



CME Review

Social media and the allergy practice

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Overall Purpose

Participants will be able to demonstrate increased knowledge of the clinical treatment of allergy/asthma/immunology and how new information can be applied to their own practices.

Learning Objectives

- Identify the most common social media tools utilized to promote the practice of allergy and immunology
- Enhance knowledge and prevent breach of patient confidentiality with social media tools

At the conclusion of this activity, participants should be able to:

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Target Audience

Physicians involved in providing patient care in the field of allergy/asthma/immunology

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Introduction

Social media services have taken the world by storm, becoming an integral part of the daily lives of billions of people. They are used widely to connect with friends and family members and, increasingly, to educate and recruit patients and to stay up-to-date with the new developments in allergy and immunology. Communication is a central part of health care delivery, and the use of social media in allergy and immunology practice will continue to increase. There are inherent risks in social media use by health care workers related to breaches of patient confidentiality, professionalism, and privacy. Malpractice and liability risks can also stem from irresponsible use of social media by medical professionals. There is a paucity of evidence-based information in the medical literature on how social network interventions can affect patient outcomes. Future studies should focus on the effect of social media and related technology tools, such as apps and self-monitoring devices on patient care.

Social Networks

Social networks represent the most popular use of social media for personal and professional purposes. An online social network is defined as a dedicated website or other application that enables users to communicate with each other. Social networks are generally used to connect with friends and family members and, increasingly, to stay up-to-date with the latest news and developments in the world around us, including the field of allergy and immunology. Some allergy practices actively use a variety of social networks to educate and recruit patients. Professional organizations are also active and engage users of social networks for member relations, public advocacy, and education.

Facebook

The undisputed leader among the social networks is Facebook, with 1.55 billion monthly active users as of September 30, 2015.¹ Even more impressive is the fact that in September 2015 there were, on average, 1.01 billion daily active users, most of them on mobile devices (894 million).

There are multiple current and potential uses for social networks in allergy practices. For example, Facebook is widely used to introduce patients to office settings and staff and to release announcements about allergy clinic work hours and related events. Most specialty organizations have Facebook pages, and the service is widely used by junior members to set up professional support groups. For example, the junior members of the European Academy

of Allergy and Clinical Immunology (EAACI) ([facebook.com/groups/376042735787392](https://www.facebook.com/groups/376042735787392)) have an active Facebook page, with more than 690 members. Facebook is well suited for sharing photographs of the allergy clinic building, examination rooms, allergy immunotherapy waiting room, and staff members, which can give a human, friendly face to the allergy practice. Table 1 lists examples of Facebook pages related to allergy and immunology.

Twitter

Twitter is the second most popular social network and appears to have a larger mind share than its membership of 320 million monthly active users would suggest.² This is likely related to the widespread use of Twitter by news media organizations (television and radio stations, newspapers and magazines, websites), celebrities, and politicians. Similar to Facebook users, 80% of Twitter users are on mobile devices.²

Twitter Chats

Twitter is widely used to engage patients and organization members by individual allergists and professional and patient-support organizations. Both the American College of Allergy, Asthma, and Immunology (ACAAI) and the American Academy of Allergy, Asthma, and Immunology (AAAAI) host regular Twitter chats between experts and patients 2 to 5 times per year. For example, the #Allergyready Twitter chat hosted by the AAAAI and

Table 1
Examples of Facebook Pages Related to Allergy and Immunology

Source	Web address
American College of Allergy, Asthma, and Immunology	https://www.facebook.com/TheACAAI
American Academy of Allergy, Asthma, and Immunology	https://www.facebook.com/AmericanAcademyofAllergyAsthmaandImmunology
World Allergy Organization	https://www.facebook.com/worldallergyorg
Food Allergy Research & Education	https://www.facebook.com/FoodAllergyFARE
Allergy & Asthma Network	https://www.facebook.com/AllergyAsthmaHQ
Kids With Food Allergies Foundation	https://www.facebook.com/kidswithfoodallergies
American Latex Allergy Association	https://www.facebook.com/American-Latex-Allergy-Association-ALAA-30637775192

the magazine *Allergic Living* on March 26, 2015, reached more than 1 million accounts and made 6,837,407 impressions during the hour-long discussion.³ Twitter chats can also be organized by individual allergists and can serve as an educational and promotional venue if hosted by local news organizations, such as a local newspaper, television or radio station. Most Twitter chats include patient questions, but there are 3 to 5 predetermined topics labeled T1 through T5, and the duration is generally limited to 60 minutes. The participating allergists have to be available for the duration of the Twitter chat because the expectation is for “live” engagement and real-time replies during the chat.

