

Barriers to Innovation in Continuing Medical Education

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Introduction: Criteria for maintenance of certification (MOC) emphasize the importance of competencies such as communication, professionalism, systems-based care, and practice performance in addition to medical knowledge. Success of this new competency paradigm is dependent on physicians' willingness to engage in activities that focus on less traditional competencies. We undertook this analysis to determine whether physicians' preferences for CME are barriers to participation in innovative programs.

Methods: A geographically stratified, random sample of 755 licensed, practicing physicians in the state of Oregon were surveyed regarding their preferences for type of CME offering and instructional method and plans to recertify.

Results: Three hundred seventy-six of 755 surveys were returned for $\pm 5\%$ margin of error at 95% confidence level; 91% of respondents were board certified. Traditional types of CME offerings and instructional methods were preferred by the majority of physicians. Academic physicians were less likely than clinical physicians to prefer nontraditional types of CME offerings and instructional methods. Multiple regression analyses did not reveal any significant differences based on demography, practice location, or physician practice type.

Discussion: Physicians who participate in CME select educational opportunities that appeal to them. There is little attraction to competency-based educational activities despite their requirement for MOC. The apparent disparity between the instructional methods a learner prefers and those that are the most effective in changing physician behavior may represent a barrier to participating in more innovative CME offerings and instructional methods. These findings are important for medical educators and CME program planners developing programs that integrate studied and effective educational methods into CME programs that are attractive to physicians.

Key Words: participation, continuing medical education, survey barriers, preferences, performance in practice

Introduction

Physicians who have completed training and are deemed qualified to practice are expected to maintain competency and consequently spend a considerable amount of time en-

gaged in continuing medical education (CME), which frequently consists of lectures given in comfortable and dimly lit auditoriums.^{1,2} In the past two decades several factors have led to reassessment of the traditional educational paradigm of passive knowledge acquisition. Several systematic reviews of the effect of CME on physician performance and health care outcomes have questioned the effectiveness of customary didactic CME activities.^{3–6} The Institute of Medicine has raised concerns about the quality of care that patients receive in the current U.S. health care system, which may in part be due to inadequate physician training.^{7,8} More recently, a systematic review found that physicians who have been in practice for more years possess less factual knowledge, are less likely to adhere to appropriate standards of care, and may also have poorer patient outcomes.⁹

In response to these concerns there have been calls for the reform of CME,^{10,11} and maintenance of certification (MOC) has emerged as one means of ensuring the competence of practicing physicians.¹² Criteria for maintenance of certification emphasize the importance of competencies such as communication, professionalism, systems-based care, and practice performance in addition to medical knowledge, as

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outlined by the American Board of Medical Specialties.¹³ The success of this new competency paradigm is in part dependent on physicians' willingness to engage in activities that assess and focus on these less traditional competencies. A previous publication reported an analysis of our survey of the awareness of and participation in MOC in a random sample of actively practicing, licensed physicians in the state of Oregon.¹⁴ We undertook this second analysis to determine whether physicians' preferences for CME are barriers to participation in these nontraditional programs.

Methods

At the time the study sample was obtained, the Oregon Medical Association (OMA) database included 9,985 licensed, actively practicing physicians in Oregon. A sample size of 755 physicians was selected to achieve $\pm 5\%$ margin of error at 95% confidence level¹⁵ with a predicted survey response proportion of 50%. To prevent oversampling from urban areas in Oregon, the sample was stratified by geographic location. The number of licensed physicians actively practicing per county was obtained from the OMA database; less populated counties were clustered together for sampling. A proportional, simple, random sample of licensed, actively practicing physicians in each county or cluster of counties was obtained from the OMA database.

Preferences for CME offering type and instructional method were rated on a 5-point Likert scale with 1 representing *least preferred* or *would not select* and 5 representing *most preferred* or *most likely to select*. Respondents were asked whether they were planning to recertify in their specialty or subspecialty. Those who were planning to recertify were also questioned about continuing medical education programs perceived as helpful for recertification. Demographic and practice information was also obtained.

