

An observational study of duplicate presentation rates between two national orthopedic meetings

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Background: National meetings such as those of the American Academy of Orthopaedic Surgeons (AAOS) and the Canadian Orthopaedic Association (COA) are invaluable in the dissemination of new research findings. Given the limits of meeting agendas, investigators who present the same paper at multiple meetings prevent other presentations on potentially important original research. To determine the incidence of duplicate presentation of research between recent COA and AAOS meetings and between national meetings (AAOS and subspecialty), we conducted an observational study. **Methods:** We hand-searched all podium papers and posters from the 2001 COA annual meeting for duplicate presentation at the 2001 and 2002 AAOS annual meetings and subspecialty meetings held in the USA. We evaluated summary data abstracted from the duplicate presentations for consistency. **Results:** Of 148 presentations at the 2001 COA meeting, 29 presentations (paper and poster) were duplicated at the 2001 or 2002 AAOS meeting: effectively 1 paper in 5 (19.5%). Canadian investigators were significantly more likely to present the same paper at both meetings than Americans (79% v. 13%, respectively; $p < 0.01$). Those who presented papers at COA altered their AAOS presentations in a variety of ways: by changing the wording in the title of their paper (24% of the time), adding or removing authors (38%), changing authorship order (34%) and changing the sample size (31%). Duplicate presentation rates between AAOS and other orthopedic subspecialty meetings averaged 11.4% (range 3.4%–26.4%). **Conclusions:** We identified a 20% duplicate presentation rate between the COA and AAOS annual meetings, and an 11% rate between the AAOS and subspecialty meetings. Stricter enforcement of guidelines and improved dissemination of research findings at both national meetings may limit this practice.

Contexte : Les congrès nationaux comme ceux de l'American Academy of Orthopaedic Surgeons (AAOS) et de l'Association canadienne d'orthopédie (ACO) jouent un rôle précieux dans la diffusion de nouveaux résultats de recherche. Comme l'ordre du jour des assemblées a des limites, les chercheurs qui présentent la même communication à de multiples occasions empêchent d'autres présentations portant sur des recherches originales qui pourraient être importantes. Afin de déterminer l'incidence de la présentation en double de résultats de recherche au cours de congrès récents de l'ACO et de l'AAOS, et entre assemblées nationales (AAOS et surspécialités), nous avons procédé à une étude par observation. **Méthodes :** Nous avons effectué une recherche manuelle dans toutes les communications présentées oralement et affichées au cours du congrès annuel de 2001 de l'ACO pour déterminer s'il y a eu des présentations en double au cours des congrès annuels de 2001 et de 2002 de l'AAOS et des réunions de ses surspécialités aux États-Unis. Nous avons évalué des données sommaires tirées des présentations en double pour en déterminer la cohérence. **Résultats :** Sur 148 communications présentées au congrès 2001 de l'ACO, 29 ont été présentées en double (oralement et sur affiche) au cours de la réunion de 2001 ou 2002 de l'AAOS : c'était en fait le cas d'une communication sur cinq (19,5 %). Les chercheurs canadiens étaient beaucoup plus susceptibles que les Américains de présenter la même communications aux deux assemblées (79 % c. 13 % respectivement; $p < 0,01$). Ceux qui ont présenté des communications à l'ACO ont modifié de diverses façons leur présentation à l'AAOS : en changeant le titre de leur communication (24 % des cas), en ajoutant ou supprimant des auteurs (38 %), en changeant l'ordre des auteurs (34 %)

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et en modifiant la taille de l'échantillon (31 %). Les taux de présentation en double entre les assemblées de l'AAOS et celles d'autres surspécialités orthopédiques se sont établis en moyenne à 11,4 % (intervalle de 3,4 à 26,4 %). **Conclusions :** Nous avons déterminé un taux de présentation en double de 20 % entre les congrès annuels de l'ACO et de l'AAOS, et de 11 % entre les assemblées de l'AAOS et celles de surspécialités. Une application plus rigoureuse des lignes directrices et une diffusion améliorée des résultats de recherche au cours des deux congrès nationaux pourraient limiter cette pratique.

National meetings are invaluable in facilitating the dissemination of new research findings to a wide audience. The annual meetings of the American Academy of Orthopaedic Surgeons (AAOS) and the Canadian Orthopaedic Association (COA) are 2 nationally prominent meetings that serve as platforms for the timely presentation of current research findings. AAOS typically receives over 3200 abstracts, and COA, over 375 for a given meeting. Given their respective agendas, time for presentation of *original research* is limited, and only a small proportion of submitted research papers (27% at AAOS and 40% at COA) can ultimately be selected for either podium or poster presentation.

