Give Me 30 Minutes and You'll Learn All You Need About NAC (N-Acetylcysteine) Transcript

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What Is NAC and Why It Matters

Without cyine in the body, the body Without cyine in the body, the body cannot synthesize mostly in the liver cannot synthesize mostly in the liver Welcome to my YouTube channel. I'm Dr.

Welcome to my YouTube channel. I'm Dr. A. So let's get into today's topic which A. So let's get into today's topic which is NAC also known as N acetylcyine which is NAC also known as N acetylcyine which is a common supplement. It's a approved is a common supplement. It's a approved drug in the United States as well. NAC drug in the United States as well. NAC or an acetylcyine is an amino acid. It or an acetylcyine is an amino acid. It absorbs very well orally and it is the absorbs very well orally and it is the rate limiting or main aector of our rate limiting or main aector of our formation of glutathione and so a lot of formation of glutathione and so a lot of clinicians will and a lot of lay people clinicians will and a lot of lay people will use an acetylcysteine to try and will use an acetylcysteine to try and increase glutathione levels in the body increase glutathione levels in the body which is great. Glutathione is one of which is great. Glutathione is one of the three most basic and most important the three most basic and most important antioxidants and those three keep each antioxidants and those three keep each other recycled. meaning when they're in other recycled. meaning when they're in their reduced state they're ready to be their reduced state they're ready to be an antioxidant. When they're in their an antioxidant. When they're in their oxidized state uh they have to be oxidized state uh they have to be reduced again. So vitamin C, glutathione reduced again. So vitamin C, glutathione and vitamin E all do this together and and vitamin E all do this together and keep each other as ready and active keep each other as ready and active antioxidants. Now when we get to an antioxidants. Now when we get to an acetylcyine people say well why is it acetylcyine people say well why is it more important? Because glutathione is more important? Because glutathione is three different amino acids. There's three different amino acids. There's glycine, there's glutamine and then glycine, there's glutamine and then there's cyine. So why is cyine or an there's cyine. So why is cyine or an acetylcyine as it's used mostly orally acetylcyine as it's used mostly orally in other ways so important? Well, it's in other ways so important? Well, it's because of the three amino acids that because of the three amino acids that make glutathione, an acetylcyine is the make glutathione, an acetylcyine is the rate limiting amino acid to make rate limiting amino acid to make glutathione. What that means is that glutathione. What that means is that your body can have glutathione your body can have glutathione production through some glycine and production through some glycine and glutamine in the body or in the diet but glutamine in the body or in the diet but without cyine in the body the body without cyine in the body the body cannot synthesize mostly in the liver cannot synthesize mostly in the liver the glutathione that it requires. So the glutathione that it requires. So when your body needs to make glutathione when your body needs to make glutathione it will go in and it will look for these it will go in and it will look for these three and assemble them through a three and assemble them through a multi-step process. The multi-step multi-step process. The multi-step process can have all the glycine and all process can have all the glycine and all the glutamine that it wants, but if it the glutamine that it wants, but if it doesn't have enough cyine, it will slow doesn't have enough cyine, it will slow down and basically stop. And so cyine down and basically stop. And so cyine through an acetylcysteine through an acetylcysteine supplementation can increase the supplementation can increase the glutathione. That's why it's so glutathione. That's why it's so important. These three base antioxidants important. These three base antioxidants that protect all of our cells, that protect all of our cells, glutathione, vitamin C, and vitamin E, glutathione, vitamin C, and vitamin E, work as a triplet. They work all work as a triplet. They work all together. Glutathione we make in the together. Glutathione we make in the body. Vitamin C we have to get from our body. Vitamin C we have to get from our diet because we don't make that as diet because we don't make that as humans. And then vitamin E we generally humans. And then vitamin E we generally have to get from the diet as well. And have to get from the diet as well. And so when we're making glutathione it's a so when we're making glutathione it's a little harder to make because the body little harder to make because the body has to go through these multiple steps.

has to go through these multiple steps. Then antioxidants are protective against Then antioxidants are protective

against free radical formation, damage to the free radical formation, damage to the blood vessels, damage to the brain, blood vessels, damage to the brain, damage to kidneys, all all sorts of damage to kidneys, all all sorts of things. That's why glutathione is so things. That's why glutathione is so important and usually why important and usually why endocetylcysteine becomes very important endocetylcysteine becomes very important especially when we're trying to raise especially when we're trying to raise levels of glutathione. Now people will levels of glutathione. Now people will often say well is there any research often say well is there any research that shows number one it's the rate that shows number one it's the rate limiting step and number two that if you limiting step and number two that if you give somebody cyine an acetylcyine it'll give somebody cyine an acetylcyine it'll actually raise their glutathione. Now actually raise their glutathione. Now when you're looking at an acetylcysteine when you're looking at an acetylcysteine so some people say well are there pluses so some people say well are there pluses and minuses of just taking an and minuses of just taking an acetylcysteine versus glutathione acetylcysteine versus glutathione there's a couple of layers we want to there's a couple of layers we want to think about both of them can be what are think about both of them can be what are called mucolytic substances which is a called mucolytic substances which is a little different than antioxidant but in little different than antioxidant but in uh hospital medicine an acetylcysteine uh hospital medicine an acetylcysteine which used to be a drug called mucamist which used to be a drug called mucamist could be used in a ventilator system could be used in a ventilator system could even be introvenously given But it could even be introvenously given But it could be taken orally used in a could be taken orally used in a ventilator nebulizer and when you ventilator nebulizer and when you breathe it in it helps to break down the breathe it in it helps to break down the mucous bonds and so mucolytic it helps mucous bonds and so mucolytic it helps you to breathe better. Well imagine if you to breathe better. Well imagine if you're uh you know having asthma or you're uh you know having asthma or you're on a ventilator and and your you're on a ventilator and and your mucous secretions are very sticky.

mucous secretions are very sticky. That's what NAC is very helpful with That's what NAC is very helpful with there. Well it turns out glutathione is there. Well it turns out glutathione is also helpful in that way but NAC is the also helpful in that way but NAC is the standard drug approach to that. The next standard drug approach to that.

