Future Publication Rates of Abstracts Presented at American Society for Surgery of the Hand Annual Conferences From 2017-2020

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Matthew Wilson is a third-year medical student at Burrell College of Osteopathic Medicine at New Mexico State University. He is originally from Detroit, Michigan. Prior to medical school, he studied Biology at the University of Michigan and obtained a MS in Nutritional Sciences from the University of Michigan School of Public Health. He is interested in pursuing a career in Orthopaedic Surgery following medical school and hopes to return to his home state of Michigan to practice.

Conflicts of Interest Statement for Matthew Wilson

Brandon Klein is a third year orthopaedic surgery resident at Northwell Health - Huntington Hospital. He completed his undergraduate education (B.S.) at Fordham University before starting medical school at the Philadelphia College of Osteopathic Medicine. Brandon also received his Masters in Business Administration from Saint Joseph's University. Brandon plans to pursue a fellowship in sports medicine upon the conclusion of his residency training.

Visit Brandon Klein's Website

Conflicts of Interest Statement for Brandon Klein

Adam Kazimierczak is a current third year at the Philadelphia College of Osteopathic Medicine-PA. He is interested in contributing to orthopaedic literature and hopes to continue on with research through residency as well.

Connect with Adam Kazimierczak on LinkedIn

Conflicts of Interest Statement for Adam Kazimierczak

Stanley Uche is an aspiring surgeon with the goal of serving in a rural community and being a part of global medical mission work. He attended the university of Texas at Arlington for College where he received his BS in Biology. He is currently a student at Burrell College of Osteopathic Medicine.

Conflicts of Interest Statement for Stanley Uche

Lucas Bartlett is a rising 4th year orthopedic surgery resident on Long Island, NY. Growing up an avid Boston Sports fan, he will be applying for a fellowship in sports medicine.

Conflicts of Interest Statement for Lucas Bartlett

Dr. Cohn is a board certified orthopaedic surgeon and sports medicine specialist with a clinical focus on arthroscopic treatment of the knee, shoulder, hip, ankle, and elbow. Dr. Cohn also specializes in anterior cruciate ligament reconstruction, hip labral injury and imingement, and shoulder arthroscopy and shoulder replacement surgery.

After graduating from Mount Sinai School of Medicine with distinction in research, Dr. Cohn performed his orthopaedic surgery residency at NYU Hospital for Joint Diseases where he was recognized for his leadership and clinical teaching. He completed his sports medicine fellowship training at Massachusetts General Hospital and Harvard Medical School. As a fellow in sports medicine and shoulder surgery at Massachusetts General Hospital, Dr. Cohn served as an assistant team physician for the New England Patriots, Boston Red Sox, Boston Bruins, New England Revolution, and numerous colleges and high schools, gaining experience in treating athletes at all levels.

Currently, Dr. Cohn is the team orthopaedic surgeon for Hofstra University and several Long Island high schools. He also serves as the director of Northwell Health's Dance Medicine and Performing Arts Program, Young Adult Hip Preservation Program, and as the medical director of the Hofstra University Athletic Training Program. Dr. Cohn's academic titles include Assistant Professor of Orthopaedic Surgery at the Zucker School of Medicine and the Associate Program Director of the Northwell Health Plainview Hospital Orthopaedic Residency Program.

Dr. Cohn's research interests include clinical outcomes of sports medicine procedures including arthroscopic surgery and ligament reconstruction. He has published in numerous peer-reviewed orthopaedic journals on topics including shoulder instability, shoulder injuries in throwing athletes, groin injuries, and hip arthroscopy.

Visit Dr. Cohn's Website

Conflicts of Interest Statement for Dr. Cohn

Dr. Kate Nellans is a board-certified, fellowship-trained Hand Surgeon practicing out of North Shore University Hospital and Long Island Jewish Medical Center at Northwell Health. Her undergraduate education was at the University of Michigan where she graduated with honors and was also an All-American gymnast. She attended Columbia University College of Physicians & Surgeons for
Journal of Orthopaedic Experience & Innovation

Purpose
Annual meetings held by the American Society for Surgery of the Hand (ASSH) highlight a variety of pre-publication research on the hand and upper extremity. We sought to evaluate publication trends and factors associated with the publication of abstracts presented at recent ASSH annual conferences.

