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Numbers needed to tweet: social media and impact on surgery

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ABSTRACT

Surgeons have taken to social media using Facebook, Twitter, LinkedIn and Instagram for both personal and professional purposes. In an age of global access to everything there is a risk for information overload, and thus a need to collate and curate. Hashtags going viral have had a huge social influence, e.g. #ILookLikeASurgeon. SoMe has become an instrument for connecting, sharing and mentoring. It is a tool for educating the next generation of surgeons. For researchers and journals the question remains whether the input required to tap into SoMe platforms is rewarded with a similar gain in output, reputation and exposure. Summarized information in visual abstracts may help disseminate study-results to a wider audience, but the effect of a #visualabstract may be specialty-specific. Currently, there is little knowledge as to the 'numbers needed to tweet' in order to make impact on figures such as downloads, citations, and eventually impact factor.

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Surgeons have taken to social media using Facebook, Twitter, LinkedIn and Instagram for both personal and professional purposes. In an age of global access to everything there is a risk for information overload, and thus a need to collate and curate. Hashtags going viral have had a huge social influence, e.g. #ILookLikeASurgeon. SoMe has become an instrument for connecting, sharing and mentoring. It is a tool for educating the next generation of surgeons. For researchers and journals the remaining question is whether the input required to tap into SoMe platforms is rewarded with a similar gain in output, reputation and exposure. Summarized information in visual abstracts may help disseminate study-results to a wider audience, but the effect of a #visualabstract may be specialty-specific. Currently, there is little knowledge as to the 'numbers needed to tweet' in order to make impact on figures such as downloads, citations, and eventually impact factor.

Social media platforms have changed how, when and to whom information is spread [1]. It should come as no surprise that the medical profession has taken to social media using Facebook, Twitter, LinkedIn and Instagram for both personal and professional purposes. SoMe is effective for connecting people and for dissemination of ideas and thoughts. Surgical trainees now frequently use

YouTube as video preparation source before surgery [2]. Surgical journals are taking up SoMe in their working armamentarium (Fig. 1). Twitter is increasingly explored for professional use among surgeons, exemplified through the hashtags (#) for #PlasticSurgery [3] and #colorectalsurgery [4] and more recently #SoMe4Surgery. For #colorectalsurgery, the number of tweets using #colorectalsurgery grew rapidly and resulted in 15 708 tweets, which resulted in >65 million impressions and involved 1863 individual Twitter accounts over some 18 months after launch. Increased volumes of #colorectalsurgery tweets were noted in association with the timing of three major international colorectal surgical conferences, and geographical trends were noted, with almost 90% of posts from male users. The top 25 users by volume of #colorectalsurgery tweets had considerable influence and posted 8023 tweets (>50%) [4]. However, after 18 months the proportions of this became too difficult to follow (some 5000 users; some 50 000 linked tweets; content related to meetings, courses, gatherings, publications etc, but also 'noise and gossip') for those exclusively interested in academic work and promotion of research ideas. Hence, a second hashtag #colorectalresearch was launched in affiliation with 4 journals (*Disease of Colon and Rectum; British Journal of Surgery; Colorectal Disease and Techniques in Colorectal Surgery*) to promote scientific content related to colorectal research in those journals [5]. In an age of omnipresent access to everything there is a risk for information overload, and thus a need

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A. Traditional output metrics



B. Social media based output metrics (Alternative metrics, altmetrics)



Fig. 1. Traditional and alternative metrics for measuring research output. The metrics used to evaluate the impact of social media activity are changing; in (A.) the traditional focus on citations and impact factor (IF; Journal Citation Reports ©Clarivate Analytics) is increasingly challenged by (B.) alternative metrics, dubbed 'altmetrics' for short (collected by various projects, including Altmetric, Plum Analytics and ImpactStory) that collect views and mentions over a wide range of sources, including (but not limited to) peer reviews on Faculty of 1000, citations on Wikipedia and in public policy documents, discussions on research blogs, mainstream media coverage, bookmarks on reference managers like Mendeley, and social networks such as Twitter.

to collate and curate material even in the 'twitterverse' or 'twittersphere' (as the domain of Twitter is often referred to) [6,7]. The hashtag can be followed by those with close interest in a specific field. You can even 'lurk', that is, be a passive follower and read the tweets and threads without even contributing or posting tweets of your own. Thus, the reach and impact may be much wider through readerships than just the individual who posts or retweets – hence the metric (called 'impressions') often referred to for real influence of a tweet, an individual account, or a hashtag (Fig. 2).