A pilot study was performed with a group of 30 Oregon Health & Science University (OHSU) physicians, and the questionnaire was revised to assure face validity on the basis of feedback received during the pilot study. Surveys were mailed August 17, 2005, with responses received through the end of October 2005. Reminder letters were sent at 1 and 3 weeks after the initial mailing if completed surveys were not received. The second letter also provided a Web address for those physicians who preferred to complete the survey electronically. Ten days after the second survey mailing, follow-up phone calls requesting participation were made to nonrespondents. The survey protocol was approved by the OHSU Institutional Review Board. There was no external funding source for this study. The survey questionnaire is included as an appendix.

Data were deidentified and imported into SPSS version 14.0 for statistical analyses.¹⁶ To evaluate the representativeness of the sample, mean age and frequency of gender of respondents were compared to the entire OMA database. The proportion of physician specialties in the sample was also compared to the entire OMA database and tested for

differences with the χ^2 test statistic. Survey return rates were calculated by major specialty and geographic cluster and tested for differences with the χ^2 test statistic. Frequencies and descriptive characteristics of demographic variables, including age, gender, years in practice, full- versus part-time work status, major practice specialty, and population of practice location, were calculated. The frequencies of responses for each question were also computed.

Four clusters were identified on the basis of amount of time spent in practice, administration, teaching, and research by using hierarchical cluster analysis. Cluster 1 consisted of physicians who spent most of their time in clinical practice (median 100%). Cluster 2 consisted of physicians who spent most of their time in clinical practice (median 85%) and the remainder of their time in administration (median 10%). Cluster 3 consisted of physicians with a variety of roles including practice (median 50%), administration (median 20%), teaching (median 10%), and research (median 10%). Cluster 4 consisted of physicians who spent a significant amount of time in research (median 53%). A grouping variable was created, and each respondent was assigned to one of the clusters described.

Using cross-tabulation to explore relationships between question response and this categorical grouping variable, initial analysis indicated few differences between clusters 1 and 2, primarily clinically oriented physicians, and clusters 3 and 4, physicians with larger proportions of time spent in teaching and research. The clusters were then collapsed into two groups, a clinical and an academic group, for further analysis.

A regression analysis was done with the practice-type variable (clinical vs. academic), location of practice, participation in MOC, and gender as fixed factors and age as a covariate and questions response as the dependent variable.

Results

Three hundred seventy-six surveys of 755 were returned over 16 weeks for a response proportion of 50%. Five physicians responded to the survey electronically by using Survey MonkeyTM (www.surveymonkey.com), 13 returned surveys by fax, and 358 returned their surveys by mail. Five mailed surveys were excluded from analysis because no questions were answered.

The returned sample size achieved $\pm 5\%$ margin of error at 95% confidence level. Distributions of specialty and geographic location of returned surveys were not significantly different from those of the original sample or Oregon physicians as a whole (data not shown). Two hundred sixty (70%) of the physicians who responded to our survey were male. Respondents ranged in age from 29 to 80 years with a mean age of 49. There were no significant differences between our sample and the OMA database on these parameters (TABLE 1).

The number of years in practice ranged from less than 1 year to a maximum of 51 years. Mean number of years in practice was 17. Medicine was practiced full-time by 289

TABLE 1. Demographic Characteristics of Sample and OMA Database

Characteristic	Sample (<i>N</i> = 371)	OMA database (<i>N</i> * = 9,985)
Gender (% male)	70%	69%
Age (mean, in years)	49 (range 29–80)	47
Years in practice (mean, in years)	17 (range < 1–51)	NA**
Practice medicine full-time	78%	NA**
Practice in urban setting (pop > 75,000)	(228) 61%	NA**
Practice in one of seven major specialties	(244) 66%	(7,338) 73%
Time-limited specialty board certification	(187) 51%	NA**
Planning to participate in MOC to maintain certification	(177) 48%	NA**

* *N* with available demographic information.

