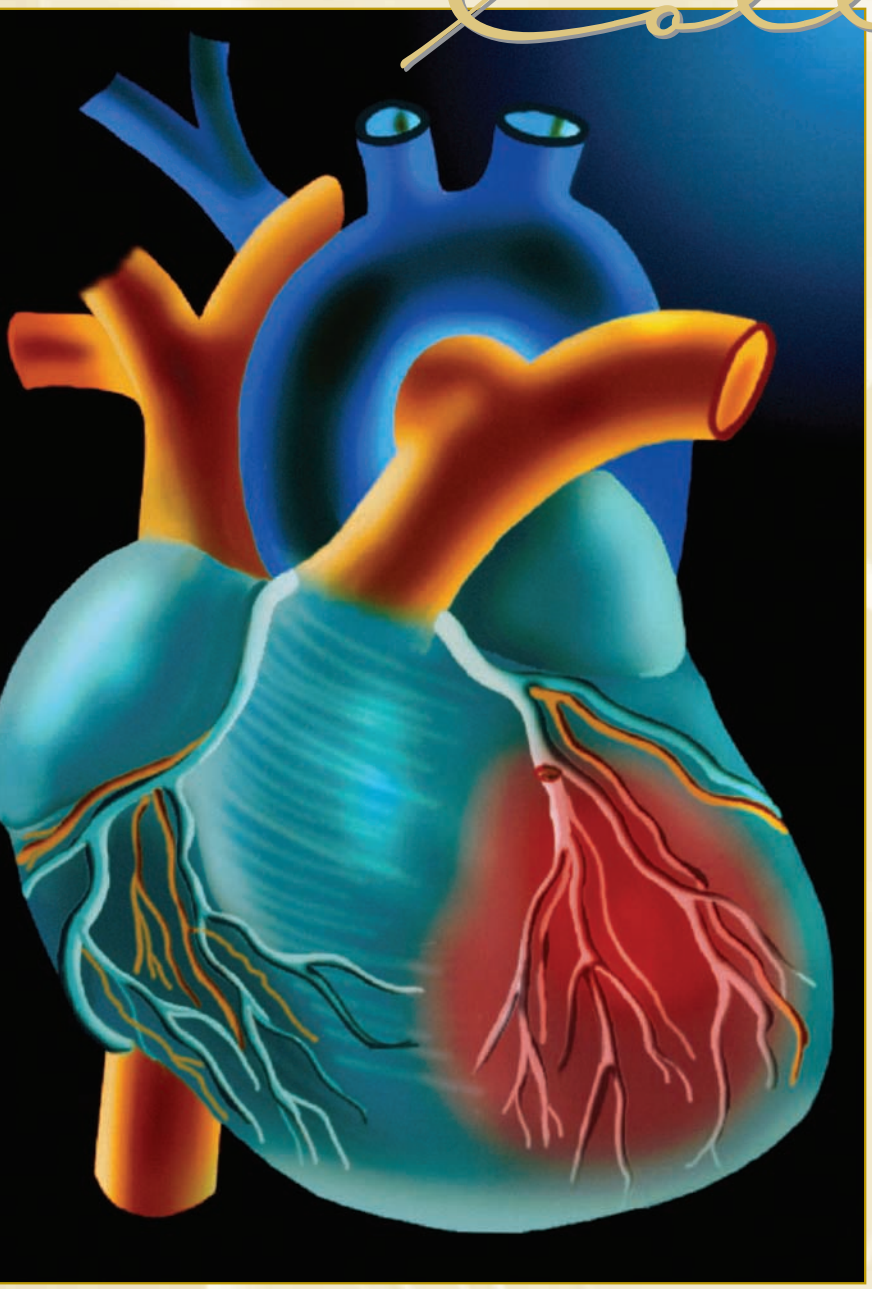
2004 Medical Director Colloquy



Managing the Spectrum of Cardiovascular Care

SECOND OF TWO REPORTS

Based on presentations at the 2004 Medical Director Colloquy, Dallas, March 25–27

Continuing education credit for physicians and pharmacists sponsored by The Chatham Institute

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INTRODUCTION

DAVID M. BERENBEIM, MD, MBA
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The spectrum of chronic progressive diseases of the heart and blood vessels is vast, and many of these diseases are interrelated. They impose a tremendous disease burden on the nation: Heart disease and stroke together account for about 37 percent of all deaths in the United States (Miniño 2002). The American Heart Association estimates that the direct and indirect costs of these diseases will reach $368 billion this year (AHA 2003).

It thus is important that we establish standards of care and determine the treatment options that will optimize the quality of health care to prevent and treat these illnesses. With that goal in mind, AstraZeneca has provided an educational grant for a Medical Director Colloquy for three consecutive years. Through the varied perspectives of the nationally prominent faculty at this year's meeting, current approaches to patient care and managing cardiovascular diseases were explored. At the 2004 Medical Director Colloquy, best practices were examined, from theory to implementation, for specific health outcomes. Edited proceedings of that meeting have been published as supplements to the September and October issues of MANAGED CARE.

In this issue, Thomas Davies, MPA, JD, begins with a discussion of how performance incentives — so common in business — can be applied to health care to improve the quality of care. Lynn B. Jorde, PhD, then presents data showing that race is at best a crude predictor of a person's predisposition to disease or response to a drug, and therefore is not a very useful tool for improving quality of care. Harold E. Bays, MD, offers a theory about the origins of the metabolic syndrome, which increases a person's risk for coronary heart disease at any level of LDL-cholesterol. Stephen B. Sondike, MD, addresses pediatric and adolescent obesity, offering practical advice for helping young patients to acquire healthier lifestyles. Victor G. Villagra, MD, concludes with a discussion of how population-based medical management programs improve outcomes and reduce cost for many health plans.

I hope you will take advantage of the continuing education credit being offered to physicians and pharmacists through this supplement, sponsored by The Chatham Institute. I also anticipate that you will find the information to be of practical use in performing your daily responsibilities and that it stimulates new ways of thinking about approaches to care.

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PHOTOGRAPHS BY DENNY COLLINS

SUPPLEMENT TO
MANAGED Care
October 2004

Managing the Spectrum Of Cardiovascular Care

A CONTINUING EDUCATION ACTIVITY

Based on the proceedings of the 2004 Medical Director Colloquy in Dallas

PRESENTATIONS

CONTINUING EDUCATION

This supplement is supported by an educational grant from AstraZeneca Pharmaceuticals LP. The material in this supplement has been independently peer reviewed. The grantor played no role in reviewer selection.

SELF-STUDY CONTINUING EDUCATION ACTIVITY

Managing the Spectrum of Cardiovascular Care

Continuing education credit is offered to physicians and pharmacists who read pages 3 through 26 of this publication, complete the post-test on pages 27 and 28, and fill out the evaluation form on page 29. Estimated time to complete this activity is 2 hours.

PURPOSE AND OVERVIEW

These articles are derived from "Exploring the Spectrum of Cardiovascular Care," the 2004 Medical Director Colloquy in Dallas, March 25–27.

Cardiovascular disease is the leading cause of death in the United States, and the soaring costs associated with the treatment of cardiovascular patients continue to present new challenges to managed care organizations. Fortunately, significant progress has been made in the development of new treatments for the often-related disease states that cardiovascular disease encompasses. A performance gap persists, however, in translating these advances into common practice in ambulatory settings. Novel drugs and other recent treatment advances also have generated a heightened need to educate physicians and health care executives on the most current approaches to care and the management of patients with cardiovascular disease. Medical directors face an ongoing need to assist clinicians in staying abreast of developments in this rapidly evolving field.

This activity focuses on best practices, from theory to implementation, for specific health outcomes for patients with diseases of the heart and blood vessels. From a variety of perspectives, the faculty explores current approaches to patient care and the utilization of therapies to optimize management of cardiovascular disease.

EDUCATIONAL NEEDS ASSESSMENT

Educational objectives

After reading this publication, participants should be able to:

- Establish the components of a successful disease management program for congestive heart failure and how those components may work best with the traditional outpatient delivery system
- Develop an understanding of the strengths and limitations of the current outpatient delivery system and of the changes that should be considered to drive optimal outcomes
- Illustrate how purchasers are collaborating with multiple constituents to develop an incentive program that uses measurable quality performance standards
- Highlight how a "pay for performance" program obtains participation by rewarding both relative performance and the improvement of physician organizations
- Understand how dysfunctional fat cells may contribute to development of the metabolic syndrome in some patients
- Describe first-line therapy for the metabolic syndrome
- Recognize why race is thought to be a crude predictor of clinical factors
- Cite evidence supporting the belief that genetic variation is shared among all human populations
- Explain the general strategies for helping overweight children and adolescents acquire skills for long-term weight management
- Know the simplest method for clinical identification of children likely to benefit from intervention for overweight/obesity

Target audiences

Managed health care professionals, including physicians, pharmacists, medical directors, chief medical officers, pharmacy directors, and other senior managers in managed care organizations.

This activity is sponsored by The Chatham Institute.

CONTINUING EDUCATION

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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 upon successful completion of the post-test and the activity evaluation.

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As an accredited provider, The Chatham Institute requires that its faculty comply with ACCME Standards for Commercial Support of Continuing Medical Education and disclose the existence of any significant financial interest or any other relationship a faculty member may have with the manufacturer(s) of any commercial product(s) or device(s). It also requires the faculty to disclose discussion of off-label uses in their presentations.

Faculty disclosures

Harold E. Bays, MD, acknowledges that he has received research grants from and served as a consultant and speaker for AstraZeneca. Stephen B. Sondike, MD, acknowledges that he has served as a consultant for Atkins Nutritionals.

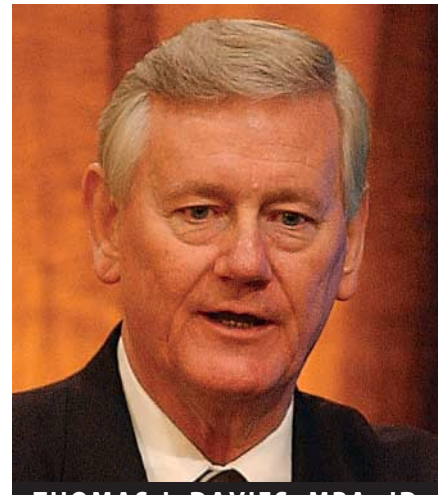
Thomas J. Davies, MPA, JD, Lynn B. Jorde, PhD, and Victor G. Villagra, MD, have declared that they have no financial interest, arrangement, or affiliation that would constitute a conflict of interest concerning this continuing education activity.

Pay for Performance: A Business Case for Quality for California Physician Groups

THOMAS J. DAVIES, MPA, JD

Acting Executive Director, Integrated Healthcare Association, Walnut Creek, Calif.

As health care premiums continue to increase at double-digit rates, purchasers are exploring ways to stabilize costs and positively influence the quality of care. This article examines one effort toward achieving these goals under way in California. This effort is led by the Integrated Healthcare Association (IHA), a leadership group representing constituents across all sectors of the health care spectrum. IHA member organizations include health plans, hospital systems, physician organizations, pharmaceutical companies, and representatives from academia and consumer organizations. These organizations have collaborated to create a quality-incentive program that rewards physician groups that use performance measures that promote improved clinical processes and outcomes, better patient experience, and adoption of new information technology.



THOMAS J. DAVIES, MPA, JD

This novel initiative is known as the IHA Pay for Performance program. Many aspects of this program are evolving still, yet there is a determination on the part of all its key stakeholders to assure its success in an attempt to control their own destinies. This determination is founded on the belief that if the health care industry — providers, payers, and purchasers alike — does not take steps to rectify the industry's problems, then most assuredly the government will try to solve the challenges presented by rapidly increasing health care costs. A government solution is considered a last resort by the health care industry, which explains the strong motivation that currently exists to find an effective way to make the system increasingly productive and more responsive to the needs of the purchasers and consumers.

Integrated Healthcare Association

IHA was created in 1996 with a commitment to policy development, public dialogue, and innovative projects associated with the continuing evolution of managed health care. IHA has been able to leverage its distinctive ability to convene important stakeholders from every sector of the health care industry to collaborate on innovative solutions. In 2000, leading physician organizations in California approached IHA with their interest in developing a uniform approach to quality incentives for physicians. Physician organizations wanted to avoid potential inefficiencies that would be created by multiple and competing incentive programs. IHA accepted a leadership role in this process, achieving a consensus among multiple stakeholder groups on a unified approach to developing a quality-incentive program.

Pay for Performance

The stated goal of the IHA Pay for Performance program is to create a compelling set of incentives that will drive breakthrough improvements in clinical quality and patient experience. Although this objective is straightforward in purpose, the project is highly complex in underlying structure and execution.