NAC vs Glutathione: Whatu2019s the Difference?

The next thing is is that what does absorb of the thing is is that what does absorb of the anacetylcyine will help you to make more anacetylcyine will help you to make more glutathione and then you have more of glutathione and then you have more of that triplet of antioxidant working.

that triplet of antioxidant working. There's also the difference in an There's also the difference in an acetylcysteine as a supplement is acetylcysteine as a supplement is moderately or reasonably priced.

moderately or reasonably priced. Glutathione as a supplement there's two Glutathione as a supplement there's two oral forms that will work. One is acetil oral forms that will work. One is acetil glutathione and the other is liposomaal glutathione and the other is liposomaal glutathione. Those are the two that have glutathione. Those are the two that have research to show that they're absorbed.

research to show that they're absorbed. And so if you're using those two, And so if you're using those two, they're very good and they get into your they're very good and they get into your bloodstream, but they can be more costly bloodstream, but they can be more costly than an acettocyine. So people will say, than an acettocyine. So people will say, okay, well, why wouldn't I just take an okay, well, why wouldn't I just take an acetylcysteine boost my glutathione that acetylcysteine boost my glutathione that way? And the answer is, well, you way? And the answer is, well, you certainly can. One of the issues that certainly can. One of the issues that can come up though is if you're using an can come up though is if you're using an acetylcyine more for an acute problem acetylcyine more for an acute problem such as those respiratory things I was such as those respiratory things I was saying sometimes what we'll do is we'll saying sometimes what we'll do is we'll just use the an acetylcyine and then in just use the an acetylcyine and then in maintenance we'll move to glutathione maintenance we'll move to glutathione with people and then there's this other with people and then there's this other factor which is some people do not go factor which is some people do not go through the multiple steps in their own through the multiple steps in their own body in the liver mostly to take the body in the liver mostly to take the three amino acids and turn them into three amino acids and turn them into glutathione. So if you don't do that, glutathione. So if you don't do that, why

would you not do that? Well, that's why would you not do that? Well, that's because of SNIPS or single nucleotide because of SNIPS or single nucleotide polymorphisms that affect the different polymorphisms that affect the different enzyme steps in formation. And so people enzyme steps in formation. And so people can have glutathione synthetase snips can have glutathione synthetase snips and there's some other synthesis enzymes and there's some other synthesis enzymes to get the three amino acids stuck to get the three amino acids stuck together and turned into glutathione. So together and turned into glutathione. So sometimes people will have a lot of NAC sometimes people will have a lot of NAC go in the body and a very little go in the body and a very little glutathione come out the other end glutathione come out the other end because their body just is not very because their body just is not very efficient because genetically they efficient because genetically they inherited that. You can check for these inherited that. You can check for these single nucleotide polymorphisms through single nucleotide polymorphisms through uh neutrogenomic testing and especially uh neutrogenomic testing and especially if you're somebody who's hyper if you're somebody who's hyper sensitive. Maybe you have massel sensitive. Maybe you have massel activation syndromes or mass cell activation syndromes or mass cell activation disorders, multiple chemical activation disorders, multiple chemical sensitivity, environmental toxins, sensitivity, environmental toxins, things of that nature. It's probably things of that nature. It's probably good to look there. And the reason that good to look there. And the reason that becomes important is although the NAC is becomes important is although the NAC is good for lots of things and it's less good for lots of things and it's less costly than glutathione, if I have costly than glutathione, if I have enzyme defects in making glutathione, I enzyme defects in making glutathione, I may need to supplement glutathione may need to supplement glutathione proper and maybe use NAC just to back it proper and maybe use NAC just to back it up or for other purposes. So your up or for other purposes. So your genetics can get in the way of putting genetics can get in the way of putting those three aminos together as those three aminos together as glutathione uh your central antioxidant.

glutathione uh your central antioxidant. So a couple of things just technically So a couple of things just technically about an acettocysteine to consider.

about an acettocysteine to consider. First is it smells smells sort of like First is it smells smells sort of like eggs. It's got a sulfury smell. Why?

eggs. It's got a sulfury smell. Why? It's a theol. It's a sulfur containing It's a theol. It's a sulfur containing amine or amino acid. It should have some amine or amino acid. It should have some smell. It shouldn't smell like rotten smell. It shouldn't smell like rotten eggs, but it's going to smell. The next eggs, but it's going to smell. The next thing is is that you your urine thing is is that you your urine certainly will have a sulfury smell to certainly will have a sulfury smell to it if you're taking uh any thols like an it if you're taking uh any thols like an acetylcysteine. So just that you're not acetylcysteine. So just that you're not there's nothing wrong. It's just that's there's nothing wrong. It's just that's the way that your urine will smell.

the way that your urine will smell. Also, if you're sweating a lot, you may Also, if you're sweating a lot, you may have a little more sulfury smell. That have a little more sulfury smell. That usually is a little more diffuse than usually is a little more diffuse than the urine smell is. Now, mostly for the urine smell is. Now, mostly for people who are trying to use it people who are trying to use it chronically long term and they're an chronically long term and they're an adult, they're probably prescribed adult, they're probably prescribed something along the lines of a half a something along the lines of a half a gram to a gram and a half, two grams a gram to a gram and a half, two grams a day, and then maybe back off to a day, and then maybe back off to a maintenance level. if somebody's having maintenance level. if somebody's having a lot of respiratory disorders and a lot of respiratory disorders and problems and you're using a nebulizer problems and you're using a nebulizer maybe gram doses or a ventilator etc. So maybe gram doses or a ventilator etc.

