3 Vitamins and a Mineral: What to Take
From: Nutrition Action Health Letter, Volume 25/ Number 4

Not sure what vitamins to take? You're not alone.

Millions of Americans are confused about supplements. And no wonder. Between media reports, advertising, and word-of-mouth, it's almost impossible to know what's hype and what's good science.

Yet a growing body of evidence suggests that people should consider taking a multi-vitamin-and-mineral supplement—to get enough folic acid, vitamin B-12, and vitamin D—plus extra calcium and maybe vitamin E.

Why consider? Some people don't need all of them. If you drink four glasses of milk a day, for example, you certainly don't need extra calcium or vitamin D.

Don't get us wrong: Vitamins aren't magic bullets. But once you get past the hocum and the headline-of-the-day, it's worth taking stock: Are you getting enough?

"The power and hope of vitamins have thrilled the American public" since the early 1900s, says Rima D. Apple, author of Vitamania: Vitamins in American Culture and professor of consumer science at the University of Wisconsin in Madison. Thrilled us to the tune of an estimated $5.7 billion in 1997 (up from $3 billion in 1990).

Clearly, some people are being hoodwinked by tricky or trumped-up claims. But that doesn't mean that you shouldn't take vitamins. Just remember these four rules of supplement common sense:

- **No excuses:** Vitamins won't fix a lousy diet. They can't neutralize saturated fat, salt, and sugar. Nor do they supply the disease-fighting phytochemicals in fruits, vegetables, and some other foods.

- **No excesses:** Some people assume that, when it comes to vitamins, more is always better. In fact, too much may cause harm. For example, when scientists gave high doses of beta-carotene to smokers to cut their risk of lung cancer, cancer rates went up, not down.

  "When beta-carotene is taken in the amounts found in fruits and vegetables, it—or something else in the foods—offers protection against almost all cancers," says Robert Russell, deputy director of the Jean Mayer U.S. Department of Agriculture Human Nutrition Research Center on Aging at Tufts University in Boston.

  "But some people thought that more would be better, and, to our surprise, it wasn't."

- **No magic bullets:** Vitamins alone can't keep you healthy. Calcium can help prevent osteoporosis, for example, but it's just part of the story. Genes, exercise, vitamin D, and other nutrients also matter.

- **No Cadillacs:** When it comes to vitamins, a Chevy will do just fine. High-priced supplements are often a rip-off. In fact, store brands from large chains like Wal-Mart or K-Mart are among the higher-quality multivitamins. To get the supplements described below, you'll need a multivitamin-and-mineral (like Centrum or Theragran-M) plus some extra calcium (about 500 mg). You needn't pay more than about 20 cents a day.
Why did we pick calcium, folic acid, and vitamins B-12, D, and maybe E as the supplements you should consider taking? Because, unlike most of the pills and potions that crowd the supplement shelves, they're backed by years of supporting research and—in some cases—by clinical trials.

In a clinical trial, researchers randomly assign people to take either a (inactive) placebo or the supplement and then count up the illnesses.

"If you conduct a clinical trial carefully, you can make sure that any differences between the groups can be attributed to the supplement," says Shirley Beresford, a researcher at the University of Washington.

That's why clinical trials are the gold standard of scientific research.

1. FOLIC ACID

Birth Defects

"Proof." That's a word you don't hear too often when people talk about supplements and disease ... except when they're talking about folic acid.

"We've proved that folic acid can prevent neural tube birth defects like spina bifida," says Godfrey Oakley, director of the Division of Birth Defects and Developmental Disabilities at the Centers for Disease Control and Prevention in Atlanta.

The defects occur when the neural tube—which becomes the spinal cord—fails to close 18 to 26 days after sperm meets egg. If the error occurs at the top of the tube, the child is born with anencephaly (no brain) and dies soon after birth.

If the error occurs further down the spinal cord, the child is born with spina bifida (open spine). The damage to the spinal cord often keeps the children in wheelchairs or on crutches.

