

Be in the Digital Room Where it Happens, Part I: Tweeting & Technology for Career Development

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Abstract

Social media has become a part of everyday life. It has changed the way we obtain and distribute information, connect, and interact with others. As the number of platforms and users grow, medical professionals have learned the value social media can have in education, research, advocacy, and clinical care initiatives. Platforms provide opportunities to network, build collaborations, and develop a reputation. This is part one of a two-part series. This article provides an overview on how social media can benefit professional career development for clinicians and researchers, as well as for advocacy to raise awareness against biases, disparities, and for patient benefit. We review challenges, limitations, and best practices for social media use by medical professionals with neurology-specific examples.

Keywords

social media, curriculum, medical education, pandemics, neurology education, COVID-19, twitter, instagram, child neurology, information dissemination

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Introduction

Social Media (SoMe) is an umbrella term for interactive platforms and tools that facilitate creation and sharing of information (*content*) through virtual communities (*networks*). Over half of the world's population uses SoMe; which drastically increased during the COVID-19 pandemic.¹ On average, users spend 2.5 hours on SoMe per day across multiple platforms.¹ The most popular platforms used by the general public include Facebook (2.9 billion active users), YouTube (2.3 billion), WhatsApp (2 billion), Instagram (1.4 billion), TikTok (1 billion), and Twitter (436 million).¹⁻⁴

The use of SoMe in healthcare has expanded over time. Hospital systems use SoMe to promote brand presence, patient education, and reputation scores.⁵ An estimated 25–65% of medical professionals are using SoMe⁶⁻¹⁰ for clinical outreach,¹¹⁻¹³ career development,^{8,14-21} research,^{15,22-33} education,³⁴⁻⁴⁴ and advocacy efforts.⁴⁵⁻⁵⁹ However, there are misconceptions, anecdotal stories, and fears surrounding a medical professional's use of SoMe use, which can foster inappropriate use, skepticism, and criticism.

The pandemic accelerated previous trends towards digital spaces as many real-world communities were shuttered in the face of social distancing. SoMe has become integral for many medical professionals and created an opportunity to shape the

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next generation of educators, researchers, and leaders. Developing fluency in various platforms, uses, and tools has become essential. We provide an introductory primer to the main SoMe platforms used by medical professionals. Additionally, we discuss the benefits and limitations of using SoMe for clinical outreach, advocacy, research, and continuing medical education and how each of these can foster career development.

The Terminology

Understanding terminology forms the building blocks for success. A *tweet* (Twitter) or *post* (Instagram) is the content you are creating and sharing. *Handle* refers to an individual's username typically symbolized by an @ sign followed by numbers and/or letters. This may be different from the *display name*, which is typically the full name of the individual, program, or organization. *Hashtags* are symbolized by a # sign followed by letters and/or numbers. Hashtags are clickable and searchable across multiple platforms. Hashtags can be registered through organizations such as Symplur[®] in order to track impact, activity, and top influencers.⁶⁰

On Twitter (**Figure 1**), there is a 280-character limit per tweet, which can be overcome by linking a series of tweets together, into a *thread*. Threads are often denoted by numbering each individual tweet at the top 1/9, 2/9 or 1/, 2/ and so forth. Twitter allows inclusion of up to 4 photos as well as external website links, polls, graphic interchange format (GIF), or short videos in the tweet. *Mentions* are when another user's handle is included in the main text. Users can be *tagged*, attaching a user's handle to the post or photograph, a feature also found on Instagram and Facebook. Users can interact with a tweet by *commenting* (through the chat-bubble icon), *retweeting* (sharing the content) or *quoting* (sharing the content with added commentary). These interactions bring the tweet to the top of the users' *feeds*, which is a stream of continually updated content.

On Instagram (**Figure 2**), there is a 2200-character limit and content is visually driven. Text falls below the visual content, which can include up to 10 photographs or short videos per post. Instagram TV allows the inclusion of longer videos (> 1 min), but interactive elements such as links, polls, or GIFs are harder to include. Website links can be included in an individual's bio but not within the post itself. Both Instagram and Twitter allow comments and likes. Unlike Twitter, commenting and liking do not alter the position of the post on the feed. Posts appear in chronological order of newest to oldest regardless of the number of comments or likes.

Career Development:

Medical professionals have learned the value SoMe can have in education, research, advocacy, and clinical care initiatives. Each of these provides opportunities to network, build collaborations, and develop a reputation (**Figure 3**).

SoMe can facilitate professional networking within a specific network that may not be readily accessible in your own institution or more broadly. Networking can occur on public or private platforms designed solely for medical professionals, such as Doximity[®], Sermo[®], and Medscape Physician ConnectSM. Traditionally mentors and sponsors can facilitate professional networking opportunities; however, this may be challenging for early career faculty who may lack access to strong mentorship or sponsorship. Leveraging SoMe for professional networking can help level the playing field against time, geography, and traditional hierarchical status of medicine.^{16–19} SoMe creates accessibility to bring your voice, name, or reputation to bigger circles.

Individuals can build their personal brand, reputation, and expertise visibility.^{14,15} This can result in speaking opportunities, educational engagements, research collaborations, mentor-mentee relationships, or media outreach.^{8,20,21} Faculty promotion and tenure committees evaluate clinicians based on educational portfolio, academic scholarship, and reputation. SoMe can facilitate professional growth through each of these avenues and support career advancement.

