**Understanding Social Media: Underlying Motivation and Untapped Opportunities for**

**Cardiovascular Medicine**

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**List of Abbreviations:** Social Media = SoMe Fellows In Training =FITs

Early Career Professional = ECP Cardiovascular = CV

Women-in-Cardiology = WIC

American College of Cardiology = ACC

Health Insurance Portability and Accountability Act = HIPAA General Data Protection Rules = GDPR

Protected Health Information = PHI Continuing Medical Education = CME

**Key words**

Twitter, SoMe, Social Media, Cardiotwitter, Cardiovascular, Facebook

**Introduction**

Social Media (“SoMe”) has become ubiquitous across society with approximately 2 billion users worldwide and over 70% of Americans utilizing a variety of SoMe platforms. Cardiology professionals have used SoMe platforms such as Twitter to gain exposure to new research, network with experts, share opinions and engage in scientific debates(1). Across academic medicine, the influence of SoMe is increasing; a search in PubMed of “social media and medicine” in September 2018, yields over 4749 publications since 2008. Meanwhile, evolving individual and institutional use has resulted in uncertainty for all parties on how to optimally advance this newer digital frontier. Thus, the purpose of this paper is to: 1) introduce the basics of SoMe usage (with the focus on Twitter); 2) provide perspective on best SoMe practices in academic and clinical cardiovascular (CV) medicine; and 3) present a vision for SoMe and the future of CV medicine.

**Basics of Twitter**

There are multiple SoMe platforms with broad multimedia tools including Facebook, Instagram, Snapchat and Doximity. In recent years, Twitter, a free microblog of up to 280 characters per message, has gained popularity within the CV community. User accounts either individual or organization (define by the symbol “@” followed by a unique identifier) are able to post short messages or “Tweets”. Other users can interact with Tweets via posting comments, “liking,” or “retweeting.” Furthermore, engagement is measured through the “impressions” or the number of times content is displayed. Users can also attach hashtags (#) to words or phrases that allow for easy searches

and for users to find specific content across multiple SoMe platforms. Some of the widest used cardiology hashtags are listed in Table 1.

**Social Media in Education and Advancement for the Individual CV Clinician and**

**Researcher**

SoMe is an effective tool facilitating communication, medical education and collaboration around CV disease, amongst a broad range of individual health-care stakeholders. Individual CV professionals have created free open-access medical education (#FOAMEd) in several interactive formats. One example is the educator-led tweetorial, a short series of grouped multimedia tweets containing educational content centered around a particular topic. Tweetorials are often structured in an interactive fashion with polls to prompt active learning, stepwise revelation of diagnostic clues, and opportunities for questions and feedback.

Cardiology fellows-in-training (FITs) have created some innovative educational content on SoMe. In July 2018, the American College of Cardiology (ACC) FIT Council organized tweetorials through the hashtag #FITSurvivalGuide on a variety of fundamental clinical topics. The open platform allows for clinicians of all seniority to equally contribute to #FOAMed material. This academic discourse has promoted in-depth scientific discussions in real time often focused around late-breaking clinical trials. In addition, interesting, unusual, and challenging clinical cases can be readily disseminated worldwide, resulting in a rich online real-time collection of angiograms, echocardiograms, and other CV imaging modalities.

For academic cardiologists, institutions have begun considering SoMe and digital activities as part of their criteria when considering academic appointment and promotions(2). In

preparation for their promotion package, academic cardiologists can develop a SoMe portfolio, that documents digital activities, demonstrate evidence of quality and impact of digital work, and how their SoMe work aligns with institutional priorities.

**Social Media in Creating New CV Communities/Networking**

Perhaps the biggest advantage of CV SoMe is crowd-sourcing the perspective of individual CV professionals with a common goal of promoting CV education, advocacy, health or overall betterment of patient care. These initial online relationships often extend from the virtual world to real-life networking, tweet-ups at national and international conferences and text groups. An example of this is Women-in-Cardiology (WIC) community that has come together on both Facebook and Twitter. Encompassing nearly 900 international members on Facebook, the community serves as a support group for female cardiologists who are addressing challenges such as work-life integration, gender related issues and salary gap. Grassroots CV advocacy has gained another dimension of reach on SoMe to spread awareness especially in heterogenous population groups. #SouthAsianCVD, #GoRedforWomen are some of the examples of SoMe CV advocacy campaigns. SoMe is a presents a variety of opportunities to amplify the influence of health advocacy campaign given the ability to communicate with the constituents directly.

