Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

Based on presentations at the 2003 Medical Director Colloquy, Chicago, May 1–3

Continuing education credit for physicians and pharmacists sponsored by

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INTRODUCTION

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This supplement derives from the 2003 Medical Director Colloquy, “Transforming Dyslipidemia Management — Assessing Clinical Outcomes and Cost,” a program that took place on May 1–3, 2003, in Chicago. The program that gave rise to this supplement was the second in a series for medical directors that focused on the care and management of dyslipidemia.

Not surprisingly, many issues that were addressed at the 2002 Medical Director Colloquy remain unresolved. The underdiagnosis and undertreatment of patients with dyslipidemia continue to pose important challenges to health plans and health professionals in managed care.

Decision makers in managed care have a range of critical concerns before them relative to this condition, including efficacy, cost, and treatment options. As medical directors, we are feeling the powerful effects of rapidly escalating trends, such as the expanding role of technology — which is transforming the nature and extent of communication with both providers and members — and the evolution (and potential revolution) of health care reform, which includes consumer-driven health care and association health plans.

Moreover, as a medical director for a health plan covering 5 million lives, I have witnessed how cost-cutting pressures affect the identification, delivery, and quality measurement of health care services. In managing benefits for cardiovascular care, medical directors continue to seek out cost-effective programs that can measurably improve health outcomes.

This supplement is being offered for continuing education credit by The Chatham Institute to physicians and pharmacists. Herein, you will be given the opportunity to examine, through the eyes of a panel of experts, a host of dynamic issues that influence the balance of outcomes and costs relative to dyslipidemia management.

Regina E. Herzlinger, DBA, a nationally recognized professor from Harvard Business School, discusses the structure and dynamics that would be likely to characterize a health care market that is driven by consumers; James O. Prochaska, PhD, renowned developer of the Transtheoretical Model, highlights the utility of behavioral change interventions; Steven M. Haffner, MD, presents a comprehensive view of managing dyslipidemia in diabetic patients; and Alan S. Brown, MD, examines a systematic approach to identifying and treating those patients at greatest risk for dyslipidemia.

In conclusion, I would like to quote Victor Hugo: “There is one thing stronger than all of the armies in the world; and that is an idea whose time has come.” The 2003 Medical Director Colloquy provided a valuable format for interaction between a highly select group of faculty members and an audience comprising top medical-management professionals. The result was the generation of new ideas that point toward innovative approaches to dyslipidemia management and health care as a whole.
Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

A CONTINUING EDUCATION ACTIVITY

Based on presentations at the 2003 Medical Director Colloquy

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Continuing education credit is offered to physicians and pharmacists who read pages 3 through 21 of this publication, complete the post-test on pages 26 and 29, and fill out the appropriate evaluation form on either page 27 (physicians) or 28 (pharmacists).

**Purpose and overview**
This supplement addresses the under-diagnosis and undertreatment of patients with dyslipidemia, and focuses on optimization of dyslipidemia management within managed care organizations. This activity is designed to assist decision makers in managed care as they address issues of treatment options, efficacy, and cost with respect to this disease. The link between diabetes and dyslipidemia is also highlighted, as are the nature of health care reform, the heightened utilization of disease management programs, and the expanding role of technology in health care delivery. The behavioral change model is discussed relative to managing patients who are at risk for dyslipidemia. The content of this program was developed on the basis of faculty perceptions of significant trends or issues.

**Educational objectives**
After reading this publication, participants should be able to:

1. Highlight characteristics of a consumer-driven health care market
2. Define reasons for resistance to consumer empowerment in the health care arena
3. Discuss application of the Transtheoretical Model toward prevention of dyslipidemia
4. Relate the stages of change to optimal cardiovascular health outcomes for dyslipidemic patients
5. Elucidate the relationship between glycemia and cardiovascular disease prior to the onset of diabetes
6. Review how to manage dyslipidemia in patients with diabetes
7. Examine a lipid-management model used in a large clinical practice
8. Analyze the impact of computer-assisted lipid management and the electronic medical record

**Target audiences**
Managers and care organization medical directors and pharmacy directors; chief medical officers and other senior managers in managed care organizations; primary care physicians, cardiologists, and pharmacists.

**CONTINUING EDUCATION**

**Accreditation**
The Chatham Institute is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The Chatham Institute designates this educational activity for a maximum of 2.0 category 1 credits toward theAMA Physician’s Recognition Award. Each participant should claim only those credits that he/she actually spent in the activity. This CME activity has been planned and produced in accordance with the ACCME Essential Areas, Elements, and Policies.

The Chatham Institute is approved by the American Council on Pharmaceutical Education (ACPE) as a provider of continuing pharmaceutical education. This activity provides 2.0 contact hours (0.2 CEU) of continuing education for pharmacists. Credit will be awarded on successful completion of the post-test and the activity evaluation form.

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**Faculty disclosures**

Alan S. Brown, MD, reports that he has received grants/research support from AstraZeneca, Bayer, Bristol-Myers Squibb, Merck, Schering-Plough, Novartis, and Pfizer. He also serves as a consultant to the above-referenced companies and is on their speaker’s bureau.

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The year 2003 marks the 100th anniversary of the venerable Ford Motor Company. With 10 employees, Henry Ford began building automobiles in an old wagon factory in Detroit. By 1926, 15 million had been sold. At first, it took about 12 hours to build one Model T, but in 1913 Ford introduced mass production to the automobile industry. With a line to assemble outsourced components, the time to build one car dropped to 5 hours, 50 minutes — and, eventually, to 1 hour, 33 minutes.

Recognizing the power of the assembly line was Henry Ford’s genius. He created a better, cheaper car that middle-class consumers could afford. His downfall was failing to recognize consumerism. He left a niche that Alfred Sloan exploited, consolidating many automobile companies as General Motors. Responding to consumers’ varying tastes, GM offered the Chevrolet, Pontiac, Buick, and Cadillac, among others.

Contemporary health insurance is like the Model T — a barely differentiated product. Just as consumerism led to differentiation in the automobile industry, consumers’ demands will transform health care.

Control, choice, and information

Consumer-driven health care empowers people to become active consumers or purchasers of their health benefits and services (Herzlinger, in press). From a menu offered by their employers, they will choose particular benefits packages (e.g., drug benefits, long-term care, chronic-disease management) and coverage options (catastrophic insurance, longer terms) offered by particular providers on the basis of information about the cost and quality of the health care they would receive.

The only nation that offers consumer-driven health care is Switzerland, where everyone is required to buy health insurance; the government subsidizes the 14 percent of the Swiss who cannot afford the insurance, thus aligning insurer and enrollee interests in health promotion. The Swiss have broader choices. One Swiss innovation is a 5-year policy that returns 45 percent of the premium to people who are healthier at the end of the 5-year period than they were predicted to be at its beginning. Not coincidentally, Switzerland spends 10 percent of its gross domestic product on health care while the United States spends 14 to 15 percent to obtain comparable care.

Control, choice, and information are hallmarks of successful industries and are as applicable to health care as to the automobile industry or retailing. In the 1990s, retailing was the industry with the most rapid growth in productivity in the United States (McKinsey 2002).

It has become so because businesses such as Staples, Office Max, and Office Depot began noticing what their customers want — wide choices, low prices, a convenient, focused shopping experience — and met those expectations. Because they work an average of 2,000 hours annually, Americans value convenience — more so than employees in any other country — and many work more than 40 hours per week. The average American claims to have only 1 hour per day for himself or herself. As customers have demanded more convenience, successful retailers have kept pace by offering catalog and Web-based shopping and convenient lifestyle-oriented outlets that supplant “everything-for-everybody” general stores.

A consumer-driven market thrives on information. American consumers are extremely well educated. Whether more education has made them smarter is irrelevant, for it has made them think they are smarter — and people who believe they are smart behave fundamentally differently than those who do not think they are smart. This characteristic has transformed the financial
sector and made it the second most rapid productivity growth industry nationally (McKinsey 2002).

Consumers were content to keep their money in savings accounts 30 years ago. They feared mutual funds and the stock market, which they regarded as an arena reserved for financial geniuses. Today, more than 80 million Americans are invested in mutual funds. Their involvement promoted productivity in the financial industry, as competition for customers forced companies to reduce costs and improve the quality and quantity of information. Although it may seem peculiar to tout the financial industry given recent stock market declines, the Dow Jones Industrial Average broke 1,000 in 1982, 2,000 in 1987, and 10,000 in 1999, just prior to reaching its all-time high of 11,722.98 on Jan. 14, 2000. Most individual investors became involved in the stock market during the past decade, and many have enjoyed enormous gains despite recent setbacks.

As much as people desire control, choice, and information about their finances, they want control, choice, and information about their health care, too. Pareto’s Principle — the 80:20 rule — has been found to apply to many aspects of life in addition to its initial use to describe the control of a society’s wealth. In health care, Pareto’s Principle means that 20 percent of patients consume 80 percent of services, and the baby boom cohort is approaching the age at which they will become that resource-devouring minority. Employers, distressed by out-of-control health care costs and employee dissatisfaction with their health benefits, are likely to satisfy their demands. Employers have only two choices: they can either embrace consumer-driven health care or accept a national health care system. Continued expansion of managed care is not viable.

Most evidence for the cost-effectiveness of managed care is based on Kaiser Permanente. Nevertheless, the vertically integrated Kaiser model is not popular, and it is extremely costly to replicate. The other organizations that began to offer managed care were not comparable to Kaiser; these insurers focused more on cost control than quality control by attempting to force health care providers to discount their prices. Providers eventually learned that they needed to join forces to resist MCOs’ efforts to fragment them and yet failed relative to reducing provider prices by their increasing consolidation.

Lacking the vertical integration of Kaiser, MCOs have been unable to unite health care providers and patients in a way that fundamentally recreates the health care system. Top-down micromanagement does not work; bottom-up, organic growth is what promotes re-creation.

