

Task Force #5—The Role of Cardiovascular Specialists as Leaders in Prevention: From Training to Champion

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Three driving forces call for an intensive effort focused on cardiovascular disease (CVD) prevention: 1) the dominant risk factors for CVD are known; 2) effective interventions are available; 3) CVD remains the leading cause of death. The previous four task forces have outlined the magnitude of the CVD problem, and documented the cost-utility, intervention efficacy, and adherence strategies available for implementation, yet a majority of the U.S. population is not receiving appropriate preventive care. The goal of Task Force #5 is to evaluate the role of the cardiovascular (CV) specialist as a leader and champion in rectifying missed preventive opportunities. The knowledge, attitudes, and beliefs of CV specialists toward prevention will be evaluated. Considering the imminent predicted increase in the CVD burden outlined in Task Force #1, it is essential that a plan for leadership in prevention be identified.

An increase in the CVD burden is predicted because of the aging of the population and the persistence of unhealthy lifestyles such as smoking, overeating, and low levels of physical activity (1). One approach to this predictable illness is to prepare a greater capacity to deal with the illness—analogue to preparing more ambulances to wait at the bottom of a cliff during a stampede. Current knowledge of interventions effective in preventing CVD, however, puts one in a position to consider, metaphorically, building a fence at the top of the cliff, thereby reducing the need for ambulances. Physicians have historically been trained for the ambulance activities and not for “fence building.” How well are current and future physicians being trained to perform prevention? This discussion addresses the extent of education about preventive practices in medical school, residency, and fellowship training. It also reviews the opinions and perceptions of CV trainees and specialists about CVD prevention. The barriers to and opportunities for integrating prevention into daily specialty practice are discussed. The need for training more preventive, academically oriented CV specialists will be outlined.

HOW MUCH TRAINING IN PREVENTION?

How much preventive training in medical school? The focus on prevention in national “report cards” such as the Health Plan Employer Data Information Set from the National Committee for Quality Assurance has increased the attention on prevention in medical training as an indicator of the quality of care. The Bureau of Health Professions of the Health Resources and Services Administration (HRSA) and the Association of Teachers of

Preventive Medicine have worked to develop a set of core competencies in preventive medicine for medical school (2). In 1995, leaders in internal medicine, such as the Society of General Internal Medicine, the Clerkship Directors in Internal Medicine, and the HRSA prioritized prevention and offered specific prevention-related learning objectives in the new model curriculum for the medicine clerkship, which is called the Core Medicine Clerkship Guide (3). Subsequent evaluation indicates that the Core Medicine Clerkship Guide has been used in some form in more than 100 medical schools (4). Notably, the Association of American Medical Colleges (AAMC) Liaison Committee on Medical Education does not include any specific preventive education content as criteria for medical school accreditation, and 33% of medical schools do not have preventive medicine content as required coursework (5).

Two recent surveys of preventive training in medical school critically review the current curriculum content in preventive training. The Prevention Curriculum Assistance Program (PCAP) documents that fewer than half of the respondents were satisfied with the quality of their achievement in any of the four domains of preventive education (6). The AAMC also performed a survey documenting that, although preventive training was increasingly incorporated into interdisciplinary teaching in some schools, it had been lost during this transition in an equal number of schools (7). The AAMC survey did note a steady increase in the proportion of graduates reporting that an “adequate” amount of time in the curriculum was spent on disease prevention—from 54% in 1993 to 76% in 1997 (8). A recent report, however, indicates that these efforts have not yet translated into applied knowledge. Among U.S. medical schools in 1999, the majority (69%) of graduates were not adequately trained to treat tobacco dependence (9). Thus, recent data imply that prevention is not adequately taught in most medical schools.

How much training in residency? Internal medicine residency programs have also developed a resource guide for preventive training (10). The resource guide identifies a core curriculum for training in internal medicine and includes competency in 20 integrative disciplines, as well as 22 clinical areas. For each integrative discipline, the guide lists a set of competencies that residents should achieve during their training and prompts residency program directors to decide which instructional methods and clinical settings are best suited to accomplish each competency. There are no available nationally representative data assessing if and how

Table 1. ACC Core Cardiology Training Symposium (COCATS) Prevention Core Components of Cardiovascular Medicine Training Programs

Level 1 includes training that should be part of the knowledge base of all clinical cardiologists and includes exposure to the following general and specific areas.

