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According to the National Vital Statistics Report 2000, seven of the 10 leading causes of death in the U.S. are chronic diseases: heart disease, cancer, stroke, chronic lower respiratory tract disease, unintentional injury, diabetes, and Alzheimer's disease. These diseases share four root causes—physical inactivity, poor nutrition, smoking, and hazardous drinking (Jordan, et al., *Medicina* (Kaunas) 44(10), 2008). There is strong evidence that even a modest intervention that lowers each of these risk factors can help reduce the prevalence of chronic diseases.

Clearly, the health care community needs to speed up interventions aimed at reducing these risk factors. But to do so, it will also need to address the following challenges:

Behavior. Chronic diseases result from behavioral choices. While individuals understand that risk factors contribute to chronic diseases, market research indicates they aren't moved to take preventive measures. Most people don't consider themselves at risk until they are older.

Risk factors. These four root causes of ill health are pervasive across the U.S. Any solutions to influence healthier lifestyles that reduce these risks must have a broad reach and must be affordable and feasible.

Health care system. Our medical system focuses more

Battling the Big Four of chronic disease

The culprits: inactivity, poor nutrition, smoking, and hazardous drinking

Melissa Marshall, MBA

on treating chronic diseases in their later stages than on preventing them. Our medical system also lacks sufficient reimbursement or payment to support preventive care.

As a result, physicians don't have the time and resources to educate or motivate at-risk individuals to adopt healthier lifestyles.

Community support. Employers and other groups are offering healthy lifestyle choices and creating environments that help reduce chronic diseases. However, only about 40 percent to 50 percent of employees use preventive service benefits, and employers report they are unsure of where to focus their efforts.

Searching for solutions

In 2007, the Institute for Clinical Systems Improvement (ICSI) set out to tackle chronic diseases in a new fashion. ICSI is an independent organization that brings together medical groups, hospitals, health plans, employers, and consumers to create patient-centered, value-driven health care solutions. In its 16-year history, ICSI has

developed more than 50 evidence-based guidelines for preventing, diagnosing, treating, and managing a wide range of health conditions.

To develop a guideline for the primary prevention of chronic disease risk factors, ICSI acknowledged that medical groups alone could not effect lifestyle changes. Community networks, physical and social environments, and public policy must also play a role.

ICSI brought together medical groups, the Minnesota Department of Health, and employers to develop its guideline. In preparation, feedback from focus groups made up of providers, employers, and patients was presented to the guideline work group. An extensive review of the literature on chronic disease revealed that health risk assessments (HRAs), tailored face-to-face counseling, phone counseling, and timely, computerized feedback all contribute to changing behaviors and improving patient outcomes (see Fig. 1).

The guideline may be downloaded from the ICSI

Web site at www.ICSI.org (go to Guidelines & More: Preventive & Health Maintenance Guidelines).

The guideline aims to improve coordination and integration among the health care system, employers, community-based groups, and patients to support a healthier lifestyle in adults. It also supports creating a patient-centered health care delivery system that collaborates with external stakeholders.

The work group determined that using pre-existing networks is an efficient way to reach many individuals. The guideline calls for providers to establish a relationship with community resources, and for employers to promote annual HRAs for their employees. HRAs are standardized surveys that can measure an individual's changes in attitudes, skills, and behaviors, as well as health status, likely need for health care services, and readiness to change habits. An HRA can heighten an individual's awareness of risk factors and provide appropriate advice on how to decrease them. If HRA results are shared and discussed by the individual and his or her physician, communication about interventions can improve identified risks. Therefore, another key objective of the guideline is to increase the percentage of patients whose HRAs are updated each year and integrated into the patient's medical record.

Additional aims of the guideline include increasing the number of individuals whose medical records indicate that they have been given information about healthy lifestyle behaviors, and asking patients to report back on their follow-through with recommended interventions. A final goal is to develop relationships with the community that foster education and resources around healthier lifestyles.

All of these goals require a redesign of the current health care system and a different type and level of interaction between health care professionals and the community. Individual providers, for example, should encourage patients to use community resources more effectively and should publicly support new, evidence-based interventions to change the physical and social environment. Employers can positively affect the health and well-being of employees through coordinated HRA and health education programs.

