

Factors associated with the publication and impact of CUA abstracts over the last decade

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Cite as: Al-Daqqaq Z, Rajesh Z, Ahmad I, et al. Factors associated with the publication and impact of CUA abstracts over the last decade. *Can Urol Assoc J* 2024 August 30; Epub ahead of print. <http://dx.doi.org/10.5489/cuaj.8843>

Published online August 30, 2024

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ABSTRACT

Introduction: The Canadian Urological Association's (CUA) annual meeting is the largest gathering of Canadian urologists, and many abstracts that are presented go on to be published as peer-reviewed papers. Our objective is to determine the publication rates and impact of these abstracts, and examine predictors associated with their publication.

Methods: We identified abstracts presented at the 2010, 2013, 2014, 2015, 2018, 2020, and 2021 CUA meetings, and determined if there were matching manuscripts based on author

and title using a comprehensive Medline search. Standardized data was extracted. Medians and interquartile ranges are presented, and regression models were used to determine factors associated with manuscript publication, journal impact factor, and time to publication.

Results: There were 1732 CUA abstracts in our years of interest. The overall publication rate was 45.4%. Median journal impact factor was 2.27 for all published abstracts and time to

KEY MESSAGES

- This study investigated the publication metrics of abstracts presented at CUA annual meetings over the past decade, and determined predictors associated with abstract publication and journal impact factor.
- Podiums, randomized controlled trials, oncology abstracts, and some institutions, among other variables, had significantly higher publication rates. CUA annual meeting abstracts were published at a similar rate to major international urology conferences.
- The CUA appropriately stratifies abstracts into podium, moderated poster, and unmoderated poster formats, as eventual publication metrics reflect presentation hierarchy.

publication was 13.2 months. Type of presentation was significantly associated with publication rate ($p < 0.001$), with 63.7% of podiums, 46.7% of moderated posters, and 39.5% of unmoderated posters published. The median journal impact factor was 3.45 for published podiums, 2.19 for moderated posters, and 2.10 for unmoderated posters.

Conclusions: Approximately 45% of CUA annual meeting abstracts are eventually published. The type of presentation correlates well with both publication and impact factor, suggesting the CUA review process and scientific program committee does a good job of judging abstract quality.

INTRODUCTION

The Canadian Urological Association's (CUA) Annual Meeting is the largest gathering of Canadian urologists. It is an opportunity for urologists and urology trainees to present their research and keep up with the latest advancements in urology. Submitted abstracts undergo a blind review by peer-reviewers and are accepted for presentation based on scientific merit and originality¹, with the most impactful abstracts being granted a podium presentation. Many abstracts accepted for presentation at the CUA, both podiums and poster presentations, go on to be published as peer-reviewed papers. Researchers have examined the publication rates of abstracts from international urology conferences,²⁻⁹ Canadian non-urology medical conferences,¹⁰⁻¹⁵ and the Quebec Urological Association (QUA),¹⁶ yet it is not clear what factors contribute to publication rates, published journal impact factors (IFs), and time to publication of CUA abstracts that are presented.

Based on our observations of similar studies, we hypothesized that predictors of higher publication rates would include oral/podium presentations,^{9,10,15,17,18} pre-clinical research,^{18,19} and randomized controlled trials (RCTs).^{6,12,18} Abstracts in oncology were hypothesized to be published in journals with higher IFs but at similar rates to non-oncology studies as seen in prior studies.⁶ We also anticipated an increase in publication rate over time, as the number of MEDLINE® citations increased from 735,004 in 2010 to 1,063,140 in 2021,²⁰ with an increase in the publication rate of conference abstracts over time in some studies,^{7,9,10,17} and no change over time^{11,16} or decrease in others.¹⁸

Our objective was to determine the proportion of CUA abstracts that are eventually published in the peer-reviewed literature and to measure the impact of the published abstracts over the past decade; our secondary objectives were to examine predictors associated with eventual publication, journal impact factor, and time to publication.

METHODS

The CUAJ 'supplements & abstracts' page was used to identify abstracts presented at the 2010, 2013, 2014, 2015, 2018, 2020, and 2021 CUA Annual Meetings. These years were selected as a generally representative sample of CUA meetings with complete abstracts lists available. The

primary author and abstract title were used to identify relevant publications in an Ovid Medline search. If a relevant paper was not found, the second author or corresponding author were used, and the search was expanded to include PubMed and Google Scholar. The abstracts were deemed to be a match to the retrieved article if they shared at least one common author and maintained the same study population and results. The paper must have been published in a peer-reviewed indexed journal to count as a published match.