Training in these areas should ideally be undertaken in a one-month (or longer) rotation in preventive cardiovascular medicine. An acceptable alternative would be a one-month (or longer) rotation in a comprehensive cardiovascular rehabilitation program that incorporates a broad range of preventive approaches besides the traditional rehabilitation effort focused mostly on physical exercise. While less ideal than a block-time rotation, training in these areas could be integrated into consultative, inpatient and outpatient rotations and didactic components of core cardiovascular medicine programs. If the latter approach is taken, the time allotted should be equivalent to at least 1 month of full-time training. Training Program Directors may also consider supplementing clinical experiences with short courses devoted exclusively to preventive cardiology or risk factors, such as the ACC Heart House Course in Preventive Cardiology.

General content areas:

1. Vascular biology of the heart and blood vessels
2. Clinical epidemiology and biostatistics
3. Principles of clinical trials and outcomes research
4. Principles of clinical pharmacology

Exposure to the following specific content areas is also essential:

1. Diagnosis and treatment of primary and secondary hypertension
2. Diagnosis and treatment of primary and secondary dyslipidemias
3. Diagnosis and treatment of thrombosis and hypercoagulable states
4. Management of smoking cessation and nicotine addiction
5. Cardiac rehabilitation
6. Exercise physiology
7. Nutrition and its effects on the cardiovascular system
8. Psychosocial and behavioral aspects of cardiovascular diseases
9. Diagnosis and treatment of peripheral vascular disease, including stroke and cerebral ischemia

Adapted with permission from Beller GA, et al. ACC revised recommendations for training in adult cardiovascular medicine core cardiology training II (COCATS II) (Revision of the 1995 COCATS training statement). American College of Cardiology Web site. 2002. Available at <http://www.acc.org/clinical/training/cocats2.pdf>.

preventive education is being implemented in residency training. A survey of randomly selected primary care physicians in Massachusetts performed in 1981 and 1994 did demonstrate an overall expansion of their perceived role in the promotion of health, although they continued to feel inadequately trained to do so (11).

How much preventive education in fellowship training?

Because cardiologists provide most of the care for patients with symptomatic or advanced CVD, the American College of Cardiology (ACC) has stated that it is imperative for CV specialists to be proficient in the primary and secondary prevention of CVD. Indeed, since 1995, the ACC Core Cardiology Training Symposium (COCATS) Recommendations for Training in Adult Cardiovascular Medicine have outlined preventive core components for both the faculty and curriculum in cardiology subspecialty training. These recommendations have recently been updated (12). Table 1 itemizes the Level 1 training, which is required for all cardiology fellows.

The ACC Prevention of Cardiovascular Disease Committee (PCDC) conducted a survey of U.S. fellowship

Table 2. Prevention of Cardiovascular Disease Committee (PCDC) Survey Results of Cardiovascular Subspecialty Fellowship Training Programs

1. Dedicated prevention faculty:
 - 95% had 3 to 4 dedicated preventive research faculty
 - 95% had dedicated preventive teaching and clinical care faculty
2. Dedicated preventive cardiology section or cardiac rehabilitation section:
 - 55% preventive section
 - 80% cardiac rehabilitation section
3. Formal preventive cardiology training:
 - 31.5% regular lectures
 - 13.5% regular rotations (range 4 h to 4 months; 50% had 1 month)
 - 35.1% regular cardiac rehabilitation rotation
4. Outpatient clinics
 - 22.5% regular lipid clinic
 - 9.9% regular hypertension clinic
 - 2.7% regular diabetes clinic

The majority of comments in the survey indicated that this preventive training was covered "semi-formally," "integrated into cardiac critical care-rotations," and "covered during clinical rotations."

Source: American College of Cardiology Prevention of Cardiovascular Disease Committee 2001.

training programs with regard to preventive training in 1999. Overall, 106 of 196 (54%) program responses were received, and the results are shown in Table 2. The majority of CV specialist training programs surveyed had both dedicated preventive faculty and preventive/cardiac rehabilitation sections, but less than one-third had formal preventive cardiology training as part of their program. Similarly a recently published survey documents that only 29% of fellowship programs had mandatory cardiac rehabilitation rotations. This survey also documented that physicians in programs offering at least one hour of cardiac rehabilitation fellowship training were more likely to refer patients to cardiac rehabilitation (13). From these survey results, it was concluded that the majority of current CV specialist training programs are not compliant with the ACC COCATS Training in CV Medicine recommendations. A lack of integration between training program certification and the ACC COCATS recommendations, which allows noncompliant clinical training programs to perpetuate inadequate training in prevention, is also noteworthy. The failure to provide training in cardiac rehabilitation places an additional limitation on the ability of future CV subspecialists to function as team leaders in an increasingly multidisciplinary healthcare system. Indeed, the current CV specialty training has been equated to training "kings and queens" rather than team leaders, resulting in both a lack of leadership and a lack of appreciation of team efficacy in surmounting the complexities of multifactorial risk management, which is required for prevention.