** Data not available from OMA database.

(78%) of respondents. Two hundred twenty-eight (61%) practiced in urban areas (defined as population > 75,000) and 244 (66%) practiced in one of the seven major specialties; emergency medicine, family practice, internal medicine, OB/GYN, pediatrics, psychiatry, or surgery (including subspecialties in these areas). The proportion of physicians in the seven major specialties in our sample differed from the OMA database as the sample was stratified by geographic location (TABLE 1). One hundred eighty-seven (51%) survey respondents were required to participate in MOC to maintain their specialty board certification and 177 (95%) of these physicians planned to recertify in their specialty.

Traditional types of CME offerings were preferred by the majority of physicians, as shown in FIGURE 1. Specialty association meetings were the most preferred method for keeping medical knowledge up to date with 262 (71%) of respondents rating them a 4 or 5 on a 5-point Likert scale. Update or review courses, short in-depth courses covering one topic, the use of journals or other medical literature, and hospital-sponsored programs such as grand rounds were also preferred methods of CME, rated 4 or 5 on the Likert scale by 50% to 60% of respondents. In contrast individual retraining programs and computer-based educational programs were rated as less desirable types of CME offerings with 50 (13%) and 80 (22%) of all respondents, respectively, rating these methods of updating medical knowledge as their more or most preferred type of CME offering.

Physicians also preferred traditional passive methods of instruction, as shown in FIGURE 2. Lecture in a large group setting was rated as desirable by 282 (76%) of respondents. They were less enthusiastic about more active methods of instruction and subject material other than traditional medical knowledge; small group interactive sessions and demonstrations of procedural techniques were attractive to 225 (61%) and 210 (57%) of all respondents, respectively. Interactive computer programs and individually arranged study were preferred by (89) 24% and (93) 25%, respectively.

There were no significant differences in CME preferences in terms of demography or practice location. Sub-group analysis revealed that academic physicians were even less likely than clinical physicians to prefer innovative forms of CME. For example, clinical physicians were more likely to prefer individual retraining programs, small group interactive sessions, demonstrations of procedural techniques, and computer-based CME (TABLE 2).

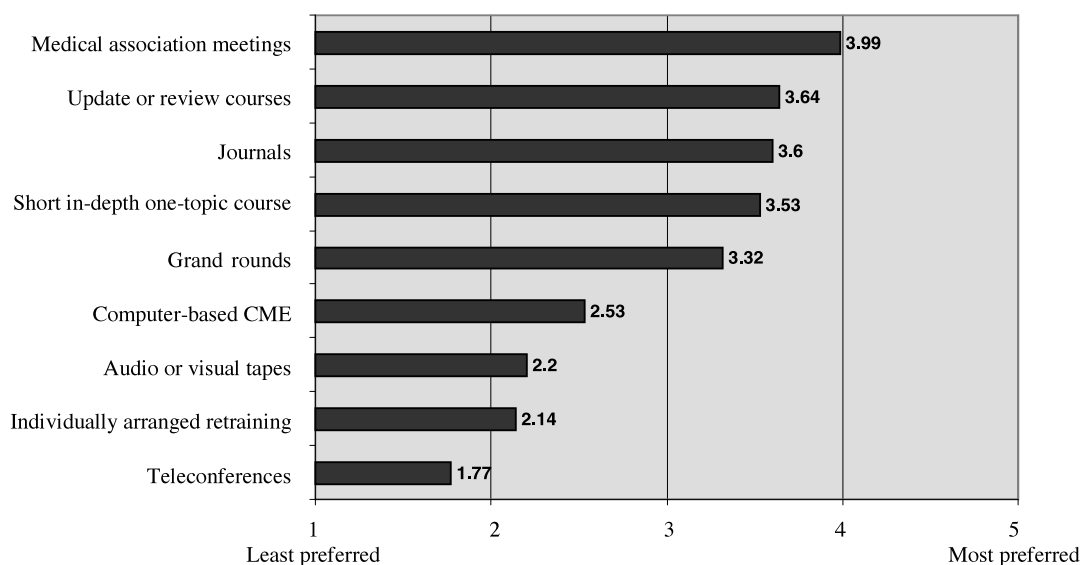


FIGURE 1. Mean preference rating of types of CME offerings.

