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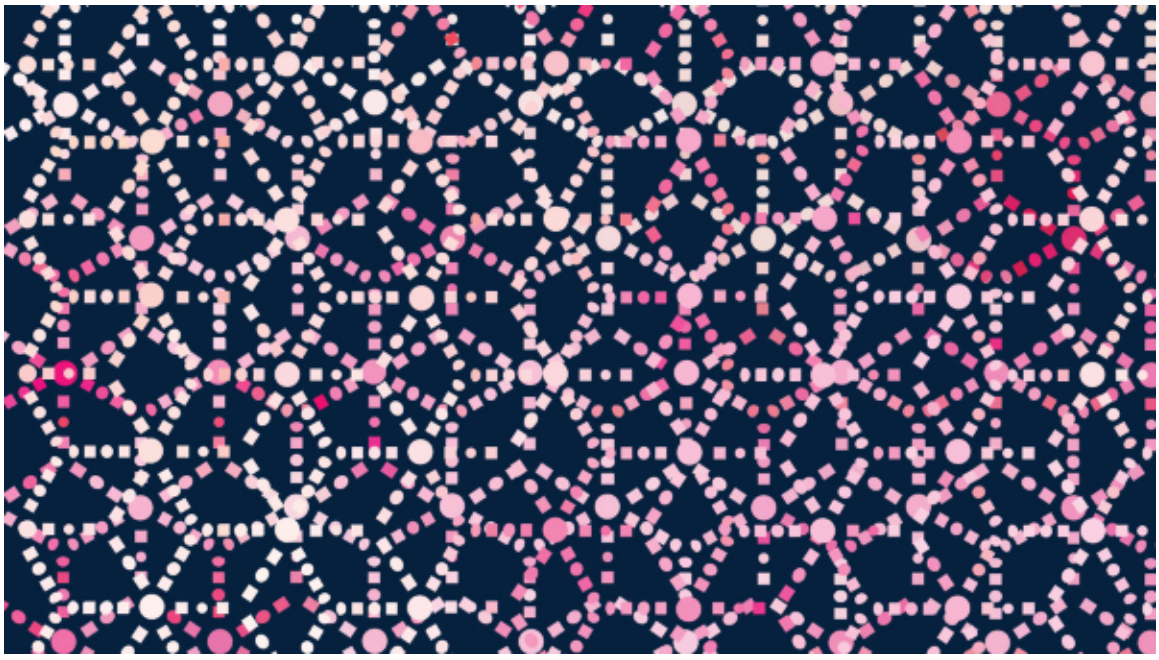

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Learning from others' experiences is an important aspect of professional development in surgery. That's why academic surgical departments across the globe hold weekly Morbidity and Mortality (M&M) conferences that gather surgeons together to review particular cases and share ideas for improving their practice.

Research has even found that surgeons in solo practice, with less opportunity to interact with their peers, scored lower on the American Board of Surgeons Maintenance of Certification examination (MOCEX) than surgeons in group practice — unless they reported engaging more often in socializing and speaking with other colleagues.

Yet, as the field of surgery has grown — both in number of surgeons, and in their dispersion across countries — surgeons are less able to rely on casual hallway conversations, conferences, or other informal knowledge sharing strategies to learn from each other and stay sufficiently up to date with new techniques or practices. Whereas new developments and refinements of surgical techniques historically arose among tight-knit communities of surgeons concentrated in large university settings, where many people performed similar cases, modern surgery encompasses a broader array of increasingly specialized procedures that are occurring in a range of settings worldwide. This dispersion of practice makes it more likely that a surgeon today may be the only one to perform certain procedures in a given geographic region (particularly outside of large cities) and that innovative ideas, tips, and best practices may arise from outside of the traditional academic "hubs."

Enter social media. Facebook, Twitter, and other social media platforms have emerged as powerful tools for keeping surgeons connected. Though online communities have been used in specific cases to share medical knowledge, in more recent years a variety of communities have formed using more accessible social media platforms to facilitate surgeons' interactions, enhance their practice, and improve patient outcomes. For instance, Facebook groups like the International Hernia Collaboration, founded by Brian Jacob, or the Robotic Surgery Collaboration (RSC) — founded by one of us (Yusef Kudsi) — allow surgeons to share de-identified cases and exchange questions and experiences regarding particular techniques or practices.

These groups have large memberships and generate numerous online discussions every day among practicing surgeons worldwide. We recently published a study in the *Annals of Surgery* examining the usage and engagement patterns of individuals in the RSC Facebook group from its inception in January 2015 through August 2016. In this time, the group grew to almost 2,000 members (and now has over 4,400), with surgeons from around the globe posting questions, photos, or videos of their techniques for others' feedback, learning, or discussion. Analyzing data on over 1,200 posts made in the group, we found that the number of posts made per day was significantly greater on mid-week days (Tuesday, Wednesday, and Thursday) than on other days, suggesting that surgeons utilize this Facebook group as part of their weekly workflow rather than in their spare time (on the weekends, for example).

We further found that posts with links, photos, or videos got more "likes" than posts with only text; but text-only posts yielded a greater number of comments, a more active form of social media interaction. This suggests that, even on a multimedia-rich platform like Facebook, a simple story or question can provoke back-and-forth discussion. And ongoing research by one of us (Chris Myers) has shown how this kind of active interaction can be more helpful for learning vicariously from others than passively acknowledging or copying someone else's experience.

