

Hannah Luu,¹ Jane Keating,^{2,3} Lenwoth Jacobs,² Jonathan Gates,^{2,3}
Daniel Ricaurte ^{2,3}

¹Emergency Medicine,
University of Connecticut
School of Medicine, Farmington,
Connecticut, USA

²Department of Surgery,
Hartford Hospital, Hartford,
Connecticut, USA

³Department of Surgery,
University of Connecticut
School of Medicine, Farmington,
Connecticut, USA

Correspondence to

Dr Daniel Ricaurte; daniel.
ricaurte@hhhealth.org

Received 24 June 2021
Accepted 28 June 2021

ABSTRACT

Social media has become an integral part of everyday life. Because of this, medical representation has become increasingly popular across social media. Medical professionals have begun to recognize the value of social media in areas such as research promotion, mentorship program expansion and collaboration with peers. To date, these online medical communities are being underused in the field of trauma. Trauma centers may benefit by creating a more prominent online presence to allow for the dissemination of critical research, expansion of injury prevention programs and participation in national annual meetings. When used properly, social media can serve as a platform for the advancement of trauma care in a cost-effective manner.

INTRODUCTION

Social media has become an integral part of everyday life. The PEW Research Center, a non-partisan fact tank looking at global trends, found that in 2021, 72% of adults in the USA use at least one social media site once a day.¹ Social media is used by 42% of Americans to search for health information, and 45% of Americans cite social media as part of their decision to visit a medical professional.² Because of this, medical representation is becoming increasingly popular across social media. Twitter, a popular platform with over 69 million American users,³ has become one of the most popular sites among healthcare providers. This has led to the creation of a large Twitter-based medical community popularly referred to as “Med Twitter”. Here, physicians, scientists and others with knowledge in the field can interact on a particular subject or topic.⁴ Online communities like #MedTwitter have become a virtual way for healthcare providers to collaborate with peers, keep up to date on current practices or engage the public.⁵ Unfortunately, only 42% of trauma, acute, and critical care surgery societies had a social media presence in 2017.⁶

The purpose of this review article was to explore the ways social media can serve the trauma community as a powerful tool both for the progress of academia as well as community outreach.

#CONFERENCES: AN OPPORTUNITY FOR GROWTH

Due to their large reach, social media platforms have the potential to allow for global participation and real-time discussions on current research.⁷ During the 2018 annual conference, the European Society of Surgical Oncology tweets (posts on the website Twitter) had a potential reach of 7.5 million and followers grew 20% alone during the conference.⁷

Multiple medical conferences have found similar results in that Twitter and hashtags (phrases used to link together posts on a similar subject) help expand audiences and allow for valuable dialogue in real time.^{7–10}

Recently, a study done on the American Association for the Surgery of Trauma annual meeting showed a decline in tweets from 2016 to 2019 but an increase in impressions (estimated potential views of a tweet⁷) from 5.8 million to 10 million.¹⁰ The increasing number of impressions for these annual meetings shows that social media continues to provide large audiences despite decline in tweets.¹⁰ The Eastern Association for the Surgery of Trauma Scientific Assembly Twitter activity was examined between 2016 and 2020. During this time, impressions increased from 6.6 million to 20.3 million over 4 years.⁹ Unfortunately, users and engagement decreased over time.¹¹ Social media fatigue could account for this decline, which occurs when users become overwhelmed with the amount of available content in a subject, leading to a decline in online activity.⁹ Despite this negative trend, the trauma community must continue efforts to encourage interactions and use of social media platforms during societal meetings to allow for dissemination of innovative research. At the same time, social media may act as the “great equalizer” as it allows access to conference content and material to people that may not be able to attend due to either geographical or financial constraints.¹²

