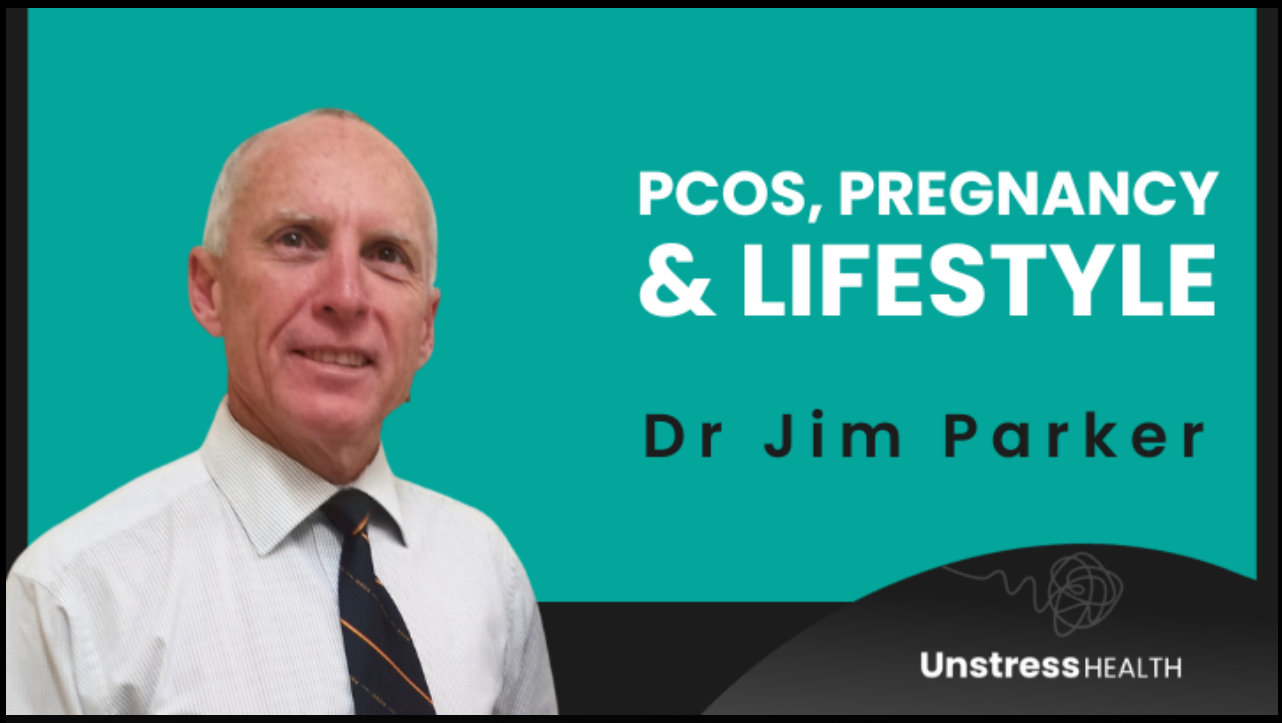

Unstress HEALTH

with Dr Ron Ehrlich

Podcast Transcript

Dr Ron Ehrlich *[00:00:00]* Hello, and welcome to Unstress. My name is Dr Ron Erhlich. I'd like to acknowledge the traditional custodians of the land on which I am recording this podcast. The Gadigal people of the Eora Nation and pay my respects to their elders past, present and emerging. I believe in Australia and in fact globally. We have so much to learn from our Indigenous First Nations people about connection and respect for not just people, each other but the planet.

Dr Ron Ehrlich *[00:00:35]* Well, whether we are talking about heart disease, cancer or autoimmune conditions, of which there are over 100, diabetes, mental health and the plethora of problems that can confront us and do confront us. At least 50% of the Australian population have one chronic degenerative disease. I think the statistic is something like 20 or 30% have two, 3 or 4 preventable. These are preventable chronic diseases. And the common denominator in all of them is lifestyle, nutritional and environmental factors. And how these diseases manifest themselves depends very much on your genetic predisposition. Well, we cover those lifestyle issues again today. But from the perspective of women's health in particular in general and polycystic ovarian syndrome in particular, and it's an interesting discussion today because it gives us an insight into some of these underlying and often undiagnosed problems which affect young women and women, in fact, of all ages. And we also cover the wonderful experience of birth now for all of us that we fall, of course, experience birth, can't remember. But for those of us that had witnessed a subsequent birth, we cannot help but be in awe today. My guest today is Dr Jim Parker. Now, Jim is an obstetrician gynaecologist and endoscopic surgeon. He's clinical associate professor of the School of Medicine at the University of Wollongong in New South Wales, Australia. He's a researcher. He's a lecturer. He's a teacher and I've met him through the Australasian College of Nutritional and Environmental Medicine. I've had the pleasure of listening to him teach many hundreds, in fact thousands of health practitioners, doctors and allied health practitioners. And I have just so been looking forward to getting him back. He was on a couple of years ago, but look forward to getting him back on and sharing him with you. I hope you enjoy this conversation I had with Dr Jim Parker. Welcome back, Jim.

Dr Jim Parker *[00:02:53]* Thank you, Ron. It's good to be back.

Dr Ron Ehrlich *[00:02:55]* Jim. We are going to be talking about PCOS, polycystic ovarian syndrome. But before we do, I know that you have been an obstetrician gynaecologist for many years, and I also know that you've lectured extensively to the Australasian College of Nutritional and Environmental Medicine. I know you've been involved in that as well and I'm just fascinated to know how you, as an obstetrician gynaecologist end up lecturing to the College of Nutritional and Environmental Medicine because I'm guessing not a lot of that was covered in your obstetrics and Gyni training. How did that happen?

Dr Jim Parker *[00:03:37]* Well, that's a bit of a long story, Ron, but I've had an interest in nutritional environmental medicine since I was a teenager. So obviously over 50 years and back in the early 70s and I actually left school when I was 16 and all the talk and everything at the time was to do with the population and global warming and all the problems that we're talking about now were equally spoken about then. So I had an interest in all of this right from the beginning and I left school when I was 16. I went back to study when I was in my early 20s, did the high school certificate. And I was immediately I didn't know what I wanted to do, but I was immediately interested in science and in biology in particular. And as I studied different sciences and subjects, it sort of led me from one thing to the other. And I soon realised that my main interest was in human biology and understanding physiology and what makes people healthy. And obviously, I've been able to follow that passion really over most of the last 50 years. So. When I studied medicine, after I finished my science degree in anatomy and physiology, I was particularly training to be an all-around general practitioner. And that's how I was orientating myself. So I wasn't focussed on speciality training at all during that time. But then when I went into general practice and I was in the country at Maitland in the Hunter Valley, and I got more and more interested in the obstetrics. I was doing shared care and I was planning to go to the country and practice in obstetrics in the, in the country situation. And then after actually working in that environment for a year doing a diploma of obstetrics, I realised there was no way I was going to have the skills to be able to practice independently in the country without backup as from the training that I was getting.

