

A sunburst graphic with numerous thin, light gray lines radiating from a central point behind the text.

# Healthy Moms Podcast

BY **Wellness Mama**<sup>®</sup>  
simple answers for healthier families

Episode 140: How Stem Cells Are Helping People  
Recover from Injury and Avoid Surgery

Child: Welcome to my Mommy's podcast.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at [wellnessmama.com/go/vivos](http://wellnessmama.com/go/vivos)

This podcast is brought to you by Beekeepers Naturals. Humans have been benefitting from bees and their nourishing super foods since prehistoric times. From Cleopatra using honey to keep her youthful glow to Hippocrates prescribing propolis to cure everything from sores to bacterial infection. Our healing relationship with bees goes way back. Beekeepers Naturals is dedicated to bringing the age-old benefits of bee products in to modern times. And they offer really high quality propolis, royal jelly, bee pollen and raw honey and many other products. And all of these are sustainably sourced from a company that is dedicated to protecting and improving the bee population. My personal favorites are their propolis spray, which helped me to head off a scratchy throat, and their B.LXR mix which is a mixture of all of those ingredients and it's a natural nootropic that I use on busy days. You can check them out at [wellnessmama.com/go/beekeepers](http://wellnessmama.com/go/beekeepers)

Katie: Hello and welcome to "The Healthy Moms Podcast." I'm Katie from [wellnessmama.com](http://wellnessmama.com) and I am here today with Dr. Christopher Centeno who is an international expert and specialist in regenerative medicine. Man, I cannot talk today, especially with the use of stem cells in orthopedics. And I'm really fascinated to learn from him today because this is a really emerging area and I think it can help a lot of people.

He is board certified in physical medicine as well as rehabilitation, and in pain management through the American Board of Physical Medicine and Rehabilitation. He's also one of the few physicians in the world with the extensive experience in what he does, which is the use of adult stem cells to treat orthopedic injuries. So, like I said, it's not something I know a lot about, but it's something I'm really interested in learning about, and I can't wait to jump in. So, welcome, Dr. Christopher. Thanks for being here.

Christopher: Oh, thanks so much, Katie, for talking to me and asking questions about this interesting area.

Katie: Okay. So, for sure, I think, to start, let's start with some background. So I know a lot of people may not be familiar with this kind of regenerative medicine, I know I wasn't. So, I understand the concepts that you're using adult stem cells to help recovery from injury. At least that's as far as I understand, but can you take us from the beginning kind of what your research has been in and what you're doing?

Christopher: Yeah. So, we take stem cells from the same patient, so this has nothing to do with embryonic, or fetal stem cells, or anything like that. So, these are stem cells from your body, and they're either isolated and then reinjected in a specific spot where we're trying to promote the body to repair itself, or another option is to grow the cells to bigger numbers over a number of weeks, if we need more than we can take out in one sitting. So that's generally it. The real focus is to try to replace the need for much more invasive surgery with a very precise injection to prompt your body to heal, so that's pretty much the 30,000-foot view.

Katie: Okay. So, to make sure...to kind of give a practical example, my sister-in-law, years ago had...she tore her ACL and her meniscus, I think, and of course, they did surgery, that was the common treatment. Are you saying this would be basically an alternative to that or it would be used in conjunction with that?

Christopher: You know, for most patients, an alternative; for some patients, used in conjunction with. So, as an example, right now, if about 70% of the patients that tear their ACL or tear their meniscus, we can inject stem cells precisely into the ACL, as an example. And three months later come back, take another MRI and show that their ACL has healed inside the knee and no longer needs to be yanked out and replaced.

Katie: Wow, that's amazing. So, is the mechanism by which this is happening, basically, the stem cells are causing this regeneration in the tissue itself?