Clearly, the goal of most researchers is to publish the results of their investigation in the highest-impact peer-reviewed journals; however the peer review, editorial and publishing process at these leading journals results in a lag of up to 2 years between completion of the study and circulation of the printed version in a journal. Nationally prominent meetings such as AAOS and COA provide an opportunity to communicate important research findings to the orthopedic community in a timely manner, receive valuable feedback from peers and enable the submission of a higher-quality manuscript to a peer-reviewed journal.

Given the limited opportunity for investigators to present their work, presenting the same paper at more than 1 meeting has several potential disadvantages: it prevents the dissemination of other potentially important studies, denies other investigators the same opportunity to receive valuable feedback for their current and future studies, and risks providing a program in which attendees

have already seen the papers and posters, which are no longer new information.

Advocates of duplicate presentation may believe this practice is necessary to ensure a wider audience than would be available at either meeting alone. This argument is based on a belief that audiences at AAOS and COA meetings are different. However, this assumption may not hold between AAOS and subspecialty orthopedic meetings held in the USA.

The extent of duplicate presentation of podium papers and posters between AAOS and COA remains unknown. Additionally, rates of duplicate presentation between AAOS and subspecialty meetings remain largely unreported. Therefore, we conducted an observational study to determine the incidence of duplicate presentation of research between recent meetings of COA and AAOS. We also aimed to determine whether rates of duplicate presentation were similar between AAOS and subspecialty orthopedic meetings within the same country.

Methods

Eligibility criteria

We included all podium papers and posters presented at the 56th Annual Meeting of the Canadian Orthopaedic

Association in London, Ont., June 1–4, 2001 (to which we refer in general as COA). COA served as the reference meeting. Searches for duplicate presentations focused upon the 68th Annual Meeting of the American Academy of Orthopaedic Surgeons, San Francisco, Calif., Feb. 28–March 4, 2001, and their 69th in Dallas, Tex., Feb. 13–17, 2002. We assumed that any duplicate presentation from COA at AAOS would have occurred in the same or immediately following year (Fig. 1).

The 2001 AAOS meeting also served as the reference meeting to identify duplicate presentations at annual meetings (2000 and 2001) of 3 subspecialty societies: the Orthopaedic Trauma Association (OTA), American Association of Hip and Knee Surgeons (AAHKS) and Arthroscopy Association of North America (AANA).

Identification of duplicate podium or poster presentations

A search of the 2001 COA program was conducted by 2 of us by hand, to identify all eligible research papers presented as podium papers or posters. Because (we reasoned) at least 1 (co)author would be associated with a duplicate presentation, we cross-referenced every COA author with the 2001 (288 podium, 481 posters)

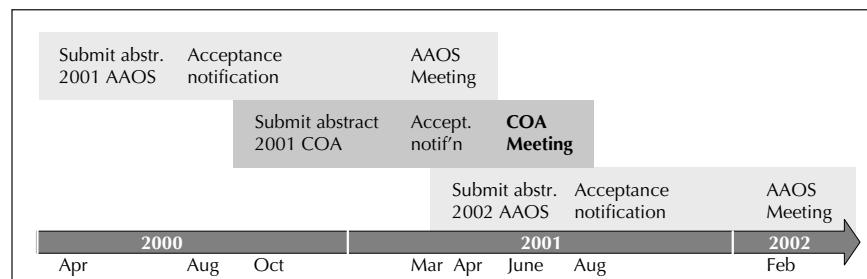


FIG. 1. Overlap in submission and meeting dates between the Canadian Orthopaedic Association and the American Academy of Orthopaedic Surgeons.

and 2002 (320 podium, 545 posters) AAOS meeting programs to identify any potential duplicates. Only those presentations based on the same paper were included for further consideration. All potential duplicate presentations (i.e., same author and title, similar title, similar topic) were retrieved and reviewed in detail by 3 of us for a final determination of eligibility.

By means of the Internet, we also searched the PubMed database to ascertain if any of the duplicate presented articles had been published. Each author's name was cross-checked against title and abstract to detect subsequent publications.

We used the same approach to identify duplicate presentations between the 2001 AAOS meeting and 3 subspecialty society meetings in 2000 and 2001: OTA (187 podium, 134 posters), AAHKS (109 podium, 88 posters) and AANA (137 podium, 125 posters).

Data collection from duplicate presentations

Characteristics of study, as reported in the study abstract

From each abstract, 2 of us abstracted the number of authors, geographic research location, number of centres, orthopedic subspecialty, study design (randomized trial, observational or basic science study), sample size, funding disclaimers and direction of results (positive or negative outcome).

