

National Appraisal of Dermatology Residency Training

A Canadian Study

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Objectives: To provide the first comprehensive assessment of dermatology residency training in Canada based on the residents' perspective; to examine and elucidate trends in current residents' envisioned career paths and aspirations.

Design: A national survey conducted in June 2004.

Participants: All Canadian dermatology residents.

Main Outcome Measures: Cross-sectional analysis of (1) satisfaction with and importance placed by the trainees on the various curriculum components as measured by a 5-point Likert-type scale and (2) current residents' career and practice plans.

Results: One hundred percent of dermatology residents across the country (n=48) responded to the survey. The greatest discrepancies between ranked importance and corresponding satisfaction were observed for the teaching from faculty (both didactic and clinic based) and for the practice management exposure and training. Residents were most satisfied with dermatopathology education (score, 4.4

of 5.0) and least satisfied with cosmetic dermatology (2.7 of 5.0) and dermoscopy training (2.8 of 5.0). Men indicated more interest than women in academics (71% [n=12] vs 45% [n=14]), research (41% [n=7] vs 16% [n=5]), and teaching (71% [n=12] vs 42% [n=13]), while female residents were more inclined toward pediatric dermatology (42% [n=13] vs 29% [n=5]) and cosmetic dermatology (48% [n=15] vs 29% [n=5]). An overall trend of decreased interest in academic and hospital-based practice was noted with progression through residency training.

Conclusions: This study provides a current picture of dermatology postgraduate education in Canada from the residents' perspective. Above all, dermatology residents desire more teaching (clinic, didactic, and practice management) and mentorship from their faculty. Recruitment and retention of women in academic dermatology may benefit from early intervention during residency. The data are intended to assist dermatology programs with development, evaluation, and improvement of their curricula and can serve as a reference point to gauge future trends.

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THE FUTURE OF DERMATOLOGY resides in our residency training programs. Development of dermatology curricula has received increasing attention and study in the past 2 decades, including appraisal of basic science and teaching conferences,^{1,2} journal clubs,^{3,4} dermatologic surgery training,^{5,6} and mandated research in residency.⁷ Notably, residents are major stakeholders in the training process, uniquely positioned to provide feedback and articulate preferences and values for consideration in curriculum innovation. Surveys of residents have yielded important data for curriculum improvement.^{1,8} For instance, findings from a study by Webb et al⁹ led to the University of Alabama dermatology program providing broader surgical training and a more diverse conference schedule.

The present study was undertaken to provide the first comprehensive assessment of dermatology residency training in Canada based on the residents' perspective. Specifically, we were interested in identifying target areas for curriculum improvement through the determination of significant gaps between resident-perceived importance and satisfaction with regard to educational components. Given that the future of the dermatology workforce, and of academic dermatology in particular, is integrally dependent on the career choices made by residents in training, a second important goal of the study was to examine and elucidate trends in current residents' envisioned career paths and aspirations.

METHODS

A comprehensive national survey of all core Canadian dermatology residents was con-

Table 1. Residents' Perceived Importance of and Satisfaction With Educational Components in the Curriculum*

Educational Component	Importance	Satisfaction	Discrepancy	P Value
Formal didactic lectures/teaching from the faculty	4.5	2.6	1.9	<.001
Teaching from the faculty in clinics	4.7	3.1	1.6	<.001
Basic science didactic teaching	3.9	2.8	1.1	<.001
Evidence-based dermatology training	3.9	3.0	0.9	<.001
Morphology/clinical unknowns slide sessions	4.8	4.0	0.8	<.001
Journal club and critical appraisal of the literature	4.0	3.3	0.7	<.001
Peer textbook review	3.8	3.2	0.6	.001
Ethics and professionalism training	3.9	3.3	0.6	<.001

*Based on a 1-to-5 Likert-type scale (1, lowest; 5, highest).

