The Optimal Male Health Diet and Dietary Supplement Program

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• Men • Diet • Cardiovascular disease • Dietary supplements

Before recommending the optimal male diet, male health concerns need to be triaged. Reiterating the most common causes of morbidity and mortality allows for an easier understanding of dietary and supplement changes that should be recommended for men in general. These recommendations need to be simple, logical, and practical for the patient as well as the clinician. Thus, reviewing common causes of mortality is paramount to construing all other recommendations in this article.

Cardiovascular disease (CVD) is the number 1 overall cause of mortality in the United States and in other industrialized countries.[1–3] CVD is currently the number 1 cause of death worldwide, and is the number 1 cause of death in every region of the world with the exception of sub-Saharan Africa. Cancer is the second leading cause of death in the United States and in most developed countries, and is expected to mirror the number of deaths from CVD in the next several years in various regions of the world. CVD has been the number 1 cause of death in the United States every year since 1900, with the exception of 1918, which was the year of the influenza pandemic. Even if cancer becomes the primary cause of mortality, most of what is known concerning lifestyle and dietary change for CVD prevention directly applies to cancer prevention.[4] For example, one of the most dramatic reductions in mortality in US history for CVD and cancer was through a common behavioral/lifestyle change (smoking cessation) that had a profound simultaneous impact on the rates of both diseases. Heart-healthy changes contribute to overall men's health improvements regardless of the part of the human anatomy that is receiving attention, including the penis and the prostate. Heart-healthy changes need to be advocated in urology clinics because this places probability and the research into perspective. Triaging preventive medicine for men's health is providing probability-based advice via evidence-based medicine.

The largest and most recent US and worldwide pharmaceutical-based cancer primary prevention trials that included only men exemplify the immediate need for a more proper perspective. For example, results of the Prostate Cancer Prevention Trial (PCPT) have garnered attention and controversy regarding the use of finasteride daily versus placebo to reduce the risk of prostate cancer.[5–8] The debate about the advantages and disadvantages of finasteride will continue, but a paramount observation from this important trial has not received adequate exposure in the medical literature. More than 18,000 men were included in this randomized trial, and 5 men died of prostate cancer in the finasteride arm and 5 men died of prostate cancer in the placebo arm, but 1123 men in total died during this primary prevention trial.[5] Thus, prostate cancer was responsible for less than 1% of the deaths, whereas most of the mortality was from CVD and other causes. Thus, the results of the first large-scale

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men's health PCPT showed that another disease is the primary cause of death in men, and randomized trials accurately reflect day-to-day morbidity and mortality in this regard. This finding does not reduce the seriousness or impact of prostate cancer prevention using a prostate-specific chemoprevention agent, but it places the overall risk of morbidity and mortality in a more proper perspective. Men inquiring about the advantages and disadvantages of finasteride for prostate cancer prevention need to be reminded that the number 1 risk to them in general is CVD, and then the potential prostate cancer risk–specific or men's health consult should occur after this first, more relevant point is discussed, emphasized, and reiterated.

The largest male health dietary supplement clinical trial to prevent cancer was the Selenium and Vitamin E Supplementation Randomized Trial (SELECT).[9] It was terminated approximately 7 years early because of a lack of efficacy, and even a potential negative impact with these high-dose supplements. However, this trial represented a pertinent teaching moment for men's health that once again was missed because of the focus on specific rather than wider issues. SELECT was the largest randomized primary prevention trial of men in urologic and medical history, and once again CVD represented the primary cause of mortality in this study with more than 500 deaths occurring from this cause compared with 1 death from prostate cancer in just 5 years follow-up. Heart-healthy programs need to receive more emphasis in urology and men's health.

The lifestyle recommendations in this article affect CVD and men's health simultaneously. Men can now be offered lifestyle changes that can potentially affect all-cause morbidity and mortality rather than just disease-specific morbidity and mortality.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 1

There should be a focus on probability-based changes before focusing on diet, which means that men should know their fasting lipid profile, blood pressure, and other cardiovascular markers as well as they know any other health numerical values, for example prostate-specific antigen (PSA).

The lack of general health knowledge shown by some patients despite an impressive and obsessive need-to-know position concerning prostate, erectile dysfunction (ED), or other health issues is concerning. For example, surveys of the general population indicate that most men do not know their cholesterol values or have little understanding of what they represent in terms of potential health outcomes, and this finding is consistent regardless of age, race, and even gender.[10,11] When the dual concern of CVD and overall men's health risks is emphasized and promoted, men tend to become familiar with all of their clinical values, numbers, and overall risks. For example, it is more relevant to conduct a cholesterol/blood pressure screening and ED or prostate screening on the same day at any institution. Men should also be educated regularly on the normal values of a cholesterol panel and blood pressure test, because these values have recently been updated on 2 different occasions by the Expert Panel from the National Cholesterol Education Program (NCEP).[12,13] A man attending a free PSA screening is at risk of ending up with a myopic health and disease perspective. Preliminary empirical evidence of this concern lies in recent data from Surveillance, Epidemiology and End Results (SEER) tumor registry, which suggests that men diagnosed or treated for prostate cancer need to focus as much on cardiovascular prevention because of the observed competing causes of mortality.[14] At our institution, we have attempted to change our previous paradigm by currently abandoning PSA screening day and organizing, at the least, an annual general health lecture for men. Men need other resources, apart from overburdened primary care doctors, to emphasize and review basic optimal lipid and general health values.[12,13] **Table 1** is a modified, quick review for men and urologic health professionals.

The NCEP suggests a first cholesterol screen at an age of 20 years,[12] which is approximately 20 to 30 years before a suggested PSA test, but few if any men have had a lipid test at this early age. Perhaps clinicians can greatly assist men in adhering to this early screening age. For example, when men with a family history of prostate cancer or ED, or an early diagnosis of most diseases, inquire about what their children should do first to prevent this condition from happening to them, a common suggestion for children or adolescents to just have an initial cholesterol screen seems most appropriate. In my experience, this tends to surprise and simplify patient concerns because most did not previously consider this thought or option for their children. The time is appropriate for this approach because of the recent concern in abnormal lipid levels among adolescents screened in the United States, which is approximately 20% to 43% based on a variety of factors, especially weight status (normal, overweight, or obese).[15]

Table 1
A partial summary of men's health goals for total cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglyceride with some added modifications that can be used in a clinical setting

Blood Test Parameter	Measurement Commentary
Total cholesterol (mg/dL)	A lower number is better
<160	Optimal
<200	Desirable
200–239	Borderline high
≥240	High
LDL = bad cholesterol (mg/dL)	A lower number is better
<70	Optimal for some high-risk individuals[a]
<100	Optimal
100–129	Near optimal
130–159	Borderline high
160–189	High
≥190	Very high
HDL = good cholesterol (mg/dL)	A higher number is better
<40	Low
40–59	Normal
≥60	High (optimal)
Triglyceride (mg/dL)	A lower number is better
<150	Normal
150–199	Borderline high
200–499	High
≥500	High

[a] High-risk individuals (existing CVD disease or a previous CVD event) may be required to reduce their LDL to less than 70 mg/dL based on new information provided to the Expert Panel.

Data from The Expert Panel. Executive summary of the Third Report of the National Cholesterol Education Program (NCEP). Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001;285:2486–98; and Grundy SM, Cleeman JI, Marz NB, et al. Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Circulation 2004;110:227–39.

CVD risk is affected by lifestyle risk factors such as obesity, physical inactivity, and a high-caloric and overall unhealthy diet. These and other emerging risk factors or risk markers should ideally be discussed, because, despite the cholesterol test being a good marker for predicting future cardiovascular problems, it is not a perfect test. Other novel cardiovascular markers such as high-sensitivity C-reactive protein (hs-CRP), or traditional markers such as impaired fasting glucose or hemoglobin A1c, and evidence of subclinical atherosclerotic disease should also be discussed with the patient.[12,16,17] Even a referral to a cardiologist may be appropriate for some men because some of these markers may also be related to overall mortality as well as CVD risk and some specific men's health conditions.[18]

Additional tangible advantages may occur for a man and his clinician that continue to follow these overall cardiovascular markers. For example, cholesterol levels are an outstanding indicator of how well a patient may be adopting lifestyle changes or even medication compliance following a PSA test, ED diagnosis, or after some definitive therapy. If these numbers improve, it may be more likely that the patient is following a men's health lifestyle program. High-density lipoprotein (HDL) provides a good indicator of the commitment to exercise by the patient. HDL tends to increase, and at times substantially, with a greater amount of aerobic physical activity,[19] and a higher HDL may be correlated with a lower risk of abnormal prostate conditions.[20] Triglycerides are an indicator of changes in belly (visceral) fat, because this compound is generally stored in this anatomic location with increasing blood levels. However, in a minority of patients who follow a healthy lifestyle, a less-than-optimal change in lipid values may occur, but these men can be

referred to a specialist for potential drug intervention and more aggressive lifestyle therapy.

Blood pressure monitoring should be emphasized as much as any other values. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure altered the criteria for what defines a healthy blood pressure.[21] Men and their partners should be informed that normal blood pressure is less than 120/80 mm Hg and individuals with a systolic blood pressure of 120 to 139 mm Hg or diastolic blood pressure of 80 to 89 mm Hg are considered to be prehypertensive, and lifestyle changes should be advocated in these individuals (**Table 2**).

Blood pressure can be reduced with a healthier lifestyle,[22] and again is a good indicator of lifestyle compliance, and a healthy blood pressure may also lower the risk of ED.[23] Again, a minority of patients may not reduce their blood pressure with lifestyle changes, but these men can be referred to a specialist. Men who adopt healthy lifestyle and behavioral changes that do not result in CVD risk improvements should still be given encouragement to continue these changes because of the other potentially profound impacts these behaviors may have on overall and mental health.[24,25] Patients seem more motivated to continue healthy lifestyle changes when there is some tangible healthy outcome with the behavioral change, and this becomes more probable when all numbers are used in the consult, including cholesterol and blood pressure, for example, as opposed to just other single and disease-specific (eg, PSA) values.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 2

The body mass index (BMI), but more importantly the waist/hip ratio (WHR) or waist circumference (WC) measurement and pant size should also become a standard part of a clinical record before initiating dietary changes.

