

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

Healthy Moms Podcast

BY **Wellness Mama**[®]
simple answers for healthier families

Episode 68: Microbirth and Your Baby's
Microbiome with Toni Harman

Child: Welcome to my mommy's podcast!

Katie: This episode is brought to you by Perfect Supplements. This is a new supplement company that I really love. I've recently discovered them. Their products are made in the USA. They make all natural, nutrient-dense super food supplements at incredibly reasonable prices. So I found this company really helps make it possible for families to eat a nutrient-packed, all-natural diet without breaking the bank. And even better, they offer both discounts. So if you have a big family this has really helped our budget. You can buy all of their amazing supplements like liver, collagen, even fermented kale and get up to 35% off on bulk orders. If you use the code wellnessmama10 at perfectsupplements.com. You can also get an additional 10% off of your order on top of that. Definitely check them out.

This episode is also brought to you by Pregnancy Exercise. If you've never heard of this website, it's a great online resource for pregnancy and post-pregnancy exercises for moms. The founder, Lorraine Scapens, is a pre and post-natal exercise specialist, and she shares her knowledge with other women and helps thousands of women to have a healthy and pain-free pregnancy, to prevent diastasis and pelvic floor muscle dysfunction and to get back in shape safely post-pregnancy. Her website has a tone of great information as well as some specific programs that you can do from home to get back in shape after pregnancy or to have a really comfortable healthy pregnancy without losing strength in the first place. So check it out, go to pregnancyexercise.co.nz/wellnessmama and make sure you use a coupon code wellnessmama for an additional 10% off.

Welcome to The Healthy Moms podcast. I'm Katie from wellnessmama.com, and I am so excited to be here with today's guest because I have been a fan of hers for years. Toni Harman is a documentary film maker turned birth warrior turned author. She graduated from Exeter University in London film school. And she's spent the past 20 years producing and directing films including a psychological thriller that was released by a Hollywood studio. But like a lot of us, after having a baby, she kind of switched modes, and now she makes amazing documentaries about childbirth including "Doula," "Freedom for Birth" and the award winning documentary, "Microbirth." And her research for "Microbirth" ignited a passion for microbiome research and this resulted in her amazing new book called, "Your Baby's Microbiome", which she co-wrote with her partner Alex Wakeford. So Toni, welcome. Thank you so much for being here.

Toni: Thank you so much for having me on. Honestly, I'm a huge fan of yours. So I feel deeply honored.

Katie: Oh my gosh. Likewise. I'm such a big fan of your work. I saw "Microbirth" shortly after it came out and was just blown away with the research because I had seen little bits of that myself in researching but the way you put it together and made it so easy to understand. So I'm gonna jump right in because I know there are so many questions I have, and I have written down some questions that readers have as well.

So obviously, your background is in film and you have done amazing things in that. And then you shifted focus after your daughter was born which I feel like a lot of moms kind of have that moment where the things that were important before shift and your whole world obviously changes pretty drastically when you have a baby. So can you talk about that experience and what really created that journey for you and the desire to travel across the world to learn from all these specialists about childbirth and also what surprised you the most?

Toni: Okay, I didn't set out to be a documentary film maker making films about childbirth. We just made...sorry, when I talk about we, it's myself and my partner, Alex. So we met at film school 20 years ago. And we've been making films together. So we've made short films, we've made documentaries with TV. We've done just kind of quite a lot of film making, and then we had just finished our first feature film so we're off to Hollywood because it got picked up by a Hollywood studio and distributed.

And then I found out I was pregnant which was wonderful and fantastic. And then I had my daughter who is called Willow. And the birth, in my birth plan, I had envisioned a beautiful, natural childbirth with scented candles and music. And I remember writing in my birth plan I didn't want any medical interventions. I didn't want any pain relief. The thing is, that my birth plan didn't actually come out my bag. No one asked me about my choices, and I found myself having an emergency C-section. And my daughter was given formula milk straight away without me being asked.

So the whole birth experience...so that was amazing having a baby girl and capping a month the first time. I was left with a whole set of questions. It was not just me and my partner, Alex too. It was just like, what happened there then? We had this kind of vision of a natural birth with candles, and we end up in emergency room and our daughter being given formula and he's, kind of like, "Okay."

So we had a lot of questions. So as film makers we were like, "Okay, let's ask these questions in a film." So we started interviewing people just around us. So we started hearing about doulas, and this is...you might never heard of a word like doula before. And this is before I've never heard of, you know, people like Ina May Gaskin, who is a childbirth advocate and pioneer, never heard of someone called Sheila Kitzinger who's been into the politics of childbirth.

