THE FAMILY PHARMACIST

A QUICK READ FOR YOUR OTC NEED!

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DO YOU NEED A MULTIPLE VITAMIN SUPPLEMENT?

You've probably noticed the large amount of shelf space that multivitamins are given in any pharmacy, supermarket, or big box store. Global sales of vitamin supplements in 2023 came close to 50 billion US dollars and will continue to grow. With all that money spent on vitamins, the question is, is it really necessary? What's a balanced view of vitamin supplementation?

Vitamins and minerals are naturally occurring chemicals that make up a small but essential part of our food. They are critical for everyday functioning and maintenance of a healthy body because they cannot (or can only partially) be made by the body. What vitamins do for us varies greatly and this is reflected in the wide range of diseases that occur when a single vitamin is missing. Diseases like scurvy, pellagra, beriberi, bleeding disorders, rickets, bone disease, infections, and blindness are to name just a few. We need vitamins to stay healthy and prevent the onset of disease.

Nutrition research began in the late 1800s when the "germ" theory was dominant. But scientists gradually began to realize that not all diseases were caused by infections due to microorganisms. Suffering from the diseases mentioned above was eventually recognized to be caused by deficiencies in the diet. The identification of these specific missing chemicals, originally known as "vitamines" (a contraction of the words "vital" and "amine") led to the use of our modern day word, *vitamin*. Since these "vital" chemicals produced amazing cures in specific diseases that were demonstrated to be the result of poor nutrition, it's no surprise that vitamins caught the attention of the public. As nutrition science gained the respect of medical doctors, everyday vitamin supplementation became a part of modern healthcare and the American diet. After decades of incorporating vitamins and minerals into various food products (milk, cereals, bread, etc.) it's rare to find diseases in developed countries due to vitamin deficiency like the ones mentioned above. In developed countries, vitamins and minerals are most often used to *prevent* rather than *treat* disease. That's not to say that poor nutrition doesn't also exist in the US.

While our bodies can make a few vitamins on their own, like vitamin D, vitamin K, and niacin, we have to get most vitamins and minerals from our food. So poor nutrition can result in vitamin deficiency no matter where you live.

There are 13 essential vitamins—vitamins A, C, D, E, K, and the B vitamins (thiamin, riboflavin, niacin, pantothenic acid, biotin, B_6, B_{12}, and folate). *Vitamins* are complicated *organic chemicals* found in food sources. *Minerals*, while also found in food, are *inorganic elements* present in the earth. Like vitamins, minerals are also critical for a healthy body.

Since the vitamin products that are sold over-the-counter (OTC) are a part of our normal diet, they are not regulated as *drugs* by the US Food and Drug Administration (FDA). In preventative doses and when sold OTC, vitamins and minerals are considered "dietary ingredients" by the FDA. The products that contain these ingredients are classified as "dietary supplements" under a different set of regulations than those covering drug products. Numerous other products fall under this description, such as, herbs and botanicals. But when vitamins are used to treat a specific disease such as vitamin D deficiency, rickets, or other bone diseases, (and when the manufacturer makes a curative claim) then the dose is much higher. These products need a prescription and are regulated by the FDA as *drugs*.

For OTC products, there is no FDA requirement for what should be included in a multivitamin supplement, but almost all products labeled as a "multivitamin" also include minerals and other ingredients.

Since scientists are now able to identify the essential nutrients in almost all foods, isn't it pretty easy to know what foods to eat to get everything you need to be healthy? Well, yes, in a perfect world. But in today's world, the problem is lifestyle. Even though we know which foods are high in vitamins and minerals, it's still hard to eat healthy, especially if you eat out frequently. And what about how so many nutritional supplements are pushed for the treatment of chronic diseases? Do they really help? Studies are mixed. For example, research has shown that vitamin and mineral supplementation can be helpful in some diseases, certain cancers, gastrointestinal disorders, and dementia, to name a few, but only if the individuals were already of poor or suboptimal nutritional status.

Assuming that none of us eat a perfectly balanced diet, let's focus on what is a reasonable way to supplement any diet with vitamins and minerals without spending an arm and a leg or taking a ridiculous amount of pills every day.