Methods
There were 2,373 abstracts presented at ASSH annual conferences from 2017-2020. These abstracts were identified from program information on the ASSH website. PubMed and Google Scholar were queried to identify publication of these abstracts using article title and each author listed. For published manuscripts, the journal, impact factor (IF), level of evidence (LOE), and time to publication were recorded.

Results
The overall publication rate was 43.9%. Podium abstracts had a higher publication rate (55.0% +/- 14.9%) than poster abstracts (41.0% +/- 8.5%) (p<0.0001). The time to publication from presentation was 12.1 +/- 6.1 months. Published abstracts had a higher LOE (3.5 +/- 0.9) than non-published abstracts (3.6 +/- 0.8) (p=0.03). The journal IF for published abstracts was 2.4 +/- 1.3. Podium abstracts had a higher average impact factor (2.6 +/- 1.5) than poster abstracts (2.4 +/- 1.5) (p=0.01). Journal of Hand Surgery (JHS) (34.4%; IF: 2.3) was the most common journal of published manuscripts. There were no differences in LOE or IF for Resident and Fellows (R&F) abstracts compared to General Submission abstracts.

Conclusions
Publication rates of abstracts presented at ASSH annual conferences from 2017-2020 are similar to previously reported literature. Podium abstracts continue to have a higher publication rate than poster abstracts. There was no difference in publication rate between R&F abstracts and General Submission abstracts.

INTRODUCTION
Annual meetings held by the American Society for Surgery of the Hand (ASSH) function as a platform to highlight a wide range of basic science, clinical, and outcome-based research on the hand and upper extremity. Presentation of pre-publication abstracts at these meetings is one way that this research is disseminated ("About The Journal" 2022). Previous literature has estimated that future publication rates of abstracts presented at major orthopaedic surgery conferences range from 34% to 67% (Narain et al. 2017; Kinsella et al. 2015; Gavazza, Foulkes, and Meals 1996). Additionally, abstracts with a stronger Level of Evidence (LOE) were associated with a higher publication rate in orthopaedic journals, as well as a shorter time to publication after initial presentation (Voleti et al. 2013). Previous literature reviewing abstracts presented at ASSH conferences has shown publication rates from 32% to 53.6%, however,

medical school and also obtained her Masters of Public Health at the Mailman School of Public Health at Columbia. She then completed her residency at Columbia’s New York Orthopedic Hospital, where she served as chief resident. Dr. Nellans then returned to the University of Michigan for her Hand Fellowship training under Dr. Kevin Chung in the Department of Plastic Surgery. This fellowship gave her broad surgical exposure to both microvascular techniques and congenital hand conditions.

Since joining Northwell, Dr. Nellans has been passionate about both medical student and resident education in the field of orthopedic surgery. She is the Program Director for the Orthopedic Residency based out of Long Island Jewish Hospital, and is the orthopedic departmental advisor for students at the Zucker School of Medicine at Hofstra/Northwell.

Visit Dr. Nellans's Website
Visit the Open Payments Data Page for Dr. Nellans
Conflicts of Interest Statement for Dr. Nellans
the most recent conference evaluated was the 2014 annual meeting. Furthermore, the number of abstracts presented at the annual ASSH meeting has grown since these trends were most recently evaluated. Between 1992 and 2014, the average number of abstracts presented annually was 146. This has increased immensely in recent years, with 618 abstracts presented at the 2020 annual meeting (Stepan et al. 2020).