How much prevention in trainee evaluation and testing?

Evaluation often drives learning, and a large body of evidence links the establishment of standards and assessment procedures to subsequent performance. Assessment through testing of the knowledge, skills, and attitudes of trainees is realistically one of the few ways to make a critical review of the outcome of instruction. In medical school,

results from the PCAP indicated that the most frequently used method of measuring student competence in prevention was a written test (6). Results of this survey also revealed that the majority (between 30% and 50%) of respondents were interested in assistance to improve their school's methods of evaluating curriculum in prevention (6). In residency and fellowship training, board certification testing also uses written standardized testing. Currently, the American College of Graduate Medical Examiners has no specified amount or content areas of preventive education assessment. The ACC PCDC recently reviewed the American Board of Internal Medicine (ABIM) preventive cardiology content of this testing. According to the ABIM report, an overall 7% of the questions were devoted to prevention, and a goal of increasing this to 10% was endorsed (J. Loscalzo, personal communication, February 23, 2001). Granted the literature-supported figure of 50% for the CV risk reduction experienced in recent decades being attributable to preventive efforts (including aspirin, beta-blockers, lipid lowering, and lifestyle-related changes), an increase in this proposed figure to at least 15% seems quite appropriate. The new ABIM Practice Improvement Module program, which is in development for physician recertification, has selected preventive cardiology as one of the first modules. Designed to assist physicians in the self-evaluation of that knowledge and ability to implement their knowledge, these modules will have four major components, including: 1) chart-stimulated patient review; 2) patient questionnaire; 3) systems questionnaire; and 4) multiple-choice questions (14).

Barriers and templates for training improvement. There are a number of barriers to the incorporation of comprehensive preventive education throughout medical training. Limited time, lack of curriculum integration, lack of trainee interest, and focus on crucial in-patient issues are commonly cited barriers. American cultural beliefs that marginalize the role of prevention and glamorize the impact of more dramatic medical interventions also probably serve as a barrier (15).

A proposed approach to incorporating prevention into all aspects of training is to build prevention-related objectives into a global curricular renewal or reform process of medical schools, residency, and fellowship programs (16). As medical school and postgraduate training programs undergo curriculum reform, core educational approaches should include a commitment to integrate crosscutting themes, such as prevention. Training guidelines, such as the PCAP Core Competencies (2), the Internal medicine residency resource guide for training in prevention (10), and the ACC COCATS recommendations (12), should be actively incorporated into problem-based learning cases, interdisciplinary conferences, and community health projects, as was done in 1999 by the University of Rochester (16). This is accomplished by leadership vision on the part of the dean, department chairs and faculty. Faculty development activities such as organizational development, instructional development and personal development, are also essential in

supporting the incorporation of preventive education. Specifically, the inadequate recognition and reward for teaching will remain a significant impediment to substantive curricular reform until direct efforts are made to acknowledge these important contributions (17).

WHAT TYPE OF PRACTITIONER TRAINING IS NEEDED?

Overview of CME/educational opportunities. There are a variety of continuing medical education (CME) opportunities related to CVD prevention available for practicing physicians and provided by CME and industry-supported education programs. The pharmaceutical industry has been among the most persistent in encouraging physicians to screen, evaluate, and treat CV risk factors more aggressively. By contrast, organizations directly involved with CV training have been less aggressive. Among ACC-sponsored educational programs from May to December of 2001, only 2 of 36 offerings appeared directly related to Preventive Cardiology. These were entitled "Implementing Coronary Risk Factor Modification: Why, How, and In Whom?" and the "1st Annual Conference on the Integration of Complementary Medicine in a Traditional Cardiology Practice." Other programs undoubtedly contain preventive components, but these could not be quantified. It is not known how many formal training programs in preventive cardiology are available for CV fellows in training.