Program development began with agreement on a number of fundamental principles that define and govern the program. First, participating health plans pay incentives to physician organizations for meeting performance criteria defined by clinical measures, patient satisfaction, and adoption of new information technology. Second, the project is focused on the commercial HMO/point-of-service population currently served by participating health plans. Third, the project uses a balanced set of metrics and audited administrative data to ensure accuracy in reporting. Fourth, an independent entity has been contracted to aggregate data across the entire program population. Fifth, there is a commitment to public reporting of the results at each stage of the program to ensure transparency and public accountability. Finally, the project is oriented to reward relative performance and improvement of physician organizations.

This last point is critical to the IHA Pay for Performance project. Prior to launch, the project faced the need to recognize the special challenges of physicians in underserved urban and rural areas. Due to the inherent differences that exist in the health status of patients who are seen by these physicians, it was deemed necessary not only to gauge the performance of these physicians against standardized quality measures, but also to measure improvements in their performance against initial baseline results. To address this need, the program is developing methodologies to account for improvement demonstrated through time.

The power of multiples

At the project's foundation is a concept of the "power of multiples." Prior to initiation of the IHA's Pay for Performance program, a number of California's health plans began developing incentive programs. These were based on various approaches that included required contract compliance with Health Plan Employer Data and Information Set (HEDIS) performance measures — in other words, a heavy-handed approach requiring that the physician behave according to specific criteria contractually outlined by the health plan. Other plans were less directive in their approach, rewarding those physician groups that demonstrated superior performance against the health plan's individual program metrics and priorities.

The different approaches and metrics presented a challenge to physician organizations because in the California environment, no health plan has more than 25 percent of any physician group's enrollment or patient population. Therefore, no single plan has the leverage to truly change behavior or performance of any physician group. In fact, the variation in approach and metrics, each attempting to drive different behaviors, actually had the potential to suboptimize the intent of these programs to improve the quality of health care. Physician groups simply would be pushed and pulled in too many different directions, thus rendering them incapable of responding successfully to any plan.

The driving principle behind the IHA Pay for Performance program is the use of a uniform approach to evaluate a physician organization's performance. To maximize the leverage from this approach, each participating health plan uses a uniform set of measures to examine performance based on the physician group's *overall combined* patient panel. This concept contrasts with more traditional approaches in which an individual health plan (e.g., Blue Cross, Health Net, or PacifiCare) rewards physician-group performance in isolation. The IHA Pay for Performance program attempts to leverage the impact of its quality-incentive program through the "power of multiples" so that all participating health plans, using common metrics, can drive performance by basing payments on the same goals and performance measures.

Darwinians vs. Social Democrats

Given the voluntary and diverse nature of the stakeholders, IHA faced differing viewpoints regarding program strategies. One faction (known as the Darwinians) adheres to the belief that the performance bar should be set high, that breakthrough improvement only occurs when the envelope is pushed, and that performance thresholds should become more difficult over time. Furthermore, this group believes incentives should be paid only to top performers, not for the level of improvement. Those in the Darwinian camp believe that poor performers will and should get consolidated into the larger, more successful groups.

Another faction (the Social Democrats) ascribes to the view that a rising tide lifts all boats. They believe that the IHA Pay for Performance program needs to have broad participation to attain credibility, that achievable goals need to be set at the beginning, that improvement as well as performance should be rewarded, and that the IHA should provide technical assistance to groups to help them succeed.

Technical development

The technical development necessary to build a meaningful, credible set of performance measures is probably one of the most important roles that IHA plays in management of the Pay for Performance program. Selection of appropriate practice guidelines that are both clinically relevant and administratively feasible necessitates a significant amount of technical work.

IHA has formed a prestigious technical committee of experts and stakeholders to lead this work. Behind this effort are individuals from the National Committee for Quality Assurance (NCQA) and the Pacific Business Group on Health (PBGH), who provide staff support to this committee.

Information technology

Participating physician-group practices range from highly integrated multispecialty medical groups with strong administrative capabilities to more loosely affiliated independent practice association (IPA) models. These organizations have vastly different information technology capabilities and capacities to introduce new clinical processes. In terms of earning incentives, "winning" or "losing" for a physician group is heavily dependent on the group's ability to monitor and record the work that is being done by physicians. Therefore, to succeed in the program, information systems that can support these efforts must be developed or adopted by physician groups.

Recognizing the importance of information systems in the process, the IHA Pay for Performance measurement set includes a domain, or category, that rewards groups for implementing specific information technology capa-

bilities. For example, a number of medical groups and IPAs in California have developed or purchased chronic disease registries to monitor their patient populations. These registries are designed with an emphasis on tracking patients with chronic diseases such as diabetes or asthma. Other groups have introduced point-of-care technology, such as wireless e-prescribing capabilities.

The improvement in care referenced above will not be in evidence unless physician groups have the ability to look at their population as a whole.

Performance vs. quality

The discussions concerning payment for quality inevitably raise tensions between those doing the measuring and those being measured. Simply settling on a definition of quality is difficult. Therefore, IHA attempted to move the discussion toward measurement of performance versus measurement of quality. The subject of performance puts the emphasis on a business orientation. In the business environment, one is rewarded for getting the job done. The theory is that if a business pays people for a specific behavior, then the individuals will move in that direction. Although that underlying concept might seem abrasive to some, it has proven to be productive for IHA because participants have been more willing to accept definitions of performance than quality.

Calculating the reward

The performance measurement set has three domains: clinical, patient satisfaction, and information technology. There has been an ongoing debate concerning the relative weighting of these domains for the purpose of calculating incentive payments. Initially, the measurement domains were weighted — clinical at 50 percent, patient satisfaction at 40 percent, and information technology investment at 10 percent.

In the program's second year, the weights were adjusted to: clinical at 40 percent, patient satisfaction at 40 percent, and information technology investment at 20 percent. The performance measurement set is included in Figure 1.

It should be noted that at the outset of program development, information technology was not a consideration for the measurement set. Ultimately, it was decided that if breakthrough improvements were to be achieved, structural investments in information technology were essential. This resulted in the decision to reward groups for making these investments.

In the clinical domain, half the measures used apply to preventive care, including breast cancer screenings, cervical cancer screenings, and childhood immunizations. Remaining clinical measures apply to chronic care

FIGURE 1 Pay for Performance Year-2 measurement set*
Revised March 2004

Domain	Measure description	Weight
Clinical	1. Childhood immunization status *Denominator changed to 24-month continuous enrollment* 2. Breast cancer screening 3. Cervical cancer screening 4. Use of appropriate medication for people with asthma 5. Cholesterol management — LDL screening and control *Expanded denominator expanded to include patients with diabetes* 6. Diabetes — HbA_{1c} screening and control 7. Chlamydia screening	**40%**
Patient satisfaction	1. Specialty care 2. Timely access to care 3. Physician-patient communication 4. Overall ratings of care	**40%**
Information technology investment	1. Integrate clinical electronic data sets at group level 2. Support clinical decision-making at point of care *Requires four IT-related activities, of which at least two are an IT measure that includes a list of potential IT activities, such as disease registries; each activity is worth 5% of the overall score*	**20%**

**For measurement year 2004, reporting year 2005.*

New measures being examined for possible inclusion at a later date:

Data on the following measures are being collected and submitted for analysis in 2005 (at this point, this information will not be reported publicly):

- Appropriate antibiotic treatment for children with upper respiratory infection
- Antidepressant medication management
- Program to measure and use physician performance information on quality, efficiency, and/or patient service

This testing measure is being field tested in 2004 for potential use in measurement year 2005 (reporting year 2006):

- Cholesterol management — *expanding denominator to include patients who are on nitrates*

SOURCE: IHA 2004

management, including appropriate medication for asthma, HbA_{1c} testing for diabetes, and LDL-c testing. In Year 2, the clinical measurement domain was expanded to incorporate screening for chlamydia.

In the patient satisfaction measurement domain, there are four measurement areas: specialty care, timely access to care, communication with physicians, and overall ratings of care. Each of these areas accounts for 10 percent of the overall score (adding up to the 40 percent patient-satisfaction portion of the overall score). These domains currently are being measured and collected in California through the Consumer Assessment Survey (CAS). Most medical groups already participated in the CAS and, therefore, were familiar with this survey tool.

FIGURE 2 Medical group summary chart

Sample page from 2003 report card

San Fernando, San Gabriel, and West Los Angeles

Medical group	Overall rating of care	Timely care and service	Getting treatment and specialty care	Communicating with patients
Medical group	☆	☆	☆	☆
Medical group	★★	★★	★★	★★★
Medical group	★	★	★	★★
Medical group	★	★	★	★★
Medical group	★	☆	★	★★
Medical group	★	★	★	★★
Medical group	★★	★★	★	★★
Medical group	☆	☆	★	★
Medical group	★	☆	★	★★
Medical group	★	★	★	★★
Medical group	★	★	☆	★★
Medical group	★	★	★	★★
Medical group	★	☆	not rated	★★★
Medical group	★	★	★	★★
Medical group	★	★	★	★★
Medical group	☆	☆	★	★
Medical group	★★	★★	★★	★★★
Medical group	★	★	★	★★
Ratings Key	Excellent ★★★	Good ★★	Fair ★	Poor ☆

"Not rated" means the medical group had too few patients in the sample to report this result.

SOURCE: IHA 2004

For the information technology measurement domain, groups must be able to show the following capabilities in either of two categories to earn incentive rewards: clinical data integration at the group level and clinical decision support at the point of care. Examples of clinical data integration are the creation of data registries that integrate physician encounters, pharmacy, and other data sources for specific chronic care patient populations at the physician-group level. Clinical decision support at point of care includes a number of qualifying activities, such as telemedicine applications and wireless point-of-care e-prescribing.

Public report cards

The desire to provide transparency and public reporting led to a decision to use the clinical data from this project to support development of a public scorecard that ranks the performance of medical groups. IHA chose to collaborate with the California State Office of the Patient Advocate to prepare and disseminate a scorecard using data from the IHA Pay for Performance program. The Office of the Patient Advocate has responsibility for receiving consumer complaint information, tabulating it, and sharing this information with the public. The Office of the Patient Advocate is also charged with the responsibility to publish an annual report card on the performance of health plans and medical groups. This has occurred during the past several years, but the report cards have not included medical group performance using clinical measures.

The IHA is committed to providing a clinical data set to generate a report card in conjunction with the State Office of the Patient Advocate. An underlying goal is to produce either a single report card or, possibly, separate report cards that are not duplicative. The intent is to produce report cards that complement each other and do not perpetuate the problem of "dueling report cards" that currently exists.

The report cards that have been published by the state of California have been widely available, with detailed information on the state Web site as well as on the PBGH Web site. Print copies are disseminated through a broad network of pharmacies, libraries, and other venues. In addition, they are consumer-friendly, with copies available in English, Spanish, and Chinese, among other languages.

The vendor that performs the statistical analysis for the state to develop the scorecard has established a threshold for patient encounters. This threshold determines whether data are included in the analysis. Currently, this threshold is 2.7 physician encounters per member per year. That number was set low to encourage participation, but it is expected to increase to 3.0 or 3.5 physician encounters per member per year in the coming years. Figure 2 provides an example of a prototype report card.

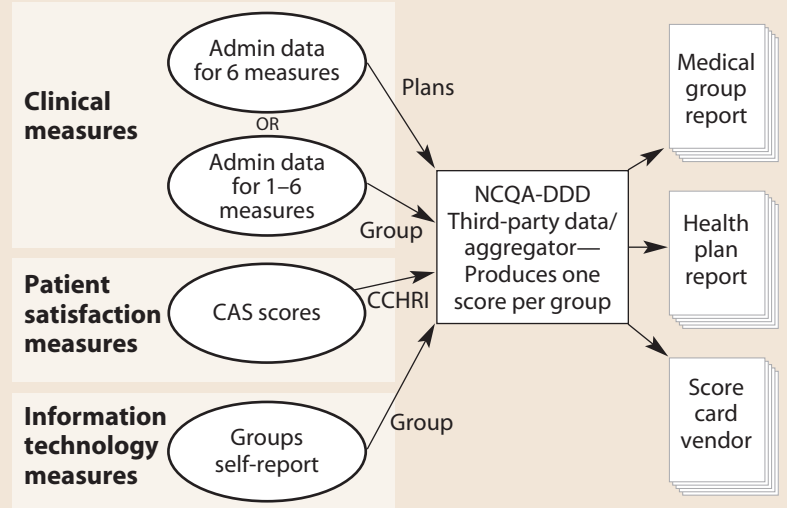
Data collection

The data collection process is displayed in Figure 3. Administrative data for the clinical measures are submitted by health plans, but this information can be augmented by the physician organizations through self-reporting. Medical groups electing to submit self-reported information must bear the expense of an external audit, however.