Christopher: Yeah, that seems to be what's happening. I mean, one of the more fascinating things we've seen with ACLs is that, again, about 7 out of 10 of the ones that are currently operated on really don't need to have any surgery. They just need a little help in healing and we do that, again, through a precise injection and then the cells seem to prompt a regeneration of the tissue. And again, follow-up MRIs, many of these ACLs later look normal and then functionally they do well. You know, the patients go back to doing everything they want to do, physical exam normalizes, etc. So it's pretty amazing stuff but it really is pretty precise work. It took us about three years to figure out how to get the stem cells in all the right spots.

Katie: Gotcha. So, how do you get the stem cells and then re-inject them? I've heard that there's a couple different methods of this and that yours is different and there's a very specific way that makes it unique?

Christopher: Yeah. So, you know, most of the folks that... Well, we were the first people on earth to do any kind of stem cell orthopedic work in patients, so that was way back in 2005. And more recently, there has been some Docs who have been starting to do some of this kind of work. Obviously, we've got a huge head start. And one of the things we realized early on, especially with this application and with others, is that you have to get the cells in very precise places or this doesn't work out so well for most patients.

And so, for us, for the ACL, that's using real-time x-ray guidance where we can place them in both bands of the ACL, the ACL has two bands. There's a top and a bottom portion of each one of those bands. So the cells have to get evenly distributed throughout both those bands for this to really maximize the likelihood that it's gonna heal.

Katie: Okay. That's makes sense. So, for the ACL, that's one use. What are some of the other areas that you guys are using these types of stem cells for recovery?

Christopher: Rotator cuff tears, is a big one right now. So we're seeing a lot...again, about 7 out of 10 patients who are currently getting orthopedic surgery to sew together a rotator cuff tear who bypass the surgery and instead just get a precise injection of stem cells, and that one's under ultrasound guidance. Other areas include: meniscus tears, knee osteoarthritis, hip osteoarthritis, bulging discs, etc. So quite a broad number of areas through the years that we've treated and kinda perfected over...you know, at this juncture, I think we're talking about 10,000 stem cell treated patients in our registry going back to 2005, so 12 years.

Katie: That's impressive. So, they say you're a stem cell expert and kind of circling back to your bio right now, so you've been doing this research for how many years? I know this has been a very long process and I'd love to hear kind of your research history and how you eventually started delving into this.

Christopher: Yeah. I got into this whole thing because in 2004, 13 years ago, there was a research paper that published, that showed that you could inject stem cells into a rabbit disc and kind of make a new disc, and that was really interesting to me. So I got together with some university researchers, locally here, who were using stem cells to treat, basically, athletic horses, mostly racehorses but other types of athletic horses. They were

interested in treating joints. At the time, we were interested in treating spines. They didn't know much about treating spines, but they knew about treating joints.

So we kind of put our heads together and we spent about two years just doing research only and treating patients. The spines took another couple years to figure out but the joints started doing well and so we started then working with some actual patients and treating their joints with stem cells, and then that led to a whole slew of publications. I think we have about 25 different publications now, in this area, where we've done research and lots of different things. Again, shoulder, rotator cuff tears, ACLs, knee arthritis, hip arthritis, low back disc bulges, etc. But again, our main focus is trying to help patients avoid more invasive orthopedic surgery because the more recent researcher is really showing that that surgery sometimes doesn't work out so well for the patient.

Katie: Yeah. I know people who've had that experience with kind of continued problems after the surgery. Is it helpful for people who maybe still are having recurring problems even though they've had surgery?

Christopher: Yeah. You know, a good number of patients that we see, as an example, are folks that have had, let's say a meniscus surgery for a tear, it seemed to work for a little while, maybe a year or two, but then they tore the meniscus again, or the pain comes back, or they're starting to get arthritis. That's a very common type of patient we'll see or a patient with a prior back surgery, and you know, again, it did better for a while but now it's starting to get bad again. Those are all very common things.

Katie: Okay. And you mentioned the spine when you were talking about your research is this something that, either now or maybe in the future, will have the potential to help with spinal recovery and even, like, more serious spinal injuries, do you think?

