



Vitamin C

Transcript

Andrew Saul: The most important antioxidant nutrient in your body is vitamin C. The most important aspects of vitamin C are that it is an antiviral. It is an antihistamine. It is an antitoxin. It is an antidepressant and it's an antipyretic. It lowers fever. It's also an anti-infective, having some properties that you might attribute to an antibiotic. Vitamin C, that C stands for cure because it can be used for so many different diseases. Now, how can one vitamin cure so many things? Because a lack of it can cause so many problems. Vitamin C deficiency is the rule, not the exception. The RDA is under a hundred milligrams a day, but animals who make their own vitamin C make the human body weight equivalent of one or two or 8,000 milligrams of C a day. Somebody made a mistake, I don't think it was nature, might have been the government. Learn more about how vitamin C can cure and also discover more about the real answers to the controversy, that's the other C word about vitamin C. This episode is going to be very important so you really know the story behind ascorbate, ascorbic acid, and all the different forms of vitamin C, the dosage and the doctors that use it.

Andrew Saul: First of all, it's all about dose. In fact, to quote cardiologist and vitamin C expert, Dr. Thomas Levy, MD, it's about dose, dose and dose. This is the key. If you're going to use vitamin C therapeutically, you have to use enough or you won't get the job done. Now, enough is determined by two things. The first is feeling better, that is symptoms go away or bowel tolerance, which is oral vitamin C saturation. Now, bowel tolerance means exactly what you think it means. If you take more C than you need, you will have loose stool. Now, no one wants diarrhea, so let's get that word out of there right away. Doing this with vitamin C will lead to loose stool long before it will lead to actual diarrhea. The marker is loose stool. That's what you want to look for. As you're taking vitamin C in high quantity, you need to divide the dose all through the day. If you don't, you'll get a false saturation loose stool that's unrealistically low and happening too soon. For example, let's say you're dealing with influenza. Let's say as Dr. Robert Cathcart, MD said with influenza you might be looking at a dose of in the neighborhood of 80 to 100,000 milligrams of C orally a day.

Andrew Saul: If you take a very large amount at once, you're going to have bowel tolerance at once. If you took your 80,000 milligrams in four 20,000 milligram doses, that would be a waste of time, a waste of money and a waste of toilet paper because you have to divide the dose to have this work properly. The way to do it is to take vitamin C as often as humanly possible. When I had viral pneumonia, I took 2,000 milligrams of vitamin C every six minutes I was awake. Now that's a lot of vitamin C. That's 10 doses an hour of 2,000 milligrams each. Four 20,000 milligrams in one hour, but 20,000 milligrams in an hour is very different than 20,000 milligrams in one dose. You divide the dose as much as you possibly can. Now some people think, aha, I'll get sustained release vitamin C and I won't have to bother. No, that's really not true. Sustained release tablets first of all don't always break down very well, and in fact in elderly people they don't break down. A sustained release tablet can be just a hard rock like matrix and the idea is that it will gradually erode in the stomach.

Andrew Saul: Some can be time-released the way pharmaceuticals are time-released in little capsules with different chemical coatings, but overall, the reliability of time-released or sustained release vitamin C is not that good and will vary from person to person. Even if it works, you're not going to be able to get what I call a loading dose. When you take plain vitamin C, particularly vitamin C powder, you can take a relatively high opening dose and then smaller frequent doses. Now, I'm not contradicting myself, I'm telling you the absolute truth here. If you take a huge loading dose, you will immediately get to bowel tolerance, loose stool. You need a larger loading dose like buying a car. You would put down a down payment, you don't pay the whole thing in a week, but you might put down a generous down payment and then amortize the rest of it. If you are going to take a lot of vitamin C and you are actually sick, if you had symptoms, the way I would do it is to take vitamin C in a loading dose, which would be several thousand milligrams. I've taken loading doses even higher than that and then calm down to very frequent lower doses.