**Social Media in Journals and Conferences**

SoMe enables CV journals to drive engagement, increase journal visibility and rapidly disseminate content to new audiences globally through new digital strategies(3). Journals can incorporate the appropriate hashtags, use more images/vidoes, create a short survey or podcast around the topic to drive the engagement to an identified article and foster discussion on SoMe. Leading journals including @JACCJournals have appointed physician SoMe Editor(s)(3). In

addition, a group of interventional cardiologists recently started an entirely Twitter-based journal

called “Tweet-book: Cardiovascular Interventions” to publish peer-reviewed cases that are posted on Twitter.

There has been increasing emergence of Twitter-based journal clubs that meet virtually and provide a forum that allows for diversity of inclusion of participants across disciplines and across the globe. Visual abstracts, podcasts, twitter live, online journal clubs(e.g.#JACCclub) and SoMe chats are other emerging methods to enable broad SoMe engagement of healthcare professionals across a variety of disciplines.

The traditional impact factor of a journal, based on citation counts, may not fully capture readership impact. To augment this, journals also track alternative metrics (or “altimetric”) that encompass an amalgam of web traffic, SoMe shares and media mentions of an article and may potentially inform funding agencies about the impact of the research they funded(4). While the full impact of SoMe on article views remains uncertain ranging from neutral to beneficial(5), a recent article found a modest correlation of altimetric attention score with the number of citations for the 8 CV journals with the highest impact factor for articles published from 2015-2017(6).

Cardiovascular meetings and congresses (Table 1) have embraced SoMe as a means to expand the reach and dissemination of education and science. Unbound by time limits or the inability for individuals to travel, SoMe allows for expanded participation and viewing talks and posters using Periscope, Twitter, Facebook and Instagram, with expanded post-presentation peer discussion. Analogous to an audience member standing at the microphone, the online discussion incorporates sophisticated analyses through a democratization of voices sometimes coupled with engagement of the authors themselves(7).

**Social Media in Organizational CV Promotion**

Healthcare providers such as hospitals are increasingly leveraging SoMe platforms to promote content consistent with the individual, departmental and organizational clinical or research enterprise. Prominent cardiology societies like the ACC (@ACCinTouch) actively post latest CV content to allow experts from across the globe to discuss ideas and provide critique on the new and upcoming research in a centralized deregulated space. The ACC’s @CardioSmart account serves to provide easy updates for clinicians and patients, readily accessible at the touch of a fingertip through SoMe. Patients and patient advocates have also used SoMe to speak out about issues surrounding heart disease.

**Social Media Best Practices**

It is important for clinicians to remember that their online presence is within the public arena that can have far-reaching implications. Patients follow CV professionals and SoMe thus providing a means for patient education and compliance towards prescribed care. Any public account where professional medical discussions originating from the United States (US) must remain Health Insurance Portability and Accountability Act (HIPAA) compliant(8). In contrast, in the European Union, the General Data Protection Rules (GDPR), stipulate that data that has been rendered anonymous are no longer considered personal(9). The US-based HIPAA rules have a much broader interpretation. There are well known cases where US physicians posting on social media omitted protected health information (PHI), but not sufficiently enough to prevent identification of a patient that resulted in legal consequences(10). SoMe users should familiarize themselves with data governance regulations within their own institutions and healthcare systems related to images, case-narratives, etc.

At the same time, the American Hospital Association also noted institutions evolving from an initial policy of discouragement to a more common sense policy for individual social media use(10). It notes some risks of avoiding social media such as missed opportunities to correct misleading health information and to engage with the broader community about new advances.

When sharing clinical cases in SoMe, in addition to avoiding sharing PHI, it is also important that commentaries remain professional and respectful. Offensive or demeaning remarks are not acceptable and may impact reputations of healthcare centers, clinics and teams’ in addition to offending patients. It’s important to realize the repercussions of mistrust of peer-reviewed research on the part of the patients.Patient-clinician communication should best be left to HIPAA- compliant hospital-endorsed communication platforms.