Christopher: You know, our focus has really been on orthopedic things like a disc bulge, or sciatica, or back pain, or neck pain, has not been as much on treating spinal cord injury although there are a number of different studies treating spinal cord injury, not our area of expertise but there are a number of folks doing that work.

Katie: Well, that's exciting research as well. So, if someone maybe has had these kind of injuries in the past, or a lot of moms listening to this could have, you know, children with these injuries in high school. I know I had three friends on my soccer team all tear their ACLs in one year. Are there limitations on who can and can't receive this kind of treatment, or people who may be contraindicated, or who can receive this kind of treatment?

Christopher: Yeah. So, for ACL tears, we have an algorithm that we have put together, meaning it has to do with some measurements we do on the MRI, it has to do with what the ACL looks like after it's torn. And again, that's about 7 out of 10 people who currently get surgery we can treat. You know, the biggest thing, I think, I would tell moms is, listen, you know, we need to stop treating our kids like NFL athletes. Meaning that, you know, we've treated a lot of NFL athletes and I can tell you that, you know, they're in a different world.

You know, they're trying to eke out another \$5 million contract extension. So they don't really necessarily care what's gonna happen 5 to 10 years down the road because 5 to 10 years down the road they're not gonna be playing. But we see a lot of families that are treating their 12, and 13, and 14, and 15, and 16-year-olds like NFL athletes. They're getting very aggressive surgeries when it's really not necessary and especially these days when all these other options are available.

Katie: Yeah, that's crazy. I mean, I agree. I've seen this kind of transition. Like, when I was a kid, we still just played you know baseball in the cul de sac and now these kids are being pushed extremely hard. And that's a great point, that maybe it would be easier just to relax on the kids a little rather than be having to develop all these treatments for kids in orthopedics.

Christopher: Yeah. I mean, certainly, you know, my biggest concern that I...or the biggest thing that I see is

just that, you know, we'll see...as an example, just to give an example of one research study that I just did a couple years ago, if you get an ACL surgery as a teenager, there's a 2 and 3 chance, by the time you're 30, that you'll have knee arthritis. So, it gives you some idea of what we're really dealing with here, with regard to treating some of these kids very aggressively with surgery...and I think you're right, a lot of that is because there's a lot of pressure to get this kid back to playing right now when maybe we should say, "Let's take a year off, let's see where that goes."

Katie: Yeah. I think that's really sage advice. So I'd love to kind of go a little bit deeper into the science of this and to help give people kind of a broader understanding. So the word stem cell gets used a lot especially now where there seems to be a lot of emerging research. But for anyone who's maybe not familiar, can you define specifically, like, what a stem cell is, especially in your area of expertise?

Christopher: Yeah. So a stem cell is merely a cell that...in this case, we're talking about adult stem cells that live in your body and the purpose of that cell is really to repair tissue. So, you know, you can think of these cells as the maintenance men of your body. They're there to keep you healthy. If you didn't have any stem cells in your body, literally, your body will eventually fall apart. Because when you go out and go for a workout, or you beat up some of the cartilage on your knee because you tweaked it or you ran too hard, all of those things are repaired by stem cells in those tissues or stem cells elsewhere in the body. So, all we're doing is taking and concentrating those healing cells in a specific spot and bringing more of them to bear at that area than your body can naturally muster.

Katie: Okay. So, what are some areas, like, in the body that naturally have stem cells, like, do those decline as we get older? I've done a lot of research in, for instance, oral health and I know the periodontal ligament is a pretty rich source of stem cells even into, like, the 60s and 70s. Is that true in other areas of the body as well?

Christopher: It is. So, the bone marrow is a rich source of stem cells, adipose tissue, or fat is a rich source of stem cells, and really there's probably not a tissue in the body that doesn't have some stem cell or what's called progenitor cell population. I mean, pretty much everything from muscle, to bone, to tendon, to ligament, to cartilage, you know, all of those things have natural stem cell populations that live in them or right around them.