Folic acid could prevent half of neural tube birth defects if women were to start taking it shortly before they conceived. The catch is that half of all pregnancies are unplanned.

So the U.S. Public Health Service recommends that "all women of childbearing age in the United States who are capable of becoming pregnant should consume 0.4 mg [400 micrograms, or mcg] of folic acid per day ..."

But the message has gotten blurred, says Oakley. "The recommendation to get 400 mcg of folic acid—which occurs only in supplements and fortified foods—gets translated into 400 mcg of folate from foods."

(Folate refers to all forms of the B-vitamin. Folic acid is the form in pills and fortified foods.) But the folate in foods is only half as available to the body as the folic acid in pills, he explains.

In the clinical trials that proved that folic acid can prevent birth defects, he says, "women were eating their usual diets—which typically have about 200 mcg of folate—and then were taking a folic acid pill."

"I don't want to detract from the `eat right' message," says Oakley, "but we have no randomized clinical trials showing that 400 mcg of folate from foods prevents birth defects."

To boost folic acid intakes, last January the government started to require manufacturers to add folic acid to any foods that contain enriched (white) flour—including breads, pasta, and breakfast cereals.
But don't assume that two slices of bread have all the folic acid you need. There are only about 15 to 25 mcg in a one-ounce slice.

"For a woman to get 400 mcg of folic acid from bread, she'd have to eat a loaf," says Oakley.

He and others argue that the government should raise the amount of folic acid in flour. "In the meantime, take a multivitamin," he says. "Fortified breakfast cereals are also a powerful source. A bowl of corn flakes has about 100 mcg."

**Heart Disease**

Even if you can't get pregnant, it's still worth taking folic acid.

"We don't have a clinical trial, but the totality of the evidence is strong that folic acid can lower the risk of heart disease," says the University of Washington's Shirley Beresford.

It all started in the 1960s, when researcher Kilmer McCully, then at Harvard Medical School, found clogged arteries in children and infants with a genetic defect that sent their levels of an amino acid called homocysteine through the roof. Excess homocysteine, he reasoned, is toxic to blood vessels.

Most scientists ignored McCully's theory. Not any more. Since then, researchers have found that:

- People with higher levels of homocysteine in their blood have a higher risk of heart disease and stroke.[1,2]
- People who consume more folate or have more in their blood--usually from taking a multivitamin--have lower homocysteine levels.[3]
- In two studies--one of 5,000 Canadians and one of 80,000 U.S. nurses--those who reported eating diets high in folate had a lower risk of heart disease over the next 15 years.[4,5]

The only thing that's missing: a clinical trial.

A few are under way. For example, the Vitamin Intervention for Stroke Prevention trial is testing whether low- or high-dose mixtures of folic acid and vitamins B-6 and B-12 can cut the risk of a second stroke in people with high homocysteine levels. (B-12 and B-6 also lower homocysteine, though the evidence is strongest for folic acid.)

You can wait for the trials, or you can take a multivitamin with 400 mcg of folic acid now. That's the amount that appears to lower homocysteine sufficiently. And because it's the Daily Value (or U.S. Recommended Daily Allowance), it's also the level that millions of Americans already take in their multivitamins. "Taking a supplement with 400 mcg of folic acid to reduce the risk of heart disease is prudent," says Beresford.

Is it safe? Some researchers worry that taking too much folic acid could mask a vitamin B-12 deficiency in seniors (see "Don't Go Overboard," p.7). But seniors can dodge that (theoretical) bullet simply by taking B-12. Many of them need it anyway.
**2...Vitamin B-12.................................**

"Older people should consider taking a vitamin B-12 supplement because many of them have atrophic gastritis," says Tufts' Robert Russell.

That means they no longer secrete enough stomach acid. And--thanks in part to the lack of acid--their stomachs are overgrown with bacteria.

"Without sufficient acid, these people can't separate vitamin B-12 from food," says Russell. "And if some of the B-12 does get separated, the bacteria in the stomach and upper intestine take it up for their own use."

