

Review

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Evan Buettmann<sup>\*</sup>, Carolyn Chlebek, Carly Lockard, Sade Clayton, Karl Lewis, [Kelsey Collins](#)<sup>\*</sup>

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Review

# Post or Perish? Social Media Strategies for Disseminating Orthopedic Research

Evan G Buettmann <sup>1,\*</sup>, Carolyn Chlebek <sup>2</sup>, Carly A. Lockard <sup>3</sup>, Sade W. Clayton <sup>4</sup>, Karl J. Lewis <sup>5</sup> and Kelsey H. Collins <sup>4,6,\*</sup>

<sup>1</sup> Department of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA

<sup>2</sup> Center for Molecular Medicine, MaineHealth Institute for Research, Scarborough, ME

<sup>3</sup> Stephens Family Clinical Research Institute, Carle Foundation Hospital, Urbana, IL

<sup>4</sup> Department of Orthopedic Surgery, Washington University in St. Louis, St. Louis, MO

<sup>5</sup> Department of Biomedical Engineering, Cornell University, Ithaca, NY

<sup>6</sup> Shriners Hospitals for Children, St. Louis, MO

\* Correspondence: **Evan G Buettmann**, Virginia Commonwealth University, Department of Biomedical Engineering, 90 S. Madison St. Engineering Research Building, Richmond, VA 23220, Email: buettmanne@vcu.edu; **Kelsey H Collins**, Washington University in St. Louis, Department of Orthopaedic Surgery, 4523 Clayton Avenue, St Louis, MO 63110, Email: kelseycollins@wustl.edu

**Abstract:** The purpose of this paper is to highlight the main themes and insights from the Journal of Orthopedic Research (JOR)/JOR Spine Workshop during the Orthopedic Research Society 2022 Annual Meeting in Tampa Bay, Florida. This workshop, organized by JOR Editor-in-Chief Dr. Linda Sandell, focused on communication strategies (particularly using social media) to broadcast published work in orthopedic research. In this manuscript, we summarize data that support the beneficial impacts of amplifying scholarly works on social media and outline a linearized workflow for constructing a Twitter posts, which can be generalized to other social media platforms, to share academic research. Finally, we identify resources to alleviate barriers to social media use and help promote professionalism and success online in the orthopedic research community. As early career scientists in orthopedics, we see immense value in using social media, particularly Twitter, to communicate our research findings and build our scholarly networks. We hope this information will be persuasive to those in the orthopedic field and be broadly applicable to others in related scientific fields who wish to disseminate findings and engage a public audience on social media. For the orthopedic research society and journal of orthopedic research, social media can assist in accomplishing our mission of creating a world without musculoskeletal limitations via the timely dissemination of orthopedic research findings and news.

**Keywords:** Twitter; Social Media; Altmetrics; Citations; Orthopedic Research Society; Publication

## The Benefits of Utilizing Social Media for Dissemination of Scholarly Content

Social media use has soared in recent years with over half of the world population active on at least one social media service for over 2 hrs a day<sup>1</sup>. Although Facebook (Meta Platforms) and YouTube (Google) remain the most used by the general public, Twitter is one of the most popular platforms for physicians and scientists<sup>2,3</sup>. In fact, nearly 10-20% of life science researchers report using Twitter, with even greater participation by researchers in the humanities and social sciences<sup>4, 5</sup>. Twitter's widespread use among scientists, particularly early-career scientists, appears to be driven by the platform's ability to rapidly reach a large audience and disseminate information to other researchers. This becomes an effective means of increasing name-recognition within research fields beyond conferences and symposia. This feeling is relatable for us at many scientific annual meetings, especially a professional research group like the Orthopedic Research Society, when meeting a new colleague for the first time and exclaiming "It's so nice to finally meet you in real-life; I follow you on

Twitter". Personally, in addition to being active on these platforms ourselves, we have witnessed the widespread use of Twitter within the broader orthopedic and musculoskeletal research community.