This updated review will provide insight into the current trends in abstracts presented at ASSH in order to evaluate the following questions: 1) Has the future publication rate of abstracts presented at ASSH annual conferences changed with an increasing number of presented abstracts?; 2) What factors are associated with a higher publication rate?; 3) In which journals are the final manuscripts of presented abstracts published?; and 4) Is there a difference in the future publication rate, level of evidence, or journal impact factor in designated "Resident & Fellow" abstracts?

METHODS

ASSH annual meeting conference programs, published on the ASSH website, from 2017 to 2020 were reviewed. Since previous literature has demonstrated that a 24-month timeframe was needed to accurately measure publication rates, the 2021 and 2022 annual meetings were not included in this analysis (Abzug et al. 2014). Abstract titles, authors, anatomic subtype (as assigned category per the ASSH conference program), type of presentation (poster or podium), and whether the abstracts were presented under the "Residents & Fellows" (R&F) section of the conference were recorded. Abstracts not designated as R&F were categorized as "General Submission" abstracts. As no distinction was made for medical students with primary authorship, these abstracts were likely categorized as "General Submission". Two online databases, PubMed (National Library of Medicine, Bethesda MD) and Google Scholar (Alphabet Inc., Mountain View CA), were queried independently by two authors to determine if each abstract was published. The identification of a full-length manuscript in a peer-reviewed journal was required to be considered a published manuscript. In order to limit the exclusion of manuscripts that underwent a title change between ASSH abstract submission and publication date, each database was searched for the abstract title and author(s) independently.

For each published manuscript, the date of publication, journal name, and the number of authors were recorded from these online databases. Overall future publication rate, as well as the 2-year publication rate, were calculated for posters and podium abstracts. A total of eighteen abstracts were published in peer-reviewed journals prior to the corresponding annual meeting presentation. These abstracts were assigned a time-to-publication of zero months in calculations. The 2-year publication rate was utilized for statistical comparison. The journal impact factor (IF) was recorded directly from the publishing journal’s website at the time of data collection to objectively measure each published manuscript’s relative impact. Manuscripts were assigned a LOE by the ASSH conference. Manuscripts that were not assigned a LOE (animal studies, cadaver studies, basic science studies, financial studies, biomechanical studies) were excluded from calculations regarding LOE.

Statistical analysis was performed using Microsoft Excel (Microsoft Corporation, Redmond WA). Descriptive outcomes were described as means with standard deviations and percentages when appropriate. T-tests and two sample Z-tests for proportions were utilized to determine the independence of associated variables. Pearson correlation was conducted to evaluate trends in changes in the total number of abstracts presented and the total number of publications by category.

RESULTS

There were 2,373 abstracts (poster: 2043; podium: 330) presented at ASSH conferences from 2017-2020. Overall, 1,044 (43.9%) of abstracts were published within 24 months from presentation. Overall, podium abstracts had a higher publication rate (55.0% +/- 14.9%) than poster abstracts (41.0% +/- 8.5%) (p<0.0001). No other significant differences in publication rate were found (Table 1).

Published abstracts were associated with a stronger LOE (3.5 +/- 0.9) than non-published abstracts (3.6 +/- 0.8) (p=0.03). There was no difference between poster and podium abstracts, R&F poster and R&F podium abstracts, or between R&F and General Submission abstracts. Trends in the number of abstracts presented within particular anatomic subcategories are shown in Figure 1. There was an increased number of abstracts published as "Hand" (R=0.91; p=0.03), "Elbow, Forearm, and Shoulder" (R=0.84; p=0.03), and fewer abstracts presented as "Pediatrics and Nerve" (R=-0.95; p=0.01). There was an increasing number of publications in "Hand" (R=0.94; p=0.02) and decreasing publications in "Pediatrics and Nerve" (R=-0.88; p=0.05) subcategories, shown in Figure 2.

