

Preventive Health: Time for Change

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It is time to make a decision. Which will be our health promotion strategy—primary prevention or secondary prevention?

Traditionally, the only one available to us was secondary prevention. Medicine consisted of a one-on-one physician-patient relationship, and taking care of patients meant minimizing the impact of any diseases the patient had. We did not have the time or tools to do anything else. More recently, we have been able to reduce a patient's mortality by 20 to 30 percent by treating heart disease with a statin or beta blocker. These two medications have had the most dramatic effects in secondary prevention.

But now, the way we practice medicine has changed. We have a real choice to make. According to recent literature, primary prevention appears to work better than any other strategy in medicine. So why do some physicians not implement primary prevention? Despite the literature, maybe physicians are not getting the news. We need to keep repeating the message to physicians and patients that primary prevention is simple and effective. Next, we need to take a look at our own behavior as physicians and determine if it makes sense in the context of primary prevention.

There are 10 major studies on the effects of primary prevention (*Table 1*).¹⁻¹⁵ These studies demonstrate very large correlations between specific healthy lifestyle behaviors and decreases in major chronic diseases (e.g., diabetes mellitus, heart disease, stroke, cancer) and all-cause mortality.

Although these studies offer a complex array of data to sift through, the elements of a healthy lifestyle are clear: not smoking, regular exercise, healthy diet, healthy body weight, and reduced stress.

Although exercise guidelines vary, I ascribe to the U.S. Department of Health

and Human Services' Physical Activity Guidelines for Americans, which recommends at least 150 minutes of brisk walking or the equivalent per week.¹⁶ For the diet criterion, the Atherosclerosis Risk in Communities study illustrates that merely consuming five servings of fruits and vegetables per day is associated with the same benefits as consumption of a Mediterranean-style diet.¹¹ A standard of five servings of fruits and vegetables is much easier to remember and adhere to.

There is strong support for at least one weight-related variable in a healthy lifestyle. This may include body weight, body mass index (BMI), waist circumference, or waist:hip ratio. The INTERHEART study showed waist:hip ratio to be the most predictive of cardiovascular disease.⁶ However, unlike BMI calculation, measurement of weight:hip ratio has not yet become standard in U.S. practices. I use BMI as the metric, and a value less than 30 kg per m² as the cutoff between a healthy and unhealthy lifestyle. The goal is to move away from this outer limit toward a more ideal parameter, such as less than 25 kg per m².

The final variable of a healthy lifestyle, which has strong support from the INTERHEART study, is stress reduction.⁷ The INTERHEART study offers useful suggestions for measuring stress—perception of severe stress at home or at work, financial stress, or major life events.⁷ The minimal lifestyle intervention that would be beneficial is not defined. However, 15 to 20 minutes of silence, relaxation, or meditation appears to be a common interval.¹⁷ To be more inclusive of patients, I set the criterion to an even less restrictive amount, about 10 minutes per day.¹⁷ This is enough time to produce a change in biorhythms and is achievable for most patients. *Figure 1* presents a formula to make healthy lifestyle goals simple and accessible.

Information alone does not lead to behavior change, however. Motivational interviewing or brief negotiation is a new ►

Table 1. Summary of Findings from Studies on the Effects of Primary Prevention

<i>Study</i>	<i>Type</i>	<i>Number of participants</i>	<i>Duration (years)</i>	<i>Factors studied</i>
NHS 2000 ¹	Prospective cohort study of women	84,129	14	Alcohol use, BMI, diet, exercise, smoking
NHS 2001 ²	Prospective cohort study of women	84,941	16	Alcohol use, BMI, diet, exercise, smoking
NHS 2009 ³	Prospective cohort study of women	83,882	14	Alcohol use, analgesic use, BMI, diet, exercise, folic acid use
Diabetes Prevention Program 2002 ⁴	Randomized controlled trial	3,234	2.8	BMI, diet, exercise
HALE project 2004 ⁵	Prospective cohort study	2,339	10	Alcohol use, diet, exercise, smoking
INTERHEART study 2004 ⁶	Case-control study	15,152 in case group, 14,820 in control group	No follow-up period	Alcohol use, diabetes, diet, exercise, hypertension, lipid levels, smoking, stress, waist:hip ratio
INTERHEART study 2004 ⁷	Case-control study	11,119 in case group, 13,648 in control group	No follow-up period	Stress
HPFS 2006 ⁸	Prospective cohort study of men	42,847	16	Alcohol use, BMI, diet, exercise, smoking
HPFS/NHS 2008 ⁹	Prospective cohort study	114,928	Variable	Alcohol use, BMI, diet, exercise, smoking
Women's Health Study 2006 ¹⁰	Prospective cohort study of women	37,636	10	Alcohol use, BMI, diet, exercise, smoking
Atherosclerosis Risk in Communities survey 2007 ¹¹	Prospective cohort study	15,708	6	Alcohol use, BMI, diet, exercise, smoking
EPIC-Norfolk study 2008 ¹²	Prospective population study	20,244	11	Alcohol use, diet, exercise, smoking
EPIC-Postdam study 2009 ¹³	Prospective cohort study	23,153	7.8	BMI, diet, exercise, smoking
ACLS 2009 ¹⁴	Prospective cohort study of men	23,657	14.7	Exercise, smoking, waist circumference
Physicians' Health Study 2009 ¹⁵	Prospective cohort study of men	20,900	22.4	Alcohol use, body weight, diet, exercise, smoking

