

Canadian Dentists' View of the Utility and Accessibility of Dental Research

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Abstract: As part of a major reorganization of health and health care research in Canada, a study was performed to investigate the views of Canadian dentists on the utility and accessibility of the results of dental research. A cross-sectional survey design was used. Questionnaires and a postage-prepaid reply envelope were mailed with the December 2001 issue of the *Journal of the Canadian Dental Association* (JCDA) to all registered Canadian dentists. No second mailing occurred. Of 17,648 questionnaires distributed, 2,797 were returned representing a 15.8 percent response rate. In this sample, 64.3 percent found research findings easily available, 88.8 percent found research findings useful, and 95.8 percent had already changed one or more aspects of their clinical practice due to research findings. Significant differences in preferred means of learning the results of research and preferred formats for written reports of research findings were evident between generalist/clinicians and specialist/researchers. These results suggest that Canadian dentists are interested in the results of research and apply them to their practice, but that there are two main groups (generalist/clinicians and specialist/researchers) with different needs for learning the results of that research.

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One of the strongest driving forces behind the evidence-based health care (EBHC) movement is the perception that a large proportion of treatments currently provided in all fields of health care is not supported by strong scientific evidence of their effectiveness. There are two principal reasons for this situation: 1) good evidence to support the use of many treatments does not exist because the research has not been done; and 2) clinicians do not apply research that has been done to support or not the use of certain treatments—that is, good quality research is available but is not used. The EBHC movement has focused primarily on the first of these reasons with a view to promoting the use of randomized controlled trials to evaluate as-yet untested interventions. However, there is an increasing awareness that the problem is not just the performance of good quality research but also the need to translate the results of that research into a format that is useful and accessible to clinicians^{1,2} and then finding means to enable clinicians to change their practice.^{3,4}

There are now numerous databases aimed at compiling evidence to help clinicians make evidence-based decisions, but the majority of clinicians are

ignorant of such facilities, do not have access to them (whether it be because they do not have a computer and the Internet or because they do not have access to an appropriate library), and do not have time to use them.²⁻⁶ Furthermore, even if information is accessible, it will not necessarily result in a behavior change—that is, a clinician altering his or her practice as a result of learning the results of new research.⁷ It has been documented that even when presented with sound scientific information, physicians can take up to fifteen years to change their practice.⁸ Recent systematic reviews of the most effective ways of getting physicians to alter their practice have concluded that personal visits to a physician's office or any combination of two methods of informing the physicians (written information, videos, CD-ROMs, etc.) are most effective, although even these will only result in approximately 50 percent of physicians' changing behavior.⁹ Similarly in nursing practice, a study investigating the effects of disseminating new evidence-based guidelines on family violence prevention found that while those receiving the guidelines thought that they were important, they also identified numerous barriers to implementing them.¹⁰ So implementing EBHC is difficult.

As is often the case, most of the aforementioned research citations concern work with physicians, and while many of the observations concerning the latter will be similar to those concerning dentists, there are likely to be some differences in barriers to implementing evidence-based research because of the different educational traditions and work settings that exist for physicians and dentists.⁴ The only work investigating dentists' views on research priorities and preferred format for the presentation of research findings was a small survey of general and academic dentists in the UK.¹¹ However, as the authors of the latter paper themselves stated, its methodology precludes any firm conclusions.¹¹

In summary, if the EBHC movement is to achieve anything with respect to dental care, we need to understand the point of view of dentists in this discussion. With this observation in mind and in the context of a recent, ongoing revision of the organization of health and health care-related research in Canada, a study was undertaken to investigate the views of Canadian dentists on the subject of dental research. Specifically, the aim of the project was to investigate their views on: 1) the utility of research; 2) the accessibility of research; and 3) possible future dental research funding priorities in Canada. This article focuses on findings concerning the first two of those aims.