Whether the source of the data is a health plan or physician organization, it is submitted to an independent third-party data aggregator. This includes not only the clinical data set, but also the CAS scores as well as the self-reported information technology measurement scores. The data aggregator produces one aggregated data set reflecting the performance of a physician organization across the entire patient population enrolled in all six participating health plans.

FIGURE 3 Data collection

Determining the relative standing of medical groups



CAS=Consumer Assessment Survey, CCHRI=California Cooperative Healthcare Reporting Initiative, NCQA-DDD=National Committee for Quality Assurance-Diversified Data Design Corp.

SOURCE: IHA 2004

It is important to note that this information is based on administrative data, not information collected manually, such as from pulling medical records. There are inherent weaknesses in a data set generated solely from administrative data. For this reason, IHA is focusing on the relative standing of medical groups rather than absolute scores.

Groups that improve significantly but are still under a threshold may receive an incentive payment from a health plan. This is important due to the variation among the medical groups regarding their ability to implement these measurements and to capture the relevant data. In the early phase of this program, it was considered critical to give credit to groups that incorporated the Pay for Performance concept into their practice.

Clinical data pilot

Among 49 physician organizations that participated in a clinical data collection pilot program in 2002, 40 ultimately submitted clinical rates. Groups submitted data for a single measure, or for up to all six clinical measures. Although many of the groups had data collection systems in place, 43 percent had never captured information for these clinical measures previously.

The profile of the physician organizations participating in the pilot was 39 percent IPA, 29 percent medical group, and 18 percent mixed medical group and IPA. In addition, 18 percent were groups managed by a subcontracted management services organization. The participating test groups had enrollments of 7,500 to 225,000 patients.

The results of the first year pilot revealed that the top performers were spread out among many groups; in fact, 44 percent were in the top performing quartile for at least one measure. For all measures, with the exception of asthma, mean scores were higher when self-reported by a physician organization. The largest discrepancy in group performance was based on lab-based measures for diabetes and cholesterol management. Also, previous HEDIS reporting experience by the medical group was a predictor of favorable performance.

Bonus payments

The bonus payments for the first measurement year (2003) are being paid in the fall of 2004, and total payments across all six participating health plans are expected to reach up to $100 million. IHA will not participate in the calculation or distribution of bonus payments or in how they are allocated to the physician organizations. Antitrust considerations restrict any collective agreement among competing health plans related to payments, therefore health plans independently determine payment amounts and methodology.

The bonus payments will be made to physician organizations, and each group determines usage of these funds — including whether any portion will be distributed to individual physicians. Currently, participating physician organizations have highly variable approaches with respect to the use of quality incentive bonuses. A significant number of groups have utilized these funds for information technology investment, while others make distributions to individual physicians.

There is wide support for encouraging physician or-

TABLE Bonus programs and targeted amounts by health plan

Health plan	Payment methodology
Aetna	Maximum 3.5% bonus
Blue Cross	Maximum $4.50 PMPM but less than 25 percent P4P
Blue Shield	Maximum $2.00 PMPM
CIGNA	Minimum $1.60 PMPM for top groups
Health Net	Maximum $2.47 PMPM
PacifiCare	Maximum $2.00 PMPM/$3.00 Secure Horizons

P4P=Pay for Performance, PMPM=per member per month.

SOURCE: IHA 2004

ganizations to distribute some portion of the bonuses to individual physicians. One health plan announced at a meeting of the California Association of Physician Groups (CAPG) that bonus payments would be increased by 10 percent for any medical group or IPA that could demonstrate that it was passing any portion of its performance bonuses to physicians. IHA stakeholders are considering developing an individual-physician component to include in the program in the future.

Each managed care organization is challenged to determine how to integrate the Pay for Performance program into its business operations and provider contracts. Several plans have said that they intend to incorporate the IHA recommended performance measure set into their provider contracts. In contrast to this approach, one health plan is not including the quality-incentive arrangement in its provider contracts because it wants to be clear that it is indeed a performance reward — over and above the underlying negotiated provider contract rate.

In late 2002, the participating health plans announced their bonus program approaches and targeted amounts for calculation of payments based on 2003 performance (Table).

Where is Pay for Performance headed?

IHA has taken the position that it does not have a role in influencing how health plans and physician organizations distribute the Pay for Performance bonuses. IHA supports the notion that these payments are truly a bonus and provide the potential for enhanced payment beyond underlying payment rates.

In the future, risk assessment and risk adjustment of the physician-group capitation payments may allow recognition that is more fair relative to differential medical burdens among physician-group patient panels. In other words, a more fair system may be in place that will recognize differences in risk relative to patient populations, which will be reflected in adjustments to physician-group capitation payments.

Because the IHA Pay for Performance project has focused on a capitated delegated physician-group model, it is important that the risk borne by a group be recognized in the capitation-payment rate. This assures that an incentive bonus is a reward for how well the group performs in caring for its patients. One question posed by more successful groups remains unanswered: What happens if my group does the best job in diabetes? Is my group going to get all the diabetics?

In the future, the program may need to incorporate some type of risk adjustment that recognizes that a group should be rewarded for caring for a disproportionate level of patients with chronic disease. The group should also receive a reward for excellence in managing the chronic care population.

Underlying the IHA Pay for Performance program is the notion that a greater proportion of the expanding premium dollar should be allocated as a reward for good health care performance. It is expected that there will be "winners" and "losers." For the losers, though, it will not mean so much that they will be earning less money from one year to the next. Rather, underperforming physicians will not have the opportunity to access additional incremental income that they may have under the old system.

Challenges ahead

This Pay for Performance philosophy is certainly familiar to those from the business world; it remains somewhat foreign in our health care environment, however. Yet, when physician groups can see clearly the benefit to their practices as well as their patients, the path becomes simplified.

The collaboration among major health plans, purchasers, and providers has been crucial to the initial success of Pay for Performance. To date, all the important constituents around the table have been sensitive to the concerns of others. As an example, cultural sensitivity and urban versus rural care continue to be issues of concern. IHA recognizes the need to continue promoting open dialogue to ensure that all participants are heard.

Lastly, because this system's success or failure depends on the quality of its data, there is significant activity directed toward the integration of clinical, pharmacy, and lab data. There is also a major, new initiative under way by CAPG to create a statewide data repository. This will be fertile ground for future collaboration between the plan and provider stakeholders of health care.

Reference

Integrated Healthcare Association. 2004. Available at: «http://www.iha.org». Accessed Sept. 14, 2004.

Genetic Variation and Cardiovascular Care

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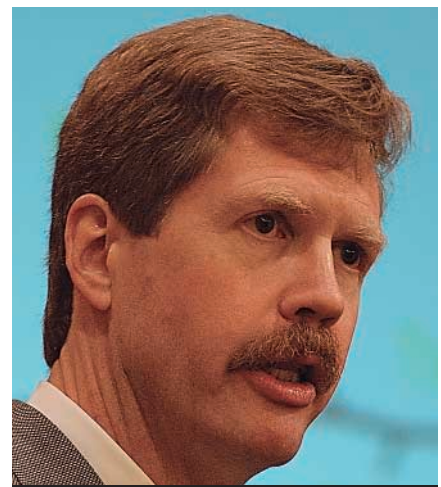
The question of whether knowledge of a patient's race provides clinically useful information continues to generate considerable controversy. Many social scientists dismiss race as nothing more than a "social construct." The American Anthropological Association, for example, has claimed that any two individuals within a particular population are as different genetically as any two people selected from any two populations in the world (AAA 1997).

Within medicine, the debate continues. Concurring with the anthropological perspective, an editorialist wrote in the *New England Journal of Medicine* that "the idea of race remains ingrained in clinical medicine" even though "'race' is biologically meaningless" (Schwartz 2001). Nevertheless, another editorialist wrote, "racial differences in the response to drugs … have practical importance for the choice and dose of drugs" (Wood 2001).



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These editorials appeared in an issue containing two articles in which the question of race was addressed in a clinical context. One article claimed that the beta blocker carvedilol provides similar benefits in black and nonblack heart failure populations (Yancy 2001); another purported to show that the angiotensin-converting enzyme inhibitor enalapril is more effective in white patients with left ventricular dysfunction than in blacks (Exner 2001). Widening the debate to a broader audience, psychiatrist Sally Satel wrote in the *New York Times Magazine* that she was "proud to be a racially profiling doctor" because race could contribute useful information for the management of patients (Satel 2002).

This article will review evidence from molecular biology supporting the position that race, while not biologically meaningless, is a crude predictor of clinical factors. Direct examination of genetic variation in individual patients ultimately will provide more reliable predictive information. Such genetic predictors could change the face of medicine.

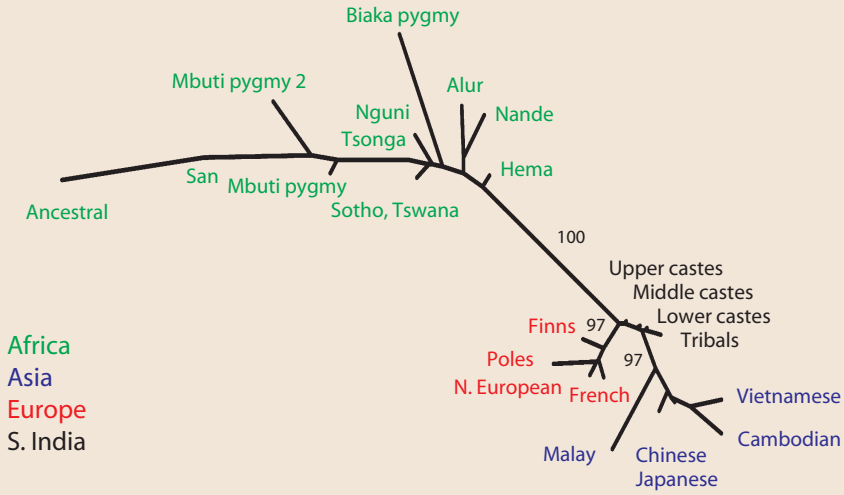
The haploid human genome consists of about 3 billion DNA base pairs distributed among 23 chromosomes. In identical twins — natural clones — all the bases in one person's genome perfectly match those of the twin. Between any two unrelated humans, however, 1 base pair in 1,000 is different, and between a human and a chimpanzee (the nearest relative to the human species), 1 base pair in 100 is different.

Because the denominator is so large — 3 billion — the 1-in-1,000 difference between any two nonrelatives amounts to 3 million different base pairs. Of the 0.1 percent of DNA bases that vary, 90 percent of the variation is distributed within continents and 10 percent between continents (Jorde 2000).

In an analysis involving 710 individuals representing 31 populations from Africa, East Asia, Europe, and India, my colleagues and I demonstrated that populations that are closer geographically tend to be more similar genetically (Watkins 2003). This result, while contradicting the assertion made by the American Anthropological Association, is not surprising, because populations that live closer together are more likely to exchange genes. Figure 1 (page 10) shows the network of genetic relationships constructed from 100 different DNA variations (*Alu* insertion polymorphisms) within these 31 populations.

Alu insertion elements are the most common type of short interspersed nuclear elements in the human genome, numbering more than 1 million. Each contains about 300 base pairs. *Alu* insertion elements are excellent markers of relatedness in humans (and other species), such that a given *Alu* insertion and its nearby flanking sequence will be identical by descent in every person in which it occurs. The network in Figure 1 is rooted in a hypothetical ancestral root that lacks an *Alu* insertion at each of the 100 loci. As the diagram shows, the genetic distance between the ancestral root and any African group is shorter than the distance between the root and

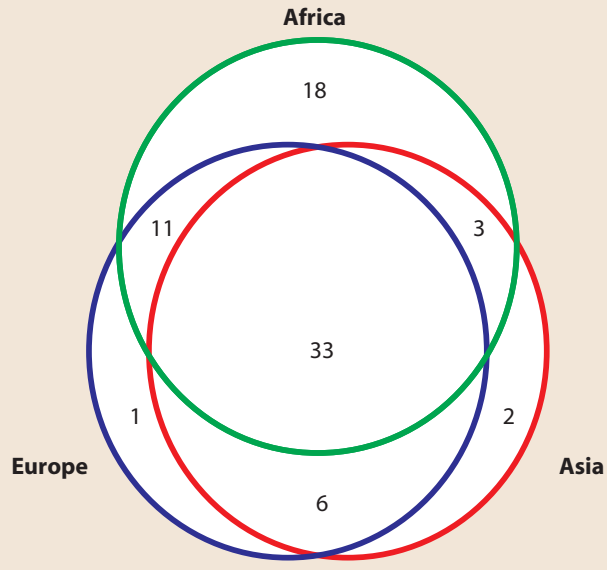
FIGURE 1 Genetic relationships based on 100 autosomal *Alu* polymorphisms



SOURCE: WATKINS 2003

FIGURE 2 Chromosome 22 noncoding single nucleotide polymorphisms, distribution by continent

Genetic variants shared across populations



any non-African group. In addition, the network shows that the average genetic distances are largest between Africans and non-Africans and that the African group has the highest level of genetic diversity.