Research and Academic Scholarship:

Dissemination

SoMe aids in the promotion of research and academic scholarship. Through SoMe scientists gain accessibility to a larger research community. Through these networks, scientists can share ideas, enable rapid large-scale collaborations, and even facilitate new funding opportunities.^{15,22–28}

SoMe can also play a pivotal role in the dissemination of publications. Journals actively broadcast new articles through SoMe platforms or integrate their own articles into Twitter-based journal clubs to facilitate visibility, downloads, views, metrics, and even journal impact factor.^{31–33} Visual abstracts distributed on SoMe lead to increased impressions for journal articles and have become standard in many fields of academic publishing.^{61,62} Inclusion of author handles enables more impressions and full-article downloads, leading many journals to request authors' twitter handles with manuscript submission.

Acquisition of New Studies and Articles

As SoMe is utilized for dissemination and promotion of academic scholarship, it can be a great place to find the latest research and publications. Over 3 million articles are published per year.⁶³ The annual growth of articles published has been steadily rising at 4–5% per year with even higher rates in 2021 due to COVID-19 related papers.⁶⁴ Publications in traditional paper journals can be both time-consuming and costly. Pre-prints, open access, and SoMe are being used to reduce the time to integrate new evidence into clinical practices although can be associated with costly publication fees.^{65,66}

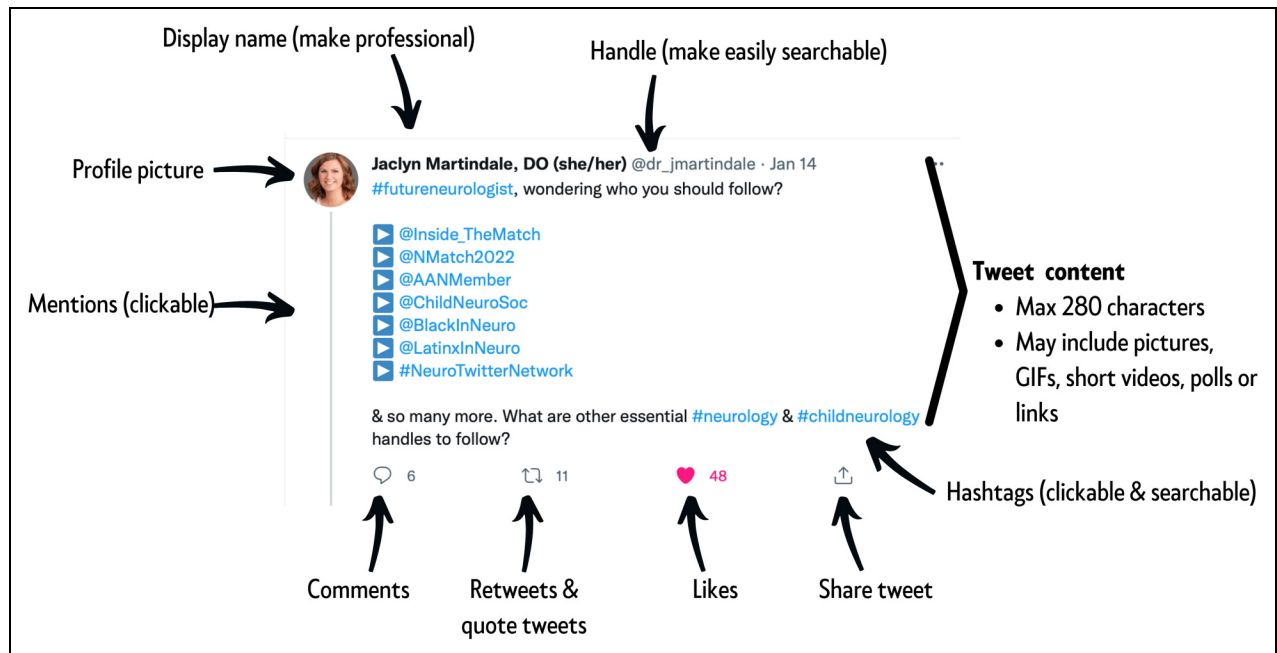


Figure 1. Anatomy of a Twitter post.

Many child neurology and neurology journals have SoMe accounts (**Table 1**).

Study Recruitment

Web-based recruitment is both cost-effective and more efficient than traditional recruitment methods.^{24,29,30} SoMe can facilitate study participant recruitment by reaching target populations. Although online support groups for rare diseases are discussed later in this article, their use in study recruitment is relevant to the current topic. The majority of members in online support groups for pediatric rare diseases supported being contacted through the group for study recruitment inquiries.⁶⁷ Use of these support groups for recruitment has been both successful and practical in rare diseases.

SoMe advertising can also accelerate clinical trial enrollment, which can be challenging in rare diseases. The ExTINGUISH Trial, a prospective randomized clinical trial for Anti-NMDA Receptor Encephalitis, is a prime example of SoMe-based recruitment to study a rare disease through a national cooperative group.⁶⁸ Investigators use SoMe to access patient advocacy and support groups, or to create targeted ads to reach a specific population. Investigators can also enlist involvement of patients or families through SoMe in decision making processes.

