

Original Article

A Model Continuing Medical Education Program on Congestive Heart Failure: An Analysis

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Abstract: *Clinical practice guidelines have become an important focus for clinical care. This article describes a process undertaken to disseminate and evaluate an educational program designed to ensure that all physicians in a large geographic area received information about the guidelines for congestive heart failure and had an opportunity to work through them and begin the adoption process to improve the care of their patients. The educational strategy was based on a combination of predisposing, enabling, and reinforcing methods. The predisposing methods included printed materials, lectures, and rounds. A computer disk that allowed the physician to test his or her cognitive knowledge as well as work through patient cases comprised the enabling method. The program was reinforced by regular newsletter reminders of the project. The program was evaluated through a combination of telephone interviews and printed questionnaires. Despite the contemporary nature of the educational thought on which the program was designed, the adoption of the guidelines fell short of expectations. The disease proved to be more complex to manage than anticipated. Physicians appeared unwilling to spend as much time as the program's design required. Physicians were less computer literate than expected and found the Windows-based computer-assisted instruction difficult to use. Additional studies are needed to identify how best to implement a community-wide strategy to promote guidelines.*

Key Words: Clinical practice guidelines, clinical recall interviews, computer-assisted instruction, congestive heart failure (CHF), needs assessment

Clinical practice guidelines have become a new force for action in clinical medicine. Virtually every professional association, government, and

medical society has developed guidelines. Unfortunately, most have developed the guidelines but have stopped short of dissemination and evaluation strategies that would allow assessment of rates of adoption of new practices or even whether the guidelines met the perceived needs that physicians have. More recently, there has been a recognition that guidelines must be disseminated and

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that there are effective ways to disseminate them. This has created new opportunities for continuing medical education (CME) providers to deliver educational products that are evidence based, current, and capable of improving care in a uniform direction.

The purpose of this article is to describe a process undertaken to disseminate and evaluate an educational project designed to enable all physicians in a large geographic area to receive information about current guidelines for congestive heart failure (CHF) and to provide them with an opportunity to work through and adopt the guidelines to improve the care of their patients. As a university-based office of CME, we had an opportunity to guide and monitor the process of guideline dissemination. We attempted to identify those factors and interventions that seemed to be the most and least effective.

Background

Cardiology was identified as an area of educational need for physicians in southern Alberta. Cardiovascular problems are the leading causes of morbidity and mortality, accounting for a large percentage of admission to hospitals. While the CME Office had delivered educational programming in the area of cardiology, it became clear that the 1-day program focused on cardiovascular disease was not popular and attendance at such courses was low.

A leading manufacturer of pharmaceutical products for cardiovascular disease agreed to work with the Office of CME toward the identification of learning needs in cardiovascular disease and the development of educational strategies to reduce the gap between current and desired clinical practice.

Needs Assessment Survey

A large-scale needs assessment was done. A total of 1524 physicians (family physicians, general

practitioners, internists, and cardiologists) in southern Alberta were surveyed to determine their learning needs and preferred learning formats related to cardiovascular disease. A total of 480 (31.5%) surveys were returned after one mailing. That survey determined that the highest priorities were hypertension, ischemic heart disease, cardiac pharmacology, CHF, and cholesterol control, respectively. The physicians indicated that their preferred learning formats were short courses, small group learning, lectures, individualized self-directed learning, reading, and computer-assisted learning.

A committee consisting of cardiologists, CME providers, and family physicians reviewed the needs assessment data and agreed to select one area of cardiology that could serve as a "model" for subsequent programs. CHF, one of the top five topics identified by physicians as an educational priority, was selected as the first program. Unlike hypertension and cholesterol reduction, it was a topic largely neglected by both the University and pharmaceutical industry. Nonetheless, statistics showed that CHF is a common problem. Mortality rates may be as high as 40% to 50% at 2 years.¹ Patients with heart failure are hospitalized frequently. In the Study of Left Ventricular Dysfunction (SOLVD) Registry, approximately 40% of patients were hospitalized at least once within a year of diagnosis.² There was a perception by cardiologists that care was suboptimal. Pharmaceutical industry data suggested that physicians continued to use older therapeutic approaches. Referring cardiologists anecdotally reported that the majority of their referrals were at later stages of the disease process, not at earlier stages in which randomized control trials had demonstrated that treatment could reduce morbidity and mortality. Further, the Canadian Cardiovascular Society was in the process of completing evidence-based guidelines for management.³ It was believed that these guidelines could serve as a robust base for our educational endeavors and provide a gold standard against which we could measure care practices and know the "gap" between current

and desired practice. It was believed that a carefully designed and targeted program based on adult educational principles could be implemented on a community-wide basis to improve physician care practices.