Dosing, Safety & Quality Concerns

So it's a very wide index but generally it's a very wide index but generally speaking we try and dose it a little speaking we try and dose it a little higher in the beginning and then taper higher in the beginning and then taper that down for maintenance over the long that down for maintenance over the long run. So when we're thinking of it we run. So when we're thinking of it we need to remember that an acetylcyine is need to remember that an acetylcyine is the more economical way to get cyine in the more economical way to get cyine in the body and

produce glutathione. We the body and produce glutathione. We might have troubles with our genetics, might have troubles with our genetics, especially if we have mass cell issues especially if we have mass cell issues or multiple chemical sensitivity, or multiple chemical sensitivity, environmental toxicities, other environmental toxicities, other sensitive sensitizing sort of issues. So sensitive sensitizing sort of issues. So maybe look at neutrogenomics about maybe look at neutrogenomics about making it and then you might need to making it and then you might need to take glutathione proper. But basically take glutathione proper. But basically it's a way to increase your glutathione it's a way to increase your glutathione and also it does a few other good things and also it does a few other good things like the mucalytic effect helping keep like the mucalytic effect helping keep the secretions flowing which we often the secretions flowing which we often use it as I said both in the hospital use it as I said both in the hospital and also uh at home with people with and also uh at home with people with People will ask what's the difference People will ask what's the difference between nastilcysteine and lcyine? Well, between nastilcysteine and lcyine? Well, cyine without any other letters is an cyine without any other letters is an amino acid. It's a sulfurbearing amino amino acid. It's a sulfurbearing amino acid. If you ever smell it, it smells acid. If you ever smell it, it smells like sulfur and it is used for a number like sulfur and it is used for a number of things in the body. Lcyine is a of things in the body. Lcyine is a stable form of the amino acid. But n stable form of the amino acid. But n acetilcyine absorbs better orally and it acetilcyine absorbs better orally and it also is used in other means and so also is used in other means and so nastilcyine is the normal kind of nastilcyine is the normal kind of supplement that is given. So you might supplement that is given. So you might see lcysteine but most oral supplements see lcysteine but most oral supplements are going to be n ailcysteine. Now the are going to be n ailcysteine. Now the next thing would be are there any next thing would be are there any quality issues? Well largely because quality issues? Well largely because we're looking at nastilcysteine we're looking at nastilcysteine in regard to its use as a dietary in regard to its use as a dietary supplement you want to make sure that supplement you want to make sure that you have a reliable supplement you have a reliable supplement manufacturer and one that does quality manufacturer and one that does quality control checks. So any supplement control checks. So any supplement manufacturer that you might use to manufacturer that you might use to purchase an acetylcysteine should be purchase an acetylcysteine should be able to have background information that able to have background information that is quality control oriented. So does the is quality control oriented. So does the company as a general rule test for company as a general rule test for impurities in the supplements that impurities in the supplements that they're making? Do they look for things they're making? Do they look for things that shouldn't be in there that are not that shouldn't be in there that are not in acetylcyine etc? Do they use approved in acetylcyine etc? Do they use approved raw materials? So when you buy these raw materials? So when you buy these capsules of an acetylcysteine, they had capsules of an acetylcysteine, they had to come from somewhere that will usually to come from somewhere that will usually come from, you know, a 1 kilogram or a come from, you know, a 1 kilogram or a five or a 10 or 20 kilogram tub of five or a 10 or 20 kilogram tub of powder. And generally that has to be of powder. And generally that has to be of a certain quality to apply for a certain quality to apply for appropriate use as a supplement. Now, appropriate use as a supplement. Now, one of the issues with dietary one of the issues with dietary supplements, especially recently, has supplements, especially recently, has been certain online sources having kind been certain online sources having kind of pirated or black label type of of pirated or black label type of supplements where they copy the bottle supplements where they copy the bottle from a particular supplement from a particular supplement manufacturer and then they sell manufacturer and then they sell something that is not what that something that is not what that supplement manufacturer would sell. This supplement manufacturer would sell. This also happens for instance in the, you also happens for instance in the, you know, topical products world. I know know, topical products world. I know dermatologists that have, you know, skin dermatologists that have, you know, skin care things and they'll have people, you care things and they'll have people, you know, knock them off and it won't be the know, knock them off and it won't be the same product as what their company same product as what their company sells. And the biggest problem is that sells. And the biggest problem is that the companies can go after these the companies can go after these resellers that aren't selling the real resellers that aren't selling the real thing, but by the time that you know thing, but by the time that you know they do, it's either so much money or they do, it's either so much money or the company the resellers disappear and the company the resellers disappear and they come back in another form. So, what they come back in another form. So, what I would say about that is you want to I would say about that is you want to make sure if you're buying it from a make sure if you're buying it from a distribution center, you know, some distribution center, you know, some something online where you're looking up something online where you're looking up and they've got, you know, a hundred and they've got, you know, a hundred different supplement companies, make different supplement companies, make sure that you're getting connected with sure that you're getting connected with the real supplement product. Many of the the real

supplement product. Many of the companies that you can find, you know, companies that you can find, you know, such as on Amazon or some other such as on Amazon or some other reseller, you can also go to them reseller, you can also go to them directly and order these sorts of directly and order these sorts of things. So quality issues are generally things. So quality issues are generally going to be if you have a reputable going to be if you have a reputable company selling it and you're actually company selling it and you're actually getting their product, you're going to getting their product, you're going to have a good index of suspicion that have a good index of suspicion that they've done the right things and they they've done the right things and they have the right background done. If have the right background done. If you're buying it from a reseller and you're buying it from a reseller and there's, you know, some sort of, you there's, you know, some sort of, you know, piracy going on and it's not know, piracy going on and it's not what's supposed to be in there, you do what's supposed to be in there, you do not have that sort of suspicion. Quick not have that sort of suspicion. Quick interruption from the regular video. If interruption from the regular video. If you are a healthcare practitioner and you are a healthcare practitioner and you have an interest in this topic, you have an interest in this topic, we're going to put a link in the we're going to put a link in the description below to my CE website and description below to my CE website and specifically the webinar that is about specifically the webinar that is about this topic. So see you over there.

