

Occasional Review

The CAS Residents' Competition: a 25 year review

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The popularity of the Residents' Competition at the annual meeting of the Canadian Anaesthetists' Society inspired this 25 yr review of the competitors and their presentations. Data were collected from a questionnaire survey of all participants and all current Anaesthesia programme directors, review of the Canadian Anaesthetists' Society records, and a Medline database search. Over the 25 yr review period, 226 presentations have been given by 211 different participants, with the annual number of participants ranging from 6 to 13. The majority of participants have been male (85.3% vs 14.2% female, $P < 0.001$), and the majority of presentations have been clinical in nature (74% vs 26% laboratory, $P < 0.01$). Over half of all the presentations (53.1%) subsequently were published as scientific papers, and 71.7% of all participants practised anaesthesia in an academic environment at some point in their career. The Residents' Competition appears to have been successful in encouraging scientific excellence in physicians' training in anaesthesia in Canada.

Après 25 ans, le concours annuel des résidents de la Société Canadienne des Anesthésistes est toujours populaire. Cette popularité motive l'analyse actuelle qui concerne les compétiteurs et de leurs travaux. Les données proviennent d'un questionnaire expédié à tous les participants et à tous les directeurs de programme actuels, d'une révision des archives de la Société et d'une recherche dans la banque de données Medline. Pendant cette période de 25 ans, 211 différents participants ont présenté 226 travaux, avec une participation annuelle de 6 à 13 résidents. La majorité des participants étaient du sexe masculin (85,3% vs 14,2%, $P < 0,001$) et la majorité des présentations, de nature clinique (74% vs 26% laboratoire, $P < 0,01$). Plus de la moitié

des travaux présentés (53,1%) ont été publiés sous forme d'articles, et 71,7% des participants ont exercé dans un milieu universitaire à un moment ou un autre de leur carrière. Le concours des résidents semble avoir été utile à la promotion de l'excellence scientifique pendant la formation des anesthésistes canadiens.

In 1967, the first Residents' Competition took place at the annual meeting of the Canadian Anaesthetists' Society (CAS). According to an announcement published in the Canadian Anaesthetists' Society Journal, the objective of the competition was "to encourage scientific excellence in physicians training in anaesthesia in Canada."¹ The top eight papers submitted by eligible residents in Canadian training programmes were selected to be presented and were judged according to content, visual aids, and a question period. The prizes awarded were as follows: first prize \$500, second prize \$200, and third prize \$200.

For the past 25 yr, the Residents' Competition has been a popular aspect of the annual meeting. The original rules of the competition stated that the competitor must be a resident or fellow in a Canadian department of anaesthesia and a member (or member-elect) of the CAS. The work presented must have been done in Canada, within the last 18 mo before obtaining FRCPC. Presentations were to be judged by all chairs of university departments of anaesthesia in Canada according to the criteria listed above.²

The purpose of this study is to review the past 25 yr of the Residents' Competition and to provide profiles of the competitors and their presentations.

Key words

EDUCATION: residents;
RESEARCH; PUBLICATIONS.

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Methods

The data from all participants and their presentations at the Residents' Competition for the years 1967 to 1991 were collected from several sources and entered into a database programme. The names of competitors, the titles of their papers, the order of presentation, and university affiliation, if available, were obtained from past CAS an-

nual meeting programmes. The award winners' (first, second, and third) names were obtained from CAS records.

A questionnaire was sent to all participants (if an address was available) to determine: (1) if his/her presentation was followed-up with a published paper, (2) the total number of his/her publications, and (3) if s/he subsequently practised in an academic (i.e., university-affiliated) setting. A follow-up questionnaire was sent two months later to participants who had not yet responded to the first mailing. A separate questionnaire was sent to the programme directors of anaesthesia from all 16 universities in Canada to fill in missing data regarding the sex and academic affiliation of each competitor who attended that university. Finally, for participants on whom incomplete information was obtained from any of the questionnaires, the Medline database was searched electronically to determine if the presentations were published subsequently in a peer-reviewed journal and to determine the number of publications (excluding abstracts or letters to the editor) attributable to each participant.

The titles (and abstracts if available) of all Residents' Competition presentations were reviewed to determine if the work presented was primarily clinical or laboratory in nature. Clinical projects included research involving human subjects, review of a clinical problem, or a case report, whereas laboratory projects consisted of animal research or evaluation of a new technology or apparatus.

Demographic data about the distribution by sex of graduates of Canadian medical schools and registrants in postgraduate anaesthesia training programmes in Canada for 1981-91 were obtained from the Association of Canadian Medical Colleges. This was done to determine if the distribution of male and female participants in the Residents' Competition was similar to that in either Canadian medical schools or anaesthesia residency programmes.