Elements of a changed health care system

A health care system redesigned for results and for productive interactions between patients and providers includes:

- Systems to provide timely clinical information and feedback to patients.
- Decision-support systems such as evidence-based guidelines and protocols and specialist expertise integrated into primary care.
- A delivery system that includes multidisciplinary teams and partnerships, use of proactive planned strategies, and systematic follow-up.
- Support of a patient-centered, collaborative process between patient and provider, along with tailored education and psychosocial support.
- Community resources for the maintenance of healthy lifestyles that include measur-

able goals, benefits to individuals, incentives to providers, visible support from senior leadership, and improvement strategies that drive comprehensive system change.

To help individuals successfully adopt healthier behaviors, the ICSI guideline recommends they be provided with self-management support. This can take the form of standardized assessments of their knowledge, skill, confidence, and supports to overcome any barriers; an emphasis on the individual's active and central role in changing behavior; and/or collaborative care planning. Collaborative decision-making and brief, combined interventions are effective in helping motivate and engage patients in healthier lifestyles.

One of the important aspects of successful behavioral change is creating a social and physical environment that

reinforces the intervention.


Improving quality of life

Health care delivery systems should be designed and organized, based on best evidence, to support already motivated and activated individuals, and to effectively collaborate with other stakeholders. Nearly all individuals could benefit from healthier lifestyles and assistance in behavior change.

There is tremendous potential to save lives and improve life quality for countless individuals if these types of guidelines are followed. Annual deaths attributed to the four root risk factors break down roughly as 400,000 for smoking; 300,000 split between physical inactivity and poor diet; and 100,000 for alcohol overuse. If current technology and use of clinical evidence could reduce smoking by 40 percent, and poor diet, physical inactivity, and hazardous

drinking by 5 percent, the combined reduction would be 180,000 deaths a year.

There would also be cost savings for the patient and to health care. The American Journal of Preventive Medicine concluded from several studies that successful interventions yield a return of \$3 to \$6 on each dollar invested over a period of two to five years.

These findings suggest that community-wide initiatives to prevent the development of risk factors for chronic disease could significantly improve the health of Americans. 

Melissa Marshall, MBA, is an ICSI facilitator who focuses on prevention and health maintenance. Clinical researchers **Thomas Kottke, MD**, HealthPartners Medical Group, and **Courtney Jordan, MD**, University of Minnesota, contributed to the concepts of this article.

FIGURE 1. Summary of the four risk factors for chronic diseases.

Risk factor	Statistics	Resulting diseases	Example of an evidence-based solution and its impact
Physical inactivity	The Centers for Disease Control (CDC) says 50 percent of U.S. adults don't engage in physical activity at recommended levels, and that nearly 25 percent of the U.S. population is completely sedentary.	Cardiovascular disease High blood pressure High cholesterol Type 2 diabetes Obesity Constipation Some cancers	A study reported on in JAMA found that pedometer users increased physical activity by 27 percent over baseline, decreasing body mass index by 0.38 and significantly reducing systolic blood pressure by 3.8 mm Hg.
Nutrition	JAMA reports that poor diets continue to increase rapidly as actual causes of death.	Cardiovascular disease High blood pressure Type 2 diabetes Obesity Osteoporosis Constipation Diverticular disease Iron-deficiency anemia Oral disease Malnutrition Some cancers	A study reported on in the Journal of Nutrition noted that adoption of desirable dietary behaviors (increase in fruit and vegetable consumption by 0.6 servings/day and a corresponding 7.3 percent decrease in calories from fat) lowered mortality rates in men and women by 16 percent and 9 percent, respectively.
Smoking	The CDC says smoking accounts for 20 percent of deaths (400,000) each year in the U.S. JAMA reports more deaths are caused each year by tobacco use than by human immunodeficiency virus (HIV), illegal drug use, alcohol use, motor vehicle injuries, suicides, and murders combined.	Based on 2004 U.S. Surgeon General's Report: Abdominal aortic aneurysm Acute myeloid leukemia Cataracts Pneumonia Periodontitis Cancers Lung diseases Coronary heart and cardiovascular disease	A U.S. Public Health Service report indicates there is a strong dose-response relationship between the intensity of tobacco dependence intervention and its effectiveness. Pharmacotherapy and treatments involving person-to-person contact (via individual, group, or proactive telephone counseling) are very effective.
Alcohol	According to the CDC, excessive alcohol use is the third leading lifestyle-related cause of death for people in the U.S. each year.	Liver disease High blood pressure Cardiovascular disease	Brief intervention at a primary care facility resulted in four fewer drinks per week at six and 12 months, according to a report in the Archives of Internal Medicine.