this topic. So see you over there. Thanks. Now doses and of course this is Thanks. Now doses and of course this is just general information. This is not a just general information. This is not a medical advice, but doses for an medical advice, but doses for an acetylcysteine for adults generally the acetylcysteine for adults generally the doses that are going to be medically doses that are going to be medically useful are going to be somewhere between useful are going to be somewhere between 500 mg to 3,000 mg and it could be more 500 mg to 3,000 mg and it could be more than that. Generally, if you're doing than that. Generally, if you're doing more than that, it's probably have some more than that, it's probably have some medical advice around it. It does smell medical advice around it. It does smell sulfury and that means when you're sulfury and that means when you're taking it your urine will often smell taking it your urine will often smell sulfury and your even your bowel sulfury and your even your bowel movements might smell sulfury. That's movements might smell sulfury. That's very normal. We had a comment one time very normal. We had a comment one time that somebody was taking an acettocyine that somebody was taking an acettocyine and they smelled their urine. It was and they smelled their urine. It was smelled very like rotten eggs or sulfury smelled very like rotten eggs or sulfury and they thought it was it was a and they thought it was it was a negative or adverse reaction and negative or adverse reaction and actually that's a normal reaction. You actually that's a normal reaction. You the sulfur works its way all the way the sulfur works its way all the way through. So the doses generally we through. So the doses generally we divide up. If you're just taking 500 mg divide up. If you're just taking 500 mg to a,000, you take it all at once. But to a,000, you take it all at once. But let's say somebody's dealing with really let's say somebody's dealing with really thick mucus secretions and they're thick mucus secretions and they're taking it as a mucalytic to help loosen taking it as a mucalytic to help loosen it up. We're probably going to give them it up. We're probably going to give them 500 to a,000 milligs three or four times 500 to a,000 milligs three or four times a day to help with that sort of a a day to help with that sort of a problem. So as long as you have good problem. So as long as you have good product, the doses, you know, are product, the doses, you know, are somewhere around what we said, you're somewhere around what we said, you're going to get some of the benefits out of going to get some of the benefits out of it. Now benefits generally would be in it. Now benefits generally would be in the area of supporting antioxidant the area of supporting antioxidant function through glutathione formation.

function through glutathione formation. That's one of them. Helping as I said as That's one of them. Helping as I said as a mucalytic substance. It's also used in a mucalytic substance. It's also used in a phase 2 liver detoxification. And as a a phase 2 liver detoxification. And as a matter of fact in emergency medicine matter of fact in emergency medicine when somebody has an overdose something when somebody has an overdose something like Tylenol they will use an like Tylenol they will use an acetylcysteine at very high doses to acetylcysteine at very high doses to help with phase 2 to get the Tylenol help with phase 2 to get the Tylenol damage to be minimized in the body. And damage to be minimized in the body.

Cancer Concerns & Clinical Guidance

And then the final thing we wanted to put in then the final thing we wanted to put in NAC 101 was some questions we got around NAC 101 was some questions we got around isn't an acetylcysteine a drug and how isn't an

acetylcysteine a drug and how does the FDA allow an acetylcysteine to does the FDA allow an acetylcysteine to be used as a drug and sold as a be used as a drug and sold as a supplement. It's a very good question supplement. It's a very good question and the FDA has had that same question and the FDA has had that same question over time. So what has happened is the over time. So what has happened is the FDA has an acettocyine as a supplement FDA has an acettocyine as a supplement in a safe harbor at the moment. What in a safe harbor at the moment. What that means is if the FDA decided to that means is if the FDA decided to tomorrow, they could take it out of the tomorrow, they could take it out of the safe harbor and tell all supplement safe harbor and tell all supplement manufacturers you can no longer make an manufacturers you can no longer make an acetylcysteine as a supplement because acetylcysteine as a supplement because it is a drug. Now they are saying this it is a drug. Now they are saying this because anicylcysteine was approved as a because anicylcysteine was approved as a drug in somewhere around 1963 or drug in somewhere around 1963 or something. a long time and their something. a long time and their contention at FDA at least a few years contention at FDA at least a few years ago was well it's we approved it as a ago was well it's we approved it as a drug before it was ever used as a drug before it was ever used as a supplement. There's been a lot of back supplement. There's been a lot of back and forth legally around that. So the and forth legally around that. So the FDA decided I think probably just so FDA decided I think probably just so there wasn't a big public outcry to have there wasn't a big public outcry to have it in a safe harbor and say well yes it it in a safe harbor and say well yes it is a drug but we will allow it to be is a drug but we will allow it to be sold as a supplement. So if you're in sold as a supplement. So if you're in the US, that's the controversy. But the US, that's the controversy. But right now, it doesn't affect anything.

right now, it doesn't affect anything. An acetylcysteine is still very safe in An acetylcysteine is still very safe in the food chain of dietary supplement the food chain of dietary supplement Will NAC cause cancer and will NAC make Will NAC cause cancer and will NAC make my cancer worse? NAC as a supplement and my cancer worse? NAC as a supplement and the potential for cancer. Those are two the potential for cancer. Those are two sides of kind of the same question. So sides of kind of the same question. So I'm going to deal with them I'm going to deal with them concurrently. So the first thing is concurrently. So the first thing is would NAC give me cancer if I don't would NAC give me cancer if I don't already have cancer. And most people already have cancer. And most people understand that we all have you know understand that we all have you know latent cancer cells we make every day latent cancer cells we make every day and our immune system takes care of and our immune system takes care of them. But let's say you're totally them. But let's say you're totally healthy and somehow you know you have no healthy and somehow you know you have no cancer, right? The other side of the cancer, right? The other side of the coin is if I already have cancer, where coin is if I already have cancer, where do I see NAC as far as an outside do I see NAC as far as an outside supplement and is it a danger to me if I supplement and is it a danger to me if I already have cancer? Where this already have cancer? Where this information and where the concern comes information and where the concern comes from is there is definitely research from is there is definitely research that shows that NAC under certain that shows that NAC under certain circumstances can make certain cancer circumstances can make certain cancer cells more resistant to treatment. So cells more resistant to treatment. So this would underscore the concern that this would underscore the concern that people have that would say well if I people have that would say well if I have cancer should I take NAC if it have cancer should I take NAC if it might make my cells more resistant to might make my cells more resistant to chemotherapy for example. This is a chemotherapy for example. This is a completely valid concern and it has a completely valid concern and it has a lot of texture to the answer but I want lot of texture to the answer but I want to get to the main points. So on the to get to the main points. So on the side of a person who already has cancer, side of a person who already has cancer, the first thing you need to remember is the first thing you need to remember is it's not all cancer cells that are it's not all cancer cells that are affected by NAC in this way where they affected by NAC in this way where they get sort of stronger if you will or more get sort of stronger if you will or more resistant to treatment. But it's enough resistant to treatment. But it's enough that we know about it from cancer that we know about it from cancer research. But then the next thing is research. But then the next thing is what is NAC? Why would I be taking it?