Katie: That makes sense. So you guys are essentially just isolating those and then using a concentrated amount of them in a specific place to kind of improve the healing response, basically?

Christopher: Exactly.

Katie: Okay. Got it. So, what is the richest source or what are you guys using? You mentioned there's a lot of different places in the body, where do you guys typically find the best stem cells?

Christopher: Yeah. Our focus for orthopedics is primarily bone marrow. So what we'll do is, we'll numb up the back of the hip and once it's numbed up, we'll take what looks like a thick needle. We'll draw out what looks like thick blood, it's called bone marrow aspirate and that's really where we get our stem cells. You can also get some of them from fat as well and there are times that we'll use that source. And then, the number of...well, the number of stem cells do decrease as you age.

What's interesting in our research is we haven't seen an age-dependent outcome drop, meaning, you know, we don't see that a 30-year-old does better than a 7-year-old. So if the stem cell population is going down, it's not going down enough where we're seeing big drops in outcome in older people.

Katie: That's really fascinating because I know, at least, there's a perception that, you know, kids tend to have...or at least they heal more quickly and that they have more stem cells. Or at least I've heard that said and I don't know if it's actually true, but that's really fascinating that even older people are able to recover like that.

Christopher: Yeah. And it's true that kids do have more stem cells and that our natural repair processes get slower as we age but realize, in this procedure, we're hyper-concentrating those cells and putting them back in an area. So, you know, let's say the number of stem cells in a given area have dropped by 10, as you went from 20 to 70, meaning a factor of 10. If we can put 10 times the number of cells back in that same spot, we can give you much better regenerative capabilities in that one area.

Katie: Okay. Got it.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at [wellnessmama.com/go/vivos](http://wellnessmama.com/go/vivos)

This podcast is brought to you by Beekeepers Naturals. Humans have been benefitting from bees and their nourishing super foods since prehistoric times. From Cleopatra using honey to keep her youthful glow to Hippocrates prescribing propolis to cure everything from sores to bacterial infection. Our healing relationship with bees goes way back. Beekeepers Naturals is dedicated to bringing the age-old benefits of bee products in to modern times. And they offer really high quality propolis, royal jelly, bee pollen and raw honey and many other products. And all of these are sustainably sourced from a company that is dedicated to protecting and improving the bee population. My personal favorites are their propolis spray, which helped me to head off a scratchy throat, and their B.LXR mix which is a mixture of all of those ingredients and it's a natural nootropic that I use on busy days. You can check them out at [wellnessmama.com/go/beekeepers](http://wellnessmama.com/go/beekeepers)

Katie: So, I'm curious how this either differs or is similar to things like platelet-rich plasma or fiber-rich plasma. We have a friend who's a dentist who uses both of those and, like, after extracting a tooth, he'll pack it with platelet-rich fibers, I believe, or fiber-rich plasma, I think that's what it is. And he'll pack it, and they don't get dry sockets, and they heal much more quickly, is this a similar technology or is it different from what you do?

Christopher: Yeah, pretty similar. Platelet-rich plasma is taking someone's platelets, which have healing growth factors in them and those growth factors kind of act like espresso shots for the cells, meaning they kind of ramp up repair in the local cells. And so you're just concentrating those platelets in blood. So, you can also coagulate that, in which case it becomes platelet-rich fibrin, and either one of those can be used in dentistry or surgery. In fact, PRP was really first used in dentistry. Meaning that the specialty, as long as history of using PRP is dentistry.

So, what we're doing is a similar thing and we use a lot of PRP in many of these orthopedic injections as well to try to help tissue heal. So stem cells is just a little beyond that in their ability to help things heal. So for most patients, PRP really works very well to heal the area and it's only some patients that we'll use stem cells in and over PRP.

