ASCO and @ASCOPost).

– *Following key opinion leaders and experts:* Many experts in several areas of hematology and oncology are prolific tweeters. By following them, one can get their opinion on a variety of topics, such as their own research and the work of their peers, as well as recently published papers. Twitter also allows the opportunity to have a discourse on health care- related topics.

– *Sharing research findings and publications:* Twitter provides a forum for dissemination of information on an individual's research and publications. Similarly, one can share information on research and papers from peers and colleagues that is interesting or cutting- edge. Twitter has been used to identify and establish research collaborations as well. Whether promoting a paper on Twitter impacts its citations is debatable, and highly tweeted publications likely represent research that would be highly cited regardless of social media use.²⁰⁻²² @BMTCTN is currently promoting the 52 publications of the network to date by tweeting them in chronological order one paper/week every Thursday (#TBT = throw back Thursday).

– *Learning opportunities:* Several professional organizations announce educational offerings through Twitter. This social media platform also can be used to “virtually attend” a medical conference (see use cases below). There are Twitter chats and Twitter journal clubs focused around health care topics.

– *Receive patient feedback:* Many patients and patient advocacy organizations have a strong Twitter presence. They can provide a unique patient-centered perspective on their experience with the health care system, what is relevant to them and the latest research in their area of interest.

– *Follow nonmedical interests:* One can use Twitter to follow other areas of interest (e.g., news, sports) that can provide a quick and needed distraction from the daily physical and mental stress of working as a health care provider.

Application of Social Media in Hematology

Another insight provided by Dr. Vartabedian was: “At some point we must go beyond the introduction and into application.”⁶ Sample case studies that highlight the direct application of social media in hematology practice are presented in this section.

Social media to facilitate clinical case discussions

The American Society of Blood and Marrow Transplantation (ASBMT) partnered with Best Doctors (Quincy, MA) to launch the Clinical Case Forum (ASBMT-CCF) using the Medting platform (medting.com) in February 2014. The CCF provides a secure online forum for the discussion of challenging clinical care issues within the field of hematopoietic stem cell

transplantation. The CCF has a user-friendly interface, which allows users to post information about cases, including attachments with images (radiology, pathology, etc.), and others to comment on the case. Cases are organized primarily in disease-specific categories and include key words to allow for search functionality. As of December 2014, a total of 120 cases had been posted, and cases received a total of 474 comments. Cases and comments were posted by 54 and 88 individual users, respectively. The CCF has facilitated engaged discussions, which have resulted in knowledge sharing among a broad group of users. In particular, the CCF has seen robust international participation, with several cases posted from countries with lower transplant team density. Examples of countries represented include Argentina, Chile, Peru, India, Jordan, Mexico, Slovenia and Turkey, among others. Thus, the ASBMT-CCF is addressing an area of need for the international community. Furthermore, some centers are using the cases for teaching purposes and a manuscript is being prepared as a case discussion based on one of the interesting cases posted. Another manuscript will include a complete analysis of the cases posted and identification of unmet needs in the field of hematopoietic stem cell transplantation. Finally, in a number of cases, the recommendations have resulted in a direct impact on the clinical care of patients. The success of the ASBMT-CCF can serve as model for other professional societies or medical specialties to foster online case-based collaboration and knowledge sharing.

Facebook Patient Groups

Myeloma patient Dana Holmes, in a post within a Facebook forum she created titled “Asymptomatic ‘Smoldering’ Multiple Myeloma ‘aka’-SMM - Information Exchange,”²³ wrote:

“I ‘met’ Michael Lalli in one of the MM FB support groups... he has been smoldering for about 3 years, relatively stable, quarterly labs and has recently begun to experience severe lower back pain and extreme fatigue. He had not yet had any advanced imaging diagnostics w/ his oncologist.

I shared the transcript to the recent Twitter chat hosted by Mike Thompson with Michael Lalli. The chat featured Dr. Morie Gertz from the Mayo Clinic. The topic was the role of imaging in MGUS and SMM and it is an excellent resource to now share w/ smoldering patients so they can begin to understand the changes being supported by the top myeloma specialists.

Here is a [link](#) to the paper Dr. Gertz authored, published in JCO in January 2015 [titled “Advanced Skeletal Imaging Redefines the Management of Plasma Cell Disorders”].