Many health care providers also support consumer-driven health care because it will give them the freedom to price, innovate, and bundle services, as well as to use risk-adjusted pricing. Instead of charging equal premiums regardless of a person’s health, risk-adjusted pricing uses higher premiums for the sick than for the well. Importantly, employers’ costs and insurers’ profits are the same with level pricing or risk-adjusted pricing; risk-adjusted pricing, however, provides a greater incentive to treat the sick, because providers are paid more. Also, there is less incentive to cherry-pick a population, because less profit would be available compared with today’s system. Neutral, competent third-party intermediaries that can maintain confidentiality already are available to calculate risk-adjusted premiums.

Greater satisfaction

Consumer-driven health care enhances satisfaction by giving enrollees and providers what they want, and it will control costs. In 2003, premiums for employer-based health insurance increased by an average of 15 percent — the largest annual rise in a decade (Strunk 2003). Premium increases would have been greater had employers — taking advantage of a soft economy and rising unemployment — not passed costs to employees as higher deductibles, copayments, and coinsurance. Such increases are likely to increase the ranks of the uninsured, as profit-stressed employers reluctantly reduce coverage.

In consumer-driven health care, costs will be controlled in three ways: limiting employers’ liability for decisions on medical treatment by providing choice; providing cost transparency for consumers; and recreating the health care delivery system.

Re-creation of the health care delivery system will be accomplished in three ways — first, through integrated medical records, as consumers will be most interested in the creation of integrated records. Consumers also will promote the growth of genomics, which has the power to prevent and cure rather than just palliate diseases. Health care delivery also will become integrated.

Today, health care delivery — representing 80 percent of health care costs — is fragmented, and care is mismanaged. Everyone blames someone else for rising costs — the pharmaceuticals, the hospitals, the physicians, the MCOs. No productivity increases will occur in a system characterized by turf warfare. Integrated care is needed. Again, the 80:20 principle can be applied, because a few diseases account for 80 percent of costs. For example, direct U.S. medical expenditures for diabetes care during 2002 amounted to $92 billion (diabetes care, $23 billion; chronic complications attributable to diabetes, $25 billion; excess prevalence of general medical conditions, $44 billion) (Hogan 2003).

Yet why, in the face of such massive expense, do only 30 percent of Medicare patients with diabetes have HbA1c tests (Asch 2000)? Care fragmentation means everyone
believes someone else has done it. The health care providers lack **focused factories** to frame their work (Herzlinger 1997).

**Focus on factories**

The word **factories** is used in a deliberate attempt to provoke. This comparison between health care and factories pinpoints the problem: unlike health care, a factory approaches its mission in a systemic, focused, and integrated way. When integrated teams treat diabetes patients, the rate of myocardial infarctions falls 14 percent and circulatory complications is reduced by 37 percent, compared with usual methods of care (Turner 1998).

Some focused factories already exist, concentrating expertise on diseases or procedures, such as hernia repair or cardiovascular interventions. Hospital-led focused factories, created by providers, exist at Duke University Medical Center, in Durham, N.C. (congestive heart failure), and Rush-Presbyterian-St. Luke’s Medical Center, in Chicago (AIDS). Duke recreated the process of caring for patients with heart failure by bundling services to avoid care fragmentation. In 1 year, it lowered the costs of care by $8,600, by improving patients’ health care so much that their use of hospitals plummeted. Unfortunately, Duke’s reward was losing $8,600 per patient per year, as the reimbursement system does not pay hospitals for improving care. Moreover, Rush was able to absorb the costs of improving the health of patients with AIDS only by raising millions of dollars in endowment.

The major impediment to focused factories is the insurance payment system, which penalizes innovation and distorts investment. Hospitals focus on cardiology instead of emergency medicine because they make money on cardiology but lose money on emergency services. In a market-based system, people would invest in activities in which they can make money not by exploiting pricing mistakes but through genuine innovations in productivity, much as Henry Ford did when he revolutionized the automobile industry.

As pressure mounts on employers, enrollees, and health care providers, the stampede to consumer-driven health care may begin as soon as 2004. Consumers will create this new, better, and cheaper industry, just as they did with other industries (e.g., automobiles, computers, financial products), without a solid understanding of how they work. In any industry, there typically is a small group of knowledgeable consumers who are assertive and fixated on the product; they drive down the price — and other consumers follow their example.

In other industries, the “path breakers” constitute about 16 percent of the consumer population; in health care, however, the critical subpopulation of informed and assertive consumers represent about 40 percent.

At present, about 700,000 Americans have consumer-driven health insurance policies, largely through the initiative of “early adopters.” Employers such as Medtronic, Johnson & Johnson, TeXtron, Novartis, and Intel recognize consumer-driven health care as a better way to do business. Employers do not want to buy health insurance, but they know they must because employees rate it as their most important benefit. An employer would cease to offer health insurance only if it became unaffordable.

Consumer-driven health care sometimes is said to promote class warfare, due to multiple tiers of health insurance — as if those did not already exist. Yet in a consumer-driven market, such as the automobile industry, the difference between the top and the bottom steadily narrows as quality steadily improves: a Toyota in many ways is a better car than a Mercedes-Benz. That has happened because consumer demand is for the cars that are less expensive, and companies seeking to tap that market must improve their products.

Some say that hospitals oppose focused factories, claiming that patients will be denied access. Yet economics reveals that 80 percent of health care costs will be contained within focused factories.

The government’s role in consumer-driven health care will be to enforce production and dissemination of performance data. Voluntary disclosure allows poor performers to hide from the public’s eye (Thompson 2003). Consumer-driven health care holds the promise of increased productivity. The resulting reduction in health care costs will make it feasible to provide health insurance for the Americans who lack it currently.

**References**


McKinsey Quarterly, the, 2002 (1).


It has been known for decades that certain behaviors — smoking, unhealthy diets, sedentary lifestyles, alcohol abuse, failure to adhere to lifesaving or life-enhancing drug regimens — are the major causes of chronic disease and premature death. These behaviors also are major drivers of the cost of health care. Whereas pharmaceuticals account for about 14 percent of health care costs, about 60 percent of health care costs can be traced to patients’ behaviors. Nevertheless, less than 10 percent of these costs are managed effectively.

**Altering behavior**

Historically, health care programs aimed at altering behavior have been based on an action paradigm. Our action-oriented society defines behavior change in terms of the occurrence of a desired action (e.g., regular exercise, smoking cessation, and diet alteration). By this definition, a behavior either has or has not been changed.

Consider the case of a 50-year-old male who is newly diagnosed with type 2 diabetes. With the best intentions, his physician tells him he must begin to test his blood glucose twice a day, take his medication twice a day, change his diet, stop smoking, stop drinking, start exercising, and lose weight. Such an action-oriented prescription has been shown repeatedly to be a method for producing noncompliant patients and demoralized physicians.

Among physicians, the leading reason for failure to practice behavioral medicine is the belief that patients cannot or will not change their behavior. This belief is held by 65 percent of American physicians (lack of time and reimbursement are second and third, respectively). It is likely that, along with their patients, physicians have become demoralized by the action paradigm. Faced with so many either-or, win-lose propositions presented by the action paradigm, physicians and patients conclude that changing behavior is unlikely to succeed and is not worth the effort.

**Stages of change**

Behavioral change is a process that unfolds over time, involving progression through a series of six stages. This model incorporates action as but one stage, the fourth, preceded by precontemplation, contemplation, and preparation, and followed by maintenance and termination.

The stage of precontemplation encompasses people who do not intend to take a given action in the foreseeable future. This stage can be identified via a negative answer to a single question: Do you intend to act in the next 6 months? A negative response does not necessarily indicate an unwillingness to change. There is a major difference between wanting and intending to change.

People can be in the precontemplation stage for various reasons, such as sheer ignorance. Millions of sedentary Americans — couch potatoes — are in precontemplation because they cannot imagine that their couch could kill them. Others are demoralized, such as the millions who have tried to lose weight too many times in too many ways. Clearly, their history shows that they want to change, but they often become demoralized through their own attributions — they may think that they do not have enough willpower, enough motivation, the right genes, or the right personality.

People also can be in precontemplation due to defensiveness. Alcoholism, for example, often is called the “disease of denial,” but patients can be made to feel defensive at any time by physicians who are trying to impose action on them when they are not ready for it.

Historically, health professionals have labeled patients...
in the precontemplation stage as noncompliant, unmotivated, resistant, or not ready for disease prevention or disease management programs. In fact, we now know that it was the health professionals who were not ready for their patients. It was the health professionals who were not motivated to provide programs to match patients’ needs. It was the health professionals who were resistant to changing from using an action paradigm to using one that could give patients the choices that would allow them to begin progressing toward healthier lifestyles.

People in precontemplation mistakenly underestimate the benefits of changing their behavior and overestimate the cost of change. Typically, however, they are unaware that they do this, making it difficult for them to change on their own. Substance abusers often are said to need to “hit bottom” to acquire sufficient motivation to change — they must have a crisis, such as a heart attack. Yet, when patients are hospitalized as a result of a heart attack and have access to a cardiovascular rehabilitation program free of charge, thereby, removing price as a barrier, only a small percentage follow through with cardiac rehabilitation (e.g., 15 percent in Massachusetts, 20 percent in Florida).

Once patients are in the contemplation stage, their awareness of the benefits of changing their behavior increases. These patients will say that they intend to take action in the next 6 months, but they are highly ambivalent about it. They follow the rule: When in doubt, don’t act. They say that they seriously intend to stop smoking; without help, however, less than 50 percent will quit for 24 hours within the next 12 months. Once they progress into the preparation stage, they are convinced that the advantages of change outweigh the disadvantages. They are ready to act.

In the action stage, the goal is to keep patients from immediately relapsing. Many months of effort are needed to help patients complete this stage successfully. It is an error to believe that the worst part of adjusting to the new behavior will pass in a few weeks, because if efforts to support changed behaviors are relaxed too soon, patients will relapse and resume unhealthy behaviors. After about 6 months, patients progress to the maintenance stage, and the level of support can be diminished. There is, however, a continuing need for awareness and preparation for the most common reasons for relapse: times of distress, depression, anxiety, and loneliness — the times when we are psychologically at our weakest. If the average American copes with distress by drinking more alcohol, smoking more cigarettes, and eating more junk food, a person trying to maintain a lifestyle change is certainly at greater risk of such behavior.

