Electronic and Social Media-based Radiology Learning Initiative: Development, Implementation, Viewership Trends, and Assessment at 1 Year

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Rationale and Objectives: We report the development of a new "Case of the Day" (COTD) educational initiative using email, social media (SoMe), and a website to disseminate content, as well as its trends in viewership and assessment of utility for the first year of implementation.

Materials/Methods: Using an image-rich format, a new unknown case was disseminated to radiology trainees and attendings at our institution by email twice per week, including history, salient images, and follow-up questions. Simultaneously, content was externally disseminated on Twitter and a publicly viewable departmental website. On subsequent days, the answer was posted via email, Twitter, and website in the form of a brief YouTube video lecture. Viewership data were collected over the first 12 months (July 1, 2016 to June 30, 2017), and an anonymous survey of participants was performed.

Results: Sixty-five COTDs had complete viewership data and were included in our analysis, yielding 4911 "case" email views (mean = 76), 3798 "answer" email views (mean = 58), 68,034 "case" Twitter impressions (mean = 1047), 75,724 "answer" Twitter impressions (mean = 1164), 5465 "case" Twitter engagements (mean = 84), and 5307 "answer" Twitter engagements (mean = 82). COTD YouTube video lectures garnered 3657 views (mean = 61) amounting to 10,358 minutes of total viewing time. Viewers were very satisfied with COTD quality, with 97% ($n = 63$) reporting the quality as "good" or "excellent."

Conclusions: Email and SoMe can serve as effective tools for disseminating radiology educational content. SoMe offers substantial external visibility and branding potential for programs.

Key Words: Social media; radiology education; SoMe.

INTRODUCTION

The past decade has seen a dramatic increase in the utilization of social media (SoMe) for uses ranging from personal entertainment, work-related marketing, and education. According to a recent national survey by the Pew Research Center, a substantial number of American internet users now use SoMe, most frequently in the form of Facebook (79%; facebook.com, Menlo Park, CA), Instagram (32%; Instagram.com, Menlo Park, CA), Pinterest (31%; pinterest.com, San Francisco, CA), LinkedIn (29%; linkedin.com, Sunnyvale, CA), and Twitter (24%; twitter.com, San Francisco, CA) (1). As of 2015, 65% of the American adult population reported utilization of SoMe, a striking increase compared to the 7% utilization rate reported in 2005 (2). SoMe engagement is particularly high among the Millennial and Generation X generations, with 86% of US adults between ages 18 and 29 and 80% of US adults between ages 30 and 49 reporting SoMe use (3).

SoMe may be an ideal platform to deliver medical education. Already familiar to medical professionals who use it recreationally (4–7), SoMe has a large built-in audience of pre-existing users. As a networking tool, SoMe transcends departmental, institutional, and even international boundaries, allowing learners to build valuable personal and professional relationships with other users. Importantly, the mainstream

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SoMe applications (apps), such as Facebook, Twitter, and Instagram, are free to download and work universally across various mobile and tablet platforms, regardless of operating system. Easy access to participation in this technology, a key ingredient to the success of all SoMe, is vital to the way that free open-access medical education allows educators to generate and instantly share content with so many users worldwide (6,8,9), a practice which is highly valued by the current generation of learners (10). Lastly, through apps such as YouTube (Alphabet, Inc., San Bruno, CA), educational content can not only be disseminated worldwide, but also archived in perpetuity for the benefit of future learners.