Twweeting Scientific Meetings

Twitter is also widely used by allergists and immunologists around the world to share the latest research news and journal articles, and many individual US physician accounts have thousands of followers. It is commonly observed that the professional use of Twitter peaks during the annual meetings of the major professional organizations, such as the ACAAI, AAAAI, EAACI, and World Allergy Organization (WAO). Hashtag is a searchable label for Twitter posts that can be used to label or tag tweets from a specific meeting. The allergists’ use of Twitter increased by 470% between 2011 (N = 18) and 2012 (N = 85).⁴ Even more impressive is the 790% increase in the number of participants using the Twitter hashtag at the 2015 AAAAI annual meeting (n = 1211) compared with 2012 (n = 136).⁵

Twitter is an efficient and cost-effective way to engage members who are not able to attend the annual scientific meetings in person and also to connect to the general public, patients, and news organizations. For example, 25 allergists expanded the educational reach of the 2012 AAAAI annual meeting to 250,000 individuals.⁶ Impressions are times a user is served a tweet in timeline or search results. In the recent years, this “Twweeting the meeting” activity has become officially supported by the professional organizations by including a hashtag, specific to each meeting, for example, #ACAAI, for the 2015 annual meeting of the ACAAI, in the printed and online materials, the meeting app, and social media channels. Allergists who are not able to attend the meeting in person can follow the latest developments from the meeting by following the hashtag stream on a mobile device or computer and thus continue to stay up-to-date. Reading Twitter updates is not considered an accredited continuing medical education (CME) activity in the United States, but allergists in Canada and Australia have reported this engagement as a CME equivalent.

Twitter Journal Club

Twitter Journal Club is a Twitter chat focused on a specific research article or a group of articles. Allergy and immunology was the first specialty to launch a Twitter Journal Club in 2008,⁷ and that approach was subsequently adopted by many other specialties as a global initiative, including popular urology and nephrology journal clubs.⁸ The latter, called NephJC, is indexed by PubMed. Twitter Journal Clubs can be used at allergy and immunology fellowship programs to expand fellow-in-training education beyond a single institution. An online journal club would also be good venue for an allergy and immunology journal to engage readers of a specific article, especially if the study authors could be made available to answer readers’ questions. The previously stated rules for Twitter chats, such as predetermined topics and specific duration, also apply. Table 2 lists examples of Twitter accounts related to allergy and immunology.

Other Social Networks

Beyond the top 2 (Facebook and Twitter), the use of other social networks is also increasing. Instagram, Snapchat, Pinterest,

Table 2

Examples of Twitter Accounts Related to Allergy and Immunology^a

Organizations
@ACAAI, American College of Allergy, Asthma, and Immunology
@AAAAI.org, American Academy of Allergy, Asthma, and Immunology
@FoodAllergy, Food Allergy Research & Education
Individual allergists
@DrAnneEllis, Anne Ellis, Queen’s University and Kingston General Hospital, Canada
@AllergyKidsDoc, Dave Stukus, Nationwide Children’s Hospital, Ohio State University
@Allergy, Ves Dimov, Cleveland Clinic Florida
@Aller_MD, Juan Carlos Ivancevich, WAO Web Editor, Argentina
@IgECPD, David Fischer, University of Western Ontario, Canada
@MatthewBowdish, Matthew Bowdish, Storms Bowdish Allergy Clinic, Colorado
@DrStanFineman, Stanley Fineman, Atlanta, Georgia
@AllergyNet, John Weiner, Melbourne, Australia

^aOne of the accounts listed above (@Allergy) is managed by a coauthor of this article.

