

# History of Social Media in Surgery

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## Abstract

In many ways, the history of surgeons on Twitter echoes the initial resistance and ultimate mass adoption of laparoscopic surgery that led to the field of minimally invasive surgery. At its inception, social media was similarly met with skepticism and concerns of threats to professionalism. Despite these concerns, numerous surgeons and other physicians pioneered the use of social media to establish a virtual medical community and share scientific knowledge regarding a variety of topics including medical conferences, journal publications, and more. After these initial successes, surgeons' views have evolved, leading to mass adoption of social media and participation on Twitter as a means of professional networking and dissemination of science. This article chronicles that history.

## Keywords

- ▶ social media
- ▶ Twitter
- ▶ history of medicine

“For any major change or progress to take place, many factors must fall into place ... there is a season for any change, requiring a favorable and supportive philosophical environment. Authoritative institutions must be convinced of the safety and efficacy of the changes relative to the comfortable status quo. Momentum always favors inertia. Fears must be overcome: fear of making mistakes, fear of failure, fear of established procedures becoming obsolete, and fear of established authorities losing control. Successful change requires timing and a force more powerful than the status quo. The strongest force for sustainable change is a worthy goal.”

–Dr. William E. Kelley's 2008 presidential address to the Society of Laparoendoscopic Surgeons, describing the adoption of laparoscopy in general surgery.<sup>1</sup>

## Background

Social media includes Web sites and smart phone applications that enable users to create and share content and engage in peer-to-peer (or social) networking. In other

words, social media refers to technology that allows users to connect in real or delayed time without geographic boundary or limitations. The American Society of Colon and Rectal Surgeons defines the term “social media” as encompassing a wide variety of online resources for sharing content among users and shall be defined to include video- or picture-sharing sites, forums, blogs, discussion groups, and accounts on various social networking sites and social media platforms, including, for example, Facebook, Twitter, YouTube, LinkedIn, Instagram, Doximity, and Tumblr.

Surgeons have long benefitted from in-person gatherings for networking, mentorship, and education, most notably at gatherings of national and international scientific meetings and societies. In a new digital age, the utility of social interactions afforded through these new types of social media for surgeons may not be immediately apparent to the uneducated eye. Some surgeons are skeptical of the efficacy of social media as a professional tool.

Oftentimes a technology exists for an indefinite period of time before it is finally adopted by the masses, at quick speed. Medicine in particular is replete with such examples, including antiseptic hand washing, gastrointestinal staplers, and

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more recently organ transplantation and laparoscopy. The opening paragraph is taken from Dr. William E. Kelley's 2008 presidential address to the Society of Laparoendoscopic Surgeons, describing the adoption of laparoscopy in general surgery.<sup>1</sup> While the origins of laparoscopy date back nearly two centuries, his introductory words uncannily apply to today's use of social media for professional purposes by the surgical community.

Though the current proliferation of surgeons on Twitter is often referred to as a "revolution," in reality its adoption by surgeons has been a relatively gradual evolution.<sup>2,3</sup> Its use has been met with skepticism, criticism, and apprehension; its pros and cons have been (and continue to be) debated.<sup>4-7</sup> Despite the arguments against it—including the warnings of an inherent threat to professionalism—social media's use for public health education, professional networking, and medical education has been pioneered by key physician leaders. Much in the way that television ratings can be used to judge the success of a particular sitcom or event, such as the superbowl, "followers" can be used to assess what type of information individuals want to have. To put things in perspective, consider that the American Society of Colon and Rectal Surgeons (@fascrs\_updates) account (created in 2012) has 4,800 followers. By contrast, the American College of Surgeons (@AmCollSurgeons) has 34,800; the New England Journal of Medicine (@NEJM) has 439,000; and the American Medical Association (@AmerMedicalAssn) has 613,000. Meanwhile, the singer Beyonce (@Beyonce) has 14.7 million, the current President of the United States (@realDonaldTrump) has 36 million, and the cable news network CNN (@CNN) has 37 million followers. More information on related topics (such as how information spreads on Twitter, how to truly measure success, and how to assess the credibility of such information) is provided elsewhere in the journal. This article endeavors to highlight a few of the milestones and leaders who paved the way for the current proliferation and spread of information in the surgical Twitter community.