Clinical Recall Interviews

To ensure that the educational program was based around clinical deficiencies identified for CHF, the clinical recall interview technique⁴ was selected for the next phase of the needs assessment. Clinical recall interviews are a method in which a trained interviewer sits with a physician and reviews the content of the chart as well as the physician's recall of the case. Unlike a chart review, which can only abstract data found in the actual record, this method allows the researcher to describe the process of care and the decisions that physicians make. The interview can also elicit information about barriers to care, patient compliance, and resources available to the physician. While a useful technique, it is costly and requires considerable staffing to set up the interviews, travel time for the interview, and data analysis. For economic and time reasons, it was decided to limit the number of interviews to 20 family physicians/general practitioners and 10 internists.

The interview schedule was set up to review how the physician reached the diagnosis of CHF, the investigations that were considered and done, the treatment that was offered over time, how the patient was monitored, and the teaching provided to the patient. The interview was thus designed to obtain information about care of the patient that could be compared to the guidelines for CHF, as the guidelines were very comprehensive and covered all of the aspects queried in the interview.

The data from the interviews confirmed a number of our anecdotal suspicions about the care provided by family physicians and general practitioners. The diagnosis of CHF was made late in the disease process. They did not have a working knowledge of the New York Heart Association

screening guidelines for CHF to draw upon to make an early diagnosis. While echocardiography is a baseline test for CHF, none of the physicians had ordered it for their patients and, as a consequence, could not differentiate systolic from diastolic dysfunction. Despite current recommendations that ACE inhibitor therapy be the first-line therapy, virtually all physicians prescribed diuretics first. Many proceeded to ACE inhibitors only after referral to a cardiologist. While physicians self-reported teaching their patients about the disease and the importance of diet, weight gain, medication side effects, and signs and symptoms of increasing failure, very few physicians covered all of the areas and most used only verbal (not printed) methods. Conversely, performance by internists was more consistent with the current guidelines.

Educational Plan

Recognizing that virtually all physicians were managing CHF and that the results of the in-depth interviews had confirmed major deficiencies in care, the organizing committee adopted a "physician community" educational strategy to disseminate the guidelines. This was based in part on Green et al.'s PRECEDE model,⁵ as confirmed by Davis et al.^{6,7} from a review of the randomized control trial CME literature. More specifically, it was felt that a successful intervention would have to have a number of components and these would have to be built into the program strategically. First, there would have to be sufficient information dissemination to predispose the physicians to earlier awareness of the signs and symptoms of CHF to increase their use of noninvasive assessments of cardiac function and earlier initiation of ACE inhibitors. Second, educational programming would have to be sufficiently intense and afford the physicians an opportunity to practice the information in some way so as to allow them to easily incorporate the newer ideas and concepts into their practices. Last, newly gained information would have to be reinforced so that it became an integral part of the physicians' care practices.

To that end, an educational program was developed that would contain predisposing, enabling, and reinforcing characteristics with the educational content based on the national guidelines. As a first step in the educational process, it was felt essential to train local cardiologists and internists about the CHF guidelines to serve as teachers and educational influentials. While their care practices were within the standards of care, as deduced from the clinical recall interviews, it was recognized that these physicians played an important role in teaching, both as lecturers and more informally through their consultant letters. Their referral practices were such that it would be helpful if their advice was consistent with the information that would be disseminated through the guidelines. A total of nine cardiologists and internists in our catchment area were invited to participate in the educational session. Other predisposing strategies included the production of quarterly newsletters to impart information about CHF management and remind physicians that we were interested in this very important clinical area. Similarly, several of the University's update courses included brief lectures on CHF.