Andrew Saul: At frequent lower doses, the absorption is more efficient, the utilization is more efficient, it's less money, it's less chance of excessive problems with loose stool and it simply works well. Dividing the dose is really important. When I say you take it as often as humanly possible, I mean that. The same way that you do not wake a person to give them their sleeping pill, you also don't fret about this, but you want to do the best you can. At the very least, if you're sick, you'd want to be taking vitamin C every half hour. That's at the minimum. In good health, maybe vitamin C every meal. When we talk about vitamin C, we are talking about ascorbic acid. I need to set a lot of things straight here because it's just amazing the nonsense you will hear about some kind of imagined problem or issue with ascorbic acid. We're going to go over the real ones and we're going to go over the false ones. First of all, vitamin C is ascorbic acid, $C_6H_8O_6$. That's what it is. You can arrange those atoms, carbon, hydrogen and oxygen atoms. Those very same atoms can be rearranged to form another substance. It is also an antioxidant, but it is not a vitamin. This is used in industry but it is not used by plants or animals or you.

Andrew Saul: Plants make ascorbic acid. They just do. That's what's in the orange. Animals make ascorbic acid in their livers, they make it from glucose. Vitamin C and glucose differ by only four hydrogens. Vitamin C is $C_6H_8O_6$ and glucose is $C_6H_{12}O_6$. Now that's a very small difference and yet it's a very big difference. This hints that animals are making their vitamin C from glucose and they are, and they have four enzymes that enable them to rip off four hydrogen successively. Curiously, we have three of the four enzymes. We do not have L-gulonolactone oxidase. It's as much fun to say it as it is to think about it and we don't have it so all we can do is say it and think about it and try to pronounce it, but animals do and they can make that final step and make vitamin C. Ascorbic acid is natural. That's what plants make. Ascorbic acid is natural. That's what animals make. They would not make it if it were unnatural, they could not make it if it were unnatural, why on earth would nature for millions and millions of years of evolution have animals make something that doesn't work?

Andrew Saul: We know that ascorbic acid is vitamin C and if anyone tells you differently, they're just wrong. They're wrong in terms of the biology, they're wrong in terms of the chemistry, they're wrong in terms of the medical knowledge here. There are food factors found in plants that are very helpful to people, animals and work well with vitamin C and these factors such as the bioflavonoids are found in fruits and vegetables and you should eat the fruits and vegetables to get your bioflavonoids and other beneficial C helping factors, but there is no vitamin C complex. Dr. Steve Hickey and I have talked about this in our book, "Vitamin C: The Real Story." Some people have misconstrued comments by researchers going back to Albert Szent-Györgyi who was talking about how it was more beneficial when rats had green peppers as opposed to just ascorbic acid. That's true, and you should eat green peppers. You should eat the foods to get those other factors, but vitamin C is still ascorbic acid, C₆H₈O₆. That's what's in fruits and vegetables. That's what animals make. Not all animals make vitamin C.

Andrew Saul: In addition to humans not being able to make it, the primates in general, chimpanzees, gorillas, orangutans, monkeys, primates cannot make their own vitamin C. Guinea pigs cannot make their own vitamin C, the red-vented bulbul, which is a bird, cannot make its own vitamin C and the fruit bat cannot make its own vitamin C. If you think about it, these animals are probably eating it just like we are. Our problem is we're not getting enough and the amount you need is the amount that keeps you well. There is no need to give numbers here because we're all different. I am asked very often how much vitamin C should I take every day? Well, I don't know. You don't either until you find out. You take the amount that keeps you well and my jingle again, which I say again and I've been saying for 42 years now, you take enough C to be symptom-free, whatever the amount might be. I know people that are healthy and happy on 1,000, 1,500 milligrams of vitamin C a day. I know people that need 35,000 milligrams of vitamin C a day to stay well. These are usually people with allergies or chronic fatigue or something like that. You find out by taking vitamin C and finding for yourself with a therapeutic trial the amount that's best for you.

Andrew Saul: If you're healthy and you're not getting sick, you're done, whatever that amount is, you're just fine with that, stay with it. When you're sick, it's a whole new deal. When someone is well, they might get to saturation at just a few thousand milligrams a day. Certainly no more than 20 or 30 if they're in good health. If you're sick, you might need far more than that. I have personally taken, as I said earlier, 20,000 milligrams an hour during viral pneumonia and I have taken 30,000 milligrams an hour when I had influenza. You're probably thinking, why did I get influenza? People get sick, they just do. We all get sick and we all need a way out and vitamin C because it's an antiviral, an antitoxin, an antihistamine, and antipyretic, it lowers fever and an anti-infective, meaning it works as if it were an antibiotic without killing off your good bacteria. Vitamin C is so good and does all those things that it is our way out, this is our solution to life's problems. Vitamin C is available as sodium ascorbate, calcium ascorbate and magnesium ascorbate, as well as ascorbic acid.