ducted in June 2004, at the end of the academic year so as to allow the fullest experience in the program for each cohort year of residents. The questionnaire on dermatology residency training was designed through focus group sessions and pilot testing among dermatology residents and was reviewed for content and validity with input from academic dermatologists nationwide. Survey questions solicited information from the residents in the following 4 areas: (1) demographic information; (2) level of satisfaction with various educational components in the program curriculum as measured on a 1-to-5 Likert-type scale¹⁰ (1, very dissatisfied; 2, somewhat dissatisfied; 3, average; 4, somewhat satisfied; 5, very satisfied); (3) perceived relative importance of the curriculum components (1, not important; 2, low importance; 3, somewhat important; 4, important; 5, very important); and (4) envisioned characteristics of future practice. For the last category, residents were allowed to check as many components as would constitute a significant part of their desired practice. We arbitrarily considered a clinically significant gap between importance and satisfaction to be at least 1.0 Likert unit, with highly clinically significant differences exceeding 1.5 Likert units.

The survey was conducted voluntarily and anonymously. The questionnaires were distributed to residents during academic rounds and subsequently collected in sealed unmarked envelopes. All data were subsequently entered into an SAS statistical database and tabulated (version 9.1; SAS Institute, Cary, NC; <http://www.sas.com>). Analysis was performed using SPSS statistical software, version 11.5 (SPSS Inc, Chicago, Ill; <http://www.SPSS.com>). The Wilcoxon signed-rank test was used to measure significance of differences between importance and satisfaction for various components of the curricula, while the χ^2 test was used for sex differences in residents' career aspirations.

RESULTS

One hundred percent of core dermatology residents in Canada responded to the survey, for a total of 48 residents in accredited residency training programs during the 2003-2004 academic year. Seventeen (35%) of the residents across the country were men and 31 (65%) were women. Fourteen residents (29%) were in their first year of core dermatology training, 14 (29%) in their second year, and 20 (42%) in their third.

Residents attributed the highest educational importance to morphology/clinical unknowns slide sessions, teaching from the faculty in clinics, and formal didactic teaching from the faculty (**Table 1**). Morphology/clinical unknowns slide sessions were associated with the highest level of satisfaction (4.0), with 81% of residents

(n=39) ranking this component of training as very important (5.0). Residents were least satisfied with the formal didactic lectures and clinical teaching they received from faculty, with almost half of respondents (48%; n=23) indicating dissatisfaction in these 2 areas (1 or 2 ranking). This was reflected by the largest gap between resident satisfaction and importance observed in these areas, with Likert scale discrepancies of 1.9 for formal didactic lectures and 1.6 for clinical teaching. Basic science didactic teaching was ranked second lowest, with 38% of residents (n=18) dissatisfied. Dermatopathology, pediatric dermatology, and pigmented lesions/melanoma specialty training were deemed most important by the residents (**Table 2**). Lowest satisfaction was observed with cosmetic dermatology training, with 21% of residents (n=10) very dissatisfied (1.0). Cosmetic dermatology training, however, was also regarded by residents as the least important of the 10 dermatology training areas queried. Satisfaction with dermoscopy, hair and nail disorders, photodermatology, and laser training were also ranked low. Differences between resident satisfaction and perceived importance in these 3 subspecialty disciplines exceeded 1 (ie, 1.1).

Table 3 reflects resident satisfaction with program characteristics and the perceived relative importance placed on those characteristics during training. The greatest importance was ascribed to a supportive and collegial learning environment, patient presentations/discussions at rounds, and volume and variety of patients seen. Residents reported the lowest satisfaction with practice management exposure and training as well as with receptiveness to their input into the training program. Fifteen percent of residents (n=7) were very dissatisfied with research opportunities and support in their programs. The largest discrepancies between resident-perceived importance and satisfaction were for practice management (1.7), responsiveness to resident input in the program (1.4), and availability of faculty mentors and career counselling (1.2).