The final stage of behavior change is termination. At this point, patients possess total confidence that, regardless of how they feel, they have no temptation to revert to unhealthy behavior. The ideal goal is for the new, healthy behavior to be under stimulus control. When stimulus control is present, a stimulus automatically triggers a behavior. No decision making or conscious effort is required to act. For example, stimulus control now governs many Americans’ use of seat belts. Simply getting in the car triggers the action. Likewise, taking a medication can be brought under stimulus control, perhaps by associating it with some daily ritual, so that executive energies can be devoted to other matters.

Meeting patient needs
Behavioral change begins with inputs, not outcomes. Outcomes are important, of course, but they are irrelevant if only a small percentage of an at-risk population participates in disease prevention or management. For example, when managed care organizations offer their state-of-the-science smoking cessation clinics free of charge, only 1 percent of smokers participate. Even for the most deadly and costly behaviors, traditional services reach such a small percentage of patients that they make no meaningful difference in patient health or in health care costs. Forty years after smoking was identified as the nation’s number one health problem, these action-oriented smoking cessation programs have failed to have an impact, because typically less than 20 percent of American smokers are prepared to take action (Table 1).

Traditional behavioral medicine programs have been designed for the relatively small minority of people who need them the least. Instead, smoking cessation programs must be designed to meet the needs of the 40 percent of people in the precontemplation stage and the 40 percent of people in the contemplation stage. (It should be noted that one benefit of 40 years of public awareness programs

<table>
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<th>Precontemplation (%)</th>
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<th>Preparation (%)</th>
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<td>42.1</td>
<td>40.3</td>
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<td>37.3</td>
<td>46.7</td>
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<tr>
<td>Four worksites</td>
<td>4785</td>
<td>41.1</td>
<td>38.7</td>
<td>20.1</td>
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SOURCE: VELICER 1995
about the hazards of smoking has been to increase the percentage of Americans in the contemplation and preparation stages. In Germany, China, or Japan, about 70 percent of smokers are in precontemplation, 25 percent in contemplation, and only 5 percent in preparation.)

The general framework for behavioral change is to assess the population in question: identify where their needs are the greatest, and match the programs to these needs. Smoking cessation is not the only behavior for which the needs of the population have been mismatched with the programs. When the Centers for Disease Control and Prevention applied our model to prevention and control programs in the communities at highest risk for HIV and AIDS, it was found that 75 percent of the patients were in the precontemplation stage but 75 percent of the programs were action oriented.

High percentages of patients can be recruited by offering programs that are tailored to the specific stages of change that patients are experiencing. Working with an MCO, we were able to recruit 85 percent of a population of 4,500 smokers. The Surgeon General’s report warns that teenage smokers will not participate in smoking cessation programs; in 22 high schools, however, we were able to recruit more than 80 percent of the smokers. On a college campus where 70 percent of the alcohol abusers were in precontemplation, we were able to achieve 80 percent participation.

Having recruited high percentages of patients for a behavioral change program, the salient question is how to retain them. Across all types of health behaviors, about 50 percent of patients drop out quickly and prematurely. Across most classes of drugs, the discontinuation rate also is about 50 percent.

Historically, we have had limited ability to predict which patients would drop out of a program or discontinue drug treatment. Patients from minority groups, patients with low levels of education, and patients with an addiction were believed to be prone to discontinuation. The leading predictor of discontinuation, however, now is known to be the person’s stage of change.

For example, consider the case of a 55-year-old woman whose physician prescribed a statin for her because she is at high risk for cardiovascular disease. Even though she had multiple risk factors, she failed to fill the prescription. While taking great care in choosing the medication that would be most appropriate for her, the physician exercised no care about prescribing new behavior. The woman came in with no intention of taking a medication each day for the rest of her life — she was in the precontemplation stage. Nevertheless, when physicians prescribe a new therapy, they act as if the patient’s mindset does not matter.

After a year and a half of feedback and interaction with her physician, the woman progressed to the contemplation stage, but she was ambivalent. She finally filled her prescription, primarily to stop the physician from continuing to badger her. That was the main advantage she had ascribed to taking the statin. Given her state of mind, it could have been predicted that she would have less ability to tolerate the drug’s side effects than would a patient who sees numerous benefits to adherence. This patient discontinued the statin within 6 months. Discontinuation of drug therapy is a discouraging development. When patients resume a sedentary life or begin smoking again, 85 percent return to the contemplation or preparation stages, getting ready for their next attempt. Unfortunately, 90 percent of patients who discontinue a medication revert to the precontemplation stage.

**Enhancing awareness**

The key to helping people progress through the stages of change is to enhance their awareness and appreciation of the benefits associated with behavioral change. It is essential for physicians to recognize that much of human decision making is not terribly conscious or rational — this year’s Nobel Prize in economics was given to psychologists who demonstrated just how irrational human decision making is — but it can be made more conscious and more rational by providing people with proper feedback and encouragement.

For example, a person in the precontemplation stage for an exercise program might be able to list five or six benefits that could be expected from regular exercise. In fact, about 50 discrete benefits are associated with 60 minutes of vigorous exercise per week. Lack of time is the primary reason cited by Americans — even retired Americans — for failing to exercise regularly. Yet, for a time-conscious person, the achievement of 50 benefits via 60 minutes of exercise should constitute a considerable bargain. Instead of enumerating the benefits for the patient, the patient is just asked to double the number of benefits on his or her list. If the number of benefits does not increase, it is a sign that the behavioral medicine is not working; if the number increases, it is a sign that the patient is in the contemplation stage.

Continuing medical education commonly is used in an effort to change physicians’ behavior, but it can only start the change process; it cannot sustain it. Likewise, patient education only begins but does not sustain their change process. Education serves primarily to help people move toward contemplation.

**Sustaining change**

For sustaining change aimed at preventing or managing chronic diseases, people need to become involved in
their care. A passive approach suffices only for acute conditions. Interestingly, the presidents of a dozen national corporations said the one behavior that they would most like their employees to adopt is taking a more active approach to problem solving.

Self-liberation — commonly known as willpower — helps people take action. If people have two choices (e.g., Alcoholics Anonymous or cognitive therapy), they will have a stronger sense of self-liberation than if they are given only one choice. Their commitment to change will be even stronger if they are presented with three choices, but adding a fourth alternative provides no additional benefit.

It also is important for patients to have someone to reinforce their new behaviors who is outside of the physician’s office. A relative often can be the provider of reinforcement management.

The clinical relevance of this model of behavioral change has been tested in controlled trials. In one study, 743 smokers were randomized to cessation programs using either stage-matched computer software or counselors and stage-matched software (Prochaska 1993). After 18 months, the abstinence rate was 18 percent in the group that received support from counselors and software — but 25 percent in the group supported by computers alone. In a second trial with 85 percent of 4,500 smokers in an MCO population, counselors initially outperformed the computers, but after 18 months the outcomes were identical for each intervention (Prochaska 2001). Computers outperformed or equaled the performance of the counselors because computers are not hindered by the huge variability associated with counselors’ exercise of clinical judgment.

Patients with multiple risk factors constitute the members of a managed care population who are at the highest risk and incur the highest costs. Historically, disease management and disease prevention programs have addressed only one behavior at a time. It was thought that patients otherwise would be overwhelmed — as they indeed would be via the traditional action-oriented approach. A stage-matched approach, however, enables multiple behaviors to be addressed simultaneously (e.g., adherence to a statin regimen, and compliance with exercise and dietary programs). In such personalized behavioral medicine, realistic goals are set to help patients progress from one stage of change to the next. Successfully implemented, this model offers MCOs an effective tool for improving members’ health and curtailing costs in disease management and disease prevention.

References
In recent decades, overall mortality from coronary artery disease has declined dramatically in the United States, but patients with type 2 diabetes have not shared this benefit. A study based on data for two cohorts from the National Health and Nutrition Examination Surveys (NHANES I, 1971–1975, and the NHANES I Epidemiologic Follow-Up Survey, 1982–1984) showed declines in the age-standardized mortality rate for ischemic heart disease of 43.8 percent ($P < .001$) and 20.4 percent ($P = .12$) from cohort to cohort among nondiabetic men and women, respectively (Gu 1999). By contrast, the mortality rate for ischemic heart disease for men with diabetes declined only 16.6 percent ($P = .46$), and the rate for women with diabetes increased by 10.7 percent ($P = .76$). If the trends in mortality rates that are suggested by this study are clarified and borne out by further research, the observations are astounding and have critical importance for managed care, given that the rates of type 2 diabetes, metabolic syndrome, and obesity are rising. This article examines data supporting aggressive management of patients with type 2 diabetes and patients with metabolic syndrome.

A Finnish study offers insight into the mortality rates among diabetic and nondiabetic patients in the first year following a myocardial infarction (MI) (Miettinen 1998). This study differs from other studies in that it follows patients from the onset of symptoms instead of from hospitalization, thus incorporating out-of-hospital deaths. Among diabetic men vs. nondiabetic men, mortality rates in the first year following a first MI were 45 percent and 33 percent, respectively. (Figure 1, page 11). Among diabetic women, the mortality rate in the first year post-MI was approximately 38 percent. These results contradict conventional wisdom, which holds that the mortality rate is higher in diabetic women than diabetic men. This comparatively low mortality rate for diabetic women is an artifact of when the data were examined. In men with or without diabetes, more than half of post-MI mortality occurs before hospitalization. In men with diabetes, this mortality rate is nearly triple that of women with diabetes. Diabetic women survive long enough to reach the hospital alive, after which they are more likely than diabetic men to die within 28 days of hospitalization. Yet, after hospitalization for an MI, across all groups, about two thirds of the deaths occur during the first 28 days of hospitalization. Thus, intervention intended to reduce mortality risk should be initiated extremely early. If the therapy is safe and effective, it should not be left for primary care physicians to initiate 6 or 8 weeks later.