The same pattern of clustering according to continent types is revealed by other kinds of genetic markers, including short tandem repeats, which also are known as microsatellites (Jorde 1997); restriction-site polymorphisms (Watkins 2001); and mitochondrial DNA (Jorde 1998). All these lines of evidence support the hypothesis that modern humans originated in Africa and, over time, accumulated a considerable amount of genetic diversity. Subsequently, a small subset of the population split off to colonize the rest of the world, which would explain why less genetic variation is seen in non-African populations than in African populations. The genetic data broadly support the notion that anatomically modern humans left Africa about 100,000 years ago to colonize the rest of the world, finally arriving at the New World about 20,000 years ago (Hedges 2000).

At the level of individuals, comparisons of mitochondrial DNA sequences from two individuals from different continents sometimes are more similar to one another than to individuals from the same continent. Comparing individual DNA sequences shows how populations mix and overlap. Both biologically as well as socially, there are no "pure" human populations. For example, a study of the DNA variants known as single nucleotide polymorphisms (SNPs) occurring on chromosome 22 showed that only one SNP was unique to Europe and only two were unique to Asia (Figure 2). More SNPs were unique to Africa, reflecting its greater genetic diversity, but the important point of the Venn diagram is that a high number of the genetic variants are shared across populations.

Combining information from 160 different genetic loci (100 *Alu* insertions and 60 microsatellites) provides enough information to estimate a person's ancestry with considerable accuracy for sub-Saharan Africans, East Asians, and Europeans (Figure 3) (Bamshad 2003). If, however, a South Indian population is added to these three groups, it becomes more difficult to assign them to a continental category because of the tremendous overlap these individuals have with those from Europe and Asia (Figure 4). This is consistent with the history of India, which probably has had migrations from many parts of Eurasia.

Using DNA chips containing a large amount of information (11,078 SNPs), it is possible to make fairly accurate inferences about the ancestry of individuals if they

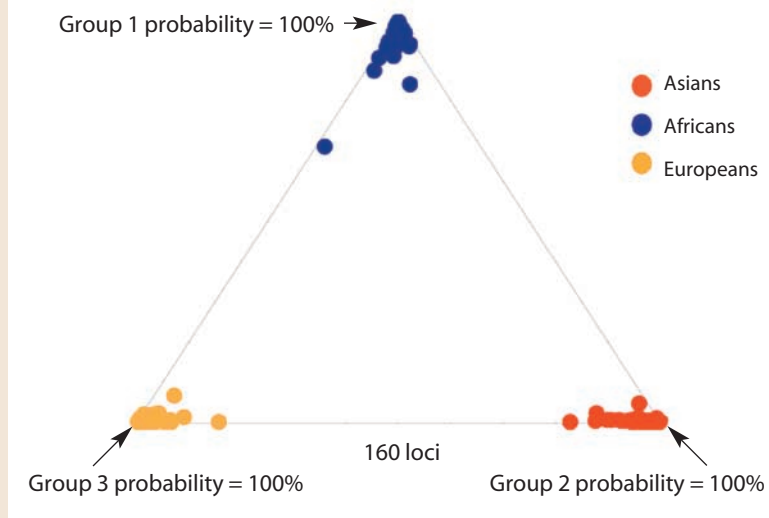
represent Altaic, Chinese, or several different African populations. When African Americans are added to the network, however, most cluster with other African populations. Nevertheless, some do not cluster with any particular population. Puerto Ricans also do not fit neatly into any category. Thus, although geographic patterning is evident in genetic variation, it is extremely difficult to define specific boundaries.

Taken as a whole, these findings underscore the fallacy of typological thinking. Thinking in terms of race tends to cause us to think in terms of mutually exclusive types, which, at the genetic level, is potentially misleading.

To focus on a specific biomedically significant gene, consider that the plasma angiotensinogen level is significantly correlated with blood pressure (r=0.39; *P*<.00001) (Walker 1979), and that the T235 variant of the angiotensinogen gene confers a 10 to 20 percent increase in plasma angiotensinogen and increased blood pressure (Kunz 1997). Because hypertension is significantly more common among African Americans than among many other American populations, it is reasonable to ask whether this could be due in part to a higher frequency of T235 in this population. In fact, among Nigerians, the frequency of this variant approaches 90 percent — and it occurs at nearly that high a rate among African Americans — although it is substantially lower in other populations (30 percent in Northern European populations) (Nakajima 2004).

FIGURE 3 Allocation of individuals

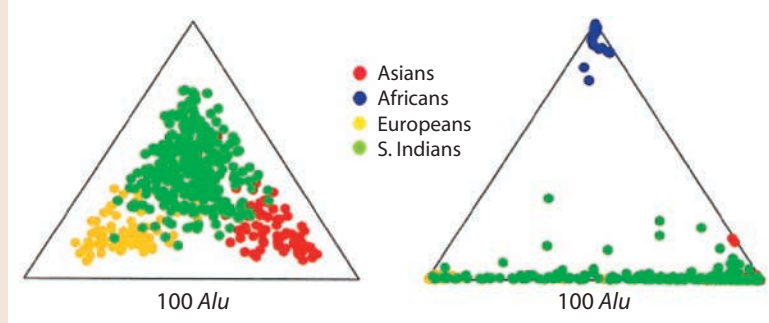
Probabilities of group membership



SOURCE: BAMSHAD 2003

FIGURE 4 Allocation of individuals, inclusive of South Indian population

Probabilities of group membership



SOURCE: BAMSHAD 2003

The prevalence of hypertension is different in African and African-American populations, however, depending on their origin and environment. Among U.S. urban African Americans, the rate of hypertension is about 33 percent; in Caribbean populations, it is about 25 percent. In Cameroon, it is lower than 25 percent; in urban populations, 20 percent; and in rural areas, 15 percent (Cooper 1999). In rural Nigeria, despite the 90 percent frequency of the T235 variant, the hypertension rate is only 7 percent. Clearly, environment plays a major role in influencing the incidence of hypertension in these populations. Although the T235 variant may play a role in the incidence of hypertension, it is insufficient in itself to be the primary cause of hypertension.

Consider also the CYP2D6 gene, which encodes one of the cytochrome P450 enzymes. CYP2D6 is responsible for oxidation of at least 30 different drugs, including antidepressants, antipsychotics, analgesics, and beta blockers. A person with a nonfunctional CYP2D6 variant therefore may be at high risk for an adverse reaction from one of these drugs (or a lack of response to the drug). Nonfunctional variants of this gene vary from about 6 percent in African populations, to 10 percent in Asian populations, 15 percent in African American populations, and 25 percent in European populations (Bradford 2002). The difference between 15 percent in one population and 25 percent in another is not appreciable; it would be more productive to investigate the gene itself,

instead of using the surrogate marker of perceived race.

The SCN5A arrhythmia variant is found in about 13 percent of African Americans but in virtually no Europeans or Asians (Splawski 2002). Still, the arrhythmia variant is not found in the vast majority of African Americans. Again, using race as a proxy is far less accurate than performing genetic tests to determine whether a person carries the variant.

These examples illustrate the fact that most genetic variation is shared among all human populations. Specific DNA variants are related to disease or drug response, and they may vary in frequency among populations, but seldom will they be entirely present in one population or entirely absent in another.

Instead of using surrogate factors, such as race, to crudely predict response to drugs or other clinical factors, it might be more productive to use DNA microarrays to ascertain individual genetic variation. A single DNA chip can accommodate hundreds of thousands of DNA sequences, each of which constitutes a probe. If DNA from a patient hybridizes to a probe, it indicates that the patient carries that DNA sequence. A single chip costs between $200 and $400 (about $250,000 for the machine to read the chip), but because it can comprise half a million different sequence variants, much information can be obtained about a patient, relatively inexpensively. Genetic testing could help to diagnose and more effectively treat diseases such as hypertension, diabetes, hyperlipidemia, and cancer (e.g., ovarian, breast), which account for a large part of today's health care burden.

In summary, although racial differences in DNA variants and drug responses exist, it is important to remember that those usually are frequency differences and that the variants tend to be shared among races and populations. Therefore, individualized genetic analysis, when available and feasible, offers a more accurate tool for risk assessment than a surrogate predictor such as race.

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Metabolic Syndrome: What Might Be Occurring?

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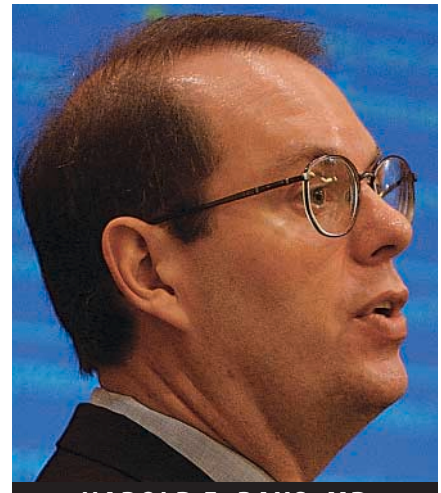
Clinicians are well aware of the common constellation of metabolic conditions that constitute what is now termed the "metabolic syndrome." Many may recall that in 1988, Gerald Reaven, MD, suggested that insulin resistance might be the common link behind the clustering of cardiovascular risk factors such as hypertension, lipid abnormalities, and hyperglycemia (Reaven 1988). He described it as "syndrome X." Since then, the similar syndrome has been described as Reaven syndrome, insulin resistance syndrome, deadly quartet, and cardiovascular dysmetabolic syndrome. Recent data suggest that fat dysfunction ("adiposopathy") may play a key role in the etiology of the metabolic syndrome.



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NCEP criteria

Various expert organizations have established criteria to define the metabolic syndrome. For example, the National Cholesterol Education Program's (NCEP) Adult Treatment Panel III (ATP III) (NCEP 2002) employs five criteria, with the presence of any three constituting a diagnosis:

- Abdominal obesity (waist circumference >40 inches in men or >35 inches in women)
- Hypertriglyceridemia (triglycerides ≥150 mg/dL)
- Low HDL-cholesterol levels (men, <40 mg/dL; women, <50 mg/dL)
- Hypertension (blood pressure ≥130/≥85 mm Hg)
- Fasting hyperglycemia (fasting blood glucose ≥110 mg/dL)

Using these diagnostic criteria, it is estimated that metabolic syndrome is found in nearly one quarter of the U.S. adult population (Park 2003). Its prevalence rises steeply with increasing weight, being found in 4.6 percent of normal-weight men (body mass index [BMI] less than 25), 22.4 percent of overweight men (BMI 25 to 29.9), and 59.6 percent of obese men (BMI 30 or higher); a similar distribution was observed among women. Modifying the ATP III criteria and the similar World Health Organization criteria, comparable results have been found in children and adolescents (Weiss 2004).

The epidemic of obesity and insulin resistance

The increasing prevalence of the metabolic syndrome can be directly related to the unabated epidemic of obesity. The prevalence of obesity has climbed sharply among U.S. children, adolescents, and adults during the past 2 decades, to the extent that 65.1 percent of U.S. adults are overweight or obese, including the 30.4 percent who are obese (Hedley 2004). Given that the prevalence of overweight and obesity shows no signs of lessening (Hedley 2004), the correlation between increasing weight and metabolic syndrome suggests the continuing evolution of not only a substantial U.S. problem, but a global one as well.

As noted before, an emerging concept is that fat dysfunction may contribute to insulin resistance, and thus the metabolic syndrome. In a genetically predisposed individual, fat cells may induce insulin resistance in muscle and the liver, and pancreatic beta cell dysfunction through the dysfunctional release — or lack of release — of various adipocyte factors. This "adiposopathy" may therefore be associated with, and perhaps even a causal factor in, hyperglycemia, dyslipidemia, hypertension, and vascular damage. Although this dysfunction may occur with minimal environmental influences, it is most often found in those patients with positive caloric balance, adiposity, and sedentary lifestyles. Therefore, adiposity often promotes "adiposopathy," which in turn

contributes to the glucose and lipid abnormalities that constitute the metabolic syndrome.

From a glucose standpoint, insulin resistance in muscle and the liver, coupled with diminished pancreatic beta cell function, may result in hyperglycemia. From a lipid standpoint, the elevated triglyceride and low HDL-c levels are often associated with abnormalities in lipoprotein particle size and subclass distribution. These complex lipid abnormalities may help explain why patients with type 2 diabetes mellitus are at such high risk for atherosclerotic coronary artery disease.