Although the radiology community has embraced SoMe, particularly Twitter, as a tool for increasing institutional visibility and practice building (11,12), physician engagement (11), networking (13), and research collaboration (13,14), published reports of its utilization explicitly for radiology education purposes are lacking within the medical literature, at least relative to other medical specialties (15). We find this apparent underutilization puzzling, as the image-rich content and subspecialty-oriented culture of academic radiology lends itself well to dissemination of educational content on SoMe. Based on a published survey of attending radiologists, fellows, and residents at our institution (15), we found that both radiology trainees and faculty expressed a strong interest in participating in a hypothetical, case-based educational initiative using SoMe. Specifically, the core feature of this proposed educational curriculum would be the electronic dissemination of high-yield, image-rich unknown radiology case material through intra-departmental email, the SoMe platforms of Twitter and YouTube, and a departmental website (Fig 1). In this regard, a SoMe-based educational tool would facilitate "inward facing" content geared toward the education of radiology trainees and faculty, as well as represent a strategic application of "outward facing" enterprise SoMe for the branding of our department (16).

In this article, we detail the design, implementation, and assessment of a successful electronic and SoMe-based "Case of the Day" (COTD) educational initiative geared toward radiology residents, fellows, and attendings. We report the multimedia (email, Twitter, YouTube, and website) viewership trends for its first year of implementation, as well as the results of an anonymous departmental survey of residents, fellows, and faculty regarding its utility and utilization at 1 year post implementation.

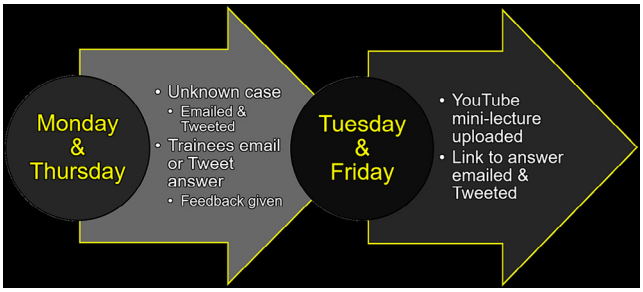

Figure 1. Workflow schematic of Case of the Day (COTD) content dissemination. On Mondays and Thursdays, an unknown case is both emailed and tweeted. Trainees and respondents then email or tweet the primary investigator, who provides feedback. On subsequent days, the answer is disseminated via email and Twitter in the form of a link to a YouTube mini-lecture.

MATERIALS AND METHODS

This Health Insurance Portability and Accountability Act-compliant investigation was reviewed by the Institutional Review Board of our medical school and was exempted from further review and monitoring. All protected health information pertaining to the educational initiative was anonymized and we conscientiously refrained from using topical case material that could potentially result in a breach of protected health information.

Educational Tool and Education Initiative Overview

As part of a new COTD radiology education initiative, unknown cases were delivered to all radiologists and radiology trainees ($n = 192$ radiologists, including attendings, fellows, and residents) within our department via email from the primary investigator (PI) on Mondays and Thursdays. Each case contained three standard components: patient history, salient images, and case-specific questions (typically querying respondents' most likely diagnosis or appropriate differential diagnoses). An "unknown case" format with open questions and free text response (ie, not multiple choice questions) was employed. Contemporaneously, the unknown case material was also disseminated to SoMe via a Tweet from the PI (Twitter @nakoontz), which contained the same core components of patient history, salient images, and case-specific questions. Additionally, the case material was posted to a publicly viewable departmental COTD website (https://radtf.iuhealth.org/COTD), allowing outward facing content to be archived in perpetuity.

Trainees and attendings were then provided a response period of 24 hours to engage the new COTD content. Participants would view the clinical history and images, generate an appropriate differential diagnosis, and finalize answers to the case-specific questions. During this time interval, participants would email or Tweet their responses back to the PI, who would then provide rapid feedback regarding their answers. Specifically, the PI would confirm correct responses or, in the case of an incorrect response, redirect each participant's train of thought toward the appropriate answer.

The following days (Tuesdays and Fridays, respectively), the answers to the COTDs were both emailed and Tweeted in the form of a link to a YouTube mini-lecture, which was uploaded to the PI's personal YouTube account (https://www.youtube.com/user/nakoontzmd). A link to the YouTube mini-lecture was also embedded into the department COTD archival website to reveal the answer. The YouTube mini-lectures were brief (mean = 5:10, range 2:22–