## The Platform

Launched in 2006, Twitter quickly gained popularity among the general public. Initially put forth as a means of "micro-blogging" or "status updates," the utility of Twitter quickly evolved into an unprecedented ability to expand one's network and engage in mass information sharing.<sup>8</sup> It provided the ability to cheaply instigate any grass-roots effort, and became appealing as a way to instantly communicate everything from one's latest research findings, opinions, new projects, or ideas to what you are currently eating for breakfast. An early cohort of physicians and medical students embraced the new technology. Without significant representation from any one medical specialty, early adopters were lumped together as "physicians on Twitter" rather than recognized by specialty.<sup>9</sup>

Just as the pioneers of laparoscopy were subjected to severe criticisms, so too the physicians on Twitter faced challenges. In laparoscopy critics argued that the risk of

complications outweighed the potential benefits without much evidence to justify these claims. The laparoscopic technique was even banned in Germany from 1956 to 1961.<sup>10</sup> Early adopters of Twitter were met with skepticism and suspicion of a similar kind, though not quite to the extent of being banned from an entire country. Debates ensued both online and in real time as to whether social media's "threats to professionalism" could be overcome.<sup>11-14</sup> While these threats can be very real (see the article on unprofessionalism in this issue), use of the technology also had to overcome a different type of criticism—in that the legitimacy of the forum itself was untested. Unlike any other form of dissemination of ideas that had existed before, social media allowed world-wide instant communication to anyone who was willing to listen. There was no peer review required prior to publication of statements on this virtual podium, and only a limited ability exists to retract any statements made. (Even if a post is deleted, if it is viewed, shared, or reposted by another user before the original is deleted, the statement will persist.)

In the early stages, Twitter quickly became associated with people tweeting photos of their breakfast. Thus, early adopters found themselves having to justify to non-tweeting colleagues that there were far more possibilities for the technology than simply sharing photos of food.<sup>15</sup> Numerous pioneers—both surgeons and nonsurgeons—overcame this stereotype to set the stage for the active surgical Twitter community that exists today. Twitter has also emerged as the primary social media platform, but a similar cultural evolution has taken place on Facebook, LinkedIn, Instagram, and other social media platforms. As Twitter has been the forerunner, this article primarily focuses on that.

## Early Adopters and Blogs

Early surgeon tweeters found themselves in a particularly multidisciplinary environment, bonded by the scarce physician population on the platform. At that time, the medical Twitterspace was punctuated by usernames such as @kidneyboy (Joel Topf, MD), @whole\_patients (Margaret Chisolm, MD), @MedPedsDoctor (Alex Djurichich, MD), @33Charts (Bryan Vartabedian, MD), @FutureDocs (Vinny Arora, MD), and @SFTraumaDoc (Andre Campbell, MD), reflecting the casual nature of Twitter, as well as hesitation of users to take the platform too seriously (or even use their real names as a handle). Medical Twitter users at this time often used discretion as to with whom they disclosed their affinity for the platform among medical colleagues. It was not so much a medical or even scientific community, but more a means for expression of personal opinions or ideas (like an Op/Ed column) where users could post unsolicited advice. In contrast to today, in these early stages there were no major scientific journals, societies, or institutions with a social media presence.

Many of the earliest surgeon tweeters were bloggers, which loans itself to a similar type of expression. The difference is that Twitter posts are limited to 140 characters, while blogs can be a much longer, and often use a short

story to illustrate a point. The diversity of backgrounds of these early adopters showed there was not a stereotype of a surgeon who tweets. One of the first surgeon bloggers to the scene was plastic surgeon Ramona L. Bates, MD (@rlbates). She started her blog, “Sutured for a Living” in 2007.<sup>16</sup> Her blog is an eclectic combination of medical and surgical topics, as well as the fruits of her sewing, quilting, and knitting. This enmeshment of professional content with hobbies illustrates one way in which social media serves to meld the personal and professional. Another early blogger was the pseudonymous @Bongi1, a self-described “general surgeon storyteller” practicing in Mpumalanga, South Africa. His writings demonstrate the challenges faced operating in a low-income country, while vividly illustrating the emotional challenges that unite surgeons across time and geography.<sup>17</sup> One particularly vocal surgical voice in the Twittersphere has been the pseudonymous @Skepticalscalpel (Skeptical Scalpel), a “former chairman of surgery and residency program director.” A prolific blogger, his combined posts have received well over one million views.<sup>18</sup> A softer, yet no less authoritative voice that also entered the blogosphere the same year is that of Dr. Mary L. Brandt (@drmlb), a pediatric surgeon whose blog “wellnessrounds” focuses on surgery, medical education, and wellness.<sup>19</sup> Her thoughtful blog posts reflect medical students’ and surgeons’ increasing interest in conversations on personal health and well-being. These are but a few examples that reflect the diversity of individuals who found the platform appealing.