Although SoMe-based recruitment can facilitate both accessibility and geographic diversity, additional recruitment methods should be used to insure phenotypic, racial, and ethnic diversity in a study population.^{30,69,70} Investigators should also be mindful of the challenges SoMe may pose in protecting study participant's identities, maintaining blinding, and retention of participants.⁷¹

Alternative Metrics

While SoMe article dissemination facilitates citation building, traditional citation-based metrics can take years to accumulate.^{72,73} In the age of electronic distribution, alternative metrics aim to capture the broader influence of publications across all scholarly outlets beyond citations alone. This type of data captures a quicker, more diverse assessment of impact and engagement across both traditional and non-traditional outlets (i.e. SoMe, blogs, news outlets, governments, or non-profits).⁷⁴⁻⁷⁶ Sites such as PlumX or Altmetrics are ways to track these alternative metrics (**Figure 4**).⁷⁷

Altmetric Attention Scores are visualized through a multi-colored donut display, where each color represents a different source and changes depending on the volume of each source. Total scores are created from automatic algorithms based on a weighted combination of mention volume, author reach, and type of source.⁷⁸ The score considers the potential source value and bias. For example, sharing of an article by a news agency, patents, or blog are weighted more heavily than SoMe shares or mentions.^{76,79} Multiple shares by the same source or within a short time are weighted less in the total score. Scores are readily accessible through a *bookmarklet*, a free web browser plug-in, for any publication with a digital object identifier (DOI). Generally, there is no 'good' Altmetric score; scores can increase with both negative and positive attention. Traditional journal citations are excluded from the Altmetric Attention Score. With these limitations, Altmetrics should be used in conjunction with traditional citation-based metrics for the best assessment of total scholarly influence.

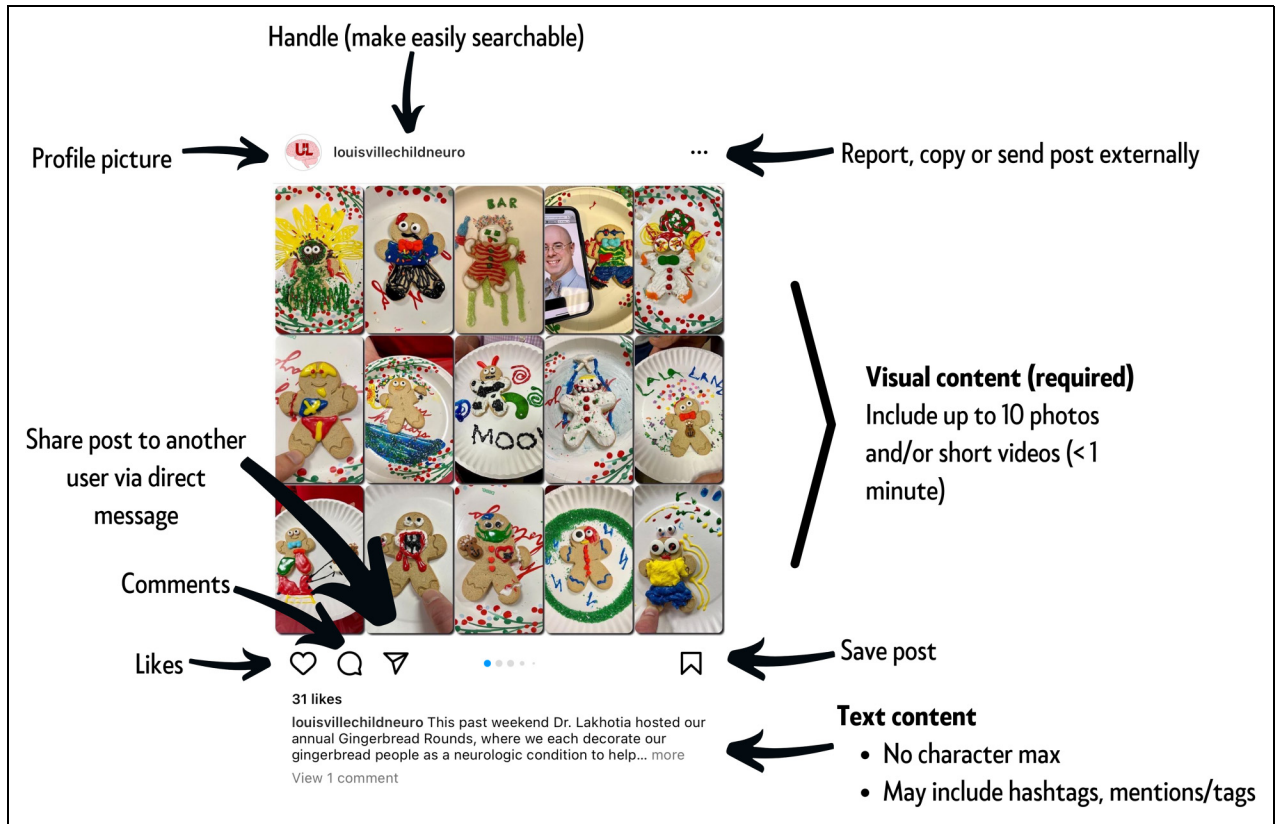


Figure 2. Anatomy of an Instagram post.