The negative impact of being overweight or obese on overall morbidity and mortality is well known. BMI is moderately reliable as an isolated measurement, but it is a rapid method to determine who may be overweight or obese.[26] BMI is defined as the weight (in kilograms) divided by the square of the height in meters (kilograms per square meter). Another method to calculate the BMI is to take weight in pounds and divide it by the height in inches squared and to multiply this number by 704 (pounds/inches^2 $\times$ 704). A BMI of less than 25 kg/m^2 is considered normal by the Word Health Organization (WHO), whereas 25 to 29 kg/m^2 is overweight, 30 kg/m^2 or more is defined as obese, and 35 kg/m^2 or more is considered morbidly obese. Several of the largest and most recent preventive medicine randomized trials of men or women have shown that most individuals in these studies are overweight at baseline,[5,9,27] and this includes trials to prevent specific men's health abnormalities with prescriptions, supplements, or just dietary change.[5,9,28] Thus, it has become so common to be overweight or obese that only a minority of men in current and past clinical trials have a BMI in the healthy range.

WHR may be another rapid measurement to determine obesity.[26] An individual must stand during the measurement of WHR. WHR more precisely measures abdominal adipose circumference or tissue and fat distribution. The waist is defined as the abdominal circumference midway between the costal margin and the iliac crest. The hip is defined as the largest circumference just below the iliac crest. For men, a WHR greater than 0.90 is a moderate indicator of an increased risk for obesity-related conditions independent of BMI.

WC is perhaps the easiest and fastest method to currently assess obesity, and is my preference, together with pant size (waist size) in men because

Table 2
A partial summary of the new blood pressure guidelines according to the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure

Systolic/Diastolic Blood Pressure (mm Hg)	What Does this Mean to Patients?
Less than 120/80	Normal = low risk
120–139/80–89	Prehypertensive (moderately high or prehigh blood pressure) = moderate risk
140/90 or greater	Hypertensive (high blood pressure) = high risk

Data from Chobanian AV, Bakris GL, Black HR, et al. for the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program Coordinating Committee. Hypertension 2003;42:1206–52.

belly fat (visceral adipose tissue) seems to have one of the best predictive values of CVD and potential all-cause mortality risk among all the other weight measurements from some of the largest prospective studies in the world.[29,30] However, the combination of WC with a BMI measurement may have added predictability. WC is also one of the best predictors of a future cardiovascular event, regardless of the ethnic group studied.[31] WC is also one of the 5 specific criteria of the metabolic syndrome. WC has a tangible advantage compared with BMI, which can be appreciated after an individual commits to resistance exercise. An increase in muscle mass from resistance activities such as weight lifting can cause an increase in BMI, which could be frustrating to the patient and clinician.[26] However, this does not occur when using the WHR or WC measurement. Informing patients of their official WC and asking pant size allows these parameters to not only be documented in the chart but allows for the patient to identify a goal of maintaining or reducing these numbers by the time of the subsequent clinical visit, thereby reducing the emphasis on the weight scale or trying to compete with a national standard. A patient with a BMI of 35 kg/m^2 and a WC of 102 cm may be considered alarming, but a lack of aerobic fitness and caloric restriction, or not being able to reduce the value slightly over time, is more of an issue. A summary of the basic interpretation of the BMI and WC value is presented in **Table 3**.[26]

Kidney stones and renal cell carcinoma (RCC) may have a strong relationship with obesity.[32,33] Obesity is also associated with lower testosterone levels, higher estrogen levels, and a higher risk of CVD, which could partially explain the preliminary finding that obese men have a higher risk of ED,[34–36] but recent novel clinical research suggests that an improvement in these parameters occurs rapidly with just a 10% weight loss from dietary changes alone.[37]

Clinicians should begin to carry and use tape measures that can measure WC, and I often argue that this is as critical as the stethoscope to the individual working in men's health. Clinicians should also refer patients on a consistent basis to ancillary diverse services such as nutritionists, therapists, social workers, a variety of professional and even surgical weight-loss programs if needed, and recent weight-loss consumer publications. Simply becoming familiar with local weight-loss resources is an initial step in the appropriate direction for the patient and clinician.

Table 3
BMI and WC values for men's health discussions

Parameter	Classification
BMI	
Less than 25 kg/m^2	Normal weight
25–29 kg/m^2	Overweight
30 kg/m^2 or more	Obese
WC	
Less than 89 cm (35 in) in men	Normal
89–100 cm (35–39 in) in men	Overweight
≥101 cm (≥40 in) in men	Obese

Data from Moyad MA. Current methods used for defining, measuring, and treating obesity. Semin Urol Oncol 2001;19:247–56.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 3

Fitness and overall health should receive more attention. Approximately 30 to 60 minutes or more of physical activity a day on average should be the goal, which should include lifting weights or performing resistance exercises several times a week. Equal emphasis should be placed on aerobic and resistance exercise; one is not more important than the other for men's health.

Physical activity, defined as at least 3 hours of vigorous exercise weekly, was associated with an approximate 70% lower risk of aggressive prostate cancer, advanced disease, and a potential for improved survival in the Health Professionals Follow-up Study.[38] More than 47,000 men were included in this cohort, with a mean follow-up period of 14 years. The investigators appropriately concluded their publication by recommending 30 minutes a day of physical activity for all individuals because of the overall health benefits of this intervention.

Morbidity and mortality from CVD are affected by exercise, but weight lifting also seems to provide additional benefits. For example, additional data were derived from the Health Professionals' Follow-up Study, which prospectively followed more than 44,000 men for 12 years.[39] Men who jogged for 1 hour or more per week had a 42% reduction (P<.001 for trend) in the risk of coronary heart disease (CHD), and those who just walked for 30 minutes or more per day or who were involved in other physical activities also experienced a risk reduction in CHD versus

those who did not engage in these activities. Men performing regular resistance exercise (weight lifting) for just 30 minutes or more per week experienced a 23% risk reduction ($P = .03$ for trend) in CHD. This observation was novel because previous prospective studies had not adequately addressed this subject. Weight training can increase fat-free mass and lean body weight, reduce sarcopenia, increase resting metabolic rate, and potentially reduce the risk of abdominal adipose deposition.[40,41] Weight training or resistance training also seems to improve glucose parameters, including insulin sensitivity, and may slightly improve lipid levels, and reduce hypertension,[41,42] which are all potential risk factors for ED and other men's health conditions. Physical activity may also greatly reduce the impact of sympathetic overload that may be one of the many causes of benign prostatic hyperplasia (BPH).[43] These studies emphasize the need to engage in aerobic and resistance activity together because of the documented synergism.

The mental health improvements with increased physical activity seem to be as profound as the physical health benefits.[44,45] For example, a landmark trial was published more than a decade ago that included 156 adult volunteers with major depressive disorder (MDD) randomly assigned a 4-month course of aerobic exercise (30 minutes 3 times/wk), sertraline therapy, or a combination of exercise and sertraline.[46,47] After 4 months, patients in all 3 groups showed significant mental health improvements; however, after 10 months, individuals in the exercise group had significantly lower recurrence rates compared with individuals in the medication arm of the study. Exercising during the follow-up period was associated with a 51% reduction in the risk of a diagnosis of depression at the end of the investigation. Men need to be instructed that regular physical activity and resistance training have adequate physical and mental health benefits such that not performing these activities reduces the potential for improved overall health. It is important to explain to male patients that, if the overall results from exercise studies were viewed similarly to a specific pharmacologic intervention, it probably would have already garnered attention worthy of a Nobel prize in, arguably, multiple categories of medicine, including male health breakthroughs.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 4

Men should reduce unhealthy dietary fat intake and increase the consumption of healthy fats, which should lower overall caloric intake. Saturated, trans-fat and even dietary cholesterol should be reduced and replaced by more healthy types of monounsaturated or polyunsaturated fat (eg, ω-3 fatty acids).

Saturated fat reduces low-density lipoprotein (LDL) receptor expression and increases LDL serum levels.[12] LDL increases by 2% for every 1% increase in total calories from saturated fat. The NCEP recommends that saturated fat be reduced to less than 7% of total calories to reduce the risk of CVD. Some nonlean meats, high-fat dairy products (whole milk, butter, cheese, ice cream, and cream), tropical oils (palm oil, coconut oil, and palm kernel oil), baked products and mixed dishes with dairy fats, and shortenings are some of the larger contributors of saturated fat to the food supply. Many foods that contain high levels of saturated fat also contain the highest levels of trans-fat (partially hydrogenated fat), cholesterol, and, more importantly, total calories in many cases. For example, there are almost twice as many calories in 237 mL of whole milk (5 g of saturated fat) compared with skim, or even almond milk or soymilk (0 g of saturated fat each).[48] Thus, identifying 2 similar products, such as milk, meats, dairy, or chips, and choosing the item lower in saturated fat can allow for a profound reduction in total caloric intake, which is critical to helping maintain or reach an appropriate weight or waist size.