Atrophic gastritis occurs in an estimated ten percent of Midwesterners and 30 percent of Easterners over age 60, says Russell. "That may be because people in the East are more frequently infected with Helicobacter pylori."

Helicobacter is the bacterium that causes ulcers and possibly stomach cancer. "The latest thinking is that almost all atrophic gastritis may be caused by Helicobacter, except for pernicious anemia, which is rare," he adds.

So why don't doctors diagnose and treat Helicobacter infections? "Once the damage is there, killing the bacteria doesn't necessarily reverse the gastritis, unless it's mild," says Russell.

And, he adds, "it would be extremely costly to diagnose and treat the huge population--an estimated 50 percent of Americans--that's been exposed to Helicobacter. It's easier to give people vitamins."

Older people have no trouble absorbing the B-12 in supplements because it's not bound to food. What's more, the quantities are so much greater than in food that the bacteria can't gobble it all up.

How much B-12 is enough? Russell recommends 25 mcg a day. Most multivitamins have only 6 mcg--that's the Daily Value. But Centrum Silver and other supplements for older people typically have 25 mcg.

**3...Calcium..................................**

Why take calcium? The answer is simple.

"In all of the trials in which they counted up the number of fractures, people given calcium--or calcium plus vitamin D--had fewer fractures compared to people given a placebo," says Bess Dawson-Hughes of the USDA Human Nutrition Research Center on Aging at Tufts University.

And of the five trials done so far, three were small.[6-10] The fact that small studies detect a difference between groups "is quite impressive," says Dawson-Hughes.

Still, you hear reports about studies that find no link between calcium and fractures. The Nurses' Health Study, for example, found no lower fracture rates in women who consumed more calcium.[11]

"That kind of study can't ever prove a point about whether calcium influences fracture rates," says Dawson-Hughes. That's because it wasn't a clinical trial. The nurses simply reported what they consumed and whether they had broken a bone.

"If you just observe and ask questions, you can't classify into high- and low-calcium groups as accurately," she adds. "When you give calcium in a clinical trial, you know there's a difference in calcium intake between the two groups."
What's more, "the nurses who consumed less calcium may have exercised more, smoked less, or done other things that could have altered the risk of fractures."

In clinical trials, on the other hand, researchers randomly assign people to the calcium or the placebo group, so the two groups end up with similar activity, smoking, and other lifestyle factors.

Can you get enough calcium from food? Yes, but it's not easy to hit 1,000 mg a day (if you're 19 to 50) or 1,200 mg a day (if you're older).

You'd need to eat about three servings of (low-fat) milk, yogurt, or cheese. The alternative: healthy fortified foods or supplements.

4 Vitamin D

"It's a silent epidemic," says Michael Holick, director of the Vitamin D, Skin and Bone Research Laboratory at Boston University Medical Center.

"We have evidence that 30 to 40 percent of adults over 50 are borderline to overtly vitamin-D-deficient, and there are no symptoms."

Without vitamin D, you can't absorb enough calcium from food or supplements, no matter how much you consume. And if you don't get enough calcium from your diet, vitamin D pulls it out of your bones.

"So vitamin D deficiency accelerates bone loss and raises the risk of fracture," says Holick.

Why do many people get too little vitamin D? Milk is fortified with 100 IU per cup, but few adults drink much. And fortified breakfast cereals usually have 40 to 50 IU per serving. But--except for foods that people rarely eat every day, like fatty fish--most foods have little or none.

Luckily, your skin makes vitamin D if it's exposed to sunlight. But older skin makes less. And no one makes any in the winter, unless they live in the South.[12]

"In the wintertime, one is totally dependent on vitamin D from diet and supplements," says Tufts' Bess Dawson-Hughes. "In Boston, sun exposure produces no vitamin D between mid-October and mid-March. For every ten degrees of latitude you go north, you can add another month at both ends of the season."

But many people avoid the sun like the plague. "A major cause of vitamin D deficiency is that older people are worried about skin cancer and 'wrinkles,'" says Holick. "So they wear a lot more clothing and they wear sunscreen." Both block the ultraviolet light that makes D.