Some of these professional uses include announcing funding and promotion updates, seeking career advice, and talking about difficult professional situations. More scientifically, we have used Twitter for surveying topics of interest at upcoming scientific meetings, networking, collaborating and promoting the latest research publications written by ourselves or our research laboratories. In particular, promotion of a publication on Twitter and other social media has become increasingly important for driving article discussion and visibility, both in preprint or peer-reviewed format. This speedy recognition, especially in the era of preprints, can be particularly rewarding for researchers and journals compared to traditional bibliometrics that can take months to years to generate and change including author citation numbers, author h-index, and journal impact factor<sup>6</sup>. Due to its widespread usage in orthopedic research, throughout the text we mainly focus on curation of Twitter posts, their dissemination and analysis of their impact on an author's bibliometrics. However, it's important to note that these same principles covered for Twitter are highly relatable to other social media platforms such as Facebook, LinkedIn, Mastodon, etc.

Individual bibliometrics (author citation numbers and h-index) have been used as key metrics of research quality, and high bibliometrics often translate into prestige and career advancement. However, discussions around using alternative metrics (aka "altmetrics", or the Altmetrics Attention Score), founded in 2011, as an additional marker of research impact, continues to be widely debated and researched. The Altmetric Attention Score is automatically updated and weighted to track online media attention of scholarly works, for example via mention in a social media posts, news articles, or policy documents.<sup>7</sup> Due to rising popularity, the Altmetric Attention Score is routinely published alongside journal articles on the publisher's website. These factors, and the increasing use of social media over time, have led to new research investigating altmetrics as a reliable indicator of traditional bibliometrics.

Emerging evidence suggests that social media (quantified by altmetrics) can have a significant and lasting impact on a researcher's recognition and the impact of their scholarly works. For example, top journals in the research fields of sports science<sup>8</sup>, pathology<sup>9</sup>, and radiology<sup>10</sup> all demonstrated significant positive correlations between citations and Altmetric Attention Scores ( $R = 0.20 - 0.771$ ), although the strengths of association varied. In addition, all three studies reported Twitter as the predominant online source contributing to each article's Altmetric Attention Scores. Recently published results by Halvorson et al. demonstrated similar trends between Twitter usage and citations within 17 orthopedic journals from 2018. For example, the authors found that twitter mentions, journal impact factor, and non-open status of the journal were all significantly associated with greater citation count.<sup>11</sup> In contrast, analysis of correlations and Altmetric Attention Scores from journals in other fields, such as rheumatology<sup>12</sup> and biology<sup>13</sup>, showed no significant and weak correlations ( $R = 0.004 - 0.12$ ). Although these data suggest that post-publication social media promotion of scholarly articles, especially via Twitter, can influence traditional metrics of success and impact, correlations vary widely based on scientific field, type of journal (i.e., impact factor), type of article (technical vs. original), and timeframe post-publication. More specifically, on average articles received higher citations and Altmetric Attention Scores if they were technique-based (versus original research)<sup>14</sup>, published in a journal with its own social media account<sup>15, 16</sup>, and included comments and graphical abstracts<sup>17</sup>.

Based on these findings in other fields, the ORS Social Media Committee (ORS SMC) currently is investigating the strength of correlation between article citations and social media use within JOR and JOR Spine published articles and the greater ORS community. Wiley and Sons, Inc. staff members and the ORS SMC have helped create and streamline @JOrthopRes and @JORSpine Twitter handles run by editorial staff, who routinely post newly accepted journal articles on Twitter (#ManuscriptMonday) and help submitting authors join social media and create graphical abstracts to personally promote their work online. Due to the growing role social media appears to play in disseminating and highlighting scholarly work, in the next section we detail steps to construct and analyze content on Twitter and other emerging social media platforms for maximum engagement.