So, what is the moral to my story? Michael brought this information to his oncologist this past Wednesday and shared it with him. Michael is having a PET/CT today which will help him get some answers to the current status of his disease state.

So members, print out this info and share it with your own oncologists at your next appointment, it doesn't hurt to be sure they are up to date on the current recommendations. Be a partner in your care.”

Holmes noted how patient forums can amplify other social media sources, such as Twitter, with references to primary literature. This educates savvy patients and can change actual care. Patients become less passive and more emotionally empowered. These participatory patients have been called e-patients for: Empowered, Engaged, Equipped and Enabled.²⁴

Curating information

The multiple myeloma social media (#mmsm) Twitter discussion Dana Holmes was referring to occurred on July 1, 2015, and is available at <http://ow.ly/P5zW1>. The creation of the #mmsm hashtag with patient Cynthia Chmielewski (@myelomateacher) has been previously discussed.²⁵ Since the first organized #mmsm Twitter discussion with Drs. Vincent Rajkumar (@VincentRK) and Robert Orlowski (@Myeloma_Doc) in September 2013, almost 20 chats have occurred and the hashtag has been used to tag multiple myeloma-specific content of interest at and between national meetings. In an analysis by Reid and colleagues, physician conversations about multiple myeloma on Twitter more than quadrupled between 2012 and 2013 in a background of physician tweets about cancer growing by 20% during 2013.^{26,27}

On January 10, 2015, Naveen Pemmaraju, MD (@doctorpemmm), created the myeloproliferative neoplasms social media (#mpnsm) hashtag based on the example of #mmsm. He had previously joined Twitter just before the American Association for Cancer Research (AACR) 2014 meeting. At the ASH 2014 meeting there was no yet established meeting place on Twitter for academic clinician/researchers interested in myeloproliferative neoplasms (MPNs). Implementation of this hashtag led to sharing educational information, research collaborations and a tweet chat. Building on these successes, Dr. Thompson created the Waldenström macroglobulinemia social media (#wmsm) hashtag in June 2015. Other cancer and hematology hashtags will continue to evolve. These rare disease discussion venues may be particularly important for both patients, researchers and clinicians as these are uncommon even at tertiary centers.

The @ASBMT Online Journal Club (@bmtjoc) was launched in 2014 by Andreas Klein, MD (@AndreasKlein MD), Dr. Perales and Dr. Wood. The journal club is held quarterly for fellows on a Google hangout with live-streaming and archiving on YouTube and simultaneous discussion on Twitter. The article is presented by a fellow and a faculty discussant (often one of the lead authors of the article being discussed). This is another example of social media being used for medical education (#MedEd).

Crowdsourcing and crowdfunding

The Myeloma Crowd Research Initiative (#MCRI, @myelomacrowd) is a new approach to funding cancer research. It combines expert opinion leaders in medical oncology with patient and advocate perspectives and is utilizing supportive patient social communities to select and fund promising research projects in myeloma. The goal of the MCRI is to review and select specific myeloma projects to fund via crowdfunding. More information is available at <http://www.myelomacrowd.org/mcrid/>. Crowdfunding cancer research and helping take care of patients is similar in some ways to the Medting concept and has been

covered by Lola Butcher in Oncology Times.²⁸ This mechanism is currently working for MCRI and ongoing fundraising is currently in process.

Leveraging social media at medical conferences

Use of social media increased conspicuously at the ASH 2014 Annual Meeting (#ASH14). As noted before, this enthusiasm was caught in the blog post “@BldCancerDoc, Or How I Learned to Stop Worrying and Love Twitter.”² Analytics from Symplur can be used to analyze various time frames for #ASH14 via <http://www.symplur.com/healthcare-hashtags/ash14/>. Over the duration of the meeting only (pre/post meeting duration increases numbers) the following analytics were for 2013/2014: impressions 17,992,383/49,624,330; tweets: 7426/16,433; users who tweet: 1,236/2,876.

According to Greg Matthews (@Chimoose) of the W2O Group, physician conversations increased 44% from #ASH14 to #ASH13, and the number of physicians tweeting increased 83% (133 to 243). His social net analysis from #ASH13 is available at <http://bit.ly/ASH13mdsna>. The corresponding #ASH14 network map is available at <http://bit.ly/ASH14mdsna>. Ekins and Perlstein have suggested “Ten Simple Rules of Live Tweeting at Scientific Conferences.”²⁹ Implementation of such suggestions may improve the network map quality – that is, more diverse connections between users.

