The Academic Tweet: Twitter as a Tool to Advance Academic Surgery

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Abstract: Social media, Twitter in particular, has emerged as an essential tool for surgeons. In the realm of academic surgery it enables surgeons to advance the core values of academic surgery, as outlined by the Association for Academic Surgery (AAS): inclusion, leadership, innovation, scholarship, and mentorship. This article details the ways in which surgeons are using Twitter to embody these values and how the Twitter account for the Association of Academic Surgeons accomplishes its goal of inspiring and developing young academic surgeons.

Introduction

Just over a decade old, Twitter (San Francisco, CA, USA, URL:twitter.com) has emerged as a professional tool for surgeons, readily facilitating learning, networking, mentoring, research collaboration, and dissemination across the traditional barriers of geography, medical specialty, and seniority.¹ Apropos of the time constraints of practicing surgeons and surgical trainees, Twitter's character limit encourages concise messages allowing users to quickly discern whether they would like to join a discussion, further disseminate a message, or obtain more information (such as from an attached link). This paper endeavors to outline the potential of Twitter to support academic surgeons through its ability to advance the core values of academic surgery, as outlined by the Association for Academic Surgery (AAS): inclusion, leadership, innovation, scholarship, and mentorship.²

Inclusion

Academic surgery is a challenging career path, and prior studies have indicated increasing dissatisfaction amongst academic surgical faculty. Up to 21% of academic physicians have considered leaving academic medicine, citing reasons such as a “lower sense of inclusion, engagement, self-efficacy, values alignment, and institutional commitment to improve support for faculty”.³ There are indications that Twitter may mitigate factors that contribute to this.

Inclusion is central to the Twitter platform—anyone can open a Twitter account, and join the “conversation” at any time. It allows unlimited users to post simultaneously, discourages any one individual from dominating a conversation, and makes it nearly impossible to pre-empt others’ participation. Naturally introverted personalities may overcome barriers to public discourse. In stark contrast to extensive *curriculum vitae* detailing publications, awards, and accomplishments, Twitter’s short biographies force users to succinctly outline their core interests and passions.

Without the pretext of traditional academic surgical hierarchy, Twitter conversations often supersede social boundaries. Thus, Twitter provides a novel way for surgeons, trainees, medical students, and even pre-medical students to interact. Influence and message amplification gained through community participation and content, rather than seniority or social standing, may enhance innovation, inspiration, and morale, with some arguing that Twitter’s elimination of the medical hierarchy leads to increased patient safety and improved outcomes.¹

The emergence of surgery-specific hashtags, such as #SurgTweeting,⁴ #ILookLikeASurgeon,^{5–7} and subspecialty hashtags such as #plasticsurgery⁸ and #colorectalsurgery.^{9,10} have created virtual communities engaged in conversation.¹¹ #SurgTweeting, one of the earliest surgical hashtags, has served as a community for both attendings and residents to interact and support each other in surgical life and research. #SurgParenting and other communities focus on life outside the operating room and allow surgeons a sense of personal camaraderie they may not feel in a purely professional setting.

Born out of female surgeons’ frustration with surgical stereotypes, the #ILookLikeASurgeon hashtag grew from initially female participants to a gender-inclusive community celebrating diversity and promoting positive perceptions of surgeons.⁶ The emphasis that #ILookLikeASurgeon places on gender equity and diversity holds particular relevance in academic surgery, where disparities in resource allocation, compensation, promotion, and advancement have resulted in a “leaky pipeline,” resulting in the proportion of women in academic leadership positions failing to reflect the number of women in the field.¹²

Leadership

In 2011 Dr. Kent Bottles presciently described Twitter as an “essential tool for the physician executive” in a blog post describing his ascent to “thought leader” on Twitter. His leadership in content curation (i.e., combing through health care articles and sharing those of interest with his followers) led to speaking and consulting jobs, as well as research contacts and interdisciplinary collaboration.¹³ Surgeons on Twitter become respected voices with large followings not based solely on their academic pedigree, but also on the degree to which they share interesting content and participate in timely conversations.

