What Your Doctor Isn't Telling You About Your CAC Score Transcript

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What Your CAC Score Actually Measures

So, today, what we want to cover, So, today, what we want to cover, really, is the coronary artery calcium really, is the coronary artery calcium score, arterial calcification, how they score, arterial calcification, how they Hi, I'm Dr. A. Welcome to the channel.

Hi, I'm Dr. A. Welcome to the channel. I've been teaching and researching in I've been teaching and researching in the naturopathic and integrated medicine the naturopathic and integrated medicine world for 30 years now. I use this world for 30 years now. I use this channel to answer questions, do patient channel to answer questions, do patient education. So, the first thing I just education.

Arteriosclerosis vs Atherosclerosis Explained

So, the first thing I just want to point out is there are two ways want to point out is there are two ways that calcium can build up in your that calcium can build up in your arteries. Now, we've all heard of, you arteries. Now, we've all heard of, you know, maybe some kind of old-fashioned know, maybe some kind of old-fashioned terms like hardening of the arteries or terms like hardening of the arteries or calcified arteries. But, one of the calcified arteries. But, one of the things that I want to make a distinction things that I want to make a distinction off the top here is that you can have a off the top here is that you can have a inside the blood vessel, inside the inside the blood vessel, inside the artery calcium that builds up that is artery calcium that builds up that is called arteriosclerosis, called arteriosclerosis, and that is literally hardening of the and that is literally hardening of the arteries. And it's calcification within arteries. And it's calcification within the artery itself. Doesn't have anything the artery itself. Doesn't have anything to do with your blood flow. Well, it to do with your blood flow. Well, it does because it makes the artery harder, does because it makes the artery harder, but it doesn't change the inside of your but it doesn't change the inside of your blood vessel. The one we're talking blood vessel. The one we're talking about, largely, is calcification inside about, largely, is calcification inside the blood vessel where the blood is the blood vessel where the blood is trying to be, and then that is called trying to be, and then that is called atherosclerosis.

atherosclerosis. atherosclerosis. So, we're going to limit this talk to So, we're going to limit this talk to atherosclerosis, the inside where the atherosclerosis, the inside where the blood's supposed to be stuff. Now, blood's supposed to be stuff. Now, here's the thing. They invented this here's the thing. They invented this coronary artery calcification score as a coronary artery calcification score as a way to look and with imaging and say, way to look and with imaging and say, "Well, that artery on your heart has "Well, that artery on your heart has this much. This artery has twice as this much. This artery has twice as much. This artery doesn't have any much. This artery doesn't have any calcium." Now, why did they pick calcium." Now, why did they pick calcium? It's because calcium's easy to calcium? It's because calcium's easy to see with imaging. If you think about, see with imaging. If you think about, you know, take X-ray of your bones, it's you know, take X-ray of your bones, it's the minerals that you see in the bone, the minerals that you see in the bone, and a lot of that's calcium. Well, if I and a lot of that's calcium. Well, if I have a special procedure done, the CAC, have a special procedure done, the CAC, it's tuned to the heart, and especially it's tuned to the heart, and especially the heart blood vessels, and then that the heart blood vessels, and then that will tell the imaging software how much will tell the imaging software how much calcification I have in very important calcification I have in very important blood vessels that are feeding my heart.

blood vessels that are feeding my heart.

How to Read Your CAC Score Percentile

And what we don't want is we don't want And what we don't want is we don't want like completely hardened, brittle blood like completely hardened, brittle blood vessels, coronary arteries feeding our vessels, coronary arteries feeding our heart because then our heart needs lots heart because then our heart needs lots of blood going

through it. be getting of blood going through it. be getting any in that area when we have a any in that area when we have a myocardial infarction or many other bad myocardial infarction or many other bad things happen. So, a couple things about things happen. So, a couple things about the CAC score. The first thing is is the CAC score. The first thing is is that it's on a scale of this essentially that it's on a scale of this essentially zero to as high as you want to go, and zero to as high as you want to go, and that scale is based on how much calcium that scale is based on how much calcium signal comes back, hence the name of it.

signal comes back, hence the name of it. But, then you report, usually you will But, then you report, usually you will get, and it will say, "You are in the get, and it will say, "You are in the something percentile." And what that something percentile." And what that means is if it says you are in the 75th means is if it says you are in the 75th percentile, percentile, percentile, that means for all of the studies that that means for all of the studies that have been done on humans in the past, have been done on humans in the past, you are at the upper quarter, at the you are at the upper quarter, at the upper quarter cutoff for calcification upper quarter cutoff for calcification of that artery, meaning 74% of people in of that artery, meaning 74% of people in studies had less calcium than you did.