The EBMT gathers more than 500 transplant centers in and outside Europe. It has made a big step forward these past two years by integrating social media into its overall strategy. EBMT created its Twitter profile, @TheEBMT, and is now engaging with several hundred followers (and growing). The objective is to increase this number to engage more participants and create a large group of tweeps who can generate, share and refine new ideas in the field of hematology. Every year, EBMT organizes its annual meeting of more than 4,000 participants, including scientists, physicians, nurses, statisticians, data managers, biologists, technicians and patients. This major forum in the field is an important moment to ensure and encourage exchange, education and scientific productivity. For the first time in 2015, EBMT engaged with its audience through Twitter, with the main objective to amplify the dissemination and discussion of scientific knowledge. Twitter has benefited the scientific community and has enabled some “virtual” participants to attend remotely. Over the four full days of the conference (as submitted to Symplur using Turkey time zone): 201 people sent 1,346 tweets using the annual meeting hashtag #EBMT15, generating 987,475 potential impressions. Many scientists may question the usefulness of Twitter in the distribution of scientific knowledge, legitimately fearing the misrepresentation of rather complex ideas. On the other hand, it has to be argued that although Twitter is not a science-specific platform, it is a powerful network that can have a long-term impact on how scientists create and publish ideas. The EBMT will continue to popularize the use of Twitter, especially during its annual meeting, as a means to amplify the scientific impact.

Conclusions

Social media is gaining traction in medicine and more recently in hematology. Online resources and mentors are available. Social media including Twitter isn’t that difficult –

even for the time- constrained – and has utility to increase education and interactions about hematology topics.

There are examples that demonstrate how this platform can and is being used. We no longer have binary stratification of “knowledge” and “no knowledge”, but rather a gradation of knowledge levels throughout medicine. This changes how we as health care professionals should interact with others including patients, the public and each other. As individuals and institutions, the time to engage is now.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

The authors have commented on a few of their mentors in social media in this publication, but we all have mentored each other and have benefited from the guidance of many more tweeps not mentioned. We appreciate Dr. Mohamad Mohty (@Mohty_EBMT) and his work in advancing social media at the EBMT. We acknowledge Joe Grundle of Aurora Research Institute (Milwaukee, WI) for helping edit this manuscript. Auden Utengen provided analytics from Symplur, LLC (@Symplur). We are grateful for the social net analysis provided by Gregg Masters and the W2O group.

References

1. Thompson MA. Social media is a form of media. ASCO Connection. May 29.2013 Available at: <https://connection.asco.org/commentary/social-media-form-media#>. Accessed August 13, 2015.
2. •(This reference is a blog post generated in response to a pharmaceutical company asking about how to interact on social media – treat it like any media.)
2. Majhail N. @BldCancerDoc, or How I Learned to Stop Worrying and Love Twitter. ASH Clinical News. Available at: <http://ashclinicalnews.org/bldcancerdoc-or-how-i-learned-to-stop-worrying-and-love-twitter/>. Accessed August 13, 2015.
4. ••(A personal account of starting on social media, especially Twitter.)
3. Majhail N. Twitter at #EBMT15. European Society for Blood and Marrow Transplantation Newsletter. May.2015 Available at: http://ebmtnewsletter.org/bulletin/may-2015/ebmt-2015-post-congress-bulletin/twitter-at-_ebmt15. Accessed August 13, 2015.
4. Thompson MA. Social media for oncologists. Cancer Network. Feb.2013 Available at: <http://www.cancernetwork.com/practice-policy/social-media-oncologists#>. Accessed August 13, 2015.
5. Katz MS, Utengen A, Anderson PF, Thompson MA, Atai DJ, Johnston C, Dizon DS. Organizing online health information with disease-specific hashtags. JAMA Oncol. In press.
6. Vartabedian B. Social media has been introduced to physicians. 33 Charts. Jan.2015 Available at: [http://33charts.com/2015/01/social-media-introduced-to-physicians.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed:+33Charts+\(33+Charts\)](http://33charts.com/2015/01/social-media-introduced-to-physicians.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed:+33Charts+(33+Charts)). Accessed August 13, 2015.
9. •(A rallying cry to move from adoption to utility.)
7. Younes A. Medicine and social media: why do I Tweet? Cancerwise. Jun 15.2009 Available at: <http://www2.mdanderson.org/cancerwise/2009/06/medicine-and-the-social-media-why-do-i-tweet.html>. Accessed August 14, 2015.
11. •(Dr. Younes was an early social media adopter and over time has influenced many hematologists and oncologists to engage with various platforms.)
8. Katz M. The evolving role of healthcare professionals. SlideShare. Oct.2011 Available at: <http://www.slideshare.net/subatomicdoc/medical-professionalism-10-20>. Accessed August 14, 2015.
13. ••(Dr. Katz has provided many “how to” resources for getting started. He then expanded these 101-102-103 type introductions to promulgate an informatics “scaffold” for improving the signal-