Google+, and others are fighting for a share of the diminishing attention span of the average social media user. LinkedIn has established itself as an interactive curriculum vitae depository where specific skills can be highlighted and endorsed. LinkedIn is used for professional discussions among allergists on a variety of topics, for example, electronic medical records. Doximity claims to be the largest professional network for US physicians, with more than 60% of physicians in the country as members.⁹

The Allergy and Immunology Interest Group at University of Chicago used the Google+ social network and a shared online spreadsheet on Google Drive for scholarly collaboration. These cloud-based services allowed sharing messages among members regarding scholarly activity. These messages were private and allowed separation of professional and personal accounts unlike other popular services, such as Facebook and Twitter. All members had an overview of the group activity and were able to share new ideas, edit current projects, update progress (eg, institutional review board status), and express interest and sign up for ongoing projects. The group recruited 18 members and produced more than 70 posts on Google+, 10 research projects, 10 abstracts, and 5 articles, facilitating the successful allergy and immunology fellowship application of 7 residents.¹⁰

The concept of social networks could be expanded to include blogging services, such as Blogger and Tumblr. Millions of posts are shared daily on the social media channels listed above. With the increasing repository of videos, YouTube has gradually morphed into a “how-to” search engine, and many patients look for answers to their questions on a variety of health topics, with a wide variation in results. New social media services continue to be launched, and the established companies attempt to fight off competition by buying the upstarts. Although the use of any specific network in the daily professional life of a practicing allergist will continue to evolve, there is one universal underpinning: communication. Referred to by Cleveland Clinic Chief Executive Officer Toby Cosgrove in a LinkedIn blog post as “the most common medical procedure,” communication is a central part of health care delivery, and the use of social media as a communication tool in allergy practice will continue to increase.

Blogging

Most social media users visit Facebook, Twitter, and the other social networks on their mobile devices to view and post photographs and short messages. Blogging has a distinctive advantage for longer-form writing. It also offers a more permanent design format and a web address that can be based on the owner’s domain. For example, neither Facebook nor Twitter allows users to change the template structure of the page, change the order of the posts, or customize searches. Those are significant disadvantages from a

Table 3
Examples of Allergy and Immunology Blogs^a

Blog name	Web address	Author
Allergy Home	http://www.allergyhome.org/blogger	John Lee and Michael Pistiner
Allergy Notes	http://allergynotes.blogspot.com	Ves Dimov
Asth.ma	http://asth.ma	Ann Wu
FARE blog	http://blog.foodallergy.org	Food Allergy Research & Education
JACI Journal Club	http://jaci-online.blogspot.com	Editors of the <i>Journal of Allergy and Clinical Immunology</i>
Allergy, Asthma, and Immunology	http://ivancevichmd.blogspot.com	Juan Carlos Ivancevich

^aOne of the blogs listed above (Allergy Notes) is managed by a coauthor of this article.

practical perspective because allergy practices would often like to highlight specific information as a top navigation menu, for example, address, contact information, work hours, physician biographies, and patient education topics. Many allergist and professional organizations use blog posts to highlight a specific issue or news event for more in-depth commentary. For example, the Journal of Allergy and Clinical Immunology (JACI) discusses specific articles from each issue, often with author interviews, on the JACI Journal Club blog.¹¹ One of us has used blog-based websites for patient and professional education that have gathered more than 2 million page views since 2008.¹² A blog post can be used as a stepping stone to a manuscript, a journal article (you are reading an example of this), or a research project.^{13–15}

Popular blogging services include Blogger.com, owned by Google/Alphabet, and the open-source content management system WordPress. Both allow custom installation, template changes, and a domain name use. The available customization of WordPress, in

particular, is so extensive that many allergists use a blogging platform to create a regular (not a blog) website for their practice, thus saving costs on web design and hosting. Table 3 lists examples of allergy and immunology blogs.