However, simply reducing all saturated fat in an individual's diet is not necessarily a practical and healthy dietary lifestyle change. The current cardiovascular goal of obtaining less than 7% of calories from saturated fat seems ideal from past studies, because getting minimal to no calories from saturated fat not only is excessive, it seems to reduce levels of HDL (good cholesterol) from past CVD and men's health clinical trials.[49,50] Reducing almost all saturated fat consumption also suggests that this type of fat, in itself, is heart unhealthy, which is not accurate from the largest recent meta-analysis of prospective studies.[51] In some countries where overall caloric intake is low compared with the United States, saturated fat may have tangible cardiovascular benefits, but this also needs to be placed in perspective.[52] Regions of the world (for example Japan) where healthy men have the largest intakes of saturated fat would still be in the lowest saturated fat consumption category in the United States.[52] Regardless, a potential impact of reducing saturated fat is that it may reduce overall caloric intake and reduce weight and waist gains. Another benefit of reducing saturated fat is that it allows

for the opportunity to reduce dietary cholesterol intake and increase the consumption of other monounsaturated and polyunsaturated fats that have shown a greater reduction in CVD from past clinical trials.[53] A summary of the different types of dietary fat, food sources, and impacts on specific lipids is found in **Table 4**.[48]

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 5

Men should consume a diversity of low-cost fruits, and especially vegetables, and not focus on high-caloric, high-cost, and high-antioxidant exotic juices. Dietary supplements that claim to substitute for fruit and vegetable consumption are also concerning.

Lycopene seemed synonymous with men's health in a variety of media and commercial sources. Few topics in men's health disease prevention enjoyed such excessive attention as lycopene, tomato products, and their potential benefits. For example, an often-cited analysis of more than 80 epidemiologic studies on tomatoes and health seemed to be used by many commercial companies.[54] Approximately half of the studies in this analysis supported the consumption of tomato products at least once a day to reduce the risk of a variety of cancers, including prostate cancer, but a large number of studies in this same analysis failed to detect a correlation. The overall recommendation of the author of the meta-analysis was to increase the consumption of a diversity of fruits and vegetables and not just tomato products, which was the most critical finding of the analysis that never garnered any commercial attention.

Perception does not seem to reflect reality in this area of nutritional medicine. For example, tomatoes were never the only, or even the primary, source of lycopene. A variety of other healthy products contain this compound, such as apricots, guava, and pink grapefruit.[55] Watermelon is also an adequate source of lycopene, and is the largest source per gram compared with any other source, including tomato products.[56]

Fruits, and especially vegetables in general, have been associated with a reduced risk of some male urologic conditions.[57] For example, the *Brassica* vegetable group is diverse and includes broccoli, Brussels sprouts, cabbage, cauliflower, kale, and watercress, and may slightly reduce the risk of urologic disease,[58] and it is interesting that these products are low in overall calories. The *Allium* vegetables have also been associated with a reduced risk, and this group includes chives, garlic, leeks, onions, and scallions.[59] Fruits and vegetables have unique and shared anticancer and anti–heart disease compounds that may contribute to improved overall health.[57] The sum of the epidemiologic data continues to support the increased consumption of a diversity of fruits and vegetables to potentially and favorably affect men's health, but the overall data currently support a slightly greater potential reduction in CVD risk and mortality,[60] perhaps through assisting in weight loss. Clinicians should

Table 4
Types of dietary fat, some of their primary sources, and the impact on lipid levels and heart health

Type of Dietary Fat	Commonly Found?	Good or Bad Fat, and Impacts on Lipids vs Carbohydrates (Sugars)
Monounsaturated fat (includes ω-9)	Healthy cooking oils (canola, olive, safflower, …), nuts, …	Good Lowers LDL Increases HDL
Polyunsaturated fat (includes ω-3 fatty acids)	Healthy cooking oils (canola, soybean, …), flaxseed, fish, nuts, soybeans, …	Good Lowers LDL Increases HDL
Saturated fat (also known as hydrogenated fat)	Nonlean meat, high-fat dairy, some fast food	Mostly bad (because it is associated with high caloric intake) Increases LDL Increases HDL
Trans-fat (also known as partially hydrogenated fat)	Some margarine, fast food, snack foods, deep fried foods, …	Bad Increases LDL Lowers HDL

Data from Moyad MA. Dr Moyad's no bogus science health advice. Ann Arbor (MI): Ann Arbor Media Group; 2009.

recommend fruit and vegetable consumption for better overall health, but not for cancer prevention where the recent large-scale data seems to be less impressive.[61]

Media attention seems to shift from one fruit or vegetable to another with each passing year. Clinicians need to be objective and explain to patients that these media reports do not necessarily represent any major breakthrough, but support the ongoing and past research that consuming a diversity of low-cost fruits and vegetables is just 1 practical and logical approach to improving men's health. A recent example of this controversy is the recent research into pomegranate juice.[62,63] The first attention-gathering study did not include a placebo group or another group of men that consumed another type of healthy juice product.[62] This should not be construed as a lack of efficacy and some of these companies should be lauded for at least investing in research, but an objective overview of the preliminary research and the caloric contribution of these and other juices is necessary. Many brands of pomegranate and other novel juices contain at least 140 calories per 237-mL serving, which translates into more, or at least similar, calories than most commercial regular soft drinks and alcoholic drinks (approximately 100–150 calories).[48,64] Many of these juices are expensive in comparison with cheaper nutritious and lower-calorie products, and it is concerning that low-income patients may find it difficult to afford them. In addition, drug and juice interactions are still being researched, which is important because grapefruit juice studies have provided a paradigm of medication interactions, but novel juices such as pomegranate may also cause some legitimate concerns with medications metabolized by CYP3A4.[65,66]

In partial defense of some of these companies, it is also laudable that some lower-caloric exotic juice options now are appearing on some store shelves.

The competitive nature of the food and beverage industry, like any commercial business, translates into millions of dollars spent yearly on advertising, which usually affects how patients eat and drink. Clinicians need to be advocates for general evidence-based advice instead of encouraging hype on a specific compound or product that does not have at least a moderate amount of evidence in an area of medical need. When a patient begins to depend on a pill alone instead of on a lifestyle change, the potential for seeking other nonlifestyle changes via pills increases.[48] This pendulum of health swings in a bidirectional fashion so, when a patient begins to exercise, there is an increased potential to seek other healthy behavioral changes such as eating better or quitting smoking or consuming less alcohol and not depending on pills. Thus, if a pill count can be kept to a minimum or nonexistent it is rewarding to watch patients depend on lifestyle change as the initial method to correct or prevent a condition. The next recommendation for men in this article would be difficult to achieve with any pill that claims to substitute for a fruit or vegetable; one healthy change improves the likelihood of another healthy lifestyle change.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 6

Consume more total (soluble and insoluble) dietary fiber (20–30 g/d) from food for overall health advantages, especially soluble and insoluble fiber, which can easily be found in higher quantities in low-cost options and not just from overcommercialized pills and powders.

General and numerous health benefits from consuming dietary fiber have been well documented and especially include a reduction in CHD risk.[67,68] A pooled analysis of past cohort studies of dietary fiber for the reduction of CHD included research from 10 international studies, which included the United States.[69] In a period of 6 to 10 years of follow-up, and after multivariate adjustment for demographics, BMI, and behavioral changes, each 10 g/d increase of calorie-adjusted total dietary fiber was correlated with a 14% reduction in the risk of total coronary events and a 27% reduction in risk of coronary death. These findings were similar for both genders, and the inverse associations occurred for both soluble (viscous) and insoluble fiber. Past studies have not observed a consistent benefit with one class of fiber rather than the other.[70,71]

Small additions of fiber can affect medication dosages in a positive manner. Only 15 g of psyllium husk supplementation daily with a 10 mg statin (simvastatin) was shown to be as effective as 20 mg of this statin by itself in reducing cholesterol in a preliminary placebo-controlled study of 68 patients over 12 weeks[72] Other cardiovascular benefits have also been consistently found. A meta-analysis of 24 randomized placebo-controlled trials of fiber supplementation found a consistent impact on blood pressure reduction.[73] Supplementation with a mean dose of only 11.5 g/d of fiber reduced systolic blood pressure by 1.13 mm Hg and diastolic pressure by 1.26 mm Hg. The reductions were greater in individuals older than 40 years of age and in hypertensive individuals compared with younger and

normotensive participants. Daily intakes of fiber in the United States and many other Western countries is approximately 10 to 15 g/d, which is approximately half of the total amount consistently recommended by the American Heart Association (AHA) and American Dietetic Association (25–30 g/d) for adequate overall health.[74]

Dietary fiber from food is easily achieved from low-cost sources of soluble and insoluble fiber. For example, I often tell patients to have just a third of a cup of a bran cereal, which is only the size of 2 liquor shot glasses, with flaxseed and some fruit, and before they leave home in the morning approximately 20 g of fiber will have already been ingested toward the goal of 25 to 30 g.[48] Low-cost fiber sources such as flaxseed can potentially provide numerous heart-healthy and general men's health benefits and outcomes.[75–79] Flaxseed is also one of the richest plant sources of heart-healthy ω-3 fatty acids, and chia seed is arguably the richest plant source of fiber and ω-3, and both of these additions to the male health diet would be ideal.[48]

However, fiber seems to have become commercialized, and some men are turning primarily toward powders and pills to solve their fiber deficit; this is not only costly, but it also provides primarily small amounts of mostly soluble fiber that make it difficult to reach their total fiber goal using only these sources. For example, I often ask students how many fiber capsules/pills are needed to be consumed daily to obtain just 20 g of fiber, and the answer always seems to provide adequate surprise value (the answer is 30–40 pills a day, depending on the commercial source).[48] Again, research continues to support the overall and heart-healthy benefits of fiber, especially when it is primarily derived from food sources.[80] Arguably, fiber should be advertised to male patients as the ideal internal antiaging product because it lowers blood cholesterol, blood pressure, and reduces the risk of constipation, diverticulitis, hemorrhoids, reflux, and weight gain, which are all conditions associated with aging.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 7

Consume moderate (approximately 2 servings or more) weekly intakes of a variety of canned, broiled, baked, and even raw/smoked fatty fish, but fried and high mercury-concentrated fish should be generally discouraged. Other healthy plant-based sources of ω-3 fatty acids (eg, nuts and healthy plant cooking oils) should also be emphasized and consumed. Fish oil supplements may provide some diverse benefits in moderation.