Andrew Saul: Generally, people look to these other forms because they have a special need. For instance, if you're going to use intravenous vitamin C, you obviously can't put ascorbic acid into the blood. Of course, you can't, so you use a pH neutral that is neither acid or alkaline vitamin C called sodium ascorbate instead of hydrogen ascorbate, which is ascorbic acid. You take sodium ascorbate, which is the sodium salt of ascorbic acid. It's no big deal, but if you look on the periodic table you'll see that hydrogen and sodium are in the same vertical column, they are interchangeable. They both go to a plus one valence and it doesn't matter to your body if the ascorbate comes from ascorbic acid or from sodium ascorbate unless you're sensitive. Some people are very sensitive to things that go in their tummy and sodium ascorbate because it's pH neutral is easier on the stomach. Some people complain about that. Generally, ascorbic acid's weakness as an acid does not cause any problem in your stomach because your stomach acid, hydrochloric acid is about 55 to 75 times stronger than ascorbic acid.

Andrew Saul: Your stomach acid is almost as strong as battery acid. Very, very low pH, that means it's very acidic. Vitamin C is not nearly as acidic. It's in the neighbourhood of vinegar and although vinegar is certainly acidic and you can taste it, it is certainly not close to your stomach acid. Sodium ascorbate is a good choice for those who do still notice a funny feeling if they take a lot, particularly if they're sick, particularly if they're sick and taking a lot on an empty stomach such as between meals. Sodium ascorbate is also less offensive tasting for children. A lot of kids will not take ascorbic acid in juice, some will because it makes it tastes like lemonade if you put it in pineapple juice or orange juice, any sweet juice. Ascorbic acid isn't too bad. Sometimes kids object. Often, kids object, all right, usually kids object and you want to have an option and sodium ascorbate is a good option. Because of the high amount of sodium in a bowel tolerance day of sodium ascorbate, I would recommend that you mix your sodium ascorbate with ascorbic acid about 50/50 if you're giving it to kids. That reduces the acidity, but it also moderates the sodium.

Andrew Saul: Why am I saying that? Because it's generally considered a good idea to not overload the body on sodium. We've all heard of low sodium diets and if a child were taking bowel tolerance amounts of sodium ascorbate, they would be getting just enough vitamin C as much sodium as they would need for the entire day. My second recommendation would be to put kids on a low sodium diet while they're taking sodium ascorbate on top of what I said earlier, which is cut the sodium ascorbate with ascorbic acid, half and half. That's the best of both worlds, 50% sodium ascorbate, 50% ascorbic acid. You can vary that. You could go one third, two thirds. It's up to you. Back to Thomas Levy, the cardiologist. He said sodium is actually not the big issue, it's actually chloride, table salt is sodium chloride. Sodium ascorbate has no chloride in it. Dr. Levy said it's the chloride ion that we really don't want to overdose on, and he said there isn't really an issue with sodium. I think it's indefensible to go to your pediatrician and say that your child was getting a huge amount of sodium every day. To avoid that scenario and having to prove it and have a debate, you can just cut the sodium ascorbate 50/50 with ascorbic acid.

Andrew Saul: Then there's calcium ascorbate and magnesium ascorbate. These are also pH neutral. Calcium ascorbate does not work as well as sodium ascorbate or ascorbic acid. Calcium ascorbate is reserved for one of two things. One is buffering ascorbic acid. You can also take ascorbic acid and make it about 10 to 15% calcium ascorbate, so you have 10 to 15% calcium ascorbate, 85 to 90% ascorbic acid and you shake that powder up together and the calcium will buffer the ascorbic acid. That's one thing you can do with calcium ascorbate. The second thing you can do with calcium ascorbate is you can apply it directly to broken skin. An example of this would be an active herpes lesion. You put ascorbic acid on a herpes lesion and it probably is going to sting a little bit. I think ascorbic acid works better on herpes lesions topically. You can use sodium ascorbate as well. You can use calcium ascorbate for comfort, but sodium ascorbate on herpes lesion is worth the sting. Calcium ascorbate has one particularly powerful and unique application and that is inside your mouth.