**The future of Social Media within CV Medicine**

The use of SoMe is evolving and advances in technology and software platforms will by necessity drive how this content is used or delivered to healthcare professionals. A wide range of material is actively posted across multiple SoMe platforms in real time, yet archiving systems of many SoMe platforms is archaic with little functionality for searching or storing content for future use. Future development of this functionality across SoMe platforms will increasingly be important.

Major congresses currently promote digital strategies for delegates attending the meeting physically. It is conceivable that societies may utilize SoMe to run virtual congresses in the future; particularly in parts of the world where cost considerations may be particularly relevant. Award of Continuing Medical Education (CME) credits for educational content posted on SoMe

at such events is particularly challenging, so innovative approaches will be required to capture use of this content. For example, SoMe companies are able to track the number of users engaged with their platforms as well as the time that each individual user follows live streaming from congresses or engages in discussion around a presentation or educational content posted on SoMe. Potentially, vendors awarding CME credits for societies or meetings could use this information to permit issuance of credit hours for SoMe users. Finally, a natural evolution of case-based tweetorial discussions and twitter journal clubs mentioned above may be the development of virtual multidisciplinary team meetings across SoMe platforms, which may be particularly relevant in situations where particular expertise is not available locally.

**Conclusion**

SoMe has transformed the cardiology community in a very short time and its impact, influence and relevance remains important but under constant evolution (Figure). It is important that CV professionals direct the content of the community, rather than allow this to be driven by others. Its power to communicate openly, with wide reaching access worldwide and at a rate faster than ever before makes it a formidable force and voice. Rather than resist it, the CV community should embrace it for the purposes that will benefit the entire community and patients, but understand its limitations and responsibilities with the use of such mediums.

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**Central Illustration Figure Legend**

A: Global Reach of Social Media by country of users of the hashtag #Cardiotwitter. B. Tweet Activity Trends of common cardiology hashtags with dates of major conferences. C. Table summary of common hashtags.

**Table 1: Cardiology Hashtag Data (Source: symplur.com in September 2018)**

**Type of**

**Hashtag**

**Hashtag Hashtag**

**Registration**

**Date\***

**Total**

**Tweets**

**(Thousands)**

**Total**

**Retweets**

**(Thousands)**

**Total**

**Participants**

**(Thousands)**

**Impressions**

**(Millions)**

**Visuals**

**(Thousands)**

**Articles**

**(Thousands)**

**General**

**Cardiology**

**Hashtags**

#Cardiotwitter 10/13/17 53.5K 44.1K 14.6K 162.9M 47.9K 19.7K

#CardioEd 01/07/16 61.6K 51.2K 12.7K 109.3M 51.9K 20.7K

**Sub-specialty**

**Hashtags**

#RadialFirst 02/24/17 48.8K 36.7K 6.1K 96.9M 42.0K 7.0K

#Echofirst 11/20/17 34.3K 29.6K 6.2K 61M 32.5K 4.2K

**Organizational**

**Hashtags**

#ACCFIT 04/02/16 33.9K 25.1K 1.6K 107.8M 23.1K 8.7K

#ACCWIC 03/20/17 12.3K 9.1K 1.9K 47.5M 7.1K 1.7K

**Conference**

**Hashtags**

#AHA17 06/29/17 62.0K 42.4K 17.4K 339.1M 44.5K 17.7K

#ACC18 12/11/17 51.4K 35.6K 10.1K 372.5M 42.2K 14.8K

#ESC18 12/29/17 54.5K 20.0K 23.8K 137.5M 17.9K 4.6K

\*Registration date reflects the date hashtag was registered with symplur.com. Individual hashtag data is from the registration date to access on September 22,

2018. ***Tweets*** *The total number of unique tweets since the hashtag was registered on symplur.com.* ***Impressions*** *Impressions are computed by taking the number of times an account has tweeted multiplied by the account's number of followers repeated for all accounts, then finally summed up.* ***Articles*** *The total number of articles, or links/urls, shared.* ***Visuals*** *The total number of times each photo, GIF, or video was shared.*