**NCEP guidelines for diabetic dyslipidemia**

Guidelines issued by the third Adult Treatment Panel (ATP III) of the National Cholesterol Education Project (NCEP) recommend that patients with diabetes be treated with the same intensity as patients with established coronary heart disease (CHD) (NCEP 2001). That recommendation rests on the following assumptions:

1. The risk of cardiovascular disease (CVD) in diabetic patients who do not have prevalent CHD is similar to that in nondiabetic patients who do have CHD.
2. Intensive glycemic control is unlikely to eliminate the excessive risk of CVD.
3. Lipid-lowering therapies and antihypertensive therapies are equally effective in diabetic and nondiabetic patients.
Compared to lipid profiles of nondiabetic patients, dyslipidemia in diabetic patients is characterized by elevated triglyceride levels, lower HDL concentrations, comparable LDL levels, and alterations in the composition of LDL and VLDL particles that increase their atherogenicity (Table 1).

The specific recommendation of the ATP III for treating patients with diabetes is to reduce their LDL cholesterol to <100 mg/dL — the same goal as for patients with CHD. If their LDL is ≥130 mg/dL, most diabetic patients will need to have pharmacotherapy initiated simultaneously with lifestyle changes (improved diet, increased exercise, weight loss). If LDL levels are between 100 and 129 mg/dL, therapeutic options cited by ATP III include increasing the intensity of LDL-lowering therapy, adding a drug such as a fibrate or nicotinic acid to modify atherogenic dyslipidemia, or intensifying control of other risk factors. If triglyceride levels are ≥200 mg/dL, non-HDL cholesterol (total cholesterol minus HDL cholesterol) becomes a secondary target of cholesterol-lowering therapy. The goals for non-HDL are 30 mg/dL higher than for LDL (Table 2), to address triglyceride-rich VLDL.

The NCEP guidelines differ just slightly from those of the American Diabetes Association, which specifies HDL as the secondary target. The ADA guidelines are based on epidemiologic data from the United Kingdom Prospective Diabetes Study (UKPDS), which showed that, in diabetic patients, the primary risk factors are, in order of decreasing importance, LDL cholesterol, HDL cholesterol, HbA1c, blood pressure (BP), and smoking (Turner 1998).

### Diabetes as a CHD risk equivalent

In the East-West Study, we demonstrated that diabetic patients without a history of MI have as high a risk of MI as nondiabetic patients with previous MI (Haffner 1998). During a 7-year follow-up of patients with type 2 diabetes (n=1,059), the incidence of fatal or nonfatal MI was 20 percent among patients with no prior MI (n=890) and 19 percent among nondiabetic patients with a history of MI (n=69), but only 4 percent among the nondiabetic patients with no history of MI at baseline (n=1,304). Among diabetic patients with a history of MI (n=169), the rate of fatal or nonfatal MI was 45 percent.

This last observation raises a question on the intensity of lipid-lowering therapy. ATP III suggests that CHD events are homogenous — the same LDL target, <100 mg/dL, applies to all. But if the treatment principle is to match the intensity of therapy to the degree of risk, it is reasonable to ask whether diabetic patients with a

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**TABLE 1** Prevalence of dyslipidemia

<table>
<thead>
<tr>
<th></th>
<th>Type 2 diabetes (n=359) (%)</th>
<th>No diabetes (n=1064) (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides &gt;200 mg/dL</td>
<td>29.2</td>
<td>13.1</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>HDL &lt;35 mg/dL</td>
<td>24.8</td>
<td>11.7</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>LDL &gt;130 mg/dL</td>
<td>72.8</td>
<td>84.4</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

**TABLE 2** ATP III goals for LDL and non-HDL cholesterol

<table>
<thead>
<tr>
<th>Risk category</th>
<th>LDL goal</th>
<th>Non-HDL goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD and CHD risk equivalent, 10-year CHD risk &gt;20%</td>
<td>&lt;100 mg/dL</td>
<td>&lt; 130 mg/dL</td>
</tr>
<tr>
<td>≥2 risk factors, 10-year CHD risk &lt;20%</td>
<td>&lt; 130 mg/dL</td>
<td>&lt; 160 mg/dL</td>
</tr>
<tr>
<td>0–1 risk factor</td>
<td>&lt; 160 mg/dL</td>
<td>&lt; 190 mg/dL</td>
</tr>
</tbody>
</table>

Source for Tables 1 and 2: Mykkänen 1991
history of MI should be treated more aggressively than non-diabetic patients with a history of MI. This question is being examined in two large studies — the Study of the Effectiveness of Additional Reductions of Cholesterol and Homocysteine (SEARCH) and Treating to New Targets (TNT).

SEARCH is a comparison of simvastatin 20 mg or simvastatin 80 mg in 12,000 patients with a history of MI to determine whether greater LDL reduction provides a further reduction in CHD events. SEARCH also will examine the question of whether lowering plasma homocysteine with vitamin B12 and folic acid reduces CHD events.

TNT is a 5-year study randomizing 10,000 patients with coronary artery disease (CAD), some of whom also have type 2 diabetes, to treatment with atorvastatin 10 mg, which is intended to enable patients to reach LDL <100 mg/dL, or atorvastatin 80 mg, which is intended to enable patients to reach LDL <75 mg/dL. The study will end in December 2004.

Based on these studies and the Heart Protection Study (HPS 2002), one would expect the NCEP’s next set of guidelines to integrate some method for grading risk in patients who occupy the highest risk category in ATP III. The Organization to Assess Strategies for Ischemic Syndromes (OASIS) registry also established diabetes as a CHD risk equivalent (Malberg 2000). Collecting data in six countries (Australia, Brazil, Canada, Hungary, Poland, and the United States), OASIS showed that after 2 years the risk of death among patients with diabetes and no history of CVD (n=1,148) was similar to that among nondiabetic patients with a history of CVD (n=3,503) (Figure 2). In fact, diabetic patients without prior CVD had the same event rates for all outcomes (CVD-related death, new MI, stroke, new congestive heart failure) as nondiabetic patients with prior CVD. The risk of death for patients with diabetes and CVD was nearly triple that for patients without diabetes and CVD.

**Glucose intolerance among patients with MI**

A Swedish study has found that among patients with acute MI, previously undiagnosed diabetes and impaired glucose tolerance are common (Norhammar 2002). The study looked at 181 consecutive patients with acute MI who were admitted to the coronary care units of two Swedish hospitals, all without previously diagnosed diabetes. Oral glucose tests were done at discharge and 3 months later. At these respective points in time, impaired glucose tolerance was found in 35 percent (58/164) and 40 percent (58/144) of patients. Additionally, previously undiagnosed diabetes was detected among 31 percent (51/164) and 25 percent (36/144) of patients, at these respective points in time.

In other words, about two thirds of these patients had glucose intolerance. Identifying patients with impaired glucose tolerance at an early stage is important, as it is an indicator of metabolic syndrome and identifies patients who are at elevated risk for developing diabetes. Lifestyle interventions are about 60 percent effective for treating impaired glucose tolerance, compared to an effectiveness rate of about 25 to 30 percent for drug interventions. Entry into a cardiac rehabilitation program marks the start of behavioral interventions for many patients. This study suggests that the scope of these rehabilitation programs should be expanded to include patients with glucose intolerance.

In general, more broad-based interventions should be used to treat the macrovascular complications of diabetes, as opposed to microvascular complications. The established cardiovascular risk factors in diabetic and possibly prediabetic patients merit aggressive treatment. In the United Kingdom Prospective Diabetes Study (UKPDS), hypertension was found to have equal effects on micro- and macrovascular complications (Adler 2000). Yet, although the relationship between hyperglycemia and MI is significant — with the risk of MI doubling as the HbA1c concentration increases from 5.5 to 11 percent — it is weaker than the relationship between hyperglycemia and microvascular complications (Stratton 2000) (Figure 3, page 13).
Metabolic syndrome indicates elevated risk

It is sometimes claimed that metabolic syndrome is a CHD risk equivalent, too. ATP III defines metabolic syndrome by the presence of at least three of the following risk factors:

- Abdominal obesity (waist circumference >40 inches in men, >35 inches in women).
- Triglyceride level of ≥150 mg/dL.
- Low HDL ( <40 mg/dL in men, <50 mg/dL in women).
- BP of ≥130/85 mm Hg.
• Fasting glucose of ≥110 mg/dL

Analyzing data from the Third National Health and Nutrition Examination Survey (NHANES III), we found that 44 percent of the United States population older than 50 have metabolic syndrome as defined above (Alexander 2003). The overall prevalence of CHD in this age group is 11.7 percent. People without metabolic syndrome had the lowest CHD prevalence regardless of whether they had diabetes (Table 3). Compared to patients with metabolic syndrome, those with diabetes but no metabolic syndrome had no increase in CHD prevalence.

The overwhelming majority of diabetic patients have metabolic syndrome — about 85 percent — but the 15 percent without metabolic syndrome have a much lower prevalence of CHD. Thus, there probably is a subgroup of diabetic patients who do not need the most aggressive therapy. This should not be surprising, because these are the patients with the more favorable constellation of risk factors (e.g., lower BPs and better lipid profiles).

CHD risk in patients with metabolic syndrome may be clarified further by measuring patients’ levels of C-reactive protein (CRP), as metabolic syndrome is associated with high levels of CRP. Elevated CRP also predicts development of type 2 diabetes. As a risk factor, CRP is about as strong as insulin concentrations. It is possible that subclinical inflammation is the common denominator for development of both type 2 diabetes and CVD.

Information about the benefits of intervening on the basis of patients’ CRP levels will be generated by Justification for the Use of Statins in Primary Prevention: an Intervention Trial Evaluating Rosuvastatin (JUPITER), in which 15,000 patients with moderately elevated CRP (>2 mg/L), relatively low LDL (<130 mg/dL), and no history of CAD are being randomized to placebo or rosuvastatin 20 mg. None of the subjects would qualify for lipid-lowering therapy under ATP III, as it would be unethical to randomize such patients to placebo. Hence, no patients with diabetes will be enrolled. Patients with metabolic syndrome will not be excluded, however.