Data were analyzed using chi-square for categorical data or ANOVA and unpaired *t* tests for continuous data using the SAS statistical programme. Results are presented as percentages or mean \pm SD. $P < 0.05$ was considered significant.

Results

Over the last 25 yr there have been 226 CAS Residents' Competition presentations by 211 participants. The annual number of participants has ranged from six in 1972 to 13 in 1987. Two participants have each presented three times, and 11 have participated twice. There were a total of 76 prizewinning presentations - 25 first place, 25 second place and 26 third place (due to a tie). All programme directors and 137 participants (65%) returned their questionnaires. Complete information was thus available for 198/211 participants. Information regarding sex (1), uni-

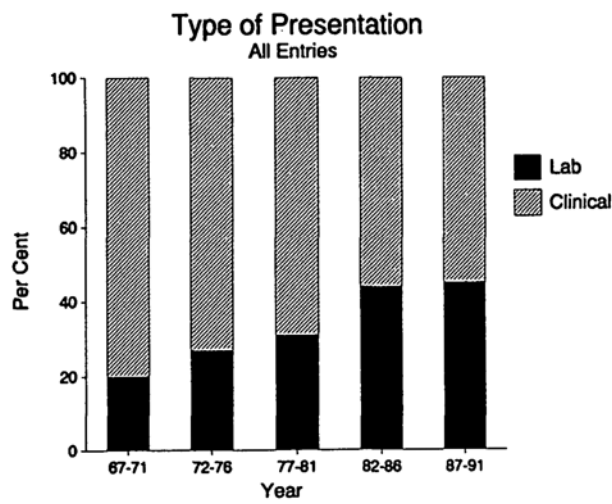


FIGURE 1 Percentage distribution of all laboratory (solid bar) and clinical (lined bar) presentations for each five-year period of the Residents' Competition from 1967 to 1991.

versity affiliation (1) and academic status (12) was missing in a total of 13 participants.

Type of presentation

The number of clinical presentations during the 25 yr study period has exceeded the number of laboratory presentations (167/226 clinical vs 59/226 laboratory, $P < 0.01$). However, there has also been a shift in both the type of presentation and the winners of the competition with time. The percent of presentations based in the laboratory has increased steadily from 20 to 45% over the past 25 yr (Figure 1), although the same pattern was not seen for prize-winning presentations. Between 1967 and 1981, 66.6% of first prizes were awarded to laboratory studies, but between 1982 and 1991 90% of winning presentations were clinical in nature (Figure 2).

Sex of presenter

Of all participants 85.3% (180/211) were male and 14.2% (30/211) were female ($P < 0.001$). Thirteen percent (10/76) of all award winning presentations (first, second, or third place), and 12% (3/25) of all first prize-winning presentations were given by women. However, female participation fluctuated widely; there were no women involved in eight of the 25 yr of the Residents' Competition. A comparison of the percent of female graduates from Canadian Medical Schools, registrants in Anaesthesia residency programmes, and participants in the Residents' Competition from 1981 to 1991 is shown in Figure 3. The proportion of women graduates from medical schools in Canada has increased gradually from 33.4% in 1981 to 44.8% in 1991. Female representation in anaesthesia

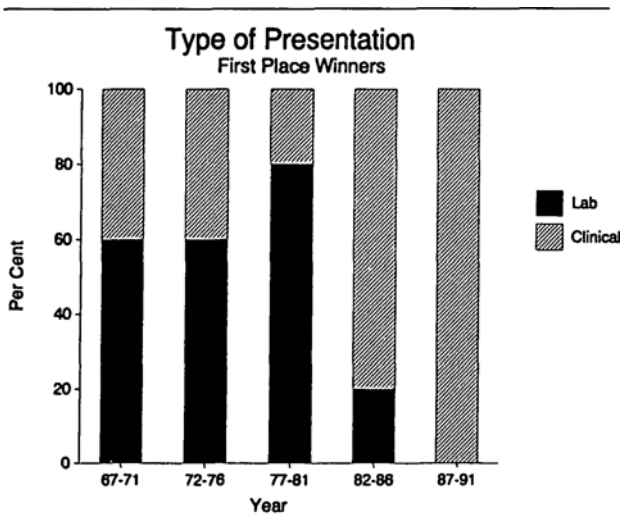


FIGURE 2 Percentage distribution of laboratory (solid bar) and clinical (lined bar) first prize winning presentations for each five-year period of the Residents' Competition.

