Integration of Social Media in Emergency Medicine Residency Curriculum

Kevin R. Scott, MD; Cindy H. Hsu, MD, PhD; Nicholas J. Johnson, MD; Mira Mamtani, MD; Lauren W. Conlon, MD; Francis J. DeRoos, MD

*Corresponding Author. E-mail: kevin.scott@uphs.upenn.edu, Twitter: @K_ScottMD.

INTRODUCTION

As education moves away from the age of pen and paper, the digital platform has become a rapidly growing resource for both emergency medicine educators and learners. Social media are any Internet-based applications that enable content sharing and rapid interactions between large populations. The growth and influence of social media technologies have allowed the distribution of ideas far beyond geographic borders.1 During the past decade, an estimated 141 blogs and 42 podcasts related to emergency medicine and critical care have been developed in 24 countries.2 Free open access medication (FOAM), defined as a community of open access resources for learning in medicine, leverages the powerful sharing and interactive qualities of social media to rapidly disseminate educational materials and expert insights.3

Social media resources are being used frequently by emergency medicine training programs; a recent survey of 226 emergency medicine residents at 12 different residency programs showed that almost 98% use some form of social media for learning for at least 1 hour per week.4 Many emergency medicine residency programs across the United States and Canada have started their own Twitter accounts (Table), largely through the work of the group at Academic Life in Emergency Medicine (ALiEM).5 Despite the strong tendency to use social media for learning, there remains a lack of understanding or science of how to implement it effectively.6

Our primary goal is to describe the different social media modalities and how our program and others have created a presence in these platforms. We will also offer specific examples of how these modalities can be integrated asynchronously or in conjunction with didactic sessions. Last, we will highlight the potential struggles and barriers that may be associated with the implementation and integration of social media in residency education. We hope that this article will spark further discussion on social media use and inspire future studies to examine the effectiveness of its integration in emergency medicine residency curricula.

SOCIAL MEDIA MODALITIES

Blogs

Blogs are Web sites where individuals or groups can post material. They serve as useful ways for educators to compile and disseminate information. Popular blogs in emergency medicine education include ALiEM (http://www.academiclifeinem.com) and Life in the Fast Lane (http://www.lifeinthefastlane.com). Some emergency medicine training programs have created their own blogs that incorporate posts from faculty, fellows, and residents. SUNY Downstate’s The Original Kings of County (http://www.blog.clinicalmonster.com) includes frequent educational posts spanning the realms of trauma, toxicology, and critical care. In addition, they provide brief synopses of their program’s morning reports and journal clubs. The University of Maryland posts daily educational pearls (http://umem.org/educational_pearls) that are available to anyone. In addition, the critical care fellows at the University of Maryland have created a blog dedicated to sharing content from their didactic curriculum to highlight controversial and cutting-edge topics in critical care (http://www.marylandccproject.org). Finally, the discussion of practice variability is one of the main themes behind a blog from New York University–Bellevue Hospital known as EM Lyceum (http://emlyceum.com).

Blogs are useful ways for residency programs to rapidly and consistently disseminate educational content to their residents, and they also allow interaction and discussion among residency programs. Although blogs vary in their format, quality, and content, many of them enable residents to rapidly access concise, current, and referenced synopses of clinical and educational material that can be used for on-shift (“on-the-fly”) learning and can point them to relevant primary literature. Because emergency medicine is both science and art, a key component of residency training is learning from the experiences of others. Often, there is a dearth of experiential commentary in traditional learning resources such as journal articles and textbooks, but blogs allow this important information to be conveyed.

Podcasts

A podcast is composed of digitally recorded material that can be downloaded or streamed by users. They are typically audio files, but may be recorded in other formats as well. Podcasts have been used extensively by emergency physicians as ways to disseminate traditional lecture material to a multitude of learners. EMCrit (http://www.emcrit.org) is a great example of how one educator uses podcasts to share his knowledge with many more
learners than are typically reached with traditional lectures. They are especially useful for the demonstration of rarely performed procedures and the dissemination of visual content such as images and ECGs. Furthermore, videocasts can rapidly incorporate the expertise of educators from other hospitals into a residency’s curriculum without incurring substantial travel expenses and time.