what is NAC? Why would I be taking it? Well, an acetylcyine is an absorbable Well, an acetylcyine is an absorbable oral form of the amino acid cyine which oral form of the amino acid cyine which is a sulfur containing amino acid. And is a sulfur containing amino acid. And if you ever smelled acettocysteine, you if you ever smelled acettocysteine, you probably smelled sulfur or rotten eggs probably smelled sulfur or rotten eggs or something like that. One of the or something like that. One of the reasons people take it is because it reasons people take it is because it helps to build up something in the human helps to build up something in the human body called theol

pool and it also helps body called theol pool and it also helps in the formation of glutathione. Now, if in the formation of glutathione. Now, if we didn't have glutathione and if we we didn't have glutathione and if we have no thol, we would be dead. So, have no thol, we would be dead. So, obviously, there's a reason for these obviously, there's a reason for these things going into our body. But then things going into our body. But then when it comes to an outside supplement, when it comes to an outside supplement, we have to be cautious because our body we have to be cautious because our body does what it's going to do and then the does what it's going to do and then the outside supplement is there, hence the outside supplement is there, hence the name supplement to supplement what our name supplement to supplement what our body is already doing. So there may be body is already doing. So there may be times when an integrative oncology times when an integrative oncology practitioner, naturopathic oncologist, practitioner, naturopathic oncologist, somebody like that may recommend an somebody like that may recommend an acetylcysteine or another theol, but acetylcysteine or another theol, but they might do it in a very specific way.

they might do it in a very specific way. They might recommend a certain dose and They might recommend a certain dose and a certain schedule so that you're a certain schedule so that you're refilling the need but you're not giving refilling the need but you're not giving it every day multiple times a day. What it every day multiple times a day. What would be the difference between pulse would be the difference between pulse dosing and continuous dosing every day dosing and continuous dosing every day long term if I already have cancer? The long term if I already have cancer? The difference is if I do pulse dosing my difference is if I do pulse dosing my normal cells that use cyine as an normal cells that use cyine as an intermediate to make glutathione or to intermediate to make glutathione or to raise theol pool etc. There's other raise theol pool etc. There's other things it does too, are going to things it does too, are going to be able to get a little bit extra, but I'm not to get a little bit extra, but I'm not getting it all the time. If I'm giving getting it all the time. If I'm giving it one, two, three times a day, 7 days a it one, two, three times a day, 7 days a week, then not only do my normal cells week, then not only do my normal cells get it, use it, etc., but also I have get it, use it, etc., but also I have excess that then if I have one of those excess that then if I have one of those cancer cell types that might be cancer cell types that might be strengthened or made more resistant by strengthened or made more resistant by the presence of NAC, then that might be the presence of NAC, then that might be a negative for me because the excess a negative for me because the excess then is going to kind of work against then is going to kind of work against me. So the answer with cancer is I would me. So the answer with cancer is I would recommend that you only dose theol recommend that you only dose theol substances. Now we've had separate substances. Now we've had separate things about glutathione the alpha things about glutathione the alpha lipoic acids of the thol and lipoic acids of the thol and acetylcysteine athile etc. under the acetylcysteine athile etc. under the guidance of somebody in integrative guidance of somebody in integrative naturopathic oncology who knows about naturopathic oncology who knows about these things knows about the kind of these things knows about the kind of cancer you have specifically and knows cancer you have specifically and knows how much you know to be doing. It also how much you know to be doing. It also depends a little bit on whether you're depends a little bit on whether you're in active treatment. You're doing in active treatment. You're doing something to kill cancer right now or something to kill cancer right now or you're in recovery or you're in you're in recovery or you're in secondary prevention. Kind of different secondary prevention. Kind of different answers, different questions here. Now, answers, different questions here. Now, let's flip that over. Let's say you let's flip that over. Let's say you don't have cancer, right? Great. If N don't have cancer, right? Great. If N acetylcysteine might make some cancer acetylcysteine might make some cancer cells more resistant to treatment, does cells more resistant to treatment, does it follow then that NAC would give me it follow then that NAC would give me cancer? This is another really common cancer? This is another really common question that came up. Generally question that came up. Generally speaking, there's no research that would speaking, there's no research that would show that just the presence of cyine show that just the presence of cyine because we need it for our body to because we need it for our body to function would give anybody cancer. And function would give anybody cancer. And let's say you're taking it for some let's say you're taking it for some other reason. Maybe you're using it other reason. Maybe you're using it because you're short on cyine for some because you're short on cyine for some reason. Maybe you're using it to support reason. Maybe you're using it to support your respiratory system. It's used for your respiratory system. It's used for that. Maybe you're using it to help that. Maybe you're using it to help support your glutathione formation. Any support your glutathione formation. Any number of things. Well, if you have a number of things. Well, if you have a medical need for the molecule cyine and medical need for the molecule cyine and you're not getting enough in your diet, you're not getting enough in your diet, then definitely you need to supplement.

