Why Magnesium Matters for Every Cell

And what they discovered by testing the And what they discovered by testing the blood levels of magnesium on people blood levels of magnesium on people before and after Epsom salt soaks is before and after Epsom salt soaks is that you actually do absorb it through that you actually do absorb it through your skin. And the form that you absorb your skin. And the form that you absorb Welcome to my YouTube channel. I'm Dr. A Welcome to my YouTube channel. I'm Dr. A and I have been treating people with and I have been treating people with complex chronic illnesses for decades.

complex chronic illnesses for decades. I've also been involved in teaching and I've also been involved in teaching and research in the integrative medicine research in the integrative medicine space for 30 years at this point. So space for 30 years at this point. So today I want to discuss something that today I want to discuss something that we introduced in a little way and then I we introduced in a little way and then I had promised to circle back to and this had promised to circle back to and this is the one and it's about different is the one and it's about different forms of magnesium. So let's get into forms of magnesium. So let's get into it. The first thing is we hear about it it. The first thing is we hear about it all the time. Like one of the most all the time. Like one of the most commonly talked about nutrients as far commonly talked about nutrients as far as supplements and diet goes online and as supplements and diet goes online and you know all over the place. Well, why you know all over the place. Well, why so important? Why people talk about it so important? Why people talk about it so much? Well, the first thing is that so much? Well, the first thing is that magnesium is a cofactor and what magnesium is a cofactor and what cofactors do, they're sometimes called cofactors do, they're sometimes called coenzymes, right? But a cofactor coenzymes, right? But a cofactor actually goes along and it helps an actually goes along and it helps an enzyme to do whatever its process is at enzyme to do whatever its process is at the proper speed. And most enzymes use the proper speed. And most enzymes use two cofactors. One is an organic two cofactors. One is an organic cofactor and that would be like a cofactor and that would be like a vitamin usually and then it has a paired vitamin usually and then it has a paired cofactor that's inorganic and that's a cofactor that's inorganic and that's a mineral. Magnesium turns out to be in mineral. Magnesium turns out to be in hundreds hundreds hundreds of different enzymatic activities. So of different enzymatic activities. So magnesium from its perspective as an magnesium from its perspective as an inorganic cofactor has hundreds of inorganic cofactor has hundreds of different enzymes it helps out. So we different enzymes it helps out. So we use lots of magnesium every day. The use lots of magnesium every day. The next reason magnesium is important, next reason magnesium is important, which is what came up in the other video which is what came up in the other video that triggered the question is that that triggered the question is that magnesium, it turns out, the level in magnesium, it turns out, the level in the cell, which is where most the cell, which is where most magnesium's inside of our cells, it's magnesium's inside of our cells, it's supposed to be, the level in the cell supposed to be, the level in the cell has a direct relationship to the amount has a direct relationship to the amount of glutathione and the function of that of glutathione and the function of that glutathione. So, the lower the cellular glutathione. So, the lower the cellular magnesium, the lower the glutathione magnesium, the lower the glutathione amount and function. You go back to that amount and function. You go back to that other video if you want a little deeper other video if you want a little deeper dive on that, but it's glutathione is a dive on that, but it's glutathione is a core antioxidant. It turns out that it's core antioxidant. It turns out that it's really supported by magnesium as well.

really supported by magnesium as well. The other thing is because of its The other thing is because of its effects on enzymes, its effects on effects on enzymes, its effects on glutathione, its effects on glutathione, its effects on neuromuscular transmission, what we call neuromuscular transmission, what we call excitable tissues, there's always a excitable tissues, there's always a movement of sodium and potassium and movement of sodium and potassium and calcium and magnesium. Magnesium is calcium and magnesium. Magnesium is super important on all of those fronts.

super important on all of those fronts. So, we see magnesium affecting our So, we see magnesium affecting our digestion, our sleep quality, our brain digestion, our sleep quality, our brain health, how every organ in our body

health, how every organ in our body functions, how our muscles work, etc.

functions, how our muscles work, etc.