Dr Jim Parker *[00:06:00]* And over that time I realised, well, if I want to do obstetrics in this situation, I really need to train as a specialist and get all the skills in difficult caesareans, breaches, twins. All of the unusual things that happened rarely that you could easily get caught with a couple of times a year in the country. So I just felt that I... That's what I wanted to do. So one thing led to the other, basically, and got me into specialist training. And I was in Maitland and I, I thought, well. Where am I going to do this training? And I looked around Australia at the different hospitals in the Royal Women's Hospital in Melbourne was at the time the largest obstetric teaching hospital in Australia and that was... They were doing 8000 deliveries a year. So I thought, well, that's where I'll try and go to get my training and I... And that's where I did go and I really got fantastic training there everyone did because you just had exposure to so many difficult cases. And also you had fantastic supervision from very experienced clinicians in all aspects of difficult pregnancy problems. And also at the same time that was in the early 90s was really the revolution in laparoscopic surgery that is removed from open laparotomy surgery to laparoscopic surgery and at the Royal Women's Hospital, one of the leaders in that at the time and I got involved in that and that sort of consumed me over the next ten years in terms of training and developing techniques and publishing research and putting it into practice in terms of operating on patients. We started off treating ectopic pregnancies, then ovarian cysts. And then by the end of the 1990s, we could pretty well do just about any gynaecological procedure through the laparoscopy, through a telescope and avoid...

Dr Ron Ehrlich *[00:08:11]* Laparoscopy is not as invasive. Just explain to our listener the difference, what a breakthrough laparoscopy was actually. Why it was such a...

Dr Jim Parker *[00:08:23]* Yeah well, prior to that you had to make an incision that you could put your hands into someone's stomach or pelvis to be able to treat cysts or ectopic pregnancies. And obviously, you need quite a big holes to do that. And that would mean that someone was going to need very strong pain relief for 24 or 48 hours, be in hospital 5 to 7 days and take six weeks to recovery versus when we could do it through a telescope. We do 3 or 4 little 5 to 10-millimetre incisions. Patient would go home the next day and the great majority of patients be back to work within 1 to 2 weeks. So that was... That happened all around the world. But we were part of the leaders in Australia and to lead that revolution in surgery, really. And then I spent the next 20 years teaching it to other people, other specialists and other registrars.

And to get back to your original question then to come bringing me back to nutritional environmental medicine, which I always had an interest in, but not my primary interest in the early... I noticed in the early 2010's I was seeing a lot more adolescent girls with polycystic ovary syndrome. They would present this to me and they referred from GPs and it just seemed to be getting more and more common. Every 1 or 2 weeks I'd see an adolescent girl with problems that usually come along with their mother, and after a while, I started to think, What is going on here? Why are we suddenly seeing this increase in this problem? And of course, it made me ask the question, well, what is polycystic ovary syndrome? And I've spent the last 12 years trying to answer that and published that 14 papers on it. But I think we're coming closer to you getting an answer that far from all the answers.

Dr Ron Ehrlich *[00:10:28]* Okay. Well, we're going to talk about that, but I still want to come back to you were in this hospital, which was presenting with a huge number of cases in the early 90s. Polycystic ovarian syndrome was not happening there or hadn't been identified or diagnosed. What was going on in the early 90s that made 2010 so different?

Dr Jim Parker *[00:10:52]* I think we had big gynaecology clinics there, so it wasn't like in... It was a hospital clinic. So in hospital clinics, you see a different range of patients than you do in specialist practice and out in the community. So you would only see patients in hospital clinics say, with polycystic ovary syndrome who had problems with infertility, which is one of the problems that happens in polycystic ovary syndrome. Women have problems getting pregnant and so that normally happens to when women are in their 20s and 30s. So at that stage, you be focusing on treating the infertility. Rather than just looking at the polycystic ovary syndrome. So it's more a community-based problem than a specialist hospital clinic problem most of the time.

Dr Ron Ehrlich *[00:11:44]* Okay. Well, just one last before we kick into this. PCOS, Polycystic Ovarian Syndrome. The amount of nutritional and environmental medicine that was taught in your undergraduate medical school of experience and your specialist experience. And now you're teaching at Wollongong University. What do you... What's... How much is given to nutritional and environmental issues in the education of doctors?

Dr Jim Parker *[00:12:17]* Well, when I was doing my medical training in the 1980s, there wasn't much at all. But there was a focus on lifestyle because at the time it was realised that the big epidemic in heart disease was primarily due to smoking. And if you look back to the 1950s and 1960s, smoking rates in men were up around 85 to 90%. And of course the lung cancer and heart disease and everything follows 20 years later. So it was a big epidemic. And people were training as many cardiologists as they could to try and deal with all of that. But there was a big focus on prevention and smoking interventions to try and prevent people from smoking. And with the lifestyle intervention and smoking rates then when I was training in the 1980s were 34%. And they're now down around ten, 12%. So they've gone from up around 90 to 30 to 12%. But it's taken 60 or 70 years of a very big effort, as you know, with all the government and other regulations that have come in with smoking. So there was a focus there and the other focus at the time was on preventative screening. Early screening for cervical cancer, breast cancer and bowel cancer. And I actually did a big... Quite a big research project at that time, putting together an integrated screening protocol to work out what was the best way to implement all of this new screening into general practice. So the focus was a bit different then. It wasn't really... That's sort of what we call secondary prevention. Not primary prevention, whereas you are thinking more and I'm thinking now more about primary prevention. How do we stop people getting the disease in the first place, Not how do we just diagnose it early and then treat it, which is what we do with pap smears and mammograms and all of those things for secondary prevention. So the emphasis has changed a bit. And looking at medical education now, there is more and more lifestyle medicine coming into medical practice all the time. And I see it coming through in the literature and in the medical education forums that I attend and things all the time now. So it's definitely time to change.

Dr Ron Ehrlich *[00:14:54]* Okay. Well, listen, coming back to what we originally talking about here today, and that is Polycystic ovarian syndrome or PCOS. So I wondered if you might just share with us what is it actually and how common is it.

Dr Jim Parker *[00:15:09]* Yeah. Well, polycystic ovary syndrome. One of the things that interests me about it is that it does occur in adolescence and it results in lifelong problems.

So you've got a very good opportunity to intervene and prevent a whole lot of problems, which I'll go through. I can go through shortly at an early age. So it's the absolute ideal preventative medicine and that's primary prevention as well. So it fits into everything that I've been looking at and thinking about for 40 years. So the other interesting thing about polycystic ovary syndrome from a medical point of view is that it covers all aspects of anatomy, physiology, biochemistry, pathology, pathophysiology. You can pick any subject in medicine and you can study it within polycystic ovary syndrome. And the reason for that is because it's a widespread systemic disease. It's not a problem of the ovaries. And in fact, there's quite a big movement around the world to get the name of polycystic ovary changed, to get polycystic ovary out of it because people are now recognising it is a lifestyle and metabolic problem, not just a problem with the ovaries, although that can be a factor. So after a lot of research and over a lot of years, we sort of come to realise now that if you think a simple definition of polycystic ovary syndrome might be that it's an inherited problem resulting in symptoms such as irregular periods, acne and excess hair growth and that they can be controlled by attention to diet and other lifestyle factors. So that's a very simple, concise definition of what I would say to a patient. Now, if I saw them, did all the testing, took their history and made a diagnosis of polycystic ovary syndrome. And that to me is a definition that people can relate to quite easily. But you won't see definitions of polycystic what is polycystic ovary syndrome written down very often because there's so many factors. There's the brain, the hypothalamus, there's the ovaries, there's the endocrine system, there's all the metabolic effects that are going on. So in the human body, we've got all these networks of systems that we tend to think about as systems, cardiovascular system, respiratory system in isolation. And we've done that in medicine, but they're not. They're all very finely tuned and interrelated and things that control, for instance, metabolism. Metabolism is the way the body makes uses and stores energy. The things that control metabolism also are involved in controlling the endocrine system and hormones, and they're also involved in co-regulating neurological systems. So what we tend to think of now is this networks of systems that are happening throughout the body. And you could say that health is a state of having those networks working together synergistically and interacting with the individual and their environment to create a system of well-being.