Yet, it has become clear that managing any single risk factor will not provide the greatest benefit for patients with diabetes; achieving major improvements in diabetic patients’ CVD risk necessitates aggressively managing multiple risk factors. In the Steno-2 study, managing cardiovascular risk factors intensively for a mean of 7.8 years reduced absolute risk of cardiovascular events by 20 percent and relative risk of macrovascular disease by 53 percent, compared to conventional Danish therapy (Gaede 2003). This randomized study enrolled 160 adults (mean age 55.1 years) with type 2 diabetes and microalbuminuria. Conventional therapy constituted treatment of multiple risk factors by the patient’s general practitioner, based on recommendations of the Danish Medical Association; referral to specialists was permitted. Intensive therapy involved behavioral modification and

### TABLE 3
Prevalence of CHD in U.S. adults aged >50 according to presence of metabolic syndrome and diabetes

<table>
<thead>
<tr>
<th></th>
<th>– Diabetes</th>
<th>+ Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic syndrome</td>
<td>8.7%</td>
<td>7.5%</td>
</tr>
<tr>
<td>+ Metabolic syndrome</td>
<td>13.9%</td>
<td>19.2%</td>
</tr>
</tbody>
</table>

SOURCE: ALEXANDER 2003

### TABLE 4
Treatment goals for conventional therapy and intensive therapy groups

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure (mm Hg)</td>
<td>&lt;160/95</td>
<td>&lt;135/85</td>
<td>&lt;140/85</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Glycosylated hemoglobin (%)</td>
<td>&lt;7.5</td>
<td>&lt;6.5</td>
<td>&lt;6.5</td>
<td>&lt;6.5</td>
</tr>
<tr>
<td>Total cholesterol (mg/dL)</td>
<td>&lt;250</td>
<td>&lt;190</td>
<td>&lt;190</td>
<td>&lt;175</td>
</tr>
<tr>
<td>Triglycerides (mg/dL)</td>
<td>&lt;195</td>
<td>&lt;180</td>
<td>&lt;150</td>
<td>&lt;150</td>
</tr>
<tr>
<td>Treatment with ACE inhibitors irrespective of blood pressure</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspirin therapy</td>
<td>• For patients with known ischemia</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>• For patients with PVD</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>• For patients without CHD or PVD</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

ACE = angiotensin-converting enzyme, CHD = coronary heart disease, PVD = peripheral vascular disease

SOURCE: GADE 2003
TABLE 5  Cardiovascular events in conventional therapy and intensive therapy groups

<table>
<thead>
<tr>
<th>Event</th>
<th>Conventional therapy (n=80)</th>
<th>Intensive therapy (n=80)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death from cardiovascular cause</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Nonfatal myocardial infarction</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Coronary artery bypass graft</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Percutaneous coronary intervention</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Nonfatal stroke</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Amputation</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Vascular surgery</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

| Total events                          | 85                          | 33                      |
| Number of patients with events        | 35                          | 19                      |

SOURCE: GADE 2003

stepwise drug therapy to targets that generally were more aggressive than those specified by the medical association (Table 4). In the intensive therapy group, changes were statistically significant for systolic and diastolic BP, fasting serum triglycerides, fasting serum total cholesterol, fasting serum LDL cholesterol, and urinary albumin excretion. During follow-up, cardiovascular events occurred in 44 percent of patients in conventional therapy vs. 24 percent in intensive therapy (Table 5).

Also important were the 61 percent reduction in the relative risk of diabetic nephropathy (31 patients in conventional therapy but only 16 patients in intensive therapy) and progression to end-stage renal disease (requiring dialysis for three patients in conventional therapy and none in intensive therapy). Also, among the intensively treated patients, relative risk of retinopathy was reduced by 58 percent. Furthermore, seven patients in conventional therapy and one in intensive therapy developed blindness in one eye. Because of the study’s design, it is not possible to draw accurate conclusions as to which component was most important for reducing the incidence of diabetes-related events.

A multifactorial approach is needed to reduce the morbidity and mortality associated with CVD in patients with type 2 diabetes or at risk of developing type 2 diabetes.

References


Since 1985, I have been the medical director of the lipid clinic at Midwest Heart Specialists (MHS). The group comprises 50 cardiologists who treat patients at nine hospitals and 14 outpatient facilities in Chicago’s western suburbs. The lipid clinic was established before my arrival, by one of the group’s senior partners. An ardent interventionist, he had become committed to long-term preventive care—not just intervention—because he had seen his father die suddenly from a heart attack before the age of 40.

With 5,000 active patients and 50 new patients being added every month, our lipid clinic is one of the largest tertiary lipid referral centers in the country. It is a nurse-intensive program—our nurses educate patients and titrate drugs, using algorithms that are derived from the current literature. Patients can call anytime to talk to a nurse, and they often ask questions that go beyond their lipid issues, relating to social concerns and other medical concerns.

By the leading objective measures (percentage of patients on lipid-lowering therapy, percentage of patients reaching their LDL goal), MHS’s lipid clinic ranks quite highly. Also, from the patient’s perspective, it is extremely cost effective: the charge is about $90 for life.

For 18 years, I flew around the country and delivered many after-dinner lectures about the virtues of lipid clinics like ours. I would travel to large and small towns, such as Sioux Falls, and talk to 10 semi-retired physicians about how to think about managing dyslipidemia. I would tell them about the benefits of dietary counseling and Framingham calculations to determine a patient’s 10-year risk of coronary heart disease (CHD), which the National Cholesterol Education Project (NCEP) recommends for determining how aggressively certain patients should be treated. The effect of these lectures was minimal, because I probably was not reaching the physicians who treat the most patients and the effects on the practice of the physicians who were attending were questionable.

Identifying patients and initiating therapy

I have stopped traveling to such places, however, as I have realized that there is a better way to provide preventive care for patients with CHD. That is simply to introduce a good system—not a perfect system—for identifying high-risk patients and initiating statin therapy. In preventive care, systems are more important than knowledge. It is less important for a physician to be able to diagnose and treat Frederickson type III hyperlipoproteinemia than it is to identify high-risk patients and provide them with a prescription for a statin. That saves more lives than all the lectures I have ever delivered.

The conventional wisdom says otherwise, holding that clinicians who manage dyslipidemia need a sound knowledge base—an understanding of chronic disease pathophysiology and genetic disorders. The conventional wisdom, as set forth in the current NCEP guidelines, is that all patients require careful screening, starting at about age 20 with a full fasting lipid profile. If an assessment of the patient’s risk factors shows that lipid-lowering treatment is warranted, the foundation for such therapy is laid with aggressive counseling about therapeutic lifestyle changes (dietary alterations, weight reduction, increased physical activity). For patients with two or more risk factors (Table 1), the 10-year risk of CHD should be calculated, via the Framingham scoring
system, to determine if the LDL goal should be less than 130 mg/dL (10-year risk ≤ 20 percent) or less than 100 mg/dL (10-year risk > 20 percent).

Patients who have established CHD or its risk equivalent (e.g., diabetes, peripheral arterial disease, abdominal aortic aneurysm, symptomatic carotid artery disease) also have LDL goals below 100 mg/dL. Aggressive follow-up and systematic titration of drug therapy should be performed.

Translating knowledge into action

Most physicians are quite familiar with these guidelines, even if they are uncertain about some of the details. Their knowledge has not been translated into action, however. For example, a chart review for a quality assurance program of 48,807 patients with diagnosed coronary disease (80 percent cared for by cardiologists, 20 percent cared for by primary care physicians) showed that 57 percent had no documented LDL level, 39 percent were on therapy, and only 11 percent were at their LDL goal of <100 mg/dL (Figure 1).

An individual practitioner looking at these results usually agrees that, while perhaps indicative of national trends, they are not reflective of his or her own practice. Yet when the same group that compiled the Quality Assurance Program (sponsored by Merck) audited our data at MHS for patients not in the lipid clinic, 47 percent of our patients had a documented LDL — about the same as the national average (Sueta 1999). Fifty-one percent were on a lipid-lowering drug, and 22 percent had reached their LDL goal. For a group that prides itself on being one of the finest in cardiology, these were embarrassing results. These results demonstrated the unfortunate fact that sometimes, “The absence of data creates the illusion of adequacy.”

Nevertheless, the data for MHS’s lipid clinic stood out: 97 percent of patients had a documented LDL, 97 percent were on a lipid-lowering drug, and 71 percent were at goal (Figure 2). Based on a review of other clinics nationwide, ours ranked first in terms of percentage of patients on lipid-lowering treatment and percentage of patients at goal. These data led me to an ironclad conclusion that every MHS patient with coronary disease should be referred to our lipid clinic for dietary counseling and all the other services that the clinic could provide.

The senior partner disagreed. He pointed out that MHS has 80,000 patients in its database. In 1 year, 20,000 patients with CHD are seen at the clinic. At the time, it cost MHS between $100,000 and $200,000 annually to provide the lipid clinic’s services for 5,000 patients, or one sixteenth of our patient base. The clinic was viewed as being worth the expense, if only to reduce the practice’s liability and enhance our reputation — the NCEP guidelines have become the guidelines cited most often in American malpractice suits — but extending the service to all 80,000 patients was out of the question. The senior partner told me to find a compromise.
Implementing the electronic medical record

At the same time, a computer-savvy electrophysiologist at MHS was charged with the responsibility of forming a committee to find the ideal electronic medical record (EMR) for the practice, one that would integrate the medical record, billing, and scheduling. It should be emphasized that a sophisticated computer system is not required to implement the systems improvements that I am about to describe — as they can be accomplished with paper and red stickers, if need be.

We devised a method for systematically identifying all patients having certain characteristics and ensuring that they do not leave the office without an intervention. At the same time, a consultant helped us to see that we were working inefficiently. To address that problem, we developed an approach in which each physician was provided with his or her own team. This team consisted of the physician, nurse, medical technician, and secretary. Our compromise melded the EMR with the team approach.