Ground flaxseed, chia seeds, and soy are good sources of plant-based ω-3 fatty acids (containing α-linolenic acid [ALA]), but numerous types of oily fatty fish also contain high concentrations of marine-based ω-3 fatty acids (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]). Fish are also the best natural food source of vitamin D3 (cholecalciferol), and they contain high concentrations of high-quality protein and minerals.[48] ω-3 Fatty acids have numerous benefits in reducing the risk of a variety of prevalent chronic diseases,[81] especially CVD.[82,83] Potential positive mechanisms of action for fish and fish oil include a reduction in triglycerides,[84] blood pressure,[85] platelet aggregation,[86] and arrhythmias.[87] However, their primary benefit has been their potential ability to reduce the risk of sudden cardiac death (SCD).[88–90] The overall probability of improving some aspect of preventive health when consuming these compounds is noteworthy.[91,92]

A variety of fatty/oily fish contain high levels of ω-3 fatty acids, vitamin D, and protein, including salmon, tuna, sardines, and a variety of other baked, broiled, raw, but not fried, fish are potentially beneficial.[48] Diversity should be encouraged to increase compliance and exposure to a range of nutrients. Research into the benefits of fish consumption to reduce the risk of certain male-specific diseases is in the preliminary stages,[93,94] but a recent meta-analysis suggested that the sum of the evidence points more toward a reduction in prostate cancer mortality compared with morbidity, which is encouraging and should be discussed with patients.[95] However, the role of ω-3 in reducing a cardiovascular event or affecting all-cause mortality is a more definitive conclusion from clinical trials of fish or fish oil consumption for individuals with, and potentially without, a history of heart disease.[96–99]

Average mercury levels in fish have been reported by the US Food and Drug Administration (FDA), but the preliminary data remain controversial and it is not known what clinical impact mercury may have on an individual.[100,101] Four types of larger predatory fish have been most concerning (king mackerel, shark, swordfish, and tilefish) because they have the ability to concentrate larger amounts of methyl-mercury. However, moderate and recommended consumption (2–3 times/wk) of most fish should have minimal impact on human mercury serum levels. A large investigation of moderate mercury serum levels in older individuals found little to no negative long-term

impacts on neurobehavioral parameters.[102] A randomized trial of mercury exposure from dental amalgam in children also found no significant health issues.[103] The positive impact of consuming fish seems to outweigh the negative impact in most individuals, with the exception of women considering pregnancy or who are pregnant. Low-cost fish such as anchovies and sardines are low in mercury and have some of the highest concentrations of ω-3 oils that are used in ω-3 fatty acid clinical trials using supplements for heart disease and cancer. In addition, the AHA recommends about 2 servings of fish per week (equivalent to 1 fish oil supplement a day) and plant ω-3 consumption,[104] which I try to reiterate often to urologic patients. Thus, the healthiest sources of ω-3 compounds in food are coincidentally low in mercury.

Tree nuts share some similar clinical positive impacts with marine ω-3 oils. A consistent reduction in the risk of CHD and/or SCD has been associated with an increased consumption of a diversity of nuts in prospective studies, and nuts can also reduce inflammatory markers that affect a variety of organ systems.[105–112] Nuts contain a variety of potential beneficial compounds such as ALA (the primary plant-based ω-3 fatty acid), other polyunsaturated fats, monounsaturated fats, vitamin E, magnesium, potassium, fiber, and flavonoids.[105] However, the primary limitation of tree nuts is their high caloric content, which limits the recommended number of servings per day.

Healthy plant oils used for cooking, such as soybean, canola, olive oil, and safflower, also contain a high concentration of ω-3 fatty acids, monounsaturated fat, and numerous other vitamins and minerals such as natural vitamin E.[48] Most cooking oils contain 120 calories per tablespoon; therefore, moderation again is the cornerstone to good health and nutrition. An extensive review of healthy ω-3 fatty acids can be found in the literature.[91,92]

Primary prevention prospective studies and trials of fish oil supplements are lacking, except for a few examples such as a 2007 study that suggested a benefit with 1800 mg of EPA fish oil daily from a supplement in addition to statin use, which reduced the composite end point of major coronary events by 18%.[99] Subgroup analysis found a benefit for those with preexisting heart disease with higher blood levels of triglycerides and low HDL, or those with abnormal glucose tolerance. Other indirect benefits was the suggestion of lower rates of daily pain (such as back pain) in the fish oil group, but this group also reported higher rates of gastrointestinal and skin reaction side effects from the supplement. Researchers from a recent dietary prospective study of more than 50,000 participants observed a 30% reduced risk of acute coronary syndrome in men, but not women, during a mean follow-up of 7.6 years.[113] The AHA therefore currently recommends a total of 1000 mg/d of the active ingredients in fish oil (EPA and DHA) in patients who have heart disease, which in general is easier to obtain with a supplement and diet in combination. Patients without heart disease are expected to get at least 500 mg/d, which again can be accomplished by consuming 2 fatty fish meals (eg, anchovies, herring, salmon, sardines) per week, or this would be equivalent to 1 fish oil supplement per day. A reduction in triglycerides of 30% to 50% and an improvement in HDL require a total dosage of 3000 to 4000 mg of EPA and DHA per day, which requires a dietary supplement or prescription.[114] The message that will be missed by clinicians and patients in all of the hype and excitement to consume fish oil is the additional benefit of consuming the plant-based ω-3 fatty acids found in seeds, nuts, and oils. In one of the largest randomized trials of a high dietary source of plant ω-3 in patients with prostate cancer, researchers noted a significant increase in the marine ω-3 levels after consuming flaxseed.[78] Plant ω-3 (ALA) gets converted to marine ω-3 (mostly EPA) by the human body in larger quantities than researchers had realized from past studies, which suggests that diversity of ω-3 sources should be the primary goal for an optimal male health diet.

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 8

Adhere to heart-healthy lifestyle recommendations (numbers 1–7) because the emerging clinical data suggest that these recommendations precisely reflect the most effective male health prevention advice. It is the sum of what is accomplished in moderation that has the highest probability of affecting male health compared with just 1 or several extreme lifestyle changes.

A unique 2-year randomized trial from Italy of vigorous aerobic exercise and diet to improve ED should receive more clinical attention.[115,116] It should change the way health care professionals treat men with ED. A total of 110 obese men (BMI 36–37 kg/m^2; ie, morbidly obese), WHR of 1.01 to 1.02, age 43 years, with ED (ED score 13–14 out of 25 [IIEF]), and without diabetes, high cholesterol, or hypertension were included in this trial. A total of 55 men were

included in an aggressive-intervention group that involved caloric restriction and increased physical activity via personalized dietary counseling (Mediterranean-style diet), and regular appointments with a personal trainer. Another group of 55 men were in the control group and were given general educational information about exercise and healthy food choices. After 2 years, the BMI significantly decreased on average from 36.9 to 31.2 kg/m^2 in the intervention group, and serum levels of interleukin-6 and C-reactive protein (higher levels are potential indicators of more vascular inflammation) also decreased significantly. The average physical activity level increased significantly from 48 minutes per week to 195 minutes per week in the intervention group, and the mean erectile function score increased significantly from 13.9 to 17. A total of 17 men in the intervention group reported an erectile score of 22 or higher (normal function). Several changes were independently and significantly associated with a higher rate of improved erections, including a lower BMI or BMI reduction, increased physical activity, and lower C-reactive protein levels. Approximately 33% of the men in this study with ED regained normal erectile function after 2 years of following healthy behaviors primarily from exercise, weight reduction, caloric control, and healthy dietary changes. This clinical trial had 1 major limitation, which was the lack of examining the impact of psychological factors and social intervention, because these lifestyle changes could have improved mood, self-esteem, and reduced depression, and this could have also been a reason for improved erectile function. However, the combined healthy changes in the intervention group that occurred after 2 years were notable and diverse:

- Total caloric reduction of 390 calories/d (from 2340 to 1950 calories)
- Complex carbohydrate increase and simple sugar reduction
- Fiber consumption increased by 10 g a day (from 15 to 25 g)
- Protein consumption increased
- No change in the overall percentage of fat in the diet (30% of calories), but a reduction in saturated fat (from 14% to 9%) and an increased intake in monounsaturated fat (from 9% to 14%)
- Ratios of ω-6 to ω-3 fatty acids was reduced by half (from 12 to 6)
- Cholesterol was reduced from dietary sources by 84 mg/d (from 360 to 276 mg/d)
- Exercise time (mainly walking) increased from about 7 minutes/d to almost 30 minutes/d
- Average weight loss was 15 kg (from 102.8 to 87.8 kg)
- Average BMI decreased by almost 6 points (from 36.9 to 31.2 kg/m^2)
- WHR decreased by 0.09 (from 1.02 to 0.93)
- Erectile function scores increased by 3 points (from 13.9 to 17 points)
- Blood pressure decreased by 3 to 4 points; systolic from 127 to 124 mm Hg, and diastolic from 86 to 82 mm Hg
- Total cholesterol decreased by 11 mg/dL (from 213 to 202 mg/dL), but HDL (good cholesterol) increased by 9 points (from 39 to 48 mg/dL)
- Triglycerides decreased by 19 mg/dL (from 169 to 150 mg/dL)
- Glucose decreased by 8 mg/dL (from 103 to 95 mg/dL) and insulin level also decreased by 7 points (from 21 to 14 μU/mL)
- CRP was reduced by1.4 mg/L (from 3.3 to 1.9 mg/L)
- Interleukin-6 was reduced by 1.4 pg/mL (from 4.5–3.1 pg/mL)
- Interleukin-8 (IL-8, another inflammatory marker) was reduced by 1.2 pg/mL (from 5.3 to 4.1 pg/mL).

Other lifestyle modifications, including tobacco cessation, should be considered to reduce all-cause mortality including cancer,[117–120] and potentially to reduce the risk of specific male health conditions.[121] Moderate alcohol consumption, regardless of the source, also seems to reduce cardiovascular events,[122] and is part of the Mediterranean diet. However, alcohol follows a U-shaped curve, which is why, when consumed in excess, the detriments of alcohol outweigh the benefits.