Perceptions/opinions about CV specialists' need for preventive education. There is little concrete information available on the perceptions and opinions about the CV specialist's need for preventive education. Only rarely has a publication addressed the training of CV specialists (18). This lack of educational research activity data is especially apparent when compared with other disciplines. There are a number of studies in general and family practice, for example, documenting attitudes toward prevention among practicing physicians and trainees (19).

A Medline search designed to evaluate published research on preventive education among physicians used the key words, "Cardiovascular," "Prevention," "Physician" and "Education," and yielded 111 references in English. Only four directly addressed prevention among CV specialists (one of these examined the issue of antibiotic prophylaxis for patients with valvular heart disease). Indeed, the total number of preventive CV manuscripts written for other health care workers equaled the number designed for cardiologists.

Cognitive training versus training in applied systems. With rare exceptions, there is little published on techniques used by practicing CV specialists to facilitate prevention in their practices. The material that is available is often anecdotal (20).

A large component of cognitive training is essential. From the general medical education literature it is clear that a physician's self-perception that he or she has the knowledge to effect change is required before that physician will

attempt intervention (21). Cognitive training and particularly CME alone, however, is not sufficient. Indeed, in some physician educational studies, cognitive training alone in the form of conferences is used as the “control” group. Compared with conferences alone, conferences and quality improvement consultations, conferences and a coordinator in prevention, and a combination of these interventions produced a greater improvement in physician performance in risk-factor management (22). In the absence of data specifically addressing CV specialists, it seems intuitive that both cognitive and applied systems training are required to prepare specialists to establish programs in prevention.

Status of the current scientific sessions with respect to prevention. The CV prevention content of the ACC Scientific Sessions has been surveyed for the last three years by the ACC PCDC. Using the resource/key words (listed in the Appendix: Resource Guide), this search demonstrated that CV prevention content has appropriately increased from 6.5% in March 2000 to 19.5% in March 2001, consistent with the increased scientific interest in this field.

Barriers and templates for improving preventive training. There is a need to clarify the role of the CVD specialist in prevention so that specialists view this area as within their appropriate domain. There are, by anecdotal data, knowledge deficits among practicing CV specialists in how best to manage hypertension, lipid disorders, diabetes, cigarette smoking, lack of exercise, and obesity, and these deficits are undoubtedly a barrier to preventive therapy. In addition, there is often insufficient feedback within the practice setting to provide the specialist with a scorecard for performance. There is virtually no formal research on educational methods for use in training CV specialists in prevention. All of these areas should be addressed to enhance the training available to both trainees and practitioners in CVD prevention.

HOW SHOULD PREVENTIVE SERVICES BE INTEGRATED INTO DAILY CV SPECIALTY PRACTICE?

Successful integration of preventive services into daily CV specialty practice requires effective discussion of four important elements. First, the perceptions and opinions about the role of the specialists in delivering long-term preventive services must be addressed and clarified. Second, evidence of current gaps and missed opportunities for identifying high-risk individuals and delivering appropriate preventive care for reducing the risk of fatal and non-fatal CV events must be presented. Third, the role of medical informatics in the dissemination of CV clinical guidelines and in facilitating the application of guidelines in daily specialty practice must be reviewed. Fourth, important barriers, proposed solutions, and templates for continued improvement must be presented.

Perceptions and opinions of the specialist. When patients are referred for evaluation and treatment of acute coronary syndromes or other acute problems, discussions about long-term lifestyle changes for the prevention or control of risk factors are not seen as germane to the chief

complaint. Additionally, laboratory data such as blood cholesterol or glucose obtained at the time of the acute event may not be considered representative of the long-term values and, thus, can fail to elicit appropriate management. Often, the CV specialist perceives his or her role as addressing the chief complaint and leaving the long-term preventive services to the referring primary care physician. This perception seems to be supported by studies also showing that most family physicians see their role in the reduction and control of CVD risk factors as central (23). Ample evidence suggests that for these and a variety of other reasons, many patients eligible for preventive counseling do not receive these services even when they come in contact with physicians (24). In fact, lifestyle and other behavioral modifications may be an important component of the appropriate care for the acute problem. For example, weight gain, excess salt intake, and medication non-compliance may be the culprits underlying “resistant” hypertension. Thus, it may be necessary to counsel patients on lifestyle changes to control resistant hypertension (25,26). The CV specialist has a clear mandate for addressing primary prevention and risk-factor control in all settings of patient encounters (27).