Videocasts
Videocasts are similar to podcasts, but as the name suggests, episodes are in a video format. Several studies have shown improved procedural techniques when residents are taught through videos and may be one of the most effective ways to integrate social media into emergency medicine resident education. They are especially useful for the demonstration of rarely performed procedures and the dissemination of visual content such as images and ECGs. Furthermore, videocasts can rapidly incorporate the expertise of educators from other hospitals into a residency’s curriculum without incurring substantial travel expenses and time.

Examples of high-quality videocasts include Hennepin County Medical Center’s instructional videos on a variety of emergency medicine–related topics, including trauma, ECGs, and procedures (http://www.hqmeded.com). In addition, the University of Maryland also offers a series of instructional procedure videos, as well as videos for oral board preparation (http://www.umem.org/page/education/residency/video_training). Finally, the Patwari Video Academy (http://www.academiclifeinem.com/category/clinical/patwari-videos) teaches learners how to perform high-yield procedures such as pericardiocentesis and thoracentesis, as well as other procedures that are often performed during emergency department shifts.

Our program has incorporated podcasts as adjuncts to our modular curriculum. Each month, residents are provided with a list of podcasts that are relevant to the core topics being covered during that period. The podcasts are selected by our residency leadership according to their quality and relevance to the modular block from multiple aforementioned resources.

Residents are required to listen to the podcasts and answer online questions about the materials reviewed. This integration has allowed a portion of required learning to be completed when it is most convenient for the residents, as well as increased interactive discussions during weekly conference time.

The residency program at Mount Sinai in New York has described a similar approach. Their residents are provided with optional instructive resources and asked to answer questions about the content. Similar to our program, such integration has also replaced 1 hour of Mount Sinai’s formal conference time each week, allowing the residents to learn on their own time.

Table. Emergency medicine residency Twitter accounts in the United States and Canada.