At the clinic, any patient seeing a given physician interacts with the members of that team only. Before a patient is seen by the physician, the nurse reviews the patient's history, which enables the physician to focus on the present illness. If the physical examination shows no change in the patient's condition, the EMR can be updated effortlessly by recalling data from the previous visit; the only data that need to be entered anew are those regarding changes in the patient's signs and symptoms.

Once the relevant data have been entered — blood pressure, LDL, HDL — the software automatically calculates the patient's NCEP goals. If the patient has no LDL on the chart or if the patient's LDL is not at goal, the computer monitor flashes a signal to alert the physician during the patient's visit. The physician cannot continue updating the EMR without acknowledging the alert: the system was designed to change a physician's behavior. If a patient has coronary disease but is not on aspirin, the physician is alerted. If the patient has heart failure but is not on an angiotensin-converting enzyme (ACE) inhibitor, the physician is alerted.

Figure 3, on page 19, provides an example of a patient's lipid data. It reflects the last three lipid profiles, the liver enzymes, the earliest recorded LDL, and the dates of initiation and discontinuation for any drugs.

Generating report cards

The system generates monthly report cards for each physician, showing how the physician’s performance in lipid management (percentage of patients with LDL in chart, percentage of patients with LDL at goal, percentage of patients being treated with a statin) compares with the practice as a whole and with the MHS lipid clinic, which is regarded as the gold standard. We are guided by the adage, “If you can measure it, you can make it better.”

Immediately before the EMR system was put into effect, 47 percent of MHS’s patients had an LDL documented in their paper records, 51 percent were on lipid-lowering therapy, and 22 percent were at goal. After 1 year with MHS’s new EMR system, during which 11,263 consecutive patients were tracked, the percentage of patients with a documented LDL increased to 81 percent, 72 percent were on lipid-lowering therapy, and 54 percent were at goal. By the time 20,000 patients had been seen, the LDL documentation rate was up to 84 percent and 60 percent were at goal (Kinn 2002).

The eye-opening aspect of these data was that they were nearly as good as the results achieved by my lipid clinic. Yet none of these patients received an hour of dietary counseling or had their 10-year Framingham risk score calculated. Patients were just started on a statin, and the physicians were given no instructions regarding which statin or which dosage to use. Of course, the physicians worked with their nurses for each patient to obtain a follow-up lipid profile and to titrate to goal, and if they failed to do so, an alert would be displayed during the patient’s next visit.
Measuring benefit

These data can be translated into benefits that are meaningful for patients and managed care organizations. We chose the Scandinavian Simvastatin Survival Study (4S) as the basis for estimating the expected results in our population, because 4S was conducted in a population of 4,444 mostly middle-aged patients with CHD (4S 1994). The primary end point was total mortality, for which the relative risk was reduced by 30 percent in the treatment group over a mean of 5.4 years of therapy; secondary and tertiary end points are shown in Figure 4. Extrapolating from the results of 4S (Pedersen 1996), we estimated that the improvement in lipid management in our practice resulted annually in about 135 fewer bypass surgeries, 230 fewer patients hospitalized, and 532 fewer total hospitalizations (including readmissions) for individual patients. We estimated the annual savings from the reduction in hospitalizations to be $1.7 million.

These were the results that led me to stop lecturing about the intricacies of dyslipidemia and the importance of lipid clinics. Lipid clinics do have an enduring value, which is to serve as repositories of high-level expertise — the knowledge base supporting the delivery of high-quality care. Complex patients — those with severe genetic disorders, a requirement for potentially hazardous combination therapy, severe hypertriglyceridemia, or rapidly progressive or unexplained coronary artery disease — clearly should be referred to a lipid clinic. As a center of excellence, a lipid clinic provides expertise and education, and the providers offer advice and solutions for their colleagues elsewhere in the practice environment. In that role, the lipid clinic staff at MHS trained all the nurses in the practice in the basics of identifying high-risk patients and regarding what to watch for when initiating statin therapy. Yet, clearly, a lipid clinic is not a prerequisite for improving preventive care for patients at high risk of CHD events.

It also bears repeating that neither is a sophisticated computer system needed to achieve improved results. For example, at the University of California – Los Angeles, Greg Fonarow, director of the Ahmanson-UCLA Cardiomyopathy Center, became alarmed by the 14.8 percent rate of recurrent myocardial infarction (MI) or death during the first year after patients' hospitalization for a coronary event; in response, he developed the Cardiac Hospitalization Atherosclerosis Management Program (CHAMP) (Fonarow 2001). This paper-based approach to atherosclerosis provided residents with a set of medi-

![Sample electronic medical record showing a patient's lipid data](image-url)
cation goals (Table 2) and a simple chart that indicated which dose of which statin would reduce a patient’s LDL concentration to <100 mg/dL. One year after implementing this system, the rate of death or recurrent MI had dropped to 6.4 percent in the first year after hospital discharge.

UCLA achieved these results because Fonarow reduced residents’ need to think. Studies invariably show that a high percentage of coronary patients have been put on aspirin, but a much lower percentage of these patients typically are put on a statin. Physicians have learned that if patients have coronary disease, they should be put on aspirin. But initiation of statin therapy seems more complicated, being burdened by the Framingham calculation of 10-year risk or the need to compute the ratio of HDL to total cholesterol. In addition, concerns about the side effects of statin therapy sometimes are cited as a reason for the underutilization of statins, but no such concern seems to extend to aspirin. Yet the death rate from aspirin therapy, owing to bleeding complications, is about 1 in 50,000, compared to an adverse event-related death rate of about 1 in 1,000,000 among patients on statin therapy. Additional data have been published recently that should make clinicians feel even more comfortable about using statins freely — the results of the large (N=20,536) Heart Protection Study (HPS 2002). HPS was designed to address questions such as whether patients with established coronary disease benefit from statin therapy even if their LDL is <100 mg/dL. The NCEP guidelines do not specify a need to treat patients whose LDL already

![FIGURE 4  4S trial: secondary/tertiary end points](image-url)
is <100 mg/dL, but HPS showed that statin therapy reduced cardiovascular events regardless of a patient’s initial LDL. HPS also showed that elderly patients benefit from statin therapy, and that statins lower the risk of CHD in patients with diabetes who do not have CHD.

From a safety standpoint, HPS showed no difference between the placebo group and the treatment group (simvastatin 40 mg) in terms of elevations in liver or muscle enzymes. These results indicate that there is no need to check liver enzymes at baseline; a statin can be started while the patient is in the office, at which time the liver test can be ordered. The test results will become available in a few weeks, and unless the patient is jaundiced, it is highly unlikely that trouble that is related to statin therapy will be encountered in the interim. Some physicians are shocked to hear my recommendation for initiating statin therapy without having liver enzyme data in hand, but my response is to ask them how often they start an ACE inhibitor without knowing the BUN: creatinine ratio.

Using statins systematically

In conclusion, medical directors need to empower physicians to develop a systematic approach to using statins, starting with the patients at highest risk. Paper and pencil will suffice. In fact, I am involved in a nationwide project designed to help 1,200 physicians improve their rate of statin utilization, just by having a nurse look at a patient’s chart the day before a visit and place a red sticker on the chart if the patient has coronary disease, any other atherosclerotic disease, or diabetes. The sticker alerts the physician to the need for starting a statin.

Once a systematic approach has been employed to identify and treat the highest-risk patients, practices then can move onto identifying patients at lower levels of risk and entering them into treatment, using 10-year risk calculations as needed. But it is important to start somewhere and not to allow the quest for perfection to stand in the way of incremental improvement. Do not allow the perfect to be the enemy of the good.

If those of us in managed care begin with the easiest tasks, especially those that can be quantified, we can do a much better job of finding the right balance among cost, quality, and access. Every business executive knows that a customer cannot have, and an organization cannot deliver, the best of all three variables — low cost, high quality, and unimpeded immediate access. The promise of managed care was, and is, to strike the right balance among these variables. The approach to dyslipidemia management that has been implanted at MHS strikes such a balance. Although it may seem desirable to give every patient access to a lipid clinic, it is not financially feasible to do so. Lipid clinics provide the expertise and knowledge base to deliver high-quality care, but only to relatively few of the eligible patients. Instead, systems are required to improve the delivery of preventive care to the large number of patients who stand to benefit from it.

### References


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### Table 2: UCLA Comprehensive Atherosclerosis Treatment Program medication goals

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<th>Patients with coronary disease, other vascular disease, or diabetes treated with aspirin*</th>
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<td>Patients with coronary disease, other vascular disease, or diabetes treated with a beta blocker*</td>
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**Targets**

- LDL <100 mg/dL
- Blood pressure <140/90 mm Hg
- Smoking cessation

*Unless contraindicated, not tolerated, or reason for not using is documented in the medical record.
†Dosed to achieve LDL <100 mg/dL.
QUESTION AND ANSWER SESSION

Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

Participants:

REGINA E. HERZLINGER, DBA; STEVEN M. HAFFNER, MD; ALL ATTENDEES

In this section, the questions posed to Regina Herzlinger, DBA, and Steven Haffner, MD, are from medical directors who attended the Colloquy.

CONSUMER-DRIVEN HEALTH CARE

QUESTION: Given employers’ pain over health care and pharmaceutical expenses, what has been the impediment for them to adopt consumer-driven health care?

REGINA E. HERZLINGER, DBA: They’re worried, and one reason is because managed care is such a disaster. They adopted managed care very rapidly and had high expectations of it, but they just got hit in the face — first by discontented employees, then by discontented providers. They went into it somewhat blindly. They didn’t ask, “What is the premise on which these expectations are based?” And so, they’re reluctant to make another quick change.

Typically, with the adoption of new technology, innovators will move ahead, and then the rest of the crew studies what happens to them and starts the next wave.

QUESTION: My concern is: Where are the consumer groups? I live in Maryland, where health professionals and employers are combining and masquerading as consumer groups. I’m concerned, vis-à-vis the consumer-driven concept, that the legislature and insurance commissioner will develop paradigms based on the demands of this combination of health professionals and employers as “consumers.”

