

The Trump Effect: With No Peer Review, How Do We Know What to Really Believe on Social Media?

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Abstract

Social media is a source of news and information for an increasing portion of the general public and physicians. The recent political election was a vivid example of how social media can be used for the rapid spread of “fake news” and that posts on social media are not subject to fact-checking or editorial review. The medical field is susceptible to propagation of misinformation, with poor differentiation between authenticated and erroneous information. Due to the presence of social “bubbles,” surgeons may not be aware of the misinformation that patients are reading, and thus, it may be difficult to counteract the false information that is seen by the general public. Medical professionals may also be prone to unrecognized spread of misinformation and must be diligent to ensure the information they share is accurate.

Keywords

- ▶ social media
- ▶ surgery
- ▶ misinformation

“A lie can travel half way around the world, while the truth is putting on his shoes.” Mark Twain

A growing percentage of the U.S. adults now use social media to get their news.¹ Unlike traditional forms of news, social media is not limited by the editorial fact-checking prior to publication. Increased social media participation has led to a proliferation of misinformation, “fake news” and “alternative facts.” The technology itself lends itself to this, as there is no requirement to prove scientific validity or truth prior to posting information. It is further complicated by the fact that most social media sites are free and posts can be instantly viewed and disseminated by anyone in the world. This affects both physicians as well as patients’ access to accurate health care information.

More than 80% of Americans use social media and online sources to find out information about health care.² This may be learning more about a new diagnosis, evaluating a potential physician, or sharing information with other providers. However, the ability to separate “good information” from misinformation may be limited. Literature suggests that low health literacy may render patients unable to accurately evaluate the truth of online information.³

A recent example is an online post claiming, “Scientist Reveals the Most Powerful Cancer Killer—Jackfruit.”^{4,5} The claim, largely unsubstantiated and inaccurate, discussed Jackfruit’s near miraculous role in preventing or curing cancers, including colorectal cancer.⁴ This posting quickly had more than 54,000 shares on Facebook and 39 tweets (▶ Fig. 1). This is one of hundreds of examples of information being spread widely and rapidly despite lack of evidence.

Sources of Misinformation

Unfortunately, fake news travels at least as quickly as true information and, given its salacious nature, misinformation may be more likely to grab readers’ attention. A large portion of misinformation is computer generated by “bots” (short for robots). While bots can provide useful information, such as informing the public in case of emergency, they have been used to manipulate political discourse, the stock market, and steal personal information.⁶ The initial tweet or post may have a semantic fingerprint, or source information identifying a bot as the source. However, the origin of fake news is often bolstered by layers of retweets, Facebook likes, or shares, which camouflage the initial message. This snowball effect



Fig. 1 Health care-related posts by nonmedical professionals. This post gives the feeling of a scientific study, including statistics and referencing a scientist, but did not have credible information to back up the data. The link has since been disabled and removed from social media.

makes sorting the good from the bad more difficult and speaks to both the popularity as well as the limitations of social media technologies. In addition, the increasing sophistication of bots makes them harder to detect. A group evaluating the effects of bots in Brazil created 120 bot accounts on Twitter. After a month of activity, almost 70% of the bots were undetected by “bot finders,” and the bots had accumulated almost 5,000 followers in that period of time.⁷

There are plans to counteract this stream of misinformation with “bot finders.” The Center for Complex Networks and Systems Research at Indiana University created Truthy, a system to track the spread of information on social media and learn more about how misinformation spreads.^{8,9} This project initially focused efforts on educating the public about deceptive information disseminated on Twitter regarding political candidates. The founders then created Hoaxy, an online “fact-checker” open to the public which allows users to gain information on the source of potential misinformation.¹⁰ In an analysis of well-known misinformation and fact-checking sites, researchers found that misinformation sites generated 10-fold higher tweet volume than fact-checking sites, and fact-checking tweets often lag behind misinformation tweets by 13 hours.¹⁰ This is due to the fact that counters to misinformation generally need to be human generated, fact-checked, and require additional research.

Facebook even went as far as to create a tutorial on how to detect “fake news.” This included tips such as checking the credibility of the Web site or source, researching to see if other credible news outlets are reporting the same information.