For example, men with type 2 diabetes mellitus are twice as likely to have small, dense LDL particles as are nondiabetic men (51 percent vs. 24 percent) (Feingold 1992); women with diabetes are 6 times as likely (36 percent vs. 6 percent) (Selby 1993). Conversely, men without diabetes are twice as likely as diabetic men to have larger LDL particles (47 percent vs. 28 percent); women without diabetes are 2 and a half times as likely (85 percent vs. 34 percent).

So what might be going on? What is behind the development of the metabolic syndrome? One hypothesis is the "Common Fat Hypothesis," as has been previously described. While fat cells/adipose tissue had previously been considered to be relatively inert storage vesicles, it is becoming increasingly clear that adipocytes are extremely active from an endocrine standpoint.

Hormones released by fat cells include leptin and adiponectin, which may increase insulin activity, as well as resistin, which may decrease insulin activity. The most commonly described cytokines released by fat cells include tumor necrosis factor-alpha and interleukin-6. Both may decrease insulin activity. Other commonly described factors include angiotensinogen, plasminogen activator inhibitor-1, and adipsin, which may be involved in obesity-associated hypertension, thrombosis, and lipid abnormalities.

Finally, dysfunctional fat cells ("adiposopathy") may release free fatty acids, which may cause infiltration of the liver ("fatty liver"), hepatic insulin resistance, and release of increased VLDL-c, resulting in the common finding of fasting hypertriglyceridemia that is characteristic of the metabolic syndrome. Through subsequent metabolic processes that may include cholesteryl ester transfer protein, the cholesterol from HDL may be transferred to VLDL particles in exchange for triglycerides. Such HDL particles then may be more easily cleared by the kidney, resulting in low HDL-c — yet another component of the metabolic syndrome. Finally, triglycerides from VLDL particles may be transferred to LDL particles in exchange for cholesterol, and the triglyceride-rich LDL particles then may undergo further metabolism through various lipases, resulting in smaller, more-dense LDL particles. Thus, dysfunctional fat cells may, in some respects, be the genesis of the dyslipidemia commonly found in the metabolic syndrome, which includes fasting hypertriglyceridemia, low HDL-c, and small dense LDL particles.

Genetic predisposition and lifestyle factors

Yet, the situation may not be this straightforward. A conference recently convened by the National Heart, Lung, and Blood Institute (NHLBI) and the American Heart Association (AHA) regards the theory that insulin resistance is a consequence of increased free fatty acid and cytokines produced by obese adipose tissue as partly true but essentially an oversimplification of a complex issue (Grundy 2004).

What is not in dispute, however, is that being overweight does not always result in the metabolic consequences associated with the metabolic syndrome. In fact, only about 25 percent of nondiabetic, normotensive obese adults actually have insulin resistance (Ferrannini 1997). This was demonstrated by an examination of a database comprising records for 1,146 European Caucasian adults, ages 18 to 85, whose insulin activity was measured with the euglycemic insulin clamp technique. Normal weight was defined as a BMI of 25 or lower. When insulin resistance was defined as the lowest decile of insulin sensitivity in this lean subgroup, insulin sensitivity was found in 26 percent of the subgroup with a BMI greater than 25 (mean BMI=29). The higher the BMI, the greater the prevalence rate of insulin resistance, rising from 19 percent among subjects with a BMI above 25 but less than 30, to 34 percent among subjects whose BMI was between 30 and 35, and to 60 percent only among those whose BMI exceeded 35. In another study enrolling healthy, nondiabetic volunteers, similar results were found, with only 25 percent of subjects in the upper tertile of insulin resistance having a BMI greater than 30 (Abbasi 2002).

Thus, in many patients, genetic predisposition and sedentary lifestyle play important roles in the development of the components and metabolic totality of the metabolic syndrome. The interplay that exists among overweight/obesity, cardiorespiratory fitness or lack thereof, and cardiovascular risk factors was demonstrated in a longitudinal study in which the cardiovascular fitness of 25,714 adult men of varying weights was assessed (Wei 1999). This study showed that the risk of cardiovascular death or death from any cause rises with increasing body weight. Cardiorespiratory fitness was determined via a rigorous treadmill test. Subjects were followed for an average of 10 years (258,781 man-years for the population), and 1,025 deaths occurred during follow-up. Not surprisingly, obese men (BMI 30 or higher) with a history of cardiovascular disease (CVD) were 14 times more likely than men of normal weight (BMI 18.5 to 24.9) without a history of CVD to die from CVD, and 4.7 times more likely to die from any cause.

Other predictors of mortality (type 2 diabetes, high total cholesterol, hypertension, smoking, low fitness) also pointed to an increased risk of CVD death or death from any cause as weight rose. Overweight or obese men with low fitness were about 5 times more likely to experience CVD death and 3 times more likely to die from any cause compared with normal-weight men who did not have low fitness. Conversely, normal-weight men with low fitness were twice as likely to die from CVD or any cause as were overweight/obese men who were not unfit. Moreover, among men who were not unfit, obese or overweight men were at essentially the same level of risk for death from any cause as were men of normal weight.

Thus, lifestyle changes — weight reduction and increased physical activity — are the foundation of therapy for patients with the metabolic syndrome (NCEP 2002). The NHLBI/AHA conference endorses that approach, seeing a secondary role for drug therapy in patients with metabolic syndrome unless otherwise indicated by guidelines for CVD (Grundy 2004). Weight loss and increased physical activity address the underlying causes of metabolic syndrome and have the potential to improve the patient's lipid profile by reducing the triglyceride concentration and increasing the HDL-c concentration, thereby improving the TG:HDL-c ratio. The NHLBI/AHA conference sees a reduction in body weight of 7 to 10 percent over the course of 6 to 12 months as a reasonable goal (Grundy 2004). The benefits of weight loss — in terms of decreased insulin concentrations and improved lipid profiles — appear to be confined to patients who were insulin resistant prior to losing weight, however.

Pharmacotherapy

If drug therapy is necessary, a reduction in LDL-c levels continues to be the primary treatment target. For this purpose, statins are the most widely prescribed drug treatment. Statins substantially improve LDL-c levels, with modest reductions in triglyceride levels and modest increases in the HDL-c levels. To improve triglycerides and abnormalities in lipoprotein particle size and subclass distribution, niacin and fibrates are alternatives or may be used in combination with statins (Bays 2003a, 2003b).

Other drugs that may be useful are those that target the peroxisome proliferator-activated receptors (PPARs). PPARs are a group of receptors that act in the nucleus. Three types of PPARs have been described — alpha, gamma, and delta. They take their name from the ability of PPAR-alpha, when activated by fatty acids and other substances, to induce, in rats, the proliferation of peroxisomes, which are organelles involved in lipid metabolism and catabolism. While this phenomenon does not appear to occur with any PPAR activation in humans, the PPAR classification remains in use.

PPAR-alpha receptors are expressed chiefly in the liver, but some also are found in the kidney, heart, skeletal muscle, as well in macrophages (including those affiliated with the vasculature). Their ligands are free fatty acids and fibrates. Fibrates were employed to treat dyslipidemia long before it was discovered that they act as PPAR-alpha agonists. In the liver, PPAR-alpha regulates the expression of genes involved in oxidation of fatty acids, synthesis of VLDL, lipolysis, and metabolism of HDL. The result of PPAR-alpha activation is an increase in HDL-c levels, and a robust decrease in the triglyceride levels (usually more than achieved with statins) and a decrease in small, dense LDL particles. PPAR-alpha agonism also may have favorable effects on the vasculature.

PPAR-gamma receptors are expressed chiefly in adipose tissue, as well as large intestine and macrophages (including those affiliated with the vasculature). Their ligands are free fatty acids and insulin-sensitizing thiazolidinedione drugs. Activation of PPAR-gamma induces fibroblast/adipocyte differentiation, thus reducing "adiposopathy," and improving the ability of adipose tissue to store lipids while also affecting the release of the previously mentioned cytokines produced by adipose tissue. Expression of TNF-alpha and resistin (each a promoter of insulin resistance) is inhibited, and expression of adiponectin (a promoter of insulin sensitivity) is stimulated. PPAR-gamma agonism also reduces insulin resistance, lowers blood glucose in patients with type 2 diabetes mellitus, improves lipoprotein particle size and subclass distribution, and may have favorable effects on the vasculature.

Much research effort has been under way to develop dual PPAR-alpha/gamma agonists. The intent is to develop drugs with a potential to improve glucose levels similar to existing PPAR-gamma agents, but with more favorable effects on lipids (through PPAR-alpha activity).

Conclusions

In the interim, from a public health perspective, weight loss and increased physical activity remain first-line therapy for patients with the metabolic syndrome (Grundy 2004).

With regard to managed care considerations, it should be noted that the federal government now has designated obesity as a disease. Thus, not only will metabolic syndrome and type 2 diabetes continue to represent an area with one of the highest expenditures of health care dollars, but an array of anti-obesity drugs in development will likely be approved in the next several years — leading to still greater formulary costs. Those involved in attempts to manage the extraordinary costs associated with the obesity epidemic should become well familiar with current and upcoming novel therapies, and develop strategic plans that will allow for their inevitable impact on the health care system. In the interim, it would con-

tinue to be wise for managed care organizations, clinicians, and business and government officials to strongly encourage appropriate diet and exercise, as this will continue to be the best overall public health option to stem the obesity, diabetes, and metabolic syndrome epidemics.

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Pediatric and Adolescent Obesity: An Increasing Problem

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Overweight and obesity in children and adolescents present not only long-term consequences in adulthood — such as an increased risk of atherosclerosis, type 2 diabetes, and osteoarthritis — but also complications posing an immediate concern. Among these complications are the metabolic syndrome, dyslipidemia, hypertension, nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatorrheic hepatitis (NASH), orthopedic problems, and low self-esteem. In the Bogalusa Heart Study — a community-based study of risk factors for cardiovascular disease in 27,000 young people (ages 5 to 24) — autopsies performed in children who died from noncardiovascular causes showed that coronary artery and aortic plaques were present in children as young as 5 years of age (Berenson 1998). The plaques were consistent with the risk factors associated with overweight adults who develop atherosclerosis and coronary artery disease. Findings like these point to the need to identify children and adolescents who are overweight or in danger of becoming overweight and to provide them with interventions that can keep their weight in a healthful range.

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Obesity can be assessed by several methods. For research purposes, the gold standard is water submersion, which is impractical in clinical practice. Skinfold measurements are limited by operator dependence. The body mass index (BMI, a person's weight in kilograms divided by the square of his or her height in meters) is used commonly, although it is limited by its inability to differentiate adiposity from lean body mass. The BMI therefore could overestimate obesity in children who are growing or athletic. Electrical bioimpedance using bipedal electrodes is as easy to use as stepping on a scale, though it can be limited by the patient's hydration status or the time of day. It is particularly useful with growing children for whom the BMI is not reliable. Simplest of all is the visual test, which involves nothing more than classifying children as overweight or obese on the basis of their appearance (without a shirt). Confirming a visual test with the BMI probably will identify most children who need intervention for overweight or obesity.

The BMI is used differently with children than it is with adults, however, because a child's weight is age- and gender-specific. Growth charts plotting BMI for children and teens from ages 2 through 20 have been published by the Centers for Disease Control and Prevention (CDC), with curves showing the percentiles of children at various BMIs (Figures 1a and 1b, pages 18 and 19). The BMI of every child or adolescent should be plotted on one of these charts to determine whether the patient is at risk for overweight.

Children or teens whose BMI-for-age is below the 5th percentile are regarded by the CDC as underweight, and those who are at or above the 95th percentile are defined as overweight. The CDC designates children and teens whose BMI-for-age is between the 85th and 95th percentile as being at risk for overweight; some pediatricians prefer to set the 80th percentile as the lower limit.