#RESEARCH: PROMOTING IDEAS AND COLLABORATION

Though subscription to scientific journals remains a major avenue by which trauma surgeons remain up-to-date, access to these journals is costly, limiting accessibility. A 2021 study found the average price for a health sciences journal is \$2460.¹¹ Because of this, researchers may be limited to journal subscribers as the audience for their work. Social media has become an opportunity for researchers to expand their audience exponentially. Though sometimes limited to abstracts only due to copyright laws, sharing new research in social media platform offers readers an easy way to stay up to date with current guidelines and ongoing research.⁵ Social media can also aide in promotion of research as it gives real-time exposure across a variety of audiences.^{7 13 14} Education can now transcend traditional boundaries as has been demonstrated by online journal clubs which have gained global participation.^{15–17}

Simultaneously, social media can serve as a major collaboration tool. Bhangu *et al* used social media

© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Luu H, Keating J, Jacobs L, *et al*. *Trauma Surg Acute Care Open* 2021;**6**:e000798.

as part of their recruitment strategy for an internal observation cohort study on mortality rates after emergency surgery.¹⁸ Multiple studies have used online platforms as a way to both collect data and engage with participants.^{13 19} Digital recruitment for studies is both cost and time effective, a significant advantage over traditional recruitment strategies. Recruitment via social media platforms has shown higher enrollment rates in clinical trials compared with traditional ways.²⁰ However, this has been associated with biases as participants recruited from social media were more likely to be white, from suburban areas and were higher educated.¹⁹

Social media can allow trauma centers to participate in free open access to medical education. Instead of limiting current research to subscribers of costly trauma journals, social media can allow for mass dispersal. Although several studies have demonstrated social media can be a useful tool in circulating research, studies with particular focus on trauma are lacking.^{14 21 22} Social media may serve as an avenue to not only promote ongoing research but also become a think tank for future projects.

#MENTORSHIP: EXPANDING NETWORKS WHILE BREAKING BARRIERS

Developing relationships with other colleagues as well as finding mentors is paramount to the development of young surgeons. This can be difficult to achieve due to geographical constraints. Social media platforms have risen as a viable option for mentorship programs to develop. The Chest Wall Injury Society, for example, uses Slack (an online messaging board) as a way for members to interact, allowing surgeons to discuss difficult patients and brainstorm ideas.

Simultaneously, social media has allowed the expansion of mentorship and networking programs among under-represented groups in surgery. Several Twitter accounts have been created for women in surgery, and tweets are shared using #womenin-surgery to celebrate triumphs and connect surgeons. In 2015, the #ILookLikeASurgeon campaign widely circulated on social media, challenging the stereotype of surgeons being solely male.²³ This campaign also allowed advocacy and awareness of the discrimination minorities face in surgery.²³

Multiple trauma surgeons with heavy social media participation have amassed thousands of followers, exemplifying the potential surgeons have to reach thousands of peers. Similarly, a number of trauma centers around the country have a considerable presence on online platforms, demonstrating their ability to gain large audiences fairly rapidly. Because of this, social media has the potential to create online trauma communities through which providers can expand their networking reach, facilitate idea exchanges, or obtain guidance from experts that otherwise would not be possible.

#INJURY PREVENTIONS: A COST-EFFECTIVE STRATEGY TO REACH THE COMMUNITY

Social media platforms allow trauma centers to interact with the community. Through this avenue, multiple injury prevention campaigns have gained or expanded national and international notoriety at a rapid pace. The “Stop the Bleed” campaign, developed as a training course to empower the general public in hemorrhage control techniques, has used online platforms to enroll trainees and spread general information and awareness.²⁴

Trauma centers involved in injury prevention campaigns have been able to use social media as a vehicle to expand their catch area. Several campaigns including “Distracted Driving Awareness Month” and “Teens in the Driver’s Seat” have

been used to promote safe driving.²⁵ The Trauma Survivors Network, a program of the American Trauma Society, has a strong presence in social media, allowing patients and families to connect with others struck by tragedy. Despite the success of these programs, participation remains a major problem.²⁶ Social media could prove to be a useful tool to increase participation.

Recently, with the COVID-19 healthcare crisis, social media has facilitated healthcare workers and facilities to promote mitigation strategies and tackle misinformation. At the same time, they have allowed the dissemination of vaccine information including availability, side effects and vaccination sites.