Proposed Workflow

A blog has been proposed as the key of the 2 interlocking cycles of patient education and physician education^{13,14} (Fig 1). The cycle of patient education starts during the clinic visit with the following. First, diagrams and illustrations of an allergy-related health condition are shown on a tablet, desktop or laptop computer, or as a paper printout. Second, printouts with a web address of a patient education website are provided on leaving the clinic. A health condition-specific web address can be included as part of a follow-up message in the electronic medical record. Third, the patients has the option to visit the educational website at a later time to review videos, for example, how to use an asthma inhaler or saline nasal rinse, and to read in more details about their condition. Fourth, follow-up questions based on the information discussed can be asked on return to the clinic or via an online portal as part of the electronic medical record.

This approach is powered by the cycle of physician education (Fig 2), which includes the following: (1) an “inbox for the web,” which receives updates from selected Twitter and Facebook accounts, RSS (rich site summary) feeds of journals, professional societies and news organizations, and podcasts; (2) links shared via social media channels, such as Twitter, Facebook, and LinkedIn; (3) feedback received via comments and favorites from the social media websites; and (4) an in-depth discussion can be planned on the hot topics, which had brought the most comments or favorites. The discussion is published on a home base blog, then the blog post via the social media channels above, thus closing the loop.

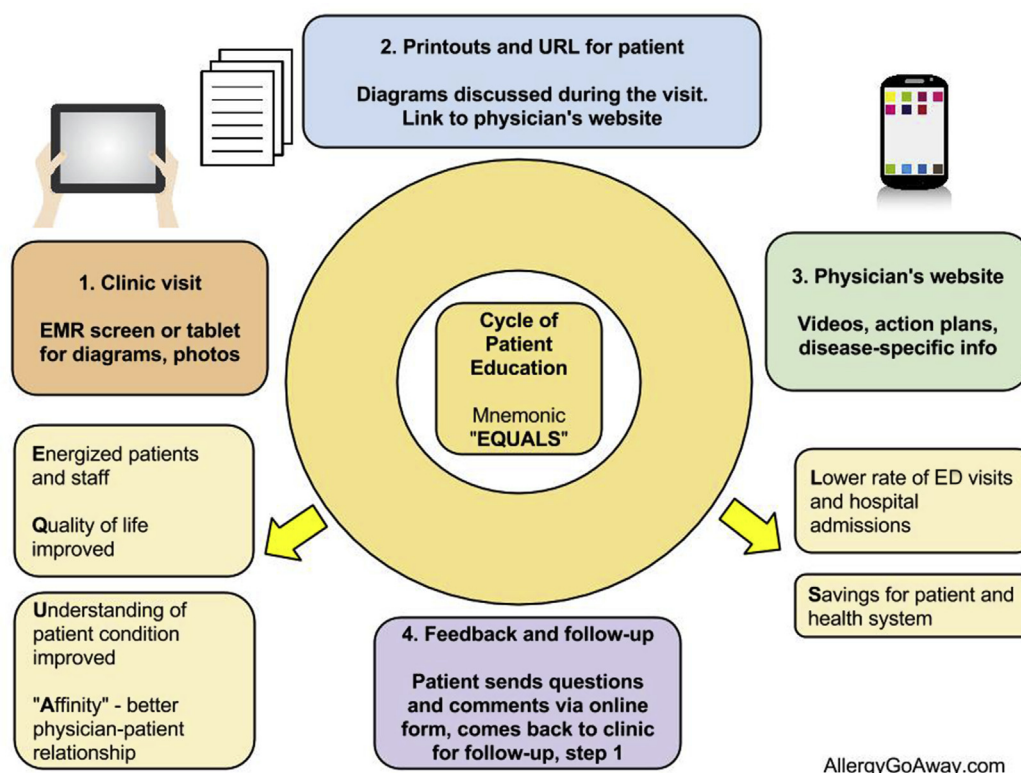


Figure 1. Cycle of patient education. ED, emergency department; EMR, electronic medical record.