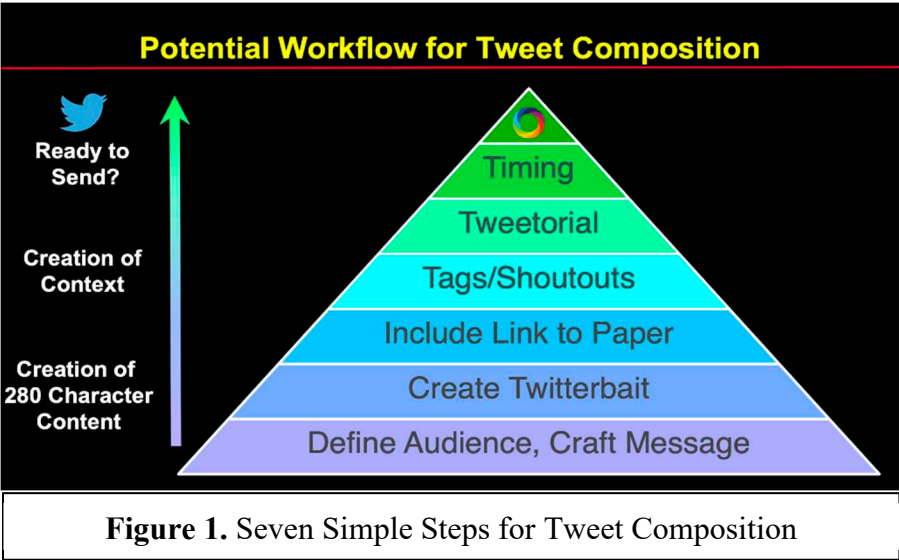
Linearized Workflow for Twitter Post Construction

Setting up a proper social media account, particularly on Twitter, may sound daunting— but is relatively straightforward and the first to successfully publicizing your scholarly works. Although a full tutorial is beyond the scope of this editorial, we suggest using the following resources to get familiar with the Twitter platform and lingo (such as “hashtag”; “handle”, and “trending”) and some basic rules for getting started<sup>18, 19</sup>. In addition, the ORS SMC has put together a brief tutorial describing how to set up an account and use Twitter and LinkedIn as a scientist in the resources column of **Table 1**. First things first, start by creating a self-explanatory Twitter handle (such as the name of your lab or research group); include your full name and credentials on the account profile (for easy searching), use a professional close-up or headshot for a profile picture, and fill out your bio with relevant research area keywords and hashtags. Once your account is created, begin your interactive social media journey by following one or two specific role-models you know personally as well as any scientific societies or organizations to which you belong or with which you want to become involved. This will provide initial visibility with accounts that are directly relevant to your interests and goals on Twitter. If you are interested in broadening your online presence, these steps are also relevant for accounts on other social media sites such as Facebook and LinkedIn. Now that your Twitter profile is ready, it’s time to send out your first social media post or tweet and join the active and engaging conversation online. Next, we identify a procedure for crafting a scientific tweet and analyzing its impact for maximum effectiveness and reach (**Figure 1**).

To Prepare:

- Define Your Audience & Message - Who do you want to reach? Is this a lay audience, or a field-specific audience? What type of language is appropriate?
- Goal setting - Define level and type of engagement desired.
- Determine how to define success of post or tweet *a priori*
- Strategies may vary with message (preprint vs job announcement vs published paper vs. technical question)