Despite all this, the full potential of social media for community outreach by the trauma community has not been used. Events such as gun buyback programs can be easily advertised and promoted, allowing a large media impact without significant financial burden. Campaigns targeting injury prevention can easily be propagated in an extremely cost-efficient manner. Social media can provide trauma centers the opportunity to link trauma survivors with counseling or connect them with other patients with similar life stories.

#DISASTER PREPAREDNESS: THE ROLE OF SOCIAL MEDIA IN DISASTERS AND MASS CASUALTY EVENTS

Preparation is paramount for any trauma center responding to a natural disaster or mass casualty event. Unfortunately, inadequate disaster responses and poor communication are not uncommon.^{27 28} Recently, social media has been reported to be a vital resource during catastrophic events. During multiple natural disasters, social media has been used to coordinate volunteer efforts, relay real-time information, aid in the localization of victims, and access to resources such as food.^{28–32} Despite this, communication remains one of the greatest challenges during a large-scale disaster.^{27 28 33} During the Maryville shooting, it took 28 minutes to get communication to law enforcement.²⁷ In contrast, social media is able to spread information in real time, with the real possibility that information becomes available even before trauma centers get notified through official means.

With such popularity, it is not surprising that social media is often used during mass casualty events by witnesses, allowing for real-time updates. During the mass shooting at the Pulse Nightclub in Orlando, Florida, bystanders were able to inform both first responders and the public what was occurring.³⁴ Not uncommonly, victims have turned to social media rather than police to warn others or inform authorities of an ongoing public safety issue.³⁴ Because of this, a strong social media presence by trauma centers may allow hospitals located near a mass casualty incident to better prepare even as situations are rapidly unfolding.²⁷

A major concern with the use of social media as a way to communicate during mass casualty incidents is the spread of misinformation.^{30 35} False news has the ability to spread faster and wider than factual news.³⁶ Because of this, trauma centers must make every effort to verify or confirm stories obtained on social media prior to mobilization of resources. Guidelines from trauma societies on social media use and its role during disaster communication would help establish best practices for the use of such a valuable resource.

Given social media’s ability to circulate information instantaneously, it is a valuable tool for trauma centers to employ during mass casualty incidents.

#ETHICS: CONSIDERATIONS AND PITFALLS

Concerns over patient privacy issues over social media create barriers that cannot be overlooked. Paramount to proper social media usage is avoiding the use of patient identifiers without patient consent.³⁷ Though only a small minority of physicians commit privacy or confidentiality violations online,³⁸ trauma centers and surgeons should recognize potential violations to the Health Insurance Portability and Accountability Act with every publication made on social media. Comparing medical student versus resident social media usage, medical students were more likely to have social media violations such as posting photos with identifiable patients.³⁹ Because of this, medical school training should consider adopting guidelines for students surrounding the appropriate use of social media. The Resident and Associate Society of the American College of Surgeons laid out social media guidelines in 2019. Key mandates included protecting patient confidentiality, respecting employer social media policies and revealing conflicts of interests.⁴⁰

Trauma societies should formulate their own social media guidelines to help promote responsible use. As long as social media is used ethically, trauma centers should have an active online presence. The benefits of using social media are limitless when used appropriately.

CONCLUSION

Even though the majority of US adults participate on some form of social media, it continues to be underused by trauma centers and surgeons. With such an immense audience, social media has the ability to connect trauma surgeons, foster mentorship programs, disseminate important research or even involve the community in outreach programs. Though it can be riddled with many ethical and patient confidentiality issues, the use of social media has the potential to improve trauma care in an extremely cost-effective manner.