Methodology

A cross-sectional survey design was used. A questionnaire and postage-prepaid envelope were mailed with the December 2001 issue of the *Journal of the Canadian Dental Association* (JCDA) to all registered dentists in Canada. No second mailing was performed. The questionnaire had four sections: 1) sociodemographic variables, 2) research utility, 3) research accessibility, and 4) dental research priorities. English and French language versions of the questionnaire were developed and pre-tested to ensure linguistic equivalence. The Canadian Dental Association has a record of preferred language of communication for each dentist, and this was used to determine which language version was sent to each address. All questions had categorical response options. The dependent variables of interest in this report were: 1) "Are the results of dental research easily available/useful to you?," 2) "Would you like the results of dental research to be more easily available

to you?" "If yes, how?," 3) "What are your principal sources of information concerning dental research?," 4) "When reading about research, which of the following formats is preferable for you?," and 5) "Have you ever altered an element of your clinical practice as a result of learning the results of some form of research?" "If yes, what?"

The JCDA is sent to all registered dentists in Canada, whether or not they are members of the Canadian Dental Association. As of December 2001, there were 17,648 registered dentists in Canada and as of March 31, 2002, we had received 2,797 responses, representing a 15.8 percent response rate. Table 1 demonstrates the relationship between the population of Canadian dentists and the sample who responded to this survey in terms of their practice location, type of practice (generalist vs. specialist), gender, and age.

Following descriptive statistics, simple bivariate analyses of the relationships between the dependent variables and age, gender, principal work role (clinician, teacher, researcher, or other), type of practice (generalist or specialist), location of practice, and questionnaire language (English or French) were performed using chi square tests. At this point it was noted that the variables "principal work role" and "type of practice" were highly interrelated (90.0 percent of clinicians were generalists, and 80.6 percent of teachers and researchers were specialists [$p < 0.001$]), so only "type of practice" was used in the subsequent multiple logistic regression analyses. Multiple logistic regression analysis was performed to investigate predictors of the various indicators of research accessibility and utility described above.

Results

Table 2 demonstrates the descriptive statistics for the whole sample and broken down by age, gender, work role, type of practice, and geographic location for the overall accessibility and utility of research. Of the whole sample, 64.3 percent reported research as easily available, and 88.8 percent reported it as useful. However, looking at different groups within the whole sample, we see major differences of opinion between clinicians and teachers/researchers and between generalists and specialists, with fewer of the clinicians and generalists claiming that research results are easily available to them. For the utility of the research there were no subgroup differ-

ences. Data from another question in the study questionnaire (not shown in Table 2) also showed that although 64.3 percent of the sample claims that research results are easily available to them, 82.1 percent would like such information to be more easily available. Of these, 59.2 percent would like improved availability through journals, 50.4 percent through the Internet, and 47.1 percent through continuing education (percentages are not mutually exclusive).

Table 3 contains data on the question of principal sources of information concerning dental research—a question for which subjects could respond more than once if they wished. Again, responses vary with subgroups within the whole sample. Age was associated with the use of continuing education, lo-

cal dental societies, and congresses, with increasing age predicting increasing use. Gender was associated with the use of four sources, with women being more likely to use congresses and the JCDA and men being more likely to use specialist journals and the Internet. Generalists were more likely to use continuing education, local dental societies, the JCDA, general dental journals other than the JCDA, and company representatives as sources of research information, while specialists were more likely to use congresses, specialist journals, and the Internet. Subjects' views on the availability of research was also significantly associated with local dental societies, the JCDA, other generalist journals, specialist journals, and the Internet as sources of research infor-

Table 1. Sample description by practice location, type of practice, gender, and age