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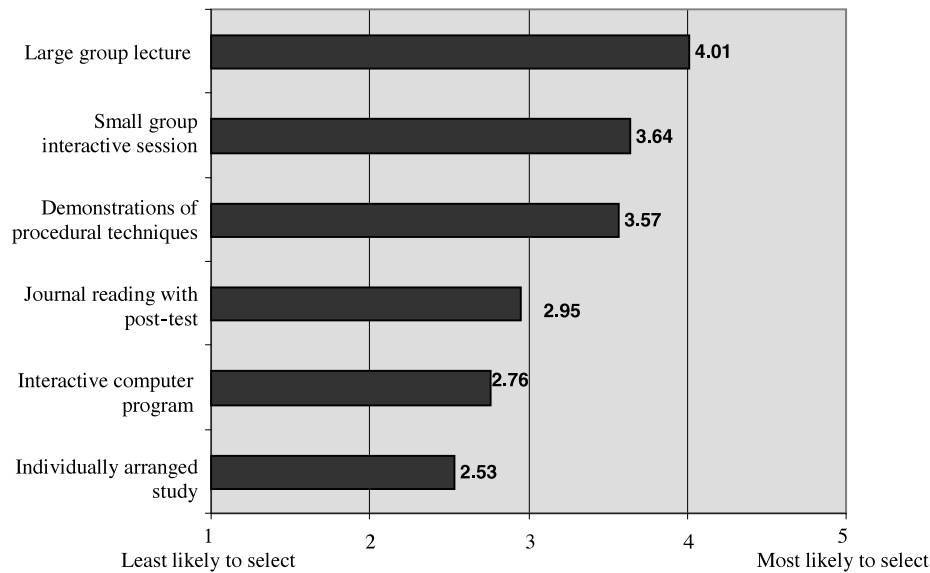


FIGURE 2. Mean preference ratings of CME instructional methods.

Even those physicians who intended to participate in maintenance of certification believed a traditional knowledge-based CME program or exam preparation course would be most helpful for MOC (128 [72%] and 107 [61%], respec-

tively) (TABLE 3). While 74 (42%) recertifying physicians were interested in attending CME programs on practice-based learning and improvement, many fewer were interested in tools to assist with compiling patient data for practice-

TABLE 2. CME Preferences of Physicians in Clinical and Academic Practices

Type of CME Offering	Clinical Mean	Clinical $\pm$ SD	Academic Mean	Academic $\pm$ SD	p Value*
Nontraditional					
Computer-based CME	2.6	1.246	2.4	1.108	0.245
Individual retraining	2.3	1.233	1.8	0.950	<0.001
Traditional					
Medical association meetings	3.9	1.240	4.4	0.843	<0.001
One- to three-day update or review	3.8	1.091	3.2	1.100	<0.001
Short, in-depth, one-topic review	3.5	1.012	3.7	1.137	0.264
Journal reading/literature search	3.6	1.024	3.8	1.113	0.097
Grand rounds at your hospital	3.3	1.165	3.5	1.095	0.045
Audio/video tapes	2.3	1.189	1.9	1.062	0.007
Pharmaceutical company events	2.1	1.020	1.7	0.993	0.002
Teleconferences	1.7	0.907	1.9	0.903	0.105
CME instructional method					
Nontraditional					
Demonstrations of procedures	3.7	1.143	3.2	1.166	0.001
Small group interactive session	3.6	1.107	3.7	1.108	0.456
Interactive computer programs	2.8	1.143	2.8	1.157	0.880
Individually arranged study	2.5	1.287	2.5	1.235	0.938
Traditional					
Large group lecture	4.0	1.028	4.0	0.868	0.719
Journal reading with post-test	3.0	1.157	2.7	1.143	0.018

* Independent sample *t* test.