Understanding Mineral Chelates

So, it's a huge player in the body. Now, So, it's a huge player in the body. Now, in order to talk about these different in order to talk about these different forms of magnesium, I just want to forms of magnesium, I just want to define one term, and that is what you define one term, and that is what you often see as a mineral chelate. Now, the often see as a mineral chelate. Now, the term chelate, we think of chelating, you term chelate, we think of chelating, you know, heavy metals or something that know, heavy metals or something that chelate, chele, claw, and so chelate chelate, chele, claw, and so chelate means to grab onto. Well, in addition to means to grab onto. Well, in addition to heavy metals, you often have stabilizing heavy metals, you often have stabilizing of minerals, the good minerals for our of minerals, the good minerals for our body, as a mineral chelate. So, that's body, as a mineral chelate. So, that's why you don't normally see the ionic why you don't normally see the ionic version of magnesium. You see magnesium version of magnesium. You see magnesium and a second word. word is the chelate.

and a second word. word is the chelate. Here's what's important. The good Here's what's important. The good chelates should be able to go to your chelates should be able to go to your digestive tract, hit the stomach where digestive tract, hit the stomach where the acid is, and then you disassociate the acid is, and then you disassociate the ion, in this case magnesium, from the ion, in this case magnesium, from the other chelate part. And so, when the other chelate part. And so, when we're talking about it, we're going to we're talking about it, we're going to see that we have direct effects of that see that we have direct effects of that ionization, taking the magnesium off, ionization, taking the magnesium off, and then that chelate doing other and then that chelate doing other things. And then we have indirect things. And then we have indirect effects where maybe that chelate is effects where maybe that chelate is better absorbed, maybe it helps me with better absorbed, maybe it helps me with certain uh organ functions, etc. So, certain uh organ functions, etc. So, when we talk about magnesium and fill in when we talk about magnesium and fill in the blank, the next word is that the blank, the next word is that chelate, and in many cases that goes and chelate, and in many cases that goes and does something different or new. Now, does something different or new. Now, these don't go in any particular order.

these don't go in any particular order. Just want to go through them. The first Just want to go through them.

Magnesium Chloride and Citrate Explained

The first one is magnesium chloride. Now, we use one is magnesium chloride. Now, we use magnesium chloride a great deal in magnesium chloride a great deal in intravenous nutritional medicine. So, IV intravenous nutritional medicine. So, IV nutrients, if you're in the hospital, nutrients, if you're in the hospital, you might get it in say a TPN formula, you might get it in say a TPN formula, total parenteral nutrition through a total parenteral nutrition through a central line. You might get a PPN central line. You might get a PPN formula, peripheral parenteral formula, peripheral parenteral nutrition. But, you might also go to a nutrition. But, you might also go to a doctor, especially integrated medicine doctor, especially integrated medicine type doctors, and they might give you an type doctors, and they might give you an intravenous infusion to help you with intravenous infusion to help you with energy or some other thing. And there's energy or some other thing. And there's two main kinds of magnesium in there, two main kinds of magnesium in there, and magnesium chloride is one of them.

and magnesium chloride is one of them. Now, it's been said in other videos. I Now, it's been said in other videos. I did a number of years doing research did a number of years doing research that was funded by the National that was funded by the National Institute of Health in people with Institute of Health in people with cancer. And one of the sub research cancer. And one of the sub research projects we had was trying to give projects we had was trying to give high-dose vitamin C with the correct high-dose vitamin C with the correct minerals so that the vitamin C minerals so that the vitamin C worked minerals so that the vitamin C worked well, but it also kept the electrolytes, well, but it also kept the electrolytes, the mineral levels as level as possible.

the mineral levels as level as possible. Turned out that if we used chloride Turned out that if we used chloride

chelates, magnesium chloride for chelates, magnesium chloride for example, that worked better afterwards.

example, that worked better afterwards. So, the chlorides are good, especially So, the chlorides are good, especially in the intravenous form. Now, you might in the intravenous form. Now, you might take a magnesium chloride orally. The take a magnesium chloride orally. The reason it can absorb reasonably well is reason it can absorb reasonably well is that the chloride, so the magnesium and that the chloride, so the magnesium and the Cl, the chloride, are going to break the Cl, the chloride, are going to break apart in the acid of the stomach. Now, apart in the acid of the stomach. Now, just as a side note, if you don't have just as a side note, if you don't have enough stomach acid, you're not going to enough stomach acid, you're not going to absorb most of your minerals very well absorb most of your minerals very well cuz this thing has to happen there, cuz this thing has to happen there, right? But, mag chloride as an oral right? But, mag chloride as an oral supplement is much less commonly seen.

supplement is much less commonly seen. It's more in the parental or the IV It's more in the parental or the IV world. Then there's magnesium citrate. world. Then there's magnesium citrate.

