Electrocardiogram training for residents: A curriculum based on Facebook and Twitter☆,☆☆

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Abstract

Background: We studied whether social media applications can serve as effective educational tools for teaching electrocardiogram (ECG) interpretation to medical residents.

Methods: 39 emergency, family, and internal medicine residents participated in the 33-week "ECG of the Week" curriculum via Facebook and Twitter. ECG skill was assessed before and after the study with a 10-ECG quiz. Outcomes of interest included predictors of participant response rates and post-study quiz performance.

Results: ECG quiz scores were 66% and 76% on the pre- and post-study assessments respectively. High-performing participants on the pre-study quiz were more likely to have above-average response rates to ECG challenges (36% vs. 0%, p = 0.015). There was no significant difference between pre- and post-study quiz scores.

Conclusions: Our social media-based ECG curriculum elicited the most participation in residents who were already above-average in ECG reading ability. Future designs will need to better reach residents with below-average baseline ECG reading ability.

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Introduction

Electrocardiogram (ECG) interpretation is an important skill that physicians are expected to learn in medical school and in residency training. In a variety of specialties, including internal medicine, family medicine, and emergency medicine, accurate ECG interpretation is critically important to providing high-quality patient care. However, multiple studies have shown that many residents do not receive the necessary training to become adept at ECG interpretation [1]. Consequently, a variety of supplemental ECG interpretation training programs have been developed and studied in various contexts [2]. However, no study has ever evaluated the use of social media as a possible educational tool to improve ECG interpretation skills in residents.

In this paper, we report a curriculum intended for residents at our institutions based entirely on social media that was designed to bolster existing curricula on ECG interpretation. In general, social media applications include many features that make them effective educational tools for ECG training. The collaborative nature of social media presents multiple opportunities to create innovative, time-efficient, and potentially more effective methods of medical education. In addition, these tools are free and ubiquitous in the personal and professional lives of many medical practitioners as well as medical institutions [3]. Due to the constant accessibility of social media, its use as an educational tool may circumvent scheduling conflicts that limit medical residents from participating in formal didactic sessions where ECG interpretation is normally taught. Similarly, social media sites may also allow for seamless multicenter and even global participation in educational projects based on these sites.

In the current study, we designed an interactive, social media-based ECG interpretation curriculum for residents and conducted a pilot multi-center study on its effectiveness. By utilizing push technology to automatically send content to participants, we hypothesized that this "active" curriculum, combined with the flexibility to access it anywhere would

be an effective way to teach ECG interpretation to busy residents.

Materials and methods

Curriculum design

We created an "ECG of the Week" curriculum geared toward internal medicine, family medicine, and emergency medicine residents. The curriculum consisted of 33 "ECG challenges" composed of a clinical vignette and an ECG, along with a multiple-choice question addressing ECG interpretation (Fig. 1). Participants would have three to five days to submit an answer before being provided with solutions with explanations (Fig. 2). Since one ECG was discussed weekly, the curriculum took participants 33 weeks to complete. All ECGs were selected by the investigators to highlight a broad range of conditions organized by multiple themes, such as supraventricular tachycardias or paced rhythms (Table 1). The ECGs used in the study were all from patients at the authors' institutions but were de-identified to protect patient privacy. One of the authors (MS), an attending cardiologist, monitored the online content to ensure that the clinical content was accurate.

The curriculum was designed to be based completely online via the social media sites Facebook and Twitter. Dedicated Facebook and Twitter accounts were created for the study curriculum. Though the curriculum was primarily based on Facebook, the Twitter account was set to simultaneously post identical content when ECG challenges were posted on Facebook. Participants were instructed to enable "Notifications" from Facebook that would notify them via alerts when new content was available and provide

links directly leading to the ECG challenge or solution. All ECG challenges or solutions were accessible from any computer or mobile device with Facebook/Twitter access. Following each challenge, participants submitted answers to a study email address, from which data were extracted. In order to protect participant privacy and minimize influence from other participants in the study, participants were not allowed to publicly post answers or comments regarding the challenges, although they were free to send emails with any questions or comments.

Study design

The study was a multi-center pilot of the "ECG of the Week" curriculum with randomization of participants into an incentive group and a control group. All participants who completed assessments both before and after the study were eligible for a cash prize. The institutional review boards for the participating academic training centers (University of Maryland School of Medicine and Johns Hopkins School of Medicine, both in Baltimore, MD) approved the study.

Participants were recruited by the investigators from the two participating academic training centers. Eligible participants included full-time, active training, internal medicine, family medicine, or emergency medicine residents. Residents completing an internal medicine internship as part of a different specialty were also eligible to participate during the year of their internal medicine training. Residents were not eligible to participate if they were participating in a shared residency or fast-tracking into a fellowship/advanced training program in the same academic year as the year of participation. Participation and performance in the curriculum was neither tracked by their residency training programs
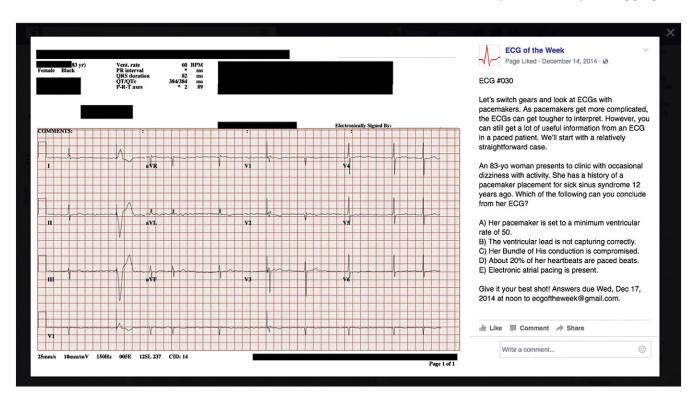

Fig. 1. Example of ECG challenge presented on Facebook with an ECG image associated with a clinical vignette and multiple-choice question.