The choice to blog pseudonymously was fairly common in the early years from 2006 to 2012. Today this practice has been largely dropped, with most surgeons choosing to receive credit for their efforts and put forth their blog as a component of their professional branding. While this type of “publication” by no means is equivalent to a peer-reviewed scientific publication, it still takes a lot of time and effort. Thus, a tweet is much shorter and takes considerably less time. Many Twitter users find a synergy between tweets and blog posts, using one to call attention to the other and/or one as a shorter more succinct version of a larger piece. Twitter serves to disseminate blog posts and allows a dialogue of comments prompted by blogs. While new bloggers continue to enter the scene, others chose to post on curated blogs such as KevinMD.com (which reposts in a centralized location those pieces that may have been previously done on lesser-known Web sites that may have a common interest to a community). Similarly, organizations such as the Association of Women Surgeons, the Association for Academic Surgery, and the British Medical Journal have blogs that allow multiple authors to post under a common theme or umbrella. The information on these more “academic” sites is typically in the form of an invited narrative. These curated venues also allow authors to share their writing without committing to the responsibilities of a personal blog, which requires constant new posts to maintain interest among readers. Most physicians also have a day job, which makes this type of commitment difficult.

## Hashtags and TweetChats and Journal Clubs... Oh My!

For those surgeons on Twitter who were not active bloggers, many sought to legitimize their presence and participation on the platform. For many Twitter users, health care “tweetchats” as well as hashtags provided a way to organize this quest for validation. A tweetchat is a planned Twitter discussion moderated through the aid of a hashtag during a set time period. Hashtags are words preceded by a hash or pound sign and used to identify messages on a specific topic. This allows all posts that contain the same hashtag to be easily identified and followed (which would otherwise not be possible given the millions of individual users). The #hscm (health care communications and social media) tweetchat emerged in January 2009 as the first regular tweetchat related to health care, founded by Dana Lewis (@danamlewis).<sup>20</sup> Another hashtag that served to legitimize physician’s presence on Twitter was #MedEd. Used to label tweets pertinent to medical education, this hashtag led to a tweetchat by the same name, founded by Dr. Ryan Madanick (@RyanMadanickMD), a gastroenterologist, in 2009.<sup>21</sup> A third tweetchat, #hcldr (health care leadership), was founded by Colin Hung (@Colin\_Hung) and Lisa Fields (@lisafieldsms) in 2012 to unite patients, physicians, nurses, CEOs, health care information technologists, caregivers, policy makers, and students focused on improving health care.<sup>22</sup> The broad nature of these tweetchats highlights the reality that many early surgeon tweeters were frequently lone surgeons in broad interdisciplinary communities.

Patient-focused tweetchats also emerged. #bcsm (breast cancer social media), a weekly Twitter chat founded in 2011 by two breast cancer survivors, Jody Schoger (@jodyms) and Alicia Staley (@stales), was an early example. After its launch, social media pioneer Deanna Attai, MD (@drattai) joined as a co-moderator.<sup>23</sup> Beyond the weekly chats, this particular hashtag serves as a community for patients, advocates, caregivers, physicians, and researchers. Dr. Attai credits her social media participation with a greater appreciation for her patients’ points of view.<sup>24</sup> A similar community-oriented chat, #lscsm (lung cancer social media), started in 2013, led in part by surgeon David Tom Cooke, MD (@David-CookeMD).<sup>25</sup> The #obsm (obesity social media) chat started in 2016, allowing bariatric surgeons a unique opportunity to interface with other health care professionals and patients with the goal of dispelling myths surrounding bariatric and metabolic surgery.<sup>26</sup>

A natural extension of tweetchats into the realm of medical education was the advent of the Twitter-based journal clubs. The first such journal club (#twitjc) was started by two internal medicine physicians, Drs. Natalie Silvey (@silv24) and Fi Douglas (@fidouglas) in 2011. This chat set the format for many journal clubs to follow. The first surgical journal club, #urojc (International Urology Journal Club), was started by Dr. Henry Woo (@DrHWoo) in 2012.<sup>27</sup> Multiple surgical journal clubs followed suit, including the Resident and Associates Society of the American College of Surgeons (RAS) and *Journal of the American College of*

