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# A Decade of Change: Levels of Evidence at the ASSH Podium from 2010-2019

## Introduction

In an effort to answer clinical questions and advance their careers<sup>1,2</sup>, academic clinicians strive to generate research for presentation at scientific meetings. To evaluate their quality and generalizability, level of evidence (LOE) has become a nearly ubiquitous component of any manuscript.<sup>3</sup> Many surgical journals now require authors to report a LOE as a marker for overall quality.<sup>4</sup> In orthopaedics<sup>5-10</sup> and plastic surgery<sup>11-13</sup> literature, there has been a recent increase in the LOE of publications.

Abstracts at the American Society for Surgery of the Hand annual meeting (ASSH-AM) are an important way for surgeons to learn about medical advancement in the field of hand surgery.<sup>14</sup> Podium presentations in particular present an opportunity for authors to receive constructive criticism from experts. This may in part explain why abstracts accepted to ASSH-AMs are published at high rates.<sup>15,16</sup> The purpose of our study was to assess trends in the LOE and characteristics of ASSH-AM abstracts over a ten-year period.

## Methods

This was an observational study of all podium presentations at ASSH-AM occurring from 2010-2019 (Figure 1). Past abstract books were obtained through the ASSH website.<sup>17</sup> Abstracts were reviewed by two authors independently to determine characteristics. This included

determination of the number of patients, evidence of multicenter collaboration, and use of a national inpatient database. Where the patient number was not recorded, the number of cases was instead used as a proxy, with larger national database studies excluded from this analysis. The ASSH Evidence-Based Practice Committee assigns a LOE to each abstract accepted for presentation at the annual meeting, which was also recorded.

Abstracts were broken down by focus and topic. Abstract foci was characterized as either distal radius fracture (DRF), flexor tendon (FT) injury, carpal tunnel syndrome (CTS), cubital tunnel syndrome, Dupuytren's contracture, thumb carpometacarpal (CMC) arthritis, peripheral nerve injury, and congenital upper extremity deformity. In addition, each abstract was categorized based on more general topics including basic science, cost analysis, opioid and pain control, and medical education. Last, where possible, presentations were stratified based on if they focused on adult or pediatric patients.

The data was curated as totals across each year from 2010 to 2019. Subsequently, it was organized into 5-year intervals, with one set from 2010-2014 and the other from 2015-2019. Chi-squared and Fisher's exact tests were utilized to compare categorical variables, and Mann-Whitney U tests were used to compare continuous variables between time periods. All statistics were conducted assuming a significance threshold of  $p < 0.05$ .



Figure 1. ASSH Annual Meeting Abstract Books, 2010-2019

## Results

A total of 787 podium presentations were available for review: 382 (48.5%) from 2010-2014 and 405 (51.5%) from 2015-2019 (Table 1). The proportion of LOE 1 or 2 studies was significantly higher in the second half of the decade (24.0% vs 16.0%,  $p=0.005$ ). Correspondingly, there was also a higher number of RCTs (9.6% vs 5.2%,  $p=0.019$ ) in 2015-2019 compared to 2010-2014. The number of patients per abstract was additionally higher during the second half of the decade (median 75.5 vs 48.5) vs 2010-2014 ( $p<0.001$ ).

An increased number of presentations from 2015-2019 evaluated the topics of cost analysis (5.2% vs 1.3%,  $p=0.002$ ) and opioids or pain management (4.9% vs 1.3%,  $p=0.004$ ). Older abstracts more frequently focused (Figure 2) on FT injuries (5.5% vs 1.5%,  $p=0.002$ ) and Dupuytren's contracture (5.5% vs 2.2%,  $p=0.016$ ). With the recent advent of national databanks, more abstracts from 2015-2019 (8.1% vs 2.1%,  $p<0.001$ ) resulted from large national databases.

## Discussion

As the fields of orthopaedic and plastic surgery observe rapid advances, so too has the LOE in published literature.

Our study demonstrates increasing LOE at the ASSH-AM since 2010. Further, more podium presentations in the second half of the decade were the result of RCTs and studied a higher number of patients.

The observation of increased LOE in a surgical specialty is not new. Voleti et al reported a 19% increase in the proportion of level 1-2 studies presented at the annual meeting of the American Academy of Orthopaedic Surgeons from 2001-2010.<sup>9</sup> While higher LOE likely improves the generalizability of research and the power to detect true differences, it should be noted that not all such studies are created equal. Further, lower level research should not be discounted for the contributions that they have made as many foundational principles in medicine are based on lower level studies.