Contributors HL contributed to study design, literature review and manuscript drafting. DR contributed to study conception and design, manuscript drafting and critical revision. JK, LJ, and JG contributed to critical revision.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Daniel Ricaurte <http://orcid.org/0000-0003-0284-4832>

REFERENCES

- 1 PEW Research Center. Demographics of Social Media Users and Adoption in the United States. Pew Research Center. Web site. 2021. <https://www.pewresearch.org/internet/fact-sheet/social-media/> (20 April 2021).
- 2 Park JH, Christman MP, Linos E, Rieder EA. Dermatology on Instagram: an analysis of hashtags. *J Drugs Dermatol* 2018;17:482–4.
- 3 Statista. Leading countries based on number of Twitter users as of January 2021. 2021. <https://www.statista.com/statistics/242606/number-of-active-twitter-users-in-selected-countries/>.
- 4 Harrell KN, Vervoort D, JGY L, Tracy BM, Daniel Stanley J. *Social media in surgery: The American Surgeon*, 2020.
- 5 Rolls K, Hansen M, Jackson D, Elliott D. How health care professionals use social media to create virtual communities: an integrative review. *J Med Internet Res* 2016;18:e166.
- 6 Khalifeh JM, Kaafarani HMA. Surgery goes social: the extent and patterns of social media utilization by major trauma, acute and critical care surgery societies. *J Emerg Trauma Shock* 2017;10:103–10.
- 7 Søreide K, Mackenzie G, Polom K, Lorenz L, Mohan H, Mayol J. Tweeting the meeting: quantitative and qualitative Twitter activity during the 38th ESSO conference. *Eur J Surg Oncol* 2019;45:284–9.
- 8 Segura Sampredo JJ, Morales Soriano R, Ramos Rodríguez JL, González-Argenté FJ, Mayol J. Twitter @ use and its implications in Spanish association of surgeons meetings and congresses. *Cirugía Española* 2018;96:352–6.
- 9 Elkbuli A, Santarone K, Meneses E, McKenney M. Twitter Hashtag and online engagement during surgical society meetings over a 5-year period. *Am Surg* 2021;87:514–9.
- 10 Santarone K, Boneva D, McKenney M, Elkbuli A. Hashtags in healthcare: understanding Twitter hashtags and online engagement at the American association for the surgery of trauma 2016–2019 meetings. *Trauma Surg Acute Care Open* 2020;5:e000496.
- 11 Bosch S, Albee B, Romaine S. The New Abnormal: Periodicals Price Survey 2021. *Library Journal*. 2021. <https://www.libraryjournal.com/?detailStory=The-New-Abnormal-Periodicals-Price-Survey-2021>.
- 12 Luc JGY, Antonoff MB. Live Tweet the Society of thoracic surgeons annual meeting: how to Leverage Twitter to maximize your conference experience. *Ann Thorac Surg* 2018;106:1597–601.
- 13 Mayol J, Dziakova J. Value of social media in advancing surgical research. *Br J Surg* 2017;104:1753–5.
- 14 Buckarma EH, Thiels CA, Gas BL, Cabrera D, Bingener-Casey J, Farley DR. Influence of social media on the dissemination of a traditional surgical research article. *J Surg Educ* 2017;74:79–83.
- 15 Luc JGY, Antonoff MB. Active learning in medical education: application to the training of surgeons. *J Med Educ Curric Dev* 2016;3:JMECD.S18929.
- 16 Roberts MJ, Perera M, Lawrentschuk N, Romanic D, Papa N, Bolton D. Globalization of continuing professional development by Journal clubs via microblogging: a systematic review. *J Med Internet Res* 2015;17:e103.
- 17 O'Leary DP, Corrigan MA, McHugh SM, Hill AD, Redmond HP. From Theater to the world wide Web—a new online era for surgical education. *J Surg Educ* 2012;69:483–6.
- 18 Bhangu A, Fitzgerald JEF, Fergusson S, Khatri C, Holmer H, Søreide K, Harrison EM, Drake TM, Bhangu A, Gobin N, et al. Mortality of emergency abdominal surgery in high-, middle- and low-income countries. *Br J Surg* 2016;103:971–88.