Andrew Saul: If you have sore gums or receding gums or a canker sore or a cut where you bit your tongue or your bit your cheek and we've all done that, you can put calcium ascorbate powder right inside your mouth and it's very soothing. It has a slight metallic taste but it's not acidic. Now, why would you want to do that? Because you're putting the vitamin C right where you need it. Instead of swallowing it, you're applying it directly and that gives you the highest concentration you can possibly get. Calcium ascorbate and sodium ascorbate and for that matter, magnesium ascorbate, because they're all non acidic, they will not affect your tooth enamel. Tooth enamel is very hard. It resists a lot of things. Vitamin C is about as acidic as vinegar or Coca-Cola or any of the cola soft drinks. I think people should rinse their mouth after they have ascorbic acid. I think they should rinse their mouth after they have a cola drink. If you rinse your mouth, you will eliminate the issue of acidity remaining on the teeth, which if repeated over time long enough could result in some erosion of tooth enamel. Rinse when you're done. I used to give my kids ascorbic acid in juice and then they'd look up at me and say, "Rinse." Then I would give them some regular juice with no vitamin C in it or a little bit of water.

Andrew Saul: Acidity comes into play with chewable vitamins for children. You should look for chewable vitamins that are buffered and they will probably contain calcium ascorbate. They might contain sodium ascorbate. You have to read the label carefully. Earlier I said that calcium ascorbate does not work as well and it doesn't, and this is one of the reasons why children's chewables are not ideal for therapy. You're better off with pure vitamin C powder, ascorbic acid or sodium ascorbate. It works better and it's cheaper, a lot cheaper. Anything that works better and is also cheaper should have your attention. I would recommend stocking up on vitamin C powder. I always had many, many pounds of it on hand because you never know. You don't want to have to scramble around at two in the morning with a sick child. Vitamin C powder, ascorbic acid and sodium ascorbate is what was recommended by Linus Pauling. Vitamin C powder as ascorbic acid or sodium ascorbate is what's recommended by Dr. Suzanne Humphries, a medical doctor, specialist in internal medicine and also a nephrologist.

Andrew Saul: These are reliable sources, and to learn more, you should chase down the videos by Dr. Suzanne Humphries on YouTube. You could spend about a week looking at those over and over again and learning a lot more from her than I can put into this particular presentation. Dr. Humphries is very, very good when it comes down to details on treating with vitamin C. Another source would be the Riordan Clinic. They're out in Wichita, Kansas, do a Google search for Riordan, R-I-O-R-D-A-N and you will find instructional videos. They have those posted. If you look across the top of the web page, there will be a clickable rectangle that says learn and you click that and you'll go right to the videos. They're all free access and done by researchers and physicians. Linus Pauling is famous, so famous that a lot of people have heard about him but have not read him. You should read Linus Pauling's books, "Vitamin C, the Common Cold and the Flu." You should read Linus Pauling's book, "How to Live Longer and Feel Better," which was revised not too long ago and still holds up very well.

Andrew Saul: Dr. Tom Levy has several good books out on Infectious Diseases and Vitamin C, Vitamin C is an antitoxin. I would recommend you read those as well. Now, Dr. Levy is an advocate of liposomal vitamin C and I don't have quite the strong interest in that as some people do because I honestly think it's just too expensive. Vitamin C as liposomal vitamin C is running about a dollar or more per thousand milligrams, whereas you can buy a pound 454 grams, 454,000 milligrams of vitamin C, a pound of vitamin C you can get on the internet for between 15 and \$20, sometimes less. Ascorbic acid is much cheaper. Sodium ascorbate is cheaper. Liposomal is very expensive. My biggest worry about liposomal is that people simply won't take enough. They'll think that it's so efficient that they can take way, way, way less. I don't think that's true. I think it's better in many ways, but it's not enough for people on a budget, and most of us are. I recommend again going with the C powders. I'll just mention briefly about magnesium ascorbate. It is expensive. You don't usually find it, it's not necessary. It's cheaper for you to simply take a magnesium supplement separately.