*Surgeons* (JACS) online journal club (#RASJACS). This includes a combination of invited commentaries from surgical experts and moderated discussions that occurs over several days. Other examples of journal clubs run by surgical societies are the Eastern Association for the Surgery of Trauma Twitter Journal Club (#EASTjc) which is open access and the Society of Surgical Oncology journal club which is for members only. The *Annals of Surgery Journal Club* utilizes a blog format whereby an invited expert is asked to provide a brief summary and a critique of a journal article and to pose several questions for discussion. These journal club discussions can be found afterward in a variety of formats including downloadable PDFs (i.e., #RASJACS discussions *Surgeons RaASotACo*, *Surgeons JotACo*. Commentary and Conversation: RAS-ACS and JACS Hosted Interactive Facebook Discussion about Bile Duct Injury. 2016; <http://www.journalacs.org/RAS-ACS-discussion-2016>. Accessed April 18, 2017.) and online blog archives (i.e., *Annals of Surgery Journal Club Annals of Surgery Journal Club*. <http://journals.lww.com/annalsofsurgery/blog/annalsofsurgeryjournalclub/Pages/default.aspx>. Accessed April 18, 2017). Journal clubs are now hosted by independent coalitions such as the International General Surgery Journal Club (#igsjc), journals, surgical societies, and departments. Each follows a similar format: a specific time (as long as several days) is set up to discuss a particular article or series of articles. Anyone can join in the conversation, and a moderator is often assigned to not only facilitate discussion but also assure that all users use the same hashtag (and not just reply to an earlier post by another user), so that all tweets can be visible to those engaged.

## Scientific Journals

Likely inspired by the popularity of Twitter journal clubs, surgical journals eventually started maintaining Twitter accounts. *JAMA Surgery* (@JAMASurgery) started tweeting in 2009; *Annals of Surgery* (@AnnalsofSurgery) in 2011; and *Journal of the American College of Surgeons (JACS)* (@AmCollSurg) in 2013. JACS appointed the first “social media editor” of a surgical journal that same year and other journals soon followed suit. The presence of journals on Twitter had been relatively subdued, with mostly links to published articles or table of contents. The introduction of the #visualabstract by Dr. Andrew Ibrahim, Creative Director for the *Annals of Surgery*, has served to increase retweeting of content and user engagement and has been adopted by other journals.<sup>28</sup> The #visualabstract concept is to reduce the content of a scientific article down to a single slide, with clip art or other illustrations that aid in this process. It has “gone viral” among scientific journals as a way to disseminate knowledge and drive traffic to journal Web sites. The advent of Altmetric ([www.altmetric.com](http://www.altmetric.com)) allows social media mentions (or citations of sort) to be tracked. Most journals now include a running total of the Altmetric social media mentions on the abstract page. Publishers’ attention to these new statistics has served to popularize, perhaps even legitimize, the use of social media for dissemination of scientific knowledge.

## The Path to Acceptance

In 2011, the potential of Twitter in academic medicine was crystallized in blog form by Dr. Vineet Arora (@FutureDocs) in her post titled, “Twitter to Tenure: Seven Ways Social Media Advances My Career.” Her list includes media interviews, workshop presentations, acquired new skills, lecture and committee invitations, grant opportunities, and dissemination.<sup>29</sup> Also, in 2011, the concept of the “twimply factor” was demonstrated by Eysenbach in his study in which Tweets predicted highly cited articles within three days of publication.<sup>30</sup> That same year, Altmetrics emerged as an additional metric to measure the impact of research articles. Altmetrics measures citations on Wikipedia and in public policy documents, discussions on research blogs, mainstream media coverage, bookmarks on reference managers like Mendeley, and mentions on social networks such as Twitter.<sup>31</sup> This has further aided in legitimizing Twitter activity with objective measures of activity and impact, spawning discussions of including social media contributions in criteria for academic advancement.