to-noise ratio of social media. Multiple references correlate with his integral involvement in helping others.)

9. Katz M. Getting started in social media – what to do before you join. SlideShare. Apr 27.2014 Available at: <http://www.slideshare.net/subatomicdoc/getting-started-in-social-media-for-healthcare-professionals>. Accessed August 14, 2014.
10. Katz M. Twitter 101 – Signing up: a tutorial for oncologists. SlideShare. May 4.2014 Available at: <http://www.slideshare.net/subatomicdoc/twitter-101-signing-up-34256570>. Accessed August 13, 2015.
11. Katz M. Twitter 102 – Account settings. SlideShare. May 4.2014 Available at: <http://www.slideshare.net/subatomicdoc/twitter-102-account-settings>. Accessed August 13, 2015.
12. Katz M. Twitter 103 – Trolls, malware & spam. SlideShare. May 5.2014 Available at: <http://www.slideshare.net/subatomicdoc/twitter-103-trolls-malware-and-spam>. Accessed August 13, 2015.
13. Bogler O, Thompson MA, Miller RS. Internet, social media, privacy regulations, and clinical trials. 2014 ASCO Annual Meeting education session. Jun 2.2014 Available at: <http://meetinglibrary.asco.org/presentationBySession/6581/1291>. Accessed August 14, 2015.
19. •(A discussion of important issues surrounding social media and an online presence took place at ASCO 2014.)
14. Katz M. Social media & academic oncology – challenges and opportunities. SlideShare. Dec.2014 Available at: http://www.slideshare.net/subatomicdoc/social-media-and-academic-oncology-42866367?utm_content=buffer4708e&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer. Accessed August 14, 2014.
15. Dizon DS, Graham D, Thompson MA, Johnson LJ, Johnston C, Fisch MJ, Miller R. Practical guidance: the use of social media in oncology. J Oncol Pract. 2012; 8:e114–24. [PubMed: 23277774]
22. •(An early manuscript discussing the basics of social media and its risks, benefits and policies.)
16. Thompson MA. How can social media improve oncology care? Commun Oncol. 2013; 10:212–7.
24. ••(A more pragmatic look at using social media.)
17. Majhail N. Why do we need Twitter? For health professionals in oncology, hematology & SCT. SlideShare. Mar 23.2014 Available at: <http://www.slideshare.net/nsmajhail/twitter-ebmt>. Accessed August 13, 2015.
18. Thompson MA. Using social media to learn and communicate: it is not about the tweet. Am Soc Clin Oncol Educ Book. 2015:206–11. [PubMed: 25993158]
27. ••(A compilation of quotes, resources and thoughts for the #ASCO15 June 2015 meeting.)
19. Geske JB, Timimi FK. Social media starter kit and managing your digital reputation. Medscape Mayo Clinic Talks. Mar 23.2015 Available at: <http://www.medscape.com/viewarticle/841381>. Accessed August 13, 2015.
29. •(Information from leaders at a leading medical and social media forward-thinking institution – Mayo Clinic.)
20. Eysenbach G. Can tweets predict citations? Metrics of social impact based on Twitter and correlation with traditional metrics of scientific impact. J Med Internet Res. 2011; 13:e123. [PubMed: 22173204]
31. •(Interesting and still unsettled thoughts on the ability to predict impact from social media.)
21. Thelwall M, Haustein S, Larivière V, Sugimoto CR. Do altmetrics work? Twitter and ten other social web services. PLoS One. 2013; 8:e64841. [PubMed: 23724101]
22. Haustein S, Peters I, Sugimoto CR, Thelwall M, Larivière V. Tweeting biomedicine: an analysis of tweets and citations in the biomedical literature. J Assoc Inf Sci Technol. 2014; 65:656–69.
23. Holmes D. Asymptomatic ‘Smoldering’ Multiple Myeloma ‘aka’-SMM - Information Exchange. Jul 10.2015 post on Facebook forum. <https://www.facebook.com/groups/1400814483494792/permalink/1629243120651926/>