Misinformation from Credible Sources

Not all misinformation in social media comes from less reputable sources or “bots.” On January 6, 2017, a prominent doctor wrote an opposite the editorial page (op-ed) piece with multiple unverified claims about toxin burdens on our bodies.¹¹ The op-ed also overstated both the negative health effects from vaccine preservatives and emphasized the link between autism and vaccines (→Fig. 2). The physician was quickly denounced on Twitter by many physicians and health

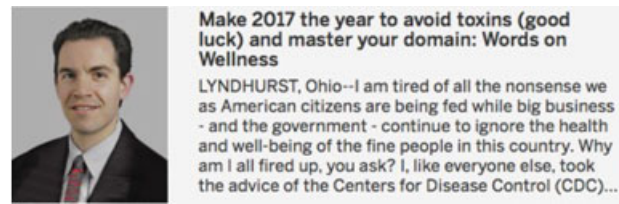


Fig. 2 Health care-related posts by medical professionals. A prominent physician made unsubstantiated claims online. The source of information matters, and this information was propagated through social media. Attempts to correct the information are often not nearly as popular or wide reaching.

professionals, including members of his home institution.¹² However, the article was picked up by multiple Web sites and “respectable” news sources that shared the physician’s viewpoints about the dangers of vaccines, and the posts promoting the initial claims generated more than 100 tweets and thousands of views.¹³ The inability to distinguish fact from opinion has been a challenge in the field of social media. Although scientific journals will often seek out expert opinions or commentaries where limited or controversial evidence exists, they are clearly identified as such and even so are subject to editorial review prior to publication.

As users of social media, there are several ways that we contribute to the spread of misinformation, to both our colleagues and patients. One such way is the use of online “quick shots,” such as the visual abstract (→Fig. 3). This new technique is being used by many high impact surgical journals including *Annals of Surgery*, *World Journal of Surgery*, and *Journal of the American College of Surgeons*. The content of an article is pared down to a few key points as a preview of the article and is much more Twitter-friendly format than a typical abstract. In abbreviating the article to a few key points, there is potential for oversimplification and omission of small but critical details, which can lead to misrepresentation or inappropriate application of results.

For example, a recent article evaluated preoperative versus postoperative chemoprophylaxis for deep vein thrombosis (DVT) and stated that the rate of DVT was equivalent between the groups (→Fig. 4).^{14,15} Within the article, the authors acknowledged the study was underpowered to accurately measure a difference between the groups, but this information was not available in the visual abstract.

Another recent visual abstract reported a decreased overall mortality in patients undergoing primary anastomosis compared with bowel discontinuity in damage control operations.^{16,17} The visual abstract neglected to include that this difference was not statistically significant (→Fig. 5). Although this new format is much more conducive to sharing scientific articles on Twitter than a traditional abstract would be, we must be vigilant to ensure that the information expressed in this new abstract remains accurate (including not only what is reported but also what is omitted).

At scientific meetings, attendees are using social media with increasing frequency. Twitter, in particular, has become a tool for virtual, often real-time discussion of research



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Following

PDF Primer on How to Create a #VisualAbstract is now online here under "Resources." surgeryredesign.com #FOAmed #MEdEd



Fig. 3 The visual abstract: A powerful information tool; however, too little information or not enough detail may alter interpretation by readers.

shared at the meeting. This back and forth of tweets allows for increased dialogue and discussion of findings with attendees as well as people not at the meeting. Social media use at meetings also promotes collaboration between researchers and wider dissemination of research findings.^{18–20} At the 2013 World Congress of Endourology, for example, more than half of all conference-related tweets were from users not at the conference.²¹

However, broad sharing of these findings creates the potential for spread of misinformation. Often, data presented at scientific meetings are unpublished/preliminary in nature, and postmeeting, interpretation of the data are subject to change as the study matures.²² A 2007 Cochrane analysis of 29,729 meeting abstracts found that only 63% of results from abstracts describing randomized or controlled clinical trials were published in full. In addition, many studies have

identified significant differences between data presented in abstracts and subsequent journal articles.²³ Most of these abstracts were nonrandomized observational studies.^{24–26} These may be appealing as a snapshot to promote discussion at a meeting. However, the threshold for acceptance of a meeting abstract may be lower than for a complete article subject to peer review for many of the reasons outlined earlier. Thus, with increased discussion and sharing of meeting content, there may be inadvertent spread of findings that are ultimately unsupported by data or findings that are never published and potentially not worthy of publication.