Past general studies of men have shown that few (less than 5%) have reported adhering to numerous moderate healthy behaviors at one time.[123] Studies of combined moderate lifestyle changes continue to suggest that it is the sum of what is accomplished, rather than 1 or 2 specific behavioral changes, that can affect cardiovascular markers, CVD, cancer, and all-cause mortality.[124] Thus, I often use checklists derived and modified from the Mediterranean diet US study,[125] and the 52-countries study and other combined male lifestyle studies to ensure verve and compliance in patients.[126–130] These studies found that, regardless of race, age, genetics, and geographic location around the world, the ability to maintain numerous consistent features of lifestyle and/or diet was associated with a 85% to 95% reduced risk of a cardiovascular event, and similar behaviors and changes in other recent studies showed

Table 5
US Mediterranean diet study. Individuals with scores of 6 or more on the checklist had a lower risk of early mortality compared with those with scores of 4 or less. Review the checklist, and add up the points

Beverage or Food	Answer Yes or No (1 Point for Each Question Answered Yes and 0 Points for a No)
Alcohol: 2 drinks a day or less for men and 1 drink or less for women	
Fat intake focused on healthy fats, mostly monounsaturated and polyunsaturated (eg, canola, olive, safflower oil)	
Fish: at least 2 or more servings per week	
Fruit: 4 or more servings a day	
Legumes/beans: 2 or more servings a week	
Meat: 1 or less servings a day	
Nuts and seeds: 2 or more servings a week	
Vegetables (other than potatoes): 4 or more servings a day	
Whole grains (eg, whole grain/multigrain and whole wheat foods with large amount of fiber and protein): 2 or more servings a day	
Total score	

Note: Traditional Mediterranean diets also allow moderate intakes of dairy, such as cheese, milk, and yogurt.
Data from Moyad MA. Dr Moyad's no bogus science health advice. Ann Arbor (MI): Ann Arbor Media Group; 2009.

an improved ability to live beyond average life expectancy with minimal mental or physical morbidity. The critical characteristics in these individuals included behavioral changes with no commentary or benefit or detriment in taking a dietary supplement. **Table 5** is a modified checklist that I provide to individuals seeking to increase their odds or probability of living longer and better through dietary changes adapted from a Mediterranean diet.[48] Other checklists can be obtained from 2 other publications that are widely available to the clinician and patient.[48,64] How many men, or even colleagues, have all of these features or need to work on these changes? How many male health conditions could be prevented or improved with these heart-healthy changes?

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 9

Less is more. Multivitamins and vitamin D have the potential to be overrated and adult men who desire to consume these specific supplements should not take more than 1 children's multivitamin a day or an 800 to 1000 IU vitamin D supplement if found deficient on a reliable blood test.

Despite a lack of rigorous or even minimal scientific evidence, multivitamins are the largest selling and used supplements in the United States.[131] They are also the primary supplement used by men in notable prostate cancer screening studies,[132] male health prevention trials,[133] and by male physicians.[134] Why? Perhaps it is the perception compared with the reality of the evidence, but until some higher quality evidence finds some realistic benefit with these supplements, the potential for harm when taking them in excess is concerning.[135] For example, an increased risk of advanced and fatal prostate was found in one of the largest prospective epidemiologic studies of multivitamins, and the greater use of other supplements was also associated with an even greater risk.[136] Men with a family history of prostate cancer experienced the largest and most significant increased risks of this condition. Other large male observational studies have found similar results.[137,138] Some recent studies in breast cancer have mirrored these negative findings.[139,140] Multivitamins are also replete with higher doses of B vitamins, which have also recently been found to have no impact on health or increase the risk of prostate cancer in the largest and most recent meta-analysis of clinical trials.[141,142] Regardless of the side of the argument

that one supports, there is no consistent suggestion of benefit with a greater intake of multivitamins, and because there is a suggestion of either no impact or serious harm, it is prudent to wait for more clarity from more clinical studies.[143]

Some insight was provided in the Supplementation en Vitamines et Mineraux Antioxydants (SUVIMAX) randomized, placebo-controlled trial that included several vitamins and minerals at moderate or low dosages not usually used in clinical trials,[144] and commonly found in children's formulations. SUVIMAX was a randomized, double-blind, placebo-controlled primary prevention trial (participants were healthy at the start of the trial). A total of 13,017 French adults (7876 women aged 35–60 years and 5141 men aged 45–60 years) were included in this study. All of the individuals took either a placebo or a daily capsule that consisted of:

- 120 mg of vitamin C
- 30 mg of vitamin E
- 6 mg of β-carotene
- 100 μg of selenium
- 20 mg of zinc.

These individuals were followed for 7.5 years. Nothing remarkable occurred in the group as a whole, but men experienced a nonsignificant ($P = .54$) 18% reduction in ischemic cardiovascular risk, a significant ($P = .008$) 31% reduction in risk of being diagnosed with cancer, and a significant ($P = .02$) 37% reduction in the risk of dying from any cause. It seemed that taking a low-dose multivitamin minimally based formula could provide a potential benefit for some men. The researchers from this study suggested that men benefited because they had lower levels of these vitamins and minerals in their blood from less-than-optimal dietary patterns at the beginning of the study compared with the women, who consumed a more healthy diet on average. A follow-up secondary observation to this study (8.8–9 years) found that this multivitamin reduced the risk of prostate cancer by 48% in men with a low PSA (less than 3), but in men with a higher PSA, a multivitamin may have been associated with a higher risk of being diagnosed with prostate cancer.[145] Therefore, if a man has an increased PSA, he should be careful about taking dietary supplements to reduce risk. This multivitamin did not affect PSA or insulinlike growth factor levels, suggesting that risk was affected by other methods. Older age (average age of men, 51 years), higher BMI, and men with higher PSA levels also had a significantly increased risk for prostate cancer. Side effects from the low-dose multivitamin were similar to placebo. One limitation in this study was that no information was collected on family history of prostate cancer. Because this is arguably the best evidence to date for men's health and the consumption of a mixed supplement product, it would be wise not to take anything larger than a children's multivitamin per day until someone can show that more is better, which, as mentioned earlier, is not the case. In SUVIMAX, the ability for this low-dose pill to do harm in men (those with a high PSA) should not be dismissed. Waiting for the results of the first randomized US trial of adult men only (Physicians Health Study II) taking a daily multivitamin should be available soon,[146] and should provide more clarity in this currently nebulous situation.

Vitamin D seems fraught with as many issues as multivitamins. The tendency for patients to ingest more of this supplement is enticing but, in men's health, vitamin D has not been impressive and, in several studies, no impact or potential harm have been shown at higher blood levels.[147] There is little doubt that vitamin D is important for bone health, but in my opinion the amount needed has been embellished and exaggerated. Vitamin D tends to function like a hormone, which is why caution should be exercised because the potential for a U-shaped risk curve exists (similar to alcohol and other hormones) for male health.[148] During the time of submission of this article, one of the largest and longest randomized trials in women found that excessively high blood levels of vitamin D from supplementation compared with placebo was associated with an increased risk of falls and fractures.[149] In my opinion, the normal level of vitamin D should be from 30 to 40 ng/mL based on this study and expert opinion from a review of past clinical trials accessing multiple outcomes.[150] A total of 1000 IU (25 μg) of vitamin D is adequate to increase blood levels of vitamin D over time, and a suggestion of outright deficiency from consistent, reliable blood testing may lead to higher intakes. However, even vitamin D blood tests have a history of uncertainty based on the assay used.[151,152] Monitoring vitamin D in men, especially higher risk patients with bone loss, for example men on luteinizing hormone–releasing hormone medications for prostate cancer may be appropriate,[64] but, in general for men's health, the vitamin D test may provide more harm than good until more clinical endpoints are followed in healthy individuals.[152]

One additional point about vitamin D merits consideration. It could be that vitamin D blood levels are simply a marker of healthy behavior. A young, lean man, with low cholesterol who

consumes fish and exercises outside regularly is more likely to have a higher blood level of vitamin D compared with an older, physically inactive obese man with a high cholesterol level.[48] Is it really the vitamin D supplement providing the most benefit for men's health, or the finding that higher vitamin D levels could be found on average in more healthy men?

OPTIMAL MEN'S HEALTH DIET RECOMMENDATION 10

Cholesterol lowering through diet, lifestyle, medications (statins), and supplements is underrated and should potentially be considered to be the real so-called male multivitamin.

Statins should have been given a large clinical trial to prevent male health conditions compared with any dietary supplement or another drug based on the plethora of past evidence.[153–156] It could be argued that it is too difficult to conduct such a trial when a large proportion of men are already taking these medications, but this does not apply when using the JUPITER trial as the most recent example of the great potential impact on cardiovascular health when aggressive lipid lowering is accomplished in individuals who are in no apparent immediate need of such intervention.[157,158] In addition, emerging clinical data continue to support the use of cholesterol lowering as one of best potential methods of reducing the risk of aggressive prostate cancer,[159,160] which arguably makes this intervention the ideal potential male health preventive method. Ongoing research in other areas of men's health also support the use of cholesterol lowering to achieve optimal results.[161,162] Thus, if not cholesterol lowering through diet, exercise, supplements, and perhaps statin use, then what other agent provides a better risk/benefit ratio? Even if aggressive cholesterol lowering were found to be ineffective for specific male health conditions (BPH, ED, prostate cancer), but only reduced the risk of dying younger from all causes,[163] or only reduced the number 1 cause of death in men,[157] then I would be content with this finding.