Variables	Sample N	Percentage of Sample	Percentage in the Canadian Population
Main role of subject			
Clinical dentist	2,595	92.8	
Teacher	78	2.8	
Researcher	23	0.8	
Other	101	3.6	
Practice location			
Alberta	287	11.1	9.6
British Columbia	495	19.1	15.1
Manitoba	86	3.3	3.2
New Brunswick	65	2.5	1.5
Newfoundland	26	1.0	0.9
Northwest Territories	5	0.2	0.3
Nova Scotia	96	3.7	2.6
Nunavut	2	0.1	
Ontario	889	34.3	41.6
P.E.I.	15	0.6	0.3
Québec	544	21.0	22.6
Saskatchewan	82	3.2	2.0
Yukon Territories	3	0.1	0.1
Total	2,595	100.0	100.0
Type of practice			
General practitioner	2,329	90.0	89.2
Specialist:	260	10.0	10.8
Periodontist	47	1.8	1.7
Prosthodontist	26	1.0	1.0
Endodontist	34	1.3	1.0
Pedodontist	44	1.7	1.1
Orthodontist	68	2.6	3.6
Oral surgeon	29	1.1	1.9
Public health	7	0.3	0.4
Oral medicine	5	0.2	0.2
Total	2,589	100.0	100.0
Gender			
Men	1,931	74.8	76.7
Women	652	25.2	23.3
Total	2,583	100.0	100.0
Age			
30 yrs or less	272	10.5	-
31 to 45 yrs	1,126	43.4	-
46 to 60 yrs	1,002	38.6	-
61 yrs or more	193	7.4	-
Total	2,593	100.0	-

Table 2. Data concerning the availability and utility of dental research results

Question	Group	Yes (percent)	No (percent)	Don't Know (percent)	Chi Square for Differences Between Subgroups
Are the results of dental research easily available to you?	Whole sample	64.3	21.1	14.6	
	<31 yrs	59.9	24.9	16.1	p=0.117
	31-45 yrs	63.7	21.9	14.4	
	46-60 yrs	64.0	20.7	15.2	
	>60 yrs	72.9	15.0	12.1	
	Males	65.0	20.8	14.3	p=0.287
	Females	61.7	22.1	16.2	
	Clinical dentist	63.3	21.6	15.1	p<0.001
	Teacher/researcher	87.0	9.0	4.0	
	General practice	61.6	22.3	16.1	p<0.001
Specialist	81.3	13.4	4.6		
Are the results of dental research useful to you?	Whole sample	88.8	3.8	7.4	
	<31 yrs	86.8	4.7	8.6	p=0.543
	31-45 yrs	89.6	3.6	6.7	
	46-60 yrs	89.2	3.9	6.9	
	>60 yrs	88.0	2.2	9.8	
	Males	89.6	3.9	6.5	p=0.071
	Females	87.5	3.3	9.2	
	Clinical dentist	88.9	3.7	7.4	p=0.117
	Teacher/researcher	92.6	5.3	2.1	
	General practice	88.9	3.5	7.5	p=0.095
Specialist	89.8	5.3	4.9		

mation. With the exception of the JCDA, wherein more subjects responding “don’t know” reported using this source, the other sources were positively associated with reporting good availability. Finally, reported utility of research was associated with all sources except the use of company representatives, with those reporting research to be useful more likely to use all other sources of research information.

Table 4 contains data on subjects’ preferred format for reading about research (again, percentage figures are not mutually exclusive). Here there is a strong pattern, with approximately 50 percent preferring a commentary on a series of related abstracts and/or a piece that translates research findings into practical guidelines. Only 18.8 percent prefer conventional research reports. Within the whole sample, older age and male gender are associated with a preference for a commentary on a series of abstracts. Generalists are more likely to have no preference, to prefer a commentary on abstracts and clinical guidelines, while specialists are more likely to prefer a conventional report or a systematic review. Significantly more subjects reporting research to be

not easily available prefer a commentary, while more of those reporting it as available prefer a conventional report. However, those subjects who “don’t know” if research findings are available or not have no preference and are less likely than the other groups to prefer a systematic review. Finally, those reporting research as useful prefer a conventional report.