Katie: Okay. And I know a lot of moms are listening and a lot are still in the phase of life of having children, and there's always a lot of pressure especially if you have a baby in a hospital to bank the cord blood and they talk about stem cells being there. Are there stem cells in the cord blood that can be banked, and if so, can those be

used in this way or would that probably not be worth it to save those?

Christopher: Yeah. That's a tough one because...so umbilical cord blood does have a stem cell type called hematopoietic stem cell that really is focused on making new blood cells. Now, the Wharton's jelly within the umbilical cord does have some what's called mesenchymal stem cells. So if they're saving the whole cord, then there are probably more useful cells than if they're saving just the cord blood. And the other problem there is really regulatory and that is the FDA currently doesn't allow those cells to be used for anything other than blood cancers in kids.

So those cells could be released to be used for a blood cancer in your child but at least, right now, there is no other approved use. So there's no other way to use those cells. So it's a little bit like buying an insurance policy that's only gonna pay off in one rare medical condition and can't be used in any other condition.

Katie: Okay. That makes a lot of sense. So, if someone chose not to do that and their child develops something that they needed stem cells for, could they get them in the same way that you guys do from bone marrow or from another source?

Christopher: Yeah. In particular, obviously, kids are going to have very rich adult stem cells and very active adult stem cells. So, you know, I think that if your child...obviously, in the rare instance, that your child will develop a pediatric blood cancer that's an extremely rare thing, these cells could be used. But I would say, you know, if you were trying to not spend that money on banking the cord, I think that would probably be money well saved because I think it's unlikely that you'll be able to use those stem cells and your kids got enough stem cells on board to really cure lots of things, anyway.

Katie: That's helpful to know. So back to the orthopedic side, is this treatment widely available at this point or do you see this as something that can eventually change the way that orthopedic medicine is practiced?

Christopher: Yeah. It's becoming more widely available. When we started in 2005, we were the only people on earth doing this work. You know, by 2010, there were maybe 20 or so doctors that were doing it. By 2014, there were maybe 100 that were doing it, and this year, you know, we're seeing several hundred physicians starting to get into using this type of treatment. We formed a nonprofit called the Interventional Orthopedics Foundation and the focus there is to train doctors how to do this stuff correctly and do it well. And so, you know, we're currently training physicians how to do this.

But I think it's gonna change things in a big way because, right now, if you think about it, I mean, if we're right, about 70% of all existing orthopedic surgeries could be replaced by a precise injection that's less invasive and gets you back to sports or whatever you wanna do much more quickly. That's gonna really shake things up, and obviously, there'll be some winners and losers and all of that, but I think it's gonna be a very disruptive technology.

Katie: Is it covered by insurance at this point or is it something you hope in the future will be covered by insurance?

Christopher: Yeah. So, right now, we are working with multiple large self-insured companies to get this covered. So, as an example, if you're in the Midwest, there's a huge grocery store chain called Hy-Vee, 85,000 employees. Hy-Vee employees have this covered under their health insurance, right now, as do about 20 other companies that we've worked with. So we're going large self-insured company, you know, by a large self-insured company to get this covered and we hope to have much broader coverage for it going forward. In the meantime, for most patients, this is an out-of-pocket procedure but we're working on that actively.

Katie: Okay. Got it. Is it...so say, for instance, someone listening, maybe their husband or their child or they have an injury of some kind that could be helped by the stem cells, are there places they can go if they're willing to pay out-of-pocket, even right now, to try that option first?

Christopher: Yeah. You know, we have a website, regenxx.com, so it's R-E-G-E-N-E-X-X.com. It has a find a provider page and those are providers that we've hand-picked and trained extensively. And we have about 45 or 50 of those around the country right now, including a number in other countries including: Australia, and India, and Europe, and we're bringing on new providers every day. For us, the big thing is making sure that they're trained how to do this correctly and that takes a little time.