Eighty-nine percent of residents across the country (n=42) felt that there should be a dedicated resident-run continuity clinic where patients can be observed on a long-term basis in the final year of training. Whereas 80% of residents (n=38) stated that they would be happy to participate in research during residency, 52% (n=25) felt that the research component should be mandatory. Overall, 24%

Table 2. Residents' Perceived Importance of and Satisfaction With Dermatology Subspecialty Discipline Training*

Subspecialty Discipline	Importance	Satisfaction	Discrepancy	P Value
Photodermatology and laser therapy training	4.0	2.9	1.1	<.001
Hair and nail disorders training	4.0	2.9	1.1	<.001
Dermoscopy teaching and practical use	3.9	2.8	1.1	<.001
Hands-on dermatologic surgery training	4.5	3.6	0.9	<.001
Cosmetic dermatology training	3.6	2.7	0.9	<.001
Pediatric dermatology training	4.6	3.8	0.8	<.001
Contact dermatitis and patch testing training	4.0	3.4	0.6	.002
Pigmented lesions and melanoma training	4.6	3.8	0.8	<.001
Dermatopathology training	4.6	4.4	0.2	.10
Wound and ulcer care training	4.0	4.0	0.0	.93

*Based on a 1-to-5 Likert-type scale (1, lowest; 5, highest).

Table 3. Residents' Perceived Importance of and Satisfaction With Training Program Characteristics*

Program Characteristic	Importance	Satisfaction	Discrepancy	P Value
Practice management exposure/training	4.5	2.8	1.7	<.001
Receptiveness to resident input into the program	4.5	3.1	1.4	<.001
Availability of faculty mentors and career counselling	4.5	3.4	1.2	<.001
Supportive and collegial learning environment	4.7	3.6	1.1	<.001
Time for independent study	4.6	3.5	1.1	<.001
Patient presentations and patient discussions at rounds	4.7	3.8	0.9	<.001
Availability of specialty clinics	4.3	3.4	0.9	<.001
Volume and variety of patients seen	4.6	3.9	0.7	<.001
Elective opportunities	4.4	3.9	0.5	<.001
Research opportunities and support	3.7	3.4	0.3	.17
Opportunity to develop teaching skills via peer-teaching	4.1	4.1	0.0	.70

*Based on a 1-to-5 Likert-type scale (1, lowest; 5, highest).

of residents (n = 12) indicated that research would constitute a significant part of their practice.

Figure 1 depicts the dermatology practice styles envisioned by the residents based on their level of training, while projected practice styles and career aspirations substratified by sex are demonstrated in **Figure 2**. Overall, the interest in academic or hospital-based practice declined with progression in residency, and a nadir in envisioned future plans was noted during the second year of dermatology training. More men than women indicated their interest in academics ($P = .09$), research ($P = .06$), and teaching ($P = .06$). Male residents were also more interested in surgical dermatology ($P = .24$) and dermatopathology ($P = .22$), while female residents were predominantly inclined toward cosmetic dermatology ($P = .20$) and pediatric dermatology ($P = .39$). Seventeen (35%) of the 48 residents planned to pursue fellowship training, with 7 indicating their fellowship interest in surgery or cosmetic procedures, 3 in dermatopathology, and 2 in pediatric dermatology.

COMMENT

The present study is the most comprehensive and inclusive national survey of dermatology education ever performed. The multiple areas of perceived strengths and weaknesses that we identified in dermatology residency training

offer insight into educational components that are important for resident satisfaction, and these findings can be used to better shape a successful dermatology curriculum. The areas of greatest discrepancy between resident satisfaction and perceived importance should receive greater attention in dermatology residency education if we hope to improve our residency programs.

Based on the study findings, above all, dermatology residents desire more teaching (clinic, didactic, and practice management) and mentorship from their faculty. Clinical practice and research have long dominated the attention of physicians, and unfortunately, teaching and mentoring have often been considered a lesser activity for which no clear incentives, career structures, or formal training is offered.¹¹ This problem is prevalent in medicine: good teaching is often neither fostered nor adequately rewarded,¹²⁻¹⁴ and the present study documents this problem in dermatology training. Several reviews have addressed the approach to teaching in dermatology.^{12,15,16} It is imperative to realize that faculty teaching and mentorship serve to strengthen our specialty; they should be valued as highly as publications and research.¹⁷ Mentorship can be a powerful tool to help residents achieve their personal and professional goals, and it should be better recognized with a proper reward and incentives system. Whereas practice management is not a formal part of training in most programs, additional structured instruction devoted to this component, as well as op-

opportunities for hands-on preceptorships in dermatologists' offices during training, may be of benefit.