<table>
<thead>
<tr>
<th>Program</th>
<th>Twitter Handle</th>
<th>Program</th>
<th>Twitter Handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baystate Health</td>
<td>@BaystateEM</td>
<td>Olive View–UCLA Medical Center</td>
<td>@UCLAEMRes</td>
</tr>
<tr>
<td>Beth Israel Medical Center</td>
<td>@BethIsraelEMED</td>
<td>Oregon Health &amp; Sciences University</td>
<td>@OHUEmergency</td>
</tr>
<tr>
<td>Beth Israel Deaconess Medical Center</td>
<td>@BIDMCEM</td>
<td>Parkland Memorial Hospital</td>
<td>@DallasMed</td>
</tr>
<tr>
<td>Boston Medical Center</td>
<td>@BMCEmergency</td>
<td>Queen’s University</td>
<td>@Qemerg</td>
</tr>
<tr>
<td>Brooklyn Hospital</td>
<td>@bkhospital</td>
<td>Regions Hospital</td>
<td>@regionsem</td>
</tr>
<tr>
<td>Brown University</td>
<td>@BrownEMRes</td>
<td>Staten Island University Hospital</td>
<td>@statenislndem</td>
</tr>
<tr>
<td>Carolinas Medical Center</td>
<td>@CMCEM</td>
<td>Stanford/Kaiser</td>
<td>@StanfordEMRes</td>
</tr>
<tr>
<td>Conemaugh Memorial Medical Center</td>
<td>@ConemaughEMres</td>
<td>St. Luke’s–Roosevelt</td>
<td>@SLREM</td>
</tr>
<tr>
<td>Dartmouth-Hitchcock</td>
<td>@dartmouthem</td>
<td>St. Joseph’s Healthcare System</td>
<td>@StJoesEM</td>
</tr>
<tr>
<td>Drexel University</td>
<td>@DrexelEmergency</td>
<td>SUNY Downstate/Kings County Hospital Center</td>
<td>@kingsfcouncty</td>
</tr>
<tr>
<td>Duke University</td>
<td>@dukeemergency</td>
<td>Temple University</td>
<td>@TempleEM</td>
</tr>
<tr>
<td>East Carolina University</td>
<td>@ECU_EM</td>
<td>Texas A&amp;M–Christus Spohn</td>
<td>@CCEMRP</td>
</tr>
<tr>
<td>Emory University</td>
<td>@EmoryEM</td>
<td>University of Alabama</td>
<td>@uaem</td>
</tr>
<tr>
<td>Genesys Regional Medical Center</td>
<td>@GenesysEM</td>
<td>University of Arizona</td>
<td>@UAEResidency</td>
</tr>
<tr>
<td>Grandview Medical Center</td>
<td>@GrandviewEM</td>
<td>University of Arkansas</td>
<td>@UAMSed</td>
</tr>
<tr>
<td>Harbor-UCLA Medical Center</td>
<td>@HarborUCLAEM</td>
<td>University of California–Davis</td>
<td>@UCDEmergent</td>
</tr>
<tr>
<td>Highland General Hospital</td>
<td>@HGHED</td>
<td>University of California–Irvine</td>
<td>@UCIvemed</td>
</tr>
<tr>
<td>Indiana University</td>
<td>@IUEmergencyMed</td>
<td>University of Chicago</td>
<td>@UCHicagoEM</td>
</tr>
<tr>
<td>Jacobs/Montefiore</td>
<td>@Jacobi_EM</td>
<td>University of Cincinnati</td>
<td>@UCMorningReport</td>
</tr>
<tr>
<td>Kaiser Permanente San Diego</td>
<td>@Sdmeded</td>
<td>University of Illinois–Peoria</td>
<td>@UICOMPME</td>
</tr>
<tr>
<td>Kelowna General Hospital</td>
<td>@FRCPMKelowna</td>
<td>University of Kentucky</td>
<td>@WildcatEMres</td>
</tr>
<tr>
<td>London Health Sciences Centre</td>
<td>@emergencylondon</td>
<td>University of Maryland</td>
<td>@UEMercuryMed</td>
</tr>
<tr>
<td>Long Island Jewish Medical Center</td>
<td>@LIU_EM</td>
<td>University of Missouri</td>
<td>@MizzouEM</td>
</tr>
<tr>
<td>Lincoln Medical and Mental Health Center</td>
<td>@LincolnEM</td>
<td>University of Nevada</td>
<td>@LasVegasEM</td>
</tr>
<tr>
<td>Maimonides Medical Center</td>
<td>@Maimonides_EM</td>
<td>University of Ottawa</td>
<td>@emergmedottawa</td>
</tr>
<tr>
<td>Maricopa Medical Center</td>
<td>@MaricopaEM</td>
<td>University of Pennsylvania</td>
<td>@UPennEM</td>
</tr>
<tr>
<td>Mayo Clinic</td>
<td>@MayoClinicEM</td>
<td>University of Texas at Houston</td>
<td>@UTEmergencyMed</td>
</tr>
<tr>
<td>McGill University</td>
<td>@mcgill_emerg</td>
<td>Washington University</td>
<td>@WashUEM</td>
</tr>
<tr>
<td>McLaren Macomb</td>
<td>@McLarenMacEM</td>
<td>WellSpan York Hospital</td>
<td>@WellSpanYHEmdoc</td>
</tr>
<tr>
<td>Mount Sinai</td>
<td>@SinaIEM</td>
<td>Wright State University</td>
<td>@WrightSTEM</td>
</tr>
<tr>
<td>NYU/Bellevue</td>
<td>@NYUEMChiefes</td>
<td>Yale University</td>
<td>@yaleem2</td>
</tr>
</tbody>
</table>
Social Media and Emergency Medicine Residency Curriculum

Scott et al

various core emergency medicine topics by using a whiteboard animation application combined with recorded audio.

