

# Orthopaedic Surgeons Should Consider Online and E-publication Resources for the Most Current Evidence-Based Medicine Following the COVID-19 Pandemic



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**Purpose:** To compare the time to publication of accepted manuscripts and content in orthopaedic sports medicine journals during the first 2 years of the COVID-19 pandemic. **Methods:** A convenience sample of articles published in January, May, and September during the years 2019–2021 was taken from *Arthroscopy*, *American Journal of Sports Medicine (AJSM)*, and *Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA)*. The duration between the aspects of the article publication process was compared between journals and years. **Results:** Overall, 826 journal articles were included. *Arthroscopy* demonstrated no significant differences in the time from manuscript submission to journal publication from 2019 to 2021, a significant decrease in time from acceptance to e-Pub (140 vs 74 vs 16 days;  $P < .001$ ), but an increase from e-Pub to journal publication (23 vs 74 vs 130 days;  $P < .001$ ). In *AJSM*, there was an overall increase in time from submission to journal publication significant between 2019 and 2021 ( $P = .05$ ) and 2020 and 2021 ( $P = .001$ ). *KSSTA* demonstrated the longest timelines in 2020. There was a trend toward a greater number of systematic reviews and meta-analyses. **Conclusion:** Changes in various aspects of the time to publication and journal content occurred in orthopaedic sports medicine journals in the years surrounding the peak of the COVID-19 pandemic in 2020. Although it is not possible to know whether these delays are caused by journal or author-related factors, orthopaedic surgeons should be aware of the possible delay in time to publication and consider online and e-publication resources for the most current evidence-based medicine, while journals may take this information into account to consider ways of improving the publication process and when determining journal content. **Clinical Relevance:** It is important to understand the impact the COVID-19 pandemic had on the publications which orthopaedic sports medicine surgeons rely on for clinical knowledge and the practice of evidence-based medicine.

## Introduction

The peer-review process is necessary to maintain the integrity of published work, but may result in prolongation of the publication timeline.<sup>1</sup> With the

suspension of clinical practice at the peak of the COVID-19 pandemic, there was a surge of scholarly work, especially among prolific researchers.<sup>2</sup> There was a significant increase in publications aiming to share the

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most up-to-date information related to the novel coronavirus.<sup>3,4</sup> Not only was there an increase in COVID-19-focused research, but there was a surge in general orthopaedic and subspecialty-focused research, as orthopaedic surgeons were displaced from the operating room. The influx of scholarly work may have resulted in an increase in manuscript submission numbers, overwhelming journals, which were already experiencing a new workflow with staff members displaced from the traditional office setting. Altogether, this prolonged time to journal publication.

Publication speed is an important aspect of research, as manuscript publication in journals is ultimately how important research findings are disseminated. Journals may be more appealing to authors if they have a reliable and efficient time to publication.<sup>1,4,5</sup> In addition, authors may also take into consideration the impact factor and journal rank when deciding to submit a manuscript.<sup>1,5,6</sup> From a journal's perspective, manuscript qualities, such as significant findings, accuracy, and involvement of a statistician have been linked to faster publication times.<sup>7-9</sup>

Although there are numerous variables that contribute to the timeliness of quality peer-reviewed journal publication, much of the responsibility falls on the journal to adequately staff editors, procure, and motivate reviewers, copyedit, typeset and proof manuscripts to finally prepare the manuscript for publication.<sup>1,4</sup> While a significant portion of the responsibility in speed of publication falls on the journal, authors also have an important role in providing prompt responses to the journal's feedback in such areas as manuscript revision.<sup>4</sup>

It is important to understand both the author and journal influences that affect time to publication. Transparency in the publication timeline better informs readers of potential influences, such as the COVID-19 pandemic, on the works being used in the practice of evidence-based medicine. The purpose of this study was to compare the time to publication of accepted manuscripts and content in orthopaedic sports medicine journals during the first 2 years of the COVID-19 pandemic. We hypothesized that all 3 journals would have an increased time to publication during the height of the pandemic in 2020.

Approval from the Institutional Review Board was obtained prior to the initiation of this study.