Andrew Saul: Magnesium citrate, magnesium chloride, magnesium gluconate or the other designer magnesiums that are much more expensive. Magnesium citrate is the one I usually recommend. If you want this to work as Dr. Robert Cathcart said, you can't send a boy to do a man's job. You have to take enough C to get the job done. You don't take the amount you think you ought to need. You take the amount that gets the job done. This sounds like a very minor point, but it is not. The amount of vitamin C you need when you have a viral infection is off the scale. I have personally taken way over 100,000 milligrams of vitamin C a day when I had influenza or pneumonia. There are people that will need more than that. Another example of needing a lot more C is if you have surgery. When I had a hernia repair and when I had eye surgery on another occasion, I was taking 125,000 milligrams of vitamin C in the first 24 hours after surgery and I did not get to saturation. Now you ask yourself, where is it going? It must be going somewhere and the answer is it sure is, that vitamin C is going to do a job and because it's an anti-infective, and an antitoxin, and an antihistamine, and antipyretic and antiviral, you're going to need a lot.

Andrew Saul: You also have to keep in mind that because it's a water-soluble vitamin that you have to continually take the vitamin C through the day. Quantity, frequency and duration. You need to take enough, you need to take it often enough, and you have to keep taking it. When you're sick, you start taking C and most people take too little too late. Linus Pauling said at the first sniffle, at the first sneeze, take 4,000 milligrams of C. That's a loading dose and that's a good idea. I've gone from sneezing or coughing to not doing either within half an hour by just following Linus Pauling's advice. Don't be steered away from Dr. Pauling, he has two more Nobel prizes than any of his critics. I take 18,000 milligrams of C every day preventively. Interestingly enough, I got that from Linus Pauling. Well, that's a good guide in my opinion. Vitamin C has been used for a very long time. It goes back to 1935 or sooner when Dr. Claus, with a C. Claus, sounds like a K. Dr. Claus Jungeblut at Columbia University, a professor of bacteriology and a medical doctor, showed that vitamin C could stop, reverse and prevent polio.

Andrew Saul: Now, Jungeblut published on this in a series of papers, 1935, 36, 37. He also showed that vitamin C was an antitoxin. Now this is a long time ago and this is a reliable doctor at a very well-known university and a series of papers all published in peer-reviewed journals and you can access these online. You can start by going to doctoryourself.com, do a search for Jungeblut, that's J-U-N-G-E-B-L-U-T and you will find links to where you can get these papers or you can just do a Google or Yahoo search and find them. It's Claus W. Jungeblut. When we have doctors using a vitamin for this many years, we have a safety record established. Dr. Frederick Robert Klenner used far higher doses than Jungeblut in the 1940s, '50s and '60s. Dr. Frederick Robert Klenner has a wonderful book which was actually put together and edited by Lendon Smith, a pediatrician known nationally as the children's doctor. He was on television a lot. Lendon Smith summarized Klenner's work in a wonderful little book called, "Clinical Guide to the Use of Vitamin C." I had a copy of this put in my hands by one of my clinical nutrition students. He said, "You've got to read this." Well, he was right.

Andrew Saul: Since you're taking this course, you are interested in knowing more details and that's why I'm sending you away here with some reading. I'm giving you homework simply because you want to know as much as you possibly can. My dad used to say, "When you want to know what's really going on, Andrew, go to the organ grinder, not the monkey." Klenner and Smith really know what they're talking about and the, "Clinical Guide to the Use of Vitamin C," is a short book, a very concise book and it reviews Klenner's 22 or 23 papers on the subject. Dr. Robert Cathcart's papers are available online. You can go to doctoryourself.com and find them there. As you search the internet, you will find more and more. whale.to is a website that has a great many papers on vitamin C and the other is CNET. If you have any trouble finding these, once again, go to my website or my books and I have links there. That'll take you to these archives of dozens of peer-reviewed papers by physicians who use high dose vitamin C. What I'm working up to here is the safety. History has shown us that vitamin C works. History has shown us that vitamin C is safe. No one has produced the vitamin C cause kidney stone, sort of like the Loch Ness monster. Everybody's heard of it. Nobody's landed one yet.

Andrew Saul: With vitamin C, theoretically it could cause a kidney stone, but that does not mean it happens and here's why. The theory is that because vitamin C increases your body's production of oxalate that you can form a calcium oxalate stone more easily. Well, that would be true except for the fact that vitamin C happens to inhibit the bond of calcium and oxalate so it doesn't happen. It's almost as if the body knows what it's doing. I can thank Dr. Emanuel Cheraskin, professor of medicine at the University of Alabama at Birmingham Medical School. Cheraskin was a dentist as well as a medical doctor, a full professor of oral surgery and a vitamin C expert. The other thing about oxalate is that you are going to produce it by eating a number of foods and people have rhubarb or spinach or chocolate. Other foods will cause increased oxalate and this is not considered a big cause for concern. To avoid kidney stones in general, people should note that calcium oxalate kidney stones and calcium phosphate kidney stones are containing calcium. Maybe you're eating or excreting too much calcium.