As opposed to all the definitions of health being the absence of disease and a pathology-focused model. And so we take this sort of new view of it. It fits very well with polycystic ovary syndrome and our current thinking about what actually causes it.

Dr Ron Ehrlich *[00:19:07]* I mean. And is it an autoimmune? Is it considered an autoimmune condition of, you know, the body attacking itself in some way? And what is it? Where is it categorised as an autoimmune?

Dr Jim Parker *[00:19:20]* No, it's not. It's categorised and we've got now the new international guidelines that have just been released and they're released every three years. The most comprehensive guidelines on the planet for any speciality in medicine or put together by 3000 health professionals from 72 countries and 264 recommendations. And I think it's a 500-page document and it's coordinated out of Melbourne, Australia. And so with the leaders in Polycystic ovary syndrome now in the world, basically, and you can see by that description, there's a lot in.

Dr Ron Ehrlich *[00:20:03]* Yes. And a great description of health and absence of health as well. And the way all these systems interrail, interrelate, how common is it? PCOS.

Dr Jim Parker *[00:20:15]* 10 to 20.

Dr Ron Ehrlich *[00:20:17]* A week. What is the... Is there a new name that's already been given to this or are we still referring to it as PCOS?

Dr Jim Parker *[00:20:24]* No, I think PCOS for the moment, but I think we're talking about things like metabolic reproductive syndrome. But still the word syndrome. So if you think about syndrome, that means a collection of signs and symptoms and other changes in the body that we don't really know where it starts or where it finishes or what actually causes it. And I think we as you know, we've published an evolutionary model of polycystic ovary syndrome, which we think does explain it. But of course, you can never prove anything in evolution. Evolution is just a good story and a way of explaining things that might or might not make sense to people, you know.

But we think that not just us, but a whole lot of people around the world have slowly been moving towards this understanding of polycystic ovary syndrome being an evolutionary problem. And that actually then gives you a reasonable explanation as to what's going on. Now, you asked about whether I should answer your question about whether it's an autoimmune problem and it's not an autoimmune problem, but it's a lifestyle problem. And in 2012, Professor Kelton Tomalin from Flinders University in Adelaide put forward the hypothesis that a diet. Poor quality diet causes changes in the gastrointestinal microbiome, the microbiome in the gut that everyone knows about now. And that those changes cause a breakdown in the lining layer, a so-called leaky gut or increased permeability that allows things that are in the lumen of the gut to get across and stimulate systemic inflammation. That inflammation then can involve the ovaries. It can involve the metabolic organs like the liver, the muscle and fat tissue. The brain can lead to things like insulin resistance, increased androgen levels. And these are all the things that we know happen in polycystic ovary syndrome. And the international guidelines. I told you there was 264 recommendations the number one recommendation for the treatment and management of polycystic ovary syndrome is diet, diet and exercise.

Dr Ron Ehrlich *[00:22:57]* Right.

Dr Jim Parker *[00:22:58]* And we've turned that around and said, well, if diet can turn it around and fix it, then maybe diet is the cause as well. And that's part of this evolutionary model that we've developed to try and understand.

Dr Ron Ehrlich *[00:23:12]* This... This were, I mean, I'm intrigued by the term this evolution evolutionary model, because this is all we could... Well, I didn't. When was PCOS first identified or is it a new condition?

Dr Jim Parker *[00:23:29]* No, no, no. If you go back in the records, the part of PCOS is excessive hair growth and acne and being overweight, obesity. So... And those things have been recognised for over 2000 years. But the actual... The modern description of polycystic ovary syndrome was put forward in the 1930s by Stein and Levinson. They were the people that recognised all the features that we currently understand as polycystic ovary syndrome.

Dr Ron Ehrlich *[00:24:04]* But the name itself suggests that, you know, it's kind of self-explanatory in a way that there are many cysts in the ovaries, and that's a common feature of the condition?

Dr Jim Parker *[00:24:15]* But there's three components to that to make a diagnosis of polycystic ovary syndrome, which anyone listening to this podcast should be able to do after I say this right. And there's three components that we use to do it. Irregular periods, elevated male hormones or androgens, plus or minus polycystic ovary. And you only need two of those three things. So you don't need polycystic ovaries to diagnose polycystic ovary syndrome. So irregular periods, you might think, well, that's not much like surely everyone has a bit of an irregular period and they do. But most people don't. 80 to 90% of women have regular periods. That doesn't mean spot on 28 days. But we define a normal menstrual cycle as from 21 to 35 days. So if you think about it, when a period happens regularly that most of the time means that, that woman is ovulating and can get pregnant and maintain our species. But when periods are too frequent, like less than 21 days or longer than 35 days, most of those women are not ovulating most of the time. So we couldn't have too many people in our species who don't ovulate, otherwise we wouldn't be here. So it's highly abnormal to have periods less than 21 days or more than 35 days. And we now understand that when that happens, it happens because there's something wrong. Something's going wrong inside the body in terms of metabolism and hormones and reproduction, that woman's not cycling regularly, not of relating and therefore has a problem. And that's one-third of the potential diagnostic criteria for polycystic ovary syndrome.

Dr Jim Parker *[00:26:13]* The second one is increased male hormones, which we can actually see by acne or excessive hair growth. Problem with acne is we can't really categorise it well, like most adolescents, 90% of adolescents will have some acne, whereas excessive hair growth. We've got a system for defining that. It's called the Ferriman-Gallwey scoring system. So we can actually quantitate that. So there's two ways we can demonstrate excessive male hormones, excessive acne or hair growth or by measuring the hormones in the blood. And if that, like the testosterone and other hormones, are elevated, then that's another feature of polycystic ovary syndrome, and that's the most common.

So the most common thing is to have irregular periods, which could be heavy and associated with infertility or increased male hormones when we measured them in the blood. And you only need to have those two things. And the international guidelines stipulate that in adolescence you should only do those two things and don't do an ultrasound at all because lots of adolescent girls can have little cysts on their ovaries, polycystic ovaries. But that's just part of the normal maturation process of ovaries. And of course, the third thing is polycystic ovaries, which we've got criteria for. They should be over 20 small cysts measuring up to 8 or 9 mm on ultrasound. So you don't need polycystic ovaries on ultrasound to be diagnosed with polycystic ovary syndrome, which fits with what I was saying earlier. It's a metabolic and lifestyle problem, not a problem that's generated from the ovaries. It's the other way around. Poor quality diet, high glycemic diet, low fibre diet, sedentary lifestyle, stress, all of the things that we talk about in nutritional environmental medicine can cause changes that affect the ovaries.