studies had less calcium than you did. So, you'll be reported a numeric value So, you'll be reported a numeric value and a percentile value, usually. It'll and a percentile value, usually. It'll be explained to you, etc. Now, those of be explained to you, etc. Now, those of you who are listening to the earlier you who are listening to the earlier part might say, "Well, is that also part might say, "Well, is that also looking at arteriosclerosis, the looking at arteriosclerosis, the hardening of the arteries?" And it will hardening of the arteries?" And it will pick that up, definitely, but because pick that up, definitely, but because the imaging is tuned to looking at this the imaging is tuned to looking at this more gross atherosclerotic more gross atherosclerotic calcification, that signal, if it's calcification, that signal, if it's there, will sort of almost overwhelm the there, will sort of almost overwhelm the arteriosclerotic signal. Now, just as a arteriosclerotic signal. Now, just as a little passing side, where can your little passing side, where can your doctor see arteriosclerosis doctor see arteriosclerosis directly? They look in your eye. directly? They look in your eye. So, you can see arterio- and atherosclerosis in can see arterio- and atherosclerosis in the eye by the way that the arteries the eye by the way that the arteries look because, of course, there's no skin look because, of course, there's no skin in the back of your eye, so the arteries in the back of your eye, so the arteries back there are just laying there, being back there are just laying there, being arteries. And if you look with the arteries. And if you look with the ophthalmoscope, you'll be able to see ophthalmoscope, you'll be able to see is, you know, is there a small, medium, is, you know, is there a small, medium, large amount of calcification back large amount of calcification back there, etc. But, anywhere else in your there, etc. But, anywhere else in your body, there's skin covering it, so you body, there's skin covering it, so you need imaging like this. And because the need imaging like this.

Why Inflammation Comes Before Calcification

And because the heart is what we're most interested in, heart is what we're most interested in, coronary artery calcium score comes up. coronary artery calcium score comes up.

Now, what are a limitation, and I'll Now, what are a limitation, and I'll just say category, of the CAC score? And just say category, of the CAC score? And this has been published since at least this has been published since at least 2014 or 15 in the cardiology literature, 2014 or 15 in the cardiology literature, maybe probably earlier. But, it came to maybe probably earlier. But, it came to my attention back around that time. And my attention back around that time. And that is because this image is looking at that is because this image is looking at calcification, if, you know, calcification, if, you know, atherosclerosis was only calcification, atherosclerosis was only calcification, it would be a perfect instrument, a it would be a perfect instrument, a perfect test. The problem is that perfect test. The problem is that atherosclerosis atherosclerosis atherosclerosis is normally a very long process that is normally a very long process that involves multiple steps, and it kind of involves multiple steps, and it kind of ends with calcification. So, your ends with calcification. So, your coronary artery calcification score is coronary artery calcification score is looking at the end of a disease process.

looking at the end of a disease process. That's fine cuz it's a measurement we That's fine cuz it's a measurement we can have, but is the rest of that can have, but is the rest of that disease process also dangerous, and will disease process also dangerous, and will the CAC tell me about that? Well, the the CAC tell me about that? Well,

the short answer is no, not going to. Why?

short answer is no, not going to. Why? Because the time period between starting Because the time period between starting atherosclerosis atherosclerosis atherosclerosis and getting calcified is made up of and getting calcified is made up of generally non-calcium-containing generally non-calcium-containing inflammatory molecules. So, that means inflammatory molecules. So, that means that the whole first part of my that the whole first part of my atherosclerosis journey may not have any atherosclerosis journey may not have any calcium in it at all. Now, that might be calcium in it at all. Now, that might be a problem if I have a coronary calcium a problem if I have a coronary calcium score of zero, high five and all around, score of zero, high five and all around, and I've got wicked amounts of and I've got wicked amounts of inflammatory atherosclerosis building inflammatory atherosclerosis building all over the place. So, this is one all over the place.

