A Clinician Perspective: It's Never Too Late To Benefit From Telomerase Activation Therapy Transcript

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Introduction to Age Management Practice

Doctor Tom Barringer has been practicing age management medicine since 2006 and his office in Washington, D. C. there, he provides highly individual eyes patient programs with focus on low glycemic nutrition, dedicated exercise, and, when needed, hormone support.

He added to 65 to patient programs in 2012, and will tell us about what he has described as the uniformly beneficial results he has been seeing in his patients.

Well, it's great to have you on the show, Tom. We've known each other for quite a while, been sort of in the telomere trenches early on, sort of trying to get the word out there and treating patients with it.

I'm excited to talk to you about a little bit more about, to start about your journey and how you got to where you are in age management or longevity medicine, however you want to call it these days.

What what what interested you in the field and then how you sort of got involved in, in telomerase activation and learning about the role of telomeres in aging and how you use, your biology and your practice.

Right. It's a pleasure being with you, Joe. Thanks for inviting me. I would say that, my involvement, started by attending the, the, Age management meetings.

Just, seeing the the, the a 65 booth, which was very small in the beginning, around, you know, 2011, 2012, eventually leading to my undergoing testing and, starting views to 65 and then expanding into my patients.

As I learned more and more about it, enthusiasm for it increased. And, my knowledge base also, and to this day, now, eight years after I started, I remain highly enthusiastic.

And although my patient base is small, based on, the length of time I've been in practice in my age, my patients remain very positive about it and about its benefits.

So. So you obviously weren't, but initially trained as an age management physician. What sort of made you get into the field and, and what kinds of treatments you use, along with 65?

I, I actually was trained in ag management medicine, with energetics.

How Tom Barringer Entered Telomere Medicine

I started with them and, 2005 and, then went independent in 2009. So my interest, in age management began early after I start my ob gyn practice in oh four, it expanded considerably with, with, introduction to, to 65 and, telomere, science.

But, as I said just a few minutes ago, that enthusiasm has not waned one one bit during this eight year interval. And I remain very, very positive about not only its benefits, but about the the sophistication of the testing and monitoring of patients who are, considering it and, using it.

So you, since you trained in, in age management, I meant to originally you were an overdue ob gyn because back when you and I first started in medicine, wasn't any field like this. So, in terms of other types of therapies you use, you do hormone optimization in your practice supplements, diet, and, curious how you fit that into discussions with, your patients about telomere.

The testing. I know you do telomere testing in your practice, so you can talk to me about that as well. Right. The the practice that I have is, is, focused very sharply on, on, lifestyle improvement, and the areas of nutrition and, and exercise, supplementation where it's beneficial and any other approaches which will, add to the, the goal of extending longevity and, making patients healthier while they are, alive, to 65, in my view, has been a, a significant contributor to, to those goals.

So you, so you, you start out with baseline testing on your patients, with, telomere length. Yes, yes. All patients, who who have started years of 65, in my practice, undergo baseline testing and regular testing, which I originally, and largely continue yearly.

The pandemic has interrupted, testing, significantly, as well as patient visits and and the entire medical picture. But, I will shortly return to, a regular program of annual testing for the patients.

In that regard, I have communicated with you regarding, various, sources of the testing and, I started out with life length, had some, some use of rapid diagnostic in Canada and have returned to a life length, because of the, the fact that they have ironed out, solve the problems with their testing templates.

And I have confidence in the results that I'm receiving now. Yeah, I know I, I think that's that's absolutely true. They, they had a little of glitch there with, with ranges there for a while, but their, their assay certainly is good.

So you said you use it for people who are going to go on to 65.

Lifestyle, Hormones, and Baseline Telomere Testing

You don't do do you screen all your patients when they come in to see whether or not they need to worry about it or I know it's a it's a money issue to a certain extent.

Obviously the testing is not inexpensive, but when you're talking about a supplement like 65, like I told, I think I might have told you, I've lectured about a patient who came in of mine who wanted to be on 65.

The reason she came to see me, a 52 year old, and she ended up having telomeres that were about as long as, the average 20 year old. So I didn't need him at that time.