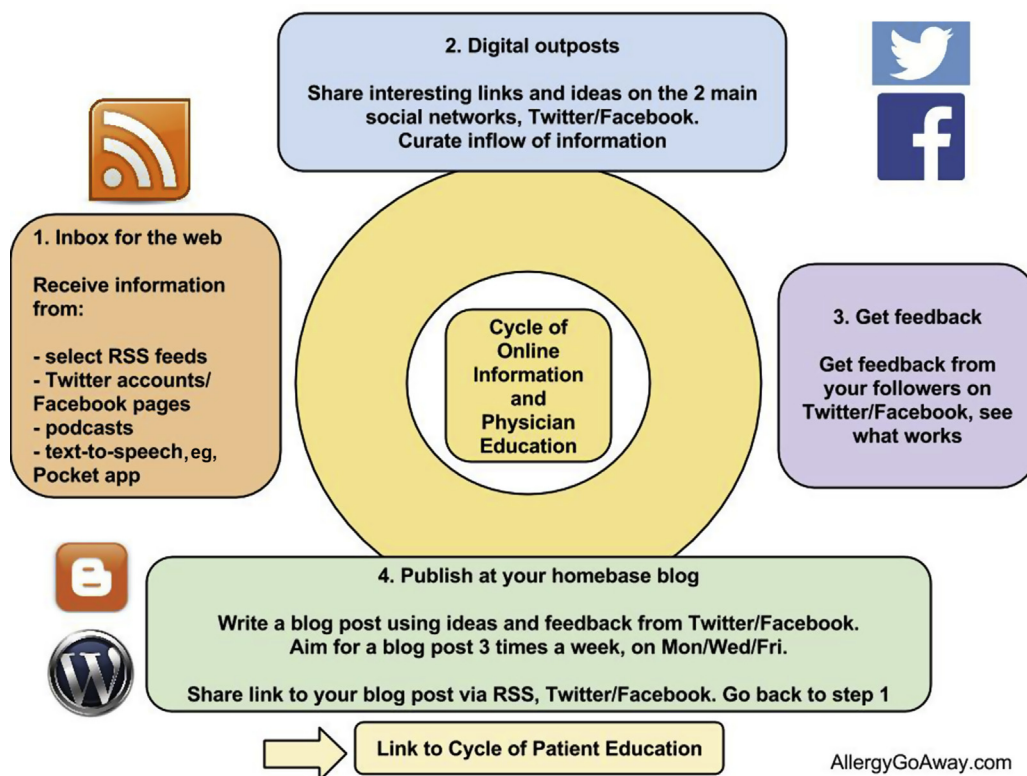


Figure 2. Cycle of online information and physician education.

RSS is a web feed used to publish frequently updated information, such as news headlines, blog posts, audio podcasts, and video. RSS feeds benefit users who want to receive timely updates from favorite websites or to aggregate data from many sites. Subscribing to a website RSS removes the need for the user to manually check the website for new content. Instead, their browser or app constantly monitors the site and informs the user of any updates. As a time-saving tool, web services such as Feedly can be used to collect RSS feeds in an “inbox for the web.” The tweets can be strategically scheduled to be published at certain intervals via the Buffer app.

The plausible outcomes of the cycle of patient education can be remembered by the mnemonic EQUALS, which implies an equal partnership in health care delivery^{13,14}:

- Energized patients and health staff
- Quality of life is improved
- Understanding of patient condition is improved
- “Affinity”—a better patient-physician relationship
- Lower rate of emergency department visits, hospital admissions, and telephone calls to the allergy clinic
- Savings for patient and health system

YouTube for Patient Education

With 1 billion monthly users, YouTube is the second largest search engine, after the flagship service provided by its owner, Google. People watch hundreds of millions of hours on YouTube and generate billions of views on a daily basis.¹⁶ Patients visit YouTube with allergy-related questions, such as “How do you use a nasal spray?” “How do you use an asthma inhaler?” and “Do allergy shots work?” Unfortunately, according to multiple studies, what patients find on YouTube is often misleading and only occasionally accurate.^{17–20} For example, only 15% of YouTube videos

returned as a search result for “How do you use an asthma inhaler?” discussed all steps of correct inhaler use.¹⁷ Videos from health care organizations and medical societies were more comprehensive than those from nonprofessional educational groups and health care professionals not posting on behalf of a medical organization. Another study found that only 7.7% of YouTube videos on how to use a nasal spray discussed all 9 steps of correct nasal spray use.¹⁸ Most viewed YouTube videos on asthma are based on alternative treatments.¹⁹

On the basis of these studies,^{17–20} there is clearly a need for more reliable and accurate patient education videos on YouTube. Professional society organizations and individual allergists are best positioned to provide such accessible and accurate information using social media channels and YouTube. Patient support organizations can also play a vital role in creating, supporting, and distributing high-quality patient education videos.