Many CV specialists recognize that the level of reimbursement for the amount of time it takes to deliver appropriate comprehensive counseling in smoking cessation, nutrition, physical activity, and other lifestyle changes for patients and their families is inadequate. It is more appropriate for someone other than the specialist to deliver that care. The use of a multidisciplinary care team that includes non-physician providers to address preventive services and health promotion counseling is an important part of the solution. In addition, reimbursement reform must address the importance of preventive services as an integral part of specialist practice. It is important to emphasize, however, that several studies have shown that changing reimbursement alone is not enough to improve delivery of preventive care (28,29).

There are various ways that physicians can incorporate prevention into their practices and be adequately compensated. Physicians can use standard billing codes and procedures for the evaluation and treatment of a multitude of CV risk factors, including hypertension, diabetes, hyperlipidemia, nicotine addiction, and standard CV conditions. Nurse practitioners and physician assistants can be employed to manage risk-factor programs such as lipid and hypertension clinics, which can be billed under the appropriate risk-factor code. Also, CV specialists can initiate cardiac rehabilitation programs that are a good source of patient retention for the practice and/or hospital. Billing codes exist for monitored exercise, and these programs are required to provide patient education and are thus excellent resources for multidisciplinary risk-factor care.

Two important misconceptions held by many CV experts are, first, the feeling that they lack the skill to deliver effective counseling about behavior modification (such as smoking cessation or weight loss) and other lifestyle changes

(30) and, second, that the elderly may not benefit as much as the young when prescribed preventive interventions (such as drug treatment for isolated systolic hypertension). These misconceptions lead to undertreatment or, at worst, withholding of preventive counseling or therapies known to prolong life and reduce mortality. In fact, these misconceptions have been dispelled by recent epidemiological data and randomized, placebo-controlled trials (31,32). Greenlund et al. (31) showed that in 52,046 persons in 20 states participating in the 1999 Behavioral Risk Factor Surveillance System, the proportion of persons who were engaged in dietary changes was higher among those who received physician advice (85.4%) than among those who did not receive such advice (56.0%). In this same population, the percentage engaged in exercise was greater among those who received physician advice (76.5%) to exercise than among those who did not receive such advice (38.5%). Regarding the relative value of preventive therapies achieved by elderly persons, Hunt et al. (32) recently showed that in patients who are 65 years or older with a history of coronary heart disease and only average or moderately elevated cholesterol levels, pravastatin treatment resulted in a significantly greater benefit (reductions in death or major CV event) than in younger patients. Furthermore, data from the Systolic Hypertension in the Elderly Program and Long-term Intervention with Pravastatin Ischemic Disease trials demonstrate the gaps in overall risk-reduction experienced when only single risk factors are treated, emphasizing the role of CV specialists and multidisciplinary teams in global risk management.

Current gaps and missed opportunities. Several studies document important missed opportunities in all settings of patient encounters (24,33-36). In the in-patient arena, the admitting clinical history, review of systems, and past medical history often fail to elicit the presence of coronary risk factors. Frolkis et al. (37) showed that even among the best performing physicians, the rate of screening for established major coronary risk factors in patients admitted to a coronary care unit were 89%, 74%, 68%, 59%, 56%, 37%, and only 11% for the presence of cigarette use, known coronary heart disease, hypertension, hyperlipidemia, family history, diabetes, and postmenopausal status, respectively. Similarly, abnormalities or clues on physical examination (such as elevated blood pressure (BP), widened pulse pressure, xanthelasma, and so forth) and on the routine blood tests and electrocardiogram (such as left ventricular hypertrophy) unrelated to the chief complaint may not trigger the appropriate preventive intervention. In fact, at the time of discharge after a myocardial infarction (MI), most patients do not receive appropriate advice and counseling about coronary risk factors and secondary prevention (38). In addition, prescriptions for aspirin, beta-blockers, and lipid-lowering agents that are known to reduce recurrent infarction and CV complications remain suboptimal (34,39).