Finally, Table 5 shows the figures relating to how subjects use the results of research to refine their clinical practice. The vast majority of the sample (95.8 percent) claimed to have altered an aspect of their clinical practice after having learned the results of some form of research. Data in Table 5 indicate what they have altered. In the whole sample, the large majority have altered the use of a dental material, an operative or surgical treatment technique and/or a medical treatment as a result of research findings. Smaller but still significant proportions have altered a diagnostic technique, educational message and/or management strategy. Looking at subgroups, for those revised aspects of dental care associated with age (all but educational messages), there was a common relationship wherein the younger subjects were

Table 3. Principal sources of information concerning dental research

Group	Cont. Educ.	Local Dental Society	Cong's	JCDA	Other General Dental Journal	Other Specialist Journals	Internet	Company Reps
Whole sample	70.1	38.6	54.2	73.6	64.7	28.0	21.6	17.8
<31 yrs	60.7	33.5	46.5	84.4	68.4	18.2	20.4	14.9
31-45 yrs	72.1	38.2	54.8	73.1	64.7	27.5	22.7	17.0
46-60 yrs	72.2	39.9	54.1	72.1	64.3	30.1	21.6	19.1
>60 yrs	62.6	42.5	61.7	71.0	63.1	34.6	17.8	19.2
	*p<0.001	*p=0.153	*p=0.009	p<0.001	p=0.589	p<0.001	p=0.399	p=0.303
Males	70.3	39.6	52.8	72.1	65.3	29.6	23.4	17.1
Females	70.4	38.9	58.5	78.4	63.3	23.4	16.6	19.7
	p=0.944	p=0.791	*p=0.010	*p=0.001	p=0.351	*p=0.002	*p<0.001	p=0.126
Clinician	71.8	39.6	54.3	74.9	66.1	26.1	20.8	18.3
Teacher/	30.7	14.9	52.5	43.6	32.7	79.2	44.6	5.9
Researcher	p<0.001	p<0.001	p=0.714	p<0.001	p<0.001	p<0.001	p<0.001	p=0.001
Generalist	73.1	40.2	53.1	78.8	70.1	19.8	20.6	19.2
Specialist	50.6	28.4	62.4	39.3	28.7	84.3	28.4	8.0
	*p<0.001	*p<0.001	*p=0.001	*p<0.001	*p<0.001	*p<0.001	*p=0.001	*p<0.001
Available	71.3	41.2	56.4	72.5	66.3	32.7	24.7	18.1
Not available	69.7	32.1	50.6	72.4	60.6	25.3	19.6	16.0
Don't know	67.4	37.9	50.3	80.8	64.6	12.8	12.6	19.0
	p=0.295	*p=0.001	p=0.013	*p=0.003	*p=0.052	*p<0.001	*p<0.001	p=0.432
Useful	71.3	39.8	55.4	75.3	66.3	28.9	22.7	18.1
Not useful	63.7	30.8	46.5	65.2	57.5	19.0	11.0	16.1
	*p=0.010	*p=0.004	*p=0.005	*p<0.001	*p=0.004	*p=0.001	*p<0.001	p=0.413

1. Figures are percentages checking that category as a response to the question (subjects could check more than one category, so rows of percentage figures do not sum to 100 percent).

2. p figures refer to results of chi square tests for differences in subgroups' proportions.

*Variable remains in multivariate model as a significant predictor of that source of research information.

less likely to have altered their care and the likelihood to have altered care increased with increasing age except for the oldest group, in whom the likelihood fell again. The only altered practice associated with gender was the use of a treatment technique, which was more likely to have occurred with men. Generalists were more likely to have altered the use of a dental material, medical treatment, and educational message. Subjects reporting research results to be easily available were more likely to have altered treatments, diagnostic techniques, educational messages, and management strategies, with the "don't know" group being less likely to have changed all of

them than the other two groups. Finally, those reporting research as useful were more likely to have changed a material, an operative/surgical treatment, and a medical treatment.