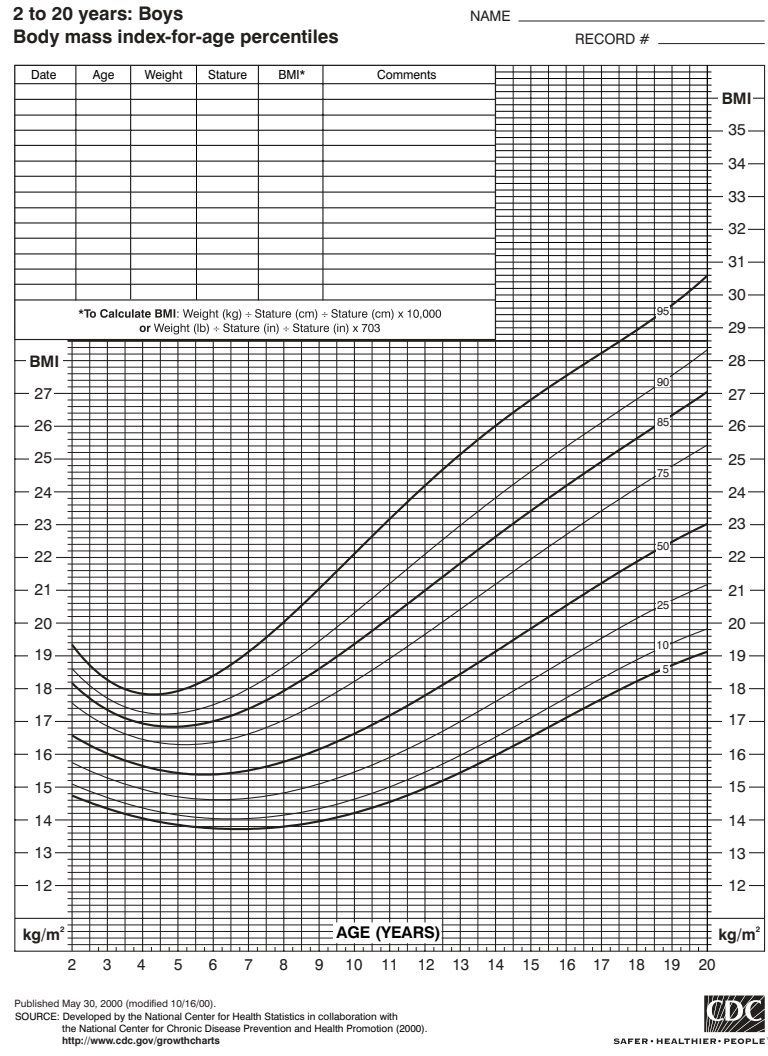
Using the CDC definitions, the most recent data from the National Health and Nutrition Examination Survey (NHANES) show that 31 percent of Americans age 6 to 19 are at or above the 85th percentile (i.e., at risk for becoming overweight or already overweight), including the 16 percent who are overweight (BMI-for-age ≥95th percentile) (Hedley 2004). Among children ages 2 to 5, 22.6 percent are at risk for overweight or are overweight, including 10.3 percent who are overweight. Probably

due to genetic or environmental factors or both, children of obese parents are at an increased risk of becoming obese adults (Whitaker 1997).

When parents are told that their child is overweight, they commonly react by invoking the possibility of a thyroid problem. A physician in fact may wish to check for hypothyroidism, but thyroid problems and related causes of obesity are far less common than exogenous obesity. Children who are overweight because of an endocrine problem (e.g., hypothyroidism, growth hormone deficiency) usually are short. If patients are above the 50th percentile for height for their age, seeking an endocrine cause of obesity probably is not warranted. If, however, a female patient has androgenic symptoms associated with overweight and irregular menses, she may have polycystic ovary syndrome.

A comprehensive workup for an overweight child would begin with a complete medical history, including medications. It is important to consider that the problem may stem from the role models in the patient's family, where obesity and nutritional issues may be present. These issues should not be pinned on one child but often can be traced to the environment in which that child lives.

FIGURE 1A CDC weight-for-age growth charts for boys 2–20 years of age

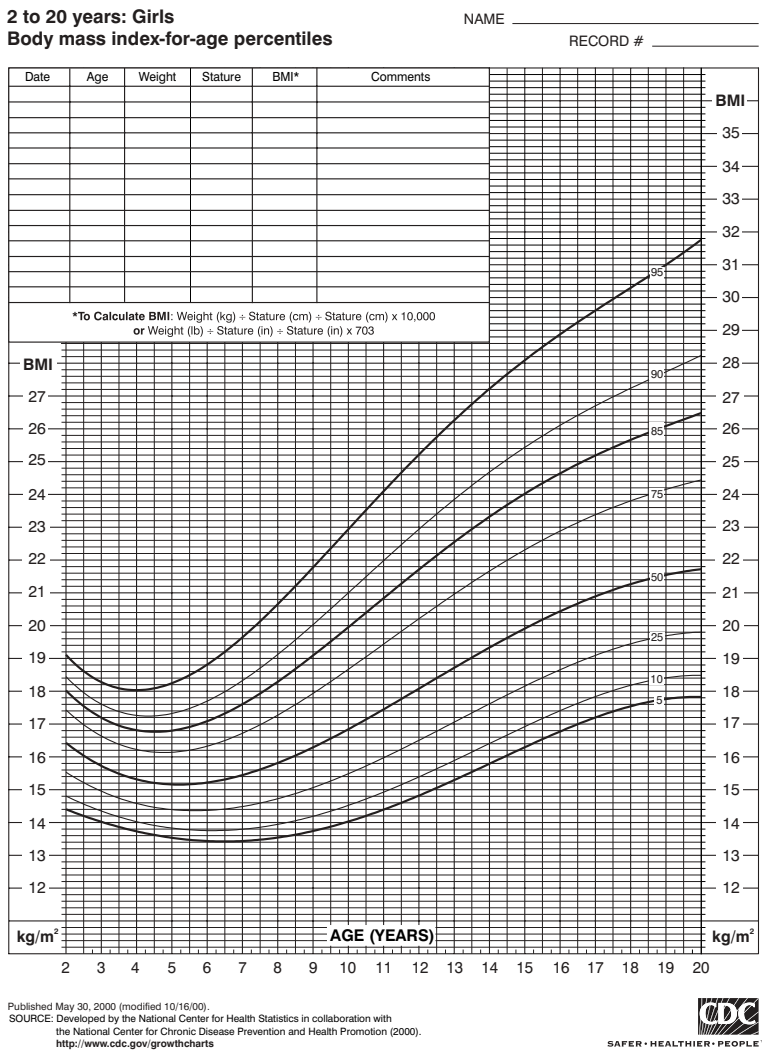


SOURCE: CENTERS FOR DISEASE CONTROL AND PREVENTION 2004

Many medications are associated with the onset of overweight, especially antipsychotics such as olanzapine or risperidone. During the physical examination the patient's height, weight, and BMI should be assessed, and the BMI should be plotted on a chart, as mentioned. A fasting lipid profile should be obtained, and glucose and insulin levels should be checked, along with standard blood counts and chemistries. If a patient appears dysmorphic or a secondary cause is suspected, additional testing may be required.

The primary dyslipidemias that are found in children are familial hypercholesterolemia (FH), familial combined hyperlipidemia (FCHL), and familial hypertriglyceridemia (FHTG). FH, a disorder of the LDL receptor, is characterized by elevated LDL cholesterol and total cholesterol but normal triglyceride levels. FCHL is distinguished by elevated triglyceride levels in the presence of moderately elevated total cholesterol and reduced HDL cholesterol. FHTG is characterized by elevated serum triglycerides in the presence of normal parameters for all other lipids. A 20-year prospective study has shown that the risk of death from cardiovascular disease is 70 percent higher in siblings and offspring in FCHL families, compared with spouse control subjects (P=.02) (Austin 2000). The risk was similar among siblings and offspring in FHTG families, but it did

FIGURE 1B CDC weight-for-age growth charts for girls 2–20 years of age



SOURCE: CENTERS FOR DISEASE CONTROL AND PREVENTION 2004

not reach statistical significance (*P*=.39). In FHTG families, however, baseline triglyceride levels predicted increased risk of cardiovascular disease mortality.

Attaining lifelong skills

The goals of treatment are to help patients attain skills for a lifetime of weight management. Instead of talking about diets, it is more helpful to discuss nutritional approaches. Patients need to understand how to monitor their eating patterns and level of physical activity. Patients also need social and emotional support, along with continued contact with the treatment team. If a patient who has been seen every month stops coming in for follow-up visits for 6 months, it is likely that the patient has gained weight and is afraid to come back. Thus, if a patient in a weight management program is not seen as often as expected, the clinician should initiate contact before the situation gets out of hand.

A realistic weight goal should be set for the patient, and this goal may vary from the patient's or the parents' expectations. For children and adolescents who are still growing, it may be a sign of progress if their weight just remains stable. The focus can be on maintaining the current weight instead of on losing weight, and the growing child eventually will grow into that weight.

Dietary treatment should begin with an assessment of current intake, which entails the compilation of detailed food records regarding the foods the patient eats, along with the patient's preferred and disliked foods, and the patient's eating habits — whether the patient eats at the table or in front of the television, or whether the patient is snacking, grazing, or binging.

Patients should be encouraged to replace foods that have high fat and sugar content with foods containing lesser amounts of fat and sugar. Toward this end, patients need to know the importance of reading food labels, because some foods that are marketed as being healthful actually may contain significant quantities of trans fats and sugar. In general, processed foods should be avoided whenever possible. When people buy groceries, they should shop the perimeter of the supermarket, where the produce, meats, and dairy products are located.

Patients also need to acquire skills for eating in restaurants. Through careful selection of menu items, it is possible to obtain a healthy meal even in fast-food restaurants.

Patients should also be warned to pay special attention to their fluid intake, because a person can easily ingest

1,000 calories a day just in juice and soda. Moreover, that kind of intake may not affect the satiety center, so it does not even register as food when a person is eating. Instead of drinking fruit juice, it is far better for those patients who are trying to manage their weight to *eat* the fruit.

Watching the traffic signals

Despite my general dislike of diets, I do favor the Stoplight Diet for Children, which places foods into three easily understood categories (Epstein 1988). The red light indicates foods that the patient should avoid — fast foods, pizza, pies, cakes, "low-fat" sweets, and juices. The yellow light marks foods to be eaten in moderation, such as starchy vegetables and breads. The green light points to foods that can be eaten without limit, including nonstarchy vegetables, skinless fowl, baked fish, fruits, and nonfat dairy products. Instead of requiring patients to count calories or control portions, this approach lets children eat in a healthy way.

Although the medical community has yet to reach a consensus relative to the value of low-carbohydrate diets, one study showed the benefits of a restricted carbohydrate diet for some adolescents with symptoms suggestive of the metabolic syndrome. In a 12-week, randomized controlled trial, there was greater weight loss among subjects who followed a low-carbohydrate diet than among those who followed a low-fat diet (9.9 kg vs. 4.1 kg). Additionally, the low-carbohydrate diet was associated with a substantial reduction in serum triglycerides (Sondike 2003).

Children also can be taught to modify their eating habits — eating more slowly — through a game for the whole family called "Put the Fork Down." The rules are simple: each diner puts down the fork (or the sandwich) between bites, and each person tries to catch someone who fails to take such a break between bites. The breaks slow down the pace of eating, enabling the brain to catch up to the stomach and produce a feeling of fullness without overeating.

Of course, children and adolescents should be encouraged to be more physically active. No weight loss program is successful without exercise. People do not have to join a gym; it can be beneficial just to engage in activities that are not even considered exercise, such as using some stairs instead of the elevator all the way to a destination or getting off the bus one stop early. Parents also should resist the temptation to have children excused from gym classes at school, if that is an option.

Properly employed, lifestyle changes like these should minimize any need for pharmacotherapy. Drug treatment for overweight tends to be a lifetime proposition because of the propensity of patients to regain weight once they go off a medication. Bariatric surgery is reserved for the most extreme cases, such as teenagers who have a BMI that is greater than 40 kg/m(2) and have sleep apnea that is life-threatening .

Disease processes such as coronary artery disease, the metabolic syndrome, and hypertension run in families. Targeting these families for lifestyle modification programs is a key to reducing obesity and, in turn, the comorbidities that are associated with it. Physicians have an obligation to discuss the hereditary nature of such diseases. This will lead to more well-informed adults, with respect to their own eating habits and the extent of their influence on the eating habits of their children.

In summary, physicians need to identify children and adolescents who are at risk for overweight or are overweight and provide appropriate intervention to prevent short- and long-term negative consequences of overweight and obesity. A comprehensive approach to weight management that involves the whole family is likely to provide the greatest benefit.

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Congestive Heart Failure: Medical Management Programs That Work

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Congestive heart failure (CHF) is increasing in prevalence (Kannel 1987), and treatment modalities for individual patients and CHF disease management (DM) programs that reach large populations affected by the disease are improving constantly. Most patients with CHF have serious comorbidities (Berenson 2003). Under those conditions, which therapies are optimal? What support system is designed ideally to ensure that effective therapies reach all those who need it? This article specifically deals with the topic of CHF DM and the configuration of successful DM programs. Additionally, this article draws on the CHF-DM model to examine the strengths and limitations of the traditional outpatient delivery system, as compared to the DM model, to drive optimal outcomes, and it explores the opportunities for effective collaboration between the two.

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Disease management is at a crossroads. How it becomes an integral component of the health care delivery system will depend, in large part, on how well it integrates with ambulatory medical practices. On the other hand, the current outpatient delivery system, which is devoted to caring for chronically ill patients — especially primary care — is also at a crossroads. Its physical plant, technological infrastructure, staffing, and economic basis have become increasingly inefficient and out of phase with the needs of patients with multiple diseases. How the primary care system redesigns itself to face the overwhelming service demands of a generation of baby boomers coming of age, the growing complexities of medical treatment, few prospects for better reimbursement from private or public payers, and many other pressures will determine its effectiveness and viability.