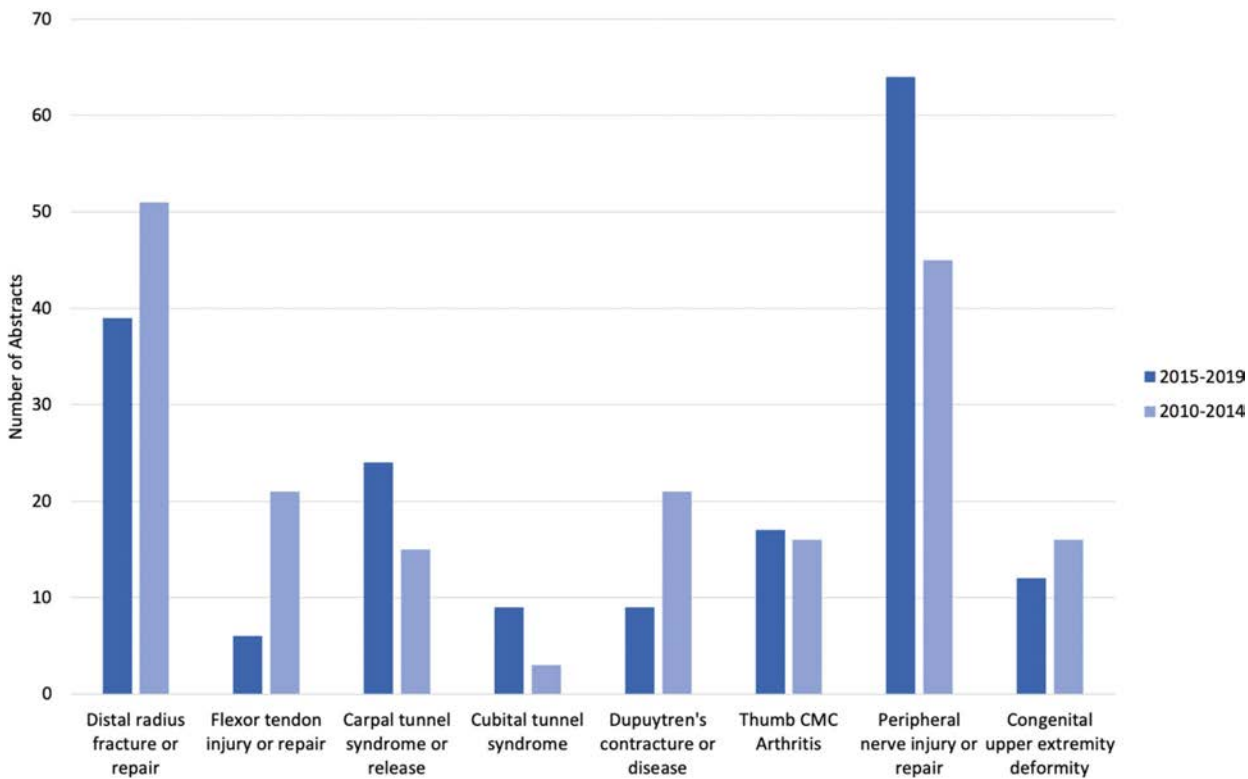
More than improving clinical practice, the importance of performing higher evidence research for many surgeons is the contribution of research productivity to academic rank. For hand surgeons, H-index - a measure of both publications/citations - is strongly correlated with academic rank.<sup>2</sup> While abstracts at national conferences are published at high rates overall<sup>15,18-20</sup>, higher LOE abstracts tend to have higher chance of publication.<sup>21</sup> A similar case can be made for the increased

**Table 1. Characteristics of ASSH Abstracts, 2010-2014 vs 2015-2019**

	2010-2014	2015-2019	P-value
Number of Abstracts	382	405	-
Level of Evidence			
1 or 2	61 (16.0)	97 (24.0)	<b>0.005</b>
3, 4, 5, or NA	321 (84.0)	308 (76.0)	
Randomized controlled trial	20 (5.2)	39 (9.6)	<b>0.019</b>
Multicenter collaboration	26 (6.8)	32 (7.9)	0.557
Median Number of Patients*	48.5 (86)	75.5 (140)	<b>&lt;0.001</b>
Database	8 (2.1)	33 (8.1)	<b>&lt;0.001</b>
Focus			
Distal radius fracture or repair	51 (13.4)	39 (9.6)	0.101
Flexor tendon injury or repair	21 (5.5)	6 (1.5)	<b>0.002</b>
Carpal tunnel syndrome or release	15 (3.9)	24 (5.9)	0.197
Cubital tunnel syndrome or release	3 (0.8)	9 (2.2)	0.145
Dupuytren's contracture	21 (5.5)	9 (2.2)	<b>0.016</b>
Thumb carpometacarpal arthritis	16 (4.2)	17 (4.2)	0.738
Peripheral nerve injury or repair	45 (11.8)	64 (15.8)	0.103
Congenital upper extremity deformity	16 (4.2)	12 (3.0)	0.354
Topics			
Basic science, anatomy, or biomechanics	82 (21.5)	79 (19.5)	0.496
Cost analysis	5 (1.3)	21 (5.2)	<b>0.002</b>
Opioids and pain management	5 (1.3)	20 (4.9)	<b>0.004</b>
Medical education or publication	5 (1.3)	4 (1.0)	0.746
Age Group			
Pediatrics	42 (11.0)	48 (11.9)	0.903
Adult	194 (50.8)	207 (51.1)	
Unclassified	146 (38.2)	150 (37.0)	

Values reported as number (%) or median (IQR)

\*Excluded large sample database studies



**Figure 2.** Comparison of Abstract Foci at ASSH Annual Meeting, 2010-14 vs 2015-19

number of abstracts resulting from national databases observed in our study, which adds to the power of any study to detect a significant result.<sup>22</sup>

Our study also observed a significant increase in the proportion of abstracts focused on cost analysis or opioids. This increase is in line with increasing national emphasis on cost-effective healthcare utilization<sup>23</sup> and appropriate opioid usage.<sup>24</sup> There are already many examples of such articles in the hand surgery literature, which has translated to the research presented at the ASSH annual meeting.<sup>25-27</sup>

Although we reviewed nearly 800 abstracts over a 10-year period, there are several limitations to our study. First, we did not assign abstract topics/focus to all presentations given the overwhelming number of possible topics. Second, because many abstracts do not report the age range of patients, it was not possible to identify the age grouping for ~40% of abstracts. Nevertheless, the simple design of our study illustrates an emerging trend across specialties of increasing LOE with an emphasis on nationally important issues, such as cost-effective care.

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