ACLS = Aerobics Center Longitudinal Study; BMI = body mass index; CHD = coronary heart disease; EPIC = European Prospective Investigation into Cancer and nutrition; HALE = Healthy Ageing: a Longitudinal study in Europe; HPFS = Health Professionals Follow-up Study; NHS = Nurses Health Study; OR = odds ratio; PAR = population attributable risk.

Information from references 1 through 15.

Major findings

83 percent reduction in CHD events in women with five healthy lifestyle behaviors compared with no behaviors

91 percent reduction in the risk of type 2 diabetes mellitus in women with five healthy lifestyle behaviors compared with no behaviors

78 percent reduction in the incidence of hypertension in women with six healthy lifestyle behaviors compared with no behaviors

58 percent reduction in the incidence of diabetes with lifestyle intervention, versus a 31 percent reduction with metformin (Glucophage)

The presence of four healthy lifestyle behaviors reduced death from any cause by 65 percent, from CHD by 77 percent, from cardiovascular diseases by 67 percent, and from cancers by 68 percent

Adhering to none of the healthy behaviors was associated with a PAR of 60 percent of deaths from any cause, 64 percent from CHD, 61 percent from cardiovascular diseases, and 60 percent from cancers

All unhealthy lifestyle factors were associated with a significantly increased risk of myocardial infarction

Smoking: OR = 2.87, PAR = 35.7 percent for current versus never smokers

Elevated lipids: OR = 3.25, PAR 49.2 percent

Hypertension: OR = 1.91, PAR 17.9 percent

Diabetes: OR = 2.37, PAR = 9.9 percent

Increased waist:hip ratio: OR = 1.12, PAR = 20.1 for highest versus lowest tertile

Stress: OR = 2.67, PAR = 32.5 percent

Lack of daily consumption of fruits and vegetables: OR = 0.70, PAR = 13.7 percent

Regular alcohol use: OR = 0.91, PAR 6.7 percent

Lack of regular physical activity: OR = 0.86; PAR 12.2 percent

These nine risk factors together accounted for 90 percent of the PAR in men and 94 percent in women

Psychosocial stress was assessed by four simple questions about stress at work and at home, financial stress, and major life events in the previous year; persons with myocardial infarction reported higher prevalence of all four stress factors ($P < .0001$).

A low-risk lifestyle reduced CHD by 87 percent, and may have prevented 62 percent of coronary events; among men taking medication for hypertension or hypercholesterolemia, a low-risk lifestyle may have prevented 57 percent of all coronary events

Men who adopted at least two additional healthy lifestyle factors during follow-up had a 27 percent lower risk of CHD compared with those who adopted no additional factors

A healthy lifestyle reduced total strokes by 69 percent in men and by 79 percent in women

55 percent reduction in total stroke and 71 percent reduction in ischemic stroke in women with the healthiest lifestyle compared with women with the unhealthiest lifestyle; healthy lifestyle did not reduce hemorrhagic stroke

40 percent reduction in all-cause mortality and 35 percent reduction in cardiovascular events after four years in persons among adults 45 to 64 years of age who had adopted a new healthy lifestyle compared with those who had not

Compared with persons with four healthy behaviors, the adjusted relative risks for all-cause mortality was 1.39 for three behaviors, 1.95 for two, 2.52 for one, and 4.04 for none

78 percent reduced risk of a chronic disease in persons with four healthy behaviors compared with no behaviors: 93 percent reduction in diabetes, 81 percent reduction in myocardial infarction, 50 percent reduction in stroke, 36 percent reduction in cancer

59 percent reduced risk of CHD events, 77 percent reduced risk of cardiovascular disease mortality, and 69 percent reduced risk of all-cause mortality in men with a normal waist circumference who were physically fit and did not smoke compared with men with no low-risk factors