So we started asking questions, and we made a film about Doulas first off. And so in making a film about doulas, that one of the doulas who we we're filming at the premier actually came to us and said, "If you really want to know what's happening with childbirth, you should look at the politics of childbirth." So I said, "Okay." So we started looking at the politics of childbirth and started interviewing various experts. And that kind of sent us on a journey across the world interviewing these experts.

And we made a film called "Freedom for Birth" and about the politics of childbirth and about informed choice and how some people in birth like myself weren't presented with the full information. We didn't have fully informed choice. And it's something I feel really passionate about because above all of everything is that women need to have informed choices, and those choices need to be respected by healthcare professionals.

But you don't have choice unless the healthcare professionals give you choices and are aware of the information themselves. So we made the film "Freedom for Birth," and then after that, we were looking out for other subjects and someone said, "You should make a film about the science of birth." And that's how we came to make "Microbirth." So we thought we were off to Hollywood, but actually, we started on this amazing journey of making films about childbirth.

Katie: That's amazing, and I'll make sure that we have links to find out more about all of those because they're amazing. And I think that people can learn a lot from them and before we start delving into the research more, I know that you and I are on the same page here. But I just wanted to say it out loud for anyone listening that a lot of this research will talk about the difference between vaginal birth and C-sections and between breastfeeding and formula feeding. And anyone listening, please just know that we are coming from a total place of love on this and just wanting women to

have the ability to make choices like you said and to have informed consent and that there is zero judgment from either of us, and that this is just sharing information, and I know that you feel that way too.

And that I also wanna echo and really give credence to the fact that a lot of times, women will have a birth experience that wasn't what they chose like you did, and they'll get toed. And this just happened to me as well, like all that matters is a healthy baby. And, I always say, the most important thing is a healthy baby, but it's not the only thing that matters and birth does affect women. So also to those who have had a birth experience that wasn't what they hoped, just sending you virtual hugs as well, and I know how that feels and that you absolutely have a right to feel that way. And I know that you're on the same page with those as well as far as you're just here to give women information to help make their decisions easier and better but not to judge.

Toni: Absolutely, I think those two points about an informed choice and not...it's very difficult because some people's birth situations like myself, it wasn't what I envisioned when I wrote a birth plan, but actually, for whatever reason, that's what happened. And it's kind of not feeling guilty about that, it's mourning, mourning what you could have had which is very different from feeling guilt because guilt is associated with something you've done wrong. Actually, there was nothing I did wrong. There's nothing other moms do wrong. It's just that that's what happens in their birth situations.

It's tricky because most people, if not all people, will remember their birth. They like will remember the moment they were having birth for the rest of... or a given birth for the rest of their life. And hopefully, those memories associated with their experience will be really positive and full of love and fantastic. But some people, those memories will have memories which just for me is like confusion and...trauma is a very strong word, but I feel quite emotional about it and quite not angry, but there's...it does dip into kind of my emotional core.

But I also know that to help other people, you've gotta raise awareness of these issues. And you've got to kinda talk about it out of just love or health professionals and for parents and for new parents to be aware of this amazing new information which is really exciting when you start delving into it. It's like it opens up this whole new world. It's exciting, and it's not about making someone feel guilty. It's like saying, "Look at this amazing information. You can make choices which involve this information."

Katie: Yeah, 100% because I tell people I am a C-section mom as well. My third was a C-section which I had placenta previa, so it was not avoidable, but I also mourned that it wasn't the birth I had hoped. And that's why I love this information that you're sharing because I wish I had had it then. And I wish I had been able to act on it then. And so that's just my goal with this podcast, is to get your information in the hands of as many moms as possible so that they can make that choice. And again at the end of the day, it's their choice of how they birth, but it is important to know all the different aspects that go into it.

So to delve a little deeper, you released "Microbirth" in 2014, and it really delves into the latest science about the impact of how a baby is born whether vaginal or C-section and how they're fed which is either breastfeeding or formula feeding and how those impact their health pretty much their entire life. And I thought I knew a lot about this, and I was literally blown away. So can you talk about the film and what the microbiome is and why this is so important?

Toni: I'm hoping that a lot of people have heard of this word, the microbiome. It's had a little press in the last couple of years, and the microbiome is your bacterial ecosystem. So if you imagine your body

is comprised of millions, trillions of human cells. But you've also got trillions of micro-organisms in there too. So bacteria, viruses, protozoa, archaea, so these microorganisms are on and in your body. And they work with your human cells. So our bodies aren't just us as the singular me, myself, I am and us. I am part human, part microbe. And so it's amazing.

So the microbes do things like they help with digestion. They help with your immune system. They help with some research... I'm sorry to say I've got scaffolding being taken down outside my house right now. So it might be a few bits of clunking. Okay, I was just looking out the window seeing...