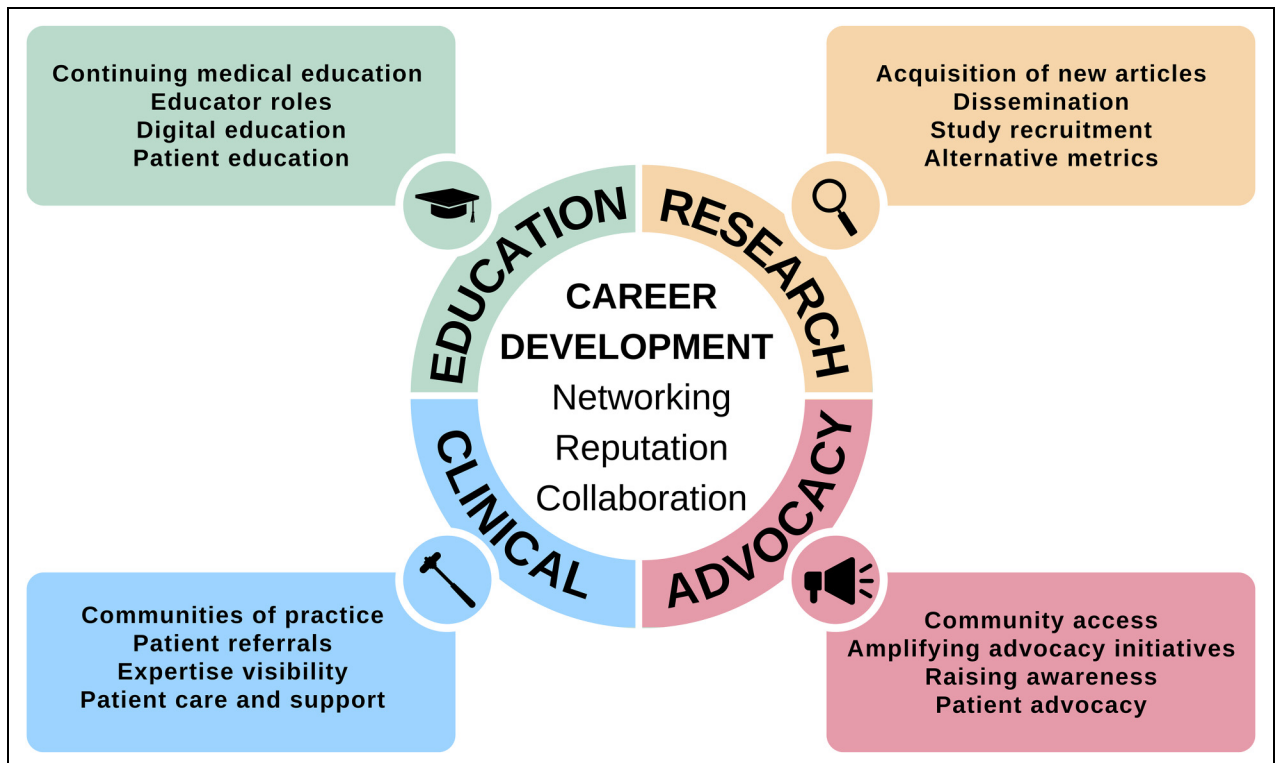


Figure 3. Facilitation of career development through social media.

Table 1. Selected Child Neurology and Neurology Journals.

Journal	Twitter handle
Annals of Neurology	@ANA_journals
Clinical Neurology	@ELSNeurology
Frontiers in Neurology	@FrontNeurol
Green Journal	@GreenJournal
JAMA Neurology	@JAMANeuro
Journal of Child Neurology & Child Neurology Open	@JChildNeurol
Neurology Today	@NeurologyToday
Pediatric Neurology	@pedneurojournal
Pediatric Neurology Briefs	@PedNeurBriefs
The Lancet Neurology	@TheLancetNeuro

PlumX is an alternative metric through Plum Analytics© that measures impact through citations, usage, captures, and mentions on SoMe. The score is provided through a visual Plum Print, which features 5 “lobes” corresponding to each of the five main categories of impact. The size of the lobe will grow with volume in each category. Hovering over the widget will provide details of each category. Plum X is only available through request to non-commercial open access journals, data providers, and platforms. It is available on certain Elsevier products such as Mendeley, Science Direct, and Scopus.⁸⁰

Education

Continuing Medical Education

SoMe is a powerful tool to disseminate and translate knowledge in a way that users, educators, learners, and others can be of up-to-date educational content. The American Academy of Neurology publishes short, high-yield YouTube educational videos called *NeuroBytes* as part of their online learning catalog offering CME. These videos are advertised on a variety of platforms in addition to SoMe. Additionally, private SoMe groups such as the Women Neurology Group (WNG) and BlackInNeuro offer regular CME series exclusively through SoMe. These groups are discussed in more detail later.

Professional medical societies also use hashtags that are often conference, specialty, or disease-specific, to share educational content to and beyond their members.^{81–84} As hashtags are searchable, it also creates a living collection of curated content. Live posts of conference sessions can aid in metrics, impact, and engagement. This is especially relevant in today’s era where conferences have adopted virtual or hybrid models of attendance due to the COVID-19 pandemic. Using meeting-specific hashtags provides a real-time opportunity for virtual-attendees and non-attendees to engage with each other, live attendees, and presenters. Linking supplemental educational material to the posts can drive scientific engagement.^{85,86}

In addition, using specialty-related hashtags can influence health-related discussions beyond conferences. Hashtags are used in Twitter journal clubs (i.e. #NeuroJC) and medical education chats (#MedEdChat). These digital formats of traditional teaching activities can facilitate deeper critical appraisal, broader accessibility, diversity of participants, and engagement of key stakeholders.³¹ Hashtags can also be used to curate best practices and pearls, for example in general medical education (#MedEd) and neurology medical education (#EndNeurophobia). This is discussed more in part two of this article series.

Advocacy

Community Access

SoMe can facilitate access to specific networks that may not be readily available within your institution such as women in medicine, sexual and gender minorities (SGM), or underrepresented minorities (URM). The complexity of disparities, stereotypes, and challenges faced by these groups is beyond the scope of this article; however, SoMe can be a helpful tool for advocacy by facilitating networking, amplifying voices, and propagating awareness efforts. Professional societies can be integral to magnify these efforts.⁸⁷

Women now represent 37.5% of practicing child neurologists compared to 30.4% in 2005,^{88,89} however, they occupy the minority of leadership and senior faculty positions.^{90–92} Although there has been change in gender and racial diversity in academic neurology, white males continue to hold the majority of leadership and higher academic positions.⁹³ Initiatives such as Women Neurologists Group (WNG), Physician Mom Group (PMG), or #EWIMS (Early Career Women in Medicine and Science) work to empower women in academic medicine.⁹⁰

The WNG is a closed Facebook group for women neurologists created in 2015. WNG aims to foster networking, support, and collaboration of women neurologists. Since its creation, WNG has grown to over 3500 members and expanded to other SoMe platforms such as Twitter, YouTube, and Instagram. The group holds regular networking dinners at national conferences, webinar series, and an annual CME-accredited conference.^{94,95} WNG also collaborated with the American Academy of Neurology (AAN) Women’s Issues in Neurology section to develop WoMEN (Women Mentoring Excellence in Neurology), a women-specific mentorship program working towards gender equity in neurology. Recognizing the critical role mentorship plays in academic satisfaction and retention, over 127 mentor-mentee pairs were matched during its pilot year.^{91,96} Several neurological societies and communities have organized similar efforts.