TABLE 3. CME Programs Identified as Helpful for Maintenance of Certification

Type of CME Program	Identified as helpful by recertifiers (<i>N</i> = 177) No. (%)
Traditional knowledge-based CME course	128 (72)
Traditional exam prep course	107 (61)
Program on practice-based learning and improvement (PIP)	74 (42)
Programs or software to assist with compiling data for PIP	49 (28)
Skills training with simulation	40 (23)
Program using chronic disease registries for education and PIP	28 (16)
Program on communication skills	10 (6)
Program on professionalism	5 (3)

based quality improvement or the use of established chronic disease registries for education and quality improvement (49 [28%] and 28 [16%], respectively) (TABLE 3). Forty (23%) selected skills training using simulations and virtual procedures as helpful, and only 5 (3%) and 10 (6%) selected courses on professionalism or communication skills as CME activities that would be helpful in preparing for MOC (TABLE 3). Multiple regression analyses did not reveal any further significant differences or confounding effects of demographics, practice location, or physician practice type.

Limitations

This study sample is limited to physicians in Oregon, and the results may not be generalizable to all states. Respondents may have had a greater interest in continuing medical education and been more likely to prefer certain types of CME offerings or instructional methods than nonrespondents or may have been more likely to be participating in MOC.

Discussion

The majority of physicians in this study chose traditional forms of CME with large group lectures as the most preferred type of offering and instructional method for continuing education. Physicians who participate in CME select from the educational opportunities that appeal to them. Despite the implementation of MOC requirements necessitating both nontraditional content (eg, communication and professionalism) and instructional methods (eg, practice improvement exercises), there appears to be little attraction to nontraditional competency-based educational content or delivery. Interestingly, academic physicians are even less interested than other physicians in nontraditional forms of CME;

this finding may be related to their customary role as faculty for traditional activities.

These findings remain similar to those of other US and international studies of physician preferences for traditional CME format published before implementation of MOC requirements. A survey of Minnesota physicians reported an overwhelming preference for traditional CME programs as compared to more interactive, technology-based activities.¹⁷ Eighty-five percent of rural general practitioners in Australia selected traditional didactic CME as their preferred method of maintaining professional standards, although self-directed learning was also frequently selected.¹⁸ Brown et al surveyed members of the Society for Healthcare Epidemiology of America and found local grand rounds and regional meetings were the most preferred educational methods.¹⁹

Robinson's study of general practitioners in the United Kingdom demonstrated a correlation between physicians' learning styles and preferences.²⁰ The majority of the physicians in Robinson's study learned best by watching and thinking and tended to prefer lectures and less interactive activities. Similar preferences for lecture format and formal postgraduate courses have been found by others.^{21,22} Most physicians have a long history of success with traditional instructional methods throughout their undergraduate and graduate education, and perhaps their success with these methods is one of the reasons why nontraditional CME is not preferred or perceived as helpful. The apparent disparity between the instructional methods a learner prefers and those that have been shown to be effective in changing physician behavior^{4,23} may represent a barrier to participating in more innovative methods of CME that are thought to be more effective and are required for MOC.

These findings emphasize the need for additional research designed to improve our understanding of how physicians select the educational activities in which they participate. A better understanding of what makes traditional types of CME offerings and instructional methods attractive to physicians would facilitate incorporation of these elements into effective instructional methods and might also identify benefits of these activities that have not been measured in current studies of the effectiveness of CME. In addition, improved methods of self-assessment, curricula shown to have lasting effect on performance, and a focus on early adopters, those willing to participate in activities involving both innovative CME content and educational methods, are important areas of study to address these barriers.

Conclusion

Physicians continue to prefer traditional instructional methods for continuing medical education, and their preferences may represent a barrier to innovation in CME. Given the assumed insufficiency of traditional methods, it is especially important to consider how to facilitate increased interest in less traditional, more effective methods focused on the competencies. There may be early adopters who are more will-

Lessons for Practice

- Physicians may prefer traditional types of CME activities and traditional, passive methods of instruction.
- Evolving criteria for CME focusing on performance in practice will require nontraditional and innovative methods.
- Physician preferences for traditional CME may represent a barrier to innovation.
- Further research to improve our understanding of what makes certain forms of CME appealing to physicians would facilitate development of activities that are both effective and attractive.

ing to engage in less traditional methods, in spite of what would first appear to be low interest. These findings may help medical educators and CME program planners in future program development as they aim to integrate studied and effective educational methods into CME programs that are available and attractive to physicians.