Twitter

The use of the microblog Twitter has become a popular route for educators to share concise pearls and reference links to useful resources. Blogs, podcasts, and videocasts are powerful disseminators of information but may require significant time for the learners to participate. We believe that learners with demanding schedules crave educational pearls and relevant references that are pertinent to a particular topic. Bahner et al described the use of “push” technology to distribute educational pearls about point-of-care ultrasonography to the emergency medicine residents at Ohio State University through the Twitter handle @EDUltrasound. Push technology can be described as an Internet-based communication in which the platform provides information as it is made available rather than the user needing to “pull” or refresh information. A majority of followers of @EDUltrasound found the tweets to include useful information.

In addition to individuals sharing their own educational snippets, emergency medicine residencies have embraced Twitter as a means to share pearls from weekly didactic sessions through the use of the #EMConf hashtag. Listeners “tweet” and spread information from a learning session to other consumers. For example, our program has a Twitter account that is used primarily to share highlights from didactic sessions and simulations (http://www.twitter.com/UPennEM). The chief residents are responsible for selecting and then tweeting pearls from lectures, which has allowed our own residents who may be on off-service rotations to follow conferences asynchronously. In addition, individuals who worked the previous evening and are not present for all of conference time can review highlights from a given day’s didactic. Consumers of these tweets include not only our own residents but also hundreds more who have chosen to follow the account.

Before the launch of the #EMConf hashtag, Twitter was used to disseminate content from regional and national conferences. Examples of these conferences included the 2013 regional Delaware Valley American Academy of Emergency Medicine conference (DVAAEM13) in Philadelphia, 2013 Society for Academic Emergency Medicine annual meeting (#SAEM13) in Atlanta, and 2013 American College of Emergency Physicians Scientific Assembly (#ACEP13) in Seattle. Conference live tweeting has continued to increase in popularity, with an increase to 1,332 individual tweeters at the 2013 American College of Emergency Physicians Scientific Assembly from only 294 at the 2012 meeting. In 2013, the inaugural Social Media and Critical Care Conference took place in Australia. There were more than 15,000 total tweets that incorporated the hashtag #SMACC13, but of more significance was the innovative integration of social media into the conference. Sessions included Google Hangouts with speakers, live-streamed sessions, and recorded sessions with the purpose of eventually making them available through YouTube. Conference speakers could easily disseminate lecture pearls, and more important, learners who could not attend the conferences were able to follow the didactic sessions.

Google Hangouts

Google Hangouts is a free utility that allows multiuser video conferencing and messaging, and has potential to be a powerful tool for interactive education. This platform allows real-time discussion and learning without participants being at the same location. Recently, it has been used in combination with other social media modalities by ALiEM and Annals of Emergency Medicine to create a venue for a global journal club using the Twitter hashtags #ALiEMJC and #ALiEMRP. The ALiEM website first served as a forum for the discussion of several questions about a journal article during multiple days. Using Google Hangouts, learners were then able to directly ask the authors questions and discuss their interpretations of the article’s findings in real time. For example, the authors answered curated questions on the clinical decision rules for subarachnoid hemorrhage, post–cardiac arrest targeted temperature management, and the nuances of multiple mini interviews during residency recruitment. These global journal clubs and the discussion of the multiple mini interviews article demonstrated that the combination of different social media modalities creates innumerable opportunities for real-time discussion. We are unaware of any programs that have used this modality during their didactic sessions, but believe this may be another potential powerful tool for residency education.

FURTHER INTEGRATION

Flipped Classroom

With so many open access resources, learners can easily individualize their education according to their needs and interests. Integration of asynchronous, individualized learning with the classroom is the basis of what is known as the “flipped classroom.” The idea is that fundamental knowledge is gained by the individual learner on his or her own time, and the classroom becomes the setting to apply that knowledge. This educational model offers a unique venue for learners to discuss their “take aways” and interpretation of a podcast or blog. Our residency has integrated modified versions of the flipped classroom model, using social media in a few specific ways with a debate format and a discussion-based Tech Talk series.