Though our research focused on the use of Facebook groups, other social media platforms have emerged as relevant tools for surgical education and advocacy as well. For instance, Twitter has been used to host "TweetChat" forums on the surgical treatment and management of particular diseases (such as a recent #obsm discussion on adolescent bariatric surgery).

The #NYerORCoverChallenge and #ILookLikeASurgeon movements on Twitter also drew attention to the inequality and underrepresentation of women and other minority groups in surgery, issues that impact surgical education and training.

What Do Surgeons Learn Through Social Media?

Here's an example: one of us (Amir Ghaferi) learned about a new surgical technique for abdominal wall reconstruction called transversus abdominis release (TAR) from participating in the International Hernia Collaboration (IHC) Facebook group. The group allowed Amir not only to review clinical vignettes, videos, and discussions from world experts but also to post his own complex cases and receive insightful input and feedback from those same experts and the hernia surgeon community at large. He has subsequently incorporated TAR into his practice — and his patients benefit from this technique's lower rate of skin infections.

Members of the Robotic Surgery Collaboration Facebook group tell us what they learned:

"Textbooks and lectures provide a framework for learning or improving; videos and images from this site complete the process by providing the fine details and allowing questions to be answered by experts almost in real-time as one tries something new. This site also allows me to run tricky cases by over a thousand colleagues and experts. … Robotic surgery is progressing and evolving so rapidly that traditional forms of teaching and learning cannot keep up."

"It gives me real time surgical feedback from my peers on a level that isn't possible any other way. Not only do I learn but others can simultaneously learn from my mistakes and not repeat them. It permits rapid dissemination of helpful and new techniques which make me a better surgeon for my patients."

"Being a young attending in an area where not many are doing advanced robotics cases, being able to come to this group and learn from everyone here has become not only part of my continuing education, but now part of my daily life and practice. … It has definitely made me a better surgeon."

Source: Survey of RSC group users conducted by the authors, 2017

This is not an isolated example. One member of the RSC Facebook group told us that participating in RSC provides "collaborative input on my own patients and cases from 'experts'" and reveals "operative options that I hadn't considered." Another member described the group as "a safe space to challenge ideas, post videos to get tips on how to do things better, and generally advance medicine

collectively." And one user summarized the RSC experience by noting, "I think the time I've spent watching and reading tips and techniques is essentially a 'robotic fellowship'" that led to a significant improvement in this user's learning curve.

Unlike local clinical settings, online discussion groups also allow a more diverse collection of individuals to come together and share their unique perspectives on a particular issue. One user told us that RSC provides "professional/social interaction that may not be available at home or with colleagues that I only see at the big conferences." Moreover, these groups often include non-surgeons — such as surgical assistants and other perioperative staff — who can also learn from the experiences surgeons describe and contribute their own perspectives. One surgical assistant described the group as welcoming and tolerant of non-surgeon members, telling us that "being a member and regular user of RSC has made me a better assistant."

Overcoming the Barriers

Despite the potential of social media communities for surgical education, there are still several significant managerial and legal barriers to the broad adoption of these platforms. And there are certainly risks to learning from social media, such as if a new technique starts being utilized without first being properly tested in studies. So managing these social media groups requires dedicated effort and oversight (typically from one or more people in a moderating role) to ensure that discussions are focused, factual, and do not infringe on patients' rights to privacy.

However, since this type of role does not fit neatly into existing paradigms or leadership structures in the field of surgery (nor in medicine more broadly), health care leaders will have to determine how to recognize, validate, and reward these learning-oriented efforts. For example, creating a role for managing social media groups similar to the M&M conference chair, which is recognized and respected, could be helpful.

At the same time, many of the benefits of these groups — including their size, global reach, and cross-institutional nature — make them inherently more difficult to govern and manage, leaving the responsibility for their maintenance and membership to volunteer administrators who must often figure out "on the fly" how best to organize the group. Dedicated guidelines from major professional organizations or support from hospital leadership are thus sorely needed to promote these social media avenues.

Another barrier is the hesitancy of some physicians to actively engage professionally on social media for a multitude of reasons. Arguably, the most pressing and anxiety-producing is the uncertainty around how a surgeon's social media activity would be treated in a malpractice lawsuit. While no specific statute exists for surgeons' peer-to-peer interaction on social media, there are prior cases that generally determined that casual conversation or interactions between physicians regarding patients does not rise to the level of a physician-patient relationship, thus providing some legal precedent for protection of the kinds of interactions that take place on social media.

In addition, there is a longstanding tradition in medicine, and in surgery in particular, of protecting peer review and quality improvement efforts (such as M&M conferences) from being subject to legal discovery. This lets clinicians gather feedback from others, which can be helpful in understanding difficult cases, unavoidable complications, and preventable errors. Yet, these protected reviews can currently only occur within hospitals and patient safety organizations, and there are no state or federal statutes that specifically protect social media groups that serve similar functions.

Social media will never completely replace in-depth, face-to-face interactions as a forum for vicarious learning in the surgical community. However, in an era where the practice of surgery is evolving faster, spreading farther, and involving greater numbers of people, social media provides a scalable tool that can augment in-person learning opportunities. Leaders of hospitals, health systems, surgical societies, and other professional organizations should embrace its potential and work to combat its current limitations. Doing so will go a long way towards furthering surgical education and delivering safer, higher-quality care for patients.

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