A three-part educational intervention was developed as the cornerstone of the dissemination program. Again, it was set up with predisposing, enabling, and reinforcing characteristics. This program consisted of a large group lecture in which the guidelines were reviewed and the physicians received copies of the guidelines. This large group session was offered numerous times throughout the southern part of the province to set the stage for learning and to impart key clinical information. At the end of the lecture, the physicians were given a Windows-based computer disk to take with them.

The computer disk was divided into five sections. A case study was used as the teaching tool in each section. The first section was designed to help physicians make an earlier diagnosis. The second section covered appropriate investigations to assist with the diagnosis of heart failure. The third section focused on therapeutics with the major emphasis being the use of ACE inhibitors as first-

line therapy. The fourth section covered the importance of patient teaching by covering the areas that should be discussed with all patients, and in the final section, the case study gave a general review of all heart failure teaching. The last section was designed by incorporating elements from each section to reinforce the key issues of early diagnosis, the use of echocardiography, distinguishing systolic from diastolic dysfunction, appropriate use of updated medical therapy, and the importance of patient teaching and follow-up. Pre- and post-tests, also on the computer disk, were included to allow the physician to test and reinforce knowledge gained.

Four weeks after the first lecture, physicians were invited to take part in a small group session in which they could bring their cases and discuss how they had incorporated this new information into their practices. This was part of a strategy to remind physicians of the importance of the disease and to give them an opportunity to reflect on care provided in the interim and check practices with a trusted specialist.

Results

Participation in the program. All of the 1400 family physicians/general practitioners in the region received the newsletters on CHF. The newsletters focused on key aspects of the guidelines, with special attention in the newsletter paid to diagnosis and treatment as these two aspects had been identified as problematic from the clinical recall interviews. It is estimated that approximately 350 physicians heard the brief talks on CHF at the regularly scheduled CME courses that took place prior to the beginning of the three-part intervention.

The three-part program was offered 13 times within the region. Approximately 360 physicians attended the first part of the program, a "major lecture" on CHF. Of that group, 160 requested the computer-assisted learning disk and 100 completed the program. Only 60 of the initial 360

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attended the small group program designed to help consolidate learning and apply it directly to their practices. Not all of the 60 who attended the small group sessions used the computer disks.

Program evaluation. Only those physicians who completed all parts of the educational intervention (lecture, computer-assisted learning disk, small group) were contacted for evaluation purposes. A total of 44 physicians were contacted.

Telephone evaluation. A questionnaire based on the findings of the case recall interviews was devised specifically looking at the following points: were physicians making an earlier diagnosis of CHF, had they increased their use of echocardiography or other noninvasive tests of cardiac function, were they prescribing ACE inhibitors as first-line therapy, could they differentiate diastolic from systolic dysfunction, and had there been any changes in patient follow-up and teaching?

Since completing the program, 72% of physicians stated that their level of confidence had increased and 68% had increased their awareness of CHF. However, only 18% felt that they could make an earlier diagnosis and only 27% felt that they had improved their physical examination and history-taking skills. Forty-five percent had increased their use of echocardiography; this is an increase over the 18% who said that they used it before the program. Sixty-three percent stated that they had increased their use of ACE inhibitors with 31% less reliant on diuretics and digoxin in treating their patients. Only 22% stated that they had a good comprehension of the systolic and diastolic dysfunction, despite it being a main teaching point in every phase of the program. The majority of physicians had not changed their follow-up of their CHF patients and 90% reported no change in their patient teaching.

Paper evaluation. This evaluation was done at the end of the small group session and included only those who had participated in all components of the educational intervention and who

completed their evaluation form ($n = 35$). Very few of the physicians (14%) felt that they had made changes in diagnosing their CHF patients, 42% would increase their use of echocardiography as a diagnostic test, and 45% reported that they would increase their use of ACE inhibitors. Ninety-two percent did not intend to alter their style or amount spent in patient teaching and 82% reported no change in their follow-up plans.