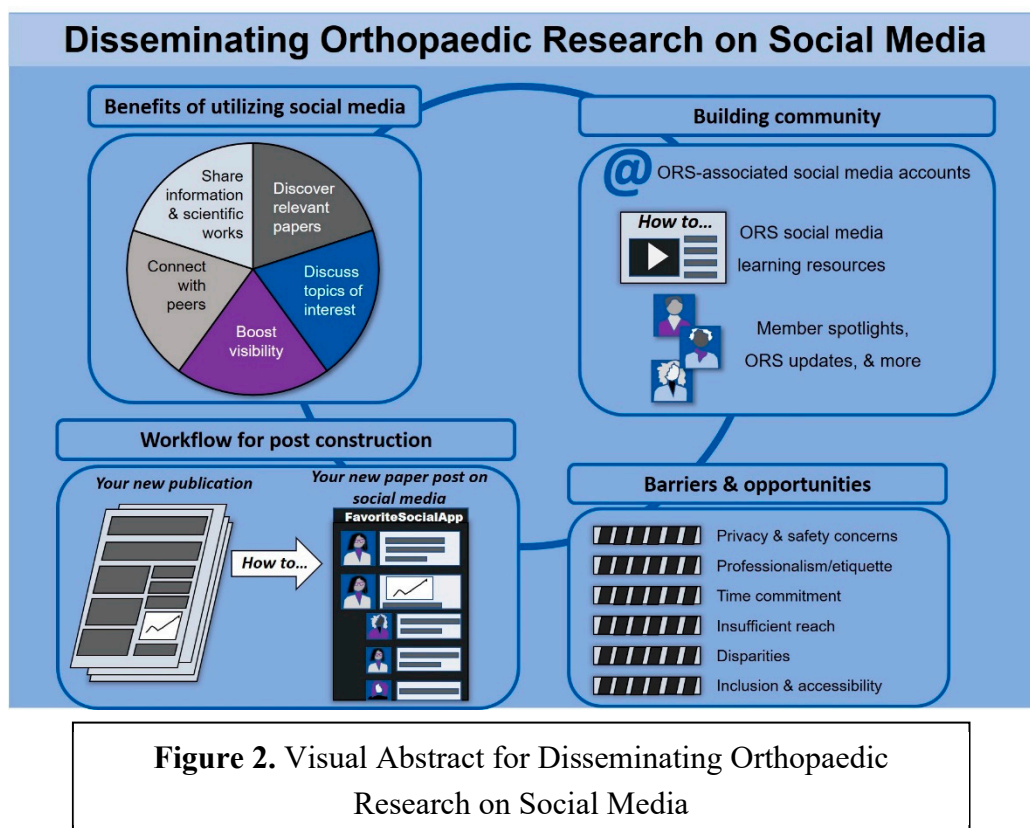
Workflow (See Figure 1):



1. **Think it through-** There are many successful strategies to effectively communicate your main message in 280 characters or more. Including a visual abstract or key figure that best represents the scope of the paper has been shown to led to increased post engagement, and could be a good strategy to drive engagement with your target audience<sup>20</sup>. Professional tools like Biorender(R), Adobe Suite, or Inkscape are useful to generate these images for both journal publications and social media posts. Explicitly promotional graphics are great for communicating with a broad



audience, and also allow for optimized size/aspect ratio of the graphic which may be different than what is typeset in a journal. We have included a visual abstract representing the scope and take-home messages of this editorial as an example (**Figure 2**). In addition, many publications now offer fee-based generation of visual abstracts for accepted authors with professional assistance. Generally, social media should target lay audience – but depending on how you craft your message, you may be targeting a key subgroup of SciTwitter or OrthoTwitter, so choose your language appropriately. Be sure to include a link to paper, either in full format or using a tool to shorten it (tinyurl, bitly, etc) to help with tracking and metrics. It is important to consider accessibility with colors, size, and alternative text up front, and not as an afterthought. Also, strategizing ahead of time and soliciting feedback from co-authors is useful in this context.



2. **Timing** - Be aware of when your publication will “go live,” or when a press release may be made by your institution. First thing in the morning early in the week may achieve better engagement to help overcome time differences with our colleagues worldwide. For those in later time zones (e.g, Eastern Time Zone), it may be worthwhile to target midday to try to capture a broader audience. Tools like HootSuite and TweetDeck allow users to compose tweets in advance and schedule the publications to maximize the beneficial timing. The ORS SMC found that tweeting ORS Basic Science Tips during the work week (particularly Fridays) on Twitter toward an orthopedic research centered-audience yielded the most engagement.
3. **Tweetorial (or not?)** - A tweetorial is a string of one or more tweets in series that allow one to expand the space you may need to tell your story. As simple as two tweets, these are composed as one united thread that all gets tweeted together to avoid disjointedness. Some authors choose to walk through every figure in the paper to tell their story whereas some choose to use the subsequent tweets to acknowledge co-authors, home institutions, funders, etc. There are many effective strategies that can be used depending on your message and target audience.
4. **Tags** - Hashtags and @-based tags help improve the visibility of your work to the broader community. Hashtags will make your post searchable under that tag, for example, #orthotwitter or #ORSSMC. @-based tags will allow for the people you tag to follow along with the post by