And she still does, actually. She's still up there in that 20 to 21 year old range. Of course she needed a bunch of other things. Hormone replacement therapy.

She needed to have her homocysteine level worked on, etc.. So do you, try to do screening on your patients or or, how do you how do you approach that?

The answer is partial. I do screening some patients. Particularly the older patients who I anticipate are going to have, a, a, a worse profile than younger patients.

And my patient age range, is from, 42 to 80, but skewed heavily toward the, the over 65 age group. Well, I should say over 60 would be more accurate. That age, that median age for my patients has shifted as time has passed.

But, I have screened for a good number of patients who like your your example, really would not benefit from day 65, at least for the present time. And for some patients I've screened who would benefit and they've, they decline, but largely the screening that I've done, which has not been uniform across the board, has, turned up results that indicate patients would benefit from the use of to 65.

And, any of those cases, stand out to you in terms of, the length of their telomeres, when they started in any other sort of clinical, attributes that they might have, that, that go along with that or in response to, the therapy because I know you do repeat testing.

Right. The the profile of my patients is unusual in that they are, we are 4 to 1 male, and, they're almost all,

entrepreneurs, business people. They are highly motivated, highly successful and highly stressed.

And so that latter factor contributed significantly, I believe, to the, to the, profiles that I see on the baselines for these patients. It has been very encouraging and positive that despite the high stress nature of the, of the, the work of most of my patients, they've they responded well to, the lifestyle improvements and to, to 65 years.

What are some of those lifestyle improvements or do I say that again, or some of those lifestyle improvements that you, prescribe specifically because there's some controversy about them?

You know, some people think when I have some ultra runners, in, in my practice and then people that do, the high intensity stuff, then there's people who want to just do walking.

What what kinds of prescriptions do you give? Yeah. Good. Good question. The lifestyle, recommendations are made and monitoring my patients that have evolved, in the beginning it was it was, narrower, in terms of, what I recommended, that was based on my early exposure to to the, to the age management world.

And, the lack of experience in dealing with this, back in oh five and oh six and seven. But as time has passed, I realized that that just as in so many aspects of life, when one size does not fit all.

And so, nutrition programs, which in the beginning were were very similar to, say, the zone diet, have evolved into a, a a list of potential dietary avenues that patients can, can travel, based upon their particular, not not to desires, but what fits them best and what they will follow.

Right now, it's in general simply low glycemic is low sugar. And, the goal is to have patients consume, in general, less than 100g of carbohydrate a day.

That is a goal. It's not a practical, a marker for a certain number of them, because I have, a couple of patients, who who are outliers? They are very large frames and therefore simply based upon muscle mass and, and, and body weight, require more of everything.

So, tailoring, programs, including nutrition programs to patients, has been one of the goals that I have achieved over time.

Who Benefits from Screening and Typical Patient Profiles

The exercise programs are, are geared to, a wide range of activity. I emphasize weight training. I emphasize, high intensity interval cardio. As, as compared with, say, running.

I don't like running because, not just my own experience, which is very bad. In terms of effects on knees and hips, but because of the of the known, detrimental effects of the of the constant pounding on the turf to to the skeletal system, particularly that, knees and hips and back.

So I discourage patients from, running on treadmills or even running outside. But if they like to do it, then I try to, to get them to, to follow the, the, the regimens that are going to be least potentially destructive to their, their, their, skeletal systems.

Yeah. I mean, I mean, running is very efficient, in terms of calorie burning and cardiovascular, but the, the toll for most people that don't have really good genetics for it, is, is pretty rough.

I would I've, I've done triathlons and trained for them and, the running part can be the most, sort of causes, the most wear and tear. So, have you noticed anything in terms of telomere length with people?

In terms of their, body composition and shorter telomeres in particularly overweight people or anything like that to you? Or maybe you don't have a large enough database to sort of to see that.

But just just one note before we leave the exercise arena. And that is, about the, the, the cardio training, I, I emphasize that there's a difference between, the endurance that you acquire through running in general and the conditioning that you acquire through, high intensity, interval cardio, conditioning is what will help us to stay alive and healthier, longer and, particularly heart and lungs, because those are the two organ systems that, principally are going to fail us as we get older.