The 2 main specialty organizations in allergy and immunology in the United States (ACAAI and AAAAI) have dedicated YouTube channels and provide videos on a variety of allergy and immunology-related conditions. Major hospitals also have dedicated patient education channels on YouTube. Practicing allergists can use such videos or create their own and embed them in the patient education section of their clinic websites. When appropriate, the patient can be provided with an individualized video prescription based on their health condition via the electronic medical records portal, for example, “What is exercise-induced bronchospasm?” “How do you use an albuterol inhaler?” and “How do you use a controller inhaler with a spacer?” These videos should present accurate information in a brief and entertaining manner to maintain public interest.^{21,22}

YouTube for Professional Education

Conferences On-Line Allergy (COLA) is a collaborative program with the ACAAI hosted by the Children’s Mercy Section of Allergy,

Table 4
Examples of YouTube Channels Focused on Allergy and Immunology

Source	Web address
ACAAI	https://www.youtube.com/user/allergists
ACAAI COLA	https://www.youtube.com/user/ACAACOLA
WAO Secretariat	https://www.youtube.com/user/TheWAOChannel
AAAAI	https://www.youtube.com/user/4AI4YOU
EAACI headquarters	https://www.youtube.com/user/EAACIHeadquarters

Abbreviations: AAAAI, American Academy of Allergy, Asthma, and Immunology; ACAAI, American College of Allergy, Asthma, and Immunology; COLA, Conferences On-Line Allergy; EAACI, European Academy of Allergy and Clinical Immunology; WAO, World Allergy Organization.

Asthma & Immunology in Kansas City, Missouri (childrensmercy.org/cola_online). The COLA program provides access to allergy-related educational experiences for the practicing and academic allergist and for primary care physicians and the general public. The COLA program is available on YouTube and from the Children's Mercy Hospital website. The YouTube channel has more than 250 videos, which have received more than 229,000 views.

WAO TV is a YouTube channel sponsored by the WAO, which includes sections such as scientific interviews with experts, disease-specific modules, research presentation, and the only complete video social media guide created specifically for allergists (worldallergy.org/education-and-programs/education/wao-tv). Table 4 lists examples of YouTube channels focused on allergy and immunology.

Apps for Allergy and Immunology Education

An app is a computer program designed to run on mobile devices, such as smartphones and tablet computers. These devices are widely used as tools for self-management and health care–related interventions for chronic conditions.²¹ Previous reports revealed that most food allergy and asthma apps are a poor source of information for patients.^{23–25} Most food allergy apps currently available are related to non-IgE-mediated reactions rather than IgE-mediated reactions, incur costs to the patient, and often fail to function properly.²⁶

Health-related apps should be engaging, interactive, and accurate and, if desired, have the option to store information specific for patients.²⁶ The development of allergy and immunology apps is an ongoing process,^{27,28} with most projects focused on food allergy and asthma.

Intangible Benefits

In addition to using social media for patient and physician education, for communication, and as a marketing tool, these services can also have intangible professional benefits. Allergists with widely followed social media accounts may increase their status and influence as experts in a specific field. Social media influence could translate into real-life personal connections among physicians who follow each other and foster scientific collaboration. Social media can also be used to promote a published article, study, or other recent accomplishment.

Risks of Social Media Use

There are risks to social media use related to breaches of patient confidentiality, professionalism, privacy, malpractice, and liability. The use of unique patient identifiers is regulated in the United States by the federal Health Insurance Portability and Accountability Act (HIPAA) of 1996.²⁹ Some of the identifiers (name, telephone number) are easy to omit in social media posts because their avoidance almost constitutes common sense when protecting a person's privacy. However, other identifiers are not

that much easier to keep in mind at all times, for example, “all geographical subdivisions smaller than a state,” “all elements of dates (except year),” and, especially, “any other unique characteristic.” A simple post on social media, for example, “I saw an interesting patient in Chicago today,” would disclose 2 of the patient identifiers listed above.

