



## Discussion

## Screening for unhealthy diet and exercise habits: The electronic health record and a healthier population

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## ABSTRACT

The US spends more money than any other country in the world on health care but does not have the best health outcomes. Most healthcare dollars are spent on treatment of preventable chronic conditions including heart disease, hypertension, diabetes, hypertension, and obesity. Many recent studies have shown that a poor diet and low cardiorespiratory fitness are associated with significant morbidity and an increased risk of all-cause mortality. There is evidence that those with higher cardiorespiratory fitness have lower annual healthcare costs. Despite continued research on the essential role of diet and exercise in optimal health, these vital health behaviors have been slow to change in the US population and do not receive adequate attention. We propose more objective screening, visible and monitored in the Electronic Health Record, to improve awareness, help educate patients, and monitor their progress over time. It would also help identify those individuals that would benefit from referral to interventional behavioral resources in the clinic and community. With an increased focus on preventive and population health measures, now is an ideal time to include both exercise and diet in health metrics. A few relatively simple changes could prompt providers to assess and educate patients about nutrition and fitness and promote a healthier population.

### 1. Introduction

Despite spending more money than any other country in the world on health care, the US does not have the best health outcomes (Papanicolaos et al., 2018). Approximately 80% of US healthcare dollars are spent on treatment of preventable chronic conditions such as heart disease, hypertension, diabetes, and obesity (CDC, 2018). In contrast, less than 3% of healthcare dollars are spent on disease prevention and public health (Himmelstein and Woolhandler, 2016). Increasingly, data support the vital role of nutrition and fitness for optimal health and prevention of many chronic illnesses. Recent changes in the health care landscape lend to a re-emphasis on preventive behavioral health measures. Medicare's accountable care organizations provide incentive for providers and health systems to reduce costs and improve the health of populations and the Electronic Health Record (EHR) provides better accounting of health metrics. With an increased focus on preventive and population health measures, now is the time to include both exercise and nutrition in health metrics.

### 2. The time is now

The current practice environment presents an ideal opportunity to

increase the medical communities focus on nutrition and exercise. We track screening tests for cancer with Pap/HPV tests, mammograms, and colonoscopies. We monitor screening for HIV, depression, diabetes, and hyperlipidemia. The EHR provides reminders of these metrics, visible in a patient's chart, with deficiencies easily identified at any clinic visit. Where are the metrics for nutrition and physical activity/exercise?

### 3. Fitness

There is an inverse relationship between level of fitness and adverse health outcomes. Individuals who are less fit have higher rates of cardiovascular disease (CVD), type 2 diabetes, stroke, hypertension, specific cancers, and all-cause mortality. It has been found that each 1-MET (metabolic equivalent) increase in cardiorespiratory fitness (CRF) was associated with a 10–25% reduction in mortality (Ross et al., 2016). The biggest gains are made in helping an inactive person become minimally active. Unfortunately, growing information on the important role of fitness has not resulted in significant behavioral change. Currently, only about 20% of US adults meet the recommended physical activity guidelines (Office of Disease Prevention and Health Promotion, 2018).

Quantifying an individual's fitness based on their history of physical

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activity and formal exercise can be difficult. Many factors (type, intensity, duration, frequency) are involved and people tend to overestimate their exercise. At a minimum, we should be tracking patient's exercise annually and providing feedback on their performance compared to recommended levels.

1. On average, how many minutes do you spend doing aerobic exercise weekly (walking, running, biking, and other aerobic activities)?
2. On average, how many times a week do you do resistance or strengthening exercises?

Patients not meeting recommended standards of 150 min of moderate-intensity aerobic exercise or 75 min of vigorous exercise and 2 sessions of resistance exercise per week (Piercy et al., 2018), could be referred to health team members or community resources for education, fitness classes, physical therapy, or cardiac/pulmonary rehabilitation as appropriate.

But we should go further and objectively evaluate an individual's CRF. Several brief tests have been shown to accurately reflect CRF including the 6-min walk test (Beatty et al., 2012), the 3-min squat test (Guo et al., 2018) and the 5-min treadmill test (de Lannoy et al., 2018). These tests can be performed by a variety of health team members and may provide valuable feedback to patients. The choice of testing could be tailored to the individual patient and available resources.

Ideally, exercise testing at periodic intervals could be used to assess the CRF of an individual and track their progress. This objective information may provide motivation for patients, help tailor fitness counseling, and improve referral to available resources. Just as patients focus on improving their LDL or HgA1c, they would be able to focus on an individualized CRF goal which could be far more meaningful for overall health than surrogate lab markers.