The dermatology workforce in North America faces a significant shortage,^{18,19} with academic and medical dermatology particularly affected.²⁰ Career aspirations of today's dermatology residents are an important barometer for the future of the specialty, and the data from the present survey establish a reference point from which future trends can be gauged. A concerning finding from the study is that as dermatology residents progress through training, their interest in an academic and hospital-based career appears to wane. While several studies have examined the factors influencing residents' decisions to embark on academic practice,^{21,22} further research is needed to elucidate this progression of attitudes. The finding that residents in the second year of core dermatology training appear to be at the nadir of their career vision and

aspirations is intriguing. Additional career counselling and mentorship may be particularly beneficial during this period of residency training. However, it is also possible that such drop in interest reflects the profile of that particular cohort year rather than evolving opinions, and longitudinal follow-up studies are needed to further assess this potential trend.

Significantly more men than women indicated an interest in academics (71% [n=12] vs 45% [n=14]), research (41% [n=7] vs 16% [n=5]), and teaching (71% [n=12] vs 42% [n=13]). In contrast, female residents were more likely to express interest in pediatric dermatology (42% [n=13] vs 29% [n=5]) and cosmetic dermatology (48% [n=15] vs 29% [n=5]). A recent study has demonstrated that parenting issues may affect the workforce choices of women in dermatology.²³ Women now make up the majority in dermatology residency training programs,²³ and at the time of the present study, 65% of dermatology residents in Canada were women (n=31). The challenge of recruiting and retaining women in academic dermatology remains, and concerted effort is needed to provide role models and mentors and to develop formal support mechanisms such as modified tenure tracks for academic advancement of women in our specialty.²⁴ With the increasing percentage of female residents in dermatology programs, early intervention during residency may help foster their involvement in academic career paths.

There are several limitations of the study. First, the small sample size of the cohort limits the power of inferential statistics to detect clinically relevant response differences. Fortunately, the 100% response in this study implies that nonsignificant *P* values are still representative of the population, because in this case the sample was the entire population of interest.

Second, based on a study of Canadian residents, we can draw inferences only about Canadian dermatology training. Because training across countries has similarities, we may find comparable results across training programs in different countries, which compels further study. We hope that this national survey will set precedent for further appraisal of curricula and learners' perspectives on training in other countries.

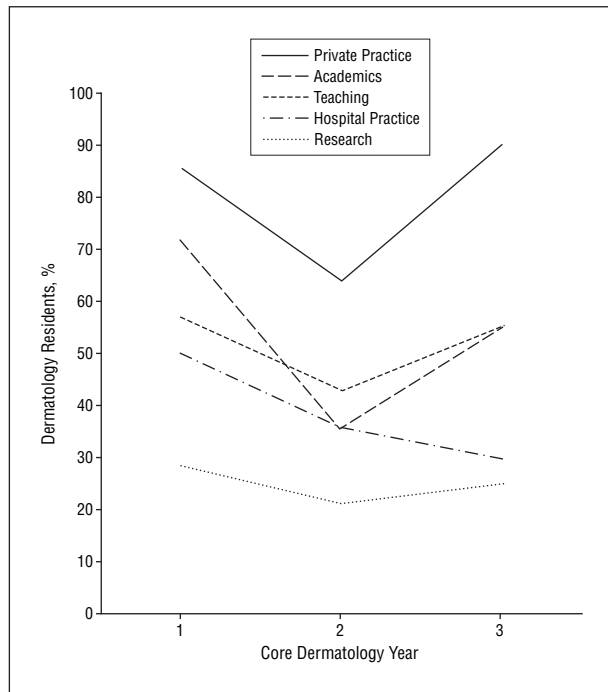


Figure 1. Envisioned practice styles of all dermatology residents. Data are given as percentage of eligible respondents in each category.