## Materials and Methods

### Journal Selection

A convenience sample of all articles published in the monthly issue during the calendar months of January, May, and September for the years 2019 through 2021 was taken from 3 of the top orthopaedic sports medicine journals, according to Scimago Journal & Country

Rank<sup>10</sup>: *Arthroscopy*, *American Journal of Sports Medicine (AJSM)*, and *Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA)*. This convenience sample was performed in order to capture representative collection of publications throughout the calendar year during months in which a single issue was published by each of these 3 journals. The dates of 1) manuscript submission, 2) manuscript acceptance, 3) electronic publication on PubMed (e-Pub), and 4) journal issue publication were extracted from each article. *AJSM* was contacted directly for submission and acceptance dates that were not publicly available for 2019 publications. The date of journal issue publication was standardized to the first day of each month. The type of article for each journal was also recorded and categorized as original research, systematic review, meta-analysis, and review article. Editorials and letters to the editor were excluded. The duration between each of these aspects of the manuscript publication process was calculated and compared between journals as well as between years.

### Statistical Analysis

Statistical analyses were performed by a Ph.D. statistician using SPSS version 28 (IBM Corporation; Armonk, New York). A one-way analysis of variance (ANOVA) test was used to detect a difference between the journals and across publication years. Fisher's exact tests were performed to compare the clinical content. An alpha level  $<0.05$  was considered statistically significant.

## Results

Eight-hundred and twenty-six journal articles were included in the convenience sample with a summary by journal and by year shown in [Table 1](#).

### Publication Times by Journal Between Years 2019 and 2021

There was a statistically significant difference in the publication timeline within each journal by year ([Table 2](#)).

*Arthroscopy* demonstrated no significant differences in the time from submission to journal publication across all 3 years ([Table 2](#)). There was a significant decrease in time from acceptance to e-Pub from 2019 to 2021 across all years compared (140 vs 74 vs 16 days;  $P < .001$ ), but an increase in the time from e-Pub to journal publication across all years (23 vs 74 vs 130 days;  $P < .001$ ). Time from acceptance to journal publication decreased over the years compared and differed significantly between 2019 and 2020 (163 vs 148 days;  $P = .004$ ) and 2019 and 2021 (163 vs 147 days;  $P = .001$ ).

In *AJSM*, there was an increase in the time from submission to journal publication between 2019 and 2021 (294 vs 329 days;  $P = .05$ ) and 2020 vs 2021 (284 vs 329 days;  $P = .001$ ). The time from acceptance to e-Pub increased between 2019 vs 2021 (79 vs 110 days;

**Table 1.** Number of Journal Articles Published in Each Journal by Year Within the Convenience Sample

Journal	Year	Article Count
<i>Arthroscopy</i>	2019	78
	2020	71
	2021	79
<i>AJSM</i>	2019	87
	2020	83
	2021	85
<i>KSSTA</i>	2019	119
	2020	118
	2021	106

$P < .001$ ) and 2020 vs 2021 (77 vs 110 days;  $P < .001$ ). There were no differences between e-Pub and journal publication between any of the years. There was an increase in the time from acceptance to journal publication between 2020 vs 2021 (128 vs 166 days;  $P = .001$ ).

*KSSTA* showed significant differences in the time from submission to journal publication over the 3 years examined (Table 2). There was an increase from 2019 to 2020 (380 vs 490 days;  $P < .001$ ) and 2019 to 2021 (380 vs 432 days;  $P < .05$ ) but a decrease from 2020 to 2021 (490 vs 432 days;  $P < .05$ ). There was an increase in time from acceptance to e-Pub from 2019 to 2020 (11 vs 14 days;  $P = .05$ ) and 2019 vs 2021 (11 vs 17 days;  $P < .001$ ). There were differences in time from e-Pub to journal publication seen across all 3 years with increased times between 2019 and 2020 (213 vs 338 days;  $P < .001$ ) and 2019 vs 2021 (213 vs 275 days;  $P < .01$ ) but a decrease from 2020 to 2021 (338 vs 275 days;  $P < .01$ ). There was an increase in the time from acceptance to journal publication over the study duration ( $P < .01$ ). Both e-Pub to journal publication (338 days) and acceptance to journal publication (352 days) timelines were the longest during the height of the COVID-19 pandemic in 2020.

### Publication Times Between Journals

Between journals, duration from acceptance to journal publication, acceptance to e-Pub, e-Pub to journal publication, and acceptance to journal publication differed significantly over the 3 years being analyzed.