So, that is like a citric acid bound to So, that is like a citric acid bound to the magnesium. Again, comes apart the magnesium. Again, comes apart usually in the acid of the stomach.

usually in the acid of the stomach. Magnesium citrate can be a reasonably Magnesium citrate can be a reasonably absorbed magnesium, but here's a absorbed magnesium, but here's a commonality we're going to see with some commonality we're going to see with some of the forms. Sometimes magnesium is is of the forms. Sometimes magnesium is is used as an osmotic agent to help you used as an osmotic agent to help you with constipation, right? What's that with constipation, right? What's that mean? If it's an osmotic agent, that mean? If it's an osmotic agent, that means it's going to pull water into, means it's going to pull water into, especially, the colon and hydrate the especially, the colon and hydrate the feces so that you're you have an easier feces so that you're you have an easier time having a bowel movement. Decreases time having a bowel movement. Decreases your constipation. The citrate form is your constipation. The citrate form is sometimes used for this. And so, here's sometimes used for this. And so, here's what you also have to think. If I take what you also have to think. If I take magnesium at a normal dose, high dose magnesium at a normal dose, high dose will always give you diarrhea, but a will always give you diarrhea, but a normal dose, and it gives me real loose normal dose, and it gives me real loose bowel. That means I'm not digesting that bowel. That means I'm not digesting that and absorbing it very well. Because if and absorbing it very well. Because if it gives you loose stools, it means that it gives you loose stools, it means that magnesium, some got absorbed, but the magnesium, some got absorbed, but the rest went down to your colon and is rest went down to your colon and is pulling water in. So, that is another pulling water in. So, that is another sign. Some people are very intolerant of sign. Some people are very intolerant of certain types of magnesium because they certain types of magnesium because they get loose stools. And what we know is get loose stools. And what we know is either they don't have enough stomach either they don't have enough stomach acid or it's just the wrong form for acid or it's just the wrong form for them. So, mag citrate for some people them. So, mag citrate for some people works great for physiological reasons works great for physiological reasons cuz they absorb it well. For other cuz they absorb it well. For other people, they get looser stools and then people, they get looser stools and then it would be used more in the case of it would be used more in the case of constipation. Then there's magnesium constipation.

Magnesium Aspartate and Malate for Pain and Muscles

Then there's magnesium aspartate. Magnesium aspartate and a lot aspartate. Magnesium aspartate and a lot of times you'll see this combined with of times you'll see this combined with potassium magnesium aspartate, aspartic potassium magnesium aspartate, aspartic acid. That one comes off a little easier acid. That one comes off a little easier than citrate. So, the magnesium will than citrate. So, the magnesium will usually absorb better with the magnesium usually absorb better with the magnesium aspartate. So, for a lot of people, aspartate. So, for a lot of people, especially where they're using it for, especially where they're using it for, you know, crampy muscles, tight muscles, you know, crampy muscles, tight muscles, maybe cardiac dysrhythmias, other things maybe cardiac dysrhythmias, other things where you might need magnesium, where you might need magnesium, magnesium aspartate is often one of the magnesium aspartate is often one of the go-to's there. Magnesium malate, that's go-to's there. Magnesium malate, that's malic acid. So, magnesium and malic acid malic acid. So, magnesium and

malic acid together. This is often used for people together. This is often used for people with chronic pain, and that can be for with chronic pain, and that can be for couple reasons. One reason is it does couple reasons. One reason is it does disassociate well, so it absorbs the disassociate well, so it absorbs the magnesium good. And the higher your magnesium good. And the higher your magnesium levels go, the slower some of magnesium levels go, the slower some of your pain receptors work. So, that's one your pain receptors work. So, that's one reason mag malate might help you with reason mag malate might help you with pain. The other reason is, remember, the pain. The other reason is, remember, the chelate comes apart in the digestive chelate comes apart in the digestive system, and so the malic acid doesn't system, and so the malic acid doesn't just go flying away. Malic acid helps just go flying away. Malic acid helps your body to detoxify particular things.