So I, I pound on that, with patients to, to try to convince them that, that testing challenging the heart and lungs with, high intensity cardio is more productive than, than, steady running, outside in addition to the to the, reduction in the and the stress on the on the skeleton regarding the telomere, it's very definitely notice a difference in patients who enter who have, bad genetics in terms of their, their, their, their physical shape, their physical makeup.

Which is, of course, genetically determined. The, the, individual with, the particular, body shape, that, that, I, I have have alluded to, the, the Indian, the South American Indian, physiology, is particularly susceptible to, to metabolic, deterioration, whether it's, development of metabolic syndrome, or, or other undesirable, metabolic changes over time.

So those patients and I have a few, have, have started at baseline and worse condition in terms of telomere length, and percentage of short telomeres than, than the majority of the others.

Have you come across anybody with would qualify as a telomere apathy meaning in the bottom one percentile for their for their age? No, I have not done that.

I look for them, but I have not seen anyone. Who is that much of an outlier to qualify for that category? I hope I never do. Yeah, well, I mean, for your patients sake, I do as well, but I certainly have.

And, you know, given us the bottom 1%, you probably will. As your numbers go up, and, you know, oftentimes, particularly the younger patients, you don't see anything, particularly different about them phenotypic other than perhaps premature graying.

And so that's why, you know, I sort of, I like to, to, to do the case finding, you call it screening, but it's really more case finding, for these people that have, you can call it a ticking time bomb.

It's really a, it's, it's a clock that's there that's been set way forward. It's so that, I had a 40 year old that came in with seven year old telomere length, and that person is somebody who, really is in need of, being quite sure that they do the things from a lifestyle, exercise and diet standpoint to keep their senior year from getting shorter, but also, you know, excellent candidates, potentially 50 to 65.

But yeah, I do what's what's the shortest deal like you've seen, just out of curiosity, I always like to talk to, you know, active practitioners about their, I would have to look to see the answer to that, but, it they have they have fallen into the, to the area, to the zone of short telomeres, and, 25, about 25% of cases.

I can certainly get that data for you, but, off the top of my head, I can't tell you the shortest one. But there have been, about 1 in 4 who who have fallen into the category of short telomeres.

Right. Okay. Yeah. So that's, that's definitely a good candidate to get on to 65. And how about, well, what's the longest, the perhaps besides yourself?

The longest? You've been treating a particular patient and what's what's been your experience with, both.

Exercise, Body Type, and Stress Effects on Telomeres

The trajectory of the tests, if they've done repeat testing over the years and also, fluctuation in the test, eight years is the duration of, the longest patient, longest use, for any patient, the trajectory has been, uniformly good.

There has been, a a fairly consistent initial burst value for use of a better word, burst of, improvement. And then a,

leveling off or plateauing of the improvement, but but, even with smaller increments of improvement, continued improvement, with, as I mentioned earlier, the the problems with the, testing templates at life length that, that, that returned erroneous results for about two years.

With that, aside, the improvement has been incremental, initially greater and then, less as time passed, but continued improvement. What I, what I've not been able to do is correlate, the, the incremental improvement, with dosing.

Well, I, I've struggled with the, the question of, what is the best dose for a given patient and should dosing be based on, on something more than the amount of improvement, body weight, or other factors?

You know, I don't think there's any, evidence for, any kinds of, markers, like body weight, body fatness. Or age or gender as, I mean, there may be, but the data isn't there for it.

I think part of the reason for that is the initial studies that the company did on bioavailability is that it's very, very wide. Up to five fold, I think differences with the same dose in peak levels in individuals that couldn't really necessarily be explained by, by, by weight or gender or anything like that.

So, I mean, I, I struggle with that as well. Do you use, the, lymphocyte subset panel that's available from UCLA at all? Because you can sometimes use that.

I've used that to, to titrate dose if I don't see a response in senescent cells. In the first 3 to 6 months, then I'll raise the dose. I start everybody out on 250.

And then because of, you know, you want to give them the dose that works at the, you know, the lowest dose. But again, there's some people that that need higher doses, unfortunately.