**Table 2.** Summary of Publication Timeline by Journal and Year

Journal	Year	Submission to e-Pub	Submission to Journal Publication	Acceptance to e-Pub	Acceptance to Journal Publication	e-Pub to Journal Publication
<i>Arthroscopy</i>	2019	314	337	140	163	23
	2020	259	333	74	148	74
	2021	219	349	16	147	130
<i>AJSM</i>	2019	236	294	79	137	61
	2020	233	284	77	128	51
	2021	273	329	110	166	56
<i>KSSTA</i>	2019	167	380	11	224	213
	2020	153	490	14	352	338
	2021	158	432	17	291	275

Values are presented in days. E-Pub, electronic publication in PubMed.

There were no differences in time from submission to journal publication between *Arthroscopy* and *AJSM* in the 3 years analyzed. Submission to journal publication was significantly greater for *KSSTA* when compared to both *Arthroscopy* and *AJSM* in all 3 years examined (Table 3).

*Arthroscopy* demonstrated a longer time from acceptance to e-Pub when compared to *AJSM* in 2019 (140 vs 79 days;  $P < .001$ ), but a shorter timeline in 2021 (16 vs 110 days;  $P < .001$ ). *KSSTA* had a significantly shorter time from acceptance to e-Pub when compared to *AJSM* in all 3 years ( $P < .001$ ) and when compared to *Arthroscopy* in 2019 (11 vs 140 days;  $P < .001$ ) and 2020 (14 vs 74 days;  $P < .001$ ).

The time from e-Pub to journal publication was significantly shorter for both *Arthroscopy* and *AJSM* when compared to *KSSTA* in all 3 years ( $P < .001$ ). When compared to *AJSM*, *Arthroscopy* demonstrated a shorter timeline in 2019 (23 vs 61 days;  $P < .05$ ) but a longer timeline in 2021 (130 vs 56 days;  $P < .001$ ). No differences were seen in 2020 between *Arthroscopy* and *AJSM*.

### Publication Content

The content of the publications changed over the years trending to fewer clinical articles and a greater number of systematic reviews and meta-analyses (Table 4). The differences in content were statistically significant in 2019 vs 2021 ( $P < .001$ ) and 2020 vs 2021 ( $P < .01$ ). Overall, the proportion of original clinical studies published in all 3 journals combined decreased from 91% in 2019 to 90% in 2020 and 81% in 2021. The changes in journal composition trended toward an increase in the proportion of systematic reviews (8% vs 6% vs 10%), narrative review articles (<1% vs 1% vs 4%), and meta-analyses (1% vs 2% vs 4%) from 2019 to 2021.

### Discussion

Our analysis of the publication timelines among 3 orthopaedic sports medicine journals demonstrated significant delays in the publication process at various

**Table 3.** Comparison of the Average Time to Publication Timelines Between Journals by Year

Year	Journal	Submission to Acceptance	Submission to Journal Publication	Acceptance to e-Pub	Acceptance to Journal Publication	e-Pub to Journal Publication
2019	<i>AJSM vs Arthroscopy</i>	157 vs 174	294 vs 337	79 vs 140***	137 vs 163	61 vs 23*
	<i>AJSM vs KSSTA</i>	157 vs 156	294 vs 380***	79 vs 11***	137 vs 224***	61 vs 213***
	<i>Arthroscopy vs KSSTA</i>	174 vs 156	337 vs 380**	140 vs 11***	163 vs 224***	23 vs 213***
2020	<i>AJSM vs Arthroscopy</i>	156 vs 184	284 vs 333	77 vs 74	128 vs 148	51 vs 74
	<i>AJSM vs KSSTA</i>	156 vs 138	284 vs 490***	77 vs 14***	128 vs 352***	51 vs 338***
	<i>Arthroscopy vs KSSTA</i>	184 vs 138***	333 vs 490***	74 vs 14***	148 vs 352***	74 vs 338***
2021	<i>AJSM vs Arthroscopy</i>	162 vs 203*	329 vs 349	110 vs 16***	166 vs 147	56 vs 130***
	<i>AJSM vs KSSTA</i>	162 vs 141	329 vs 432***	110 vs 17***	166 vs 291***	56 vs 275***
	<i>Arthroscopy vs KSSTA</i>	203 vs 141***	349 vs 432***	16 vs 17	147 vs 291	130 vs 275***

Values are presented in days. e-Pub, electronic publication in PubMed.

\* $P < .05$ .

\*\* $P < .01$ .

\*\*\* $P < .001$ .

stages over the years surrounding the COVID-19 pandemic.