Guidelines for Social Media Use

The American Medical Association issued a 2010 report entitled “Professionalism in the Use of Social Media,”³⁰ which has been used as a basis to create society, institution, and employer social media policies. The report addresses 6 main topics:

1. Physicians should be cognizant of standards of patient privacy and confidentiality that must be maintained in all environments.
2. Physicians should routinely monitor their own Internet presence to ensure that content posted is accurate and appropriate.
3. If they interact with patients on the Internet, physicians must maintain appropriate boundaries of the patient-physician relationship.
4. To maintain appropriate professional boundaries, physicians should consider separating personal and professional content online.
5. When physicians see content posted by colleagues that appears unprofessional, they have a responsibility to bring that content to the attention of the individual. The physician may have to report the matter to appropriate authorities.
6. Physicians must recognize that actions online and content posted may negatively affect them.

All physicians must comply not only with their country-specific privacy regulations but also with the social media guidelines provided by their professional societies and employers. Some simple rules for safe and productive social media use by allergists are listed below:

- Write as if your boss, colleagues, and patients are reading your social media website every day.
- Comply with HIPAA.
- Do not post anonymously. List your name and contact information.
- If your social media website web site is work related, it is probably better to let your employer know.
- Use a disclaimer, eg, “All opinions expressed here are those of their authors and not of their employer. Information provided here is for medical education only. It is not intended as and does not substitute for medical advice.”

Conclusion

We live in exciting times in which establishing an online connection to another human being is only a click away via a Twitter follow or Facebook follow/friend functions. Social media services are omnipresent and influence the daily lives of both patients and physicians. Allergists, professional society organizations, and patient support groups are using social media in an attempt to improve patient care and to increase the awareness of allergic and immunologic conditions. Patients will continue to search for health information online as their first point of reference. Unfortunately, there is still insufficient information in the medical literature on how social media use affects patient outcomes and allergy practices. The specialty of allergy and immunology should focus future research projects on how social media services and other technology tools can improve patient care and the practice of allergy and immunology.

