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# High Publication Rate of Abstracts Presented at Lumbar Spine Research Society Meetings

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## ABSTRACT

**Background:** Although publication rates from multiple orthopedic research conferences have been published in the literature, the publication rates of abstracts presented at the Lumbar Spine Research Society (LSRS) meetings have never been reported. The purpose of this study is to evaluate the publication rates from the LSRS annual meeting years 2008–2012 and then to compare those rates with that of other spine research society meetings.

**Methods:** Podium presentations from 2008 to 2012 and poster presentations from 2010 to 2012 were reviewed. For each presentation, a PubMed search was performed to determine if a full-text publication existed.  $\chi^2$  tests were used to compare LSRS publication rates to those of other spine meetings. In addition, impact of published articles was evaluated by average citation count and average journal impact factor.

**Results:** From 2008 to 2012, a total of 332 podium and poster presentations were identified. The overall publication rate was 55.1% (183/332). For podium presentations, this was greatest in 2012 (66.0%) and lowest in 2008 (51.5%). For poster presentations, this was greatest in 2012 (53.6%) and lowest in 2010 (25.0%). The publication rate of presentations is statistically greater than the publication rates of Eurospine (37.8%,  $P < .001$ ), North American Spine Society (40.0%,  $P < .001$ ), The International Society for the Study of the Lumbar Spine (45.0%,  $P = .012$ ), and the Scoliosis Research Society (47.0%,  $P = .042$ ) but not statistically different than that of Cervical Spine Research Society (65.7%,  $P = .059$ ). In addition, the average citation count per published article categorized by year ranged from 13 to 31. The average journal impact factor of published articles categorized by year ranged from 2.31 to 2.55.

**Conclusions:** While LSRS is a relatively young society, these findings point to the high quality of presentations at this scientific meeting. These findings speak to the scientific rigor of presentations at LSRS.

**Clinical Relevance:** This study helps clinicians and scientists gauge the quality of a research meeting and make informed choices on which gatherings to attend.

Lumbar Spine

Keywords: Lumbar Spine Research Society, publication rate, annual meeting, podium, posters

## INTRODUCTION

Annual scientific meetings serve as a forum for disseminating new research findings prior to publication in peer-reviewed journals. Because novel findings presented at these meetings often impact current orthopedic practice and are commonly referenced in major orthopedic textbooks, the research presented should be of high caliber.<sup>1,2</sup> Common wisdom would suggest that quality studies should eventually result in full-text publications. Therefore, the quality of a scientific meeting often directly correlates with the rate of publication of the abstracts presented.<sup>3–5</sup>

The Lumbar Spine Research Society (LSRS) was founded in 2008 and is affiliated with other spine societies such as AOSpine North America, Cervical

Spine Research Society (CSRS), and Scoliosis Research Society (SRS) through membership in the Council of Surgical Spine Societies. The mission of the LSRS is to fill the need for a scientific gathering focused on the surgical treatment of the lumbar spine. The society accomplishes this by maintaining an academic annual meeting with no corporate funding, which offers an opportunity for research presentations followed by discussion.<sup>6</sup> This gathering is an occasion to advance the body of knowledge surrounding the lumbar spine in order to improve patient care. The number of abstracts presented has gradually increased since the annual meetings for this society began in 2008.

As one considers the impact and quality of papers presented at research societies, the rate of eventual

publication of the work presented is often considered. Publication in a peer-reviewed journal endorses the rigor, significance, and originality of research, as a detailed manuscript must withstand the scrutiny of multiple editors. Although this type of study has been conducted and widely accepted for other spine societies that are members of the Council of Surgical Spine Societies and for a variety of other orthopedic society meetings, it has never been applied to the annual gathering of the LSRS.<sup>2,4,5,7–12</sup>

In this context, the purpose of the present study is to evaluate the publication rates from the LSRS annual meeting years 2008–2012 and then to compare those rates with that of other spine research society annual meetings in order to evaluate the comparative impact of this relatively young society. The hypothesis is that the overall publication rate of podium and poster presentations at LSRS annual meeting years 2008–2012 will be statistically equivalent to those of other spine research society annual meetings reported in the literature.

## MATERIALS AND METHODS

This is an observational study. LSRS podium presentations from 2008 to 2012 and posters from 2010 to 2012 were identified from published meeting programs. Posters were first presented at LSRS in 2010. These represent all the abstracts accepted by all LSRS meetings through 2012.