The timeliness of the publication process has a significant impact on the dissemination of information. The publication timeline in addition to other factors, such as manuscript acceptance rates and journal metrics, may influence an author's decision as to which journal to submit a manuscript.<sup>5</sup> Behera et al.<sup>11</sup> found that among anesthesia journals, there was a shorter review time during the height of the pandemic, but those journals with a greater h-index experienced a longer peer-review process. Furthermore, those manuscripts pertaining to COVID-19 had a significantly shorter turnaround time to publication. During the height of the COVID-19 pandemic in 2020, many journals aimed to speed up the publication timeline in order to disseminate pertinent information, particularly related to COVID-19, which has been termed the "infodemic".<sup>2,3,5,12</sup> Although the overall submission to publication timeline for *Arthroscopy* did not vary significantly from 2019 to 2021, *Arthroscopy* did demonstrate a shortened time from acceptance to e-publication, which is consistent with the trend toward a more rapid dissemination of information over the course of the pandemic. However, within orthopaedics, an influx of manuscripts may have overwhelmed the infrastructure of journals and placed increased demands on the need for peer reviewers and editors. *KSSTA* demonstrated the longest timelines for submission to journal publication, acceptance to journal publication, and for e-Pub to journal publication during the height of the pandemic in 2020. Although statistically significant, the differences seen in *KSSTA* for time from acceptance to e-Pub were perhaps not clinically relevant with the difference between the shortest to longest timeline being 6 days. As in many other fields, accommodations were made during the pandemic, and reviewer timeframes may have been extended, thereby resulting in a longer time to journal publication.

The changes in content of these journals over the 3 years showed an increase in the number of reviews, systematic reviews, and meta-analyses and may reflect several factors. With the suspension of many elective procedures and the necessity to isolate and avoid exposure to the novel coronavirus, the practice of elective orthopaedics was particularly affected and saw a decrease in surgeries and office visits, which impacted clinical follow-up. Although this additional time may have provided orthopaedic surgeons with the ability to refocus their attention to outstanding research projects, possibly leading to an increase in manuscript submissions, it may have also led to a decrease in new clinical articles. With the changes in clinical practice observed over the course of 2020, and as we entered into the new reality in 2021, the relative decrease in the production of clinical manuscripts occurred potentially as a result of a decreased number of surgeries performed and a disruption in data collection with a hesitancy to follow-up in person for office visits, thereby impacting data collection and new research areas of focus during the height of the pandemic in 2020. Additionally, Valderrama et al.<sup>13</sup> found that both the average number of manuscripts and the percentage of systematic reviews have the most influence on the Journal Citation reports and a significant influence on the Journal Impact Factor.

The effects of the COVID-19 pandemic on the field of orthopaedics, as in many other areas of medicine, have not yet been fully realized. Chopra et al.<sup>14</sup> found that among orthopaedic surgery peer-reviewed journals, sports medicine journals demonstrated the longest

**Table 4.** Contingency Table: Publication Content Versus Year

	Clinical	Systematic Review	Narrative Review	Meta-analysis
2019	258 (90)	22 (8)	1 (<1)	3 (1)
2020	246 (90)	17 (6)	3 (1)	6 (2)
2021	218 (81)	28 (10)	12 (4)	12 (4)

N (%).

publication timelines, including time from submission to acceptance, submission to published in press, and submission to published in print. For a specialty that relies heavily on peer-reviewed dissemination of clinical studies for quality and performance improvement, it is likely that the increased publication timelines and decrease in clinical articles could have a negative impact and is something for journals to take into consideration in the future.

### Limitations

This study is not without limitations. A convenience sample from only 3 orthopaedic sports medicine journals was used for this study, which may reflect a sampling bias. The publication frequency was not identical across all 3 journals, as *AJSM* recently began releasing 14 issues per year rather than 12. This may lead to a faster overall time to publication within this journal, as more articles are published per year. Finally, with the information available for this study, it is not possible to determine whether publication delays were caused by journal/reviewer delays or by author delays in submitting revisions.

### Conclusion

Changes in various aspects of the time to publication occurred in orthopaedic sports medicine journals in the years surrounding the peak of the COVID-19 pandemic in 2020. Orthopaedic surgeons should be aware of the possible delay in time to publication and consider online and e-publication resources for the most current evidence-based medicine, while journals may take this information into account to consider ways of improving time from acceptance to publication and in determining journal content.

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