Anyhow, so you've got your microbiome and it does all these amazing things for your body. It keeps your body kind of moving and functioning. And there's a research between what happens in your gut and what happens in your brain. There's a gut-brain connection and that scientists are thinking now that what happens in your gut can affect your mood, your behavior, even who you are.

So anyway, so this is a whole bacterial microscopic world and when you're pregnant, your baby grows up, it develops inside the amniotic sac. And it's mostly protected from the microbial world. So it's not entirely sterile, but there's microbes there, but it's very limited exposure. Then the moment your amniotic sac opens, ruptures, so when your waters breaks when you're pregnant or during labour, that's your baby's first main contact with the bacterial world. That's what's called the seeding of the baby's microbiome.

And normally that happens, with vaginal birth that happens in the birth canal. In your vagina, all these amazing microbes, which are a special type of microbes and their job...not their job, they're there, and they seed the baby's microbiome. So basically, they're the first microbes, the first main exposure to microbes that your baby will be exposed to. So the microbes and micro-organisms, the bacteria, the viruses, the archaea, the protozoa, they go in your baby's eyes, ears, mouth. They get squished into your baby's skin, and then some of those microbes go into the baby's gut to found the baby's microbiome.

And then more microbes come from the...from when the baby is born, from contact with the mom's fecal matter. So it's like vaginal microbes and microbes from the mom's poop, and then there's more microbes coming from air and the baby being kissed by the mother or touched by the mother. All those microbes will kind of go together to come colonize the baby's bacterial ecosystem. And this, that moment is incredibly important because that founds the baby's microbiome. And those first microbes to arrive in the microbiome, they help train the baby's immune system. And that immune training lasts across the whole lifetime. So you have those microbes which arrive during the birth process, during some vaginal birth from the mother's vagina and the mother's gut microbes plus all the microbes from skin to skin contact and then breastfeeding, more microbes, so much species of microbes in breastfeeding.

It just blows my mind. I get so excited by this because within breast milk you have this thing called human milk oligosaccharides. They are special sugars that are there, not to feed the baby, but special sugars there to feed the microbes that just arrived in the baby's gut. So during vaginal birth is the seeding process, but during breastfeeding is the feeding process, the feeding of the baby's microbes. And it's this beautiful, intricate system which helps train your baby's immune system. But it sets your baby's microbiome for the rest of its life. And if that system is interfered with during a birth process or if I'm formula feeding, that could affect the baby's developing immune system and metabolic systems which could have lifelong consequences.

So it's an amazing process that happens during birth and early infancy and the baby's microbiome keeps on developing over the first two to three years of life until it stabilizes around about age two to three, and then it stays pretty stable from then onwards. So you've got that critical window from latent pregnancy, during birth and those first two three years of life. So a thousand critical days where your microbiome, it kinda happens. It develops, and that's gonna last a lifetime. So yes, that's the kind of long and short of it. It's the kind of what happens during a birth process and whether anything interfered with those critical processes, the hypothesis is they affect the immune training, and that immune training affects the baby's immune system which means that if you have a vaginal birth and are exclusively breastfed, your child has the best chance of the best possible health. And so the flipside of that is that if there's a C-section or formula feeding, your baby is at increased risk of not having optimal immune health.

Katie: Well, let's talk a little bit about that and go a little deeper with a C-section because you and I have both had one. We've just talked about in the vaginal birth what happens with the seeding and every time you say it, it just boggles my mind. It's so amazing. But obviously that doesn't happen in a C-section, so like obviously the birth itself is different but from a microbiome seeding perspective, what happens with a C-section and how is the baby seeded and how is it different?

Toni: Okay, so there's different types of C-section. So there's an elective C-section. So it's a C-section where their mother hasn't been in labour in any way. So the waters are still intact. So during C-section, this is quite graphic, so I'm just gonna say it out there. So during a C-section a mommy's tummy is cut open and then they cut through the layers of muscle and tissue. And then they expose the baby still within the amniotic sac and then the obstetrician, the surgeon will cut through the amniotic sac. And that's the first cut of opening of the amniotic sac. That's the first moment when the baby is gonna be exposed to the bacterial world. That would have happened in the birth canal with vaginal birth. But with C-section, it's done in the operating theatre.

So as the baby doesn't pass through the birth canal, with an elective C-section anyway, doesn't pass through the birth canal, does not have any contact with the mother's vaginal microbes, nor does have any contact with the mother's fecal microbes, so that's the contact with the mother's poop because the baby comes direct from the abdomen, so the seeding, the main seeding event for a baby born by C-section that their microbiome is still seeded, but those microbes are coming from the air of the operating theatre. And scientists have gone even further to find out that the air of the operating theatre more specifically is from the skin of someone in the operating theatre. So the baby's microbiome, the main seeding event is with the skin of say it could be the surgeon, it could be the anesthetists, could be the dad, could be anyone standing in the operating theatre. So it's not even coming from the mom or likely not even to come from the mother's own microbes the baby is seeded with. It's likely to come from someone else.