Consistency in reporting between presentations

Two of us abstracted information relating to consistency between duplicate presentations, including differences in the study title, number and order of authors, presentation of all outcomes, discrepancy in the study objective/hypothesis, study design, primary outcome measure, sample size and study results. Any difference

in study results between presentations at both meetings constituted an inconsistency.

Agreement among reviewers in abstracting data

To ensure consistency in identification, application of eligibility criteria and data abstraction, we conducted assessments in duplicate or triplicate.

The κ statistic was used as a measure of interobserver agreement, from +1 (perfect agreement) to -1 (absolute disagreement).¹ A κ value of 0 represents an agreement no better than what could occur by chance alone. Because multiple observers were involved in this study, κ was calculated according to the method described by Fleiss¹ and interpreted according to the guidelines proposed by Landis and Koch.² These guidelines suggest that κ values of 0–0.2 represent slight agreement, 0.21–0.40 fair, 0.41–0.60 moderate and 0.61–0.80 substantial agreement; values > 0.80 were considered near-perfect agreement. For each κ value, we also calculated the 95% confidence interval (CI).

All discrepancies were resolved by consensus.

Database development and data entry

We created a database using SPSS statistical software (version 10). Logic checks built into the database further limited errors in data entry; for example, the program flagged numbers other than those specified for a particular question. One coauthor entered all data, and another checked it for accuracy. An independent author did a final visual check, reviewing each database cell for inconsistent or missing data.

Statistical analysis

Categorical variables (country of research, orthopedic subspecialty, etc.) are presented as proportions with

95% CIs; continuous variables (e.g., sample size), as means or medians with standard deviations. Differences between continuous variables were compared with Student's *t* test, and dichotomous variables with a χ^2 test. We explored whether differences between AAOS presentations were distributed similarly at the 2001 and 2002 AAOS meetings by using cross-tabulations. A *p* value of 0.05 or less was considered statistically significant.

Results

Identification of duplicate presentations

At the 2001 COA annual meeting 148 papers were presented, of which 84 were podium presentations and 64 poster presentations. The initial review of the 2001 and 2002 AAOS programs revealed 34 potentially duplicate presentations. After detailed review of the titles, authors and abstracts, 5 papers were excluded, leaving 29 duplicate presentations for consideration. Agreement among reviewers for identifying duplicate presentations was high ($\kappa = 0.83$, CI 0.72–0.94).

The duplicate presentation rate from AAOS was 19.5% (29/149). Effectively 1 in 5 papers presented at AAOS in 2001 (23 podium, 6 posters) was presented again at COA in 2001 (11/29) or 2002 (18/29). No disclaimer indicating previous presentation appeared in any 2001 or 2002 COA or AAOS program. With an Internet PubMed search we identified 4 articles (13.8%) published in 4 different journals to date: *Journal of Bone and Joint Surgery*, *American volume* and *British volume*; *Journal of Arthroplasty*; and *Clinical Orthopedics and Related Research*. Of the 4 articles, 3 focused upon hip arthroplasty and 1 on methodology.

Our review of duplicate presentations between AAOS and subspecialty meetings revealed rates of 3.4% to 31.3%.

Characteristics of the duplicate presentations

Although the majority of COA presentations (17/29, 59%) were repeated in the same format (poster to poster or podium to podium), more

Table 1

General features of duplicate presentations at meetings

Characteristic	No. (%)
Total presentations at COA	148
Podium papers	84 (57)
Posters	64 (43)
Duplicate presentations	29 (20)
At 2001 AAOS	11 (38)
At 2002 AAOS	18 (62)
Format from COA to AAOS	
Podium → podium	12 (41)
Podium → poster	11 (38)
Poster → poster	5 (17)
Poster → podium	1 (4)
Country of research	
Canada	23 (79)
United States	4 (13)
Both	1 (4)
Other	1 (4)
Funding disclaimers	0 (0)
Subspecialty	
Foot and ankle	0
Hip/knee	19 (66)
Shoulder	1 (4)
Spine	0
Pediatrics	0
Oncology	0
Sports	1 (4)
Trauma	6 (19)
Other (methodology)	2 (7)
Study design	
Randomized trial	4 (13)
Prospective cohort	8 (29)
Retrospective cohort	12 (41)
Systematic review/meta-analysis	0
Case report (< 5 cases)	0
Basic science	1 (4)
Survey	0
Other (methodological)	4 (13)
Study results	
Significant	9 (32)
Non-significant	4 (13)
No statistics	16 (55)

AAOS = American Academy of Orthopaedic Surgeons Annual Meeting; COA = Canadian Orthopaedic Association Annual Meeting

than one-third of COA podium presentations (38%) were shown at AAOS as posters (Table 1). Of the duplicate presentations, 85% focused upon hip or knee surgery and trauma; only 13% were randomized trials.