Discussion

We have performed a survey of Canadian dentists to elicit their views on aspects of the availability and utility of dental research. Consideration must be taken of the 16 percent response rate, suggesting strongly that the results of this survey do not neces-

Table 4. Preferred formats for reading research results

Group	No Preference	Conventional Report	Abstract	Commentary on a Series of Abstracts	Systematic Review	Clinical Guidelines
Whole sample	9.0	18.8	39.4	48.2	28.0	53.0
<31 yrs	10.5	19.6	36.7	37.8	28.0	48.9
31-45 yrs	8.9	18.7	38.2	46.4	29.4	53.4
46-60 yrs	8.1	17.8	41.4	53.1	27.3	53.2
>60 yrs	11.7	23.4	39.7	47.1	24.3	54.7
	p=0.299	p=0.288	p=0.347	*p<0.001	p=0.433	p=0.538
Males	9.3	18.9	38.9	50.3	28.1	51.9
Females	8.0	18.3	41.3	42.0	27.6	56.2
	p=0.282	p=0.751	p=0.272	*p<0.001	p=0.842	p=0.052
Clinician	9.2	17.9	39.6	48.6	26.7	53.5
Teacher/	4.0	42.6	34.7	37.6	60.4	37.6
Researcher	p=0.072	p<0.001	p=0.315	p=0.030	p<0.001	p=0.002
Generalist	9.7	15.7	39.2	49.8	24.7	54.3
Specialist	4.5	39.6	41.7	37.2	50.6	43.8
	*p=0.002	*p<0.001	p=0.383	*p<0.001	*p<0.001	*p<0.001
Available	8.8	21.8	39.4	48.2	29.6	51.7
Not available	5.9	13.4	40.6	52.0	30.5	56.1
Don't know	14.3	12.8	37.9	43.2	16.7	52.8
	*p<0.001	*p<0.001	p=0.686	*p=0.027	*p<0.001	p=0.205
Useful	8.9	19.0	40.2	49.2	28.7	53.9
Not useful	10.7	10.3	34.6	41.9	21.0	49.8
	p=0.348	*p<0.001	p=0.074	p=0.023	p=0.007	p=0.198

1. Figures are percentages checking that category as a response to the question (subjects could check more than one category, so rows of percentage figures do not sum to 100 percent).

2. p figures refer to results of chi square tests for differences in subgroups' proportions.

*Variable remains in multivariate model as a significant predictor of that preferred format for reading research results.

sarily represent the views of all Canadian dentists. Nevertheless, the sample was broadly representative of Canadian dentists in terms of their geographic location, gender, and practice type, and the results of the survey are interesting, especially in view of the observation that the overwhelming majority of respondents were general dental practitioners. The vast majority of those who completed this survey seemed to be interested in research findings and in applying them to their practice as indicated by 88.8 percent claiming that research was useful to them, 82.1 percent stating that they would like research findings to be more accessible, and 95.8 percent claiming to have altered some aspect of their clinical practice after

learning the results of some research. These findings compare favorably with a similar but smaller cross-sectional survey of British general medical practitioners in which 90 percent reported that primary care research was important, 61 percent were "interested in research," 68 percent used research to directly influence their practice, and 53 percent were interested in participating in future research.¹²

Looking at the findings in more detail, it was predictable enough that clinicians and generalists more often claimed that research was not easily accessible compared to their teacher/researcher and specialist peers. This supports previous work report-

Table 5. Elements of clinical practice subjects have altered after learning research results