Amplifying Advocacy Initiatives

SoMe not only creates accessibility to specific networks, but also can amplify advocacy efforts quickly and broadly. Leveraging SoMe for this purpose can strengthen the impact and reach of advocacy initiatives. A medical student-run organization, White Coats For Black Lives (WC4BL), originated

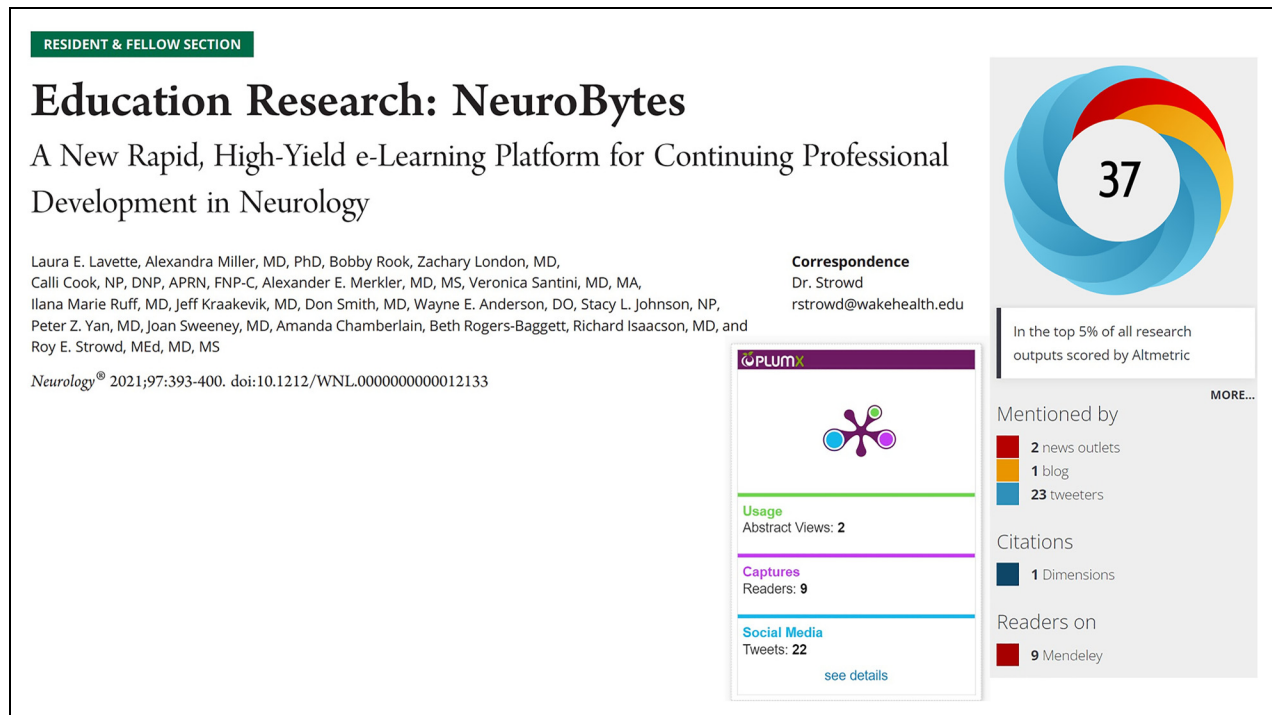


Figure 4. *Neurology*® article demonstrating both PlumX and Altmetric analytics.

through a SoMe organized national demonstration. Over 3000 medical students from 80 schools participated in a National White Coat Die-In to show solidarity against police brutality in support of Black Lives Matter.⁹⁷ The demonstration called for health professionals to address structural and institutional racism as a public health crisis. The hashtag #WhiteCoatsForBlackLives gained national media attention. In the subsequent years, WC4BL has 70 active medical school chapters working to promote racial justice.

Two trainee led hashtag turned movements amplified gender disparities, sexism, and unconscious bias in the operating room. The hashtag #ILookLikeASurgeon, created by a surgical resident, reinvigorated after the *New Yorker's* Health, Medicine & the Body Issue featured a cover illustration of an all-female surgical team gazing down in 2017. A global movement of female surgeons recreated their own version of the cover leading to over 1 billion impressions and more than 350,000 hashtag uses.^{98,99} Likewise, a publication on unprofessional SoMe usage of recent trainees in the *Journal of Vascular Surgery* led to a SoMe #med-bikini backlash protesting sexism and unconscious bias.⁵²⁻⁵⁴ These hashtags created a network of mentorship and support for female surgeons globally. It also brought the unconscious bias against women in medicine to national and international media attention.⁴⁷⁻⁵¹ Similar hashtags exist in neurology, such as #NotJustGuysInTies or #ILookLikeANeurologist.