The gaps in effective delivery of preventive services noted in the in-patient setting are similarly seen in patient encounters in the out-patient and diagnostic laboratory

settings. For example, analysis of the National Ambulatory Medical Care Survey data about preventive health behaviors during office visits demonstrated that a high proportion of office visits in 1995 did not include counseling for the prevention of CVD (35). Berlowitz et al. (40) showed that increases in therapy occurred in only 6.7% of visits despite an average of more than six hypertension-related visits per year in a group of 800 male veterans (40% of whom had a BP greater than or equal to 160/90 mm Hg) during a two-year period. Current smokers may not receive counseling or advice to quit smoking during any number of visits to the clinic, and praise or encouragement is rarely given when patients achieve mild success in lifestyle changes. Many hospitals do not have a structured smoking-cessation program or medical director responsible for coordinating global CV preventive services. Luzier et al. (41) recently showed that even in the presence of compelling laboratory data (such as left ventricular ejection fraction less than 40% in post-infarction patients) as many as 46% of eligible patients are discharged without a prescription for an angiotensin-converting enzyme inhibitor. Of the patients who received the drug, only 11% received the recommended dosages (41).

The role of medical informatics in improving preventive services. Although lack of adequate training and limited skills are often cited as reasons for the observed gaps in the delivery of quality preventive services (42,43) CME alone is unlikely to change practice patterns unless it is coupled with chart audits and constructive feedback to specialists when deviations from guideline recommendations are noted. Most importantly, reliance on the busy specialists to remember all guidelines for all CV diagnoses during all patient encounters is unrealistic. A recent review of the National Guidelines Clearing House Website showed a total of 119 published guidelines intended for physicians on CVD alone (44). The use of evidence-based prompts, alerts, and reminders can help improve physician compliance with guidelines for preventive care (45-47).

Gaps in the delivery of preventive services and limited compliance with established guidelines by CV and hypertension specialists are more reflective of health care systems issues, forgetfulness, and limited time during the patient encounter than of deficiencies in the specialists' knowledge (48). This contrasts with what has been published for internists regarding diagnostic testing in preventive services (use of electrocardiograms, cholesterol level tests, and chest radiographs) and behavioral counseling to promote health (in the areas of smoking cessation and physical activity). Schwartz et al. (49) concluded that internists used effective preventive interventions less frequently and ineffective practices more frequently than experts recommend and that this observation was associated with habit, attitude, and a lack of adequate knowledge. In addition to providing continuing education, even greater emphasis must be placed on health care systems changes and informatics supports that will enable of guideline-based electronic prompts and reminders to be implemented at each patient encounter. Notably, a

number of informative tools are available to assist with global risk assessment (see Appendix: Resource Guide). These changes at the health care system level will represent an important safety net for CVD prevention for all patients.

Important barriers and templates for improvement. The key barriers to the successful delivery of preventive services include the lack of effective communication between CV specialists and referring primary care physicians, decreasing the length of time the CV specialist spends with the patient, the inadequate reimbursement for preventive services, inadequate medical informatics support, and other health care system barriers.

Templates for improvement must focus on the building of partnerships and improved communication among and between CV and hypertension specialists, referring primary care physicians, and non-physician providers. As Turner and Ball (50) stated 25 years ago:

“Cardiologists on their own are unlikely to succeed in a program of prevention. They need the help of many others, including community nurses, nutritionists, public health workers, sociologists, and of course general practitioners, but they have responsibility for leadership and for providing background knowledge.”

Investments must be made in improving informatics support and development of guideline-based electronic prompts, alerts, and reminders to facilitate the delivery of preventive care services.

CAN CV SPECIALISTS BE CHAMPIONS OF PREVENTION?

Cardiovascular specialists shoulder a broad range of responsibilities for the care of individuals with CVD or the potential for developing it. They also bear responsibility for the CV health of communities, specifically by acting at the political level to encourage and assist in the implementation of healthy lifestyle changes, for example, through promotion of sidewalks for walking, parks for recreation, and healthier food in schools. For individual patients, through educational and other efforts, CV specialists are expected to contribute significantly to both the treatment and *prevention* of CVD.

There is no question that, among other duties and responsibilities, CV specialists should serve as *champions of prevention*. For example, in the recent ACC COCATS document on Training in Preventive Cardiovascular Medicine (12), in the Cardiac Rehabilitation guidelines of the American Heart Association (AHA)/American Association of Cardiovascular and Pulmonary Rehabilitation (51), and in such documents as the AHA Primary and AHA/ACC Secondary Prevention Guidelines (52,53), cardiologists are designated as being responsible for delivering preventive care to their patients. As a further specific example, in a recent AHA statement on when to start cholesterol-lowering treatment after a MI (54), the following appeared:

“The cardiovascular specialist or attending physician should be responsible for starting some form of cholesterol-

lowering therapy in patients upon discharge from the hospital after acute coronary events. Failure to do so can convey a message to the patient’s follow-up physician that cholesterol management is not necessary. The cardiovascular specialist thus should ensure that appropriate therapy is initiated and maintained. Interaction between the cardiovascular specialist and primary care physician will further assure that cholesterol management is initiated and continued and that the patient is monitored for drug toxicity.”