Along with the 13 essential vitamins, the National Institutes of Health (NIH) identifies 16 essential minerals (elements). Look for a multivitamin that contains most of these essential chemicals. Vitamins and minerals are usually measured in micrograms (mcg) or milligrams (mg). The table on page 3 lists these essential building blocks.

Recommended Dietary Allowances. According to the NIH, "*Recommended Dietary Allowances* (RDAs) are the average daily levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged … to be adequate to meet the known nutrient needs of practically all healthy persons." So it's not necessary to exceed the RDA limit. If you're taking a multivitamin for *preventative* reasons, assume that you will get at least some of these vitamins and minerals in your diet. For treating a particular vitamin deficiency (referred to as a *therapeutic* use of the vitamin), your doctor may recommend higher doses than the RDA.

Multivitamin labels, however, don't usually list the RDA. Instead they show the *Percent Daily Value* (%DV). This tells you how much of the RDA you are getting. For example, look at *thiamin* on the sample label on page 2. It indicates the *"Amount Per Serving"* as 1.2 mg, which is 100% of the %DV. So, 100% of your need for thiamin is supplied daily in one serving in this vitamin supplement product. %DV is simply a way to show you if you're getting as much as you need every day. A %DV of 50% (see *vitamin K* on the label) means you need to get the rest of that vitamin in your diet.

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Pills or Liquid? Multivitamins are expensive and you want to get the best value for your dollar. The choice is not just limited to finding the least expensive product. Quality and dosage form are related and also important. *Dosage form* means it may come as a pill (tablet, capsule, gelcap, etc.) or a liquid. Unlike liquids, tablets and capsules break apart in the stomach at different rates to release their ingredients. The quality of the product will greatly affect this. There are many inferior products on retail shelves and you may be paying for vitamins that don't deliver what they claim.

My suggestion is to go with liquid vitamins. Liquids avoid the incomplete breakdown of solid products like tablets and capsules. Liquid vitamins are easier to swallow, may taste better, and studies show that they are better absorbed and deliver more of the labeled ingredients to the blood and tissues where needed.

Summary:

If you are just supplementing your diet because you may not always be eating right, pick a product that has all of the vitamins and most of the minerals listed in the table on page 3.

To find a liquid multivitamin product, you may have to go online. Retail pharmacies and supermarkets don't usually carry liquid vitamins. Liquid multivitamins that are labeled "liposomal" use a delivery system that gets the vitamins into your body more efficiently. Try to find one of these. They are available on Amazon or directly from credible vitamin suppliers like Manna® and Vitacost.®

Buy from companies using industry Good Manufacturing Practices (GMP certified). GMP regulations are enforced by the FDA, and require that manufacturers, processors, and packagers of dietary supplements take steps to ensure that their products are safe, pure, and effective. Good quality liquid multivitamins can be expensive. You can expect to pay from $30 to $50 for a month supply.

Look at the sample label listed below. The "Amount Per Serving" column tells you *how much* of each vitamin or mineral you will get in one serving. The %DV column tells you what daily *RDA percentage* of each vitamin or mineral you will get in each serving. If it's less than 100% on your vitamin label, make sure your diet supplies the rest. Choose a multivitamin based on age and other requirements. Use the table on page 3 to determine if the product meets your needs.