A tweet or hashtag have sometimes received unexpected spread or gained momentum for a wider cause. Examples of hashtags that went 'viral' in the twittersphere and have had a huge social influence on surgery is #ILookLikeASurgeon and the #NYer-ORCoverChallenge. The #ILookLikeASurgeon has embraced diversity (not only gender) and the important role and recognition of women surgeons [8,9], but welcomed the involvement of men with the goal of including surgeons from all backgrounds, regardless of gender identity, ethnicity, culture, or physical impairment [8]. The campaign has brought the community of surgeons together to communicate and collaborate to address stereotypes in surgery that affect both men and women, and which ultimately affect all surgeons' lives. The positive tone of the message and the spirit of inclusion have helped spread the campaign globally, importantly with early involvement of the surgical colleges (ACS and RCS) in both North America and Europe [8]. Social media's role in breaking down barriers has been important, but also in helping identifying role models and mentors across surgical disciplines [10–12], particularly in areas where none or only a few exist. Thus, social media has become an important tool for connecting, sharing and mentoring despite geographical distances. It has become a powerful tool to shape the surgical profession as well as a tool for educating the next generation of surgeons.

The obvious social impact of 'social media' may thus not be questioned and it will continue to shape surgery from an educational and political agenda. However, for researchers and journals the questions remains whether the input required to tap into SoMe platforms is rewarded with a similar gain in output, reputation and exposure (Fig. 1). The surgeon scientist or clinical investigator may still rely on the traditional impact factor (IF) to measure influence and – indeed – most journals still do as well. However, there is a change, with major institutions such as the Mayo Clinic now looking at SoMe activity when evaluating academic output. During 2016, the Mayo Clinic's Academic Appointments and Promotions Committee began using Social Media scholarship as part of their metrics for promotion [13]. This was based on the recognition of the increasing importance of SoMe for patient care and engagement, outreach, research and medical education. While proposing a generic grid for evaluation and promotion [14], it is not clear how and if other institutions have adopted the same or similar solutions for academic promotion.

For journals measuring the apparent success by traditional metrics (Fig. 1) the relation between tweets (and hence, reach and impressions; Fig. 2) and the effect it may eventually have on citations and, hence, the journal's IF, is far from clear. When considering 6 surgical journals, 3 of which are general in scope and 3 of which covers surgical oncology specifically (Fig. 3), an immediate connection comparing the SoMe involvement and the related IF seems difficult to find. It may even be hard to find any relation between citations, followers, tweets and impressions. However, one paper investigated the correlation between twitter activity, followers and tweets to journal impact factor across general medical journals, and found that scientific and social media impact were correlated [7]. However, such correlation has not been found to be consistent among other fields of medicine. For surgery, very little