HERZLINGER: That’s a big danger in Switzerland, for example, where health spas are a covered benefit. You have to buy coverage for spas. Well, if I have insurance for spas, I’m going to use it and so is everybody else. How did that happen? Obviously, the spa lobby is powerful in Switzerland and in Germany. And, we’ve seen it with mandated benefits — masseuses show up and give a massage, and suddenly massage therapy is a mandated benefit. That’s why information is so important in this market. If consumers think that having spa therapy means they cannot send their kids to college or that they are trading that money for something else, that will be a countervailing force. And in this country, consumers are extremely powerful.

QUESTION: The issue of patient productivity links both the payer and provider. For example, everybody said triptans for migraines were too expensive to cover. Yet, when employers recognized that a patient who aborts a migraine can work all day and one who cannot is out for 2 days, they paid for them.

HERZLINGER: Absolutely.

QUESTION: I heard recently that consumer-driven health plans have about 500,000 enrollees, or less than 1 percent market share, and that some start-ups are running out of venture capital. Do you think they’re really going to hang on, or are they going to rise and fall like a lot of other innovations?

HERZLINGER: People asked that about managed care. The indemnity carriers said that managed care was going to go away. But managed care was driven by the same inevitable forces, especially the employer population, which was just dying on the vine with the cost of indemnity insurance.

So you’ve asked two questions, both of which are interesting. The first is: Is the consumer-driven movement going to persist? What choices do employers have right now? Costs are increasing at double-digit rates. Employees are dissatisfied. They have to do something. Some employers are arguing for national health insurance. I can’t predict, but in my view, we’re not going toward national health insurance until we try something else, something consumer-driven.

Your second question is: What about the startups? I don’t know of any that are running out of capital. I know of some cases where the funders would love to see these startups purchased, but they keep funding them. Is their entrepreneurial fervor, their view on consumers, enough to make them effective competitors with people who see the world the same old way? Even if the entrepreneurs go away, the giants are doing it.

QUESTION: In terms of retailing, it doesn’t matter where I am, because I can use the Internet for purchasing, but purchasing health care is much different. Are the principles of consumer-driven health care as applicable to the vast rural areas as they are to urban areas?

HERZLINGER: I’m not sure health care should be different,
but it is. Consumers want local and specific information. They want to know more about Dr. Sam and Dr. Ken.

The only way we’ll get that information is for the federal government to say, “You’ve got to disclose it.” I am not a person whose mind thinks of government as a solution; I tend to see government as a problem. In this case, however, voluntary disclosure will not happen. No professional will have himself or herself compared with others, so I think the federal government or the states will make this a requirement.

Is it feasible in rural areas? This is an 80:20 proposition. Some costs are so staggering in the 20 percent of the population that accounts for 80 percent of health care expenditures, that you can build an infrastructure to deal with their needs, even in rural areas. I computed that in an average state with expenditures for diabetes of about $2 billion a year, you could have a number of 300-bed hospitals plus hundreds of community facilities all over the state just to deal with diabetics. And it’s because the focus is on these very costly diseases. It’s not on people with acute episodes but on people with very costly chronic conditions — which is totally feasible in rural areas.

**QUESTION:** I want to disagree that managed care has been a disaster. That’s pejorative hyperbole. I’ve been in the field for 20 years, and there are children who weren’t able to have immunizations until managed care took a big percentage of the population, because indemnity insurance didn’t pay for these kinds of preventive services. So for you to call it a disaster is incorrect. You are a scholar, and people pay attention to what you say. We keep people insured, we bring preventive services to people, and I’m not quitting my day job based on the comments you have made this morning. I don’t think we’re going to see consumer-driven health care anytime soon, for a couple of reasons. First, you haven’t even spoken about the broker community; 60 percent of the business in managed care plans is driven by brokers. These people are not going to stop counseling employer groups under 50 or under 100 on what they’re going to do, because they take 6 or 7 percent of the entire health care dollar. That’s a disaster. You and I would agree that we don’t need them, but they’re there and they’re not going away.

But I’m older than you, and I won’t say that I am going to see this in my lifetime. Certainly I think that what we are doing in managed care — in trying to collect information, create predictive models, and enhance quality — is energy well spent. In our markets, the companies move away from traditional managed care are losing market share to those that are doing it well.

**HERZLINGER:** What I said about managed care being a disaster was in reference to the perception that most CEOs hold about managed care, rather than my take on this. You may have a different perception, but most CEOs now feel they are in a disastrous situation. They are paying more and more for health care, and their employees do not like managed care.

The role of brokers is a very interesting situation. If you’re a broker and earn 6 percent, it’s in your interest to have a larger insurance product rather than a smaller product. But if you’re an American employer in a down economy, you say to the broker, “Get me a cheaper product or I go out of the insurance business.” Now the broker faces a different dynamic: It’s 6 percent of nothing or 6 percent of a cheaper product. The movement toward consumer-driven health care is driven by the fact that employers are in this situation; they can no longer afford double-digit price increases.

Managed care will survive as an option. Some people will want MCOs. I was talking with somebody earlier who told me about an employer that dropped a high-deductible policy. I don’t think high-deductible policies will be the models. If you ask me to predict which consumer-driven offering will be used most, it will be those in which the providers organize into systems of focused care for specific diseases and particular disabilities. These providers will permit the quality of their care to be measured and allow these data to be disseminated, pricing themselves accordingly — which will appeal both to insurers who will bundle those providers and directly to the consumers.

**QUESTION:** I’m from Southern California, where the sun always shines, the people are always beautiful, the health premium is very low, and health care is viewed as an entitlement. I believe we unfortunately have consumerism in our marketplace but without any extra dollars to go with it, for a couple of reasons. We have a successful Kaiser Permanente, and therefore employers won’t offer other types of plans that are too expensive for them. In California, the legislature has made everything an entitlement. If my physician writes for spa treatment, that will be covered. It is a very difficult market to be in. The problem is also that as consumers get older and sicker — or perceive they are getting sicker — they demand more, and more is not always better. New technology is wonderful, but it can be abused — not by the physicians but by patients. How do we match the dollars to what we can supply?

**HERZLINGER:** The idea in consumer-driven health care is that the consumers judge the appropriateness …

**QUESTION:** But they have to pay for it, and they’re not paying. That’s the key.

**HERZLINGER:** That is the key. That is what consumer-driven health care is about. You get the money, you have a menu of options. If you choose cheaper options,
you get to use the money for something else. That is what’s missing in this situation you describe. If someone says you can do everything and not pay for it, that is political; it’s easy to keep mandating. You get consumers to recognize that this affects their salary. With lower cost health insurance, they’d receive more wages, they’d have more income to use elsewhere. So, you’re going to change that political dynamic.

QUESTION: I suspect that when managed care premiums remained somewhat flat, CEOs said managed care was a great thing. Now, times have changed a little. I’ve come away with an impression that there is not one patient type, consumer type, or employer type. So how large do you expect consumer-driven health care to be as a movement and over what period of time?

HERZLINGER: Consumer-driven health care is not an alternative to managed care; it subsumes managed care. It’s about offering choices. Now, some people will choose Kaiser in a consumer-driven system. Some will choose high-deductible policies in a consumer-driven system. Some are going to choose insurers who offer a bundle of focused factories with measurable outcomes. There will be a lot of choices in a consumer-driven system. The high-deductible option is the first one out of the gate but it will hardly be the last. That type of policy will be widely available by 2004 or 2005. The real change will be when providers organize into groups and offer themselves to insurers at prices that are adjusted for the risks of their participants. That’s going to take longer. But in the United States, things move very fast. That’s why I told you about the rate of increasing productivity. Despite the elephant that we are, once something takes hold, it becomes broadly available.

DIABETIC DYSLIPIDEMIA

QUESTION: Is there enough evidence to support the use of agents to normalize blood sugar aggressively in patients with impaired glucose tolerance, particularly agents such as glitazones?

STEVEN M. HAFFNER, MD: There are no guidelines on this. I was the principal investigator at the San Antonio Heart Study. We randomized 200 patients. I’m on the management committee for NAVIGATOR, which is a trial with ramipril and valsartan.

The DPP study and the Finnish Prevention Study showed about a 58 percent reduction with lifestyle changes. Other studies show a 30 percent reduction with metformin, 25 percent with acarbose. Nobody uses acarbose in the United States, but the study is actually not bad. There are two smaller studies: TRIPOD, which demonstrated about a 55 percent reduction in Hispanic women with gestational diabetes, and some DPP data that have yet to be published show about a 50 percent reduction after 1 year.

So, what do we do with these people? It’s clear that lifestyle is more effective than at least the drugs that have been tested in big studies like metformin or acarbose. Whether it’s more effective than TZDs [thiazolidinediones], I don’t know because those are smaller studies with less power.

How do I handle this? IGT subjects have a risk rate of about 5 to 6 percent for developing type 2 diabetes. In those with less than a 10 percent risk, lifestyle changes are sufficient. In people with a rate above 10 percent — which is similar to the DPP population that not only had IGT but also a high fasting glucose and obesity, with a rate of 12 percent per year — you should start with lifestyle and then move to a pharmacological intervention.

In a sense, this is like what we do with high blood pressure and in lipid therapy, in which we grade the intensity of therapy to the degree of risk. Additionally, I wouldn’t use a TZD at this point. You could use a drug but I’d probably use metformin. I have never had much luck with acarbose.

QUESTION: Given that you are recommending diet and lifestyle modifications, what studies have shown that diet and lifestyle changes really work in a real-life population, outside of a research trial?

HAFFNER: Two randomized controlled trials, the Finnish Prevention and the DPP, will show similar effects. There's
a Chinese study with group randomizations. You’re really asking how to translate the DPP into Finnish Prevention. There are things we could do. The DPP intervention was individually based; that’s extraordinarily expensive. I know because I ran this project. Group interventions are just as effective. You need some individual customization to talk to patients to find out what they eat. Sometimes, if you can either change portion sizes or get them to switch from ice cream to yogurt and fruit-based drinks, you can make a tremendous impact.