There are many other examples in the recent cardiology literature affirming that prevention of CVD or prevention of recurrent disease in cardiac patients (secondary prevention) is directly within the role of CV specialists.

In many clinical settings, prevention of CVD is a multi-disciplinary responsibility, and this division of labor can be both a help and a hindrance to the delivery of CV preventive services. For example, in the delivery of services for cardiac rehabilitation, smoking cessation, exercise therapy, dietary therapy, weight control, and hypertension control programs, CV specialists are typically members of a team of therapists rather than solo practitioners. Moreover, for many of these services, a patient may view a primary care physician as the most responsible physician, rather than the consulting CV specialist. Nonetheless, as suggested by the quotation above concerning the delivery of cholesterol-lowering therapy after MI, communication between practitioners and the delivery of a clear, consistent message is crucially important. Coordination of efforts is also important, and although the CV specialist may not have exclusive (or even primary) responsibility for the delivery of preventive services, it is imperative that CV specialists convey to patients the importance of the effort and secure the necessary care within the local health care system.

In some cases, the cardiologist will be the leader of the team (e.g., Head of the Cardiac Rehabilitation Program), but in many clinical settings, the CV specialist may be uninvolved in the direct delivery of the services (e.g., most smoking cessation programs). Whether as team leader, team member, or referral source, it is extremely important for a CV specialist to collaborate with other professionals when this is in the best interest of the patient. Specialists may need to draw on the complementary skills and knowledge of nurses, pharmacists, dietitians, optometrists, dentists and physician assistants. Cardiovascular specialists also need to learn when to utilize other specialists by appropriately referring patients for more intensive counseling. Minimally, CV specialists should be expected to perform the “Four As” of preventive care developed in the treatment of smoking cessation (55):

Assess the need for the preventive service.

Advise the patient to seek preventive services or to modify behavior as indicated.

Assist the patient in the provision of preventive treatments (as needed).

Arrange for follow-up of the patient to reinforce positive changes and to redirect behavior as needed.

A number of barriers inhibit the delivery of preventive services in clinical medicine (56). One of the barriers most commonly cited is “lack of time” to provide personal delivery of the preventive service, whether it is smoking cessation, dietary counseling, or other aspects of the comprehensive approach to preventing CVD (57,58). As several authorities in the field of prevention have designated, lack of time is most often an excuse, not a real barrier. There are a variety of systems (59) and other assistance devices to allow busy clinicians to promote the practice and delivery of services in preventive cardiology (60). If the clinicians are properly organized and committed, they can have “time” to succeed and deliver preventive services. Successful approaches to the delivery of CV preventive services have been reported (59,61,62), and most of these require primarily that CV specialists focus on prevention for only a few minutes with the patient. Success often requires development of a multidisciplinary approach (63) built on a strong commitment to the best possible preventive service that can be offered.

Although preventive services are distinctly within the purview of CV specialists and many successful programs are available, evidence shows that referrals to these programs and participation in these programs are sub-optimal (63,64). Problems with optimal participation in such programs involve patient factors, physician factors, and system factors. Reviews have suggested ways of addressing each of these problem areas.

In conclusion, CV specialists should indeed be champions of prevention. There are useful examples in the literature to guide even the busiest specialists, including those in private practice (20,65–67) to meet this challenge. In addition to the role of CV specialists as champions for their own patients, CV specialists possess distinctive knowledge and skills that should be shared with other physicians through preventive cardiology educational sessions, promotion of optimal practice patterns, and leadership in local preventive cardiology practices. The CV specialist is “the expert” on prevention of CVD and typically possesses superior knowledge about the most up-to-date preventive strategies available (68,69). It is logical—and appropriate—for specialists to share this knowledge more widely with colleagues and to champion the broader adoption of evidence-based preventive and CV rehabilitation services in the community.

WHAT IS THE ROLE OF ACADEMIC PREVENTIVE CV SPECIALISTS?