then definitely you need to supplement. If you have a medical need and you need If you have a medical need and you need the cyine for the medical need, you're the cyine for the medical need, you're probably never going to get enough probably never going to get enough inside of your body to turn on a cancer inside of your body to turn on a cancer cell or make something else happen.

cell or make something else happen. That's just not going to happen. Now, That's just not going to happen. Now, theoretically, this question did come theoretically, this question did come up. Someone said, "Well, what if I up. Someone said, "Well, what if I technically don't need it, but I like technically don't need it, but I like taking it and I just take it three, four taking it and I just take it three, four times a day." it's probably still not times a day." it's probably still not going to cause cancer for you. So, you going to cause cancer for you. So, you probably don't need to worry about that.

probably don't need to worry about that. But anything in the nutrient world that But anything in the nutrient world that you take in excess of what you need and you take in excess of what you need and you don't have a medical need for you don't have a medical need for eventually will either be eliminated by eventually will either be eliminated by your body or will go somewhere and your body or will go somewhere and imbalance your body and amino acids can imbalance your body and amino acids can do this. So what we normally recommend do this. So what we normally recommend is is that if people are taking it cuz is is that if people are taking it cuz it's cold and flu season or people are it's cold and flu season or people are taking it to keep their glutathione taking it to keep their glutathione levels, you know, elevated or people are levels, you know, elevated or people are taking it because it helps with their taking it because it helps with their asthma or people are taking it for some asthma or people are taking it for some other preventive medicine reason, you other preventive medicine reason, you just work with somebody who can help you just work with somebody who can help you dose it in a way where the amount that dose it in a way where the amount that goes in is going to be whatever your goes in is going to be whatever your body needs pretty much every day andor body needs pretty much every day andor you cycle it periodically. But a lot of you cycle it periodically. But a lot of that is about dosing. But NAC is not that is about dosing. But NAC is not going to take somebody who doesn't have going to take somebody who doesn't have cancer and create cancer in them. Now, I cancer and create cancer in them. Now, I know I've come back to this a couple of know I've come back to this a couple of times, but if you are working with any times, but if you are working with any substance at all in nature and you're substance at all in nature and you're working with something as a supplement working with something as a supplement on top of what your body needs and on top of what your body needs and especially if you have cancer, work with especially if you have cancer, work with somebody who is trained in integrative somebody who is trained in integrative or naturopathic oncology because they're or naturopathic oncology because they're going to know the answers to these going to know the answers to these questions. are going to know the safety questions. are going to know the safety guidelines and they're going to be able guidelines and they're going to be able to help you to sort these things out.

to help you to sort these things out. You don't have to do all that on your You don't have to do all that on your own. If you're taking NAC because it was own. If you're taking NAC because it was prescribed to you, just take it as prescribed to you, just take it as prescribed. And if you have concerns prescribed.

Brain, Respiratory & Detox Benefits

And if you have concerns about the safety, ask the person who who about the safety, ask the person who who prescribed it because they will know the prescribed it because they will know the safety parameters around which the safety parameters around which the reason they prescribed NAC to you is reason they prescribed NAC to you is Okay. So the first thing is NAC or Okay. So the first thing is NAC or Nastilcysteine.

Nastilcysteine. Nastilcysteine. What is it? There's an amino acid that What is it? There's an amino acid that your body uses called cyine. And the your body uses called cyine. And the form nacetil or an acetylcysteine is a form nacetil or an acetylcysteine is a bioavailable form that is made that's bioavailable form that is made that's pretty stable that can be given orally.

pretty stable that can be given orally. You can inhale it like in a nebulizer You can inhale it like in a nebulizer for example. It can be given for example. It can be given intravenously. It's a very useful form intravenously. It's a very