Variables were collected from abstracts using a standardized data collection form. Information including study title, number of authors, year of presentation, presentation mode (i.e. podium, moderated poster, or unmoderated poster), session topic (i.e. oncology, pediatrics, etc), institution of the first author, clinical/basic science research, and research methodology (i.e. RCT, observational study). Presentation mode and session topic were assigned by the CUA, while the authors institution and research methodology was determined from a title and abstract review. Canadian institutions with less than 25 abstracts presented across the representative years were grouped for analysis. Additional variables were collected for abstracts that were subsequently published in peer-reviewed journals, including date of publication (month and year), journal title, and year-specific IF at the time of publication was gathered using journal IF search engines bioRxiv.com and academic-accelerator.com.

Descriptive statistics were used to identify overall trends. A multivariable logistic regression model was used to determine if factors identified a priori were associated with manuscript publication. Univariate linear regression models were used to determine if these same factors were associated with journal IF and time to publication among the studies that were published; Tukey's post-hoc test was used to assess differences between categorical variables. All statistical analyses were performed with SPSS © Version 26, and a 2-sided alpha <0.05 was considered significant. As this study did not involve patients, institutional ethics review was not necessary.

RESULTS

There were 1732 CUA abstracts in our years of interest. By presentation type, there were 193 podium presentations (PODs), 815 moderated poster presentations (MPs), 709 unmoderated poster presentations (UPs), and in 2010 and 2015 there were 15 video submissions (MVDs) which were largely excluded from analysis due to a limited sample size. Abstracts reporting on an observational study (retrospective, prospective, and case studies) were the most common with 1342 abstracts. There were 132 surveys, 113 animal/basic science studies, 82 RCTs, 49 reviews, and 14 economic analyses. There were 126 preclinical/basic science studies which did not involve human subjects and 1608 clinical studies. Oncology was the most common session topic with 820 abstracts, followed by functional/benign with 426, endourology with 180, pediatrics with 153, education with 120, and transplant with 33 presented abstracts. The Universities of Toronto, Montreal, and Western University presented the most abstracts over the representative years, with 347, 150, and 121 respectively.

The overall publication rate was 45.4% (787/1732) and median time to publication in months was 13.2 (IQR 6.1-23.3), with 9.4% (74/1732) of abstracts being published before the conference date, and of those 20% (15/74) were published more than 6 months prior to the CUA Annual Meeting. The median year-specific IF for all published abstracts was 2.27, and by presentation type was 3.46 [2.05 - 5.65] for PODs, 2.19 [1.37 - 3.77] for MPs, and 2.10 [1.41-3.40] for UPs. There was a median of 6 authors [4-8] among presented abstracts. The most popular journal that abstracts were published in was the Canadian Urology Association Journal, which published 26.04% of the articles. This was followed by the Journal of Urology (10.55%), Journal of Endourology (5.97%), Urology (5.85%), and the British Journal of Urology International (4.57%).

Factors influencing eventual publication

Presentation modality was significantly associated with publication rate, with likelihood of publication decreasing with the expected presentation hierarchy: 63.7% of PODs were published (reference group), followed by 46.7% of MPs (OR 0.503; $p < 0.001$), 39.5% of UPs (OR 0.314; $p < 0.001$), and 20% of MVDs (OR 0.161; $p < 0.008$) (Table 1). Abstracts presented in 2015 (OR 1.663; $p = 0.007$) and 2021 (OR 2.59; $p < 0.001$) were significantly more likely to be published compared to abstracts presented in 2010. Gross publication rates for 2010, 2015, and 2021 were 36.2%, 48.1%, and 53.1% respectively. There was a wide range of abstracts presented per year, with a median of 246 abstracts in 2010 and a range from 196 abstracts in 2021 to 310 abstracts in 2015.

Research methodology was a significant predictor of publication; with observational studies as the reference group, surveys (OR 1.537; $p = 0.033$), RCTs (OR 1.936; $p = 0.009$), and reviews (OR 2.596; $p = 0.002$) had significantly higher odds of publication. Clinical research (compared to basic science) had a higher odds of publication, but it did not quite reach statistical significance (OR 1.904; $p = 0.074$). Subspecialty interest area of the abstract was significantly associated with overall publication with abstracts in pediatrics having a significantly decreased odds of publication compared to abstracts in oncology (OR 0.562; $p = 0.005$).