## Social Media at Scientific Conferences

The door to academic tweeting by Twitter users was opened when Symplur metrics entered the scene in 2011.<sup>32</sup> In simple terms, Symplur serves as a clearinghouse for healthcare-related hashtags and health care tweetchat schedules. It also allows for real-time analysis of hashtag metrics including impressions, tweets, and participants. A meeting hashtag can even be registered here in advance. This provides a formality to health care and conference hashtags and enables academic research and analysis of tweets and Twitter users. One common usage of this technology is to tabulate statistics on conference tweeting, a practice that has become increasingly popular. Various ontology projects further serve to formalize health-related dialogues on Twitter.<sup>33</sup> More recently, societies have utilized tools such as scavenger hunts, and Twitter walls, or electronic billboards which include the most popular tweets, to “socialize” the process and attract more participants. A tipping point of Twitter’s popularity at conferences is credited to the 2007 South by Southwest Interactive (SXSWi) conference. During the event, plasma screens streamed tweets in the conference hallways and Twitter usage increased from 20,000 tweets per day to 60,000.<sup>34</sup> Thus, it should come as no surprise that conference tweeting is extremely popular among surgeons who utilize the platform.

## Surgical Societies

The presence of surgical societies on Twitter allows academic and community surgeons alike to connect with their professional societies in real time. The American College of Surgeons has a full-time social media manager and joined Twitter in 2009. Less than a decade later, the College is extraordinarily active on social media with four separate Twitter accounts—@AmCollSurgeons, @RASACS, @ACSTrauma, and @bleedingcontrol. The

Association of Academic Surgery (@AcademicSurgery) started tweeting that same year. As needs grew, The American Society of Colon and Rectal Surgeons hired a Communications Manager to oversee not only Social Media but also media relations as a whole. The Twitter account of the Association of Women Surgeons was initiated by medical students in 2011 and is now team-managed by a virtual army of individual users. All users sign a use agreement, and the posts are managed by software that organizes and can schedule the account activity.

The American Society of Colon and Rectal Surgeons has a social media committee, created in 2012. The mission statement of this group is “to support and increase the awareness of the mission of [the society] as the world’s leading authority on colon and rectal disease through social media outlets. We aim to assist health care providers with a specific interest in diseases of the colon, rectum and anus to achieve high-quality patient care by providing an interactive venue for discussion, information and education regarding all aspects of colorectal disease utilizing several multimedia platforms.” Similarly, purposed groups exist within other societies as well. Several minority surgical societies are now on Twitter—the Society for Black Academic Surgeons (@societyofBAS), the Society of Asian Academic Surgeons (@AsianAcadSurg), and the Indian American Surgical Association (@IndoAmSurgAssoc). There are also several international and specialty-specific women in surgery organizations with Twitter accounts.

## Turning Tweets into Science

The first academic article on medical conference tweeting was “Smartphones, Twitter and new learning opportunities at anaesthetic conferences” by McKendrick.<sup>35</sup> A testament to the changing face of knowledge-sharing, the article describes attempts of the Association of Anaesthetists of Great Britain and Ireland to encourage Twitter promotion and knowledge dissemination at two of its conferences. The first attempt failed to produce a single tweet and the second resulted in 36 tweets. The first article on Twitter use for a surgical conference was written by Cochran et al and described the use of Twitter to document the 2013 Academic Surgical Congress.<sup>36</sup> The conference hashtag was tweeted 434 times by 58 users. #Urologists have been particularly enthusiastic adopters of conference tweeting. Wilkinson et al analyzed the tweets of eight international meetings, in their article titled, “The social media revolution is changing the conference experience.”<sup>2</sup> One specific conference analyzed showed nearly a 10-fold increase in tweeting in 3 years, from 347 tweets to nearly 6,000. The trend of increased tweeting is consistent with most conferences analyzed.<sup>37–39</sup>

## Hashtag Evolution

Concurrent with expanding conference tweeting and the requisite increase in conference hashtags, Twitter users began utilizing hashtags for more general surgical topics, in part getting back to the more colloquial roots of the technology. In 2014, Dr. Christian Jones put forth the #SurgTweeing hashtag for shorthand use in an isolated conversa-

tion.<sup>40</sup> The hashtag was expanded upon by many others to encompass the entirety of surgical Twitter activity, inspiring many sibling hashtags. Dr. Joel Adler jokingly tweeted that he dreamed #SurgSandwiches would catch on,<sup>41</sup> bringing the food obsession of early users now full circle. His dream came true and its reality spawned conversations from #SurgVeggies to #SurgDesserts. The practice of surgeons posting photos of zany socks and colorful clogs lent itself to the #SurgSocks and #SurgShoes hashtags.<sup>42,43</sup> Surgery resident and parent Dr. Luke Selby (@LVSelbs) put forth #SurgParenting to share the endearing moments of parenting as a surgical trainee and beyond, many of which show a humorous side to the tribulations of balancing what can be two full-time jobs. Less tongue-in-cheek offshoots of variable popularity include #SurgEd, #SurgMentoring, #SurgLeadership, #SurgEthics, and #SurgScience.