The average time to publication from presentation was 12.1 +/- 6.1 months. There was no difference in time to publication or LOE between poster and podium abstracts, R&F poster and R&F podium abstracts, or between R&F
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Table 1. Factors Associated With Publication For Poster And Podium Abstracts From ASSH Annual Meetings From 2017-2020

<table>
<thead>
<tr>
<th></th>
<th>Publication Rate</th>
<th>Time to Publication (months)</th>
<th>Level of Evidence</th>
<th>Impact Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>43.9%</td>
<td>12.1</td>
<td>3.5</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>All Abstracts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poster</td>
<td>41.0%</td>
<td>12.1</td>
<td>3.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Podium</td>
<td>55.0%</td>
<td>12.2</td>
<td>3.4</td>
<td>2.6</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.0001</td>
<td>0.47</td>
<td>0.25</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Resident And Fellow Abstracts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poster</td>
<td>40.3%</td>
<td>15.6</td>
<td>3.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Podium</td>
<td>53.6%</td>
<td>11.2</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>p-value</td>
<td>0.17</td>
<td>0.32</td>
<td>0.43</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>Comparisons</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Submission</td>
<td>46.9%</td>
<td>12.2</td>
<td>3.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Resident and Fellow</td>
<td>49.0%</td>
<td>11.9</td>
<td>3.6</td>
<td>2.2</td>
</tr>
<tr>
<td>p-value</td>
<td>0.76</td>
<td>0.34</td>
<td>0.06</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Podium abstracts were associated with a higher publication rate and IF (p<0.05) than poster abstracts when reviewing all abstracts. There were no differences found for R&F abstracts from General Submission abstracts.

Figure 1. Number Of Total Abstracts By Category Presented At Annual ASSH Conference From 2017-2020
and General Submission abstracts. Abstracts were published in 122 unique journals. The average IF of journals for published abstracts was 2.4 +/- 1.3. Published podium abstracts had a higher average IF (2.6 +/- 1.5) compared to published poster abstracts (2.4 +/- 1.3) (p=0.01). The most common journal for publication is the Journal of Hand Surgery (JHS), with 55.5% (n=193) of the total published manuscripts (Table 2). There was no significant difference in the distribution of accepting journals between poster and podium presentations.

DISCUSSION

Previous literature has evaluated abstracts presented at ASSH annual conferences, however, the most recent conference evaluated was held in 2014 (Stepan et al. 2020). This study reviewed current publication rates, as well as factors associated with publication, of abstracts presented at ASSH annual meetings from 2017-2020. Abstracts presented during the R&F portion of the ASSH meetings were evaluated separately, an aspect that was not performed in previous reviews. The overall publication rate for abstracts presented at ASSH annual conferences was 43.9%. While this aligns with previous literature demonstrating a publication rate of 46% for meetings from 2000-2005, it is considerably lower (53.6%) than that reported by Stephan et al for 1992-2014 meetings (Stepan et al. 2020; Abzug et al. 2014). This lower publication rate could reflect the increased volume of presented abstracts in recent years. This study demonstrated that published abstracts had a significantly stronger LOE than those which did not result in publication. Studies focusing on the hand were associated with significantly increased publication rate when compared to other anatomic foci. Publication rates may be enhanced with study designs of a stronger level of evidence (i.e. randomized controlled trials, meta-analyses) and with focus on the hand. Peake et al evaluated the future publication rates of abstracts presented at the American Association for Hand Surgery (AAHS) annual conference, another meeting where hand and upper extremity research is disseminated. In AAHS annual meetings from 2012-2016, 47% of the 1,135 presented abstracts were published, demonstrating similar results to this review (Peake et al. 2019). This review demonstrates a higher publication rate for podium abstracts (55.0%) when compared to posters (41.0%) (p<0.0001). Nearly identical findings have been previously reported for podium and poster abstracts presented at ASSH meetings, as well as multiple other orthopaedic subspecialty meetings (Narain et al. 2017; Stepan et al. 2020; Bowers et al. 2017; Williams et al. 2017).