Raising Awareness:

SoMe can raise awareness against bias and disparities. Anti-black movements, such as @BlackInTheIvory and @BlackInNeuro, drew attention across SoMe to anti-Black racism in

academia.^{100,101} The first #BlackInNeuroWeek took place only 3 weeks after its creation and received over 3.4 million twitter engagements.¹⁰² These communities gained sponsors and a growing network of scholars and allies.⁵⁶⁻⁵⁸ What started from a tweet in the midst of a global crisis of anti-Black racism, created two movements working to sustain significant and meaningful change to the centuries of suppression and systemic racism in the neuroscience community and beyond.¹⁰³ Only 1.6% of practicing child neurologists and 2.2% of child neurology trainees are black;⁸⁸ however, both @BlackInTheIvory and @BlackInNeuro created a growing network of black scholars to inspire, empower, celebrate, and address anti-Black discrimination.⁵⁵

Similar movements have risen in other SGM and URM communities, such as @LatinxInNeuro and @QueerInNeuro. SGM and URM face their own unique inequities and systemic injustices. Identification with multiple layers of minorities increases the complexity of disparities, from which neurology is not exempt.¹⁰⁴ According to a 2015 child neurology clinical workforce survey 79.9% of practicing child neurologists were White, 14.8% Asian, 1.6% Black, 0.7% American Indian or Alaska Native, and 4.7% reported other race. There was a mild increase in racial and ethnic diversity from the prior workforce survey in 2005.⁸⁸

While SoMe can facilitate these discussions, some argue it may amplify preexisting disparities. One study found that women physicians had less visibility, lecture invitations, and collaborative opportunities on SoMe compared to their male colleagues.¹⁰⁵ While outside of SoMe women have fewer publications and citations than men even with co-authorship or team collaborations, having women co-authors did not decrease Twitter dissemination of articles.⁷³ The role of SoMe in

amplifying or mitigating these disparities needs to be further explored.

Patient Advocacy

Organizations are crucial influencers to patient advocacy and disease-specific discussions. This aspect of advocacy becomes even more important for child neurologists as many of the conditions encountered in child neurology frequently fall under the rare disease umbrella. Organizations such as Child Neurology Foundation (@Child_Neurology), International Alliance for Pediatric Stroke (@StrokePediatric), and Epilepsy Foundation (@EpilepsyFdn) are a few examples where SoMe has been successfully used to increase outreach, promote advocacy, and raise awareness, as well as to disseminate helpful information and tool-kits for professionals and the general public (Table 2).

AAN events such as Neurology on the Hill (#NoH, #AANAdvocacy) leverage the power of SoMe to bring issues pertaining to neurology into a larger conversation. Tagging state representatives by sharing content about these issues can engage them and the public in key topics, complementing discussions from advocacy days.

The role of SoMe in patient advocacy could not be discussed without mentioning the #icebucketchallenge. The Ice Bucket Challenge began as a challenge for nominees to videotape themselves dumping ice water over their head within 24 hours or donate to a charity of their choosing. In July 2014, Chris Kennedy whose relative has Amyotrophic Lateral Sclerosis (ALS), dedicated his challenge to ALS. The challenge reached a former baseball player Pete Frates causing it to spread rapidly on SoMe.¹⁰⁶ The campaign not only rapidly raised over \$115 million for the ALS Association but also increased public interest, awareness, publications, funding, and advancement of research for the ALS community. The Ice Bucket Challenge had direct impact on the discovery of five new genes connected to ALS as well as acceleration of the largest ALS genomic study

Table 2. Selected Patient Advocacy Organizations.

Organization	Twitter handle
Batten Disease International Alliance	@BattenDisease
Child Neurology Foundation	@Child_Neurology
Children's Tumor Foundation	@ChildrensTumor
Cure Duchenne	@CureDuchenne
Cure Spinal Muscular Atrophy	@CureSMA
Danny Did Foundation	@DannyDidOrg
Epilepsy Foundation	@EpilepsyFdn
Friedreich's Ataxia Research Alliance	@CureFA_org
Functional Neurological Disorder Hope International	@FNDHope
International Alliance for Pediatric Stroke	@StrokePediatric
Lennox-Gastaut Syndrome Foundation	@LGS_Foundation
Tourette Association of America	@TouretteAssn
Tuberous Sclerosis Complex Alliance	@tscalliance

in the United States.¹⁰⁷ Similar campaigns have been created by a variety of patient organizations.

Clinical

Communities of Practice

At the beginning of the pandemic, healthcare providers turned to SoMe for crowdsourcing of advice, information, and best practices against the novel severe acute respiratory syndrome due to coronavirus-2 (SARS-CoV-2). *Crowdsourcing* generally refers to a large group of people collectively contributing knowledge, value, or problem solving usually via the internet. COVID-19 information was scarce and rapidly evolving. Within 3 weeks of the World Health Organization (WHO) declaring COVID-19 a global pandemic, there were over 26 Facebook groups for medical professionals with a mean number of 21,000 members. One of the largest US COVID-19 physician and advanced practice provider (APP) groups has 146.8K members. The majority of these groups were private with a variety of security measures before admittance. Facebook groups emerged to rapidly crowdsource collective knowledge on patient management, resources, and personal protective equipment.^{108,109}

Information sharing also occurred across other platforms such as WhatsApp and Twitter.^{110,111} In neurology, early uncertainty regarding the risk of COVID-19 to patients with multiple sclerosis on disease modifying therapy raised the need for urgent clinical decisions. The hashtag #MSCOVID19 was created during the early phase of the pandemic as a way for the international medical community to rapidly share case information.¹¹² As information evolved, disease-specific journals and organizations readily shared protocols and guidelines to create communities of practice.¹¹³

Patient Referrals and Expertise Visibility

We previously discussed the importance of SoMe in professional networking, reputation building, and expertise visibility. In clinical practice, this can translate to larger referral networks and lead to new patient referrals. Patients research their physicians online. Google rankings, word-of-mouth, and group recommendations influence a patient's decision-making when seeking specialty care. One study showed that a medical professional's SoMe visibility was more influential on front-page placement on Google Rankings than medical school ranking or years in practice.¹¹⁴ This is an important consideration when trying to build a niche, brand, and reputation.