Dr Ron Ehrlich *[00:28:19]* Hmm. And how common is PCOS in 2020? In the 2020s, let's say.

Dr Jim Parker *[00:28:27]* 10 to 20% of all reproductive-age women on the planet. And we... And it's been studied in all populations. And if you do some quick calculations like we had, there's 8 billion people on the planet. Half are women and half of those women are reproductive age. That's 2 billion. And 10% of that is 200 million. So there's at least 200 million women we know of with polycystic ovary syndrome on the planet.

Dr Ron Ehrlich *[00:28:57]* Wow.That's a... And if one has been watching this, as you have over the last 20 or 30 years, has that number been increasing, decreasing, staying stable? What's been the trend?

Dr Jim Parker *[00:29:11]* It's very hard to give exact figures on that because the definition has been changing over time, as we've sort of talked about a bit here. But what we do know is that in the Third World and in developing countries, in the middle classes of the developing countries where they've inherited all our lifestyle and diet, there has been a significant increase in polycystic ovary syndrome, which is consistent with our understanding of it being a lifestyle-related problem. So yes, we do think it's increasing and particularly in the developing world.

Dr Ron Ehrlich *[00:29:46]* I mean, this you know, we've called it an evolutionary model. And I wonder whether maybe a lifestyle or epigenetic model may be a different way of putting it. Evolutionary sounds kind of neat. It's inevitable. This is what was going to happen anyway. But that doesn't really capture what the reality is, is it?

Dr Jim Parker *[00:30:09]* No, because you've got to add one more word, and that is mismatch. It's an evolutionary mismatch problem. So what it means is that we've got the genetics that were perfectly set up for an ancestral environment to make us cope with starvation, food deprivation, the stresses of the time and were matched to our activity levels at that time and our reproductive needs. Fast forward a couple of billion years and we've got a modern environment where we've got a highly-processed diet, rapidly absorbed carbohydrates that give us spikes in blood sugar levels and cause insulin resistance and excessive weight gain and affect hormone levels like the androgen levels and we've got sedentary activity and stress and all of those sort of things. So we've got the same genetics. But in a totally different environment. And that's the same sort of thinking that we're using for like women with polycystic ovary syndrome, get a whole range of... Can get a whole range of other complications which are real diseases, polycystic ovary syndrome, not really a disease. It's just a biochemical endocrine change thing. You know, circumstances inside the body that can lead to diseases like diabetes where you can actually lose your sight and your kidneys and etc. metabolic syndrome where you've got blood pressure and cholesterol problems and the other features there and endometrial cancer, women with polycystic ovary syndrome can progress that's how I like to think of it too. All of these things, when they're diagnosed early as an adolescent and if they continue to have the same adverse environmental exposures, they can progress to all of these things. And all of those things are also considered evolutionary mismatch disorders because there's no difference. And in fact, the genetics is very similar between diabetes and PCOS, as you'd expect. And in addition to all of that this is like my current interest, women with polycystic ovary syndrome have double the risk of miscarriage, preterm labour, foetal growth restriction and preeclampsia and all of the pregnancy. We call them the great obstetrical syndromes. All of the pregnancy problems are much more common in women with polycystic ovary syndrome.

And this is really my current research interest in looking at why is that? Why is that happening? We know it's happening, but why is it happening?

Dr Ron Ehrlich *[00:33:03]* Hmm. I mean, you've identified lifestyle as clearly a trigger for this kind of condition. And if we were doing a program on and we have on cardiovascular disease, on diabetes, on cancer, whatever, you know, this will sound familiar to everyone. I mean, to all of us who've sat in lecture theatres on all of those topics and come up with what are the causes of these things. It's a recurring issue, isn't it? That it's just a question of genetically I guess that's the evolutionary mismatch part, how your genes will present themselves or, you know. Yeah, that's the whole...

Dr Jim Parker *[00:33:45]* How is it expressed in me compared to you? Like, I have a strong family history of Alzheimer's disease and poor lifestyle habits are going to be expressed in me in that way. You might have a strong family history of heart disease. So your genetics is, you know, and the way you process that, let's just say poor quality diet or lack of physical activity or whatever other features they are, are going to be slightly different in everyone.

Dr Ron Ehrlich *[00:34:15]* That's I mean, this is you've identified, you know, quite a few potential complications there in pregnancy for PCOS. You might just repeat some of those again for us, just, you know, the what... The pregnancy problems that happen with PCOS because I think that just bears repeating.

Dr Jim Parker *[00:34:36]* Yeah. Well, I think one thing that's happened is just to lead into that is that we look at all those pregnancy problems and we have done, particularly over the last 30 years from the side of from the point of view of the foetus, because it's a pregnancy and we've sort of ignored a little bit what's happening in the mother. But you can imagine that if what's happening in the mother and to take, you know, an obvious example if the mother is an alcoholic or a heavy smoker, you would expect that her environment, her metabolic and endocrine environment is going to affect that pregnancy. And we all know it does because you get foetal alcohol syndrome and small babies in smokers. But we've... In the research,

we've focussed on what's happening in the placenta and in the foetus and how all of that is regulating and causing these pregnancy-related problems. Whereas now there's a paradigm shift and it's very much like the paradigm shift from laparotomy to laparoscopy. We're shifting to hang on what's going on in the mother. In terms of diet and lifestyle that could be affecting the way the placenta grows and develops and therefore affecting all of these poor outcomes in pregnancy. And if you think about it right from the beginning of the sperm and the egg coming together and forming that first single cell, which of course then has the DNA from the mother and the father that is then copied trillions of times to make every single cell in the body which comes from that original cell. So the whole rest of any person's life, every cell and every bit of DNA is copied from that original program that's developed the first day after fertilisation. And that introduces a whole lot of things that are interesting to think about, like stem cell therapy and all sorts of things. But that fertilisation happens at the end of the fallopian tube. And over the next week, that one cell turns into 2, 4, 16, 1000. And in a week's time, it enters the uterus and it has to stick to the lining of the endometrial. So it's got to have certain receptors on its surface, the lining of the endometrium, which is the part of the uterus that bleeds every month when women have a period. Obviously, when you get pregnant, it doesn't bleed. It grows and develops and accommodates the pregnancy.

Dr Jim Parker *[00:37:18]* So from the very start that developing concept is has got to adhere to the lining of the uterus. If it doesn't, well, that's called a miscarriage. And of course, if things go wrong in the development and reproduction of those cells in copying that DNA. Nature will not cause a pregnancy to continue in the majority of circumstances and end up with an abnormal foetus and baby. It will cause a miscarriage. So a miscarriage is common. 15 to 20% of all pregnancies and double in women with polycystic ovary syndrome. And that tells you straight away that there's probably something in the maternal environment. Something adverse, like all the things that we know are going on in polycystic ovary syndrome that are affecting why that embryo can't attach and why it can't grow into the mother and form a healthy pregnancy. And then, of course, the big thing that happens as soon as that embryo attaches it has to grow into the mother and grow a placenta.