Discussion

Our program was designed as a community-wide approach to the difficulties we perceived, and both our needs assessment survey and clinical recall interviews showed that physicians had difficulty diagnosing and managing patients with CHF. The program was based around a number of theoretical and tested concepts in adult education. First, it incorporated Green et al.'s PRECEDE model,⁵ which shows that physicians need a combination of facilitating, enabling, and reinforcing factors to initiate and sustain change. Davis's meta-analysis of the randomized control trials in CME demonstrates the improvements in physician behavior and patient care that are possible with this type of strategy.⁷ Second, the clinical content was based on a solid foundation of evidence as articulated in the Canadian Cardiovascular Society's guidelines for the management of CHF.³ Research has shown that physicians are more likely to adopt and comply with guidelines when the clinical evidence is strong.^{8,9} Last, needs assessments were conducted twice, first to determine whether CHF was an area of difficulty and second to determine care practices in this area through the use of clinical recall interviews. Davis et al.'s work shows that CME based on "real" gaps in care is more likely to show improvement than CME interventions that are based on less rigorous needs assessment.⁷

Despite the adult educational principles on which the program was built, the general consensus was that it fell short of the success that was

expected. Physicians did not embrace learning in CHF as readily as we anticipated. Turnout for the large group sessions was lower than anticipated and substantially lower than expected for the computer-assisted instruction and small group components of the program. While the physicians indicated that they were interested in CHF, it is possible that they were not ready for an intervention of the depth and scope that we provided. Indeed, subsequent analysis of needs assessment in another disease area indicated that primary care physicians need to maintain currency in a large number of areas and they are very judicious in the amount of time they can allocate to a single disease.¹⁰ The fact that most of the physicians who participated in the clinical recall interviews were unavailable to be reinterviewed, claiming that they had not identified any new CHF patients, further reinforces the impression that, while a common problem, physicians see it infrequently and were unable to reinforce new learning about CHF through patient contact and patient improvement.

Using the guidelines for CHF as the basis for the educational program may have made the educational task unduly difficult and complex. It may have been better to have selected a few issues to address and provided simplified information. The guidelines were written by cardiologists for cardiologists as a comprehensive document to guide care. They did not contain a concise profile of recommended care practices and required a considerable amount of time to understand and internalize. Studies such as Grilli and Lomas's⁸ suggest that compliance will be compromised when guidelines are complex. That study also suggests that primary care physicians will have more difficulty with compliance to guidelines than specialists such as cardiologists who work in environments in which the exchange of scientific data among colleagues is more frequent. Work in Ontario in the field of cholesterol demonstrates the difficulty that family physicians had with total compliance to those guidelines, though partial compliance for specific aspects was high.¹¹

The computer-assisted learning component of the program was particularly problematic. While physicians have computers in their offices to handle their patient billing, as required by the provincial health plan, in fact, for the most part, they were neophytes with computers. The program was designed on an IBM Windows base, which was a leap for DOS users as well as problematic for the Macintosh users within the community. Attempts to install Windows on computers in hospital libraries within the southern part of the province helped somewhat but most physicians required some tutelage with Windows in order to access and use the program successfully. Further, few physicians had done any computer-assisted instruction and were uncomfortable with the medium. In other cases, physicians had small computers with insufficient hard disk space to run the program. In addition, we had hoped to capitalize on the potential of the computer as an interactive learning modality. Unfortunately, early in the design of the computer-assisted instruction, the physicians in the pilot group asked that it be made less interactive.

The telephone and paper evaluations did reveal some interesting findings that indicate additional work is needed to improve clinical care practices. Identification of patients with CHF continues to be a problem, with most physicians not indicating that they improved in that domain. Further, it was clear that they continued to have difficulty distinguishing between systolic and diastolic heart failure. Without knowing this, appropriate treatment is very difficult. It is likely that the primary care physicians did not feel this to be an educational need and the program did not establish the need to know this adequately. A relatively simple educational result was attained in that physicians were more ready to use ACE inhibitors (which augers well for treatment) and echocardiography in the diagnosis of CHF. However the more complex behavioral changes, such as follow-up and patient education changes, were not achieved. We believe that the program may not have emphasized

these topics enough and that they were not clearly identified as physician educational needs.