your body to detoxify particular things. One of the things, which is in One of the things, which is in groundwater and we're always exposed to groundwater and we're always exposed to it, and we hope it just sort of moves it, and we hope it just sort of moves through the body, but that can cause through the body, but that can cause chronic pain and other stuff that malic chronic pain and other stuff that malic acid does is to help your body remove acid does is to help your body remove aluminum by helping it be excreted aluminum by helping it be excreted through the urine. So, in people with through the urine. So, in people with high aluminum and they've uh researched high aluminum and they've uh researched this in the nephrology world, the kidney this in the nephrology world, the kidney doctors, because when they're doing doctors, because when they're doing dialysis, there's a lot of fluid dialysis, there's a lot of fluid involved, and a lot times the aluminum involved, and a lot times the aluminum levels go up. And so, malic acid is levels go up. And so, malic acid is often used as a way to decrease aluminum often used as a way to decrease aluminum storage in the body. Aluminum storage is storage in the body. Aluminum storage is one of the many things that can cause a one of the many things that can cause a lot of pain, but also a lot of lot of pain, but also a lot of dysfunction in the body. Then there's dysfunction in the body.

Magnesium Glycinate and Threonate for Sleep and Brain

Then there's one of my favorites, magnesium one of my favorites, magnesium glycinate. And magnesium glycinate glycinate. And magnesium glycinate disassociates very very quickly. So, the disassociates very very quickly. So, the glycine and the magnesium fall apart glycine and the magnesium fall apart real quickly in the stomach normally.

real quickly in the stomach normally. So, the magnesium goes and does good So, the magnesium goes and does good magnesium stuff, but now I have glycine.

magnesium stuff, but now I have glycine. Now, glycine in the peripheral nervous Now, glycine in the peripheral nervous system and in the central nervous system system and in the central nervous system has an effect where it calms down the has an effect where it calms down the nervous system by opening chloride nervous system by opening chloride channels. So, we talked about chloride channels. So, we talked about chloride earlier. We think of the movement of earlier. We think of the movement of sodium, potassium, calcium, magnesium as sodium, potassium, calcium, magnesium as excitatory activity and that's true. And excitatory activity and that's true. And when they cross the membranes in the when they cross the membranes in the brain or the nerves peripherally or the brain or the nerves peripherally or the muscles or wherever, they cause muscles or wherever, they cause excitatory activity. But what's the excitatory activity. But what's the emergency brake for all that? Well, it's emergency brake for all that? Well, it's chloride channels opening up. So if I chloride channels opening up. So if I open a chloride channel, I calm things open a chloride channel, I calm things down. So magnesium glycinate, in down. So magnesium glycinate, in addition to being highly absorbed, can addition to being highly absorbed, can be very good to help people sleep, calm be very good to help people sleep, calm down, help muscle cramping, muscle down, help muscle cramping, muscle twitching, things of that nature cuz twitching, things of that nature cuz you're getting the magnesium, but you're you're getting the magnesium, but you're also getting the glycine with it. And also getting the glycine with it. And there's one that we see more and more there's one that we see more and more now cuz it gets a lot of play on the now cuz it gets a lot of play on the internet and that's magnesium 3 and 8 or internet and that's magnesium 3 and 8 or magnesium L-3-8. And the 3 and 8 magnesium L-3-8. And the 3 and 8 basically, again, the magnesium comes basically, again, the magnesium comes off the 3 and 8 codes and it gets it has off the 3 and 8 codes and it gets it has an affinity for the nervous system. We an affinity for the nervous system. We use this a lot with people. It's kind of use this a lot with people. It's kind of like the glycinate story. It will help like the glycinate story. It will help sort of modulate in the nervous system, sort of modulate in the nervous

system, but magnesium 3 and 8 also can help with but magnesium 3 and 8 also can help with the neuroinflammatory picture such as the neuroinflammatory picture such as neurological autoimmunity, healing neurological autoimmunity, healing nervous system after an infection like nervous system after an infection like long COVID. We see this a lot, magnesium long COVID. We see this a lot, magnesium 3 and 8. Then there's magnesium taurate, 3 and 8. Then there's magnesium taurate, which is taurine and magnesium. And they which is taurine and magnesium.