In addition, as physicians respond to the new educational and regulatory environment in which they practice and learn, it will be important to monitor change in their preferences for CME.

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Appendix

Division of Continuing Medical Education
Oregon Health & Science University School of Medicine

NEEDS ASSESSMENT SURVEY

1. **There are many different avenues for keeping medical knowledge up to date.** Please indicate which of the following sources of continuing medical education (CME) you prefer by circling your response:

	Least Preferred				Most Preferred
Meetings of your specialty society or medical Association	1	2	3	4	5
Short (4 hour) in-depth coverage of one topic	1	2	3	4	5
1–3 day update or review courses	1	2	3	4	5
Journals/reference texts/literature searches	1	2	3	4	5
Pharmaceutical sponsored events	1	2	3	4	5
Audio/video tapes	1	2	3	4	5
Computer-based CME (Internet or CD-ROM)	1	2	3	4	5
Programs sponsored by your hospital (e.g. Grand Rounds)	1	2	3	4	5
Teleconferences	1	2	3	4	5
Individually arranged retraining programs	1	2	3	4	5

2. **There are many different educational designs used for CME activities.** Please indicate the likelihood of your selecting each of the following formats by circling your response.

	Would Not Select				Most Likely To Select
Lecture in large group setting	1	2	3	4	5
Small group interactive sessions	1	2	3	4	5
Demonstrations of procedural techniques	1	2	3	4	5
Interactive computer programs	1	2	3	4	5
Journal or Internet reading with post-test	1	2	3	4	5
Individually arranged study/mini-sabbatical	1	2	3	4	5

3. **In selecting a CME activity, what topics are of greatest interest to you?** Please list in order of importance from 1 to 3.

Topic 1: _____
Topic 2: _____
Topic 3: _____

4. **What are the most important reasons you participate in formal or informal CME?** Please mark your top three choices with a “1”, “2” or “3”.

____ keep up on latest medical information and research
____ pass a certification or re-certification exam
____ obtain credits required for hospital privileges or state licensure
____ meet and/or network with colleagues
____ discuss cases/questions with experts in the field
____ combine recreation/travel with learning

5. **In the past three years, have you attended any CME programs sponsored or jointly sponsored by the OHSU School of Medicine?**

____ Yes ____ No

6. **Are you board certified?**

____ No. (*please skip to question 15*).
____ Yes, I have lifetime certification (*please skip to question 15*).
____ Yes, I have my lifetime certification, but plan to **voluntarily** re-certify (*please read the information below and proceed to question 7*).
____ Yes, my certification is time-limited (*please read the information below and proceed to question 7*).

New Re-Certification Requirements

Beginning in 2006 all specialty boards will institute a new, more complex re-certification process. Though the requirements may vary somewhat by specialty, in general candidates for re-certification will be required to demonstrate:

1. Professional standing—Must hold an active, unrestricted medical license
2. Cognitive expertise—Must successfully complete a secure exam
3. Lifelong learning and self-assessment—Must complete a computer-based knowledge assessment test and/or a minimum number of CME credit hours
4. Practice performance that meets peer standards and national benchmarks for both medical care and physician behaviors—Typically, must complete an assessment of practice performance through chart review, develop an improvement plan, and schedule a future reassessment

All of these components must be repeated with each re-certification cycle.