For each abstract, we searched PubMed to determine if a full-text publication existed. Searches included the interval 4 years prior to and following a given meeting. A 4-year interval was chosen because studies have shown that full-text articles are usually published in this time frame.<sup>3,9,13–17</sup> First, the title was searched. If the title was not found, each individual author's name was searched. If authors and content found on PubMed were similar to the abstract, then the abstract was considered published. This search methodology is similar to those of previous published studies.<sup>2,4,5,10</sup> The type of study, clinical or basic science (basic lab studies, biomechanical studies, cadaveric studies, animal studies), was recorded. In addition, the journals in which more than 1 paper were published in were also recorded. Further, the citation count for each published article was recorded using Google Scholar. The average citation count categorized by year was then calculated. Lastly, the journal impact factor for each published article was recorded using

**Table 1.** Publication rates from 2008 to 2012 LSRS annual meetings.

Year	Total	Published	Unpublished	Publication Rate, %
Podium presentations				
2008	33	17	16	51.5
2009	55	31	24	56.4
2010	48	25	23	52.1
2011	49	30	19	61.2
2012	50	33	17	66.0
Poster presentations				
2010	16	4	12	25.0
2011	40	21	19	52.5
2012	41	22	19	53.7
All presentations				
Total	332	183	149	55.1

the 2008–2012 Journal Citation Reports. The average journal impact factor categorized by year was then calculated.

## Statistical Methods

$\chi^2$  tests, performed using Microsoft Excel, were used to compare LSRS publication rates to those of other spine meetings reported in the literature ( $P < .05$  was considered significant).

## RESULTS

From 2008 to 2012, a total of 332 podium and poster presentations were identified (see Table 1). The publication rate for podium presentations in 2008 was 51.5% and trended to increase through 2012 to 66.0%. The publication rate for posters showed a similar increasing trend. The overall publication rate for the lifetime of the meeting is 55.1% (183/332). Of studies that were published, 71.0% was clinical and 29.0% was basic science. Podium presentations were published at a rate of 66.0% in 2012 while poster presentations were published at a rate of 53.7% in 2012. However, these rates were not statistically different ( $P = .231$ ) (Figure 1).

In comparison to other published rates of publication from other spine conferences, the LSRS meeting publication rate, including both podium and poster presentations, was statistically greater than that of the meetings of the North American Spine Society (NASS) (40%,  $P < .001$ , 1990–1992), SRS (47%,  $P = .042$ , 1991–1993), International Society for the Study of the Lumbar Spine (ISSLS) (45%,  $P = .012$ , 1991–1993), and Eurospine (37.8%,  $P < .001$ , 2000–2003) (Table 2).<sup>3,18</sup> The publication rate of podium presentations at the LSRS annual meetings from 2008 to 2012 (136/235, 57%) was statistically equivalent to that of the CSRS meetings

**Table 2.** Summary of overall publication rates from other spine-specific meetings.

Spine-Specific Meeting	Meeting Years Evaluated	Overall Publication Rate, %	P-Value*
The International Society for the Study of the Lumbar Spine (ISSLS)	1991–1993	45.0	<b>.012</b>
Scoliosis Research Society (SRS)	1991–1993	47.0	<b>.042</b>
North American Spine Society (NASS)	1990–1992	40.0	<b>&lt;.001</b>
EuroSpine	2000–2003	37.8	<b>&lt;.001</b>
Cervical Spine Research Society (CSRS)	2007–2011	65.7	<b>.059</b>

This is in comparison to the results of the current LSRS study data (2008–2012) for which the overall publication rate is 55.1%. Bold equals statistically significant.

\*Significant at  $P < .05$ .

from 2007 to 2011 (211/321, 65.7%,  $P = .059$ , 2007–2011) (Table 2).<sup>5</sup>

For those presentations from LSRS that were published, the top 5 destination journals for publication were *Spine* 32.2% (59/183), *The Spine Journal* 16.4% (30/183), *Journal of Neurosurgery: Spine* 9.8% (18/183), *Journal of Spinal Disorders & Techniques* 4.4% (8/183), and *The Journal of Bone and Joint Surgery* 3.3% (6/183). Journals in which 2 or more papers were published in along with their respective impact factors, which were obtained from the 2012 Journal Citation Report, are shown in Table 3.

The average number of citations per published article ranged from 31 in 2008 to 13 in 2012. The average number of citations per published article for the years in between is shown in Table 4. In addition, the average journal impact factor of published articles ranged from 2.39 in 2008 to 2.53 in 2012. The average journal impact factor of published articles for the years in between is shown in Table 5.

## DISCUSSION

The study of publication rates at spine scientific gatherings is important because it allows one to

assess the efficacy of the meetings to allow for early dissemination of information.<sup>10</sup> This can help clinicians and scientists make informed choices on which gatherings will offer the best prediction of data to be published in the coming years. Further, conference attendees can then use these publication rates to decide how likely the results of the presentation are to weather the peer review publication process.