receiving notifications based on the post's activity and work on Twitter, LinkedIn and Instagram. Alternatively, you can tag individual accounts in your images to leverage the space in the tweet for other text. It might be useful to generate a strategy of groups to tag in the image for consistency and to improve inclusion. As stated in the next section, receiving consent from individuals and entities to be tagged is suggested.

5. **Takeaways** - Getting to the point quickly is key. Craft a snappy 1-2-line question, statement, or finding to make the big message clear. Making the "so what" as clear and engaging as possible will increase the engagement with the post. However, be mindful of your audience and avoid jargon if possible. In our experience, the more concise, succinct, and catchy a tweet is, the better its overall engagement will be.
6. **Thank you's** - Science is a team sport, and after the completion of studies many individuals and entities are deserving of acknowledgement and gratitude. This includes co-authors, collaborators, funding agencies, end-users (foundations, societies, patient groups, clinical collaborators), affiliated departments, groups that might have provided seed funding, professional organizations, etc. These individuals and organizations should be acknowledged during the initial post or during followup replies.
7. **Tracking and Metrics** - The easiest way of gauging effectiveness is to use tracking tools built into Twitter and the Altmetric Attention Scores in the journals. The social media engagement information is available below the tweet itself and will help the user identify how many people saw, engaged with any links, liked or retweeted (shared) the post. The quantity and type of engagements are meaningful data points to gauge the success and reach of your tweet. You can also choose to "pin" your tweet to the top of your personal account to remain accessible and continue to have engagement.

In our experiences and those reported by others<sup>21</sup>, actively composing tweets and engaging with content from others will help your online presence grow. The content generated on social media will contribute to the community's perception of the personal brand of the group or individual represented by the publishing account. As in traditional forms of communication (in-person) posting with a consistent voice and in a timely manner is key (<24 hrs). Outside of announcing publications, users can share their experiences in the lab, grant review comments, and opinions on academic trends. For example, many users share their experiences and advice during interview seasons for graduate admissions and faculty hiring. Research group accounts also will feature social activities, in addition to updates about research presentations and progress. Asking technical or professional questions on social media is a norm in the scientific communities, and often yields effective advice and feedback for users. All interactions on Twitter, including responding to or engaging with other posts and content creation, will contribute to your online personal brand, which should be a genuine reflection of your offline persona. A great way to get started and quickly grow your online presence on Twitter and beyond is to actively follow and engage with content already curated by the ORS SMC, ORS official accounts, and by the JOR/JOR Spine accounts (**Table 1 and Table 2**).

Though Twitter is the most utilized social media platform for academics, other emerging platforms like Mastodon and Post are steadily building traction within the scientific community. Mastodon is an open source, decentralized social network similar in build to that of Slack or Discord where users must join independent servers, called "instances", organized around topics of interest or geographical locations.<sup>22</sup> The parsing of user interactions based on interest offers a more tailored experience for those aiming to only engage with other academics in their field, but engagement with the complex interface of the platform can be overwhelming for new users. Contrarily, Post is a platform that aims to capture the essence of the diverse interactions offered by Twitter, but prioritizes minimizing the more negative components of Twitter by offering, "Real People, Real News, Civil Conversations"<sup>23</sup>. The user interface is simple and user friendly, but the platform is only in its Beta stage at the time and thus still in its infancy. Like Twitter, both Mastodon and Post users can comment, like, share and repost content on their account and by using the workflow (**Figure 1**) aforementioned can reach maximum effectiveness at sharing their scientific content. Unlike Twitter however, posts lengths on Mastodon (known as a toot) and Post can be much longer (up to 11,000

characters). A caveat to sharing scientific content on these platforms instead of Twitter is that posts may not have reduced engagement from the scientific community since many academics are established on Twitter and have not transitioned to or duplicated accounts on Mastodon or Post yet.