Magnesium Taurate and Sulfate Uses

And they generally fall apart pretty well, but generally fall apart pretty well, but taurine actually is one of those things taurine actually is one of those things that helps the minerals at the cell that helps the minerals at the cell membrane. So we give people taurine membrane. So we give people taurine because it's a gatekeeper. In because it's a gatekeeper. In biochemistry, they call it a osmolite, biochemistry, they call it a osmolite, but basically what it means is without but basically what it means is without taurine at your nervous system taurine at your nervous system membranes, your cell membranes, etc., membranes, your cell membranes, etc., what's going to happen is the movement what's going to happen is the movement of the sodium and potassium and calcium of the sodium and potassium and calcium magnesium back and forth to create magnesium back and forth to create action potential, nervous system action potential, nervous system activity, and stuff. But without enough activity, and stuff. But without enough taurine, those don't move as fluidly. So taurine, those don't move as fluidly. So taurine is the osmolite that helps with taurine is the osmolite that helps with the transfer out to different channels.

the transfer out to different channels. So, if you give magnesium taurate, So, if you give magnesium taurate, you're giving the taurine and the mag you're giving the taurine and the mag together, and that can be very helpful together, and that can be very helpful as well. Then, there's a real workhorse as well. Then, there's a real workhorse called magnesium sulfate. Now, going called magnesium sulfate. Now, going back to the intravenous use, we use back to the intravenous use, we use magnesium sulfate in IVs a lot, and magnesium sulfate in IVs a lot, and people will often ask me because I'll do people will often ask me because I'll do trainings about these different minerals trainings about these different minerals and IVs and stuff. Why does your formula and IVs and stuff. Why does your formula for pain control have magnesium sulfate, for pain control have magnesium sulfate, but your formula for high-dose vitamin C but your formula for high-dose vitamin C has magnesium chloride? Well, the reason has magnesium chloride? Well, the reason is is that in the high-dose vitamin C, I is is that in the high-dose vitamin C, I want the chloride salts to disassociate, want the chloride salts to disassociate, and I want to use the chloride to help and I want to use the chloride to help balance the electrolyte activity. In a balance the electrolyte activity. In a pain formula, I want the magnesium to be pain formula, I want the magnesium to be available very quickly without a available very quickly without a chloride because then it's going to have chloride because then it's going to have a quicker effect cuz there's no chloride a quicker effect cuz there's no chloride tagging along with it than the chloride tagging along with it than the chloride salt would. So, mag sulfate is more salt would. So, mag sulfate is more immediately helpful in the intravenous immediately helpful in the intravenous form for calming muscles, dysrhythmias, form for calming muscles, dysrhythmias, and a number of other things that go on.

and a number of other things that go on. And you might say, "Well, that sounds And you might say, "Well, that sounds almost magical. How else is magnesium almost magical. How else is magnesium sulfate used?" Well, you can take it sulfate used?" Well, you can take it orally. It can cause some stomach upset orally. It can cause some stomach upset and diarrhea, but starting in 1917, and diarrhea, but starting in 1917, there have been publications about there have been publications about magnesium sulfate used in a different magnesium sulfate used in a different way, and there are publications way, and there are publications up to a couple years ago, probably this up to a couple years ago, probably this year, using magnesium sulfate year, using magnesium sulfate transdermally. And most of you have transdermally. And most of you have heard of Epsom salts or magnesium baths.

heard of Epsom salts or magnesium baths. That's what they started publishing That's what they started publishing research on because it's been sort of a research on because it's been sort of a folk medicine forever. And what they folk medicine forever. And what they discovered by testing the blood levels discovered by testing the blood levels of magnesium on people before and after of magnesium on people before and after Epsom salt soaks is that you actually do Epsom salt soaks is that you actually do absorb it through your skin. And the absorb it through your skin. And the form that you absorb really easily is form that you absorb really easily is magnesium sulfate. So, a lot

of times, magnesium sulfate. So, a lot of times, you'll see Epsom salts, they'll be other you'll see Epsom salts, they'll be other forms of magnesium, but they'll be forms of magnesium, but they'll be magnesium sulfate in there. So, again, magnesium sulfate in there. So, again, works really well. That's why those works really well.