#### 4. Nutrition

Poor quality diet was the leading risk factor for the most deaths in the US in 2016 (US Burden of Disease Collaborators, 2018). Two thirds of adults are either overweight or obese and often are trying to lose weight. Patients are bombarded with conflicting information about diets from multiple sources (internet, newspaper, TV) so it is difficult for patients to know what to eat. Luckily, the type of diet most supportive of optimal health has become clearer in the past few years. The message should be simple and straightforward. A diet should be plant-based including vegetables, fruits, whole grains, legumes, and nuts, with modest amounts of eggs, dairy, fish, and meat, while minimizing consumption of processed foods and added sugar. These dietary principles can be applied to a wide range of cultural and food preferences (US Department of Health and Human Services, 2015; WHO, 2018).

A plant-based diet is associated with lower levels of total cholesterol, LDL cholesterol, glucose, and BMI (Dinu et al., 2017). High animal protein intake is inversely associated with both all-cause and CV mortality (Song et al., 2016). High added sugar consumption can lead to a significant increase in risk of CV mortality (Yang et al., 2014).

In PREDIMED (Primary Prevention of Cardiovascular Disease with a Mediterranean Diet), a recent large trial, participants at increased risk for vascular disease randomized to a Mediterranean diet supplemented with olive oil or nuts experienced roughly 30% fewer CV events over almost 5 years compared to a low-fat diet (Estruch et al., 2013). This reduction is similar to reductions in CV events seen in both primary and secondary prevention trials using statins.

It is important that primary care provider teams screen for poor eating habits which are common in the population. Unfortunately, there are no brief, standardized, validated screening tools for diet in primary care. Based on the Dietary Guidelines for Americans (US Department of Health and Human Services, 2015) and the World Health Organization's Healthy Diet (WHO, 2018), we propose a screening tool for the EHR.

The screening would be two simple questions:

1. How often do you eat 5 or more fruits/vegetable servings a day?

0-1 days a week	3
2-3 days a week	2
4-5 days a week	1
6-7 days a week	0

2. How often do you consume sugary food/drinks? Examples are dessert, candy or sweetened drinks (juice, sweetened coffee, soda)

0-1 days a week	0
2-3 days a week	1
4-5 days a week	2
6-7 days a week	3

A combined score of 3 or greater would then prompt further counseling whether it be by a provider, nurse, nutritionist, web based educational site, or community resource. Also, these screening questions need not be done by the primary care provider but could be done by a medical assistant, other healthcare team member, or the patient themselves.

#### 5. Cost

Are the costs involved in efforts to improve patient behavior worth the investment? Better diet and exercise habits lead to better health, but we do not have cost analysis data to adequately answer this question. There is no doubt that the cost of treating preventable medical conditions is high, accounting for most of US healthcare spending. Over 215,000 bariatric surgeries were performed in 2016, a number that has been increasing yearly since 2002 (Johnson et al., 2016). Bariatric surgical costs range from \$18,000 to \$35,000 and do not include expenses for post-op complications, lab testing and clinic visits incurred over a lifetime. Approximately one million angioplasties and 400,000 cardiac bypass surgeries are done each year for cardiovascular disease (Alexander and Smith, 2016). The average cost for a hospitalization for a coronary artery bypass graft procedure in 2014 was \$42,000. Over 30 million people in the US have diabetes and one in four health care dollars is spent on their care (American Diabetes Association, 2018). Evidence suggests that significant savings can result from better care of low-risk patients (McWilliams et al., 2017) and some cost information is available regarding exercise interventions. Recently, Meyers determined that individuals with greater CRF have lower health care costs (Meyers et al., 2018). This study looked at CRF expressed as a percentage of age-predicted peak MET achieved. They found that each 1 MET increment in fitness was associated with a \$1592 annual reduction in health care costs.

Although at this time not all insurance companies cover the cost of behavioral counseling interventions, hopefully this will change with the current emphasis on population health. The Affordable Care Act mandated that their private health plans cover preventive services that were identified by the U.S. Preventive Services Task Force. These include referring adults who are overweight or obese and have additional cardiovascular disease risk factors to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention.

#### 6. Maintaining focus

It is vital to educate patients on the significant impact nutrition and exercise can have on their health over time. Just as we have patients check in after starting a medication for hypertension or diabetes, follow-up visits are important for health care providers to reinforce the

benefits of lifestyle changes and at the same time show that they are highly valued. Incremental and nuanced care reinforcing the importance and health promoting role of diet and exercise is vital to the overall health of the individual and the population.

### Conflicts of interest

We do not have any conflicts of interest.

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