### *Building Community on Twitter*

The Orthopedic Research Society community is active on a wide variety of social media platforms (**Table 1**). On Twitter, all ORS-related information, such as award deadlines, member spotlights, annual meeting updates and more are shared from the society account (**Table 2**). The research sections within the ORS provide more targeted updates and features for their members via Twitter (**Table 2**). Research articles submitted to the Journal of Orthopedic Research (@JOrthopRes) and JOR Spine (@JORSpine), publications of the ORS, are frequently featured on the journal-specific accounts. In addition to features by the journal-specific Twitter accounts, ORS publications in JOR and JOR Spine are also advertised by ORS SMC no later than 3-4 weeks following publication. Committee members post these articles and other content of interest for ORS members. ORS SMC content and member accounts are searchable with #ORSSMC. Although the ORS twitter account has the greatest number of followers and posts, ORS members on Facebook, LinkedIn, TikTok and Instagram can also connect with fellow orthopedic researchers via the ORS official accounts (**Table 1**). To capitalize on industry connections, the ORS LinkedIn page posts frequent updates and stimulates discussion in the community groups. Video-based media is frequently posted to the ORS TikTok and YouTube accounts, featuring member spotlights, instructional webinars, and more. To assist members new to social media, the ORS SMC created instructional videos for Twitter and LinkedIn account creation and participation, both of which are featured on the YouTube channel. For more advanced materials on the use of social media in the publication process, the ORS offers a LearnORS course entitled “The ORS Forum for Enhanced Writing and Publication Skills”.

**Table 1. ORS-Associated Social Media Accounts and Resources.**

Platform	Account Name	Social Media Resources	Platform Strengths	Platform Weaknesses
Twitter	@ORSSociety	<a href="https://youtu.be/HfYu8bJF3-g">https://youtu.be/HfYu8bJF3-g</a>	Large opportunity for networking & finding new resources	Large communities can be overwhelming to new members
Facebook	Orthopaedic Research Society		Increased opportunity to share with non-science community	Networking limited to approved “friends”
Instagram	@orssociety		Increased opportunity to share with non-science community	Networking limited to approved “followers”
LinkedIn	Orthopaedic Research Society	<a href="https://www.youtube.com/watch?v=eTgP5YqaVis">https://www.youtube.com/watch?v=eTgP5YqaVis</a>	Large industry-focused network & profile serves as living resume	Less frequent interactions with network
YouTube	Orthopaedic Research Society		Long-format videos are easy to access	Limited interaction between ORS members
TikTok	@orssociety		Short-format videos are easy to access & can achieve educational outreach efforts	Limited interaction between ORS members

**Table 2. ORS-Associated Twitter Accounts**

<i>Group</i>	<i>Twitter Account</i>
ORS Society	@ORSSociety
Journal of Orthopaedic Research	@JOrthopRes
JOR Spine	@JORSpine
Tendon Section	@ors_tendon
Preclinical Models Section	@ORSPCMSection
Meniscus Section	@ORSMeniscus
Spine Section	@OrsSpineSection
ISFR	@isfrfractures

### Potential Barriers for Social Media Usage

Although the orthopedic research community has a strong and growing presence on social media, some members may be hesitant to use social media in a professional context due to lack of familiarity with the social media platforms, its extra time commitment and ethical concerns. Concerns related to social media use include privacy, etiquette/professionalism, overload or burnout, perceptions about popularity (quantity) versus substance of content (quality), widening of disparities, and inclusion/accessibility of social media content. We acknowledge that existing norms can be used as guidelines to participate in social media in a way that mitigates, but may not fully eliminate these concerns.

