

>> Rona Brynin: Okay, so we were up to sulfur. Actually, don't worry about this mineral. It's very rare that somebody would be deficient in sulfur. So, and there's no test questions on it. But, let's move on to trace minerals. Remember that trace minerals are minerals that are required in smaller doses, 100 milligrams or less per day, as compared to the major minerals. They are no less important, we just need less of it. So, the first one is iron. And, please, highlight this in your notes. This is a test question, that the most common nutrient deficiency in the world is actually an iron deficiency. It's very difficult to absorb iron. We'll talk more about that, but you can see here that we only absorb about 18% of the iron that we take in, whether that's by food or supplements. And, please, note this also for the quiz, that animal sources are much more absorbable than plant sources, okay? So, if you're anemic, eating chicken for iron would be a better choice than say spinach. Vitamin C increases iron absorption, so that's something to think about. If you're taking iron pills, take it with vitamin C. And remember that fiber interferes with all minerals absorption. Some compounds in tea interfere. But, we need iron, particularly in larger doses during pregnancy and when you're growing, when you're a kid. Okay, and just to review, if you've had biology, most of the iron that we have is inside our red blood cells inside the hemoglobin. Hemoglobin is a protein inside the red blood cell and that's where the iron is. Some iron is in bone marrow. So, if you've ever had a chicken bone and kind of cracked it open, you know that it's kind of like a brownish color, that's really loaded with iron. If your blood levels are low sometimes your body will pull some iron from the bone marrow. If you're – then your bone marrow start getting low, then that's when you start getting iron deficiency symptoms, okay? And we'll talk about that in a minute here. And, also, in a blood test, if you are anemic usually what happens is the number of red blood cells will be low, your iron might be low, your hemoglobin listed in the blood tests will also list as being low. Without the hemoglobin – without the iron you don't have as much hemoglobin. Without the hemoglobin you don't have as much oxygen being brought to your body, and that's what causes a lot of the anemia symptoms. So, like I said, so most of the iron is in your hemoglobin, which is in your red blood cells, and its purpose is to carry oxygen to your cells. We also use iron for some enzymes in your body. We also need it for our immune system and your brain to function, and it also is part of bone health. Now, who gets iron-deficiency anemia? It is more common with women that have a menstrual cycle, for obvious reasons. It's also common in kids that are growing, whether they're infants or preschoolers, puberty. When you're growing your bones are growing, your muscles are growing, and you have more tissues that need iron. Pregnant women, obviously, also can commonly get anemia because they are sharing their food and their blood with their fetus. It's very uncommon to have a grown man, male, with iron-deficiency anemia, because they're not growing anymore, and so a grown male would have no need for extra iron and there would be no reason why they'd be losing iron as with women who lose iron monthly with their menstrual cycle. So, you always want to think of other things to rule out, like ulcers. Maybe they're losing blood because of a bleeding ulcer. Maybe they have colon cancer even or just hemor-

rhoids. But, they – whatever it is, a grown male, you know, meaning if you're in 20's, you're not growing anymore, you should not be anemic. And, if you are, you need to find out why. Clinical signs of iron-deficiency anemia is usually you're pretty pale, again, because you're not getting oxygen to the skin. You can get pretty tired or fatigued when you start exerting yourself, like climbing a flight of stairs, or walking even or exercising. Usually you tend to run a little on the cold side. Sometimes people get loss of appetite and apathy, which kind of looks like this guy here, where you just don't care about anything because you're just quite frankly just too tired. This, I'm not sure if this is an old wife's tale or not, but my mom used to do this, where you pull down your lower eye there and you can see. This tissue here should be a nice dark pink. If it's pale that could be an indication of anemia. Again, the best sources for iron are animal sources. They do also fortify cereals and breads. Spinach and beans have iron, but, again, not as well-absorbed as from the animal products. For men that are grown and women over 50 who no longer have a menstrual cycle, you only need about eight milligrams a day, and women in their menstrual years needs double that, well, more than double that, 18 milligrams a day. And you can look at your book for sources for these minerals. Zinc, again, we don't absorb it very well, about 40% of what we take in from food and supplements. All minerals compete each other for absorption. That's another problem of why get – tend to get a little bit low. But like magnesium, that we talked, zinc also is needed by over 200 enzymes in order to function. So, all these enzymes in your body are not going to work very well if you're deficient in zinc. And, over time, this is why as you get older we start breaking down, because we've been deficient for so many years in all these minerals. I gave an example of one enzyme in your body, alcohol dehydrogenase. This is the enzyme that helps you metabolize your alcohol. So, if you drink alcohol, an enzyme – this enzyme helps you process it in your body and, if you're deficient in zinc, this is just an example of one enzyme. When you drink alcohol, if you're deficient in zinc, you're just not going to process it very well, you'll be quicker to get drunk, and take longer to get over it. Zinc is needed by, again, over 200 enzymes that are involved with DNA synthesis, with protein metabolism, with wound healing. So, if you get cuts or scrapes or break a bone or you've had surgery, zinc is really needed particularly then to help heal your wounds. Kids need it for proper growth. You need it for a good immune system functioning, bone health. You need it for bones to be nice and strong. Insulin, this is the second mineral. Magnesium was the other one that we talked about so far. Insulin requires zinc to function. So, again, if you're deficient in zinc, your insulin may not be functioning well, which means your blood sugar can be higher than it should. Kids needs zinc for development of their sexual organs, for cell membranes to function, for antioxidants. This is just a partial list. So, you can see how important this mineral is. You can get in food. Most people are deficient, which is why, again, a multivitamin mineral supplement would help fill in the gaps. This is, again, a partial list of problem that can occur if you're deficient, acne. Acne can be from a zinc deficiency. Also, other common causes of acne would be dairy products. Some people have that reaction, and also sugar, sugar in your diet. It can – a deficiency can cause