Is Arterial Calcium Good or Bad

So, this is one limitation. The next thing is, and limitation. The next thing is, and there's different ideas, theories about there's different ideas, theories about this. The first part of atherosclerosis this. The first part of atherosclerosis is very bad. It's full of inflammation, is very bad. It's full of inflammation, full of immune cells that shouldn't be full of immune cells that shouldn't be inside of your blood vessel walls. And inside of your blood vessel walls. And so, one of the ways that the body tries so, one of the ways that the body tries to calm it down is to send calcium and to calm it down is to send calcium and other molecules there to build a hard other molecules there to build a hard plaque that's like a bandage and says, plaque that's like a bandage and says, "Let's cover this inflammation up." So, "Let's cover this inflammation up." So, then some people will say, "Well, okay, then some people will say, "Well, okay, so that means then the calcium is so that means then the calcium is actually good cuz it's like a bandage actually good cuz it's like a bandage covering up a wound." Well, yes and no.

covering up a wound." Well, yes and no. The goal would be to deal with your The goal would be to deal with your coronary artery calcification and coronary artery calcification and inflammation before we get to the inflammation before we get to the calcium bandage part so that we don't calcium bandage part so that we don't have to build up all of this calcium have to build up all of this calcium because then the other group of people because then the other group of people would say, "Well, no, the would say, "Well, no, the calcification's not a good sign because calcification's not a good sign because high coronary calcification scores are high coronary calcification scores are associated with worse outcomes." And associated with worse outcomes." And that makes sense because if I have a that makes sense because if I have a high CAC score, yes, got a nice calcium high CAC score, yes, got a nice calcium bandage there on the side of the blood bandage there on the side of the blood vessel wall, but it means that there and vessel wall, but it means that there and in other places in my arteries, I still in other places in my arteries, I still have lots of inflammation, and what it have lots of inflammation, and what it took for me to get all of this calcium took for me to get all of this calcium onto the wall of the artery required a onto the wall of the artery required a lot of inflammatory activity in my blood lot of inflammatory activity in my blood vessels that should have never been vessels that should have never been there. That's the part that's very there. That's the part that's very dangerous. So, then by the time I go in dangerous. So, then by the time I go in and I get a CAC score done, and it's and I get a CAC score done, and it's super high, no wonder that's associated super high, no wonder that's associated with worse outcomes. It's because I not with worse outcomes.

Why CAC Scores Rise With Statin Treatment

It's because I not only have the end of the trail being only have the end of the trail being calcification, but I have the whole lead calcification, but I have the whole lead up to it, which is actually inflammation up to it, which is actually inflammation in my arteries that shouldn't be there, in my arteries that shouldn't be there, immune activation gone wrong. Now, immune activation gone wrong. Now, there's another twist to this that there's another twist to this that people find interesting, and that is people find interesting, and that is that if you're on the trail and there's that if you're on the trail and there's a number of pathways this can take, so a number of pathways this can take, so I'm only going to describe one, keep I'm only going to describe one, keep that in mind, but well published. If that in mind, but well published. If you're on the trail towards you're on the trail towards calcification, and then somebody comes calcification, and then somebody comes along and says, "Oh, you have high along and says, "Oh, you have high markers of inflammation in the blood, markers of inflammation in the blood, you know, like apoB and

lipoprotein A you know, like apoB and lipoprotein A and these inflammatory markers that we and these inflammatory markers that we look at." And they've been unchecked, look at." And they've been unchecked, and then somebody aggressively changes and then somebody aggressively changes your diet, and they put you on your diet, and they put you on treatments to deal with these treatments to deal with these inflammatory markers, and it works.

inflammatory markers, and it works. There's a phenomenon that was first seen There's a phenomenon that was first seen with statin drugs that leads you towards with statin drugs that leads you towards less inflammation in the blood vessels, less inflammation in the blood vessels, but it speeds up that calcification but it speeds up that calcification step. So, there's actually a phenomenon step. So, there's actually a phenomenon where appropriate treatment will take where appropriate treatment will take you from a lower CAC score to a higher you from a lower CAC score to a higher CAC score. And this blows people's CAC score. And this blows people's minds, hence people research it and have minds, hence people research it and have to explain it. And it's like, "Wait a to explain it. And it's like, "Wait a minute. My CAC score when we started was minute. My CAC score when we started was 200, and I didn't know I had all these 200, and I didn't know I had all these problems. And then my, you know, my apoB problems. And then my, you know, my apoB was high, and LP little a and all all was high, and LP little a and all all the things. And then you treated it very the things. And then you treated it very aggressively. Great, they all, you know, aggressively. Great, they all, you know, the blood markers are looking better, the blood markers are looking better, but here, a year later, my blood looks but here, a year later, my blood looks better, but my CAC score now is 280 or better, but my CAC score now is 280 or 300, like 80 or 100 points higher. That 300, like 80 or 100 points higher. That doesn't seem like the right direction." doesn't seem like the right direction." Well, it's because Well, it's because in trying to aggressively undo the in trying to aggressively undo the inflammatory component, you had already inflammatory component, you had already tipped over. This tends to happen in tipped over. This tends to happen in people who already have a noticeable CAC people who already have a noticeable CAC score. Generally, it doesn't happen if score. Generally, it doesn't happen if you have a zero or something like that.