#### *Privacy Concerns*

When creating a Twitter account for a research group or other non-individual entity, privacy should be the highest priority. For a variety of reasons, including safety and privacy concerns, individuals may wish to avoid having their photo posted on social media; therefore, consent prior to posting is necessary for posting pictures of people or their research, especially if unpublished. The addition of editing posts via Twitter Blue (paid subscription) and LinkedIn may be a more appropriate for handles associated with multiple individual entities such as labs, organizations and clubs since minor errors and typos can be easily remedied. Online avatars can be used for those who wish to engage via media attachments but chose not to share their own face. Further, when posting about people other than yourself, tweets should not include personal details, such as medical conditions, family status, or sexual orientation. This concern can be bypassed if the person posting the tweet has obtained specific permission, which should be clearly stated in the post (example: "shared with permission").

#### *Etiquette and Professionalism*

The scientific community active on social media already has established a foundation of acceptable and unacceptable behaviors related to etiquette and professionalism<sup>24, 25</sup>. Here, we will summarize some of the best practices to keep in mind while engaging on Twitter. Professional social media behavior should mirror expectations for day-to-day professional interactions in the non-social-media setting (i.e. in person; face-to-face); users should remember that social media accounts are associated with individuals, whose feelings and expectations for behavior are similar to 'real life' expectations. While accepted etiquette and professionalism standards will vary by individual or research group just as in 'real life', some research-specific norms require additional attention. For example, always consider the risks of plagiarism or 'scooping' when sharing unpublished results on social media, particularly when sharing work by others being presented at conferences. Conference rules regarding photography and social media should be followed. If photography is allowed but the presenter has not given permission to share presentation content, the best approach is to share abstract-level information about what is being presented and to limit image sharing to the title or



acknowledgment slides, or poster titles. Other research-specific considerations include taking special care to redact or omit sensitive information related to supervisees, study participants, intellectual property, research animals, tissue donors, etc. to ensure a respectful and safe, privacy-protecting social media presence.

#### *Time Commitment/Burnout*

Social media participation can seem like one more thing to add to an already busy schedule. To avoid being overwhelmed and not spend too much time online, one can use tools such as the ability to create lists. For example, Twitter allows the creation of 'Lists' that curate content and user profiles more strictly than on the general timeline. Scheduling dedicated social media times for focused browsing and post creation can similarly reduce feelings of being overwhelmed. In addition, using free online tools for content creation for simultaneous posting to multiple social media sites, such as Hootsuite and Tweetdeck, allow for one to save time crafting multiple similar posts.

#### *Insufficient Reach*

Social media participation may seem futile if a user's reach (i.e. number of people who see your content) and follower count seem small or remain stagnant. Grace and patience are important, as success and positive feedback may not occur immediately. For science-focused accounts on Twitter, a threshold of approximately 1000 followers are needed before the range of follower types expands to include a broader audience beyond other researchers, such as media, members of the general public, decision-makers, and research/educational organizations<sup>26</sup>. Users aiming for larger scale, effective 'outreach' can better achieve their goals with follower counts over 1000. To reach this follower count will take some time (potentially years or more). For reference, since 2019, the official ORS social media page on Twitter and Facebook have grown by an average of 1100 and 620 followers annually. Therefore, just as with real-life networking, follower count will build and grow naturally over time via interactions with more people and quality content curation.

#### *Is This Just A 'Popularity Contest'?*

Social media can feel like a popularity contest and does have the potential to exacerbate existing opportunity gaps and imbalances in science. Researchers on social media should push back against the impression of a 'popularity contest' by building a genuine online network/community and amplifying the work of others in addition to just sharing one's own or a team member's work habitually. For example, repost content from others using tools, such as Retweet on Twitter, that allow amplification with credit to the original post. Users also can promote others by posting about interesting papers and presentations or influential ideas, and recognizing the relevant researchers with tags if they are also on the social media platform.