Men with no low-risk factors had a shorter life expectancy (by 14.2 years) than men with three low-risk factors

50 percent reduction in the incidence of heart failure in men with at least four of six healthy lifestyle behaviors compared with no behaviors



Figure 1. Formula to help patients achieve healthy lifestyle goals. A full-size pdf of this figure can be downloaded in the online version of this article at <http://www.aafp.org/afp>.

framework that can close the gap between knowledge of available lifestyle interventions and changing behaviors. The framework has already been proven markedly effective for tobacco, drug, and alcohol addiction.¹⁸ Few physicians have received the training necessary to implement motivational interviewing or brief negotiation. Resources for learning about these skills include the Kaiser Permanente Medical Group Web site (<http://www.kphealtheducation.org/bnroadmap/index.html>) and the book *Motivational Interviewing in Health Care: Helping Patients Change Behavior*.¹⁸

In terms of health, we can have it all. We have the requisite tools to convert knowledge into healthy behaviors. This newfound power to reduce diabetes, heart disease, stroke, cancer, and all-cause mortality with primary prevention strategies should impel us to change how we counsel patients. Research is needed to explore why some physicians are not making this change.

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REFERENCES

- Stampfer MJ, Hu FB, Manson JE, et al. Primary prevention of coronary heart disease in women through diet and lifestyle. *N Engl J Med.* 2000;343(1):16-22.
- Hu FB, Manson JE, Stampfer MJ, et al. Diet, lifestyle, and the risk of type 2 diabetes mellitus in women. *N Engl J Med.* 2001;345(11):790-797.
- Forman JP, Stampfer MJ, Curhan GC. Diet and lifestyle risk factors associated with incident hypertension in women. *JAMA.* 2009;302(4):401-411.
- Knowler WC, Barrett-Connor E, Fowler SE, et al.; Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 2002;346(6):393-403.
- Knoops KT, de Groot LC, Kromhout D, et al. Mediterranean diet, lifestyle factors, and 10-year mortality in elderly European men and women: the HALE project. *JAMA.* 2004;292(12):1433-1439.
- Yusuf S, Hawken S, Ounpuu S, et al.; INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet.* 2004;364(9438):937-952.
- Rosengren A, Hawken S, Ounpuu S, et al.; INTERHEART Investigators. Association of psychosocial risk factors with risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): case-control study. *Lancet.* 2004;364(9438):953-962.
- Chiuve SE, McCullough ML, Sacks FM, et al. Healthy lifestyle factors in the primary prevention of coronary heart disease among men: benefits among users and nonusers of lipid-lowering and antihypertensive medications. *Circulation.* 2006;114(2):160-167.
- Chiuve SE, Rexrode KM, Spiegelman D, et al. Primary prevention of stroke by healthy lifestyle. *Circulation.* 2008;118(9):947-954.
- Kurth T, Moore SC, Gaziano JM, et al. Healthy lifestyle and the risk of stroke in women. *Arch Intern Med.* 2006;166(13):1403-1409.
- King DE, Mainous AG III, Geesey ME. Turning back the clock: adopting a healthy lifestyle in middle age. *Am J Med.* 2007;120(7):598-603.
- Khaw KT, Wareham N, Bingham S, et al. Combined impact of health behaviours and mortality in men and women: the EPIC-Norfolk prospective population study [published correction appears in *PLoS Med.* 2008;5(3):e70]. *PLoS Med.* 2008;5(1):e12.
- Ford ES, Bergmann MM, Kröger J, et al. Healthy living is the best revenge: findings from the European Prospective Investigation into Cancer and nutrition—Potsdam study. *Arch Intern Med.* 2009;169(15):1355-1362.
- Lee CD, Sui X, Blair SN. Combined effects of cardiorespiratory fitness, not smoking, and normal waist girth on morbidity and mortality in men. *Arch Intern Med.* 2009;169(22):2096-2101.
- Djoussé L, Driver JA, Gaziano JM. Relation between modifiable lifestyle factors and lifetime risk of heart failure. *JAMA.* 2009;302(4):394-400.
- U.S. Department of Health and Human Services. 2008 physical activity guidelines for Americans. <http://www.health.gov/paguidelines/guidelines/>. Accessed March 17, 2010.
- Dialogue Partner. <http://www.zenmeditation.biz/>. Accessed March 18, 2010.
- Rollnick S, Miller WR, Butler CC. *Motivational Interviewing in Health Care: Helping Patients Change Behavior*. New York, NY: Guilford Press; 2008. ■