And the placenta is, of course, and the cells that are growing there, it's called the trophoblast cells have 50% of the mother's DNA and 50% of the father's. So the placenta is a foreign organism, 50% of it. If we took the kidney from the father and put it into the mother of that child, it would be immediately rejected. But we can take 50% of the father's DNA put it into a pregnancy in the uterus. And the majority of the times, it's very well accepted because those placental cells are regulating the immune system of the mother and allowing the mother to tolerate that developing embryo. And not only tolerate it, but nurturing. And not only that, you can take that embryo and you and you can put it in a different womb. That's called surrogacy. And that woman has got no DNA in common with that embryo and it'll do perfectly fine.

Dr Jim Parker *[00:39:31]* It'll regulate that in the mother's environment so that it doesn't reject the embryo. And of course, we can talk about this later possibly, too. But the placenta is full of stem cells, placental stem cells, which also don't get rejected. And that's a whole another story, but something that, you know, that we, the people in our investigating and thinking about and is trying to work out what's going on with this interaction between the foetal cells and the maternal cells to make this whole placenta work because the placenta has got to regulate, regulate the amount of blood flow that's getting to it so it can supply nutrients to the embryo so that the embryo can grow properly. And there's a there's a huge amount of physiology and anatomy and engineering that is fascinating that goes on in the placenta to make it all work or not work. And of course, if it doesn't work, then you get a baby that could doesn't grow properly. Pre-term labour or preeclampsia, which is a blood pressure problem in the mother that's generated by the placenta because of stress to the placenta. So the first interesting thing for people to work out is how does a placenta work and therefore and then when you work that out, well, how could it all go wrong and then how can we prevent these problems from... Or reduce the risk of these problems happening and that's what I'm involved with a team of researchers at the moment. We're looking at answering all of those questions. And we and we have quite a lot of good answers to those questions.

bromide, I haven't included those, but you know, it's a toxic soup out there.

Dr David Brownstein *[00:34:28]* We've certainly made a mess of things and that's why it's important to try to adopt a holistic lifestyle where you detox and where you exercise and where you try and get rid of some of these things because it's really hard to avoid a lot of it these days before.

Dr Ron Ehrlich *[00:34:45]* I want to move on to... I want to talk about holistic, but let's just finish with iodine and just say what is some basic recommendation? You know, I mean, obviously, depends on levels and all of that, but what should the ordinary person, you know, at least be having?

Dr David Brownstein *[00:35:02]* You know, it's different for different people. But...

Dr Ron Ehrlich *[00:35:04]* Yeah.

Dr David Brownstein *[00:35:04]* It's best to work with an iodine-literate healthcare practitioner who can measure your levels and help you adjust your doses. And that's the best thing. But I will tell you, the average iodine dose most of my patients are 25 to 50mg. And if they have glandular problems, that includes the breast, ovaries, uterus, prostate, pancreas, thyroid sometimes more, if they have quadrolic cancer problems they're on more. But for the average patient, 25 to 50mg and there are a few people to have an autonomous functioning nodule in the thyroid they can run into problems with. Once you take iodine that makes a lot of thyroid hormone because I'm hypothyroid. I've only had a few patients over the decades with that. That can happen. That's why it's it's best to do this you know under someone's, you know help and guidance that can recognise that and just test for it and adjust things when it's needed.

Dr Ron Ehrlich *[00:35:58]* It's so interesting, isn't it? Because this is what prompted me... Again, I just so grateful that you got on for us to have a chat about because the salt issue is another... Is an example of so many other issues, you know, like fluoride in the water supply. For example, one of the greatest public health moves if you asked the dental community, they would say that and I'm a dentist, so I know that it's heresy to even question this,

Dr Ron Ehrlich *[00:41:20]* Well, I mean, I have never thought of the placenta as a foreign body in that sense of 50% of father's DNA or 50% mother's DNA. And even the surrogacy is a totally foreign body. And yet it happens. It happens.

Dr Jim Parker *[00:41:35]* And look at the size of it. The placenta weighs 500g a turn. That's massive. That's like a lot bigger than one kidney and kidney transplant. That's a massive organ that's sitting there full of foreign DNA that in the majority of cases is providing a very healthy environment for this embryo. So what the placenta has to do, it has to separate the mother's blood from the foetal blood. But they have to get close enough that you can transfer all the proteins amino acids, lipids, glucose, vitamins, minerals, everything that the embryo needs, needs to go from... Through the placenta, from the mother. But those blood circulations never, never touch. And not that they've got to go to transfer and then you've got to get all the waste products out. You've got to get the oxygen in and the carbon dioxide out. So the placenta is going to regulate all of the nutrient things that happen. Which, of course, tells you straight away that nutritional environment of the mother is going to be extremely important in supplying the appropriate nutrients for the placenta to do its job. And the reason for all of those problems that I mentioned in pregnancy growth restriction, pre-eclampsia is that the placenta doesn't grow properly. So the placenta, the foetal side of the placenta has to grow into the uterus. Just enough to supply all the blood supply and nutrients that the baby needs, but not too much. In fact, it can it can grow right through the uterus. That's called the placenta accreta placenta percreta and they're life-threatening problems that we need that obstetricians need to be trained to do emergency caesarian hysterectomy, remove the uterus for those problems. This is a life-threatening problem.

Dr Ron Ehrlich *[00:43:35]* You know, Jim, I thought birth was pretty amazing just from the birth of my two children and my grandchildren. But to be seeing this on a daily basis and have it explain to us some of what is actually going on and what can go wrong. It's just... It's incredible, isn't it? And actually interesting also that you say 15 to 20% of all women have miscarriage, which is very I mean, upsetting.

I mean, in my own family, we had a stillborn between our two children. And it's not until something like that happens that people will say, oh, yeah, we had a miscarriage when we... This happened to us. Because when you see someone who's pregnant, you don't go up to them. Go, Oh, congratulations, you're pregnant. By the way, I had a miscarriage. You know, it's not the sort of thing that's spoken about, but it is interesting to hear that it's not unusual and PCOS doubling that. What can women do to lower the risk of developing complications in pregnancy?

Dr Jim Parker *[00:44:36]* That's, let's say, one of the things that's occupied a lot of research around the world. But say with pre-eclampsia, that's a problem where the placenta doesn't grow properly and it doesn't get an adequate amount of oxygen and nutrients. So the placenta is continually sending out messages to the mother in the form of chemicals like cytokines, and it sends out little packages called exosomes. Every cell in the body communicates with other cells in all the same way. And the placenta cell sends out these exosomes and other molecules that contain messages, chemicals, messenger RNA and DNA, all sorts of things that then regulate the mother's blood pressure. And that's a touring and throwing process that's going on throughout the whole of pregnancy because the mother's blood pressure's going to change to supply blood to the developing pregnancy. And there's like a 50% increase in blood volume. So this is a lot of blood. Got to go through the placenta, as you can imagine, to supply all that nutrition and oxygen. And if it doesn't get what it needs, it'll keep sending out stress messages to the mother to regulate her blood pressure and increase of blood pressure to try and get more blood and nutrients going to the placenta. And that's the problem we call preeclampsia, where the mother's blood pressure goes out in during pregnancy. And one of the treatment that's most used for that is aspirin. And aspirin has been very well researched and trialled in women that have had particularly severe onset early preeclampsia. That's before 34 weeks and it causes a 62% reduction. If you take it started early in pregnancy where it can affect placental development and all of these processes between 12 and 16 weeks and take it up to 36 weeks, it causes a reduction in severe early-onset preeclampsia and delivery of babies before 34 weeks.