The current study highlights that the rate of publication for LSRS presentations has been high and increasing over time. Further, this rate of publication is statistically greater or equivalent to the publication rate from other spine societies (LSRS vs CSRS, NASS, SRS, ISSLS, and Euro-spine). These results refuted our hypothesis. In addition, the average citation per published article was as high as 31 in 2008 and the average journal impact factor was as high as 2.55 in 2010. These metrics speak to the quality of the research presented at LSRS.

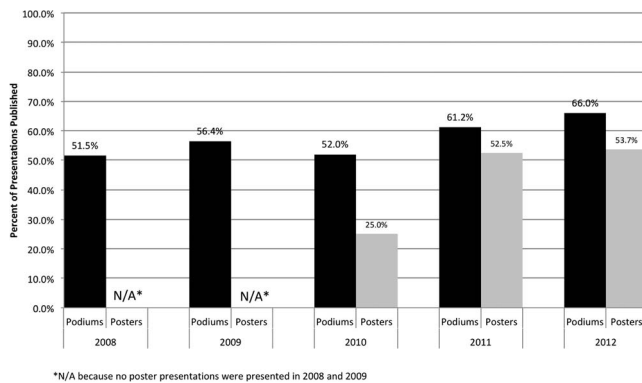
As would be expected, podium presentations were published at an overall higher rate than poster presentations. This is consistent with what has been observed at other society meetings,<sup>10,11</sup> and presumably reflects that the highest quality papers are selected for podium presentation.<sup>3</sup> That said, the

**Table 3.** Journals publishing podium or poster presentations from the Lumbar Spine Research Society annual meetings (2008–2012).

Journal Name <sup>a</sup>	Number of Publications	Impact Factor <sup>b</sup>
<i>Spine</i>	59	2.16
<i>The Spine Journal</i>	30	3.22
<i>Journal of Neurosurgery: Spine</i>	18	1.98
<i>Journal of Spinal Disorders &amp; Techniques</i>	8	1.77
<i>The Journal of Bone and Joint Surgery</i>	6	3.23
<i>Neurosurgery</i>	5	2.53
<i>European Spine Journal</i>	5	2.13
<i>The International Journal of Spine Surgery (SAS Journal)</i>	4	0.30
<i>Journal of Orthopaedic Research</i>	3	2.88
<i>World Neurosurgery</i>	3	1.77
<i>Clinical Biomechanics</i>	2	1.87
<i>Tissue Eng Part A</i>	2	4.07
<i>Orthopedics</i>	2	1.05
<i>Neurosurgical Focus</i>	2	2.49
<i>Journal of Pediatric Orthopaedics</i>	2	1.16

<sup>a</sup>Journals with  $\geq 2$  papers published.

<sup>b</sup>Impact factor from 2012 Journal Citation Reports.



**Figure 1.** Publication rates of podium and poster presentations from the Lumbar Spine Research Society annual meetings (2008–2012).

difference in the rate of publication of podium and poster presentations in the 2012 LSRS data was not statistically significant.

Strengths of the present study include the novelty of the present analysis for the LSRS annual meeting, the rigorous search methodology, and the ability to analyze the acceptance rate data for a growing meeting from its very inception. However, this study does have some limitations. For example, the publication rates cited for other spine meetings were from different calendar years than the LSRS publication rate calculated in this study. For this reason, the apparently greater publication rate of studies presented at LSRS meeting may be contributed to by a secular trend of increasing publication rates of studies presented at meetings generally. Furthermore, the authors were only able to analyze the publication rates of studies that were accepted for presentation at LSRS and not those that were rejected. In addition, several studies that were eventually published did not include their level of evidence. Due to the large variation in study designs, the authors of the current study did not attempt to assign the level of evidence due to concerns regarding accuracy. Therefore, this variable was not analyzed. Further, some publications might be missed because only PubMed was utilized in the search. Lastly, a comparison of average citation count and average journal impact factor

**Table 4.** Average number of citations per published article by year.

Podium and Poster Presentations		
Year	Published	Average # of Citations
2008	17	31
2009	31	27
2010	29	28
2011	51	14
2012	55	13

**Table 5.** Average journal impact factor of published articles by year.

Podium and Poster Presentations		
Year	Published	Average Journal Impact Factor <sup>a</sup>
2008	17	2.39
2009	31	2.43
2010	29	2.55
2011	51	2.31
2012	55	2.53

<sup>a</sup>Impact factor from 2008 to 2012 Journal Citation Reports.

between different societies could not be performed. This was due to lack of necessary publication data from other societies.

In summary, the publication rate of studies presented at the LSRS annual meeting was statistically greater than those of studies presented at the meetings of multiple other spine societies (NASS, SRS, ISSLS, and Eurospine) and was statistically similar to that of CSRS. The high publication rate of LSRS abstracts speaks to the quality of the research presented at those meetings. These novel findings can help clinicians and scientists gauge the quality of a research meeting and make informed choices on which gatherings to attend.

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