7. Were you previously aware of the new re-certification requirements?

☐ Yes ☐ No

8. Within how many years are you due to re-certify?

☐ 1 to 2 years ☐ 3 to 5 years ☐ 5 to 7 years ☐ 7–10 years ☐ N/A, will voluntarily re-certify

9. Do you plan to complete the re-certification process?

☐ Yes
☐ No (*please skip to question 13*)

10. Please rate the importance of the following factors in your decision to re-certify in your specialty:

	Not at all Important				Extremely Important
Required for hospital privileges	1	2	3	4	5
Required for practice group	1	2	3	4	5
Required for medical licensure	1	2	3	4	5
Demonstrate expertise in my specialty	1	2	3	4	5
Demonstrate that my medical knowledge is up to date	1	2	3	4	5
Demonstrate my competency to provide patient care in my specialty	1	2	3	4	5
Other (please specify _____)	1	2	3	4	5

11. What resources does your practice setting provide to help you with re-certification? Please check all that apply.

- ☐ Time off from practice to complete requirements
- ☐ Financial assistance with fees for testing and other program components
- ☐ Administrative support for data gathering
- ☐ High-speed Internet access and computer support
- ☐ Other (please specify _____)
- ☐ None

12. Please indicate which of the following programs would be helpful to you as you participate in the re-certification process. Please check all that apply.

- ☐ Traditional knowledge-based CME courses
- ☐ Traditional exam prep course for re-certification exam
- ☐ CME program on professionalism
- ☐ CME program on communication skills
- ☐ CME program including skills training using simulations and virtual procedures
- ☐ CME program on updating computer skills
- ☐ CME program on how to efficiently complete the re-certification process
- ☐ CME program focused on practice-based learning and improvement (i.e. quality improvement based on patient data)
- ☐ Courses, programs or software to assist with compiling patient data for practice-based quality improvement
- ☐ Courses, programs or software using established chronic disease registries as basis for education and quality improvement in your practice
- ☐ Searchable database of standardized learning content
- ☐ Searchable database of CME courses and content
- ☐ Other (please specify _____)

(Please skip to Question 15)

13. Please rate the importance of the following factors in your decision *not* to re-certify in your specialty:

	Not at all Important				Extremely Important
Unnecessary for my practice	1	2	3	4	5
Too expensive	1	2	3	4	5
Too time-consuming	1	2	3	4	5
Expect to retire before I need to re-certify	1	2	3	4	5
Expect to change careers before I need to re-certify	1	2	3	4	5
Other (please specify _____)	1	2	3	4	5

14. If board certification were required for medical licensure in the state of Oregon, would you change your decision and proceed with re-certification in your specialty?

____ Yes ____ No

We appreciate the time you have taken to respond to our survey regarding your continuing medical education interests and preferences. In order to best use the information you have provided for us, we need to know a little about you and your practice.

15. Are you currently practicing medicine (e.g., direct patient care and other patient-related activities)?

____ Yes, full-time
 ____ Yes, part-time
 ____ Not presently in practice (*please skip to question 19*).

16. What is the major specialty in which you currently practice?

____ Emergency Medicine
 ____ Family/General Practice
 ____ Internal Medicine
 ____ Obstetrics/Gynecology
 ____ Pediatrics
 ____ Psychiatry
 ____ Surgery
 ____ Other (please specify: _____)

17. If you practice in a major subspecialty please identify:

18. Please mark the answer which you feel best describes the location of your practice or work:

____ Rural setting, population of 2,000 or less
 ____ Community of more than 2,000 but less than 10,000
 ____ Community of more than 10,000 but less than 75,000
 ____ Urban setting, population of 75,000 or more

19. Please estimate the percentage of your working time spent in each of the following activities in a typical month (*total should equal 100%*):

PRACTICE _____% ADMINISTRATION _____% TEACHING _____% RESEARCH _____%

20. Please complete the following information:

AGE (yrs) ____ YEARS IN PRACTICE (yrs) ____ GENDER M ____ F ____

21. If you have additional comments that would help us to better understand your needs for continuing medical education, please add them here:

OUR SINCERE THANKS FOR YOUR TIME AND ASSISTANCE WITH OUR SURVEY

Please return survey in the postage-paid envelope provided or mail to:

Continuing Medical Education-L602
 Oregon Health & Science University
 Portland, OR 97239-3098