You know, the the study that we published on the varying doses, even, breaking up the doses into twice a day didn't show any major difference. I mean, the good news is that all doses and, you know, improved telomere length, and all dosing regimens did, but it didn't tell us which one was better.

And so, you know, I don't know that the take home from that is that, you know, the lowest dose once a day works for everybody. Because I pretty clearly see that that's not the case.

I think perhaps the studies just need to be larger to get, information about differences between dosing and dosing regimens and perhaps longer, which, you know, of course, gets expensive because it was a full year and, any case, yeah, I think if you struggle with those, I mean, I definitely do.

And other doctors I've talked to and practitioners that used to 65 have struggled with that. Right. It's a it's a in regard to the dosing, it's, of significance to me, as a clinician, treating patients day to day that, that the, the data, are not conclusive about, advantage of say, daily versus twice daily dosing.

We know the half life of t 65, isn't long, so less than 12 hours and so on paper, it should be, twice a day dosing, should be superior to, daily dosing.

But the data from the studies that, that I've seen, don't clearly indicate that, it would be wonderful if we had definitive data on, daily versus twice daily, because if, if daily dosing is is equal to, twice daily dosing, then the compliance among patients is, is is enormously greater.

You and I will know, the, the difficulty in getting patients to comply with anything more than daily dosing. Yeah. No question about it. I mean, and, and, even if it was, I mean, women taking progesterone, I usually get them to take that at night in addition to their morning medications.

But, you know, there's a fairly compelling reason for that. If they don't, they'll start having bleeding. So and they won't sleep as well for the vast majority of them.

But, with men, we don't have that. And then, you know, twice a day is, is just it's just difficult. If you took it at bedtime, you would probably, you know, that's not as good as splitting up of the doses if you did it truly bad.

So, so, yeah. So there are those challenges. But you see, an increase in telomere length and then you see, a plateauing. Do you, have you had anybody that hasn't responded in terms of stopping attrition or, or maintaining telomere length? You.

No, I've had some deaths. By that, I mean, I've had some patients who have been ill, from, one source or another, some who have undergone surgery. And the stress of the surgery has, has, caused a, a decrease in, telomere length.

The, another kind of stress, but, it it simply emphasizes and I've, conveyed that to patients that that stress in any form is bad. And the prolonged stress is much worse.

And so, one of the lifestyle issues that I pursue with patients, in addition to nutrition and exercise, hormone support and and supplementation is stress control.

You use to use meditation, and, and, other relaxation techniques. Yes. So whatever works, I'm not, wedded to anyone, but, I simply tell patients to, to pace themselves.

And in a basic sense, to, recognize the stresses there and to, admit that they need to take steps to, to deal with it and to neutralize it. So it may be as simple as, as, ordering vacation, time, time away from the job on a, on a daily basis, taking weekends off and not turning the computer on.

It's, the list is endless, but, there are so many ways to, to deal with stress. In addition to the standard meditative approaches that, that, patients are not aware of.

Dosing Questions and Clinical Response to T65

And, it really don't, don't seem to, to understand even sophisticated patients how, how impactful, stress is, in a negative way on, on health in general, including telomere length.

Yeah. Sounds like I might have to start incorporating some of those suggestions into. But right now my telomeres are holding steady. Perhaps because up to 65 I mean, I do exercise a lot.

So, when you first sit down with patients to have a conversation with them, and let's say you have telomere length results in here. What kind of a sort of informed consent discussion do you have with them?

Around potential benefits, what to look for. But also, you know, there is that, and you can answer this last I sort of, sort of more of the, this question that most patients come up with.

Is there any, risk of cancer with to 65? Right. The informed consent session that I had with patients before, it's starting to age 65. And sometimes along the way, if any new evidence emerges, has to do with, with the data that we have and, we have significant data on, on the, on the, cancer risk, which once again, as with, say, growth hormone, the, the, the theory versus the practice are quite divergent, quite different.

With, with the growth hormone as with the 65, the the theory, would support, an increasing and cancer risk in general, because of the nature of the medication, how it works.