Group	Dental Material	Treatment Technique (e.g., restorative)	Diagnostic Technique (e.g., for caries)	Medical Treatment (e.g., chlorhexidine)	Educational Message (e.g., for smoking)	Management Strategy (e.g., risk assessment)
Whole sample	84.9	85.0	47.7	69.6	44.2	31.2
<31 yrs	80.1	80.5	34.1	55.9	41.8	23.8
31-45 yrs	88.4	87.9	48.6	71.2	45.3	31.6
46-60 yrs	91.2	91.2	54.6	77.4	47.7	35.6
>60 yrs	83.5	86.4	50.5	74.8	45.6	31.6
	*p<0.001	*p<0.001	*p<0.001	*p<0.001	p=0.358	*p=0.003
Males	89.2	90.1	51.5	73.2	45.1	33.0
Females	85.5	82.8	43.9	69.5	48.1	30.5
	p=0.010	*p<0.001	p=0.001	p=0.068	p=0.183	p=0.237
Clinician	89.0	88.8	49.3	72.3	45.6	31.6
Teacher/	68.5	76.1	57.6	75.0	54.3	53.3
Researcher	p<0.001	p<0.001	p=0.118	p=0.564	p=0.098	p<0.001
Generalist	90.1	88.4	49.5	73.0	46.9	31.3
Specialist	75.8	88.2	49.4	67.4	38.8	40.1
	*p<0.001	p=0.925	p=0.958	*p=0.035	*p=0.006	p=0.002
Available	87.7	88.9	51.2	72.5	47.8	34.5
Not available	89.4	90.0	50.3	75.1	47.1	31.2
Don't know	88.6	83.7	40.7	67.9	36.3	24.9
	p=0.547	*p=0.008	*p=0.001	p=0.057	*p<0.001	*p=0.002
Useful	89.3	88.9	49.9	73.6	46.5	32.7
Not useful	84.1	82.7	43.1	64.4	38.1	28.0
	*p=0.014	*p=0.005	p=0.045	*p=0.003	p=0.013	p=0.140

1. Figures are percentages checking that category as a response to the question (subjects could check more than one category, so rows of percentage figures do not sum to 100 percent).

2. p figures refer to results of chi square tests for differences in subgroups' proportions.

*Variable remains in multivariate model as a significant predictor of that element of clinical practice subjects have altered after learning research results.

ing that service-based clinicians find accessing research information more difficult than university-based personnel.²⁻⁶ Our study supports these differences between generalist clinicians and specialist teacher/researchers in terms of the sources of research information, preferred formats for reading research findings, and how they apply the findings. Clinician generalists differed from specialist teacher/researchers in their principal sources of information in all but one of the categories in our study. Clinician generalists preferred generalist journals, continuing education, local dental societies, and company represen-

tatives (in that decreasing order of preference), while specialist teacher/researchers preferred congresses (specialists, not teacher/researchers), specialist journals, and the Internet (in that decreasing order of preference). Complementary to that information, generalist clinicians preferred commentaries and clinical guidelines, while specialist teacher/researchers preferred conventional reports and systematic reviews more often for reading the results of research. These results complement the previously mentioned small British survey in which the preferred formats for learning of research results were a lecture (simi-

lar to many continuing education courses) and printing in a generalist journal (in the case of this study the *British Dental Journal* rather than the JCDA).¹¹ Again, similar to our sample, the least favorite formats were the Internet and other electronic formats such as compact discs.¹¹

The data in our study suggest strongly that, in terms of their interest in research, there are two separate groups of dentists: 1) generalist clinicians who want easily available research that is written in a form that they can rapidly apply to their everyday practice; and 2) specialist teacher/researcher dentists who are happy with the more conventional means of reporting and reading about research, presumably because they want to know about the details of how that research was done. If this is the case, it confirms the already reported need among physicians to have translational pieces (that is, reports that fuse the latest research findings together to produce practical, guideline-type information for clinicians) published in generalist journals whose target audience is generalist clinicians.

The implications for generalist journals such as the JCDA, JADA, and the *British Dental Journal* are very important. The results of this study suggest that one of their principal roles should be the transfer of knowledge from researchers and specialists to generalist clinicians through translating research findings into more accessible and practical formats such as commentaries on abstracts and/or practice guidelines. Although this survey had only a 16 percent response rate, the almost 3,000 respondents are eager to learn about research and to apply it to their clinical practice, and generalist journals are their preferred medium for that knowledge transfer.