The first author's institution had a significant association with publication odds ($p < 0.001$), with 3 Canadian universities having a significantly increased odds of publication compared to the reference group of international submissions.

Predictors of published journal impact factor and time to publication

Compared to podium presentations that were eventually published, the year-specific mean IF of moderated posters (-3.82, $p < 0.001$) and unmoderated posters (-4.49, $p < 0.001$) were significantly lower. Endourology abstracts (-2.72, $p = 0.019$), functional/benign (-2.38, $p = 0.004$), and education (-3.52, $p = 0.004$) had a significantly lower mean IF compared to oncology abstracts. RCT abstracts (+8.54, $p < 0.001$) had a significantly higher mean IF compared to all other types of studies. Almost all abstracts were published within 3 years of the CUA Annual Meeting (96%,

1662/1730). There were no statistically significant predictors of time to publication in our logistic and linear regression models (Appendix A).

DISCUSSION

This is the first study to perform an analysis of abstracts presented at the CUA Annual Meeting. By analyzing selected years from 2010-2021, we determined the overall publication rate was 45.4% in journals with a median IF of 2.27 (mean 4.04) after approximately 1 year. Variables associated with increased odds of publication included abstracts selected as PODs, abstracts from the 2015 and 2021 Annual Meeting, RCTs, and select institutions. Abstracts in pediatrics and with observational methodology were associated with decreased odds of publication. Published PODs were associated with a higher IF, while the year of publication was not a significant predictor of IF. The higher proportion of PODs that are published, also with higher impact factors suggests that the CUA does an excellent job at assigning presentation modalities based on study importance however even with the podium abstracts, over a third are unpublished.

The selection of representative years between 2020-2021 was aimed at achieving a representative and manageable sample size among available CUAJ archives to capture changes in clinical practice guidelines over the past decade that may influence abstract outcomes. Our sample lacks representation for annual meetings held in Western Canada (2012, 2016), and Quebec (2011, 2019) which may bias institution-specific results. This contributed to our decision not to publish institution-specific data. However, we hypothesize that those who must travel to present their research may be more likely to share more robust studies with increased odds of publication, and have mentors that prioritize publication. In a study of Quebec Urology Association's (QUA) abstracts, there was a higher overall publication rate (56%), although Al-Qaoud et al also found that non-Quebec research presented at the QUA was twice as likely to be published.¹⁶ Our data demonstrated that abstracts from the USA (OR 1.714; $p=0.049$) and three Canadian institutions had significantly higher publication rates. It is not entirely clear what led some institutions to have abstracts with higher publication rates, yet it's likely multifactorial, with factors such as program size, presence of research fellows, and conference location all potentially contributing to observed differences. We ultimately chose not to report institutional data to avoid potential misinterpretation and stigmatization.

The two years with the highest publication rates were 2015 (OR 1.663; $p=0.007$) and 2021 (OR 2.59; $p<0.001$), which had overall publication rates of 48.1% and 53.1% respectively. Interestingly, these were also the two years with the fewest presentations (196 in 2021) and the most presentations (310 in 2015). There was a non-linear trend observed in publication rate over time, as 2018 (OR 1.102; $p=0.634$) and 2020 (OR 1.135; $p=0.526$) had overall publication rates of 43.6% and 42.5% respectively, which did not significantly differ from 2010 rates. The 2020 and 2021 CUA Annual Meetings were both held virtually, with the 2020 meeting converted to a virtual format more abruptly amidst the start of COVID-19, while the 2021 conference was planned as a virtual conference. The 2021 meeting was unique as it had the least number of abstracts presented, and the highest publication rate. Plausible explanations for this might include

that time away from clinical duties due to COVID-19 restrictions encouraged a shift to research productivity. The virtual format should in theory decrease the barrier-to-entry for those with geographic or time restrictions, yet there were 50 less abstracts presented in 2021 than on average. The in-person format may in fact promote participation by providing exciting opportunities to travel and network with urologists and trainees across Canada.