Through the debate format, senior residents and faculty participate in an evidence-based discussion about the clinical management of an acute disease process; an example would be rhythm versus rate control for atrial fibrillation. Before the debate, residents and faculty are sent several podcasts and articles chosen by the residency leadership that are related to the evidence available about a controversial topic. Additional literature review is conducted by the senior resident leading the discussion. A moderated debate then occurs during scheduled conference time involving faculty and residents. We believe that providing blog entries or podcasts for review before conference results in more
participation during the asynchronous component and may be
due to the materials being more engaging than a journal article
or textbook chapter. This approach has promoted critical
thinking and lively discussion of topics of immediate interest in
evidence-based medicine among the residents and faculty.

Another integration of a modified flipped classroom model is
our Tech Talk series. Each fourth-year resident is required to
identify one or two interesting podcasts or blogs that are sent to
the faculty and residents before the assigned conference time.
During conference time, the fourth-year resident then leads a
discussion about the disseminated material and highlights any
limitations or errors found in the podcast or blog post. Previous
topics have included dealing with the difficult consultant,
discharge instructions, and palliative care in the emergency
department.27-29 We recognize that this approach may not
strictly adhere to the fundamentals of the flipped classroom
model, but suggest that the information obtained from reviewing
the material outside of conference encourages faculty and
residents to develop individual opinions and thoughtful
discussions of the topics at hand. Not only have these Tech
Talk discussions led to more stimulating interactions during
conference but also they have generated many resident-driven
quality improvement projects.

Technological advancement has been the catalyst for
exponential growth in the amount of information available to
learners. However, the amount of time available for residents to
learn is shrinking. The use of the flipped classroom model in
residency education may promote more efficient, engaging, and
higher-level cognitive learning during didactic sessions, just as it
has been shown to do in undergraduate medical education.30

The hope is that the integration of asynchronous methods with
traditional classroom didactics would enhance the level of
interest, motivation, and retention rate among the learners.

Didactics Enhanced by Outside Interaction

The most significant potential of social media incorporation
into residency education is the ability for real-time, continued
feedback and discussion. This will become of particular importance as residencies become inundated with technologically adept
millennial learners. Twitter has been described as the “global
counter[sic] in medicine.”31 Frequently, tweets pose questions
or spark discussions. For example, during a panel discussion at
our residency about the senior resident job search, we received
questions for the panel from residents at other programs through
Twitter, which we were then able to pose to the panelists and
respond to (Figure 1). Twitter also allows residents to rapidly access
experts and educators from around the world. During another
recent resident conference, a discussion ensued about whether
patients with calf or superficial vein thrombosis should receive
anticoagulation. The question was sent by Twitter to Jeffrey Kline
(@klinelab), a recognized expert in this area, who immediately
responded with his approach (Figure 2). In addition to discussing
topics relevant to emergency medicine practice, there is the
opportunity to exchange various ways residency programs use
their didactic time on Twitter (Figure 3).

BARRIERS TO SOCIAL MEDIA USE

Generational Gaps and Unfamiliarity

One of the most obvious barriers to use may be a lack of
familiarity with social media. The Millennial Generation has
grown up immersed in technology. As a result, these digital
natives are able to effortlessly adopt new technologies.32
Conversely, earlier generations might not as easily do so and as a
result might be more reluctant to embrace the use of social
media. We believe this lack of familiarity may further prevent
individuals from recognizing the power and potential for social
media as an educational tool. We think that having more faculty
and residents engaged in technology and social media will lead to
more meaningful use in residency programs. We have attempted
to bridge this knowledge gap by holding workshops for faculty
and residents. Specifically, we have attempted to hold a “hands-
on” session covering Twitter and rich site summary feeds, but
only some of the attendees participated. We have yet to identify a
reliable tactic for engaging individuals resistant to this
implementation.