Conclusion

This study provides useful information in a number of areas of interest to continuing education professionals. First, it reinforces the difficulties inherent in working in the field of guideline dissemination. While the guidelines were developed by a very credible Canadian organization, we learned, as others have, that compliance with guidelines can be difficult. We may have been more successful had we simplified the guidelines and obtained a commitment from the physicians to change their care practices. A number of studies^{12,13} point out the importance of gaining that commitment prior to beginning the educational program and following through on the changes that are made. Given that contemporary management of CHF requires a number of changes at the diagnosis, investigation, treatment, and follow-up levels of care, it is important that physicians understand the nature of the changes that are expected.

The study also provides new insights about a community-wide approach to continuing education. Contemporary thinking about continuous quality improvement reinforces the need to keep working on a problem area until it is resolved. A short period of 1 month from the time of the first large group lecture through the completion of small group sessions may be insufficient time for physicians to regear their approach to a disease and a group of patients.

Last, our work gives us special insights about the difficulties inherent in working with a computer-assisted instruction format. While computer-assisted instruction offers many advantages over other more didactic learning methods, it is important to understand physician use and acceptance of technology. Our success was severely compromised by our failure to appreciate the lack of computer acumen that our physicians had. More recent work shows that, while physicians are inter-

ested in computers and have fairly sophisticated equipment, they are neophytes with both hardware and software.¹⁴

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References

1. Smith WM. Epidemiology of heart failure. *Am J Cardiol* 1985; 55:3A–8A.
2. Bourassa MG, Gurne O, Bangdiwala SI, et al. Natural history and patterns of current practice in heart failure. *J Am Coll Cardiol* 1993; 22(Suppl A):14A–19A.
3. Johnstone DE, Abdulla A, Arnold JM, et al. Diagnosis and management of heart failure. *Can J Cardiol* 1994; 10:613–631.
4. Lockyer JM, McMillan DD, Magnan L, Akierman A, Parboosingh JT. Stimulated case recall interviews applied to a national protocol for hyperbilirubinemia. *J Cont Educ Health Prof* 1991; 11:129–137.
5. Green L, Kreuter M, Deeds S, Partridge K. *Health education planning: a diagnostic approach*. Palo Alto, CA: Mayfield Press, 1980.
6. Davis DA, Thomson MA, Oxman AD, Haynes RB. Evidence for the effectiveness of CME. A review of 50 randomized controlled trials. *JAMA* 1992; 268:1111–1117.
7. Davis DA, Thomson MA, Oxman AD, Haynes RB. Changing physician performance: a systematic review of the effect of continuing medical education strategies. *JAMA* 1995; 274:700–706.
8. Grilli R, Lomas J. Evaluating the message: the relationship between compliance rate and subject of a practice guideline. *Med Care* 1994; 32:202–213.

9. Hall RE, Cohen MM. Variations in hysterectomy rates in Ontario: does the indication matter? *Can Med Assoc J* 1994; 141:1713–1719.
10. Toews J, Lockyer J, Addington D, McDougall G, Ward R, Simpson E. Improving the management of patients with schizophrenia in primary care: assessing learning needs as a first step. *Can J Psychiatr* 1996; 41:617–622.
11. Rosser WW, Palmer WH. Dissemination of guidelines on cholesterol: effect on patterns of practice of general practitioners and family physicians in Ontario. *Can Fam Physician* 1993; 39:280–284.
12. Jones DL. Viability of the commitment for change evaluation strategy in continuing medical education. *Acad Med* 1990; 65(Suppl 9):S37–S38.
13. Parker FW III, Mazmanian PE. Commitment, learning contracts and seminars in hospital based CME: change in knowledge and behavior. *J Cont Educ Health Prof* 1992; 12:49–63.
14. Lockyer J, Davis D, Thivierge R, Langille D, Behrens A. Computers and the primary care physician. *Intercom: Official Newsletter of the Society of Medical College Directors of Continuing Medical Education* 1996; 10(3): 13–14.