The CUA abstracts are published at higher rates than several international urology conferences, however many of these comparator studies range back several decades (Table 3). It is possible that other urology annual meetings would have seen increased publication rates over time. However, the British Association of Urologic Surgeons Annual Meeting saw a decline in publication rate across 2004-2013 from 42% to 24.2%⁵ and the AUA was relatively unchanged from 2000 to 2017, with publication rates of 55% and 51.9% respectively (although these are select samples of only podium presentations or oncology abstracts).^{2,6} A 2018 Cochrane review by Scherer et al., looked at 307,028 abstracts presented at 425 conferences and found a publication rate of 37.3%, which is a decrease from the 2007 rate of 44.5%.¹⁸

Of the 74 abstracts published before the annual meetings, the 15/74 that were published more than 6 months before the meeting were likely already accepted for publication at the time of submission. This is remarkably similar to the 2017 study of AUA podium presentations by Chua et al., where 8.5% of abstracts were published before the meeting, with 13/74 of these abstracts being published before the submission deadline.⁶ It remains possible that some authors may have retracted their published abstracts which may introduce bias to any study of this kind. This can be mitigated by our large sample size, and as of 2024, the CUA submission guidelines do not explicitly prohibit abstract submissions of previously published work, but require disclosure of this information, decreasing the likelihood of retracted abstracts.

In Chua et al's study of 2017 AUA podium presentations, they found that abstracts in oncology had similar publication rates to non-oncology papers, but had higher median IFs of 3.4 vs 2.6 respectively, which was statistically significant ($p < 0.001$).⁶ We observed a similar trend, as the oncology publication rate did not differ much from the overall publication rate (46.8% vs 45.4%), yet the median IF was higher at 2.77 vs 2.27. However, when restricting our data to just podium presentations, we found that PODs in oncology had a publication rate and median IF of 69.2% and 4.7 respectively, compared to the overall POD publication rate and median IF of 63.7% and 3.46 respectively. Furthermore, 27/28 of all abstracts published with an IF above 15 were in oncology. Oncology-focused journals such as *Lancet Oncology* and the *Journal of Clinical Oncology* had some of the highest IF's in our study, which helps explain the higher IF among published oncology abstracts. CUA abstract presentations in oncology were therefore strongly linked to publication in higher impact factor journals.

Some prior studies show evidence of higher publication rates in clinical research,¹⁴ while others suggest that pre-clinical research is published at higher rates.^{18,19} We found no significant association ($p = 0.074$) with publication when comparing clinical and pre-clinical abstracts submitted to CUA Annual Meetings. The lower publication rate of 37.9% in pediatrics compared

to 46.8% in oncology was statistically significant (OR 0.571; $p < 0.005$), yet there was no statistically significant difference ($p = 0.099$) in the IF of published pediatrics abstracts compared to oncology. Among RCTs in pediatrics, 75% (6 of 8) were published. Contributing factors may include the low number of submitted pediatrics abstracts with RCT methodology and more limited options for journals in pediatric urology.

Some limitations of our work include that we did not investigate the reasons for non-publication of CUA abstracts. Reasons for non-publication of abstracts from the 2003 Urological Brazilian Meeting were investigated by Oliveira and colleagues²¹ and they found that 57% of authors had no attempt to publish, 11% had abstracts under review by a journal, and only 4% received outright rejections. A 2018 Cochrane review by Scherer and colleagues¹⁸ identified predictors of abstract publication such as studies with large sample sizes, positive results, an established funding source, and multicentric studies; unfortunately we were not able to examine those factors with the data we collected.

CONCLUSIONS

CUA Annual Meeting abstracts are published at an impressive rate when compared to both international urology conferences and to global averages of abstract publication rates. The CUA does a good job at stratifying presentations into podium, moderated poster, and unmoderated posters based on perceived significance, as there are expected differences in publication rates and impact factors across these hierarchical groups. While impactful and exciting research is presented at the CUA, there are still many abstracts, even from the podium presentations, that are not published in peer reviewed journals. This suggests that some results are not tested with formal peer review, and CUA abstracts should be critically evaluated by attendees.