Distraction and Disruption

There is potential for social media to be distracting and
disruptive to other aspects of residency education. For instance, if
residents are engrossed in Twitter or other social media platforms
during clinical shifts, it could potentially affect patient care or
teaching. Other times, there exists the perception of disruption.
For example, some speakers at our weekly conference find it
unfortunate if multiple residents are on their laptops, iPads, and
iPhones during their lectures. Many times, these residents are
actually quite engaged and are, in fact, tweeting highlights and
pearls from the lecture. If speakers are not informed of this
beforehand, there exists a potential to offend them. Further, a
number of visiting grand rounds speakers have specifically
requested that information from their lectures not be tweeted or
posted on the Internet for reasons including repetition, liability,
and intellectual property.

Core Knowledge

In social media, some topics are discussed incessantly, whereas
others are much less frequently covered. For example, airway
management (especially controversial subtopics such as cricoid
pressure, induction and paralytic agents, and video versus direct
laryngoscopy) are discussed ad nauseam on Twitter and other
social media forums, whereas core emergency medicine topics
such as basic orthopedics or first-trimester vaginal bleeding are
rarely mentioned. Textbooks, however, dedicate roughly an equal
number of pages to exciting topics and mundane ones. If an
emergency medicine resident uses social media as their sole
source of learning, it is possible that many of these important
core topics will be overlooked or de-emphasized. As a result, we
believe that emergency medicine residents still must use
traditional resources such as textbooks to build core knowledge
and review the literature for topics that are less often covered by
social media.
Several educators have also recognized this problem and have attempted to address it using social media. For example, BoringEM (http://www.boringem.org) was created to address "the unsexy, common aspects of emergency medicine like palliative care, quality improvement, medical education, and urine." EMBasic (http://www.embasic.org) is a podcast and blog about core emergency medicine topics targeted at medical students and interns that is organized by chief complaints.

Overreliance

As the different social media resources become more widely used by emergency residents, a potential concern is the overreliance on free open access meducation as the sole method for critical appraisal of literature. This issue, especially if combined with inadequate literature review training during residency, could lead to emergency medicine residents’ inability to independently interpret primary literature. As such, evidence-based blogs and podcasts such as the NNT (http://www.thennt.com/), Best Bets (http://www.bestbets.org/), and SMART EM (http://www.smartem.org/) may serve as fundamental resources to a residency’s research and literature review curriculum. Furthermore, it is of utmost importance for the residency leadership to stress the value of reviewing the primary sources and independent learning.

Quality Assurance

Another notable concern is that open access resources lack peer review before their publication. Although ALiEM is currently testing a peer-review system, a formal quality assurance process does not exist. The rebuttal to social media lacking peer review is that the process takes place postpublication through consumers’ comments, but is not necessarily consistent or formal. There is no evidence to suggest that one approach is better than another, but we believe neither is perfect. Recognizing this, our program directors review multiple blogs, podcasts, and videocasts.
to determine the “best” material for the asynchronous portion of our curriculum. This approach involves at most 3 individuals and is not impervious to bias or opinion. Perhaps a better approach would be the identification of best-quality sources to supplement residency curricula through a larger consensus group such as the Council of Emergency Medicine Residency Directors.

Quality assurance may also be a problem on Twitter. Although our residency attempts to avoid tweeting inaccurate or highly controversial information, these tweets do not undergo a formal review process and may have unintentionally been inaccurate. Other times, controversial tweets may negatively affect the health system affiliated with a residency program. Although the messages in Twitter are short, tremendous responsibility is allotted to the individuals tweeting from a program’s account.

Information Overload

Learners may be overwhelmed by information overload with the ever-expanding number of available blogs, podcasts, and videocasts. With so many available resources, learners and educators need to be aware of filtering technologies and Web syndication tools to improve efficiency. An example of a filtering technology is The LIFTL Review, which is a weekly post on Life in the Fast Lane that highlights high-quality posts, podcasts, and tweets in emergency medicine. However, this list is determined by a group of individuals. If particular sources are determined to consistently provide reliable substance, Web syndicators such as Feedly or NewsBlur may ease filtering by enabling the aggregation of information from multiple Web sites into a single location.