Patient Care and Support

In the era of genetic testing, rare and new diseases are increasingly encountered in child neurology. The European Union defines rare disease as one that affects fewer than 1 in 2000 people.¹¹⁵ With over 7000 rare diseases in the US, there is a

good chance families would never encounter another child with the same disorder without the help of the internet.

Online support groups, particularly on Facebook, allow families to locate, receive emotional support, exchange information and knowledge, and connect with others going through the same thing. These are widely used with over 6000 support groups for pediatric diseases on Facebook. In a survey of pediatric rare disease support groups, almost 80% reported they would like to have health professionals as members.¹¹⁶

SoMe can also be used to quickly crowdsource resources for patient care. One author's general tweet for insurance denial of epilepsy medications led to multiple messages regarding patient support programs, resource contacts, societal committee assistance, and appeal templates within several hours (Figure 5).¹¹⁷ In addition to supporting patient care, raising awareness to barriers of clinical care may help influence broader change. It is important to note that SoMe also poses ethical and privacy considerations, whether it be the patient or clinician sharing case information for collective advice.¹¹⁸

Documentation of Social Media Scholarship

Faculty promotion and tenure committees evaluate clinicians based on educational portfolios, academic scholarship, and local, regional, or national reputations. Customary documentation of achievements fails to capture the broader impact and influence of non-traditional activities. A growing body of literature provides guidance on how to include these digital achievements and alternative metrics in the promotion and tenure process.^{14,23,75,119–124}

SoMe portfolios, mission-based content, and scholarship are meaningful contributions to academic portfolios.²³ High-impact original content should be included in both the curriculum vitae as well as the appropriate portfolio. Contributions chosen should demonstrate both influence and quality while facilitating career development. Including detailed analytics of digital content such as impressions, downloads, subscribers, or more platform-specific metrics can demonstrate overall impact and reach. Although objective metrics can provide some insight, overall impact can be more subject to interpretation. Individuals should briefly highlight why these contributions were included and how it supports their academic mission.

Challenges

While SoMe is a powerful tool, it is not without pitfalls. One of the most common barriers to SoMe use by medical professionals is skepticism. This often arises from a misunderstanding of how using SoMe for professional purposes differs from personal or non-clinical use. As such, it is recommended to separate professional and personal content.

As a medical professional, activity on SoMe platforms should be treated as a digital extension of your professional identity and thus held to the same degree of accountability and professional standards. Users should consider how content reflects their professional goals, area of expertise, on themselves, and their employers. Content is public and viewable by patients, colleagues, employers, or media. Content can also invite users known as *trolls*. Trolls are usually anonymous users, who purposely try to instigate conflict or provoke anger. They can be persistent, intrusive, rude, or even offensive. As tone and context may be misinterpreted in SoMe exchanges, it is best to disengage, block, or report these users. It is also important to keep this in mind when sharing content and responding to others. Both the American Medical Association (AMA) and the AAN have developed codes of conduct for medical professionals using SoMe.^{125,126} Similar guidelines have been created by different specialties and organizations. It is best to review your institution's SoMe policy before engaging in professional or personal SoMe use.

Medical professionals should also be mindful of Health Insurance Portability and Accountability Act (HIPAA) compliance. Appropriate steps need to be taken to eliminate potential breach of patient confidentiality or identification. This is especially important in a specialty such as child neurology, where rare diseases are frequently encountered. As a result, it may be easy for patients or patient families to identify themselves in content shared on SoMe platforms. Written consent must be obtained prior to sharing of any personal health information. Most institutions have a standard consent form for pictures or other media that can be modified to share digitally. Altering details of the patient and clinical presentation can preserve privacy while sharing clinical cases for collective advice or educational purposes.

Although SoMe can facilitate knowledge translation, content shared on SoMe is often criticized for lack of a formal peer review process. Medical professionals should take extra steps to ensure accuracy of information and

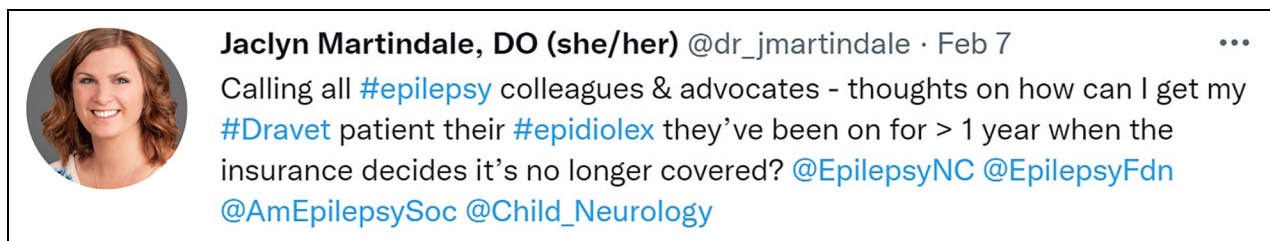


Figure 5. Example of tweet crowdsourcing patient care resources.

avoid plagiarism. Attaching references, original articles, or reputable resources can reduce the risk of misinformation. It is also important to read content and supporting references fully before sharing with others to diminish risk of misinformation propagation.