While some might consider hashtags on food and footwear to be inconsequential banter (similar to the early complaints about tweeting breakfast foods), they offer a means for residents to interact with attendings without the tension of the traditional surgical hierarchy. #SurgParenting allows surgeon parents an opportunity to share an aspect of their life not visible at work, which many others can relate to. There are others who have made an entire occupation out of tweeting, blogging, and chronicling the often comedic process, raising of children (such as @HonestToddler and @XplodingUnicorn, who provide snapshots of funny moments in the interaction with young children). This opportunity may be of particular importance for male surgeons who are less frequently asked about their children compared with female colleagues.

## Changing the Culture

As Dr. Kelley astutely posited in his presidential address, “Successful change requires timing and a force more powerful than the status quo. The strongest force for sustainable change is a worthy goal.” That Twitter moment came for surgeons in 2015, when they were united by the hashtag #ILookLikeASurgeon, championed by Drs. Heather Logghe (an author of this work), Kathryn Hughes, and Marissa Boeck.<sup>7,44,45</sup> Initially put forth to support women in surgery, it quickly grew to include all surgeons celebrating their passion for surgery, diversity, and commitment to a welcoming, inclusive profession. The hashtag led to public acknowledgment of surgeons’ presence on Twitter. Patients took notice.<sup>46</sup> The hashtag was adopted globally and was even noticed in the mainstream media including on NBC’s Today Show (<http://www.today.com/health/looklikeasurgeon-raises-awareness-about-women-medicine-t38191>; <http://www.newyorker.com/culture/rabbit-holes/the-new-yorker-cover-thats-being-replicated-by-women-surgeons-across-the-world>). While the initially viral intensity of the hashtag subsided, the hashtag continues to serve as a community uniting surgeon in conversations on diversity, inclusion, and humanism in the profession. It demonstrates spikes in tweeting when events occur or new hashtags appear that are of particular significance to the community.

Other hashtags that have united the surgical community are #DearIntern and #SurgStories. #DearIntern was inspired in 2015 by when Dr. Amalia Cochran (@AmaliaCochranMD) asked her followers to tweet their “best advice they would give a new intern” and label it #DearIntern.<sup>47</sup> The hashtag was used again for the same purpose in 2016. The #SurgStory hashtag was put forth by Dr. Heather Yeo, Joel Adler, and Niraj Gusani and summarized in a blog post for the Association of Women Surgeons, encouraging others to share their story of how they got “hooked” on surgery.<sup>48</sup> While the hashtag no longer enjoys frequent usage, it once again demonstrated that surgeons are present and willing to “come together” to reminisce and celebrate their connection and inspiration for the profession, even in a nontraditional forum.

The most recent hashtag revolution in surgery has been the evolution of specialty-specific hashtags. Hashtags such as #colorectalsurgery and #plasticsurgery have received significant attention, support, and adoption including from respective societies and prominent members.<sup>49,50</sup> Others such as #pedsurgery, #entsurgery, and #traumasurgery have significant, though limited, adoption. Subspecialty-specific hashtags may very well be the next frontier for surgeons to hone their knowledge dissemination among each other and with the greater public.

## Going Global

While this article has focused mainly on the experience of North American surgeons, the experience of Twitter is an inherently global phenomenon. From the earliest tweets, the #ILookLikeASurgeon movement was an international effort. Twitter allows surgeons to share, engage, interact, and collaborate on a global scale with unprecedented ease. Thus, it is not surprising that the #GlobalSurgery hashtag has united surgeons passionate to ensure safe access to surgery for all world citizens.

## Conclusion

The time from the first crude cystoscope to the coining of the term “minimally invasive surgery” spanned nearly two centuries. A decade after the first tweet, surgeons have now achieved a critical mass. Just as with minimally invasive surgery, the tools and footprint of social media will continue to evolve. Whether or not Twitter is here to stay (or if it will be replaced by a different platform), the social media revolution in surgery has occurred. Surgeons worldwide are virtually connected. The tool is established; the art is yet to be perfected.

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