But practically speaking, it's been quite the opposite. Oh, so I tell them, here, here are the data we have, that do not, support, any increased cancer risk.

And in fact, with, with preservation of telomere length, the, the, the strengthening of the immune system will help to reduce cancer mutations and to, as it were, nipped in the bud, before they reach a point, they are are self-sufficient.

Yeah. So any other things you talk to them about in terms of, side effects or things that you've seen anecdotally potentially, beneficial and and have you heard anything back from them on that.

Yes. I, I give them anecdotes, because we don't have enough information at this stage to be able to state definitively that, that 65 does this or that.

The goals are to do, protect the telomeres, to lengthen telomeres. To strengthen the immune system, to reduce, senescent cells, and therefore also, strengthen the immune system.

It all is linked together. That's how I present to them. But, anecdotally, I have, for example, two patients who, swear that they've both aged 65 or 6 or seven years and both swear that they go to the dentist.

Let's, because they don't accumulate plaque nearly as as rapidly as they did before, they began, to 65 years, that, that the for me, in the beginning.

And when the second patient made that announcement, I scratched my head and, and started looking for it, but I didn't find much. Yeah, I know that. I mean, that's kind of interesting that, you know, we hear things like that.

You don't know whether that's from the 65 or not. But, I mean, we've certainly had documented cases of improvements in, presbyopia and even, myopia in patients.

You know, so obviously good reasons why that might occur, particularly for the, the myopia, if it has anything to do with macular, you know, early macular degeneration in the retinal epithelial cells, pigmented epithelial cells, being able to regenerate themselves better on it.

Tom Dowd actually, you know, published a study on some improvements with, the mirror, instrument to show improvements in macular health. But other things, you know, you hear about recovery from workouts.

If you have any, you know, high intensity athletes or, long, endurance athletes, which I think, you know, the the training for these endurance athletes is really pretty, probably pretty bad if you really relax and when it gets it past a certain level, which it does oftentimes, seeing them able to improve their personal bests, in areas is, is kind of an interesting thing.

And, and hopefully will be looked at more, more closely. Just getting back to the, the whole, you know, I think, you know, the conversations I have in terms of the theory versus practice, which I guess is is a good way to put it.

I mean, with growth hormone, you and I both been in this field long enough that there was all this talk about, well, growth hormone causes cells to divide and therefore increases your risk of cancer.

And there are some observational studies that came out. And there was of course, in animal models there, transgenic animal models. You know, it's it's that same fallacious reasoning that takes place with testosterone.

You you, you know, men have more cardiovascular disease, men have more testosterone, and therefore, testosterone increases your risk of cardiovascular disease.

You know, just easy to think about, but not borne out when you look at the data, particularly the rota data, where we see an increase in cancer over every decile from from the lowest, decile to the to the highest up to the shortest decile in cancer risk in mortality.

There are other mitigating factors, perhaps ones like you mentioned, the immune cell, system improvement, and reduction in oxidative stress because of the health that, 65 can bring to your mitochondria.

These are the health benefits you can make your mitochondria. So, you know, I would just as you do and as I do with my patients, counsel patients to see, look at the data that we have and not the theory that people put forth.

Because oftentimes, that's not the case. Unless unless you have hard data to show otherwise. There is another anecdotal case. I have, a patient from Memphis, who is, is in his, late 50s, has been taking to 65 for, six years.

When he began Ironman competition. Initially, he was able to continue his, hormone support program, but he stopped that because of his concern that, that, even in the, in an amateur status, he could be, tested, if he were, shown to be on any hormone support, he would be disqualified.

After stopping the hormone support program and continuing to 65. He must have sent me, a dozen emails and text messages about his continued improvement and, and his area of physical performance.

And, he was convinced and, I'm pretty certain also that the to 65 continue to contribute as his performance. And all those areas and that, to 65 was largely responsible for his ability to continue at that high level of physical performance in the face of a loss of of all the hormonal support.

So he was an Ironman triathlete, which, of course, the Ironman itself is not really beats you up to training for it, which is incredible. The, did, he, and how old you say was in 50s is 59.