What is the role of academic preventive CV specialists? Is there a need for subspecialty preventive cardiologists? With the burden of CV illness increasing by 30% to 40% over the next 20 years and with over two million cases of heart failure in America today, the need for a preventive

academically oriented CV specialist has never been greater (70,71). In addition, patients are not meeting National Cholesterol Education Program targets for low-density lipoprotein cholesterol, many patients do not meet the Sixth Report Joint National Committee VI on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI) targets for BP control, and over five million Americans are likely to have insulin resistance syndrome, the precursor to full-blown diabetes. Addressing this need will most certainly improve the care delivered by a variety of physician specialties and allied health care professionals, but the need for a preventive academically oriented CV specialist has never been greater.

With current CV training focused primarily on subspecialization in either interventional/electrophysiologic cardiology or noninvasive imaging cardiology, there are very few CV specialists focusing on the ever-increasing challenge of prevention. Although generalists may have some understanding of this field, the complex interplay of lipid disorders, hypertension, and type II diabetes makes preventive cardiology a subspecialty of its own (27). Furthermore, there is a progressive increase in the complexity of risk assessment (genetics, novel risk factors, testing strategies, and so forth) and in the range of interventions (e.g., drugs). Finally, there is evolving evidence that CV specialists perform better in these tasks than generalists (72). Therefore, there is a clear role for the academic CV preventive specialists and a need to promote such a subspecialty. A model to consider is the academic CV specialist defining the field and contributing to research in prevention while co-participating in the delivery of preventive services with the primary care physician and allied health professionals.

What role should preventive CV specialists play in the division of cardiology? Preventive CV specialists should not only provide consultation to the primary care physician, when required, but should also provide expertise to colleagues in the division of cardiology through subspecialty consultation for refractory patients (as done by other internal consultations such as electrophysiology, heart transplantation, and the like). Preventive CV specialists should also develop educational initiatives and leadership in outcomes-oriented research. A preventive cardiology clinic is vital for supporting clinical activities and should involve colleagues from other subspecialties (e.g., nephrology, diabetology) and allied health professionals (e.g., dietitians, social workers). This preventive cardiology program would serve as the foundation for educating medical students, house officers, and fellows in the comprehensive diagnosis and management of CV risk (16).

Is academic achievement more difficult in prevention? Many large scale randomized trials and large cohort studies have been led by academic preventive CV specialists. These trials, including the Scandinavian Simvastatin Survival Survey and Heart Outcomes Prevention Education have had a significant impact on public health. In the future, preventive cardiologists, who have a unique understanding of the

research questions before them, should lead these research initiatives. There is no question that the field of academic preventive CV is evolving. Academic recognition is disproportionately higher for basic and translational research than for outcomes research (seen as less cutting-edge). Inadequate funding for preventive cardiology is a significant barrier to academic achievement, and a lack of funding often leads to dependence on the pharmaceutical industry for support. Funding must be increased to a level of parity with other CV research if this subspecialty is to survive. As an epidemic of CVD evolves, measures to reward and recognize excellence in academic/preventive research in cardiology, and education must be undertaken in order to recruit young investigators to this field (73).

Are there enough preventive CV specialists? Relative to the increasing burden of CV illness, there is a significant shortage of academic preventive CV specialists, primarily because of the relatively small number of training programs available to cardiology fellows with specific preventive subspecialty training. For those universities with training programs, there are no clear standards for subspecialty qualification. Fortunately, the updated COCATS will provide an overview of Level III training that is focused on academic preventive CV specialists (12). As outlined in COCATS, it is anticipated that each academic program should have at least one or two full-time academic preventive CV specialists to meet the needs as outlined. Reinstitution of effective training programs such as the NHLBI-sponsored Preventive Cardiology Academic Awards, which did much to supply the currently trained academic preventive cardiologists should be considered.

How might the academic CV preventive specialist help foster an effective partnership between the CV field and public health? Because CV prevention is a multidisciplinary endeavor, public health outcomes research needs to be directed by experts knowledgeable in the complex interactions of the various factors. Educational initiatives for the public at large, patients at high risk, and the medical community as a whole must be championed by those with the highest level of expertise. Comprehensive national faculty development workshops that focus principally on instructional development have been found effective in achieving a broad range of educational initiatives guided toward the specialists and toward the public (74).

The preventive CV specialist would ideally have formal clinical training as well as a Masters degree in public health or similar expertise in outcomes research. Such a specialist would serve as a natural bridge between public health issues and the way those issues affect frontline cardiology. The medical and the public health community are in constant need of education and feedback in the management of conventional CV risk factors. This would be a natural role for the academic preventive CV specialist and could conceivably lead to better adherence to national guidelines and evidence-based medicine.

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