Five Strategies to Effectively Use Online Resources in Emergency Medicine

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INTRODUCTION

For health professions learners of all levels, staying abreast of the literature can seem like an insurmountable task as the number of clinically oriented articles continues to grow at an increasing rate.[1,2] Fortunately, there has been a veritable explosion of online secondary resources that endeavor to digest the expanding medical literature and present it in a format that is optimized for adult learners. Particularly in emergency medicine, these resources have been dubbed "free open access medical education," also known as free open access meducation (FOAM).[3] The FOAM movement has figured prominently in the proliferation of blogs and podcasts made available online by practicing clinicians.[3,4] As an unintended consequence, learners must now contend with an exponentially expanding library of both primary literature and secondary online resources.

To make effective use of this stream of knowledge, learners must filter and choose from myriad resources. Simple digital tools can be used to organize and manage this otherwise overwhelming amount of information. This article outlines 5 strategies to help learners and practicing physicians stay abreast of both foundational and cutting-edge literature by using digital solutions. Table 1 provides an overview of each step.

STRATEGY 1: USE A REALLY SIMPLE SYNDICATION READER

Following FOAM by visiting individual Web sites can be time consuming and overwhelming. Rich Site Summary, also know as Really Simple Syndication (RSS), feeds allow the latest content from specified Web sites to be exported directly to a personalized reader. Rather than going to each site to check for updates, content is automatically synced when it is published and presented in a magazine-like format that is easy to read. There is a variety of free or inexpensive RSS readers available. A video tutorial demonstrating how to use Feedly, a popular multiplatform reader, is available (Video E1, available online at http://www.annemergmed.com).

The flexibility of an RSS reader, however, can be a double-edged sword. This strategy works well when an appropriate amount of content is added by a user. However, new users can have difficulty finding good content, whereas experienced users may add so much over time that they cannot keep up with the reading list. New users should consider asking trusted colleagues for recommendations or an exported list of the Web sites they follow. Additionally, they can look at the list of recommended blogs or podcasts that their favorite blogs or podcasts follow, which can often be found on the home page (sometimes referred to as a "blog roll").

STRATEGY 2: USE A PODCAST APPLICATION

Downloading, formatting, and organizing podcasts can be time consuming and overwhelming. Podcast applications are to podcasts as RSS readers are to blogs. In both cases, the user specifies the content, and the software automatically acquires and queues the content for consumption. Podcast applications notify users when new podcasts have been released, download them, and play them. There is a variety of free and inexpensive podcast applications available for all models of smartphones. As with RSS readers, users must specify which podcasts they want to download, leading to the same potential problems. Again, a good place to start is to ask for recommendations from a trusted colleague, as well as recommended sites on blog rolls.

STRATEGY 3: USE COMPILATIONS TO FIND QUALITY RESOURCES

The difficulty of identifying good resources has long been recognized. We have compiled and categorized a list of recommended resources in Table 2. Several innovators have developed unique solutions to help collate and curate content:

- The Life in the Fast Lane Review[5] outlines the top FOAM content published each week. It is written by an international team of authors that identifies quality resources in 5 categories (emergency medicine, critical care, pediatric emergency medicine, toxicology, and medical education).
- FOAM EM is a blog that simply reposts content from most of the popular FOAM blogs and podcasts. The aggregated content is linked to the original Web site.
- A recent survey of Canadian residents found that faculty recommendations are highly valued by residents selecting online resources.[6] It may be worthwhile for residency programs to compile internal lists of resources that have been vetted by faculty.

Table 1. Examples and brief descriptions of the 5 strategies to effectively use online resources in emergency medicine.