Andrew Saul: One of the simplest ways to fix this is not trouble yourself with calcium, but make sure you're getting enough magnesium. If you're getting more magnesium, you're going to be able to handle your calcium better and you're much less likely to form a calcium stone. The secret is not really less calcium. In fact, people with calcium deficiency can still form a calcium stone, so have more magnesium and I think that's going to help you. The other thing is lots more water, plenty of fluids helps reduce stones. Avoiding soft drinks helps to reduce kidney stones and taking the B vitamins, particularly vitamin B6, pyridoxine will help reduce the incidence of kidney stones as well. Avoid excess protein, you're less likely to have uric acid stone. As far as struvite stones, the magnesium-based stones that are formed after surgery, those are actually dissolved by ascorbic acid in the urine and so our calcium phosphate stones. The different types of kidney stones are either prevented or actually dissolved by vitamin C. Vitamin C has been used to prevent and cure kidney stones, at least since Dr. William J. McCormick of Toronto, Canada back in the early 1950s.

Andrew Saul: We have decades of safety here. So many people take vitamin C and it's still used as a warning to try to scare these people away from it. "Well, vitamin C can cause a kidney stone." Well, it hasn't. That's what you need to remember. Don't be buffaloes on vitamin C. There's a lot of things that you'll be told about vitamin C that are just nonsense. One of the most common nonsense urban legends is that vitamin C will cause spontaneous abortion, that it'll cause miscarriage. That is nonsense, and yet a lot of people believe it, but it's still nonsense. Here's why. Animals make their own vitamin C. Animals make more than the U.S. RDA. As a matter of fact, animals that make their own vitamin C make the human body weight dose equivalent of 1,500 to 10,000 milligrams of C a day, depending on what source you quote. Now if an animal was making a mega dose of C every day and if it causes spontaneous abortion, these animals would be extinct. Vitamin C must actually help hold the pregnancy and ensure a healthy baby and a healthy mother because all nature does this.

Andrew Saul: Animals either eat a lot of vitamin C. In the case of monkeys or gorillas, they get the human equivalent of around four to 8,000 milligrams of C a day.

That's a mega dose. That doesn't cause them spontaneous abortion, that gives them healthy little monkeys and healthy little gorillas. Vitamin C actually is good for pregnant women and this was demonstrated by Dr. Frederick Robert Klenner, who in his general practice in Reidsville, North Carolina had over 300 women as patients who delivered babies and they were given high doses of vitamin C all through the pregnancy. Okay. As much as 15,000 milligrams a day in the third trimester. Klenner had no miscarriages. Now, if anybody had miscarriages in his population of patients, it would have been Dr. Klenner. It just doesn't happen. You will hear the most amazing things about vitamin C, how ascorbic acid is somehow bad for you. That's a lot of nonsense. How it's going to kill off your bacteria, your good bacteria. Of course, they ignore the fact that if an acid we're going to kill off your bacteria, your stomach acid would already have done it. Your body knows this and works around it.

Andrew Saul:

You trust to the wisdom of the body and you use a high amount of a very simple molecule, $C_6H_8O_6$. Vitamin C is a very simple molecule, smaller than the simplest sugar, inexpensive, nonprescription, effective and safe, and the odds are nine out of 10 that your own doctor doesn't know that. Fortunately, you and I have the benefit of these other doctors who do. As Bertrand Russell said some years ago, don't pay too much attention to authorities because an alternate authority can always be found. I think the authorities who use vitamin C to get well are the ones that I'm going to listen to. With vitamin C, you need to take enough, you need to take it often, and you need to take it long enough. Quantity, frequency, and duration. If you use vitamin C as therapy, you have to take enough to get the job done. You don't take the amount of C you think you should need. You take the amount your body responds to. For 42 years now, I had been teaching this little jingle and now it's your turn. Take enough C to be symptom-free, whatever the amount might be. Episode three is coming up next. You're going to watch it. It's not about vitamin C, but it's going to be on a topic you really want to know a lot about.