Yeah. That's, if he was, he wound up wound up in the top ten in the country in his his age group. Yeah. I have some Masters athletes, that, that, you know, get get to that level and, see improvements on to 65 but also worry about their, their hormone replacement therapy as well.

When you get too good and your start to win, then you have to, you have to step back a little bit on that, even though it's, you know, we're we're just replacing the physiologic levels.

Yeah. You know, it's, it's, you know, it's something they shouldn't necessarily be doing in these competitions because it does give it advantage because it does work.

Have you had any adverse effects in, in that you've seen in patients at all? No, none that I could, link even, even, casually to, to 65 years, occasionally a patient will note some gastrointestinal, mild gastrointestinal symptoms, but, it's it's really, it's really, insignificant.

Safety, Anecdotes, and Patient Outcomes

So the answer is no, no, no side effect profile. Any note, compared with just about any medication I've ever written. All right. Well, you know, the, the molecule is fairly inert other than its effect on the promoter for the, for the telomerase gene.

I mean, there may be some off target, activity in the bomb business system, but that hasn't really been worked out that well. But say, I mean, I have, hundreds of patients and then probably thousands of patient years, patients on it.

And I haven't seen anything, that's had anybody have to stop to 65. So, that's a good bit of, and I talked to many physicians, and your patient basically is how many?

Over the, over the years have you been treating. Oh, I've treated about 50 altogether. I currently have, 22 patients. And, I think I can I'm going to put on a, I'm going to make a greater effort to enroll some of my, nonusers into the program by approaching them, with the with the, senescent cell.

Logic as opposed to, the the previously, the previous approach, which had to do with biological age decreasing. Most of my patients are sophisticated enough, that they understand if it's put into a, into a, format, which makes sense.

My previous view of the of the, the senescent cell testing was that it would be hard for them to understand and to translate that to, their, their personal situation.

But, I, I see that it is possible to do that, and, it makes just as much sense as doing a, a, telomere, median telomere

length test or a percentage of short telomeres and reporting that in terms of biological age.

Yeah. And, it's a it's a shorter term marker. We, I use both typically, but in terms of, short term dosing, that's the one I rely on more because, you know, even with, a pretty small coefficient of variation of 2 to 3%, which is sort of what, repeat diagnostics is, I don't know where right off the top.

I'm not aware. Right off the top of my head what it is with, life length, but it's in that ballpark, and expected telomere length loss for the year, which is 2.05 killer bases.

You know, you're talking about point two to point three killer bases in, you know, test to test variation. So it takes a while to get an idea about whether or not you're going in the right direction with telomere testing.

And so the senescent cells do work out nicely. I also sort of just if you, if patients are cost averse, and it's about 350, 400 bucks for the, the, the UCLA lymphocyte subset panel, which gives you those markers.

Let's just refresh our audiences. Memory or introduce them to the fact that it's the Cd28 negative, suppressor cells or the CD8 positive Cd28 negative suppressor cells that we looked at in the study that showed a significant reduction, in a large, 500 patient, randomized, controlled trial of T 65, about 20%, in, in CMV positive patients and, around 10% of CMV negative patients.

So that is, I think, a good mark to look at. But if you can't afford it, just don't want to do that. And you can look at the the immune risk profile, which is just the CD4 to CD8 ratio that you can get LabCorp, quest and a regular lymphocyte panel from them.

And if they're below one, you really want to get them on something. And if they move out of that from below one to above one, and, you know, 1.5 to 2.5 is optimal, then you've really made a big improvement in their potential, longevity, I think, and, and, and, and immune health.

So but I think going forward that is a that is a good approach. We have software, you know, that can help you track that. We should actually talk to you about getting your, your practice set up for that because that makes it, you know, real easy.

We give them a grade, what we call an immuno age, and and could be helpful. We just I find it easier for patients to think of it in terms of grades and years.

So, I'll talk to you about that afterwards. Let me, it's. Well, it's been great. Talk to you if you have any closing thoughts about, what to where are you going to go with your, with your practice and, and your and and your use of telomere biology and your other approaches?

Yes, yes. I do have a couple of comments. The, the discussion you just made about the, benefits of, of, measurement of, senescent cells, with the UCLA test or otherwise, makes sense.