Magnesium Oxide and Lactate for Digestion

That's why those soaks, Epsom salts baths, or Epsom salts soaks, Epsom salts baths, or Epsom salts foot soaks will work for neuromuscular foot soaks will work for neuromuscular hyperactivity, help calm your muscles hyperactivity, help calm your muscles down, etc. Then there's magnesium oxide.

down, etc. Then there's magnesium oxide. There is a prescription, it's really an There is a prescription, it's really an over-the-counter supplement, but a lot over-the-counter supplement, but a lot of times a doctor will write for Mag-Ox, of times a doctor will write for Mag-Ox, which is magnesium oxide. What are they which is magnesium oxide. What are they using that for? They're not using it for using that for? They're not using it for the magnesium, they're using it as the magnesium, they're using it as something to help you go to the something to help you go to the bathroom, something for your bathroom, something for your constipation. And that's because the constipation. And that's because the magnesium oxide stays together very magnesium oxide stays together very well, and it just pulls water into the well, and it just pulls water into the small intestine or large intestine. And small intestine or large intestine. And so, if you take magnesium oxide, you're so, if you take magnesium oxide, you're not going to get a ton of mag into your not going to get a ton of mag into your bloodstream, but you are going to go to bloodstream, but you are going to go to the bathroom. So, that's why that's the bathroom. So, that's why that's used. Remember, it's osmotic agent. One used. Remember, it's osmotic agent. One that we sometimes use, it's it's not as that we sometimes use, it's it's not as common in supplements, but you'll find common in supplements, but you'll find magnesium lactate. And this can be magnesium lactate. And this can be helpful for people who have digestive helpful for people who have digestive upsets. Um not as much the diarrhea upsets. Um not as much the diarrhea thing, but there are some people who thing, but there are some people who take oral magnesium and they'll just get take oral magnesium and they'll just get stomach aches and things like that. So, stomach aches and things like that. So, magnesium lactate is often used with magnesium lactate is often used with those folks. Now, another thing that those folks. Now, another thing that goes on with people is they'll say, goes on with people is they'll say, "Well, I can take, let's say, 100 mg of "Well, I can take, let's say, 100 mg of magnesium glycinate twice a day. Don't magnesium glycinate twice a day. Don't get any loose stools, no problem. But get any loose stools, no problem. But I've tried to take 200 mg twice a day, I I've tried to take 200 mg twice a day, I get loose stools." Or they say, "Gee, I get loose stools." Or they say, "Gee, I took magnesium oxide and I really, you took magnesium oxide and I really, you know, I was going to the bathroom all know, I was going to the bathroom all the time." And then they go and they get the time." And then they go and they get maybe an intravenous magnesium, and they maybe an intravenous magnesium, and they say, "Well, won't that magnesium give me say, "Well, won't that magnesium give me diarrhea?" And the answer is no. And the diarrhea?" And the answer is no. And the reason is that the reason magnesium reason is that the reason magnesium loosens your stool, or makes your bowels loosens your stool, or makes your bowels work more, is when I take it orally, it work more, is when I take it orally, it pulls water into the GI tract. If you pulls water into the GI tract. If you get magnesium intravenously get magnesium intravenously or transdermally, like an Epsom salt or transdermally, like an Epsom salt soak, most that magnesium, all of it soak, most that magnesium, all of it with an IV, is going to go in your with an IV, is going to go in your bloodstream. It has nothing to have bloodstream. It has nothing to have anything to do with your GI tract. So, anything to do with your GI tract. So, we can give people higher doses of we can give people higher doses of magnesium intravenously than they would magnesium intravenously than they would ever tolerate orally. So, the things you ever tolerate orally. So, the things you want to keep in mind is every form of want to keep in mind is every form of magnesium has a different target. I magnesium has a different target. I haven't mentioned them all cuz there's a haven't mentioned them all cuz there's a zillion of them. The next thing is that zillion of them. The next thing is that the name tells you what's riding along the name tells you what's riding along with the magnesium, what the chelate is.

with the magnesium, what the chelate is. So, magnesium oxide, it's literally So, magnesium oxide, it's literally oxide. Magnesium citrate, citric acid.

oxide. Magnesium citrate, citric acid. Magnesium glycinate, glycine. Tells you Magnesium glycinate, glycine. Tells you what that is. You can easily now with what that is. You can easily now with the internet look up each one, and

you the internet look up each one, and you may have some that you tolerate better may have some that you tolerate better than others. All right, I'm Dr. Axe.

than others. All right, I'm Dr. Axe. Been great talking to you. I'm glad I Been great talking to you. I'm glad I was able to answer this question in more was able to answer this question in more detail. We got a lot of comments on it.

detail. We got a lot of comments on it. We're going to link below a video that We're going to link below a video that was real popular about glutathione. We was real popular about glutathione. We get into magnesium in that, but it kind get into magnesium in that, but it kind of gets to that connection a little bit of gets to that connection a little bit more. So, I'll see you guys on the next more. So, I'll see you guys on the next