SUMMARY

Other, simplistic dietary changes could have been proffered in this article, such as sodium reduction and increased amounts of sleep, but these and other changes should be addressed in another publication focused on overall health, regardless of gender.[48,64] In the meantime, why wait for any more recommendations, evidence, or even motivation? Clinicians have access to a wealth of data that suggest that an optimal male diet and overall program does exist to reduce the primary causes of morbidity and mortality in men, and many of these recommendations are outlined in this article. Whether it is incorporating moderation in terms of behavioral changes, or reducing or increasing dietary supplement or medication use, the time to triage men's health is now. Health care professionals must prioritize these changes in all aspects of their behavior and this has not been an easy task. Official treatment guidelines in urology need to focus as much on lifestyle changes and supplements that are, and are not, effective, as on other medical interventions. When this occurs, I believe patients will take our recommendations more seriously but, until that time, articles that continue to advocate an optimal health program may be a step in the right direction.

REFERENCES

1. Lloyd-Jones D, Adams RJ, Brown TM, et al. Heart disease and stroke statistics-2010 update: a report from the American Heart Association. Circulation 2010;121:e46–215.
2. Bonow RO, Smaha LA, Smith SC, et al. The international burden of cardiovascular disease: responding to the emerging epidemic. Circulation 2002; 106:1602–5.
3. World Heart Federation web site. Available at: http://www.world-heart-federation.org. Accessed March 20, 2010.
4. Eyre H, Kahn R, Robertson RM, et al. Preventing cancer, cardiovascular disease, and diabetes: a common agenda for the American Cancer Society, the American Diabetes Association, and the American Heart Association. Circulation 2004;109:3244–55.
5. Thompson IM, Goodman PJ, Tangen CM, et al. The influence of finasteride on the development of prostate cancer. N Engl J Med 2003;349:215–24.
6. Scardino PT. The prevention of prostate cancer-the dilemma continues. N Engl J Med 2003;349:297–9.
7. Reynolds T. Prostate cancer prevention trial yields positive results, but with a few cautions. J Natl Cancer Inst 2003;95:1030–1.
8. Kaplan SA, Roehrborn CG, Meehan AG, et al. PCPT: evidence that finasteride reduces risk of most frequently detected intermediate- and high-grade (Gleason score 6 and 7) cancer. Urology 2009;73:935–9.
9. Lippman SM, Klein EA, Goodman PJ, et al. Effect of selenium and vitamin E on risk of prostate cancer and other cancers: the Selenium and Vitamin E Cancer Prevention Trial (SELECT). JAMA 2009;301:39–51.
10. Nash IS, Mosca L, Blumenthal RS, et al. Contemporary awareness and understanding of cholesterol

as a risk factor: results of an American Heart Association National Survey. Arch Intern Med 2003;163: 1597–600.
11. Hickey A, O'Hanlon A, McGee H, et al. Stroke awareness in the general population: knowledge of stroke risk factors and warning signs in older adults. BMC Geriatr 2009;9:35.
12. The Expert Panel. Executive summary of the Third Report of the National Cholesterol Education Program (NCEP). Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001;285: 2486–98.
13. Grundy SM, Cleeman JI, Marz NB, et al. Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Circulation 2004;110:227–39.
14. Ketchandji M, Kuo YF, Shahinian VB, et al. Cause of death in older men after the diagnosis of prostate cancer. J Am Geriatr Soc 2009;57:24–30.
15. Centers for Disease Control and Prevention (CDC). Prevalence of abnormal lipid levels among youths-United States, 1999-2006. MMWR Morb Mortal Wkly Rep 2010;59:29–33.
16. Ridker PM. Clinical application of C-reactive protein for cardiovascular disease detection and prevention. Circulation 2003;107:363–9.
17. Ridker PM, Cannon CP, Morrow D, et al. C-reactive protein levels and outcomes after statin therapy. N Engl J Med 2005;352:20–8.
18. Chang ST, Chu CM, Hsu JT, et al. Independent determinants of coronary artery disease in erectile dysfunction patients. J Sex Med 2010;7(4 Pt 1): 1478–87.
19. Kraus WE, Houmard JA, Duscha BD, et al. Effects of the amount and intensity of exercise on plasma lipoproteins. N Engl J Med 2002;347:1483–92.
20. Hammarsten J, Hogstedt B. Hyperinsulinaemia as a risk factor for developing benign prostatic hyperplasia. Eur Urol 2001;39:151–8.
21. Chobanian AV, Bakris GL, Black HR, et al. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension 2003; 42:1206–52.
22. Whelton SP, Chin A, Xin X, et al. Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials. Ann Intern Med 2002;136:493–503.
23. Ponholzer A, Temmi C, Mock K, et al. Prevalence and risk factors for erectile dysfunction in 2869 men using a validated questionnaire. Eur Urol 2005;47:80–5.
24. Strijk JE, Proper KI, Klaver L, et al. Associations between VO_2max and vitality in older workers: a cross-sectional study. BMC Public Health 2010; 10:684.
25. Blair SN, Morris JN. Healthy hearts-and the universal benefits of being physically active: physical activity and health. Ann Epidemiol 2009;19: 253–6.
26. Moyad MA. Current methods used for defining, measuring, and treating obesity. Semin Urol Oncol 2001;19:247–56.
27. Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the Women's Health Initiative randomized controlled trial. JAMA 2002;288:321–33.
28. Shike M, Latkany L, Riedel E, et al. Lack of effect of a low-fat, high-fruit, -vegetable, and -fiber diet on serum prostate-specific antigen of men without prostate cancer: results from a randomized trial. J Clin Oncol 2002;20:3592–8.
29. Pischon T, Boeing H, Hoffmann K, et al. General and abdominal adiposity and risk of death in Europe. N Engl J Med 2008;359:2105–20.
30. Jacobs EJ, Newton CC, Wang Y, et al. Waist circumference and all-cause mortality in a large US cohort. Arch Intern Med 2010;170:1293–301.
31. Zhu S, Heymsfield SB, Toyoshima H, et al. Race-ethnicity-specific waist circumference cutoffs for identifying cardiovascular disease risk factors. Am J Clin Nutr 2005;81:409–15.
32. Taylor EN, Stampfer MJ, Curhan GC. Obesity, weight gain, and the risk of kidney stones. JAMA 2005;293:455–62.
33. Moyad MA. Obesity, interrelated mechanisms, and exposures and kidney cancer. Semin Urol Oncol 2001;19:270–9.
34. Riedner CE, Rhoden EL, Ribeiro EP, et al. Central obesity is an independent predictor of erectile dysfunction in older men. J Urol 2006;176:1519–23.
35. Bacon CG, Mittleman MA, Kawachi I, et al. Sexual function in men older than 50 years of age: results from the Health Professionals Follow-up Study. Ann Intern Med 2003;139:161–8.
36. Walczak MK, Lokhandwala N, Hodge MB, et al. Prevalence of cardiovascular risk factors in erectile dysfunction. J Gend Specif Med 2002; 5:19–24.
37. Khoo J, Piantadosi C, Worthley S, et al. Effects of low-energy diet on sexual function and lower urinary tract symptoms in obese men. Int J Obes 2010;34:1396–403.
38. Giovannucci EL, Liu Y, Leitzmann MF, et al. A prospective study of physical activity and incident and fatal prostate cancer. Arch Intern Med 2005;165:1005–10.
39. Tanasescu M, Leitzmann MF, Rimm EB, et al. Exercise type and intensity in relation to coronary heart disease in men. JAMA 2002;288:1994–2000.
40. Poehlman ET, Melby C. Resistance training and energy balance. Int J Sport Nutr 1998;8:143–59.