Two functions are central to meeting the needs of patients with CHF (and other chronic conditions); the first is the role and capacity of the primary care delivery system to manage all its medical decisions and care coordination across multiple specialists. The second hinges on the DM resources that are available to patients to help them to better understand their disease and to improve adherence to treatment recommendations. A successful linkage between these two interrelated functions represents patients' best chance to receive good care coordination and improved CHF outcomes.

The primary care setting

Without focused and decisive action, primary care may represent an endangered specialty. The primary care setting is operating at capacity, but market incentives for growth are lacking. The supply of primary care physicians is on the decline. From 2002 to 2003, there was a 6 percent decrease in the number of medical graduates applying to primary care specialties through the National Residency Matching Program and a 44 percent decline in the past 4 years. This year saw a small respite in this trend in internal medicine. Additionally, the average educational debt of a graduating medical student is between $118,000 and $125,000, but his/her annual earning potential during the debt repayment period and beyond is in the $150,000 to $175,000 range — with the prospect of a much higher income if one seeks a career as a specialist. Professional satisfaction in primary care has eroded, balancing family and work demands is increasingly difficult, and overall professional stature compared to specialists is poor. All these factors make primary care a less attractive area of focus.

Nonetheless, primary care is the system-designated locus of care coordination for patients with chronic conditions. Any attempt to track the number of contact points between the primary care physician and specialists, payers, patients, labs, pharmacies, hospitals, and home health care providers quickly turns the requisite

paperwork that is associated with those relationships into a frustrating exercise. A graphic mapping of these encounters looks like a confused, unmanageable jumble that lacks the necessary data, information management, advanced communication technology, decision-support tools, staffing, or reimbursement — rather than a logical, adequately resourced, safe system. Under these circumstances, it is not surprising that practice overhead continues to run in the 50 to 60 percent range, as it was 20 years ago. This translates into a unique failure of the current reimbursement system to stimulate physician practices to incorporate technology and innovative management strategies to lower production costs, as so many other industries have done.

The implications are that primary care practices are in desperate need of revitalization and that patients who are chronically ill, along with payers and policy makers, should have a keen interest in seeing it happen. Yet most practices lack the financial reserves to modernize. Even if capital was available, there are no clear prospects indicating that physicians would recoup their investment through higher reimbursement from payers. Other challenges, even more daunting, also stand in the way of modernization — most notably an entrenched professional culture clinging stubbornly to traditional ways. Nevertheless, questions regarding office redesign now are being explored by the American Academy of Family Physicians and the Institute for Health Care Improvement, among others.

Architecture of care and DM

If the current system is not working, the question that emerges is, can DM and medical practices collaborate to accelerate the transformation necessary to meet the needs of complex patients sooner, while strengthening the vitality of the two organizations? This question could be explored by asking: What would a brand new clinic look like if a physician opened a new primary care medical practice today? What resources and technology would the physician want? What practice-wide operational attributes would be highly desirable? The list undoubtedly would be a long one but is likely to include the following:

- Identify all patients with a given condition such as CHF with a single push of a button (population-identification process)
- Make decisions supported by medical evidence (evidence-based practice guidelines)
- Collaborate fully with all members of the care team and with other physicians caring for the patient
- Impart patients with state-of-the-art self-management education and have a surveillance system in place to allow early intervention if problems arise between office visits
- Track processes and outcomes measurement, and evaluate practice patterns and improve them as needed
- Obtain aggregate reports routinely, and establish feedback loops among all stakeholders in the care process

This wish-list could be granted immediately through collaboration with full scope DM programs, because they already are deployed in most locations around the country. Physician practices and DM programs are only loosely connected, however. The reasons for this lack of coordination are complex, but three key factors are the lack of a receptive organization (technology, staffing, and clinician role definition) in the physician office, the association of DM with managed care early on (which raised concerns about unnecessary interference with patient care), and the absence of a business case for physicians in the equation.

It is not difficult to understand why DM found fertile ground for growth under managed care. Health plans focused initially on specific disease states, because a target population could be identified easily through claims queries and because DM programs could drive behavior modification in patients and — to a lesser extent — in physicians who saved money and improved the quality of care. Health plans have focused on asthma and diabetes as conditions with sizable populations and for which intervention is truly possible. CHF also fits this model and has been aggressively addressed by the managed care industry through DM.

Congestive heart failure

CHF is relevant to health plans because intervention has short-term return-on-investment (ROI) benefits pertaining to both cost and quality. This is due to the fact that the decompensation-recovery cycles are relatively short and the program can intervene successfully (e.g., lowering hospital admissions) (Rich 1999). Short-term returns are especially attractive to employers with high employee turnover rates.

Nevertheless, long-term benefits should be most attractive to health plans, and especially to Medicare, because CHF is so widespread — affecting between 6 and 10 percent of beneficiaries. According to the American Heart Association, CHF is associated with readmission in unmanaged populations in about 45 percent of cases, with high mortality rates — 70 and 80 percent for women and men, respectively, at 8 years and 20 percent for both men and women within 1 year.

Finally, Medicare expenditure that is associated with CHF is estimated to be $60.9 billion per year (Foote 2003). Making matters worse, the prevalence of the disease in the future is likely to rise, because, increasingly, people with acute heart attacks tend to survive, only to

re-enter the system later in life when they are diagnosed with CHF.

These facts compelled Congress to introduce a bold new Medicare initiative: Section 721 of the Medicare Modernization Act of 2003 mandated phased-in DM for patients with chronic diseases (DMAA 2003) — including CHF, diabetes, and chronic obstructive pulmonary disease — and earmarked $100 million to the Centers for Medicare and Medicaid Services to help accomplish that goal.

Interventions that work

CHF has been one of the most successful examples of DM. First, pharmacotherapy clearly is extremely effective for this disease. At least five clinical trials have shown that agents such as ramipril and captopril result in reductions in hospital admissions (Table 1).

Telephonic approaches also are highly attractive, because they can be scaled and because — by leveraging the technology — the unit costs of dispensing care between office visits become appealing. Nonetheless, this approach must be carried out correctly. It is not simply a matter of making a phone call. As Figure 1 shows, 7.5 calls lasting 5.7 minutes had no impact, whereas 13.6 calls during 6 months or 16 hours of telephonic intervention during 6 months do result in either lower admissions or bed days and decreased costs (Riegel 2002). Comprehensive telephonic case management results in superior reductions in hospital admissions compared with pharmacotherapy alone.

Underlying all this is the need to take this opportunity to examine how the delivery system can be transformed effectively. Although CHF is just one disease state, it provides a genuine chance to approach DM again and address inefficiencies in the system.

Missing link

The general discussion of DM and what does and does not work leads naturally to a discussion of how best to transform the outpatient delivery system to ensure that the interventions are successful. The problem with most DM programs is that the program elements and physician practices simply have failed to link to one another. The explicit intent of managed care organizations and DM vendors for DM programs always has been to connect with physician practices, but that is not occurring as rapidly as planned.

For appropriate integration to occur, the anatomy of a regular office visit needs to be reevaluated. Certainly, the compressed amount of time allowed for office visits for patients with multiple chronic conditions is insufficient, making it impossible to accomplish all that is needed — conversation with the patient, physical exam-

TABLE 1 Effective interventions for congestive heart failure

Pharmacotherapy reduces hospitalizations from 12 percent to 35 percent

Drug	Reduction in admissions (%)	Trial	References
Ramipril	12	HOPE	*NEJM.* 2000;342:145–153
Captopril	22	SAVE	*J Am Coll Cardiol.* 1995;26:914–919
Digoxin	23	DOG	*NEJM.* 1997;336:525–533
Bisoprolol	32	CIBIS II	*Lancet.* 1999;353:9–13
Spironolactone	35	RALES	*NEJM.* 1999;341:709–717

SOURCE: RIEGEL 2002

FIGURE 1 Effective telephonic interventions

Results of five congestive heart failure studies suggest that intensity/duration matter

Frequency or intensity of telephonic interventions	Admissions/ days	ER use	Office visit	Cost	References
8 calls in 2 years			–19%		*JAMA.* 1992;267:1788–1793
13.6 calls in 6 months	–87%	–67%	–31%		*Am J Cardiol.* 1997;79:58–63
16 hours in 6 months	–26%	NC	NC	($1,000)	*Arch Intern Med.* 2002;162:705–712
7.5 calls lasting 5.7 minutes	NC				*Eur Heart J.* 1998;19:1254–1260
1 call postdischarge	+14%				*NEJM.* 1996;334:1441–1447

ER=emergency room, NC=no change

SOURCE: RIEGEL 2002

ination, patient education, and charting. Also, while an internist might make every good effort, the ability to coordinate care often fails due to the lack of a suitable infrastructure. As a result, instead of acting as a true coordinator of care, many physicians find that they cannot go beyond providing basic primary care, and thus they function most often as referral sources.

Given the number of patients that primary care physicians see; the number of specialists with whom they must work; the varied payers having differing rules with whom they interact; and the many pharmacies, home health agencies, hospitals, durable medical equipment companies, and others with whom they also are in contact, it is clear that this is a rudderless system in crisis. It is imperative to meet the service needs of chronically ill patients; to do so, the system needs to relieve primary care of some of its burden.

DM was supposed to assist in this process. When DM emerged from within MCOs, it was because the plans had the needed data with respect to claims, eligibility, provider files, pharmacy, labs, etc. The health plans are able to run queries regarding specific patients and con-

DM Lit Finder

The Disease Management Association of America (DMAA) offers its members the use of a research tool called DM Lit Finder. This tool was developed to look for often hard-to-find outcomes of DM. It focuses exclusively on DM; one can conduct a search relevant to a disease state, such as CHF, and find cost and utilization reports or patient health care interventions. Other information that can be accessed includes programs or trials that were sponsored by academic institutions, the federal government, pharmaceutical companies, or managed care organizations.

In this case, CHF was entered into the database, resulting in 494 titles that showed 22 peer-reviewed studies. Four were nonrandomized with a control, seven were clinical trials, and 11 were pre- or postquasiexperimental studies. (See example of a DM Lit Finder, below.)

In most of these cases, the interventions took place in person in the outpatient setting. In one case, it was remote; in two cases it was mixed.

All these studies showed a decrease in CHF readmissions; one, however, showed a decreasing number of visits (one increased visits, and two did not change). Seven studies demonstrated a decrease in hospital length of stay, and nine studies showed a decrease in general hospital admissions.

DMAA Disease Management Association of America
DM LitFinder™

Utilization and Cost Report

HEALTH & TECHNOLOGY VECTOR • INC.

Disease: *CHF* ID: *167*
Authors: Rich MW, Beckham V, Wittenberg C, Leven CL, et al.
Title: A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure.
Journal: New England Journal of Medicine Date: 11/2/1995
Citation #: 7565975 Pages: 333 (18): 1190-5

Sponsor(s)	Care Provider(s)
Jewish Hospital at Washington University	Dietician
NHLBI	Nurse
	Physician

Study Objective Narrative:
To determine if a multidisciplinary approach to treatment could reduce the rate of readmission for high risk elderly patients.

Study Findings Narrative:
The principal effect of the intervention was to reduce the rate of readmission due to recurrent heart failure – this rate declined by 56.2%. Due to the multidisciplinary nature of the intervention, it is not clear which elements were most relevant in decreasing readmissions.

Utilization

Outcome	*Result*	*Statistical Significance*
Readmissions	Decrease	Statistically Significant

Inpatient Cost:	N/A	Outpatient Cost:	N/A	Total Cost:	N/A
Inpatient Cost Result:	Decrease	Outpatient Cost Result:	N/A	Total Cost Result:	Decrease
Inpatient Cost Significance:	Unknown	Outpatient Cost Significance:	N/A	Total Cost Significance:	Unknown

Eligible:	1306	Enrollment:	282	Final:	282
Study Duration:	Short-term (< 6 Mths)	Severity Description:			
Study Sites:	Single	Physician Guidelines:	No		
Study Methodology:	Experimental: Randomized Controlled Trial	Physician Collab:	Yes		
Pop Identified:	Referral (professional)	Severity Stratified:	No		
Severity Stratified:					
Practice Guidelines:					

ditions and identify at-risk patients with a fair degree of accuracy; now, these members even can be stratified through predictive models.

The plans also were able to leverage economies of scale, centralize massive amounts of data on servers accessible to care coordination centers, and ensure that information was collected in a consistent manner.

The discipline of DM grew to become outsourced by more and more MCOs during the 1990s, thus allowing plans to increase their clinical offerings without making major capital investments. So, the original intent was that there would be a strong connection with the practicing physician either within the MCO or the DM company.