Dr Ron Ehrlich *[00:46:49]* And this is just low, low-dose aspirin.

Dr Jim Parker *[00:46:51]* Low-dose aspirin.

Dr Ron Ehrlich *[00:46:53]* Yeah, like 100mg a day or this is like Cartia, would be... Things like that where you have about 100mg a day or something.

Dr Jim Parker *[00:47:00]* Exactly the same as what we use for stroke prevention in people with actual food relation and all of that because it's another blood vessel problem. We don't know the full mechanisms of action of how it works, but that obviously doesn't stop us using something like that. But of interest to what we're talking about with nutritional and environmental medicine, what has been neglected is of course the effect of nutrition and diet on preventing these problems. And that's where this bit of a paradigm shift is happening now to look at what's happening in the mother because all of the fluid that's produced in the uterus to supply the nutrition to the embryo up to 12 weeks is a reflection of what's happening in the mother. So obviously, a poor quality diet and problems with insulin resistance and inflammation and all those things that are going on in the chronic disease situation and in polycystic ovary syndrome can cause an abnormal nutrient environment for the foetus in the embryo to growing. And you won't be surprised to hear that we have got 100 years of research looking at the effects of diet on pre-eclampsia and it hasn't hit mainstream practice yet.

Dr Ron Ehrlich *[00:48:26]* Right. Right. Well, you know, where's where's the randomised double-blind controlled trials to prove it is often what's thrown up. And yet we dive into new medications and don't even get us. Let's not go down that rabbit hole, Jim, because it doesn't surprise you or I, but a lot of people are not necessarily aware of it. And that is... There's a lot of fantastic research that has gone on for a very long time about these things.

Dr Jim Parker *[00:48:55]* But last year and last time we spoke a couple of years ago, we did. We talked about Alan Hewson, which was one of my mentors. He published a study in 1957 looking at the effects of dietary fibre on the incidence of pre-eclampsia in 1957. And I've got studies from the 1940s that are systematic reviews of studies in the 20s and 30s that it was the effect of diet and simply all they've found is the same as we find with everything else that we've spoken about.

A high-quality diet, which means fresh food grown in nature, high in fibre, low in refined carbohydrates and starches, and low in environmental chemicals that are added to all of our processed and ultra-processed foods. Those diets have found to be associated with a decreased incidence of pregnancy-related problems. And the one we're looking at in particular is preeclampsia. And as I said, we've got 100 years of those studies that show very high-level evidence, and it's recognised by big international conventional obstetric groups like the precise network as well. But we haven't quite moved them into... This into clinical practice. And that's one of the things that we're looking at in this study that we're doing at the moment. We want to bring all that research together and and make it more obvious to people that it's an important component and it fits in nicely with this paradigm shift to the maternal effects of what's causing all of these pregnancy problems.

Dr Ron Ehrlich *[00:50:43]* Now, that's so interesting that you should say this hasn't moved into clinical practice to the degree that it should, even though there's over 100 years of research. And I think this begs a question about what is going on in clinical practice and what are the greatest influences on clinicians, you know, as the conduit to patients. I mean, we could what do you think it is, Jim?

Dr Jim Parker *[00:51:11]* Well, take another example. Gestational diabetes, that's a problem of diabetes in pregnancy. That's a problem that is... That women with polycystic ovary syndrome have doubled the risk of getting as well because insulin resistance causes gestational diabetes and it's a big component in polycystic ovary syndrome. So that's not surprising. But we recognise that there's a big worldwide movement trying to improve the treatment of women with gestational diabetes, and all of those women get referred to a dietician and they all see a specialist endocrinologist, and they monitored carefully in pregnancy because they had gestational diabetes. And obviously, we recognise that diabetes and gestational diabetes can have significant effects on pregnancy outcomes in terms of growth of babies and morbidity and mortality outcomes and here we have polycystic ovary syndrome now that is not recognised as a risk factor in pregnancy and we've got a number of international organisations that itemise a lot of

risk factors in pregnancy and gestational diabetes and previous preeclampsia and hypertension, and there's a whole range of things there that are recognised and PCOS is not on that, but it is recognised in the new international guidelines it is a significant thing. So again, in this research that we're doing, where we're trying to bring that more to attention because of course, you can treat women with polycystic ovary syndrome before they get pregnant. Potentially decrease their risk of all of these problems in pregnancy and have better outcomes. So one extension of that is that once we recognise the increased risk, then women with polycystic ovary syndrome can be identified before and in early pregnancy. And for instance, we could treat them like gestational diabetics and refer them to a dietician and to see a specialist and to get health coaching throughout pregnancy to optimise their pregnancy outcomes. They can get specialised screening with early pregnancy, ultrasound and blood tests that we can do. And if they're at particular high risk, they could get treated with aspirin like other women that are high risk of three times a year, for instance. So there's a lot we can do, and that's what we're in the process. This is our bit of a mission at the moment, is to get polycystic ovary syndrome more recognised for all of these things and to get earlier treatment and intervention and prevention of problems.

Dr Ron Ehrlich *[00:54:01]* It's interesting when you say use the example of gestational diabetes and they would go to see a dietitian. And therein is another area where, in my opinion, where, you know, if the dietitian then uses the Australian healthy eating guidelines as a guide to healthy eating, to me, those healthy eating guidelines is where the food industry and the pharmaceutical industry have a beautiful synergistic relationship because I don't think the information in the Australian healthy eating guidelines is going to necessarily make people as healthy as they could or should be.

Dr Jim Parker *[00:54:43]* No, and we've published papers on this topic and we've discussed this at length. But if you take all of the dietary options that you've got, whether it's a Mediterranean diet or vegetarian diet or whatever, and you take the healthy components that everyone agrees on out of those diets. You then come up with what we call a whole foods diet, which is basically a predominantly plant-based diet of fruits, vegetables, nuts, seeds and grains that are unprocessed.

So, you know, most people agree that the majority of these different diets that are that are around. So at least at the start, we can just try and move people to take whatever diet they're particularly interested in, at least take the majority of the best parts of that healthy diet. And obviously, there is changes in the dietary guidelines and in some countries like Canada, that they're a step ahead of us, you know. So, you know, it's just it's a slow progression over time. Yes. And as you say, there's a lot of influences. But in the end, we have to work with patients on a day-by-day basis so we can, in my situation, educate doctors about it and then they can interact with patients and hopefully give them the best outcomes as well. But the whole lot of this comes back to research as well.

Dr Ron Ehrlich *[00:56:21]* Well, I was going to ask you about that because I know that this is your particular area of interest. And what are some of the new areas of research in the understanding of, you know, developing complications in pregnancy?