Last August, the National Academy of Sciences issued new recommendations for vitamin D: People aged 50 or younger need 200 IU a day, those aged 1 to 70 need 400 IU, and the 71-plus crowd needs 600 IU, said the NAS. "If you can't get there by diet or the sun, you need to add vitamin D from a supplement," says Dawson-Hughes.

In one of her studies, people aged 65 or older who were given 700 IU of vitamin D plus $00 mg of calcium every day for three years had less than half the fractures of those who took a placebo.[6]

"A multivitamin has 400 IU," she adds. "If you need 600 IU, a combined calcium-and-D supplement is a good way to go."

WHAT ELSE IS IN THAT MULTI?

"Two B vitamins found to cut women's heart disease," announced the Los Angeles Times in February.

"Selenium flying off shelves in response to cancer study," trumpeted the Miami Herald last year.

It's hard to keep up with the vitamin headline-of-the-day. The good news: If you take an ordinary multivitamin-and-mineral supplement to get folic acid and vitamins B-12 and D, you'll get at least some of the other nutrients that could turn out to prevent disease. For example, in a recent study, women who consumed higher levels of folate or vitamin B-6 had a lower risk of heart disease.[1] So far, folate appears to be more important, but an ordinary multi has the Daily Value (2 mg) of B-6.

**Not enough?** You can't expect a multi to have everything. For example, you may want more vitamin E than your multi supplies (see "The Vitamin E Story," p. 6). Ditto for selenium.

In 1996, a clinical trial stunned researchers. People were given selenium (200 mcg a day) to see if it could lower their risk of skin cancer. It didn't. Instead, it cut their risk of colon, prostate, and lung cancer ... by half.[2]

A clinical trial is powerful evidence, but it needs confirmation. Few other studies have uncovered a link between selenium and cancer. It's also possible that selenium prevents cancer only in people--like the Southeastern U.S. residents in the study--who get little selenium from food.

A daily dose of 200 mcg of the high-selenium yeast used in the trial appears to be safe. But you won't find that much in most multis. If you decide to take it separately, don't exceed 200 mcg a day. Too much selenium is toxic.

**Too much!** Some multis may have more iron than you want. The evidence that too much iron can promote cancer or heart disease is preliminary. But if you're a man or postmenopausal woman, you simply don't need the Daily Value (18 mg) of iron in an ordinary multi. (Premenopausal women may need 15 mg a day to prevent anemia, so the DV is reasonable for them.)

If you want less iron, shop around. Some brands--like Centrum Silver and Mature Balance--have less (or no) iron.


THE VITAMIN STORY

Should you take vitamin E? As we went to press, a new study made the evidence more compelling.

Finnish smokers who had been given 50 IU of vitamin E a day for five to eight years had a 32 percent lower risk of prostate cancer, reported researchers at the National Cancer Institute (NCI) and elsewhere.[1] Of the 29,133 men in the clinical trial, those who got vitamin E (instead of a look-alike but vitamin-E-free placebo) were 41 percent less likely to die of the disease. That's impressive.

Most other studies (not clinical trials) have found no link between vitamin E and prostate cancer.[2,3] Only one small study hinted at a lower risk in men who had higher blood levels of E, but only in smokers, so vitamin E may not protect everyone.[4] Of course, there are other reasons to consider taking vitamin E.

In several large studies, men or women who took at least 100 IU a day had a lower risk of heart disease.[5] But something else about people who chose to take vitamin E could have protected their hearts.

Clinical trials to answer the question should be finished in two to five years. Those done so far are ambiguous. The trial of Finnish smokers found no protection against heart attacks and a possible increased risk of hemorrhagic stroke (from 50 IU a day).[6] Another found a 77 percent lower risk of second heart attacks (with 400 IU to 800 IU a day), but no lower death rate, perhaps because the trial didn't last long enough.[7]

The bottom line: If you're taking an ordinary multivitamin, it's likely to have 30 IU of vitamin E. That's not far from the 50 IU a day that might cut the risk of prostate cancer.