Social Media Bubbles

Another reason that social media is so successful at propagating misinformation is that people create networks of like-

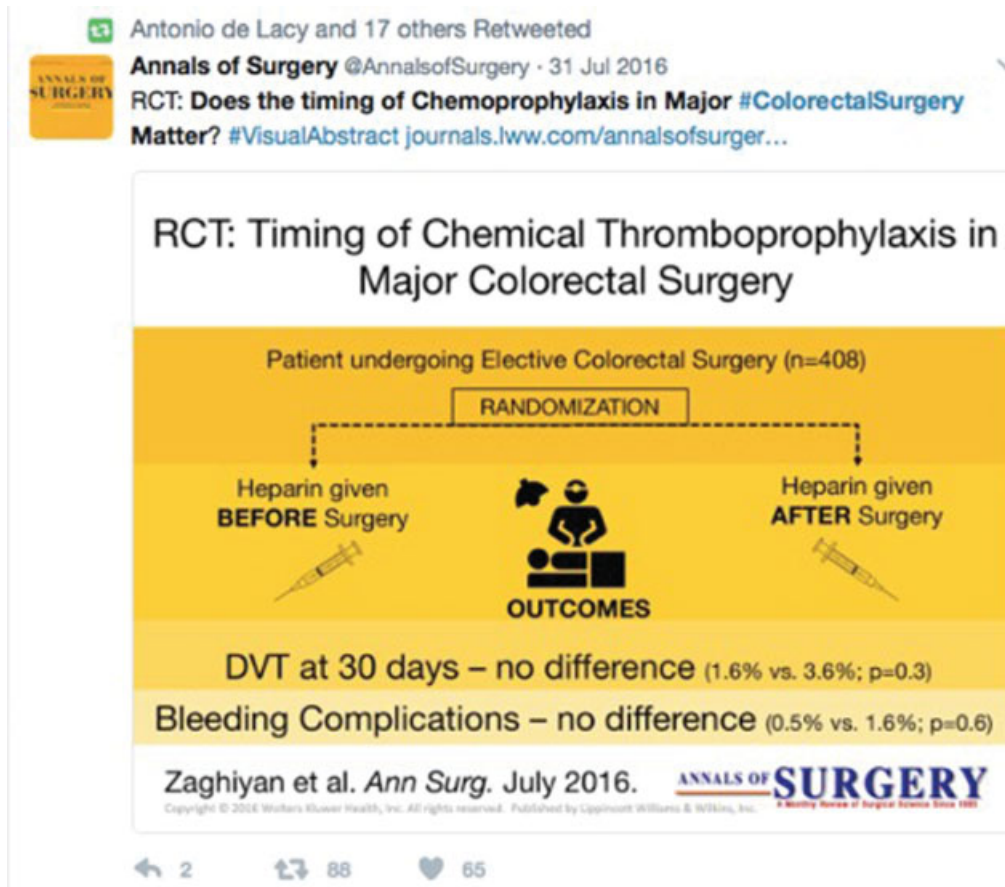


Fig. 4 Misinformation in visual abstracts. A visual abstract demonstrates that there was no difference between the rate of DVT in patients given prophylaxis before or after surgery, but fails to include information that the study was inadequately powered to detect such a difference it should exist. DVT, deep vein thrombosis.

minded individuals with which they interact. This relatively narrow stream of content is an example of a social “bubble” or “echo chamber.”²⁷ One great surgical social media innovation taking advantage of this bubble is the International Hernia Collaborative (IHC), a closed group on Facebook with more than 3,000 members from across the globe.²⁸ This group allows surgeons to discuss challenging patients and share information to improve surgeon knowledge and patient care. It is not open to the general public, to allow surgeons more liberty to discuss the details of their patients.