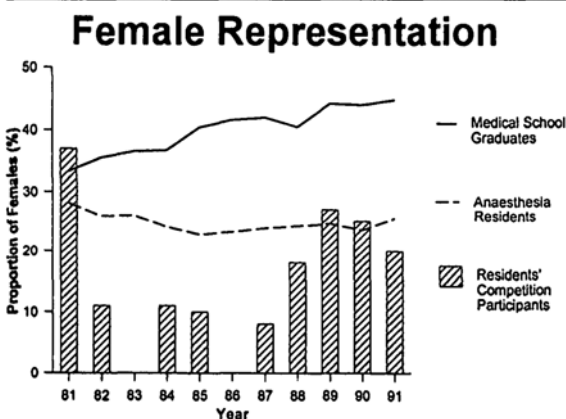


FIGURE 3 Percentage of female graduates from Canadian medical schools (solid line), female postgraduate anaesthesia trainees (dashed line), and female Residents' Competition participants (bar graph) for the years 1981-1991.

residency programmes was 28.1% in 1981, 22.8% in 1985, and 25.5% in 1991.

Publications

Of all presentations at the Residents' Competition, over half (53.1% - 120/226) were followed by a paper in the medical literature of the material presented. This number increased to 75% (57/76) for first, second, or third prize winners, and 76% (19/25) for first prize-winning presentations. The average number of publications by all participants in the Residents' Competition is 7.8 ± 14.6 and 12.6 ± 17.6 for first prize winners ($P > 0.05$ by ANOVA).

Academic practice

At the time of data analysis (1992), the academic status was unknown or "resident in training" for 12 participants. Of the remaining participants, 76.4% (152/199) had practiced in a university-affiliated environment at some point in their careers.

Discussion

The CAS Residents' Competition has been a prominent part of the annual meeting of the CAS for the past 25 yr. Over this time, it has provided a public forum for the presentation of scholarly work undertaken by over 200 trainees in the specialty of anaesthesia and has provided the opportunity for residents to participate in the scientific process. The majority of the work presented has subsequently been published in the medical literature and almost three-quarters of all participants in the Residents' Competition have practised anaesthesia in an academic setting. These findings suggest that the Residents' Competition has indeed encouraged scientific excellence in anaesthesia.

An interesting finding of this study is the changing pattern of type of presentation over the 25 yr period. The number of laboratory reports increased progressively, probably reflecting a general increase in Canadian scientific laboratory-based research in general and in anaesthesia in particular. It is interesting that the type of presentations awarded first prize has not matched the overall distribution of the type of presentation. We cannot determine whether this phenomenon may be due to varying quality in research and presentation or to a changing preference for clinical studies by the judging process.

Our study demonstrated that women have been underrepresented in the 25 yr history of the Residents' Competition when compared either with female enrolment in medical school in general or in anaesthesia residency programmes. Female participation in the Residents' Competition has been highly variable, but recently has approached the levels found in medical school and residency programmes. We could discern no reason for the underrepresentation, but did note that the percentage of female winners of the competition was similar to the participation rate by women.

The relative underrepresentation of women in academic and scientific endeavours is not unique to the Residents' Competition or to anaesthesia. A recent survey of mathematics departments in ten US universities showed that women comprised only 6.7% of all departmental members and only 1.7% of tenured faculty.³ Similarly, it has been recently reported that although approximately 20-25% of US medical school faculty are women, less than 10% of these women were full professors, and none had been dean.⁴ Data obtained from the Medical Re-

search Council of Canada for MRC Operating Grants from 1985–91, show that only 15% of all applications were from women, although the percent of successful applications was similar for both sexes (41% vs 44%). Our data suggest that inequities of gender participation in the Residents' Competition may recently have been reduced.

There are several limitations to a review such as this. The data were collected retrospectively from review of records and questionnaires and, therefore, may be subject to measurement bias of certain outcomes. More important, there is no control group of residents who did not participate in the Residents' Competition. Thus, we cannot establish whether participants in the Competition were more likely to enter academic practice or contribute to the scientific knowledge base in terms of publications. Furthermore, we cannot determine with certainty whether the Residents' Competition actually promoted scientific research in anaesthesia or whether it merely provided a forum for presentation of research by residents which may have been done even in the absence of such a competition. In addition, no effort in this study was made to evaluate the method of selection of abstracts for, or the judging of the Residents' Competition, a subject which has generated much controversy over the years. Thus, we do not know if some of the results we observed were attributable only to the type and quality of the presentations, or affected by some unmeasured bias in the selection and judging process.

In summary, the Residents' Competition at the annual meeting of the CAS has been a popular forum for presentation of scholarly activity by residents in Canadian university departments of anaesthesia. A large number of participants have been exposed to the scientific process, have subsequently published their work in peer-review journals, and have practised at some point in their careers in an academic setting. The Residents' Competition has been an important and unique part of the annual meeting of the CAS and appears to have been successful in encouraging scientific excellence in Anaesthesia.

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