#### *Social Media and Widening Disparities*

Disparities on social media are real and often reflect those seen in other facets of life but also represent an opportunity for mitigation and change. For the social media platform of Twitter, female researchers in some fields are less likely to participate compared to male scientists<sup>27</sup>. Evidence of disparities in follower numbers and amplification also reflect existing gender and racial biases in several fields<sup>28-30</sup>. However, social media has improved visibility of younger scientists<sup>27</sup>, and some disparities were reduced in one study<sup>28</sup>. While these disparities cannot be overcome on an individual user basis, users can combat known disparities when choosing who to follow and who to amplify, and when encouraging others to join various platforms. Regular review of your twitter analytics can help determine if you're accurately promoting the work of the entire orthopedic research community and doing your best to be more inclusive and equitable. Social media is an opportunity to seek out and help boost the visibility of researchers who may be less visible or well-known via conventional research-sharing mechanisms. These individuals include trainees, people at less well-recognized institutions, people from underrepresented/marginalized or excluded groups, those who may be

unable to frequently attend conferences for various reasons (international/visa restrictions, funding, health, family responsibilities, etc.), or researchers who may have followed less traditional career paths.

### *Inclusion and Accessibility*

Social media has particularly high potential for inclusion and accessibility, when used with those goals in mind. Good practices for maximizing inclusion and accessibility include combining complementary types of media (text, image, video, audio) when possible, taking advantage of accessibility features that exist on the various platforms, and using language that is inclusive and appropriate for your target audience (avoiding overly technical terms or jargon)<sup>31, 32</sup>. Accessibility features include alt text or captions for image descriptions and video captions. Users who may have difficulty reading social media text or rely on screen reader technology also benefit from practices such as avoiding using all caps, using camel-case for hashtags, minimizing the number of emojis used, etc.

Increasing social media accessibility is one of the many ways to the ORS can champion diversity, equity, and inclusion (DEI) practices. **Orthopedics is the least diverse clinical and biomedical research specialty<sup>33, 34</sup>. Therefore, intentional actions that aim to improve diversity, retention and inclusion in orthopedic research have high potential impact and are long overdue.** The ORS has made strides to establish DEI efforts by offering tangible opportunities that promote and encourage diversity such as the establishing the Spine Section diversity travel awards to fund underserved scholars to attend meetings and by offering ORS community networks such as the Asian Leadership Forum, Pride @ ORS, Emerging Orthopedic Surgeons and Junior Faculty Network to members through the ORS website. The use of social media to promote these efforts have been instrumental in spreading awareness of their existence to the field, but there is always room for improvement. The creation, support, and targeted social media advertisement of DEI focused programs offered by other societies such as the Future Leaders Advancing Research in Endocrinology (FLARE) program <sup>35</sup>sponsored by the Endocrine Society or the Choose Development program sponsored by the Society of Developmental Biology<sup>36</sup> are great examples of maximizing the use of social media platforms to highlight DEI efforts. Social media is a powerful tool commonly used by academics at every career stage; therefore, the creation and promotion of DEI focused programs within the ORS has the capability to make the Orthopedic field more welcoming and supportive of underserved populations. We posit that social media is a key opportunity to improve diversity, inclusion, accessibility, and equity, and we hope that the Orthopedic community uses social media as a tool to help foster these goals.

### **Conclusion and Future Directions**

All media, including social media, has the potential to broadly reach and inform the public about research and to decrease disparities. For the ORS and JOR, social media can assist in accomplishing our mission of creating a world without musculoskeletal limitations. Currently public outreach for musculoskeletal diseases using social media is limited and will require not only a critical mass of online musculoskeletal researchers but one that has a strong unified voice. This community effort will be critical to informing all audiences, including elected officials and members of the public, on the burden of orthopedic diseases and importance of research funding. We, therefore, encourage all researchers in our community to develop a strong social media presence for their research. To help our community initiate these efforts and maximize impact, we have recommended musculoskeletal social media platforms and channels to engage with, along with their strengths and weaknesses. Ultimately, social media is a tool to enhance the timely and truthful dissemination of orthopedic research findings and news.

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