However, social “bubbles” can also limit information that physicians are exposed to and able to respond to. Within these normally occurring bubbles, users are separated from points of view incongruous with their own, and users’ newsfeeds or Twitter feeds no longer represent a heterogeneous cross-section of opinions. For instance, physicians often follow other physicians, professional organizations, and journals on social media. The IHC group members are not exposed to questions from the general public about hernia repair in this forum, and the general public is not exposed to the groups’ opinion of less optimal procedures or outcomes. Our patients are likely exposed to different social “bubbles” from those in which most surgeons and physicians live and they may get inaccurate information on surgery topics.⁵ Physicians may be reluctant to “friend” and “follow” patients, thereby losing

access to the information that patients see online. In addition, because the information inputted into our social media accounts is from colleagues, friends, and like-minded individuals, we tend to trust this information, rather than verifying. This allows information to be propagated without traditional source checking.

Physician Engagement: How Are We Using Social Media?

Part of deciding what to trust on social media must involve evaluating who is sharing the information. Physician adoption of social media for personal use and for health communication has grown, but colorectal surgery lags behind other specialties. Plastic surgery is at the forefront of social media. Not only have plastic surgeons increased readership of articles with online conversation and postings but also have reached out to potential patients via Snapchat and Instagram. Cross-sectional studies of Canadian and the United Kingdom found that more than 81% of plastic surgeons were using at least one social media platform and more than 14% were using Twitter.^{29,30} Other surgeons are not so active; in 2016, a cross-sectional study of Great Britain’s vascular surgeons found that 47% were using a social media platform and 4.8% had a Twitter profile.³¹ There is only



Alberto @almagoch · Feb 20

Discontinuity of the bowel vs #anastomosis, following damage control operation is associated with higher risk of bowel #ischemia @worldjsurg

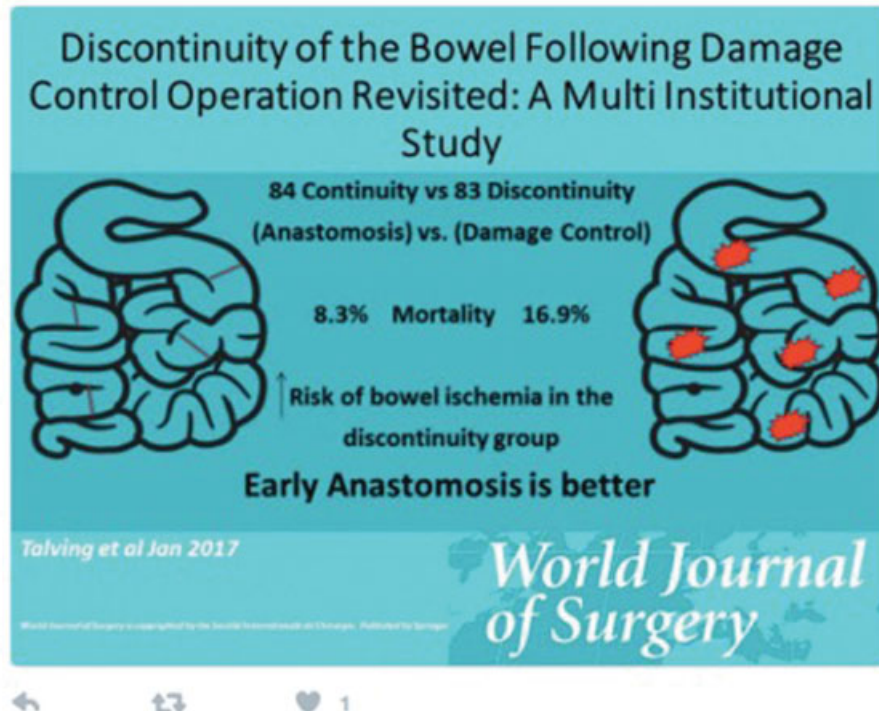


Fig. 5 How misinformation is propagated from credible sources. This dynamic visual abstract captured on social media does not capture the fact that the difference in bowel ischemia was not statistically significant between the two groups.

one study evaluating the use by colorectal surgeons from the United Kingdom; it showed that just more than 37% of physicians had a LinkedIn profile (the highest percentage of the social media platforms listed in the study) and only 3.1% had a Twitter account. This skewed representation can increase potential sources of bias from personal opinion among a few groups of key stakeholders.