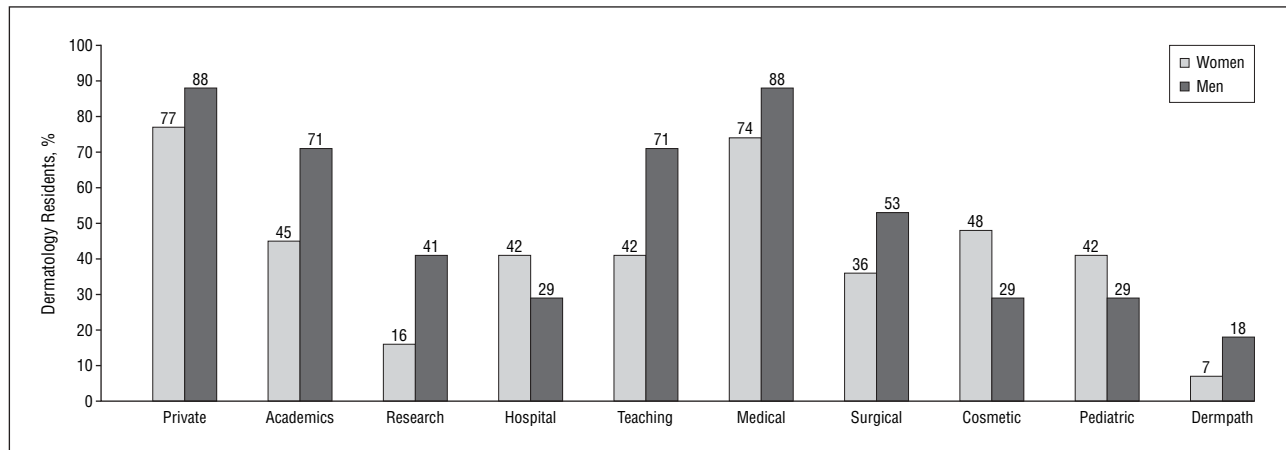


Figure 2. Residents' envisioned practice style and career aspirations by sex. Dermopath indicates dermatopathology. Data are given as percentage of eligible respondents in each category.

Finally, we recognize that residents' perspectives on education may evolve as they leave training and enter practice. For example, residents may find themselves better prepared than they thought in certain areas and conversely lacking training in other areas they did not identify as important during residency. Longitudinal studies of recent graduates could provide additional insight on the evolution of attitudes.

A multifaceted approach is needed to best inform policy, including examination of educational structure, process, stakeholder values, and outcomes. Trainee opinions and input into residency programs are vitally important and underused. The present study provides a broad characterization of epidemiology of resident satisfaction and perceptions of training and the relationship between these variables. While our findings help identify target areas for dermatology curriculum enhancement, it is important to recognize that many other factors are pertinent to the consideration of curriculum development, including the measurement of primary outcomes. Ideally, follow-up and reappraisal of the effects of any intervention are necessary to confirm the intended outcome. Rigorous and generalizable outcomes research in medical education is challenging,^{25,26} and further studies focusing on training outcome measurement and attained domain competency assessment are needed in dermatology.

In conclusion, this survey provides insight into Canadian dermatology residents' perspective on dermatology education. Although academic workforce numbers and budgetary constraints pose a challenge to improving certain areas of the curriculum, the value of incorporating the thoughts and perceptions of trainees must not be ignored. While dermatology and other medical postgraduate programs provide a training structure founded on departmental leadership, years of experience, and the requirements of educational governing bodies, dermatology trainees should be seen as active players in their education. Recognition of the factors important to residents and their incorporation into curricula will strengthen the specialty by improving the education of future generations of dermatologists.