That is a a a a item for discussion that will resonate with patients and will, impress them. Getting patients like, I should say my group of patients, are impatient to get results.

They're impatient about just about everything, which is, a major part of their success. They move forward quickly and they move forward aggressively in general.

Which is not so good for stress, but it's very good for, for, their personal achievement and for, their level of satisfaction. So getting those results back to them quickly, or frequently, will will reinforce their, their use of to 65 and perhaps convince non-users to become users in the in the same vein, the the geriatrics Journal, study that I just read, from you and, the coauthors, was good.

It would be great to have a, a, study that that had two years or three year duration, and involved even more subjects, as always. But, the, the data from that, that study impressed me in a couple of ways.

One is, the dose, that it may be that, that, daily dosing is just as good as twice daily dosing, despite the half life. I would love that to be the case, because I can get my existing patients.

Some of them are just, very difficult about taking anything but once a day anything. Several of them take all their supplements at one time. Today. I don't know how they do that, but they do it.

But that's just the nature of my patient base. So if that were to to appear over time, I would love that. The other point in the study was the, the CMV negative patients, 32% of them, there was no comparison.

Future Research and Closing Thoughts

In terms of, their response compared with CMV positive patients, I would love to see that, because if if I can tell one of my patients who CMV positive that he is that and that his chance of, of, experiencing, short telomere, development over time is greater than I see in the negative patient.

Then he's more likely to, to adhere to the not only the lifestyle program, but but to, to switch to a program involving use of to 65. Yeah. So interestingly, there there, there there was, I mean, I'm not sure what you're, pointing out, but there, there was a comparison.

I mean, see, in the negative patients, this is why I test CMB serum status. And all my patients, do typically have 25 to 30% the number of, senescent cells that can be positive ones, too.

There was. And so they have less of a burden of senescent cells. And I was surprised to see that they, in fact, actually had an improvement in them, even though they, in fact, did not have a whole lot of them.

And I thought that was great, because that meant that even patients who aren't CMV positive, will benefit from an immune rejuvenating, in, in an immune rejuvenating effect.

Of course, the the magnitude of the effect was less, but that's because they didn't have as big a burden of them. I mean, the average person that can be positive has about 250 to 300, senescent T cells per microliter versus the CMB positive negative being around 60 or so.

So, we did see a reduction. I didn't see patients, you know, come in at 2030 and go down to 10 or 15, which is a good thing. And a percentage was a pretty reasonable drop.

But I agree with you, certainly on continued continuation, because I see patients continue to see improvement in senescent cells. You know, at one year or two years, etc..

You know, perhaps we'll get the company to do that at some point. Well, looking for that that longer, that longer duration study, which, will, yield so much more information and, and to my mind, be a real blockbuster over, over the, the, population who should be taking 65, but or not.

Yeah. No. So, hopefully the, the company will invest in another study with which we're waiting right now for the results of the tactic trial, which is the 65 after first, am I to prevent second, I, based not so much on endothelial cells, but more based on, the known idea of the relatively, you know, well worked out idea that it is, the T regulatory cells and the immuno senescence that puts people at increased risk for inflammation and, and, cardiovascular events.

And so, Doctor spear dockless in the UK is enrolling patients to look at that as a primary endpoint reduction in senescent senescent cells. So you'll see another study showing hopefully, beneficial effect, to corroborate this, this effect and, and then a secondary endpoints, they do have secondary m eyes or secondary need for advanced revascularization.

But the probably won't be powered enough for that. It's, pilot study to look at, you know, to see whether or not you can get the reduction senescent cells in this group.

So that'll be more in the senescent T-cell, side of the story for T 65. Joe, the future of telomere science is extremely exciting. I wish I were as young as you so I could, be around longer to enjoy the the developments that I know are coming.

Well, you know, if they come as soon as I expect, then they will. We may be having this conversation 20 or 30 years from now. I. I hope we do. All right. Well, it's been great talking to you, Tom.

Thanks for taking the time. Yeah, I've enjoyed it, Joe. Have a good day the remaining week. All right. Take care.