Innovation	Examples	Description
RSS reader	Digg Reader, http://digg.com/ Feedly, http://feedly.com/ G2Reader, http://www.g2reader.com/	An RSS feed reader gathers and automatically delivers articles from Web sites that you follow as they are published. This can prevent you from needing to repeatedly visit the same Web sites.
Podcast application	Pocket Cast (Android/iOS, $4) AntennaPod (Android, free) Podcasts (iOS, free) Podcatcher (Windows telephone, $1)	Podcast streaming applications automate the process of downloading and listening to podcasts by indicating when new podcasts are available for download, downloading them, and playing them.
Resource compilations	LITFL Review, http://lifeinthefastlane.com/blog-news/litfl-review/	A team of authors at LITFL writes a review article outlining the best new blog posts and podcasts released each week in emergency medicine, critical care, pediatric emergency medicine, toxicology, and medical education.
	FOAM EM, http://www.foamem.com/	FOAM EM is a blog that reposts content from other popular emergency medicine blogs and podcasts.
Social networks	Twitter, https://twitter.com/	Most producers of blogs and podcasts have Twitter accounts. With a Twitter account, you can follow and interact with them through brief (≤140 characters) notes. They send out links to their resources and other helpful information.
	Facebook, https://www.facebook.com/	Most blogs and podcasts have Facebook pages. With a Facebook account, you can follow their updates, which often include links to their resources, and contact their editors.
	Google+, https://plus.google.com/	Some blogs and podcasts have Google+ pages and communities. With a Google account, you can follow their updates and participate in detailed discussions.
Custom search engine	FOAMSearch, http://foamsearch.net/	FOAMSearch is a custom search engine that searches only specific medical journals, blogs, and podcasts, which cuts down the number of irrelevant search results by finding only resources published on Web sites directed at physicians.

LITFL, Life in the Fast Lane.

STRATEGY 4: USE SOCIAL NETWORKS TO CONNECT WITH CONTENT PRODUCERS AND PEERS

With 1-way media (eg, textbooks, e-books, podcasts), some learners can feel disconnected from the creators of the resources. Social networks have revolutionized communication between producers and consumers of educational content by removing traditional barriers. Authors, presenters, innovators, and thought leaders are readily available on platforms such as Twitter, Google+, and Facebook.

Twitter is a microblogging platform for sharing and receiving brief (≤140 characters) pearls and links to recommended content. Most blog and podcast content producers use it to publicize, share, and discuss their material. Twitter is also used to extend the reach of conferences[7] and local academic teaching sessions by reporting lessons learned.[8] Recent tweets about FOAM resources can be easily found by searching for the hashtag #FOAMed. Some organizations and groups are using Twitter to discuss literature through microblogging-based journal clubs.[9] Pearls from the weekly didactic sessions incorporated into most emergency medicine residency programs are tweeted out with the hashtag #EMConf. A video tutorial demonstrating how to follow other users, tweet, and use hashtags is available (Video E2, available online at http://www.annemergmed.com).

Google+ is better suited to detailed discussions because there are no space limitations. Like Twitter, it is possible to follow the producers of online content, and some independent Web sites have companion Google+ pages. Google+ also allows users to establish communities to foster discussion on particular niches such as critical care.[10]

Many of the larger blogs and podcasts have Facebook pages that can be "liked." Although it is not as easy to engage the content producers or have detailed discussions on Facebook as it is on Twitter and Google+, it is a well-recognized social media platform for personal and professional use.

Social media sites can also be used as an informal feed of online resources. By following select members of the FOAM community, users can see what new podcasts or blog posts are available and which garner the most discussion. In comparison to RSS reader curation, this social media–based curation strategy trades comprehensiveness for diversity and allows the user to selectively choose content that has been implicitly endorsed by various individuals.

STRATEGY 5: USE CUSTOM SEARCH ENGINES TO FIND RESOURCES WHEN THEY ARE NEEDED

Finding specific resources quickly when needed can be a challenge. FOAMSearch[11] (formerly GoogleFOAM) is a Google custom search engine that searches only specific sites that are relevant to emergency medicine and critical care clinicians. By focusing on both medical journals and reputable FOAM resources (including blogs, podcasts, decision support Web sites, and medical calculators), it is easier to find specific, helpful resources.

FUTURE DIRECTIONS

Medical education, particularly within emergency medicine, is rapidly embracing online educational resources. In fact, the Accreditation Council for Graduate Medical Education Residency Review Committee now permits residency programs

Table 2. Recommended emergency medicine blogs, podcasts, and Web sites.