References

- [1] Stats. Facebook, 2015. <http://newsroom.fb.com/company-info>. Accessed November 15, 2015.
- [2] About. Twitter, 2015. <https://about.twitter.com/company>. Accessed November 15, 2015.
- [3] Practice Matters. American Academy of Allergy, Asthma, and Immunology. <http://aaaai.activehosted.com/social/c0c7c76d30bd3dcaefc96f40275bdc0a.65>. Accessed November 15 2015.
- [4] Fenny N, Wolf R, Dimov V. Rapid growth of Twitter use by allergists and immunologists for professional purposes, P309, American College of Allergy, Asthma & Immunology (ACAAI) 2012 Annual Meeting. *Ann Allergy Asthma Immunol*. 2012;109(suppl):A125. P309.
- [5] Stukus DR. Using Twitter to expand the reach and engagement of allergists. *J Allergy Clin Immunol Pract*. 2015 Nov 25 [Epub ahead of print]. <http://dx.doi.org/10.1016/j.jaip.2015.11.002>.
- [6] Mehrotra N, Dimov V. Tweeting the Meeting: investigating Twitter activity at the 2012 AAAAI Conference. *J Allergy Clin Immunol*. 2013;131(suppl):AB34. [http://www.jacionline.org/article/S0091-6749\(12\)02805-9/fulltext](http://www.jacionline.org/article/S0091-6749(12)02805-9/fulltext). Accessed May 3, 2015.
- [7] Dimov V, Randhawa S, Auron M, Casale T. The utility of a real-time micro-blogging service for journal club in allergy and immunology: American College of Allergy, Asthma & Immunology (ACAAI) 2009 Annual Meeting. *Ann Allergy Asthma Immunol*. 2009;103(suppl 3):A126.
- [8] Thangasamy IA, Leveridge M, Davies BJ, Finelli A, Stork B, Woo HH. International urology journal club via Twitter: 12-month experience. *Eur Urol*. 2014;66:112–117.
- [9] Doximity Press. <https://www.doximity.com/about/press>. Accessed November 15, 2015.
- [10] Nickels AS, Wolf R, Dimov V. Use of novel social media and cloud-based services for scholarly collaboration focused on allergy and immunology during residency and medical school: American College of Allergy, Asthma & Immunology (ACAAI) 2013 Annual Meeting. *Ann Allergy Asthma Immunol*. 2013;111(suppl):A108.
- [11] JACI Journal Club. jaci-online.blogspot.com. Accessed May 3, 2015.
- [12] AllergyGoAway.com and Related Group of Websites Visitor Statistics. <http://www.sitemeter.com/?a=stats&s=s37allergynotes>. Accessed November 15, 2015.
- [13] Dimov V. *Social Media in Medicine: How to Be a Twitter Rockstar and Help Your Patients and Your Practice*. CasesBlog. <http://casesblog.blogspot.com/2011/10/social-media-in-medicine-how-to-be.html>. Accessed November 15, 2015.
- [14] Dimov V, Eidelman F. Utilizing social networks, blogging and YouTube in allergy and immunology practices. *Expert Rev Clin Immunol*. 2015;11:1065–1068.
- [15] Scalpel S. Why I blog and tweet. *Can J Anaesth*. 2015;62:563–567.
- [16] Statistics - YouTube. <https://www.youtube.com/yt/press/statistics.html>. Accessed November 15, 2015.
- [17] Joshi S, Dimov V. Quality of YouTube videos for patient education on how to use asthma inhalers. *World Allergy Organ J*. 2015;8(suppl 1):A221.
- [18] Joshi S, Dimov V, Eidelman FJ. YouTube videos for patient education on how to use nasal sprays associated with insufficient reliability. *J Allergy Clin Immunol*. 2015;135(2):AB136.
- [19] Gonzalez-Estrada A, Cuervo-Pardo L, Ghosh B, et al. Popular on YouTube: a critical appraisal of the education quality of information regarding asthma. *Allergy Asthma Proc*. 2015;36:121–126.
- [20] Gonzalez-Estrada A, Abraham J, Barcena-Blanch MA, et al. YouTube and CVID: a critical appraisal of the educational quality of information. *J Clin Immunol*. 2015;35:305–328.
- [21] Hubspot Blogs. <http://blog.hubspot.com/blog/tabid/6307/bid/4915/10-Qualities-That-Can-Make-Your-Video-Go-Viral.aspx>. Accessed October 16, 2015.
- [22] Desai T, Shariff A, Dhingra V, Minhas D, Eure M, Kats M. Is content really king? an objective analysis of the public's response to medical videos on YouTube. *PLoS One*. 2013;8:e82469.
- [23] Ackerman MJ, Filart R, Burgess LP, Lee I, Poropatich RK. Developing next-generation telehealth tools and technologies: patients, systems, and data perspectives. *Telemed J E Health*. 2010;16:93–95.
- [24] Cuervo-Pardo L, Barcena-Blanch MA, Gonzalez-Estrada A, Schroer B. Apps for food allergy: a critical assessment. *J Allergy Clin Immunol Pract*. 2015;3:980–981.e1.
- [25] Huckvale K, Car M, Morrison C, Car J. Apps for asthma self-management: a systematic assessment of content and tools. *BMC Med*. 2012;10:144.
- [26] Marcano Belisario JS, Huckvale K, Greenfield G, Car J, Gunn LH. Smartphone and tablet self-management apps for asthma. *Cochrane Database Syst Rev*. 2013;11:CD010013.
- [27] Farooqui N, Phillips G, Stukus D. Feasibility and acceptability of a novel asthma self-management smartphone application for children and adolescents. *J Allergy Clin Immunol*. 2014;133:AB127.
- [28] Farooqui N, Phillips G, Stukus D. Improved education and self-management in children and adolescents with asthma using a personalized smartphone application. *J Allergy Clin Immunol*. 2014;133:AB156.
- [29] Health Information Privacy. <http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/De-identification/guidance.html>. Accessed November 15, 2015.
- [30] American Medical Association. Opinion 9.124 - Professionalism in the Use of Social Media. June 2011. <http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion9124.page>. Accessed November 15, 2015.