Currently, payers are contracting with DM companies and giving them data. The relaying of critical information between the physician and patients was supposed to occur in the physician's office, but the office work processes, technology, and staffing are not suitable to receive and process the large amount of information coming from DM companies. As a result, DM companies largely bypassed the office and went directly to the patients via call centers. Upward of 5 million people are actively involved in some of the larger outsourced DM programs. The conditions, therefore, are ripe for connecting physicians and DM programs to promote stronger care coordination. Physicians could use the DM infrastructure without the need for additional investment, and DM companies could enhance their own effectiveness by achieving more direct involvement from physicians.

Silo DM evolves

Most DM companies started out as silo organizations, focusing on (and, in many cases, being named for) a specific disease state. Quickly, though, the MCOs demanded that DM companies integrate their services, putting the DM companies at risk for the totality of the patient claim experience. This quickly led DM companies to acquire complementary competencies in comorbid conditions that cluster in the same patients. It is understandable, therefore, how DM companies expanded their portfolio of services and expertise and developed a nearly ideal technological and clinical infrastructure to support a patient-centric coordinated care system.

As DM companies expanded their clinical capabilities and technical infrastructure, their ability to support interspecialty coordination also grew. The integration of multiple clinical guidelines from separate professional organizations (e.g., American Diabetes Association, American Heart Association, American College of Cardiology) onto a single computer-based decision support system created "metaguidelines" (Villagra 2004), which represent a higher order of instruction to guide complex patient care.

Metaguidelines, in their early forms, account for the reciprocal modifications imposed by one guideline onto another. Primary care physicians mentally execute similar metaguidelines every time they synthesize multiple recommendations for a single patient. Yet the lack of a means for constantly upgrading the contents of various guidelines and working through their synergies and contradictory recommendations makes such guidelines subject to inconsistencies. Metaguidelines go beyond simple disease-specific recommendations, but they do not exist as written instructions to clinicians. Most likely, they will emerge from DM organizations in the form of software.

Physician perceptions of DM programs

In trying to uncover the physician perceptions of DM, Fernandez and Grumbach surveyed primary care physicians in California's 13 largest counties (Fernandez 2001). Of 178 primary care physicians who had direct experience with DM programs, 75 percent believed that the program had a positive effect on the overall and disease-specific quality of care. Furthermore, 91 percent of these primary care physicians felt that the program had no effect on their income, and 38 percent reported that the program decreased their workload. Practice satisfaction increased among 48 percent of respondents.

Other than Fernandez's peer-reviewed article, there are only anecdotal accounts of physicians' perceptions of DM programs. Professional organizations, such as the American Heart Association, have issued position statements about DM that generally endorse the model and outline various conditions for successful programs (Faxon 2004).

Locus of care, an opportunity

As DM moves forward, expanding its role in medical management beyond managed care and into the fee-for-service environment, another question emerges: what is the ideal locus of care for complex medical management? In the absence of clear answers to that question, an unspoken competition among providers (more generally, the delivery system), the MCO, and the DM organization may ensue.

With the withdrawal of utilization management from managed care, the locus of care is defaulting to the delivery system and, increasingly, to consumers. This trend is returning the responsibility for medical decisions to its traditional home, the patient-physician relationship. Historically, consumers have identified physicians and nurses at the top of the "trust chain" for medical decisions, with MCOs and insurance companies near the bottom.

Given this historical identification of the delivery system as the locus of medical management expertise, it would be logical for DM programs to align their operations more closely with physician offices rather than with payers. If the patient is contacted by the physician's

office, there is a much greater likelihood that the patient will answer the phone and become engaged in the process. This naturally would capitalize on patients' trust of their physicians. In addition, the benefits of the DM programs would accrue to physicians, thus enhancing their competitiveness and overall quality of service.

Perhaps, then, we should be looking at a new system in which the responsibility and the revenues from DM are shared between the DM organization and the physician. The MCO that traditionally has sponsored the DM program would have to recalibrate its aspirations of attaining "brand equity" through the DM program offered directly to consumers and begin to build collaborative relationships with the provider community. The medical cost savings realized by having the physicians more closely involved in the DM program would accrue to the insurance company or the self-insured employer.

The ultimate DM opportunity, then, is to create a platform for collaborative relationships between MCOs and physician groups or individual physicians. Physician practices, especially small practices, should be interested in such a collaboration, because independently they would not have to make the capital investment required to modernize their practices. They could be linked with all resources available to improve their clinical and financial performance.

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CONTINUING EDUCATION POST-TEST

Managing the Spectrum of Cardiovascular Care

On the combined answer sheet/evaluation form on page 29, please place an X through the box of the letter corresponding with the correct response for each question. There is only ONE correct answer to each question.

1. A person with a dysfunctional variant of the CYP2D6 gene might be at high risk for:
a. Hypertension.
b. An adverse drug reaction.
c. Arrhythmia.
d. Cystic fibrosis.

2. What percentage of DNA base pairs differ between two unrelated people?
a. 0.01 percent.
b. 0.1 percent.
c. 1.0 percent.
d. 10.0 percent.

3. Although the T235 variant of the angiotensinogen gene occurs with similar frequency in rural Nigerian and African-American populations, the rate of hypertension is _____.
a. Higher in rural Nigerian populations than in African American populations.
b. Higher in African-American populations than in rural Nigerian populations.
c. Approximately the same in each population.
d. Unknown.

4. When the genetic component behind risk for a disease or response to a drug is known, the most accurate way to assess an individual's risk or likely response is through _____.
a. Determination of the patient's race.
b. Individualized genetic analysis.
c. Detailed family history.
d. U.S. Census records.

5. Patients who are overweight or obese invariably will be found to have the metabolic syndrome.
a. True.
b. False.

6. Fibrates are agonists of _____.
a. PPAR-alpha.
b. PPAR-beta.
c. PPAR-gamma.
d. PPAR-delta.

7. Normal-weight men with low fitness are more likely to die from cardiovascular disease or any cause than are obese men who are not unfit.
a. True.
b. False.

8. Which of the following is the foundation of therapy for patients with metabolic syndrome?
a. Fibrates.
b. Lifestyle changes.
c. Niacin.
d. Statins.

9. In routine clinical practice, the best method for determining whether a child or adolescent is overweight is _____.
a. Body mass index.
b. Electrical bioimpedance.
c. Visual test.
d. Visual test plus body mass index.
e. Water submersion.

10. Children who are overweight should be encouraged to drink more fruit juice.
a. True.
b. False.

11. A child who is overweight because of an endocrine problem most likely will be _____.
a. Short.
b. Tall.
c. Sedentary.
d. Hyperactive.

12. Familial hypertriglyceridemia is characterized by _____.
a. Elevated LDL-c and total cholesterol but normal triglyceride levels.
b. Elevated triglycerides in the presence of normal parameters for all other lipids.
c. Elevated triglyceride levels in the presence of moderately elevated total cholesterol and reduced HDL-c.
d. Elevated triglycerides, elevated LDL-c, and reduced HDL-c.

CONTINUING EDUCATION POST-TEST, continued

Managing the Spectrum of Cardiovascular Care

13. According to Villagra, which of the following operational attributes would accelerate changes needed to meet patient needs better?
a. Instituting a population identification process.
b. Making medical decisions using evidence-based practice guidelines.
c. Collaborating among members of the care team.
d. Offering patients state-of-the-art self-management education.
e. All the above.

14. Limited coordination between disease management (DM) programs and physician practices can be traced to _____.
a. The receptive organization in physicians' offices.
b. The early association of DM with managed care.
c. The business case for physicians in the equation.
d. None of the above.

15. Congestive health failure (CHF) is relevant to health plans because intervention has short-term return-on-investment benefits that pertain to cost and quality, and long-term benefits command their attention because CHF is so widespread.
a. True.
b. False.

16. According to Villagra, it is imperative to meet the service needs of chronically ill patients and, to do so, the system needs to relieve _____ of some of the burden that is being carried.
a. Disease management.
b. Pharmacy benefit providers.
c. Managed care organizations.
d. Primary care.

17. Integrated Healthcare Association (IHA) represents:
a. A quality-incentive program.
b. A collaborative effort to promote improved clinical processes and outcomes.
c. An attempt to better patient experience.
d. An effort to encourage adoption of new information technology.
e. All the above.

18. A fundamental principle of IHA is that the project uses a balanced set of metrics and audited administrative data to ensure accuracy in reporting.
a. True.
b. False.

19. Which of the following statements is false?
a. The IHA Pay for Performance program uses highly varied approaches in evaluating a physician organization's performance.
b. Stakeholders in the IHA Pay for Performance program believe that the health care industry must begin rectifying the industry's problems before the government begins to address rapidly rising health care costs.
c. The stated goal of the IHA Pay for Performance program is to create a compelling set of incentives that will drive breakthrough improvements in clinical quality and patient satisfaction.
d. All the above.
e. None of the above.

20. Among IHA stakeholders, the "Darwinians" adhere to a strategy that sets the performance bar:
a. High, and performance thresholds gradually ease over time.
b. At an easily attainable level, and thresholds decrease over time.
c. Low, and breakthroughs occur as a natural evolutionary process.
d. High, and performance thresholds become increasingly difficult over time.

CONTINUING EDUCATION ANSWER SHEET/CERTIFICATE REQUEST

Managing the Spectrum of Cardiovascular Care

CE Credit for Physicians/Pharmacists

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I certify that I have completed this educational activity and post-test and claim (please check one)
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Physicians — This activity is designated for a maximum of 2.0 category 1 credits toward AMA Physician's Recognition Award.

Pharmacists — This activity is approved for 2.0 contact hours (0.2 CEU).

ACPE Universal Program Number (UPN): 812-000-04-018-H04
Release date: Oct. 15, 2004
Expiration date: Oct. 15, 2005

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Credit will be awarded upon successful completion of assessment questions (70 percent or better) and completion of program evaluation. If a score of 70 percent or better is not achieved, no credit will be awarded and the registrant will be notified.

Please allow up to 6 weeks for processing.

EXAMINATION: Place an X through the box of the letter that represents the best answer to each question on pages 27 and 28. There is only ONE answer per question. Place all answers on this form:

	A.	B.	C.	D.	E.
1.	☐	☐	☐	☐	
2.	☐	☐	☐	☐	
3.	☐	☐	☐	☐	
4.	☐	☐	☐	☐	
5.	☐	☐			
6.	☐	☐	☐	☐	
7.	☐	☐			
8.	☐	☐	☐	☐	
9.	☐	☐	☐	☐	☐
10.	☐	☐			
11.	☐	☐	☐	☐	
12.	☐	☐	☐	☐	
13.	☐	☐	☐	☐	☐
14.	☐	☐	☐	☐	
15.	☐	☐			
16.	☐	☐	☐	☐	
17.	☐	☐	☐	☐	☐
18.	☐	☐			
19.	☐	☐	☐	☐	☐
20.	☐	☐	☐	☐	

PROGRAM EVALUATION
So that we may assess the value of this self-study program, we ask that you please fill out this evaluation form.

Have the activity's objectives been met?

1. Establish the components of a successful disease management program for congestive heart failure and how those components may work best with the traditional outpatient delivery system ☐ Yes ☐ No

2. Develop an understanding of the strengths and limitations of the current outpatient delivery system and of the changes that should be considered to drive optimal outcomes ☐ Yes ☐ No

3. Illustrate how purchasers are collaborating with multiple constituents to develop an incentive program that uses measurable quality performance standards ☐ Yes ☐ No

4. Highlight how a "pay for performance" program obtains participation by rewarding both relative performance and the improvement of physician organizations ☐ Yes ☐ No

5. Understand how dysfunctional fat cells may contribute to development of the metabolic syndrome in some patients ☐ Yes ☐ No

6. Describe first-line therapy for the metabolic syndrome ☐ Yes ☐ No

7. Recognize why race is thought to be a crude predictor of clinical factors ☐ Yes ☐ No

8. Cite evidence supporting the belief that genetic variation is shared among all human populations ☐ Yes ☐ No

9. Explain the general strategies for helping overweight children and adolescents acquire skills for long-term weight management ☐ Yes ☐ No

10. Know the simplest method for clinical identification of children likely to benefit from intervention for overweight/obesity ☐ Yes ☐ No

Was this publication fair, balanced, and free of commercial bias? ☐ Yes ☐ No

If no, please explain: _____

Did this educational activity meet my needs, contribute to my personal effectiveness, and improve my ability to:

Strongly agree — *Strongly disagree*

Treat/manage patients?
5 4 3 2 1 N/A
Communicate with patients?
5 4 3 2 1 N/A
Manage my medical practice?
5 4 3 2 1 N/A
Other _____
5 4 3 2 1 N/A

Effectiveness of this method of presentation:

Excellent	*Very good*	*Good*	*Fair*	*Poor*
5	4	3	2	1

Time spent reading this publication:
Hours _____ Minutes _____

What other topics would you like to see addressed? _____

Comments: _____