Resource	Type	URL
Basic emergency medicine resources		
BoringEM	Blog	http://boringem.org/
EM Basic	Podcast	http://embasic.org/
Flipped EM Classroom	Video podcast	http://flippedemclassroom.wordpress.com/
Critical care resources		
EMCrit	Podcast	http://emcrit.org/
Pulm CCM	Blog	http://pulmccm.org/
The RAGE Podcast	Podcast	http://ragepodcast.com/
Resus.Me	Blog	http://resus.me/
EMS/retrieval medicine		
PHARM	Blog/podcast	http://prehospitalmed.com/
Rural Flying Doctor	Blog	http://ruralflyingdoc.com/
Evidence-based medicine		
Best Bets	Web site	http://bestbets.org/
EM Literature of Note	Blog	http://emlitofnote.com/
EM Nerd	Blog	http://emnerd.com/
The NNT	Web site	http://thennt.com/
SMART EM	Podcast	http://smartem.org/
General emergency medicine resources		
Academic Life in Emergency Medicine	Blog	http://academiclifeinem.com
EM Cases	Podcast	http://emergencymedicinecases.com/
Emergency Medicine Ireland	Blog/video podcast	http://emergencymedicineireland.com/
ER Cast	Podcast	http://ercast.org/
Life in the Fast Lane	Blog	http://lifeinthefastlane.com/
REBEL EM	Blog	http://rebelem.com/
St. Emlyn's	Blog	http://stemlynsblog.org/
The Skeptic's Guide to EM	Podcast	http://thesgem.com/
Interpretive resources		
Amal Mattu's Emergency ECG of the Week	Video podcast	http://ekgumem.tumblr.com/
Dr. Smith's EKG Blog	Blog	http://hqmeded-ecg.blogspot.com/
Sonospot	Blog	http://sonospot.com/
Ultrasound Podcast	Video podcast	http://ultrasoundpodcast.com/
Pediatric emergency medicine		
Don't Forget the Bubbles	Blog	http://dontforgetthebubbles.com/
Pediatric EM Morsels	Blog	http://pedemmorsels.com/
PEM ED	Podcast	http://pemed.org/
EM PEM	Podcast	http://empem.org/
Toxicology resources		
The Poison Review	Blog	http://thepoisonreview.com/
Tox Talk	Podcast	http://toxtalk.org/
Trauma		
Trauma Professional's Blog	Blog	http://regionstraumapro.com/

to replace up to 20% of didactic lectures with "individualized interactive instruction"[12] that may include these resources. However, there is substantial room for continued growth in terms of quality, responsible use, curation, and academic recognition.

Quality remains a primary concern with online content because of its lack of peer review or other mechanisms to ensure accuracy. Despite the many examples of high-quality online content and the successes of peer review in FOAM,[13] verifying reliability remains elusive. There are increasing efforts to adapt and implement peer review for online educational resources[13,14] and, in the future, quality indicators may be developed to assist with the evaluation of these resources. However, as with other secondary scholarly resources, online content needs to be considered and discussed critically.[15]

Despite the tools discussed in this article, curation remains a constant challenge. Developing archival systems for diverse groups of digital resources and enhancing custom search engines will enhance their usefulness. The Social Media Index[16] is a tool that attempts to quantify impact for these resources in a way that is similar to journal impact factors for scientific journals: it uses objective metrics of distribution, including Web site traffic, to create a ranked list of the most widely accessed emergency medicine and critical care content and, with further validation, may serve as a helpful directory of resources. iClickEM is a search engine currently in beta testing. Rather than using a Google search engine to search specified resources on the Internet (such as FOAMSearch), iClickEM uses customized algorithms to search the entire Internet and return the highest-yield resources for emergency physicians. Natural language search[17] (search that uses naturally spoken language or questions rather than key words) may also help physicians to find what they are looking for, especially when combined with a search engine that can make use of medical terminology and physician-specific algorithms.

Finally, although there has been an explosion of the number of these educational resources,[4] they receive minimal academic recognition.[18,19] This may inhibit the involvement of academic physicians and slow the advancement of the field. Measures must be taken to acknowledge these forms of scholarly expression on par with similar techniques for dissemination, such as national lectures, review publications, and textbook chapters. After all, a podcast is simply a permanent lecture that can be shared with a much wider audience. For these works to be rewarded as scholarly activities, reporting standards for impact will need to be created.

CONCLUSION

The world of online educational resources in medicine is growing quickly. Tools such as RSS readers, podcast applications, curated lists of current blog or podcast content, social networks, and custom search engines have been developed that can assist learners to navigate the flood of information. Educators and learners should consider adopting these tools to customize their online medical education and personal learning network.

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