One example of leadership facilitated by Twitter is the #hldr (healthcare leader) tweetchat.¹⁴ Started in 2012, this conversation convenes weekly to discuss a topic amongst a diverse

community united by a passion for improving healthcare. The chat provides a unique opportunity for surgeons to interface with patients, physicians, nurses, CEOs, health information technologists, caregivers, policy makers, and students.¹⁴ Other popular tweetchats include #MedEd (medical education),¹⁵ #bcsm (breast cancer social media),^{16,17} and #AWSchat (Association of Women Surgeons).¹⁸ Regularly scheduled discussions that narrow the scope of the Twitter discourse for a brief period of time allow surgeons an influential voice in areas of expertise, as well as exposure to areas with which they may have limited engagement.

Surgical societies use Twitter accounts to expand their leadership influence beyond the confines of their geographic representation. For example, in 2015 the Royal Australasian College of Surgeons (RACS) commissioned a report on bullying, discrimination and sexual harassment in surgery.¹⁹ The final report was shared worldwide via social media, and fostered a global discussion on the impact of harassment on medical education and the lives of practicing surgeons. By releasing the report via Twitter and other social media platforms, the RACS extended its reach and impact, positioning itself as a world leader regarding an issue faced by surgeons globally. RACS' established social media presence also afforded a swift response to negative press on the topic of surgical culture.

Innovation

Most advances in surgical science are the result of cross-disciplinary collaboration between surgeons and engineers, material scientists, and other non-clinicians. Twitter serves as a modern space where key stakeholders can meet and collaborate. Due to Twitter's international reach, discovering and connecting with collaborators is no longer limited by proximity or geography. Direct message Twitter chats allow for asynchronous or real-time conversations amongst two or more individuals in order to collaborate privately. With no more than a common interest, researchers can be connected, facilitating each other's work through virtual exchanges and collaborative writing efforts—such as the one leading to this manuscript.

Similarly, Twitter-facilitated innovation allows collaborator coordination in trial recruitment and data synthesis, such as GlobalSurg, a global surgical outcomes collaboration.^{20–22} These collaborations have resulted in enhanced participant identification and recruitment, larger sample sizes, ahead-of-schedule study completion and increased external validity. In the Student Audit and Research in Surgery (STARSurgUK), students coordinated data collection for multi-center studies, crediting their success to social media and internet-driven collaborator recruitment.^{23,24} Similar collective networks have been established in South Africa, and are proposed for sub-Saharan Africa²⁵ and Australia.²⁶

Scholarship

With over 500 million daily tweets, Twitter serves as a rapidly growing dataset that is ripe for “big data” analysis.²⁷ Twitter research techniques include content analysis,^{28–30} public health surveillance,^{31–35} qualitative analysis,^{36,37} and network analysis.^{38,39} The term “infodemiology” has been coined to refer to the “science of distribution and determinants of information...with the ultimate aim to inform public health and public policy.” Using Twitter for infodemiology research, Bosley et al. analyzed the public discourse on cardiac arrest and resuscitation, and found tweets on symptoms, risk factors, personal experiences, training, education, news media events, research articles, cardiac arrest/AED locations, fundraising opportunities, and conferences.⁴⁰ Such information can be useful to inform public health messaging and improve delivery of care, among other applications.

One of the greatest areas of impact of social media on academic surgery has been the dissemination of research.^{41,42} Live tweeting of professional conferences is an increasingly popular way to promote the latest research findings and to establish connections for future investigations.^{43–53} Savvy presenters utilize Twitter to amplify the reach of their conference posters, workshops, and presentation content, and it is now becoming popular for presenters to pre-plan tweets of key figures to coincide with their podium presentations at meetings. Post-publication tweeting of a visual abstract, a graphic representation of the study's methods and results, has been shown to increase article dissemination and readership.⁵⁴

Academic journals have generally embraced social media with dedicated Twitter accounts publicizing recently accepted articles with author tags and electronic links, facilitating and accelerating global discussions on content leading to timely and rapid debate. Increasingly the traditional academic performance scores of citations, impact factor or H-index^{55,56} are complemented by alternative metrics ("altmetrics") such as those by Altmetric (London, UK, URL:altmetric.com), ImpactStory (URL:impactstory.org) and Plum Analytics (URL:plumanalytics.com) which offer statistics on social media reach and dissemination, including page views, downloads, and mentions in media outlets, on blogs, and on Twitter.^{57,58}