useful form of cyine. And because of its stability, of cyine. And because of its stability, it can go in all of those different it can go in all of those different routes. respiratory, introvenous, oral, routes. respiratory, introvenous, oral, all that, and be stable until the cyine all that, and be stable until the cyine can get into your body and do the job of can get into your body and do the job of cyine. Now, cyine, if you might cyine. Now, cyine, if you might remember, or if you ever smelled an remember, or if you ever smelled an acetylcyine, is a sulfurbearing amino acetylcyine, is a sulfurbearing amino acid, also known as aol. So, the sulfur acid, also known as aol. So, the sulfur bearing amino acids often will smell bearing amino acids often will smell very sulfury. The other thing is that if very sulfury. The other thing is that if you're sweating, you might smell sulfury you're sweating, you might smell sulfury and your urine will smell sulfury. So if and your urine will smell sulfury. So if you're taking an acetylcyine or you get you're taking an acetylcyine or you get an injection of it or you're using it as an injection of it or you're using it as a respiratory drug, you're going to a respiratory drug, you're going to potentially smell that out in your potentially smell that out in your urine. And there's nothing wrong with urine. And there's nothing wrong with that. Doesn't mean there's anything that. Doesn't mean there's anything wrong with you. That is the way that wrong with you. That is the way that your biochemistry takes care of the your biochemistry takes care of the cyine in your body because it has sulfur cyine in your body because it has sulfur in it. So NAC is just a very in it. So NAC is just a very bioavailable form of the amino acid bioavailable form of the amino acid cyine. Now what in the world would cyine cyine. Now what in the world would cyine do and why would it be so important kind do and why would it be so important kind of across the board for health? Well, of across the board for health? Well, one of the first things and this is one of the first things and this is often not thought about is it's very often not thought about is it's very supportive to the formation of your supportive to the formation of your integment and so that's like your skin, integment and so that's like your skin, your hair, your nails, but also your hair, your nails, but also connective tissue inside. So for connective tissue inside. So for example, we had a chronic and acute example, we had a chronic and acute viral supplement pack that that our viral supplement pack that that our patients would use and one of the patients would use and one of the supplements in there was an acettocyine supplements in there was an acettocyine and we had a number of people just and we had a number of people just report sort of anecdotally that they report sort of anecdotally that they will they were taking it you know as a will they were taking it you know as a viral prevention or viral healing viral prevention or viral healing supplement but also their hair was a lot supplement but also their hair was a lot shinier or whatever and their their shinier or whatever and their their nails were growing better and all of nails were growing better and all of that. Well, that's because cyine is that. Well, that's because cyine is required to help you grow hair, skin, required to help you grow hair, skin, nails, connective tissue, etc. So, it's nails, connective tissue, etc. So, it's sort of a side benefit. But if you think sort of a side benefit. But if you think about it beyond hair, skin, and nails, about it beyond hair, skin, and nails, your integmentaryary system also is what your integmentaryary system also is what kind of holds you together. And so, that kind of holds you together. And so, that helps with the integmentaryary helps with the integmentaryary confirmation of your skin and the way confirmation of your skin and the way that your skin looks. It also helps with that your skin looks. It also helps with your connective tissue and holding you your connective tissue and holding you together or healing up from injuries, together or healing up from injuries, stuff like that. So that that's one that stuff like that. So that that's one that doesn't usually get mentioned. I thought doesn't usually get mentioned. I thought I'd throw that in there. Cyine or an I'd throw that in there. Cyine or an acetylcyine in high doses is used a lot acetylcyine in high doses is used a lot in psychiatry and that is a relatively in psychiatry and that is a relatively new advent as far as using an new advent as far as using an acetylcyine in neurossychiatry. Now acetylcyine in neurossychiatry. Now we've known about mechanisms in the we've known about mechanisms in the brain for a long time but the last I brain for a long time but the last I would say 10 to 15 years especially would say 10 to 15 years especially there's been more psychiatry papers there's been more psychiatry papers published on higher dose an acetylcyine published on higher dose an acetylcyine use. And so one of the big things that use. And so one of the big things that it does, and this is something that uh it does, and this is something that uh I've been teaching you medical students I've been teaching you medical students and doctors for a long time about, is and doctors for a long time about, is your bloodb brain barrier if it's your bloodb brain barrier if it's working right, which it doesn't always working right, which it doesn't always work right, is supposed to be helping work right, is supposed to be helping you keep your neurotransmitters kind of you keep your neurotransmitters kind of in and around your brain tissues and to in and around your brain tissues and to keep bad things out. And also the bloodb keep bad things out. And also the bloodb brain barrier has these little brain barrier has these little transporters that pump good stuff in and transporters that pump good stuff in and pump bad stuff out. Well, it turns out pump bad stuff out. Well, it turns out that cyine, so an acetylcysteine goes in that cyine, so an acetylcysteine goes in and then eventually it dissociates into and then eventually it dissociates into cyine. Cyine runs something called the cyine. Cyine runs something called the antiporter. And what that means is it's

antiporter. And what that means is it's an antiporter where the cyine goes in an antiporter where the cyine goes in towards your brain and when it does that towards your brain and when it does that it forces glutamate out. Now glutamate it forces glutamate out. Now glutamate we need in our brain but we get higher we need in our brain but we get higher glutamate in inflammatory and some glutamate in inflammatory and some neurossychiatric conditions. So if we neurossychiatric conditions. So if we can lower glutamate, we tend to lower can lower glutamate, we tend to lower things like anxiety, agitation. It's things like anxiety, agitation. It's used in bipolar mania. It's used in all used in bipolar mania. It's used in all sorts of things. And we use it a lot for sorts of things. And we use it a lot for the anti-inflammatory or the glutamate the anti-inflammatory or the glutamate lowering effect in people who have other lowering effect in people who have other neurinflammatory disease. You could see neurinflammatory disease. You could see it used in Parkinson's disease, multiple it used in Parkinson's disease, multiple sclerosis, brain injuries, all all sorts sclerosis, brain injuries, all all sorts of things like that. The other upside is of things like that. The other upside is then it gives your brain some cyine and then it gives your brain some cyine and it takes away the glutamate out to the it takes away the glutamate out to the body to be removed and so that cyine body to be removed and so that cyine going into your brain can feed into going into your brain can feed into whatever you need it for some of the whatever you need it for some of the things that are coming up. Cyine also is things that are coming up. Cyine also is commonly used in the synthesis of commonly used in the synthesis of proteins. So we talked about you know proteins. So we talked about you know integmentaryary proteins and holding integmentaryary proteins and holding your body together and skin hair nails your body together and skin hair nails and all of that. Well, cyine is also and all of that. Well, cyine is also used in a lot of other protein used in a lot of other protein synthesis. So, cyine is an amino acid synthesis. So, cyine is an amino acid and if we take some amino acids and put and if we take some amino acids and put them in a string, that's called a them in a string, that's called a peptide. And if we string enough peptide. And if we string enough peptides together, we call it an amino peptides together, we call it an amino acid. So, the formation of these longer acid. So, the formation of these longer peptide strings turning into an amino peptide strings turning into an amino acid can be supported by the addition of acid can be supported by the addition of cyine into the diet and the body in cyine into the diet and the body in general. Now I mentioned that an general. Now I mentioned that an acetylcyine is a drug that we will acetylcyine is a drug that we will prescribe for respiratory problems and prescribe for respiratory problems and it might be used in a nebulizer. Now I it might be used in a nebulizer. Now I also said it could be taken orally it also said it could be taken orally it could be injected like intravenously but could be injected like intravenously but in the respiratory world mucamist used in the respiratory world mucamist used to be a drug trade name that was the to be a drug trade name that was the original. It's just generic an original. It's just generic an acettocyine now can be inhaled through a acettocyine now can be inhaled through a nebulizer and that helps to break up nebulizer and that helps to break up mucus secretion. So they call it a mucus secretion. So they call it a mucalytic drug. This we use a lot in mucalytic drug. This we use a lot in respiratory problems. So back with the respiratory problems. So back with the earlier varants of COVID when people earlier varants of COVID when people were having a lot of respiratory were having a lot of respiratory problems and sticky mucus we were problems and sticky mucus we were prescribing a lot of home nebulizer prescribing a lot of home nebulizer treatments and one of the things we treatments and one of the things we would use would be an acetylcyine to would use would be an acetylcyine to help to break the mucus down etc. So help to break the mucus down etc. So that can be a very useful purpose for an that can be a very useful purpose for an acetylcysteine as well and it is one of acetylcysteine as well and it is one of the reasons it's used as a drug. Now the reasons it's used as a drug. Now what would be another reason it's used what would be another reason it's used as a drug? Well, another drug reason for as a drug? Well, another drug reason for an acetylcyine which this would just an acetylcyine which this would just generally be injected like intravenously generally be injected like intravenously is it is used in overdose of Tylenol.