This review revealed no difference in the overall publication rate between R&F abstracts and General Submission abstracts. Within the R&F abstract category, there was no difference in publication rate between podium and poster abstracts. Therefore, it is reasonable to conclude that residents and fellows are presenting research of similar quality.
to General Submission abstracts. In review of the literature, no prior evaluation of resident and fellow-specific abstracts was identified at ASSH or other orthopaedic subspecialty annual meetings.

Increased time to publication from abstract presentation to full-length manuscript has been shown to be an independent factor of changes to primary outcomes and results (Bhandari et al. 2002). As such, a shorter time to publication may result in a full-length manuscript that is more consistent with its presented abstract at society meetings. In this review, published abstracts had a mean time to publication of 12.1 months, with no differences between poster and podium abstracts. Kuczmarski et al previously demonstrated a time to publication of 16.7 months for abstracts presented at ASSH conferences from 2007-2012, while Abzug et al reported an average greater than 25 months for those presented between 2000-2005 (Abzug et al. 2014; Kuczmarski et al. 2020). In comparison, abstracts presented at AAOS annual meetings have been reported to have an average time to publication of 17.6 months (Bhandari et al. 2002). This review indicates that abstracts presented at recent ASSH conferences have a decreased time to publication when compared to other highly regarded orthopaedic conferences. With a shorter time to publication, the risk of inconsistencies between abstract and future manuscript may be minimized, and therefore abstracts presented at ASSH annual meetings may be a more reliable source of new research compared to other conferences.

Quality of research was objectively assessed using the LOE of the abstract and the IF of the publishing journal. Published ASSH abstracts were found to have stronger LOE than abstracts that were not published. We found no difference in LOE between published podium or poster abstracts. However, manuscripts of podium abstracts were published in journals with higher IFs than that of poster abstracts. While IF of journals publishing manuscripts presented at ASSH conferences have not been previously evaluated, similar findings were reported for American Orthopaedic Society for Sports Medicine (AOSSM) annual meetings, as podium abstracts were published in higher impact journals than poster abstracts (Gowd et al. 2018). In addition to having a higher likelihood of future publication, podium abstracts are also more likely to be published in high-impact journals and therefore may be more influential in guiding clinical decision-making.

Research presented at ASSH annual meetings is most frequently published in the Journal of Hand Surgery. This is likely due to the affiliation between the sponsoring society and journal ("About The Journal" 2022). In this review, 35.5% of manuscripts that were published within two years of presentation were accepted into JHS, the leading hand journal in the orthopaedics and hand category of journals based on IF and Citerscore ("About The Journal" 2022). Previous reviews of ASSH annual conferences have also shown JHS to be the most common journal of published manuscripts presented at ASSH annual meetings (Abzug et al. 2014; Kuczmarski et al. 2020). While some journals possess a right of first refusal policy, no such policy exists for ASSH abstract presentations. Absence of this policy allows researchers the freedom to choose a journal for peer-review, which may encourage increased abstract submissions to ASSH annual conferences, thus providing the potential for higher quality research to be presented. However, as many manuscripts were still published in JHS, authors likely consider this a high-quality journal and an ideal place of future publication.

This review was not without limitations. While a thorough effort was made to identify all published manuscripts

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Table 2. Publication By Journal From Abstracts Presented At ASSH Annual Meetings From 2017-2020