Some of the benefits of SoMe may also provide challenges. Character limits allow concise delivery of content but may hinder more complex views or discussions. You can circumvent character limits through threads, Tweetorials, including external website links, or transitioning to a different platform. Additionally, while SoMe can facilitate building a personal brand, too much self-promotion can disengage followers. A healthy mixture of sharing personal accomplishments with sponsoring others' work is important.

Lastly, SoMe use has the potential to develop into a significant time commitment and distract from other professional duties. Scheduling small amounts of time in your workweek for SoMe can minimize distraction and fatigue. Consider keeping a list of content ideas to create during your dedicated SoMe time. Additionally, scheduling content and working in teams are effective strategies that facilitate SoMe presence without constantly being "plugged in".

Conclusion and Future Directions

SoMe has grown over the last decade and is part of our daily routines. The use of SoMe has changed the way we obtain and disseminate information, educate, network and collaborate. Medical professionals have leveraged this to broaden the impact and reach of clinical, educational, research, and advocacy initiatives. Through understanding effective and appropriate uses of SoMe in each of these capacities, SoMe has become a powerful tool for career development strategy. Becoming familiar with benefits and challenges of SoMe use by medical professionals is important to navigate the evolving trends of academia. The next leaders of child neurology and neurology will be fluent in various platforms, tools, and SoMe uses to support their academic mission. Current practicing medical professionals should develop familiarity with these practices to engage with the next generation of learners. Part two of this article series will review the role of SoMe and digital tools in medical education. Future research exploring how medical professionals engage with SoMe will aid in ongoing work to incorporate these metrics in academic promotion processes. Additionally, exploration of the role of SoMe in mitigating and/or propagating existing disparities within healthcare is critical.

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Ethical Approval

Not applicable, because this article does not contain any studies with human or animal subjects.

Informed Consent

Not applicable, because this article does not contain any studies with human or animal subjects.

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Trial Registration

Not applicable, because this article does not contain any clinical trials.

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Author Biographies

Jaclyn Martindale, DO, is a movement disorder specialist with interest in Tourette syndrome, an Assistant Professor of Pediatric Neurology, and the Associate Program Director of the Child Neurology Residency at Wake Forest University School of Medicine. She is passionate about leveraging social media for career

development and advancing digital education initiatives. Martindale leads the social media strategy for the Child Neurology Society as a member of the Electronic Communications Committee and is the Chair of the Digital Committee for the Professors and Educators of Child Neurology.

Jessica Goldstein, MD, is an Associate Professor of Neurology at the University of Minnesota School of Medicine and a medical educator. Her research is focused on exploring the innovative use of technology in medical education as well as professional development and identity formation. She is currently working collaboratively to explore the effectiveness of creating a community of practice center on faculty engagement with digital technology and social media.

Roy Strowd, MD, MS, Med, is a neurologist, neuro-oncologist, educator, associate professor of neurology, and vice chair for health system integration in the Department of Neurology. His research is advancing the field of neuro-oncology by discovering new treatments for glioma and neurofibromatosis. He is also a passionate education researcher and serves as an assistant dean for education and scholarship at the Wake Forest University School of Medicine.

Adam Rodman, MD, MPH, is a general internist at Beth Israel Deaconess Medical Center in Boston, MA, a medical historian focusing on the history of diagnosis and medical epistemology, and a medical education researcher. He is the co-director of the Innovations in Media and Education Delivery (iMED) Initiative at BIDMC, which is dedicated to the study and promotion of digital medical education. He also co-leads the Digital Education Track of the internal medicine residency.

Arpita Lakhotia, MD, is an assistant professor in neurology at University of Louisville/Norton Children's Medical Group. She has a special clinical interest in pediatric stroke and pediatric neuromuscular conditions. She serves as the Chair for American Academy of Neurology Section on Neurogenetics, and is part @ChildNeuroSoc twitter admin team.

Nancy Bass, MD, is currently a professor of pediatrics at University Hospitals of Cleveland/Rainbow Babies and Children's Hospital and has a faculty appointment at Case Western Reserve University in Cleveland, Ohio. She is the program director for the Child Neurology Residency program at this institution and currently serves as President of the Professors and Educators of Child Neurology, a national organization comprised of the leaders in Child Neurology Education. Bass has received numerous teaching awards in her career as a medical educator. She also specializes in the field of pediatric neurogenetics and neuromuscular disorders and runs the multidisciplinary clinics at her current institution in these two areas.

Lauren Doyle Strauss, DO, FAHS, is a pediatric and adult headache specialist at the Comprehensive Headache Program at Atrium Health Wake Forest Baptist who focuses on improving the lives of children with headache disorders through educating patients, parents, and other healthcare professionals. Strauss became interested in the use of social media early in her career and its influence on medical care, patient advocacy, and education. As the cochair of the American Headache Society's Electronic Media Committee, she plans social media campaigns for the organization including new social media posts and website content. Strauss teaches Twitter 101 sessions to support Neurology faculty and residents joining twitter to advance the academic mission. In 2020, Atrium Health Wake Forest Health Baptist recognized her as one of the top 25 influencers at the medical center.

Kathryn Idol Xixis, MD, is an assistant professor of neurology and pediatrics at the University of Virginia. Xixis has an interest in medical education and currently serves as the Child Neurology Residency Program Director at UVA. She also has an interest in how digital tools can be incorporated into medicine and especially medical education. As such, she is the Project Lead for the Child Neurology Society Podcast Project, Brainstorm – High Yield Topics for Physicians Short on Time. Xixis is also actively involved in patient care and has a clinical interest in neurofibromatosis.