Blog posts have the potential to serve as a powerful adjunct to Twitter, explaining results and sharing the significance of surgical research in more depth with both the surgical community and general public. Highlighting the practice of blog posts as guideposts to journal articles, a study of Twitter citations of 28 academicians showed that 48% were "secondary citations," meaning there was an intermediary web page (typically a blog post or news article describing the study) between the tweet and the target resource.⁴¹ To determine the impact of a corresponding blog post, Dixon et al. wrote a blog post summarizing a PLoS ONE publication in radiology, including a link to the journal article.⁵⁹ The blog post was promoted via Facebook and Twitter. In the 7 months preceding the blog post, the PLoS ONE article received 3534 views. Within 7 days of blog publication, the article view count climbed by 3234 to 6768 (97% increase).⁶⁰

Twitter additionally contributes to scientific excellence by providing a forum for both formal and informal post-publication peer review. Following the 2015 publication of a randomized controlled trial comparing appendectomy to antibiotics for the treatment of acute appendicitis, the #SurgTweeting world instantly took notice, and turned to Twitter for discussion.⁶¹ The resultant, robust dialogue spawned its own hashtag (#AppyGate), and led to Behind the Knife: The Surgery Podcast, hosting its first live debate, with two surgeons active on Twitter discussing the pros and cons of the paper.⁶² The online discussion and debate did not occur at the behest of the original article's publisher, but rather because surgeons read the paper and sought a forum in which to discuss it. Physicians on Twitter not only increase their chances of expeditiously hearing about and reading the article, they also benefit from the spontaneous, vigorous, global discourse unique to social media platforms like Twitter. Indeed, some proponents argue that the live, public review of medical literature using SoMe platforms (such as online journal clubs) may become a modern form of peer review.^{63,64}

Mentorship

Mentorship is essential to the practice of surgery.⁶⁵ Yet in 2015, a study of 565 surgical trainees in the UK and Ireland revealed fewer than half identified a mentor.⁶⁶ One barrier to successful mentorship can be the difficulty in locating mentors with whom to establish a personal connection. Twitter expands the pool for mentorship beyond one's geographic location, making it possible for trainees to have multiple mentors for the various realms of their professional and

personal lives. These connections can prove beneficial not only for the mentee but also for the mentor, often in the form of “reverse mentoring,” in which mentors learn about emerging technologies and skills from their mentees.^{67–69} Once a mentoring relationship is established, dialogue can be facilitated through a variety of social media tools, such as direct messaging on Twitter, Facebook, and video conferencing.

Attendance at society conferences has historically been the avenue for students, residents, and junior faculty to present and learn about current research, find extra-mural mentors, and foster research collaborations. Many surgeons are now accomplishing these tasks via Twitter, and arrive at conferences with networks already in place and an eagerness to meet their Twitter network members in person. These virtual networks form organically out of shared interests recognized through tweet content, retweets, and replies. Though academic networks traditionally formed over the course of many mutually-attended meetings, Twitter has the capacity to markedly accelerate this process.

Inspiring and developing young academic surgeons

Through its Twitter account, @AcademicSurgery, the AAS connects with its membership, potential members, and the general public asynchronously and in real-time. Twitter users receive updates from and interact with AAS year-round through tweet announcements of career and educational opportunities, awards, research breakthroughs, member accomplishments, tweet chats, and journal clubs. Feeling connected to one’s surgical societies outside of the annual conference can be especially useful for residents with limited time and funding to travel during clinical years. The AAS effectively uses Twitter for its primary goal of “inspiring and developing young academic surgeons.”

Conclusion

Academic surgery is a challenging career enjoyed by many. Twitter enables surgeons to join a global community of academic surgeons passionate about improving the art, science and practice of surgery. These time-honored objectives are being carried forward in a novel fashion by social media. Science is not advanced in isolation but rather through the sharing and investigating of ideas. Today’s surgeons are using Twitter to advance the values that form the core of surgical practice: inclusion, leadership, innovation, scholarship, and mentorship. Ultimately, this collaboration has the power to improve the care of our patients.

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