Canadian investigators were significantly more likely to present the same paper at both meetings (79%) than American investigators (13%; $p < 0.01$). In addition, 20 of the 29 duplicate papers (69%) occurred in 2 Canadian centres (centre A, 11 papers; centre B, 9 papers).

In our review of 3 major orthopedic subspecialty meetings, duplicate presentations were significantly more common between AAOS and OTA (26.4%) than between AAOS and either AAHKS (3.4%) or AANA meetings (4.4%; $p < 0.01$; Table 2).

Consistency between duplicate presentations

Study information that was presented at both COA and AAOS (Table 3) was highly consistent in study objectives, design, outcomes and direction of results (Table 4). Investigators who presented papers at AAOS altered their AAOS presentations by adding or removing authors 38% of the time, changing authorship order 34% of the time, changing the sample size 31% of the time and changing the wording in the title of their paper 24% of the time. For example, 1 paper focusing upon multidirectional instability of the shoulder was presented with 5 authors at COA and 4 authors at AAOS in the same

year: despite having the same content, 2 authors were removed and 1 new author was added between COA and AAOS.

We explored whether differences between presentations at AAOS were distributed similarly in the 2001 and 2002 AAOS meetings. Order of authorship was changed in a significantly greater proportion of papers presented at the 2002 AAOS (83%) than at the 2001 AAOS meeting (36%; $p = 0.02$). Changes in authorship (additions, removals or both) in presentations occurred with similar frequency at both AAOS meetings: 45% in 2001 and 34% in 2002 ($p = 0.65$).

Discussion and conclusions

In our study, we found that 1 in 5 abstracts were presented in duplicate at COA and AAOS meetings; that 1 in 10 abstracts were presented in duplicate between AAOS and subspecialty meetings; and that frequent changes in AAOS presentations included changes to the study title or authorship.

Whereas the double data abstraction and assessment of reliability strengthens the inferences that can be made from this study, our findings may not be generalizable to meetings outside of COA, AAOS, OTA, AAHKS and AANA. Our decision to use the annual COA and AAOS meetings was based solely upon their status as the most notable national meetings in Canada and the USA. In addition, we believed that

Table 2

Duplicate presentation rates, no. (and %), between the 2001 AAOS annual meeting and subspecialty meetings

Specialty society	Papers	Posters	Overall*
Orthopaedic Trauma Association	8/35 (23)	19/67 (28)	27/102 (26)†
American Assoc. Hip and Knee Surgeons	2/70 (2.9)	5/136 (3.7)	7/206 (3.4)
Arthroscopy Assoc. North America	1/21 (4.8)	2/47 (4.3)	3/68 (4.4)

AAOS = American Academy of Orthopaedic Surgeons; Assoc. = Association of
 *Number of duplicate presentations as a proportion of the total number of subspecialty presentations at the 2001 AAOS meeting.
 † $p < 0.01$ when compared with other subspecialty meetings.

trauma, hip and knee surgery and sports medicine constituted a suitable sample of subspecialties to provide an informed estimate of duplicate presentation rates.

Although several studies have reported publication rates following specialty meetings,³⁻¹³ little has been written on duplicate presentation at multiple meetings. Abstract submission guidelines for AAOS and subspecialty meetings alike require researchers to report whether their work has been previously presented or published. We are uncertain how 1 in 5 abstracts were presented at both the COA and AAOS meetings.

Several reasons for duplicate presentation at AAOS remain:

1. Investigators neglected to report prior presentation on the abstract submission form.
2. Overlaps between the submission of abstracts and notification of acceptance between the 2 meetings (Fig. 1) did not enable investigators to disclose prior presentation.
3. Changes in abstract titles and authors modified the appearance of abstracts and permitted them to pass through review.
4. Reviewers may have decided that certain abstracts were worthy of re-presentation.

We contacted the executive officer responsible for annual COA meeting programs to discuss policies about duplicate presentation. Currently, there is no formal policy prohibiting the submission of papers that have been published or presented elsewhere. Neither does COA require authors to disclose prior publication or presentation, although COA does

hope that authors will be forthcoming with this information. Acceptance of such papers is currently at the discretion of the Program Chair for each year.

AAOS, on the other hand, requests during its abstract submission process that authors disclose whether their work was previously published or presented at another meeting.

Based upon typical abstract submission times (Fig. 1), it remains plausible that an investigator who submits a paper for the next year's COA meeting in October will not have received a response from AAOS about the same abstract submitted in March–April of the same year.