is it is used in overdose of Tylenol. Tylenol overdose is very deadly and it's Tylenol overdose is very deadly and it's also one of the most common also one of the most common over-the-counter drug overdoses in the over-the-counter drug overdoses in the world and not just in the US in the world and not just in the US in the whole world. And the reason is that your whole world. And the reason is that your body will take the Tylenol acetaminophen body will take the Tylenol acetaminophen and it gets partway through the detox and it gets partway through the detox processes in the liver and it can use up processes in the liver and it can use up a lot of the components that help with a lot of the components that help with its particular detox pathways, its particular detox pathways, glucuronidation, etc. And so if that glucuronidation, etc. And so if that backs up then you wind up with an acute backs up then you wind up with an acute liver injury and you could go into acute liver injury and you could go into acute liver failure which is obviously deadly.

liver failure which is obviously deadly. Well, it turns out that you can support Well, it turns out that you can support those steps that get backed up from the those steps that get backed up from the acetaminophen drug by giving an acetaminophen drug by giving an acetylcyine. And in in those toxicology acetylcyine. And in in those toxicology cases, it's given in quite high doses cases, it's given in quite high doses intravenously. Now, we also use it intravenously. Now, we also use it intravenously in a little bit lower intravenously in a little bit lower doses with people for some of the brain doses with people for some of the brain things that we're talking about things that we're talking about Parkinson's and MS and other things like Parkinson's and MS and other things like that. We use it introvenously for people that. We use it introvenously for people with other liver support needs, maybe a with other liver support needs, maybe a lower dose because they're not dying of lower dose because they're not dying of acute liver injury, but we'll still use acute liver injury, but we'll still use it intravenously as well. You also, of it intravenously as well. You also, of course, can take it orally. And anytime course, can take it orally. And anytime I have had occasion to give somebody an I have had occasion to give somebody an acetylcyine from a respiratory point of acetylcyine from a respiratory point of view, so they're breathing it through a view, so they're breathing it through a nebulizer or IV, I always have them take nebulizer or IV, I always have them take it orally in between IV treatments or it orally in between IV treatments or nebulizer treatments to keep their nebulizer treatments to keep their levels elevated and then that helps a levels elevated and then that helps a lot. Now what's the other thing that an lot.

NAC and Glutathione Explained

Now what's the other thing that an acetylcyine does that most people talk acetylcyine does that most people talk probably the most about? Nic acettocyine probably the most about? Nic acettocyine or NAC provides cyine which is also the or NAC provides cyine which is also the rate limiting amino acid for a rate limiting amino acid for a tripeptide. So three amino sequence tripeptide. So three amino sequence called glutathione. Everybody's heard of called glutathione. Everybody's heard of glutathione. It's one of the primary glutathione. It's one of the primary three antioxidants that the body uses.

three antioxidants that the body uses. Now, there's a ton of antioxidants, but Now, there's a ton of antioxidants, but at the level of just your cell, there is at the level of just your cell, there is a base of three antioxidants that your a base of three antioxidants that your cell uses, and those are vitamin C, cell uses, and those are vitamin C, vitamin E, and then glutathione. And vitamin E, and then glutathione. And they all help to recycle each other. And they all help to recycle each other. And then all the other antioxidants work then all the other antioxidants work around them as the base. Your body around them as the base. Your body naturally makes its own glutathione. We naturally makes its own glutathione. We make most of it in our liver. It can be make most of it in our liver. It can be synthesized elsewhere as well. And if we synthesized elsewhere as well. And if we don't have cyine, cyine's in the middle don't have cyine, cyine's in the middle of those three amino acids, then we're of those three amino acids, then we're not going to be able to make any not going to be able to make any glutathione because it's the rate glutathione because it's the rate limiting step. The other two are glycine limiting step. The other two are glycine and glutamine, the two G's, and they get and glutamine, the two G's, and they get together with cyine and form together with cyine and form glutathione. And normally we have lots glutathione. And normally we have lots of glutamine around. We often have of glutamine around. We often have glycine around, but cyine is a very glycine around, but cyine is a very determinate part of your diet or determinate part of your diet or supplementation to make the glutathione.

supplementation to make the glutathione. So that's another reason why an So that's another reason why an acetylcysteine can be very useful acetylcysteine can be very useful medically from a nutrient point of view, medically from a nutrient point of view, health point of view, etc. So what health point of view, etc. So what you're looking at then is if I don't you're looking at then is if I don't have enough cyine among other things, have enough cyine among other things, whether it's my hair, skin, and nails, whether it's my hair, skin, and nails, or my brain getting rid of glutamate, or my brain getting rid of glutamate, the inflammatory intermediate glutamate the inflammatory intermediate glutamate or protein synthesis or whatever, I also or protein synthesis or whatever, I also not going to be able to make as much not going to be able to make as much glutathione. And that's critical for all glutathione. And that's critical for all of my antioxidant properties in the of my antioxidant properties in the body. All right. Well, I hope this body. All right. Well, I hope this answers those questions that we got answers those questions that we got about NAC. We got a bunch of other NAC about NAC. We got a bunch of other NAC content

as well. We'll put some other content as well. We'll put some other videos up here for you to look. Thank videos up here for you to look. Thank you everyone. Please like, share, you everyone. Please like, share, subscribe, and I'll see you all in the subscribe, and I'll see you all in the