- 19 Sinnberg L, Buttenheim AM, Padrez K, Mancheno C, Ungar L, Merchant RM. Twitter as a tool for health research: a systematic review. *Am J Public Health* 2017;107:e1–8.
- 20 Benedict C, Hahn AL, Diefenbach MA, Ford JS. Recruitment via social media: advantages and potential biases. *Digit Health* 2019;5:205520761986722.
- 21 Hoang JK, McCall J, Dixon AF, Fitzgerald RT, Gaillard F. Using social media to share your radiology research: how effective is a Blog post? *J Am Coll Radiol* 2015;12:760–5.
- 22 Zhao JY, Romero Arenas MA. The surgical blog: an important supplement to traditional scientific literature. *Am J Surg* 2019;218:792–7.
- 23 Ansari H, Pitt SC. #LookLikeASurgeon: Or do I? The local and global impact of a hashtag. *Am J Surg* 2021;221:908–9.
- 24 Fisher AD, Carius BM, Lacroix J, Dodge PM, Dodd J, Soderlund E, Thompson D, Loos P, Fannin J, Montgomery HR, et al. National stop the bleed day: the impact of a social media campaign on the stop the bleed program. *J Trauma Acute Care Surg* 2019;87:S40–3.
- 25 Burrell TD, Mistry KB. Safety: Texting while driving. *Pediatr Rev* 2018;39:372–4.
- 26 Castillo RC, Wegener ST, Newell MZ, Carlini AR, Bradford AN, Heins SE, Wysocki E, Pollak AN, Teter H, Mackenzie EJ. Improving outcomes at level I trauma centers: an early evaluation of the trauma survivors network. *J Trauma Acute Care Surg* 2013;74:1534–40.
- 27 Callcut RA, Moore S, Wakam G, Hubbard AE, Cohen MJ. Finding the signal in the noise: could social media be utilized for early Hospital notification of multiple casualty events? *PLoS One* 2017;12:e0186118.
- 28 Huang C-M, Chan E, Hyder AA. Web 2.0 and internet social networking: a new tool for disaster management?—lessons from Taiwan. *BMC Med Inform Decis Mak* 2010;10:57.
- 29 Merchant RM, Elmer S, Lurie N. Integrating social media into emergency-preparedness efforts. *N Engl J Med* 2011;365:289–91.
- 30 Umihara J, Nishikitani M. Emergent use of Twitter in the 2011 Tohoku earthquake. *Prehosp Disaster Med* 2013;28:434–40.
- 31 Vera-Burgos CM, Griffin Padgett DR. Using Twitter for crisis communications in a natural disaster: Hurricane Harvey. *Heliyon* 2020;6:e04804.
- 32 Spence PR, Lachlan K, Burke JM, Seeger MW. Media use and information needs of the disabled during a natural disaster. *J Health Care Poor Underserved* 2007;18:394–404.
- 33 Barnes MD, Hanson CL, Novilla LMB, Meacham AT, McIntyre E, Erickson BC. Analysis of media agenda setting during and after Hurricane Katrina: implications for emergency preparedness, disaster response, and disaster policy. *Am J Public Health* 2008;98:604–10.
- 34 Cumiskey KM, Hjorth L. "I wish they could have answered their phones": Mobile communication in mass shootings. *Death Stud* 2019;43:414–25.



- 35 Regehr C, Glancy GD, Carter A, Ramshaw L. A comprehensive approach to managing threats of violence on a university or College campus. *Int J Law Psychiatry* 2017;54:140–7.
- 36 Vosoughi S, Roy D, Aral S. The spread of true and false news online. *Science* 2018;359:1146–51.
- 37 Hrynaszkiewicz I, Norton ML, Vickers AJ, Altman DG. Preparing RAW clinical data for publication: guidance for Journal editors, authors, and peer reviewers. *Trials* 2010;11:9.
- 38 Chretien KC, Azar J, Kind T. Physicians on Twitter. *JAMA* 2011;305:566–8.
- 39 Thompson LA, Black E, Duff WP, Paradise Black N, Saliba H, Dawson K. Protected health information on social networking sites: ethical and legal considerations. *J Med Internet Res* 2011;13:e8.
- 40 Logghe HJ, Boeck MA, Gusani NJ, Hardaway JC, Hughes KA, Mouawad NJ, Kulaylat AN, Hoffman RL, Turner P, Jones C, *et al.* Best Practices for Surgeons' Social Media Use: Statement of the Resident and Associate Society of the American College of Surgeons. *J Am Coll Surg* 2018;226:317–27.