Inferences relating to the data concerning the application of research findings are more complex. There is a strong pattern of revising care associated with age. The likelihood to alter five out of six categories of care (a dental material, treatment technique, diagnostic technique, medical treatment or overall management strategy; see Table 5) increases with age until the oldest group, in whom the likelihood drops slightly. The fact that the same pattern is observed for the majority of dental care categories suggests that the simple explanation that the older you are, the more chance you have had to change something is probably true. The observation that the oldest group is slightly less likely to have changed these aspects of dental care than the group immedi-

ately younger may be related to a cohort effect in which that group now aged over sixty years had a reduced tendency to alter their practice.

Another interesting observation is that male gender is associated with increased likelihood to alter an operative/surgical technique, while none of the other fields are associated with gender. Also, males prefer specialist journals and the Internet as sources of information, while females prefer congresses and the JCDA for their research information. These observations suggest that gender is associated with some aspects of interest in using research and sources of information.

Finally, it is interesting to note the differences in practice revisions observed between generalist clinicians and specialist teacher/researchers. Where there are differences (dental materials, medical treatment, and educational message), it is the generalist clinicians who are more likely to have revised their practice. This is superficially counterintuitive as one would expect the specialists, who think research is more easily available, would be more likely to read and apply this information by altering their practice. However, there are no differences between generalist/clinicians and specialist/researchers concerning their view on the utility of research. So, it could be that specialist teacher/researchers are more comfortable learning about and understanding the results of research findings but are also more critical and hence perhaps less likely to believe what they hear and/or read and less likely to alter their practice as a result. It may also be that the extra postgraduate education necessary to become a specialist/researcher could have had a very strong influence on their clinical practice, thereby leaving them paradoxically less likely to change when reading or listening to new material. However, further research is required to repeat these findings and investigate the cause of this apparent eagerness of generalists and/or reluctance of specialists to alter their clinical practice.

In conclusion, this study, while compromised by the survey response rate, suggests strong differences between generalist/clinicians and specialist/researchers in their preferred source and reading format of research information. These findings have important implications for knowledge transfer, the role of generalist clinician journals, and other forms of research results dissemination and application if we want to see progress in the EBHC movement.

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REFERENCES

1. Haines A, Jones R. Implementing findings of research. *Br Med J* 1994;306:1488-92.
2. Kerse I, Arroll B, Lloyd T, Young J, Ward J. Evidence databases, the Internet and general practitioners: the New Zealand story. *N Z Med J* 2001;114:89-91.
3. Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, et al. Changing provider behaviour: an overview of systematic reviews of interventions. *Med Care* 2001;39(8 Suppl 2):II2-II45.
4. McGlone P, Watt R, Sheiham A. Evidence-based dentistry: an overview of the challenges in changing professional practice. *Br Dent J* 2001;190:12:636-9.
5. Haines A, Donald A. Getting research findings into practice: making better use of research findings. *Br Med J* 1998;317:72-5.
6. Prescott K, Douglas HR, Lloyd M, Hainers A, Rosenthal J, Watt G. Awareness of and attitudes towards research-based information. *Fam Pract* 1997;14:320-3.
7. Marinho VCC, Richards D, Niedermann R. Variation, certainty, evidence and change in dental education: employing evidence-based dentistry in dental education. *J Dent Educ* 2001;65(5):449-55.
8. Davis O, O'Brien MA, Freemantle N, et al. Impact of formal continuing medical education: do conferences, workshops, rounds and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA* 1999;282:867-74.
9. Bero L, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson AM. Getting research findings into practice: closing the gap between research and practice—an overview of systematic reviews of interventions to promote the implementation of research findings. *Br Med J* 1998;317:465-8.
10. Lia-Hoagberg B, Schaffer M, Strohschein S. Public health nursing practice guidelines: an evaluation of dissemination and use. *Public Health Nurs* 1999;16(6):397-404.
11. Grace M, Stuart-Wilson F, Pitts N. Asking the academics. *Br Dent J* 1997;183(10):356-7.
12. Robinson G, Gould M. What are the attitudes of general practitioners towards research? *Br J Gen Pract* 2000;50(454):390-2.