diarrhea, lack of appetite, reduced sense of taste and smell. It's pretty common, why I have that underlined. It tends to happen a lot as people get older. Remember, as you get older we secrete less acid, and without the acid in our stomach we're not going to digest – we're not going to absorb these enzymes quite as well. And if you're taking an antacid every day, also you're not going to be absorbing these minerals. A zinc deficiency can also cause hair loss. So, that's something to think about. There's other causes of hair loss, like stress or thyroid problems, not enough protein, things like that, but this is another cause. In kids, if children are deficient in zinc it can stunt their growth, their sexual development, and their learning ability. So, that's pretty important that kids get a multivitamin mineral supplement. Zinc is found in protein-type food. So, meat and poultry and fish, also beans and nuts. And, of course, alcoholics are usually pretty deficient like they are in everything. Here's your sources that you can look at. Now, selenium, I hate to say this is another important mineral, they're all so important, but selenium is a very potent antioxidant. So, remember, antioxidants help prevent diseases like cancer and heart disease. But, selenium is particularly important for your thyroid health. It is needed to make your thyroid hormone. So, if any of you are hypothyroid, you have a thyroid problem, it possibly can be due to a zinc – I'm sorry, a selenium deficiency, or make matters worse, in any case. Again, selenium is found more from animal products; eggs, egg yolk, fish, and meat, seeds and grains, it depends on the soil they were grown in, but it could be a good source. Iodide, another mineral that's important for your thyroid. Sometimes they put this in salt. They iodize salt. They put a little bit, it's not very much. But, your thyroid gland uses iodide for making thyroid hormone. So, again, this is the second mineral that your thyroid needs. Most Americans, according to the research, are deficient in iodide. You need your thyroid gland to keep your metabolism rate at a – at a good – you know, at a good rate. If you have a sluggish thyroid your metabolic rate will slow down. We'll talk more about that in the weight loss chapter. We also need iodide for growth. And, again, most Americans are deficient. You can get it in a good multivitamin mineral supplement, not all of them have it. We have to read the label. Please note this for the quiz, goiter. If you are deficient in iodide, sometimes you can get what's called a goiter. And I'll show you what that looks like, but basically the thyroid gland gets a little bit larger because it's struggling to take up some iodide. And if you're deficient in iodide while you're pregnant, you can have a baby born with mental retardation, and we call that cretinism. But, in a milder level, if you're pregnant and iodide deficient you can just have a baby with a lower IQ. That's an enlarged thyroid gland. I've had students with enlarged thyroid glands. It doesn't necessarily have to be that large. This is particularly large, but hopefully your doctor checks your thyroid gland each year on a regular basis. Here's your thyroid gland. It should be about that size. Anything larger than that indicates an iodide deficiency and possible hypothyroidism, which is a sluggish thyroid. A lot of times they add iodide to salt. You'll see iodized salt in the store. It's also in seafood and saltwater fish and seaweed. The sea salt that we talked about, this is a great source of 72 minerals. There is a little iodide in here, not a whole lot. So,

again, some people take iodide supplements separately or just a multivitamin mineral that has it. Copper, don't worry about copper. Most people don't have a problem with copper and it won't be on the quiz. But, just know that we do need it. And, again, a good multivitamin mineral supplement will have it. And here's your sources. You see beans and nuts and seeds have pretty much all these minerals we've been talking about. So, it's great to include that. Let me stop the slide here, the podcast, and take up fluoride when we finish this chapter with part three.