Dr Jim Parker *[00:56:36]* Yeah. Well, there's some really dramatic changes, I think, and innovative changes happening in the world in science that... So, for instance, one of the things that's happening is what's called organoid research, that is the growing of different organs and tissues in the laboratory that mimic the real situation. And this is sort of been revolutionised over the last 5 to 10 years, particularly because in the past we could only grow two-dimensional models of things in a laboratory, and they are very limited with what you can do and the understanding you can even get from that. But for instance, this technology has been used for so many different applications in society. For instance, you can get the glands of a snake. Grow that in a laboratory and produce the venom so you don't have to go and catch snakes and milk the venom out of them. We can use it in the brain so we can grow brain tissue, which develops into a three-dimensional structure, and then we can access then we can get those cells to produce cerebrospinal fluid. So do these experiments on it. We don't have to go and stick needles into people's spine and take the fluid. In the endometrium now we can grow what's called endometrial organoids. So you can imagine in the past what has slowed down all this pregnancy research is how do you experiment on someone who's pregnant. You can't take a chance at interrupting the pregnancy and going into the uterus with

a telescope or a pipette and taking fluid, or you can't access... Accessing that environment that we were talking about before. That's been extremely difficult and techniques for growing tissue in the lab has been restricted to two dimensional. Well, technology's changed and now we can grow three-dimensional organoids. And the difference there is that organoids have polarity, and polarity means in a cell has to have a basement side and a luminal side. So it's got a cell and a side and it's gotten up and down and the front and the back. It's... That's what we call polarity. We've never had that before so we can look at what's happening on each of the borders of those cells is totally different. What's happening in the lumen.

Dr Jim Parker *[00:59:09]* Where the cell releases some fluid like in the uterus into the cavity of the uterus to supply nutrition to the embryo is totally different on the other side of the cell, which is getting the nutrients from the mother's blood. So we can now in a laboratory because of these organoids do experiments that are basically real lives that are telling us the sorts of things that would be happening. And we animal experiments now show that what's happening in these organoids reflects very closely what's happening in the real situation. And the difference there is then we can apply nutritional things, for instance, or pharmaceuticals or nutraceuticals or anything else to these organoids and see how they respond, measure their genetic changes and measure a whole lot of biochemistry and other things that are happening. So, for instance, one recent study that's being done in polycystic ovary syndrome, they've got a woman with polycystic ovary syndrome who's had miscarriages and problems. You can do a curette on that woman, which just means taking a biopsy of the lining of the uterus. Take those cells, develop up the stem cells, and grow a uterine lining in a laboratory in these organoids. Then you can look at the biochemistry and the genes that are being expressed in everything that's going on and you get a profile. You can do the same thing in a patient who hasn't had any problems and has normal pregnancy outcomes. And you can see dramatic differences in the profiles of gene expression and biochemistry and nutrients in those two patients, which gives you a window of opportunity of understanding why is someone with polycystic ovary syndrome getting twice the miscarriage, right, pre-eclampsia and everything else. And this particular group, they did what I just explained. Then they treated the woman with polycystic ovary syndrome for sixteen weeks with a high-quality diet and exercise.

She lost weight and she got her metabolism and endocrinology under control and started cycling regularly, went back, did another curette. It grew up the stem cells in the organoid. And guess what they showed? It was normal, the same as the patient who was normal. In other words, the symptoms and signs and features of polycystic ovary syndrome that affect the endometrium, the fluid that's being supplied to nourish the baby. Can be reversed and changed by diet and lifestyle changes. Now, that's very preliminary research and hot off the press. I don't think it's only been presented at a conference and not published yet, but it makes the point of what a lot of other research backs up as well, that we... If we get women with polycystic ovary syndrome before they're pregnant as adolescents and can educate them about all of these things and implement lifestyle changes before they get pregnant, before they get infertility problems, then we should be able to circumvent a lot of those issues.

Dr Ron Ehrlich *[01:02:37]* Mm hmm. Well, I've not I mean, I've not heard of Organoid research, and and I mean, that is, that is really new. And, I mean, I can see you've given an example there of its diagnostic value. Is there a therapeutic potential there as well?

Dr Jim Parker *[01:02:56]* Well, this is all exciting new research, which is what inspires me to be involved in that as well. But of course, what we're doing is we're growing up stem cells and stem cell research and applications and biology is a whole new dimension as well, not only in pregnancy but outside. But if you think about it, the first bone marrow transplant was done in 1956, which is a year that you and I can relate to quite well.

Dr Ron Ehrlich *[01:03:35]* Oh, I'm not much older than you, Jim. I'm 55... I was in 1955. But go on.

Dr Jim Parker *[01:03:39]* Yeah, it was. But so 1956. So it's a long time ago. So we've been using bone marrow transplants and stem cell biology now for 68 years. So we've had a lot of experience with that. But of course, with bone marrow, it's difficult to get. You've got to stick a big needle into someone's bone marrow to get that.

Then you've got to treat someone who's got the problem in the first place like leukaemia or whatever with high-dose chemotherapy to totally wipe out their bone marrow. You then inject the bone marrow into the new patient and that bone marrow can be injected intravenously, circulate throughout the whole body that there's stem cells. And those stem cells will then find the niche they need to go to in the bone marrow, establish themselves, regrow, repopulate, and hopefully, they lead to an improved outcome in those situations where it works. But that donor needs to be carefully matched to the recipient, and the recipient needs to have anti-rejection therapy and all the rest of it. So it's an incredibly complicated procedure. Fast forward to placental cells. Placental cells don't have a problem with matching. They will in some patients, it won't be perfect. But this is just the beginning of this research. But placental cells can regulate the immune system of the recipient, so they're not rejected. That's their job. That's how they're born. From the first cell after fertilisation is the ultimate stem cell that you like because that leads to a brain cell, a kidney cell, bone cell. So the first cell has got the genetic program to be every cell in the body. And every cell in the body has that same genetic program. A brain cell is no different in its DNA to a heart cell. What's different is not the genes that are possessed, but the genes that are expressed. So as cells differentiate, they get certain genes turned off so that a bone cell wants to differentiate a stem cell differentiates into a bone cell it can no longer form a brain cell or a heart cell that program's gone.

Dr Ron Ehrlich *[01:06:17]* And are stem cells from bone marrow and stem cells from placenta different?

Dr Jim Parker *[01:06:24]* Yeah, because as they... As a stem cell, if you think about it, the ultimate stem cell is the first one. The first cell after fertilisation because that cell can become anything. And it does it becomes a placental cell, or if it starts to form an embryo and then it forms a head or tail. And that cell's got an open letter to the whole of the human genome, the whole of the human DNA. But as each cell division happens. And say in the first instance, some of those cells become placental cells, some become embryo cells. The embryo cells have turned off their program for becoming a placental cell, and it can never be accessed again. And as cells become differentiated in an embryo, they turn off their other programs.

So if you take stem cells from adipose tissue or fat tissue and inject that into the body, it can go to certain places and differentiate into certain tissues, but it can't access the full program to do everything.

Dr Ron Ehrlich *[01:07:37]* But in terms of rejection, the... As you as you pointed out and as I'm thinking more and more about is this the ability of the placenta, 50% of which is foreign, not to be rejected. And I assume... And when you take a stem cell from bone marrow, there's always the problem of rejection. But if you take a stem cell from placenta, is the rejection problem overcome?