24. Thompson MA. Participatory medicine in oncology. ASCO Connection. Oct.2011 Available at: <http://connection.asco.org/commentary/participatory-medicine-oncology>. Accessed August 23, 2015.
25. Thompson MA. Online patient communities for the e-patient: “betwixt and between” a new patient and an expert. ASCO Connection. Aug.2013 Available at: <http://connection.asco.org/commentary/online-patient-communities-e-patient-“betwixt-and-between”-new-patient-and-expert>. Accessed August 13, 2015.
26. 2014 ASCO Annual Meeting. New MDigitalLife analysis shows breast cancer dominates physician tweets about oncology. Business Wire. May 14.2014 Available at: <http://www.businesswire.com/news/home/20140514006754/en/MDigitalLife-Analysis-Shows-Breast-Cancer-Dominates-Physician#.U3PeXoFdXSd>. Accessed August 13, 2015.
38. •(Analysis of oncology tweets from MDs.)
27. Reid BB, Rodriguez KN, Thompson MA, Matthews GD. An analysis of cancer-specific Twitter conversations among physicians in 2013. J Clin Oncol (Meeting Abstracts). 2014; 32(15_suppl):e17644.
40. •(Analysis of oncology tweets from MDs.)
28. Butcher L. Cancer-related crowdsourcing and crowdfunding move beyond the basics—with many active projects ongoing in myeloma. Oncology Times. 2015; 37(10):18–20.
42. •(Looks at crowd (=people) engagement in determining trial design and funding. This may help engage the public in science and fiscal policy around research.)
29. Ekins S, Perlstein EO. Ten simple rules of live tweeting at scientific conferences. PLoS Comput Biol. 2014; 10(8):e1003789. [PubMed: 25144683]
44. ••(Great commentary to look at before conferences.)

Figure 1.
Composition of a tweet. Typical steps involved in composing a “tweet,” which cannot exceed 140 characters (including spaces).

Figure 2.
Anatomy of a tweet.

Table 1

Resources for health care providers interested in Twitter

Resource	Author(s) (Date)
Medicine and Social Media: Why Do I Tweet? ⁷	Younes A (June 15, 2009)
The Evolving Role of Healthcare Professionals ⁸	Katz MS (Oct. 20, 2011)
Practical Guidance: The Use of Social Media in Oncology ¹⁵	Dizon DS, Graham D, Thompson MA, Johnson LJ, Johnston C, Fisch MJ, Miller R (July 17, 2012)
How Can Social Media Improve Oncology Care? ¹⁶	Thompson MA (Sept. 3, 2013)
Why Do We Need Twitter? For Health Professionals in Oncology, Hematology & SCT ¹⁷	Majhail NS (March 23, 2014)
Getting Started in Social Media – What to Do Before You Join ⁹	Katz MS (April 28, 2014)
Twitter 101: Signing Up – A Tutorial for Oncologists ¹⁰	Katz MS (May 4, 2014)
Twitter 102: Account Settings – A Tutorial for Oncologists ¹¹	Katz MS (May 5, 2014)
Twitter 103: Trolls, Malware & Spam – A Tutorial for Oncologists ¹²	Katz MS (May 5, 2014)
Internet, Social Media, Privacy Regulations, and Clinical Trials ¹³	Bogler O, Thompson MA, Miller RS (June 2, 2014)
Social Media & Academic Oncology – Challenges and Opportunities ¹⁴	Katz MS (Dec. 19, 2014)
"@BldCancerDoc, Or How I Learned to Stop Worrying and Love Twitter" ²	Majhail NS (March 2015)
Using Social Media to Learn and Communicate: It Is Not About the Tweet ¹⁸	Thompson MA (June 2015)