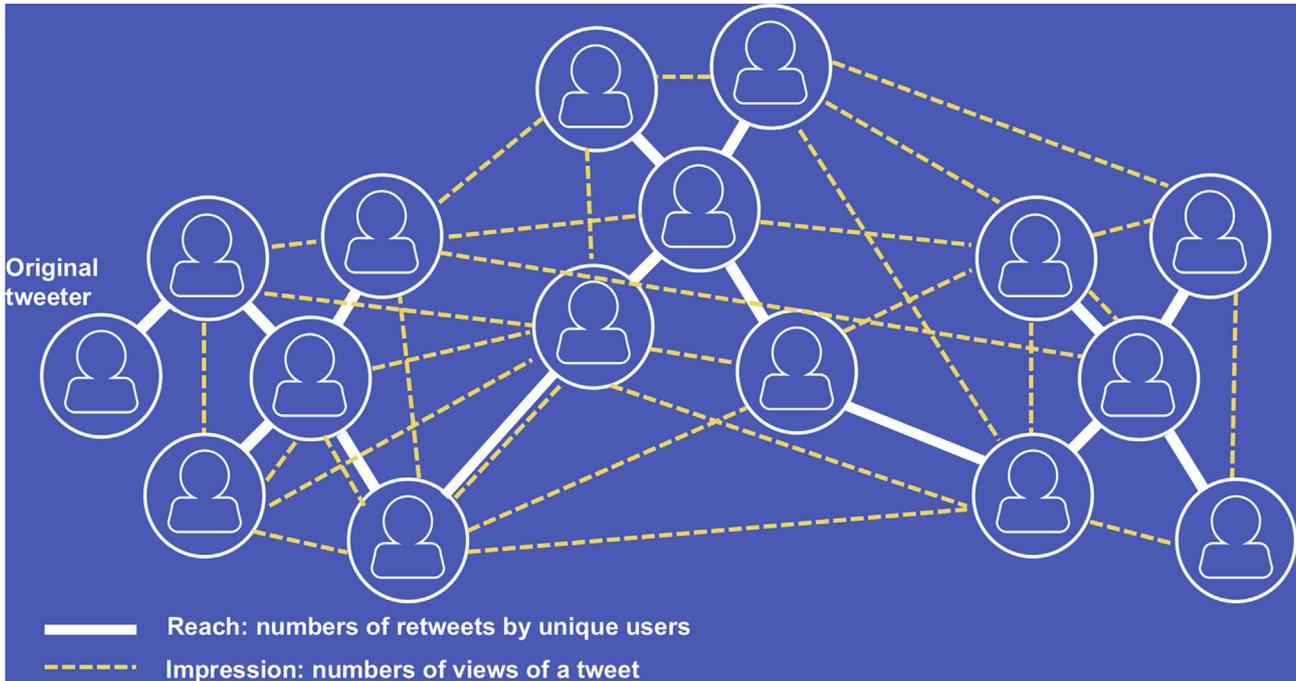


Fig. 2. A tweet and impact on reach and impressions.



Twitter handle	@BJSurgery	@AnnalsofSurgery	@JAMASurgery	@ESSOnews	[none]	@AnnSurgOncol
Followers (n)*	17.4K	26.5K	24.0K	1.5K	-	4.1K
Tweets *	7,537	5,711	7,728	1,631	0	1,574
Journal IF **	5.4	9.2	8.5	3.7	2.9	4.0
Total citations **	22,899	48,932	4,515	7,996	9,904	26,598
SoMe editor (n)	SoMe lead, 2	'creative director', 2	yes	no	-	'Multimedia', 3
VisualAbstract	yes	yes	yes	no	no	yes

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Fig. 3. Comparison of 6 surgical journals for traditional and altmetrics.

data exist on the correlation between twitter activity and actual citations. One seminal surgical publication investigated how the inclusion of a visual abstract (see #visualabstract on twitter) could influence retweets, impressions and article visits [15]. The investigators performed a case-control cross over trial, with either tweeting just the article title or, adding a visual abstract to the tweet. They found that tweets including a visual abstract had about 8 times as many retweets and impressions, and had almost 3 times

as many article visits, compared to tweets of the article title alone [15]. While using clear, condensed visual aids of a study is not new (e.g. previously also called graphical abstract [16]), the systematic use and value to reach a larger audience through use of tweets certainly is – at least in surgery. The value and its importance are shown by the high number of journals in surgery and medicine that has now taken up the use, including *New England Journal of Medicine* (@NEJM, #Visualabstract). As previous results have

demonstrated contradictory effects of this visual aide on article attention [17], the effect of a #visualabstract may be highly specialty specific. It may be that surgeons are more attracted to visual content than for example basic scientist. Currently, there is little knowledge as to the “numbers needed to tweet” in order to make impact on figures such as downloads, citations, and eventually impact factor.

While SoMe has many positive attributes for surgeons it also has its known downsides and practical and ethical concerns [18–20]. Knowledge is power and – thus – should be shared, but, importantly, the readily access to information does not equal knowledge. As the various SoMe platforms used for information spread are (per definition) not edited or curated, there is a risk of misinformation (“fake news”) and spread of biased, selected or right out wrong data. Also, the flattening of hierarchy that allows anyone to speak up still has the risk of creating influencers that have a large group of followers based on SoMe activity alone, despite having no or very little substantial contributions to the science or topic discussed. Dubbed the “Kardashian index” [21] - ‘being famous for being famous’ - it has created debate over influencers’ actual contribution to science beyond their being highly influential through social media – some clearly are, while others are not [22,23]. One should always keep in mind that the same respect for colleagues, the public and patients exists, and that inflammatory remarks, net trolling or otherwise bad behaviour may reflect back and potentially jeopardize ones current and future professional carrier. Even if deleting a post in hindsight, this may live on in the twittersphere if already re-tweeted or shared by someone else. Thus, one should ‘think twice and tweet once’. Further, while abbreviated and visual presentation of a study and its content may be attractive from the point of gaining attention and spread the message, there is an inherent limitation and bias in the limited info given. Thus, the risk of oversimplification, for projecting a too strong message or even presenting data with loss of context should be of concern to the surgical community. A visual abstract should get the reader on the hook, but it can never replace the need for reading, analysing, interpreting and understanding the full scientific article. Thus, as we move from several page articles, to 250 words-abstracts, to tweets of 140 signs and down to visual abstracts containing a few illustrative numbers we should be aware of the information not shown or even lost in translation. However, the educational potential and attractiveness to disseminate research is improved and there is no going back. Thus, as we will still need to teach the next generations of surgeons to write and read full text articles, there is now great opportunity to create attention, summarize results, spread the information for surgeons who want to engage and get involved. Further, we should investigate how SoMe continue to change, influence and effect surgery to better understand the mechanisms and modes of communication and involvement.

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