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FIGURES AND TABLES

Table 1. Publication rate across studied variables.					
Publications for CUA conference abstracts					
	Total no.	No. published	% published	Odds ratio	p
Overall	1730	785	45.4	-	-
Modality					<0.001
Podium	193	123	63.7	Ref	Ref
Moderated poster	815	380	46.7	0.503	<0.001
Unmoderated poster	709	280	39.4	0.314	<0.001
Video	15	3	20.0	0.161	0.008
Methodology					–
Observational	1329	589	43.9	Ref	Ref
Survey	132	72	54.5	1.537	0.033
Animal studies	113	38	33.6	1.154	0.701
RCT	82	52	63.4	1.936	0.009
Review	49	29	59.2	2.596	0.002
Economics	14	7	50.0	1.23	0.723
Basic/clinical					
Basic science	126	43	34.1	Ref	Ref
Clinical	1606	744	46.3	1.889	0.074
Session Topic					
Oncology	820	384	46.8	Ref	Ref
Functional/benign	426	181	42.6	0.834	0.174
Endourology	180	88	48.8	0.874	0.448
Pediatrics	153	58	37.9	0.571	0.005
Education	120	65	53.8	1.204	0.398
Transplant	33	12	36.4	0.673	0.306
Institution*	–	–	–	–	<0.001

*To avoid misinterpretation and stigmatization, we choose not to report results of specific institutions.

Table 2. Impact factor across studied variables.			
Impact Factor analysis of CUA Conference Abstracts			
	Median impact factor [IQR]	Tukey HSD mean difference*	p
Overall	2.3 [1.4, 3.8]	–	–
Modality			
Podium	3.0 [1.9, 5.8]	Ref	Ref
Moderated poster	2.2 [1.4, 3.8]	-3.82	<0.001
Unmoderated poster	2.1 [1.4, 3.4]	-4.49	<0.001
Video (MVD)	2.062 [N/A]	-5.42	0.700
Methodology			
Observational	2.3 [1.4, 3.7]	Ref	Ref
Survey	1.7 [1.1, 2.1]	-1.74	0.347
Animal studies	3.5 [2.1, 4.7]	+0.43	0.999
RCT	7.6 [2.9, 16.3]	+8.54	< 0.001
Review	2.2 [1.7, 3.8]	+0.64	0.997
Economics	1.7 [1.7,1.9]	-1.18	0.999
Basic/clinical			
Basic science	3.5 [1.6, 4.9]	Ref	Ref
Clinical	2.2 [1.4, 3.8]	-2.88**	0.814
Session topic			
Oncology	2.8 [1.5, 5.1]	Ref	Ref
Functional/benign	2.1 [1.4, 3.6]	-2.38	0.004
Endourology	2.1 [1.4, 3.1]	-2.72	0.019
Pediatrics	1.9 [1.4, 3.9]	-2.61	0.099
Education	1.9 [0.95, 2.4]	-3.52	0.004
Transplant	1.7 [0.5, 4.1]	-3.17	0.686
Presentation year	–	–	0.579

*Note that the IF data was right skewed, and therefore we reported medians; however, this means the difference in the medians do not match exactly with the calculated mean difference derived from the linear regression analysis. **Mean square.

Table 3. Summary of results from analyses of Canadian and international urology conferences since 2000, listed in descending order by date					
Conference	Year(s)	Author	Publication rate	Impact factor mean (median)	Months to publication mean (median)
CUA	2010–2021	Al-Daqqaq et al	45.4%	4.04 (2.27)	(13.2)
USANZ ASM*	2015–2019	Arora et al	26.45%	N/A	8.6
AUA* (podiums only)	2017	Chua et al	51.9%	(3.2)	(12.5)
AUA (oncology only)	1997–2017	Shibley et al	56.3%	(3.3)	13.2
BAUS*	2012–2013	Moon and Harding	24.2	3.854	11.6
QUA	2000–2010	Al-Qaoud et al	56%	N/A	N/A
USANZ ASM	2005–2009	Yoon et al	29.8%	2.9	14.5
SIU*	2002, 2004	Autorino et al	22.1%	N/A	13.0
UBM*	2003	Oliveira et al	39%	N/A	(14)
EAU*	2000–2001	Autorino et al	47.3%	1.95	8.6
AUA	2000	Hoag et al	55%	3.2	17.0

*USANZ ASM: Urological Society of Australia and New Zealand Annual Scientific Meeting
 AUA: American Urological Association; BAUS: British Association of Urological Surgeons;
 EAU: European Association of Urology; SIU: Société Internationale d’Urologie; UBM: Urological Brazilian Meeting