Dr Jim Parker *[01:08:05]* Yeah, it's minimal. Yeah. Because as we said at the beginning, you can get that embryo which is got one woman's DNA and one male and put it in a surrogate and it'll do very, very well. It's not rejected at all. So you can... That placenta is full of billions of stem cells, some of which are from the mother's side, because the placenta is getting the mother and some of which are from the foetal side. So what researchers do is get the placenta. And by the way, there are few centres available. This is like... There's 140 million births on the planet every year. That is a big amount of placentas we can access. They can then extract the foetal stem cells. And those stem cells then can be used for various purposes.

Dr Ron Ehrlich *[01:09:00]* And accessing that... Those stem cells in the placenta would occur once birth is given and there is the placenta before the cord has been cut.

Dr Jim Parker *[01:09:10]* And not only that, you know, whether that placenta is healthy, because if that woman has had. Blood pressure, pre-eclampsia, growth restriction and a whole lot of other problems. You go, well now there's a problem with that placenta. We don't want those stem cells. If that woman has had a perfectly healthy well-run baby delivered at 40 weeks those stem cells have a proven track record. They are the best stem cells you will ever get. And of course, if you then inject those stem cells into you or me instead of your stem cells that we've got that are 68 years old and have been subject to all the glasses of wine and everything else

that we've done to them in our lifestyle they've been exposed to that. Placental stem cells are coming in from an embryo with minimal exposures and from a healthy woman that we know has got no problems and delivered a healthy baby. They've got a very good track record. You'd expect that their DNA programs and their healing potential and what they're very good at is anti-inflammatory, which is what most of the chronic diseases have as an underlying basis inflammation.

Dr Ron Ehrlich *[01:10:31]* And is this happening? Are we harvesting stem cells from placenta? I imagine this is ethically an issue, but is this happening? Because it sounds like a compelling argument for life-giving life beyond just the birth of a child.

Dr Jim Parker *[01:10:47]* It's dramatically infecting all the aesthetics to do with all the different treatments that people are looking at to get themselves looking better. It's dramatically affecting ageing. Because this is an anti-aging treatment, placental stem cells. It's dramatically affecting how we treat a whole variety of autoimmune diseases, neuroinflammatory, Parkinson's is very promising. There's clinical trials all around the world. And there is no... There are no ethical issues with stem cells from placenta. They're not embryonic stem cells. They're placental stem cells. They're not from a miscarriage or an abortion, they're not grown in a test tube from an embryo. They totally... The ethical issues are very much minimised and their biological potential is very much maximised. And they've been growing every day in Australia and in most countries around the world are doing experiments... Experimenting on this. And this only lasts 5 to 10 years and it's really taken off. And there's animal trials, pre-clinical trials, laboratory trials going on everywhere. It's a dramatic change and an exciting area of research that's happening around the world. And there will definitely be good treatments and outcomes that come out of that once we you know, it's a bit like the microbiome. You know, we initially thought probiotics were a magic cure and then we found they only lasted for two weeks and they didn't repopulate. And they have these beneficial effects. But it's not a panacea. It will be the same sort of process with stem cell research. But eventually, we will find, I believe, a lot of good applications once we learn about their biology and how to use them and how to program and how to minimise any complications and side effects and there's no treatment that's not without risk.

So at the moment, there is... This is a booming area of research, just like the organoid research is dramatically changing what we can find out about abnormal pregnancies and problems there. So it's what these... Those things are married with is the dramatic revolutions in technology. AI how we can analyse gene things like there's 20,000... 23,000 genes producing proteins in the human genome, which is 3 billion base pairs. Well, we can look at 30 days worth as that over cycle of pregnancy and work out what's the best time to implant an embryo with IVF. That the statistics and the software power and the AI that you need to analyse all that is like mind-boggling that it's all there now. So we've got revolutions in technology. We've got revolutions in this organoids and stem cells all happening simultaneously. And... also revolutions in technology and being able to sample and measure things in fluid and that we couldn't previously like for instance, insulin, insulin is a hard molecule to measure because it's in such a low concentration. You need mass spectrometers and all sorts of fancy atomic sort of technology and gadgetry to be able to do that. So all of these technology and AI as well as our knowledge is dramatically changing all simultaneously. And that's why people saying I don't know where these statistics come from, but medical knowledge is doubling every 76 days. Even if it's 90 or doesn't matter what the true value is, it's there's a dramatic revolution in in medical research and literature. And for any individual to try and keep up with that doesn't matter what their subspecialty, it's almost impossible. And what I do which is interest me is look at what everyone else is doing and try and bring all this stuff together in the one place so that people can see what's actually out there. Because obviously, if you're researching in and in endometrial organoids and doing your experimenting, that takes a lot of time and effort. If you're a clinician seeing patients every day and operating patients on patients, you haven't got the time to scour that literature as well. And so there's a lot of people like myself that are looking at all these breakthrough areas, bringing it together and trying to bring it to the attention of researchers and clinicians, but also trying to what we call bedside to bench to clinic research called translational medicine. Finding new research and then getting it moved through into clinical practice quicker, which is of course what you were referring to previously, is to what, why are we so slow with all of this thing? Getting new breakthroughs into clinical practice and the research on nutrition, Why isn't that getting into clinical practice and all of these things.

You know, there's a process of doing it and there's an avalanche of information for people to process and get on top of and sort of work out, well, what's real, what's important, what's a good level of evidence and proof that we can actually implement this. And there's been many, many examples where we've jumped too quick and put things in, says we have to find a happy medium between rushing into new technologies and new treatments and new ideas and paradigms and causing a whole lot of problems. But going too slow and missing out on all of the advantages of new breakthroughs and technology. So anyway, we're trying to be in the middle there somewhere and bring these research things into clinical practice.

Dr Ron Ehrlich *[01:17:21]* Well, Jim, I think that's a great note to finish on. And listen, I have sat in many lecture rooms listening to you at conferences and in courses, and I've always been so struck by your knowledge and your delivery of that knowledge in a really a cheap, sort of understandable way. So I have to share you with my listeners. Thank you so much for coming and joining us today and sharing your knowledge and wisdom with us.

Dr Jim Parker *[01:17:46]* Right. It's been a pleasure, Ron. Really enjoyed talking about these things that I really passionate... I'm passionate about at the moment.

Dr Ron Ehrlich *[01:17:56]* Again, lifestyle. It's a recurring theme. And as I said, as I sat in many lecture theatre conferences which are focussed on various issues, be it oral health, be it cardiovascular disease, be it cancers, be it autoimmune conditions, diabetes, it comes back to lifestyle. And it's often said that our genes load the gun, but nutritional and lifestyle and environmental medicine pull the trigger. And it's a shame really that isn't more a normal part of mainstream medicine, but it is part of what this podcast is all about. It's part of what the unstress health community is all about, which I again encourage you to join. So I hope this finds you well. Until next time, this is Dr Ron Ehrlich. Be well.

Dr Ron Ehrlich *[01:18:49]* This podcast provides general information and discussion about medicine, health and related subjects. The content is not intended and should not be construed as medical advice or as a substitute for care by a qualified medical practitioner. If you or any other person has a medical concern, he or she should consult with an appropriately qualified medical practitioner. Guests who speak in this podcast express their own opinions, experiences and conclusions.

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