

Diet for Fecal Occult Blood Test Screening: Help or Harm?

Fecal occult blood testing (FOBT) is the most commonly recommended test for colorectal cancer screening. Yearly testing, with rehydration of the samples and follow-up of positive results, can reduce colorectal cancer mortality by one third.¹

However, FOBT screening is associated with two important problems. First, screening rates are low. Less than one third of U.S. adults had FOBT in the past year,² and only about half of Massachusetts residents over age 50 years are up-to-date with any of the screening tests for colorectal cancer.³ Therefore, any measure that could reduce the burden of testing is important. Second, FOBT results are frequently positive: 9.8% of people tested have a positive result if the samples are rehydrated, and 2.4% have a positive result if they are not rehydrated.¹ A large proportion of the positive results (94.4% to 97.8%, depending on whether the sample is rehydrated) are false-positive results—that is, positive test results in the absence of colorectal neoplasia (either adenoma or cancer). All patients with positive FOBT results should have a complete structural examination of the colon, usually by colonoscopy,⁴ although such diagnostic testing is often not done.⁵

Dietary advice usually accompanies FOBT screening, and the advice might affect these two FOBT-screening-related problems, for better or worse. Dietary advice might decrease the positivity rates by eliminating some causes of false-positive test results. Such advice might also decrease completion rates by making testing, which is already often perceived as burdensome, even more difficult to carry out.

There are good reasons for believing that dietary advice might lower completion rates. The usual advice is, after all, not so simple. The test kit used in my institution, Coloscreen, includes the following instructions:

Two days prior to and including the test period, a red-meat-free, high-residue diet should be followed.

Diet may include:

Meats: Only small amounts of well-cooked chicken, turkey, and tuna

Vegetables: Generous amounts of both cooked and uncooked vegetables, including lettuce, corn, spinach, and celery, except as noted below.

Fruits: Plenty of fruits, especially prunes, grapes, plums, and apples.

Cereal: Bran and bran-containing cereals.

Other fiber and roughage foods (i.e., peanuts, popcorn, etc.).

If any of the above foods are known to cause discomfort, the patient is instructed to consult his/her physician.

To be avoided:

Meat: Diet should not include any red or rare meat.

Horseradish, cantaloupe, raw turnips, broccoli, cauliflower, red radishes, and parsnips.

Medications: Do not ingest high-dose aspirin or other anti-inflammatory drugs for 7 days prior to and during testing, or vitamin preparations which contain vitamin C (ascorbic acid) in excess of 250 mg per day for 2 days prior to and during testing.

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Only health professionals could imagine patients following this advice!

As for false-positive test results, a variety of drugs and foods can cause a positive reaction in the absence of colorectal neoplasia, including drugs that cause gastrointestinal bleeding (among which nonsteroidal anti-inflammatory drugs are the most widely used) and foods, such as red meat and some vegetables, that contain large amounts of hemoglobin or peroxidase. It makes sense, on the face of it, to attempt to eliminate these causes of false-positive results by providing dietary instructions at the time of testing. After all, positive results, even one trace positive result in six specimens, should be followed with colonoscopy—even if occult bleeding might be attributed to another cause. Screening is like looking for a needle in a haystack; therefore, physicians cannot afford to disregard any clue to the presence of cancer.

The effects of dietary advice on completion and positivity rates in patients in actual practice are less clear. How many people, under ordinary circumstances, ingest enough of the drugs or foods that cause false-positive test results? After all, on average, Americans don't eat many turnips or parsnips or much horseradish, and most rarely eat raw red meat. So the theoretical arguments may be plausible, but what about empiric evidence?

The systematic review by Pignone and colleagues⁶ in this issue summarizes five randomized, controlled trials that bear directly on these questions. The evidence indicates rather clearly that dietary advice does not affect testing completion rates. A possible exception might be the situation in which an especially restrictive diet is recommended; in one small trial, completion rates were substantially lower in persons receiving such advice compared with unadvised persons (a 51% vs. 73% completion rate, respectively). Pignone and colleagues chose not to pool data on completion rates because of heterogeneity among the five trials. Nevertheless, because the 95% CIs were relatively narrow, it seems unlikely that these trials would have missed clinically important effects. The evidence suggests that dietary advice does not affect positivity rates, either. The authors pooled the results for positivity rates and found decisively in favor of no effect: The pooled difference was 0 and the 95% CI was -1 to 1. These findings are for a nonrehydrated (the less sensitive) test and may not be generalizable to rehydrated specimens.

The authors of this review were unable to distinguish between the two explanations for the finding that dietary advice had no observable effects: Does the diet itself have no effect, or did the people in the study simply not follow the dietary advice? Regardless, as a practical matter the dietary advice had little or no

effect on the main outcomes of testing, completion, and positivity.

Given the already high rate of false-positive FOBT results and the effectiveness of screening colonoscopy, a few more positive test results might not do much additional harm. After all, some expert groups favor screening by a complete structural examination of the colon by colonoscopy,⁷ and screening colonoscopy in persons with average risk has gained momentum after a prominent editorial advocated this method.⁸ A positive FOBT result provides an excuse for advocating the more definitive examination. Moreover, it has been asserted⁹ that FOBT-prompted colonoscopies account for much of the benefit of FOBT testing, although some have disputed this assertion.¹⁰

Vitamin C ingestion is a different story. If false-negative screening results were commonly caused by ingestion of vitamin C, this would defeat the purposes of screening. But how many adults take more than 250 mg of vitamin C per day? That amount is about four times the dose found in most multivitamins and is substantially more than most people could consume with diet alone. Some individuals take this amount of vitamin C or more, but setting a screening policy for all people to accommodate the habits of a few seems unwise.

With time, better tests may replace the familiar peroxidase-based tests, such as Hemoccult, rendering dietary advice moot. For example, HemeSelect, an immunochemical test for human hemoglobin, theoretically avoids false-positive results related to upper-gastrointestinal bleeding (because the hemoglobin is digested) and from most foods (because they are digested or do not contain hemoglobin). However, at least one good empiric study did not demonstrate greater specificity with HemeSelect than Hemoccult II.¹¹ Tests for altered DNA in stool, which detect the acquired genetic abnormalities that accompany large-bowel carcinogenesis, may have greater sensitivity and specificity for detecting colorectal neoplasia than other tests for bleeding.¹² Such screening tests are being field-tested. For now, however, peroxidase-based stool tests for occult blood are the standard of practice, and we should use these methods as effectively and efficiently as possible until something better comes along.

I believe it is time to simplify dietary advice for FOBT testing, when possible. For now, the collection of two samples from three consecutive stools is the standard. We cannot do much about that source of complexity without better data on the yield of more limited sampling. Also, whatever diet is recommended must begin 2 days before testing and continue throughout the testing to be effective. As for the diet itself, I recommend advising something similar to the following: "Do not

take any pain medications or more than a single multivitamin per day.” Such advice could apparently make adherence easier for the occasional patient who finds the dietary advice burdensome—at the cost of few, if any, additional false-positive results.

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