It is probably manageable using group-based interventions. But let me tell you a couple things about this. You need an intensive period. It doesn’t need to be every week except during the first couple of months; maybe it could be every other week afterward. But the key to this is the maintenance program. Patients need to be seen or need to be in some group every month, probably for a very, very long time. That sounds awfully expensive, but treatment effects are greater than 50 percent — very impressive. Their blood pressure reductions are almost equivalent to those obtained with use of a single agent. Their glucose control, looking at some data from the big diabetic study, also increased. If there’s less pharmaceutical use, you won’t realize it in the first 6 months. But after that, I think this would be cost effective, not on an individual basis but for group-based interventions.

**QUESTION:** Do you think there will be a J-point phenomenon with cholesterol lowering?

**HAFFNER:** The J-point is usually determined on observational data rather than on clinical trial data. There’s not a lot of evidence of a J-curve for cholesterol if you plot the Y-axis on a log scale. The problem is when it’s an arithmetic scale, it looks like it flattens out because the absolute risk for each 30 percent change becomes smaller. The argument against the observational data is that people who have very, very low LDL have better genes and better diets and they’re more physically active, so you don’t know if it’s all cholesterol. The way to determine this, frankly, is in clinical trials. If the TNT and the SEARCH trials disagree, it’s unlikely that the NCEP will change recommendations for a lower LDL for CHD, because you need more than one big trial to change guidelines. I’m not going to say much more because I’m on the Data Safety and Monitoring Board for one of them.

If CHD is reduced but overall mortality is not, then they might not change the guidelines. Guidelines are conservative. What prompted change in the NCEP guidelines was not only the CHD reductions but the overall mortality reductions seen in a couple of big trials. We look for consistent results. Clinical trials trump observational studies if they show a CHD reduction in high-risk patients with a reduction in overall mortality.

**QUESTION:** As MCOs, we know that most patients with type 2 diabetes are overweight or obese. But most of us do not pay for weight management programs and may pay for bariatric surgery only because it may be state-mandated. For weight management programs, though, we do nothing.

**HAFFNER:** There are some activities in the Centers for Disease Control called the National Diabetes Educational Program. They’ve been pushing for changes in payment. If it occurs, it may wind up becoming a federal mandate.

The problem with managed care is that in many areas of the country, there is tremendous churning of patients. If there are only two major players in a region, as in some areas in the Northwest, then you could collude — an ugly word — but you could if you thought it ultimately to be beneficial. My guess is that it probably is beneficial. But you can’t do this in 6 months or a year. The benefits might take a few years to capture. If your patients leave you every year, you’re stuck holding the bill. But I think it is feasible. I think the question is developing a group-based intervention with occasional individual visits that can be used.

I was very encouraged by DPP. Everybody says you regain all your weight within 1 or 2 years. In our study, they regained about a third of the weight after 3 years, which is not so bad. In our new trial, the subjects have lost more than 9 percent in the first 6 months; at 1 year, they’re at about 8 percent. That’s pretty good for a large number, and these are diabetic subjects; they’re even harder to manage in terms of weight loss. At least that’s the conventional thought. And this is all group-based.

**QUESTION:** Can you speculate how long it will take to have the JUPITER data and whether NCEP IV will consider C-reactive protein?

**HAFFNER:** JUPITER is a 4-year study. I cannot speculate about NCEP IV because it hasn’t been determined when it’s going to meet. It’s such a painful process that you put it off as long as possible.

The NCEP did consider C-reactive protein and the EBCT. It did not put it in a mandated set of things to measure. The NCEP is extremely conservative with this; you have to understand that we wouldn’t put glucose tolerance tests in. We also considered whether C-reactive protein should be part of diagnosing the metabolic syndrome. At our last meeting for ATP III, in late 2000, it came fairly close. There is a group considering revisiting the metabolic syndrome, and some people want to make C-reactive protein an option. So if it’s going to appear, it might appear first as an amendment for the metabolic syndrome.
6. Which set of entry criteria applies to the population being enrolled in JUPITER?
   a. CRP >2 mg/L, LDL >130 mg/dL, no history of CAD.
   b. CRP <2 mg/L, LDL <130 mg/dL, no history of CAD.
   c. CRP >2 mg/L, LDL <130 mg/dL, no history of CAD.
   d. CRP >2 mg/L, LDL >130 mg/dL, history of CAD.

7. Among the diabetic patients enrolled in the Heart Protection Study, the reduction in cardiovascular risk:
   a. Was dependent on their LDL level at baseline.
   b. Was similar regardless of their LDL level at baseline.
   c. Was inversely proportional to their LDL level at baseline.
   d. Was determined by the extent of glycemic control, not the reduction in LDL level.

8. According to the ATP III guidelines, a diabetic patient whose LDL level is less than 100 mg/dL:
   a. Would be a candidate for lipid-lowering treatment that includes therapeutic lifestyle changes and pharmacotherapy.
   b. Would be a candidate for lipid-lowering treatment that includes therapeutic lifestyle changes only.
   c. Would be a candidate for lipid-lowering treatment that includes pharmacotherapy only.
   d. Would not be a candidate for lipid-lowering treatment.

9. Haffner argues that a cardiovascular disease prevention strategy based on frequent screening for diabetes is problematic because:
   a. Diabetes screening tests lack sufficient specificity.
   b. Diabetes screening tests lack sufficient sensitivity.
   c. Screening for diabetes is insufficient to eliminate cardiovascular disease that occurs in the pre-diabetic stage.
   d. Screening for diabetes is not cost effective.

10. In Herzlinger’s vision, care for patients with high-cost chronic diseases, such as diabetes, may be provided in the future by “focused factories.” She says the major impediment to the creation of these organizations is:
    a. Consumer resistance.
    b. Health care provider resistance.
    c. Lack of venture capital.
    d. The insurance payment system.

continued on page 29
CONTINUING EDUCATION ANSWER SHEET/CERTIFICATE REQUEST

Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

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See page 28 for answer sheet for pharmacists

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Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

CPE CREDIT FOR PHARMACISTS
See page 27 for answer sheet for physicians

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9.   □   □   □   □
10. □   □   □   □

PROGRAM EVALUATION
To receive continuing education credit, please provide all information requested below. This assures prompt and accurate issuance of your continuing education certificate.

Please rate this program as follows:

<table>
<thead>
<tr>
<th>Overall quality of program</th>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tr>
<td>Content</td>
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<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Relevance to objectives</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Effectiveness of this format for learning</td>
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<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Value to me in my daily responsibilities</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tbody>
</table>

How long did it take you to complete this continuing education activity?
Hours _____ Minutes ______

Requested topics/skills to address in future programs:

Comments:

Did you detect any bias in this presentation?
Yes _____ No _____
If yes, please explain:

28 MANAGED CARE / SUPPLEMENT
CONTINUING EDUCATION POST-TEST, continued
Transforming Dyslipidemia Management: Assessing Clinical Outcomes and Cost

11. Applying Pareto's Principle to health care, one can conclude that:
a. The consumption of health care resources is evenly distributed across a given patient population.
b. The number of health care providers in the United States is too small.
c. The number of health care providers in the United States is too large.
d. A small minority of patients consume the majority of health care services.

12. A key to the success of consumer-driven health care, Herzlinger says, is:
a. control of wages and prices.
b. Information.
c. Voluntary disclosure of performance data by health care providers.
d. A single-payer system.

13. Alan S. Brown, MD, the medical director of one of the nation’s most successful lipid clinics, argues that:
a. The services of a lipid clinic should be made available for every patient with dyslipidemia.
b. Developing a good system to identify and treat dyslipidemic patients at high risk of CHD is more important than having a lipid clinic for these patients.
c. Knowing how to calculate a patient’s 10-year risk of CHD with Framingham point scores is the key to successful treatment of dyslipidemia.
d. Well-managed lipid clinics can generate substantial revenue streams for cardiology practices.

14. According to the ATP III guidelines, the LDL goal for patients with coronary heart disease or its risk equivalent is:
a. <100 mg/dL.
b. <130 mg/dL.
c. <160 mg/dL.
d. <190 mg/dL.

15. The chief value of a lipid clinic, according to Brown is to:
a. Provide counseling about therapeutic lifestyle changes for all dyslipidemic patients, and initiate and monitor any drug therapy required to help them reach their LDL goals.
b. Provide on-site laboratory services.
c. Serve as repositories of high-level expertise.
d. Serve as regional screening centers to identify patients with dyslipidemia.

16. The Cardiac Hospitalization Atherosclerosis Management Program (CHAMP) at UCLA reduced the rate of death or recurrent MI during the first year after hospitalization for a coronary event from 14.8 percent to 6.4 percent. This improvement was achieved by:
a. Implementing an electronic medical records system.
b. Improving medical residents’ understanding of the Frederickson classification of hyperlipoproteinemia.
c. Giving medical residents a written set of medication goals and a chart showing how to use statins to reduce a patient’s LDL to <100 mg/dL.
d. Improving medical residents’ understanding of the genetic basis for certain forms of dyslipidemia.

17. The Heart Protection Study showed that statin therapy reduced cardiovascular events even among patients whose initial LDL level was less than 100 mg/dL.
a. True.
b. False.

18. Historically, health care programs aimed at altering behavior have been based on an action program.
a. True.
b. False.

19. People in the precontemplation stage changing their behavior and exaggerate the cost of change.
a. Underestimate the benefits of
b. Focus on the positive consequences of
c. Justify the reasons for
d. Continually negate the usefulness of

20. The behavioral change model developed by Prochaska involves progression through six stages in the following order of occurrence:
a. Precontemplation, contemplation, preparation, maintenance, termination, action.
b. Preparation, contemplation, precontemplation, action, maintenance, termination.
c. Precontemplation, contemplation, preparation, maintenance, action, termination.
d. Precontemplation, contemplation, preparation, action, maintenance, termination.