you have a zero or something like that. But, if you got, you know, a 200 or But, if you got, you know, a 200 or something or 250, you may wind up after something or 250, you may wind up after one or two years of treatment with a 300 one or two years of treatment with a 300 or 350. And the important part about or 350. And the important part about that is the treatment is still that is the treatment is still warranted, whatever they did. And it's warranted, whatever they did. And it's beyond the scope of this to get into beyond the scope of this to get into whether it was done with, you know, just whether it was done with, you know, just diet or diet and, you know, omegas or diet or diet and, you know, omegas or statins or what- whatever mixture they statins or what- whatever mixture they did for you. Whatever they did, it did for you. Whatever they did, it worked, but it made your CAC score go worked, but it made your CAC score go higher. Now, we don't have great data on higher. Now, we don't have great data on this, but generally, what I have seen is this, but generally, what I have seen is if that's the change and you did all the if that's the change and you did all the right things to lower all the bad right things to lower all the bad markers in your blood, decrease the markers in your blood, decrease the inflammation, and you just incidentally inflammation, and you just incidentally raised your CAC score, it doesn't really raised your CAC score, it doesn't really increase your outcomes that are increase your outcomes that are negative. If your CAC score went from negative. If your CAC score went from 200 to 300 and you were doing no 200 to 300 and you were doing no treatment, then your risk of future treatment, then your risk of future coronary events is definitely higher.

coronary events is definitely higher. So, the CAC score is a great tool. It's So, the CAC score is a great tool. It's got lots of reasons why it's there. It's got lots of reasons why it's there. It's a part of a continuum and appropriate a part of a continuum and appropriate treatment can actually affect it in a treatment can actually affect it in a way that might make it a little bit way that might make it a little bit higher if you already have a high CAC higher if you already have a high CAC score. So, you have to take this all score. So, you have to take this all into account. The part about the CAC into account. The part about the CAC score going up certainly with statins is score going up certainly with statins is well known in in the cardiology well known in in the cardiology literature. And again, I guess what I'm literature. And again, I guess what I'm saying is if the score went up, but you saying is if the score went up, but you also aggressively treated the underlying also aggressively treated the underlying problems, that's probably not going to problems, that's probably not going to be a huge deal as far as disease effect be a huge deal as far as disease effect of the score going up. If the score went of the score going up.

Choosing the Right Cardiologist for You

If the score went up 100 points and you weren't treating up 100 points and you weren't treating anything and you're super inflamed, that anything and you're super inflamed, that just means that the inflammatory cascade just means that the inflammatory cascade and process is on the sort of and process is on the sort of out-of-control train and the higher the out-of-control train and the higher the CAC score goes, the more risk you have.

CAC score goes, the more risk you have. So, the bottom line is you want to work So, the bottom line is you want to work with cardiologist, integrative with cardiologist, integrative cardiologist, somebody who understands cardiologist, somebody who understands these things and can look at it from these things and can look at it from multiple points of the compass and multiple points of the compass and really can deal with the underlying really can deal with the underlying problem, which is the inflammatory problem, which is the inflammatory arteriopathy that's going on underneath.

arteriopathy that's going on underneath. And again, that's beyond the scope of And again, that's beyond the scope of this. This was just answering question this. This was just answering question about CAC scores going up with about CAC scores going up with treatment. All right, we're going to do treatment. All right, we're going to do more on this. I'm Dr. A. Thanks for more on this. I'm Dr. A. Thanks for listening. Thanks for subscribing. Like, listening. Thanks for subscribing. Like, share, subscribe. Do hit the share, subscribe. Do hit the notification bell and thank you for notification bell and thank you for watching. Thank you for telling your watching. Thank you for telling your friends about us. We really do friends about us. We really do appreciate it. I'll see you all on the appreciate it. I'll see you all on the