Should you go higher? It depends on your risks. If you have high blood pressure, it's not worth the possible risk of a hemorrhagic stroke (check with your doctor). On the other hand, if you already are at high risk for prostate cancer--because of family history, a high PSA, or African-American heritage--extra vitamin E makes sense,
especially if you're a smoker. Ditto if you have risk factors (other than high blood pressure) for heart disease like family history, high LDL ("bad") cholesterol, or low HDL ("good") cholesterol.

Soon we'll know more: the NCI is talking about a clinical trial to see if it can duplicate the two that found a lower risk of prostate cancer in men taking vitamin E or selenium.

THE BOTTOM LINE

* Take an ordinary multivitamin-and-mineral supplement with 100 percent of the Daily Value for folic acid (400 mcg) and vitamin D (400 IU). If you're over 70 and get little or no sun, make sure you get 600 IU a day of vitamin D.

* If you're older than 50, take a multi with at least 25 mcg of vitamin B-12.

* If you don't consume three (low-fat) dairy foods a day, take a supplement that contains 300 mg of calcium, or eat a healthy fortified food like calcium-fortified orange juice, for each of the three servings of dairy you miss.

* Consider taking 50 to 100 IU a day of vitamin E
Use this chart to help you choose the best foods to maximize your intake of vitamins and minerals.

### Pyramid PLUS

<table>
<thead>
<tr>
<th>Grains</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Milk</th>
<th>Meats &amp; Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make half your grains whole</td>
<td>Vary your veggies</td>
<td>Focus on fruit</td>
<td>Get you calcium-rich foods</td>
<td>Go Lean</td>
</tr>
<tr>
<td><strong>Fiber, B Vitamins, Folic Acid, Iron, Magnesium</strong></td>
<td><strong>Fiber, Potassium, Vitamins A, C, &amp; E</strong></td>
<td><strong>Fiber, Potassium, Vitamin C, Folic Acid</strong></td>
<td><strong>Calcium, Potassium, Vitamin D, Protein, Magnesium</strong></td>
<td><strong>Protein, Vitamin A, Iron, Magnesium, Zinc, Vitamin E</strong></td>
</tr>
<tr>
<td>100% whole grains cereals, oatmeal, 100% whole grains breads, bagels, tortillas, and crackers, popcorn (lite), wild rice, barley, whole wheat pasta, brown rice</td>
<td>(fresh, frozen, canned) Spinach, bok choy, mustard greens, asparagus, leaf lettuce, broccoli, celery, cauliflower, zucchini, iceberg lettuce, bell peppers, mushrooms, green beans, cabbage, tomatoes, winter squash, sweet potatoes, artichokes, cucumbers, salsa, beets, eggplant. 100% vegetable juices</td>
<td>(fresh, frozen, canned in juice) Cantaloupe, papaya, grapefruits, blackberries, oranges, strawberries, apricots, kiwi, raspberries, pineapples, tangerines, mango, honeydew, watermelon, avocado, peaches, plums, blueberries, grapes, cherries, bananas, apples, pears. 100% fruit juices Dried fruits</td>
<td>Fat-Free &amp; Low Fat Dairy Milk, flavored milk, plain yogurt, flavored yogurt, cottage cheese park-slim ricotta.</td>
<td>Lean Meats, Fish, Poultry Shellfish, fish, beef (flank, top round, lean ground), pork (loin, lean ham), eggs, poultry (skinless light meat, lean ground)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Beans &amp; Peas Vegetarian burger, lentils, soy beans (edamame, tofu, beans (black, kidney, garbanzo, pinto), peas (black-eyed split)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Seeds &amp; Nuts Seeds (flax, pumpkin, sunflower), nuts (almonds, hazelnuts, peanuts, walnuts), peanut butter</td>
</tr>
</tbody>
</table>

From: Nutrition Education Services/ Oregon Dairy Council
www.oregondairycouncil.org