Katie: Okay. And so, also for someone listening, if there's anyone who, they or their husband or a doctor that does orthopedic medicine, they could find information on your website about learning more about doing that themselves?

Christopher: They could, and we have an entire series of courses that covers 85 different, very precise, injection procedures using these kinds of cells to heal various things, everything from shoulder, labral tears, to hip labral tears to meniscus etc. So there's an entire nonprofit educational system that they can get engaged with in order to learn how to do this correctly.

Katie: Awesome. I'll make sure I link to your website and the show notes, so people can find that. Are there any negative side effects to adult stem cell therapy that someone could anticipate if they ever have this kind of a treatment?

Christopher: Yeah. Right now, we published the world's largest safety paper last year. It was on 2,372 patients, more than 3,000 procedures that we had done up to 2014, and the side effects or complications of these procedures were really no different than other injection-based procedures and much, much less than surgery. So, at this point, you know, things like soreness from the injection site, soreness from the injection of cells, swelling in the area, those are common complications but dramatically, less than the surgeries that these procedures help patients avoid.

Katie: That's fascinating. Definitely, something I wish I could have told my sister-in-law about, those years ago, when she had her surgery. I'm curious what you think we'll see in the future as far as stem-cell research and other applications because, obviously, it's working in orthopedics. Are there other areas where you think it has promise as well?

Christopher: Oh, yeah. There's so much going on right now with regard to research treatment for heart failure. There was a big study that came out last week showing a very good efficacy for this, treatment for neurodegenerative diseases like Alzheimer's, treatment for COPD, lung disease, those sorts of things. So, many, many different studies are showing good promise for this kind of therapy. And what we're seeing with this kind of therapy is it's not a panacea. It's gotta be used in the right patients and the right ways. But when it's used in the right patients in the right ways, it can be very helpful in conditions that really don't have good options right now.

Katie: I'm surprised to hear you say Alzheimer's, which would indicate it could be used even in the brain or in the heart, are there areas of the body that you would not want to use stem cells?

Christopher: You know, at this juncture, I think all of it is a possibility. I think in each area, it's gotta be studied and shown to be helpful and safe. The good news is that adult stem cells have a very robust safety profile. So I think on the safety side, it's unlikely that we'll see big issues, but again, everything is different. As an example, early on when they started using stem cells to treat heart conditions, they were applying them the wrong ways and seeing some side effects that had to do with arrhythmias, meaning irregular heartbeat. Now, once they figured out how to use them correctly, they didn't see that anymore. But it's like anything else in each area, it's gonna have to be studied and it's gonna have to...you know, the physicians doing that work are gonna have to learn through research or trial and error.

Katie: That makes sense. So for anyone listening, especially if you're listening in a car and don't have access

to the show notes, which all of this information everything you talked about will be in the show notes at [wellnessmama.fm](http://wellnessmama.fm), but where can people find your work specifically and your website. You mentioned it, but can you mention it again?

Christopher: Yeah. It's [www.regenexx.com](http://www.regenexx.com), two Xs at the end. And there you can find information about the different kinds of treatments we do. I've got a blog with about 2,400 posts, I blog every day on these kinds of topics. And in addition to that, there's also books that you can download on this, lots of videos about various procedures, those sorts of things. And then, obviously, an entire map of where we have providers so that you can try to find someone that's close to you.

Katie: Awesome. Well, Dr. Chris, thank you for your time. It's definitely fascinating and I'm so curious to see where the future of this research goes and hopefully, you guys will continue to get more awareness about this, so this becomes a more viable treatment option in a lot of places. Thank you for being here.

Christopher: Okay. Thank you so much, Katie.

Katie: And thanks to all of you for listening. And I'll see you next time on "The Healthy Moms Podcast."

If you're enjoying these interviews, would you please take two minutes to leave a rating or review on iTunes for me? Doing this helps more people to find the podcast, which means even more moms and families could benefit from the information. I really appreciate your time, and thanks as always for listening.