Colorectal Issues Online: How Accurate Is in the Information?

To date, only one peer-reviewed publication reviewed the credibility of colorectal cancer posts on Twitter.³² Park et al collected tweets from individuals and organizations that contained colorectal cancer keywords which were then evaluated by board-certified physicians in colorectal surgery, gastroenterology, oncology, or family medicine. Over a 3-month period in 2014, more than 76,000 tweets by more than 43,000 users were analyzed. There were nearly 69,000 individual users; only 2% were believed to be health professionals. Overall, 84.5% of the tweets were considered medically correct and of the 1,000 most popular tweets, 90.7% were considered medically correct. These numbers are impressive given that 98% of people tweeting were not health professionals. Another study by Alnemer et al³³ investigated 635 separate tweets in Arabic. Around 80% were from government institutions, and 51.2% were deemed to be false

after review by board-certified consultants. A study by Love et al³⁴ investigated the medical accuracy of 6,827 tweets about vaccination. Approximately two-thirds were substantiated by medical information; 13% of tweets were negative and tended to contain claims about alleged dangers.

Social Media: What Are the Next Steps?

If colorectal surgeons want to guide a well-informed discussion on social media about colorectal topics, we must have a greater presence on these platforms. This cannot be limited to simply having an account on social media, either; we must be active participants. In an effort to promote the dissemination of accurate information, there are a few simple things that all surgeons can do to combat misinformation. Twitter users can be a peer review of sorts and critically evaluate posted information in the same way that expert reviewers evaluate an article. The difference in social media is this occurs after “publication” (or tweeting), rather than before.

It is very easy to “like,” share, or “retweet” something that one sees on social media, and some users may falsely conclude that if a post is popular, it is true.³ Thus, it is important to fact-check before sharing, “liking,” or “retweeting” other users’ content on social media. This starts with finding the original source behind the story before sharing. It may turn out that there is no factual evidence to support the post. A degree of caution should also be used with visual abstracts,

meeting slides, and partially published information, all of which are becoming increasingly popular on social media. The visual abstract will likely continue to grow in popularity, and physicians must therefore remember that just as traditional abstracts can gloss over relevant study details, visual abstracts may over or understate pertinent study information. Particularly author-created visual abstracts should be reviewed with caution, as methods are often excluded to communicate the main points. Ideally, linking the visual abstract and the tweet to the published article should be a goal of the scientific community. The creators of this new visual abstract fully acknowledge it is an imperfect medium designed to generate discussion and drive further inquiry, not be a definitive source of data.

Some readers who are hesitant to get involved in social media may be dissuaded by the above recommendations. However, misinformation on social media is not going away, and if we are not engaged, someone else will lead the discussion. By increasing social media presence and active engagement by generating and sharing fact-based content, colorectal surgeons can counter inaccurate health information and increase their influence over the direction of discussion.

These efforts may have little effect if patients' and physicians' social media habits remain unchanged, and thus, simply increasing activity is not enough. Just as physicians are only exposed to certain content within their social media networks, patients' social "bubbles" may or may not include health care providers, scientific journals, and official pages of health institutions such as the Centers for Disease Control and Prevention or users such as the Surgeon General. Consequently, though physicians may increase efforts to accurate and useful health information, it may not effectively reach its intended audience. On a systems level, it is vital that hospitals, clinics, and provider groups link patients into their social media pages. Physicians may also recommend accounts or users that patients can follow. Efforts to better integrate physician-produced content into patients' social media streams will augment physician activity on social media platforms to more effectively direct accurate, helpful discussion of surgical topics.

Conclusion

Social media presents a tremendous opportunity for surgeons to collaborate with colleagues across the globe and educate the public about surgical topics. Limited evidence suggests that most of the information distributed in colorectal surgery circles is accurate, but the potential for abuse of the medium to spread misinformation is large. With increased responsible engagement in social media by surgeons, we can all work to ensure that the information shared is accurate and reaches a wide audience.

Conflict of Interest
None.

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