41. Braith RW, Stewart KJ. Resistance exercise training: its role in the prevention of cardiovascular disease. Circulation 2006;113:2642–50.
42. Hurley BF, Roth SM. Strength training in the elderly. Sports Med 2000;30:249–68.
43. Platz EA, Kawachi I, Rimm EB, et al. Physical activity and benign prostatic hyperplasia. Arch Intern Med 1998;158:2349–56.
44. Blake H, Mo P, Malik S, et al. How effective are physical activity interventions for alleviating depressive symptoms in older people? A systematic review. Clin Rehabil 2009;23:873–87.
45. Deslandes A, Moraes H, Ferreira C, et al. Exercise and mental health: many reasons to move. Neuropsychobiology 2009;59:191–8.
46. Blumenthal JA, Babyak MA, Moore KA, et al. Effects of exercise training on older patients with major depression. Arch Intern Med 1999;159:2349–56.
47. Babyak M, Blumenthal JA, Herman S, et al. Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. Psychosom Med 2000;62:633–8.
48. Moyad MA. Dr Moyad's no bogus science health advice. Ann Arbor (MI): Ann Arbor Media Group; 2009.
49. Yu JN, Cunningham JA, Rosenberg Thouin S, et al. Hyperlipidemia. Prim Care 2000;27:541–87.
50. Ornish D, Weidner G, Fair WR, et al. Intensive lifestyle changes may affect the progression of prostate cancer. J Urol 2005;174:1065–9.
51. Siri-Tarino PW, Sun Q, Hu FB, et al. Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease. Am J Clin Nutr 2010;91:535–46.
52. Yamagishi K, Iso H, Yatsuya H, et al. Dietary intake of saturated fatty acids and mortality from cardiovascular disease in Japanese: the Japan Collaborative Cohort Study for Evaluation of Cancer Risk (JACC) Study. Am J Clin Nutr 2010;92:759–65.
53. Mozaffarian D, Micha R, Wallace S. Effects of coronary heart disease of increasing polyunsaturated fat in place of saturated fat: a systematic review and meta-analysis of randomized controlled trials. PLoS Med 2010;7:e1000252.
54. Giovannucci E. Tomatoes, tomato-based products, lycopene, and cancer: review of the epidemiologic literature. J Natl Cancer Inst 1999;91:317–31.
55. Moyad MA. The ABCs of nutrition and supplements for prostate cancer. Ann Arbor (MI): JW Edwards Publishers; 2000.
56. Available at: www.usda.gov. Accessed October 25, 2010.
57. Cohen JH, Kristal AR, Stanford JL. Fruit and vegetable intakes and prostate cancer risk. J Natl Cancer Inst 2000;92:61–8.
58. Kristal AR, Lampe JW. Brassica vegetables and prostate cancer risk: a review of the epidemiological evidence. Nutr Cancer 2002;42:1–9.
59. Hsing AW, Chokkalingam AP, Gao YT, et al. Allium vegetables and risk of prostate cancer: a population-based study. J Natl Cancer Inst 2002;94:1648–51.
60. Walker C, Reamy BV. Diets for cardiovascular disease prevention: what is the evidence? Am Fam Physician 2009;79:571–8.
61. Boffetta P, Couto E, Wichmann J, et al. Fruit and vegetable intake and overall cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC). J Natl Cancer Inst 2010;102:1–9.
62. Pantuck AJ, Leppert JT, Zomorodian N, et al. Phase II study of pomegranate juice for men with rising prostate-specific antigen following surgery or radiation for prostate cancer. Clin Cancer Res 2006;12(13):4018–26.
63. Forest CP, Padma-Nathan H, Liker HR. Efficacy and safety of pomegranate juice on improvement of erectile dysfunction in male patients with mild to moderate erectile dysfunction: a randomized, placebo-controlled, double-blind, cross-over study. Int J Impot Res 2007;19:564–7.
64. Moyad MA. Promoting wellness for prostate cancer patients. 3rd edition. Ann Arbor (MI): Ann Arbor Media Group; 2010.
65. Uno T, Yasui-Furukori N. Effect of grapefruit juice in relation to human pharmacokinetic study. Curr Clin Pharmacol 2006;1:157–61.
66. Komperda KE. Potential interaction between pomegranate juice and warfarin. Pharmacotherapy 2009;29:1002–6.
67. Van Horn L. Fiber, lipids, and coronary heart disease. Nutrition Committee advisory. Circulation 1997;95:2701–4.
68. Brown L, Rosner B, Willett WW, et al. Cholesterol-lowering effects of dietary fiber: a meta-analysis. Am J Clin Nutr 1999;69:30–42.
69. Pereira MA, O'Reilly E, Augustsson K, et al. Dietary fiber and risk of coronary heart disease: a pooled analysis of cohort studies. Arch Intern Med 2004;164:370–6.
70. Pietinen P, Rimm EB, Korhonen P, et al. Intake of dietary fiber and risk of coronary heart disease in a cohort of Finnish men: the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study. Circulation 1996;94:2720–7.
71. Rimm EB, Ascherio A, Giovannucci E, et al. Vegetable, fruit, and cereal fiber intake and risk of coronary heart disease among men. JAMA 1996;275:447–51.
72. Moreyra AE, Wilson AC, Koraym A. Effect of combining psyllium fiber with simvastatin in lowering cholesterol. Arch Intern Med 2005;165:1161–6.
73. Streppel MT, Arends LR, van't Veer P, et al. Dietary fiber and blood pressure: a meta-analysis of randomized placebo-controlled trials. Arch Intern Med 2005;165:150–6.

74. Marlett JA, McBurney MI, Slavin JL, et al. Position of the American Dietetic Association: health implications of dietary fiber. J Am Diet Assoc 2002; 102:993–1000.
75. Pan A, Yu D, Demark-Wahnefried W, et al. Meta-analysis of the effects of flaxseed interventions on blood lipids. Am J Clin Nutr 2009;90:288–97.
76. Demark-Wahnefried W, Price DT, Polascik TJ, et al. Pilot study of dietary fat restriction and flaxseed supplementation in men with prostate cancer before surgery: exploring the effects on hormonal levels, prostate-specific antigen, and histopathologic features. Urology 2001;58:47–52.
77. Demark-Wahnefried W, Robertson CN, Walther PJ, et al. Pilot study to explore effects of low-fat, flaxseed-supplemented diet on proliferation of benign prostatic epithelium and prostate-specific antigen. Urology 2004;63:900–4.
78. Demark-Wahnefried W, Polascik TJ, George SL, et al. Flaxseed supplementation (not dietary fat restriction) reduces prostate cancer proliferation rates in men presurgery. Cancer Epidemiol Biomarkers Prev 2008;17:3577–87.
79. Zhang W, Wang X, Liu Y, et al. Effects of dietary flaxseed lignan extract on symptoms of benign prostatic hyperplasia. J Med Food 2008;11:207–14.
80. Anderson JW, Baird P, Davis RH Jr, et al. Health benefits of dietary fiber. Nutr Rev 2009;67:188–205.
81. Morris MC, Evans DA, Bienias JL, et al. Consumption of fish and n-3 fatty acids and risk of incident Alzheimer disease. Arch Neurol 2003;60:940–6.
82. Bucher HC, Hengstler P, Schindler C, et al. N-3 polyunsaturated fatty acids in coronary heart disease: a meta-analysis of randomized controlled trials. Am J Med 2002;112:298–304.
83. Kris-Etherton PM, Harris WS, Appel LJ, et al. Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease. Circulation 2002;106:2747–57.
84. Harris WS. N-3 fatty acids and serum lipoproteins: human studies. Am J Clin Nutr 1997;65(Suppl 5): 1645S–54S.
85. Morris MC, Sacks F, Rosner B. Does fish oil lower blood pressure? A meta-analysis of controlled trials. Circulation 1993;88:523–33.
86. Mori TA, Beilin LJ, Burke V, et al. Interactions between dietary fat, fish, and fish oils and their effects on platelet function in men at risk of cardiovascular disease. Arterioscler Thromb Vasc Biol 1997;17:279–86.
87. Christensen JH, Korup E, Aaroe J, et al. Fish consumption, n-3 fatty acids in cell membranes, and heart rate variability in survivors of myocardial infarction with left ventricular dysfunction. Am J Cardiol 1997;79:1670–3.
88. Leaf A, Kang JX, Xiao YF, et al. Clinical prevention of sudden cardiac death by n-3 polyunsaturated fatty acids and mechanism of prevention of arrhythmias by n-3 fish oils. Circulation 2003;107: 2646–52.
89. Albert CM, Campos H, Stampfer MJ, et al. Blood levels of long-chain n-3 fatty acids and the risk of sudden death. N Engl J Med 2002;346:1113–8.
90. Kromhout D. Fish consumption and sudden cardiac death. JAMA 1998;279:65–6.
91. Moyad MA. An introduction to dietary/supplemental omega-3 fatty acids for general health and prevention: Part I. Urol Oncol 2005;23:28–35.
92. Moyad MA. An introduction to dietary/supplemental omega-3 fatty acids for general health and prevention: part II. Urol Oncol 2005;23:36–48.
93. Augustsson K, Michaud DS, Rimm EB, et al. A prospective study of intake of fish and marine fatty acids and prostate cancer. Cancer Epidemiol Biomarkers Prev 2003;12:64–7.
94. Yang YJ, Lee SH, Hong SJ, et al. Comparison of fatty acid profiles in the serum of patients with prostate cancer and benign prostatic hyperplasia. Clin Biochem 1999;32:405–9.
95. Szymanski KM, Wheeler DC, Mucci LA. Fish consumption and prostate cancer risk: a review and meta-analysis. Am J Clin Nutr 2010;92:1223–33.
96. Burr ML, Fehily AM, Gilbert JF, et al. Effects of changes in fat, fish, and fibre intakes on death and myocardial reinfarction: Diet and Reinfarction Trial (DART). Lancet 1989;2:757–61.
97. GISSI-Prevenzione Investigators. Dietary supplementation with n-3 polyunsaturated fatty acids and vitamin E after myocardial infarction: results from the GISSI-Prevenzione trial. Lancet 1999;354:447–55.
98. Marchioli R, Barzi F, Bomba E, et al. Early protection against sudden cardiac death by n-3 polyunsaturated fatty acids after myocardial infarction: time-course analysis of the results of the Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardico (GISSI)-Prevenzione. Circulation 2002;105:1897–903.
99. Yokoyama M, Origasa H, Matsuzaki M, et al. Effects of eicosapentaenoic acid on major coronary events in hypercholesterolaemic patients (JELIS): a randomized open-label, blinded endpoint analysis. Lancet 2007;369:1090–8.
100. Guallar E, Sanz-Gallardo MI, van't Veer P, et al. Mercury, fish oils, and the risk of myocardial infarction. N Engl J Med 2002;347:1747–54.
101. Yoshizawa K, Rimm EB, Morris JJ, et al. Mercury and the risk of coronary heart disease in men. N Engl J Med 2002;347:1755–60.
102. Weil M, Bressler J, Parsons P, et al. Blood mercury levels and neurobehavioral function. JAMA 2005; 293:1875–82.
103. DeRouen TA, Martin MD, Leroux BG, et al. Neurobehavioral effects of dental amalgam in children: a randomized clinical trial. JAMA 2006; 295:1784–92.