Inconsistencies between orthopedic presentations and subsequent full-text publications have previously been reported.¹³ The current research is the first to report inconsistencies between papers presented at multiple meetings. Investigators who presented papers at COA altered their AAOS presentations by changing the wording in the title of their paper 24% of the time, by adding or removing authors 38% of the time, or

changing authorship order 34% of the time. Perhaps subtle changes in the study title, the addition or removal of 1–3 authors, or a change in authorship order has led AAOS reviewers to believe the submitted study was an extension of previously presented work.

Advocates of duplicate presentation may argue that papers deemed important in the field should receive the broadest audience for dissemination of their findings. If this were so, we would expect that such work would be published in peer-reviewed journals. Our review of the literature identified only 14% of duplicate presentations (4/29) that, to date, have subsequently achieved journal publication. Publication rates of abstracts from international meetings, which have reportedly ranged from 11% to 68%,³⁻¹³ suggest that as a group, the duplicate presentations studied were no different from other papers presented at both meetings. Several factors have recently been identified¹⁴ as barriers to publication after presentation at international meetings: perceived quality of the research, limits

Table 3

Content features of duplicate presentations

Datum	Mean	SD	Range
No. of authors	4.8	1.9	2–8
No. of centres	1.1	0.26	1–2
Sample size	385	60	6–7687

SD = standard deviation

Table 4

Consistency between duplicate COA and AAOS presentations, n = 29

Aspect of presentation	Unchanged		Changed	
	No. (%)	95% CI	No. (%)	95% CI
Title	22 (76)	56–78	7 (24)	12–42
Authors	18 (62)	44–77	11 (38)	
Added			1 (3)	0.01–17
Removed			6 (21)	10–38
Added and removed			4 (14)	6–31
Range of no. of authors added			0–3	
Range of no. of authors removed			0–2	
Order of authors	19 (66)	47–80	10 (34)	20–53
Study objective	28 (97)	83–99	1 (3)	0.01–17
Study design	29 (100)	88–100	0	
Primary outcome	28 (97)	83–99	1 (3)	0.01–17
Sample size	20 (69)	51–83	9 (31)	
Became larger			7 (24)	12–42
Became smaller			2 (7)	2–22
Outcomes (in abstract)	26 (90)	74–96	3 (10)	4–26
Direction of results	28 (97)	83–99	1* (3)	0.01–17

AAOS = American Academy of Orthopaedic Surgeons annual meeting; CI = confidence interval; COA = Canadian Orthopaedic Association annual meeting
*Statistically significant result at COA meeting changed to non-significant at AAOS.

to available time, the responsibilities of manuscript preparation, difficulties with coauthors, and studies that are still in progress.

The finding that 79% of duplicate COA/AAOS presentations (23/29) occurred among Canadian investigators likely represents the paucity of US-based abstract submissions to COA. It may also reflect a belief among Canadian researchers that presenting their work only at COA may limit the international dissemination of their findings. However, duplicate presentation was not solely a phenomenon occurring between nations. It also occurred within a single nation, as evidenced by a mean 11% rate of duplicate presentation between AAOS and US-based subspecialty meetings.

Whether duplicate presentations should be limited or supported remains debatable. In our study, 66 investigators were denied the opportunity to present their research findings at AAOS, COA or subspecialty meetings due to multiple presentation of the same paper at both meetings. Potential strategies to limit duplicate presentation may require increased communication between the organizers of both national meetings. One potential solution may be to allow investigators to present research findings at 1 national meeting only. At the time of abstract submission, investigators may be asked to report whether they have submitted work to other meetings for consideration of presentation. Those that disclose submission to other meetings may then be required to choose only 1 meeting for presentation, allowing sufficient time for organizers to contact other investigators. If duplicate presentation is allowed, meeting organizers should enforce disclosure and report such occurrences in the program booklet.

An alternative approach that may prevail could be a compromise between the strict rejection of duplicate papers versus welcoming them. Papers deemed by program committee members to be of international interest and merit further dissemination may overrule a duplicate presentation policy, whereas less "meritorious" duplicate papers may be rejected to allow other authors an opportunity to present (and disseminate) their work.

In conclusion, we identified a 20% duplicate presentation rate between COA and AAOS annual meetings and an average 11% duplicate presentation rate between AAOS and subspecialty meetings. Stricter enforcement of guidelines and improved dissemination of research findings at both national meetings may limit the occurrence of duplicate presentations. A better understanding of attitudes toward duplicate presentation, not only among researchers but also meeting organizers and program committees, may help provide answers to some of the questions around this issue.

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