Sample of typical liquid multivitamin/mineral label

Serving Size 1 tbsp (15 mL)
Servings 30

	Amount Per Serving	%DV
Calories	55	
Calories from Fat	27	
Total Fat	3 g	4%*
Monounsaturated Fat	3 g	†
Total Carbohydrate	6 g	2%*
Protein	1 g	
Vitamin A (as Palmitate)	900 mcg	100%
Vitamin C (as Ascorbic Acid)	300 mg	333%
Vitamin D (as Plant-Based Cholecalciferol from Algae)	30 mcg	150%
Vitamin E (as D-Alpha Tocopherol)	20 mg	133%
Vitamin K (as Menaquinone-7) (K2)	60 mcg	50%
Thiamin (Vitamin B1)	1.2 mg	100%
Riboflavin (Vitamin B2)	1.3 mg	100%
Niacin (Vitamin B3) (as Niacinamide)	16 mg	100%
Vitamin B6 (as Pyridoxine HCl)	1.7 mg	100%
Folate (as L-Methylfolate Calcium)	400 mcg DFE	100%
Vitamin B12 (as Methylcobalamin)	50 mcg	2083%
Biotin	100 mcg	333%
Pantothenic Acid (Vitamin B5) (as D-Calcium Pantothenate)	5 mg	100%
Calcium (as Calcium Carbonate)	9 mg	< 1%
Iodine (as Potassium Iodide)	150 mcg	100%
Magnesium (as Magnesium Bisglycinate Chelate)	21 mg	5%
Zinc (as Zinc Bisglycinate Chelate)	11 mg	100%
Selenium (as Selenomethionine)	110 mcg	200%
Manganese (as Manganese Citrate)	2.3 mg	100%
Molybdenum (as Molybdenum Aminomin)	70 mcg	156%
Mixed Natural Fruit Blend (Blueberry, Tart Cherry, Cranberry, Grape, (Fruit), Prune, Raspberry, Strawberry and Wild Cherry) (Extract)	100 mg	†
Beet Juice	50 mg	†
Carrot	50 mg	†

* Percent Daily Values (DV) are based on a 2000 calorie diet
† Daily Value (DV) not established

Recommended Dietary Allowances (RDA) for All Age Groups					
Nutrient	**Measured In**	**Infants through 12 months**	**Children 1 through 3 years**	**Adults and children 4 years and older**	**Pregnant and lactating women**
VITAMINS					
Biotin (vitamin B7)	Micrograms (mcg)	6	8	30	35
Choline	Milligrams (mg)	150	200	550	550
Folate (vitamin B9)	Micrograms (mcg)	80	150	400	600
Niacin (vitamin B3)	Milligrams (mg)	4	6	16	18
Pantothenic acid (vitamin B5)	Milligrams (mg)	1.8	2	5	7
Riboflavin (vitamin B2)	Milligrams (mg)	0.4	0.5	1.3	1.6
Thiamin (vitamin B1)	Milligrams (mg)	0.3	0.5	1.2	1.4
Vitamin A	Micrograms (mcg)	500	300	900	1300
Vitamin B6	Milligrams (mg)	0.3	0.5	1.7	2
Vitamin B12	Micrograms (mcg)	0.5	0.9	2.4	2.8
Vitamin C	Milligrams (mg)	50	15	90	120
Vitamin D	Micrograms (mcg)	10	15	20	15
Vitamin E	Milligrams (mg)	5	6	15	19
Vitamin K	Micrograms (mcg)	2.5	30	120	90
MINERALS					
Calcium	Milligrams (mg)	260	700	1300	1300
Chloride	Milligrams (mg)	570	1500	2300	2300
Chromium	Micrograms (mcg)	5.5	11	35	45
Copper	Milligrams (mg)	0.2	0.3	0.9	1.3
Iodine	Micrograms (mcg)	130	90	150	290
Iron	Milligrams (mg)	11	7	18	27
Magnesium	Milligrams (mg)	75	80	420	400
Manganese	Milligrams (mg)	0.6	1.2	2.3	2.6
Molybdenum	Micrograms (mcg)	3	17	45	50
Phosphorus	Milligrams (mg)	275	460	1250	1250
Potassium	Milligrams (mg)	700	3000	4700	5100
Selenium	Micrograms (mcg)	20	20	55	70
Sodium	Sodium is not included in multivitamin/mineral supplements because of its abundance in food sources.				
Sulfur	There is no RDA for sulfur because it is so abundant in the diet. Sulfur deficiency is only seen with severe protein deprivation. It's usually not included in multivitamin/mineral supplements				
Zinc	Milligrams (mg)	3	3	11	13

Table modified from: https://s3.amazonaws.com/public-inspection.federalregister.gov/2016-11867.pdf (pages 903-904)

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References On File
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