<table>
<thead>
<tr>
<th>Journal</th>
<th>IF</th>
<th>Total Number</th>
<th>Overall</th>
<th>General</th>
<th>R&amp;F</th>
<th>p-value</th>
<th>General</th>
<th>R&amp;F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal of Hand Surgery</td>
<td>2.342</td>
<td>193</td>
<td>35.3%</td>
<td>50.2%</td>
<td>41.7%</td>
<td>0.33</td>
<td>49.2%</td>
<td>40.0%</td>
<td>0.59</td>
</tr>
<tr>
<td>Hand</td>
<td>1.140</td>
<td>71</td>
<td>12.9%</td>
<td>17.4%</td>
<td>27.8%</td>
<td>0.13</td>
<td>14.8%</td>
<td>20.0%</td>
<td>0.67</td>
</tr>
<tr>
<td>PRS</td>
<td>4.730</td>
<td>39</td>
<td>7.1%</td>
<td>9.8%</td>
<td>5.6%</td>
<td>0.41</td>
<td>9.8%</td>
<td>20.0%</td>
<td>0.35</td>
</tr>
<tr>
<td>JSES</td>
<td>3.019</td>
<td>23</td>
<td>4.2%</td>
<td>5.2%</td>
<td>11.1%</td>
<td>0.16</td>
<td>6.6%</td>
<td>0.0%</td>
<td>0.41</td>
</tr>
<tr>
<td>Journal of Wrist Surgery</td>
<td>N/A</td>
<td>18</td>
<td>3.3%</td>
<td>4.2%</td>
<td>5.6%</td>
<td>0.70</td>
<td>4.9%</td>
<td>10.0%</td>
<td>0.52</td>
</tr>
<tr>
<td>JBJS</td>
<td>4.578</td>
<td>14</td>
<td>2.6%</td>
<td>2.8%</td>
<td>0.0%</td>
<td>0.31</td>
<td>8.2%</td>
<td>10.0%</td>
<td>0.85</td>
</tr>
<tr>
<td>JHAM</td>
<td>2.090</td>
<td>14</td>
<td>2.6%</td>
<td>4.5%</td>
<td>2.8%</td>
<td>0.62</td>
<td>0.0%</td>
<td>0.0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Journal of Pediatric Orthopaedics</td>
<td>2.110</td>
<td>11</td>
<td>2.0%</td>
<td>2.8%</td>
<td>0.0%</td>
<td>0.31</td>
<td>4.9%</td>
<td>0.0%</td>
<td>0.47</td>
</tr>
<tr>
<td>JAOS</td>
<td>3.020</td>
<td>11</td>
<td>2.0%</td>
<td>3.1%</td>
<td>5.6%</td>
<td>0.45</td>
<td>0.0%</td>
<td>0.0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>394</td>
<td>72.0%</td>
<td>287</td>
<td>36</td>
<td>61</td>
<td>10</td>
<td></td>
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</tr>
</tbody>
</table>

No differences were found between R&F and General Submission manuscript destination for poster or podium abstracts presented. PRS: Plastic and Reconstructive Surgery; JSES: Journal of Shoulder and Elbow Surgery; JBJS: Journal of Bone and Joint Surgery; JHAM: Journal of Hand and Microsurgery; JAOS: Journal of the American Academy of Orthopaedic Surgeons.
of presented abstracts, unidentified manuscripts may exist. While two databases (PubMed and Google Scholar) were queried for manuscripts, it is possible that manuscripts were published in journals not included within these databases. As the review process was limited to only abstract title and author names, manuscripts that underwent significant changes in these aspects may have led to inaccurate search results, underestimating the overall future publication rate. Previous reviews evaluating publication rates from ASSH conferences analyzed abstracts presented upwards of 10 years prior to their study (Stepan et al. 2020; Abzug et al. 2014). Since this study reviewed ASSH conference abstracts published within 6 years of presentation, it is likely that there will be a higher publication rate when all manuscripts reach a time point similar to previous reviews. However, previous studies have identified two years as an adequate interval to identify most published research presented at orthopaedic society meetings.

Overall, publication rates of abstracts presented at recent ASSH annual conferences from 2017-2020 were similar to reports from previous years even with the increased number of abstracts presented compared to previous studies. Podium abstracts and abstracts with a stronger LOE were published in higher-impact journals. Abstracts presented at the Residents & Fellows meeting had a similar future publication rate as abstracts presented at the general meeting. Journal of Hand Surgery was the most common journal for published manuscripts. ASSH annual meetings continue to showcase high-quality research in hand and upper extremity with a significant two-year publication rate in high-impact journals.

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REFERENCES