104. Kris-Etherton PM, Harris WS, Appel LJ, et al. Omega-3 fatty acids and cardiovascular disease: new recommendations from the American Heart Association. Arterioscler Thromb Vasc Biol 2003; 23:151–2.
105. Albert CM, Gaziano JM, Willett WC, et al. Nut consumption and decreased risk of sudden cardiac death in the physicians' health study. Arch Intern Med 2002;162:1382–7.
106. Ellsworth JL, Kushi LH, Folsom AR. Frequent nut intake and risk of death from coronary heart disease and all causes in postmenopausal women: the Iowa Women's Health Study. Nutr Metab Cardiovasc Dis 2001;11:372–7.
107. Hu FB, Willett WC. Optimal diets for prevention of coronary heart disease. JAMA 2002;288:2569–78.
108. Hu FB, Stampfer MJ, Manson JE, et al. Frequent nut consumption and risk of coronary heart disease: prospective cohort study. BMJ 1998;317:1341–5.
109. Fraser GE, Shavlik DJ. Risk factors for all-cause and coronary heart disease mortality in the oldest-old: the Adventist Health Study. Arch Intern Med 1997;157:2249–58.
110. Fraser GE, Sabate J, Beeson WL, et al. A possible protective effect of nut consumption on risk of coronary heart disease: the Adventist Health Study. Arch Intern Med 1992;152:1416–24.
111. Sabate J, Wien M. Nuts, blood lipids and cardiovascular disease. Asia Pac J Clin Nutr 2010;19: 131–6.
112. Casas-Agustench P, Bullo M, Salas-Salvado J. Nuts, inflammation and insulin resistance. Asia Pac J Clin Nutr 2010;19:124–30.
113. Bjerregaard LJ, Joensen AM, Dethlefsen C, et al. Fish intake and acute coronary syndrome. Eur Heart J 2010;31:29–34.
114. O'Keefe JH, Carter MD, Lavie CJ. Primary and secondary prevention of cardiovascular diseases: a practical evidence-based approach. Mayo Clin Proc 2009;84:741–57.
115. Esposito K, Giugliano F, Di Palo C, et al. Effect of lifestyle changes on erectile dysfunction in obese men. JAMA 2004;291(24):2978–84.
116. Giugliano D, Giugliano F, Esposito K. Sexual dysfunction and the Mediterranean diet. Public Health Nutr 2006;9:1118–20.
117. Critchley JA, Capewell S. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review. JAMA 2003;290:86–97.
118. Plaskon LA, Penson DF, Vaughan TL, et al. Cigarette smoking and risk of prostate cancer in middle-aged men. Cancer Epidemiol Biomarkers Prev 2003;12:604–9.
119. Roberts WW, Platz EA, Walsh PC. Association of cigarette smoking with extraprostatic prostate cancer in young men. J Urol 2003;169:512–6.
120. Rodriguez C, Tatham LM, Thun MJ, et al. Smoking and fatal prostate cancer in a large cohort of adult men. Am J Epidemiol 1997;145:466–75.
121. Horasanli K, Boylu U, Kendirci M, et al. Do lifestyle changes work for improving erectile function? Asian J Androl 2008;10:28–35.
122. Mukamal KJ, Conigrave KM, Mittleman MA, et al. Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men. N Engl J Med 2003;348:109–18.
123. Platz EA, Willet WC, Colditz GA, et al. Proportion of colon cancer risk that might be preventable in a cohort of middle-aged US men. Cancer Causes Control 2000;11:579–88.
124. Trichopoulou A, Costacou T, Bamia C, et al. Adherence to a Mediterranean diet and survival in a Greek population. N Engl J Med 2003;348:2599–608.
125. Mitrou PN, Kipnis V, Thiebaut AC, et al. Mediterranean dietary pattern and prediction of all-cause mortality in a U.S. population: results from the NIH-AARP Diet and Health Study. Arch Intern Med 2007;167:2461–8.
126. Yusuf S, Hawken S, Ounpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet 2004; 364:937–52.
127. Joshi P, Islam S, Pais P, et al. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. JAMA 2007; 297:286–94.
128. Wilcox BJ, He Q, Chen R, et al. Midlife risk factors and healthy survival in men. JAMA 2006;296:2343–50.
129. Yates LB, Djousse L, Kurth T, et al. Exceptional longevity in men: modifiable factors associated with survival and function to age 90 years. Arch Intern Med 2008;168:284–90.
130. Terry DF, Pencina MJ, Vasan RS, et al. Cardiovascular risk factors predictive for survival and morbidity-free survival in the oldest-old Framingham Heart Study participants. J Am Geriatr Soc 2005;53:1944–50.
131. Rock CL. Multivitamin-multimineral supplements: who uses them? Am J Clin Nutr 2007;85(Suppl): 277S–9S.
132. Barqawi A, Gamito E, O'Donnell C, et al. Herbal and vitamin supplement use in a prostate cancer screening population. Urology 2004;63:288–92.
133. Kristal AR, Arnold KB, Schenk JM, et al. Dietary patterns, supplement use, and the risk of symptomatic benign prostatic hyperplasia: results from the Prostate Cancer Prevention Trial. Am J Epidemiol 2008;167:925–34.
134. Muntwyler J, Hennekens CH, Manson JE, et al. Vitamin supplement use in a low-risk population of US male physicians and subsequent cardiovascular mortality. Arch Intern Med 2002;162:1472–6.

135. Giovannucci E, Chan AT. Role of vitamin and mineral supplementation and aspirin use in cancer survivors. J Clin Oncol 2010;28:4081–5.
136. Lawson KA, Wright ME, Subar A, et al. Multivitamin use and risk of prostate cancer in the National Institutes of Health-AARP Diet and Health Study. J Natl Cancer Inst 2007;99:754–64.
137. Stevens VL, McCullough ML, Diver WR, et al. Use of multivitamins and prostate cancer mortality in a large cohort of US men. Cancer Causes Control 2005;16:643–50.
138. Neuhouser ML, Barnett MJ, Kristal AR, et al. Dietary supplement use and prostate cancer risk in the Carotene and Retinol Efficacy Trial. Cancer Epidemiol Biomarkers Prev 2009;18:2202–6.
139. Larsson SC, Akesson A, Bergkvist L, et al. Multivitamin use and breast cancer incidence in a prospective cohort of Swedish women. Am J Clin Nutr 2010;91:1268–72.
140. Berube S, Diorio C, Brisson J. Multivitamin-multimineral supplement use and mammographic breast density. Am J Clin Nutr 2008;87:1400–4.
141. Clarke R, Halsey J, Lewington S, et al. Effects of lowering homocysteine levels with B vitamins on cardiovascular disease, cancer, and cause-specific mortality. Arch Intern Med 2010;170:1622–31.
142. Collin SM, Metcalfe C, Refsum H, et al. Circulating folate, vitamin B12, homocysteine, vitamin B12 transport proteins, and risk of prostate cancer: a case-control study, systematic review, and meta-analysis. Cancer Epidemiol Biomarkers Prev 2010;19:1632–42.
143. Ng K, Meyerhardt JA, Chan JA, et al. Multivitamin use is not associated with cancer recurrence or survival in patients with stage III colon cancer: findings from CALGB 89803. J Clin Oncol 2010;28:4354–63.
144. Hercberg S, Galan P, Preziosi P, et al. The SU.VI.MAX study: a randomized, placebo-controlled trial of the health effects of antioxidant vitamins and minerals. Arch Intern Med 2004;164:2335–42.
145. Meyer F, Galan P, Douville P, et al. Antioxidant vitamin and mineral supplementation and prostate cancer prevention in the SU.VI.MAX trial. Int J Cancer 2005;116:182–6.
146. Christen WG, Gaziano JM, Hennekens CH. Design of Physicians' Health Study II-a randomized trial of beta-carotene, vitamins E and C, and multivitamins, in prevention of cancer, cardiovascular disease, and eye disease, and review of results of completed trials. Ann Epidemiol 2000;10:125–34.
147. Barnett CM, Nielson CM, Shannon J, et al. Serum 25-OH vitamin D levels and risk of developing prostate cancer in older men. Cancer Causes Control 2010;21:1297–303.
148. Michaelsson K, Baron JA, Snellman G, et al. Plasma vitamin D and mortality in older men: a community-based prospective cohort study. Am J Clin Nutr 2010;92:841–8.
149. Sanders KM, Stuart AL, Williamson EJ, et al. Annual high-dose oral vitamin D and falls and fractures in older women. JAMA 2010;303:1815–22.
150. Bischoff-Ferrari HA, Giovannucci E, Willett WC, et al. Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. Am J Clin Nutr 2006;84:18–28.
151. Zerwekh JE. Blood biomarkers of vitamin D status. Am J Clin Nutr 2008;87(Suppl):1087S–91S.
152. Isenor JE, Ensom MH. Is there a role for therapeutic drug monitoring of vitamin D level as a surrogate marker for fracture risk. Pharmacotherapy 2010;30:254–64.
153. Moyad MA. Why a statin and/or another proven heart healthy agent should be utilized in the next major cancer chemoprevention trial: part I. Urol Oncol 2004;22:466–71.
154. Moyad MA. Why a statin and/or another proven heart healthy agent should be utilized in the next major cancer chemoprevention trial: part II. Urol Oncol 2004;22:472–7.
155. Moyad MA. Heart healthy equals prostate healthy equals statins: the next cancer chemoprevention trial. Part I. Curr Opin Urol 2005;15:1–6.
156. Moyad MA. Heart healthy equals prostate healthy equals statins: the next cancer chemoprevention trial. Part II. Curr Opin Urol 2005;15:7–12.
157. Ridker PM, Danielson E, Fonseca FA, et al. Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. N Engl J Med 2008;359:2195–207.
158. Everett BM, Glynn RJ, MacFadyen JG, et al. Rosuvastatin in the prevention of stroke among men and women with elevated levels of C-reactive protein: Justification for the Use of Statins in Prevention: an Intervention Trial Evaluating Rosuvastatin (JUPITER). Circulation 2010;121:143–50.
159. Platz EA, Till C, Goodman PJ, et al. Men with low serum cholesterol have a lower risk of high-grade prostate cancer in the placebo arm of the Prostate Cancer Prevention Trial. Cancer Epidemiol Biomarkers Prev 2009;18:2807–13.
160. Murtola TJ, Visakorpi T, Lahtela J, et al. Statins and prostate cancer prevention: where we are now and future directions. Nat Clin Pract Urol 2008;5:376–87.
161. St Sauver JL, Jacobsen SJ, Jacobson DJ, et al. Statin use and decreased risk of benign prostatic enlargement and lower urinary tract symptoms. BJU Int 2011;107(3):443–50.
162. Dadkhah F, Safarinejad MR, Asgari MA, et al. Atorvastatin improves the response to sildenafil in hypercholesterolemic men with erectile dysfunction and not initially responsive to sildenafil. Int J Impot Res 2010;22:51–60.
163. Katz MS, Carroll PR, Cowan JE, et al. Association of statin and nonsteroidal anti-inflammatory drug use with prostate cancer outcomes: results from CaPSURE. BJU Int 2010;106:627–32.