Effectiveness and Residency Review Committee Compliance

One of the largest barriers to the incorporation of social media is the lack of research demonstrating an objective measurable effect on resident learning. A systematic review of social media use in medical education, published in 2012, found that social media use seemed to correlate with improved knowledge, attitudes about learning, and skills. Unfortunately, only 1 of the articles was a randomized controlled trial, highlighting the need for more scientifically rigorous studies examining social media integration and its effects on learners and educators.

Another significant barrier is determining how to quantify resident participation and educational effectiveness in a manner that is meaningful and measurable by the Residency Review Committee for Emergency Medicine (RRC). The committee has allowed up to 20% of required didactic curriculum to be individualized, interactive, and asynchronous, provided that resident participation is monitored by the program director. In addition, there must be faculty supervision, evaluation of activities, and measurement of the effectiveness of integration for these components to be acceptable. Having residents take quizzes related to material presented through individualized interactive instruction might demonstrate participation and compliance, but not necessarily understanding. Evaluation should measure competency-based metrics to show that the learners actually comprehended and retained the material. With the myriad available platforms and learning preferences, the “input” is effectively different for each individual and source, both in content and understanding. Having a way to measure the “output” in a competence-based manner needs to be the focus. As we continue to move into the next accreditation system as defined by the RRC and Accreditation Council for Graduate Medical Education, ideally the use of open access resources in residency education would demonstrate an improved progression of residents through the different levels of the Emergency Medicine Milestone Project.
 Privacy and Professionalism  
With the use of social media, there exists the potential for lapses in professionalism, privacy violations, and legal liability. The creation of a social media policy outlining both appropriate and inappropriate use is imperative. It is essential to protect patients’ privacy and to uphold professionalism while educators and learners use these tools. In addition, if residencies choose to participate in social media, there needs to be a clearly documented explanation between the program and affiliated institution about what constitutes acceptable and appropriate use. As was the case with our program, the development of a specific policy may require significant time and discussion among many stakeholders. The American Medical Association, Mayo Clinic, and CORD have published policies on professionalism in the use of social media, and there are a few examples of policies available online.39-41  

CONCLUSION  
In summary, the incorporation of social media into emergency medicine resident education provides opportunities for individualized learning and greater dissemination of
information. There are several available tools and each can be used in different ways. Some platforms are simply a source of information, whereas others allow real-time, active learning with other residents and educators globally. Many resources are freely available for learners and educators who are considering participation.\textsuperscript{3,42-45} Also, a comprehensive list of blogs, podcasts, and videocasts that may be useful to emergency medicine residency programs can be found on Life in the Fast Lane.\textsuperscript{46}

It is necessary for those participating to be aware of potential barriers and pitfalls in social media use. Of utmost importance is the maintenance of professionalism and patient privacy. With social media gaining in popularity within emergency medicine, we have the unique opportunity to collaborate, create, and share high-quality educational resources from expert educators covering core content. In addition, more controversial or cutting-edge issues can be discussed. With great vigilance and creativity, emergency medicine educators and learners possess the capability to transform medical education in an unprecedented way.

The authors acknowledge Michelle Lin, MD, for her insightful suggestions during the initial creation of this article, and David Marcus, MD, Anand Swaminathan, MD, MPH, Jordana Haber, MD, and Jeffrey Kline, MD, for their comments to @UPennEM.

**Supervising editors:** Debra E. Houry, MD, MPH

**Author affiliations:** From the Department of Emergency Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA.

**Funding and support:** By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). All authors contribute to the Hospital of Pennsylvania’s Emergency Medicine Residency Twitter account @UPennEM and Web site, http://www.PennEM.com.

**REFERENCES**

Annals' Toxicology Resource Center: Acetaminophen

Acetaminophen toxicity is now the most common cause of acute hepatic failure. Go to the Resource Center for the best information at www.annemergmed.com.