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REFERENCES

1. Cruz PD Jr, Charley MR, Bergstresser PR. Basic science conferences in residency training: a national survey. *J Am Acad Dermatol.* 1987;16:413-419.
2. Cruz PD Jr, Chaker MB. Teaching conferences in dermatology residency programs revisited. *J Am Acad Dermatol.* 1995;32:675-677.
3. Anderson BE, Marks JG Jr, Miller JJ. Continue reading. *Arch Dermatol.* 2001;137:1105-1106.
4. Arndt KA. Information excess in medicine: overview, relevance to dermatology, and strategies for coping. *Arch Dermatol.* 1992;128:1249-1256.
5. Todd MM, Miller JJ, Ammirati CT. Dermatologic surgery training in residency. *Dermatol Surg.* 2002;28:547-550.
6. Reichel JL, Peirson RP, Berg D. Teaching and evaluation of surgical skills in dermatology: results of a survey. *Arch Dermatol.* 2004;140:1365-1369.
7. Kirsner RS, Kerdel FA, Falanga V, Trent J, Eaglstein WH. The role of mandated research during dermatology residency training. *J Invest Dermatol.* 1999;112:400-401.
8. Cruz PD Jr, Knipper JE, Black AA, Sonnier GB, Hud JA Jr, Chaker MB. 1992 AAD Award for Excellence in Education: the Integrated Basic and Clinical Science Conference Series at the University of Texas Southwestern Medical Center. *J Am Acad Dermatol.* 1993;29:761-772.
9. Webb JM, Rye B, Fox L, Smith SD, Cash J. State of dermatology training: the residents' perspective. *J Am Acad Dermatol.* 1996;34:1067-1071.
10. Likert RA. A technique for the measurement of attitudes. *Arch Psychol.* 1932;140:1-55.
11. Lempp H, Seale C. The hidden curriculum in undergraduate medical education. *BMJ.* 2004;329:770-773.
12. Cruz PD Jr. A personal perspective on residency education. *Arch Dermatol.* 1995;131:406-410.
13. Shea S, Nickerson KG, Tenenbaum J, et al. Compensation to a department of medicine and its faculty members for the teaching of medical students and house staff. *N Engl J Med.* 1996;334:162-167.
14. Powner DJ, Rogers PL, Kellum JA. Compensation for teaching in critical care. *Crit Care Med.* 2000;28:1612-1615.
15. Brodell RT, Wile MZ, Chren MM, Bickers DR. Learning and teaching in dermatology: a practitioner's guide. *Arch Dermatol.* 1996;132:946-952.
16. Stratman E, Dyer J. Problem-based learning: an approach to dermatology resident education. *Arch Dermatol.* 2002;138:1299-1302.
17. Schindler N, Winchester DP, Sherman H. Recognizing clinical faculty's contributions in education. *Acad Med.* 2002;77:940-941.
18. Maguiness S, Searles GE, From L, Swiggum S. The Canadian Dermatology Workforce Survey: implications for the future of Canadian dermatology—who will be your skin expert? *J Cutan Med Surg.* 2004;8:141-147.
19. Resneck J Jr, Kimball AB. The dermatology workforce shortage. *J Am Acad Dermatol.* 2004;50:50-54.
20. Werth VP, Voorhees J, Freedberg IM, Sontheimer RD. Preserving medical dermatology: a colleague lost, a call to arms, and a plan for battle. *Dermatol Clin.* 2001;19:583-592.
21. Prystowsky JH. Factors influencing the pursuit of careers in academic medicine. *J Invest Dermatol.* 1992;98:125-127.
22. Rubenstein DS, Blauvelt A, Chen SC, Darling TN. The future of academic dermatology in the United States: report on the resident retreat for future physician-scientists, June 15-17, 2001. *J Am Acad Dermatol.* 2002;47:300-303.
23. Jacobson CC, Nguyen JC, Kimball AB. Gender and parenting significantly affect work hours of recent dermatology program graduates. *Arch Dermatol.* 2004;140:191-196.
24. Pincus S. Women in academic dermatology: results of survey from the professors of dermatology. *Arch Dermatol.* 1994;130:1131-1135.
25. Carney PA, Nierenberg DW, Pipas CF, Brooks WB, Stukel TA, Keller AM. Educational epidemiology: applying population-based design and analytic approaches to study medical education. *JAMA.* 2004;292:1044-1050.
26. Lim JK, Golub RM. Graduate medical education research in the 21st century and JAMA on call. *JAMA.* 2004;292:2913-2915.