But because we have evolved as mammals over millennia over thousands of millions of years, we've evolved this beautiful intricate system for a baby to be born vaginally and then to be exclusively breastfed. Which means those microbes, the mother's microbes are really important to be transferred from mother to baby. So with a C-section, the baby is not...well, C-section which is elective where the mother's waters haven't gone, the baby is not gonna have exposure to the mother's own microbes. So the microbiomes will still be seeded and that could be, there was two theories, that could result in an altered microbiome, which could be the theories are as to why babies born by C-section are at increased risk of certain non-communicable diseases. Say things like, asthma, Type 1 diabetes, celiac disease and even increased risk of becoming obese later in life. So that's one theory, the altered microbiome theory.

But there's also, because with the C-section born baby, the baby doesn't pass through the birth canal, doesn't experience the same sort of pressures and hormone release as with a normal vaginal birth, there's a thing called epigenetics so where genes are switched on and off by certain things that happen during the kind of natural birth process. So they're squeezing through the pelvis and the exposure to the cascade of hormones the baby is supposed to be exposed to. Scientists think that that could also play a part in switching on or switching off of genes.

Okay, so that's what the situation is like with elective Caesarian birth. So this is where it gets a bit more complicated. So there's not been much research into what happens if a mother has been in labor for a certain number of hours, and the waters have gone, so the baby is still being exposed to the mother's vaginal microbes, and because the waters have gone while the baby is still in the birth canal, and then if the mother needs to have a caesarian section. There's not been much research but the theory is the baby could still have received some exposure to the mother's vaginal microbes. But probably, no exposure to the mother's fecal matter, so the mother's poop because the baby is being poured out of the mother's abdomen.

So there is a difference. There is some research which suggest there's a difference between babies born by elective caesarian and some research which suggest that those mothers who have gone into labor first, they might have received some exposure to the mother's vaginal microbes. So it's complicated, and this research is ongoing. And there's also some very recent research looking at the degree of pre-seeding that happens late in pregnancy in their third trimester where the baby is exposed to microbes from the mother's placenta or from the amniotic fluid itself because it's not sterile. There's microbes there. So the latest research is that, that could present like a pre-seeding environment effectively setting the conditions for birth and breastfeeding. Does that make sense or is that a bit technical?

Katie: No, absolutely it does, and I'm excited for more of research about the pre-seeding during the third trimester because I think for a long time, we kind of thought that it was mostly sterile, and the baby wasn't really exposed in utero. So I'm excited to see that, but I also really wanna delve deeper into this because after seeing "Microbirth," there are things that moms can do even in the case of a C-section from the way you explain in the movie. And I really wanna kinda talk about those because there are times when C-sections are necessary. And like we said, we're not here to judge a mom's choices, but there are things you can do if you do have a C-section. So talk about that. What are some of the things that a mom can do if she knows she's gonna have a C-section or if she finds out that she's having one pretty emergently, that she can do to protect and help her baby's microbiome?

Toni: Okay, so certain things that all mothers could do anyway, so during pregnancy it's having a healthy diet, eating lots of fresh fruits and vegetables. Our grandmothers always talked about eating vegetables. But vegetables and a high fiber diet and possibly some prebiotics or probiotics, so sort of lactobacillus-fermented foods, all of that is really, really good for your microbiome because you want a mother to have a really healthy microbiome because that's what she's gonna pass on to her baby if she has a vaginal birth but also...this is the thing.

So it's diet, lifestyle, avoiding unnecessary antibiotics where possible so when I say unnecessary, some antibiotics, just like C-section, they can be lifesaving. It's fantastic that we have them. But antibiotics play a devastating effect on a mother's microbiome. And because it affects the mother's microbiome, it also affects the baby's microbiome after the baby is born. All through if the baby is exposed to some degree of exposure during pregnancy. So, during pregnancy, attention to diet,

exercise, and there's lots of research about moderate degree of exercise for a pregnant mom. What else? Avoiding unnecessary antibiotics, avoiding unnecessary antibacterial products if possible. There's a great research I saw at a conference about three weeks ago, and they're talking about some research into the positive benefits for the baby's microbiome, of the mother being exposed to pets, animals during pregnancy because that decreases the risk of asthma and other allergic diseases.

Okay, so that's all the things that a mother can do or mothers can do, and that goes for after a baby is born too. So for the mother to have plenty of fresh fruits and vegetables, loads of reduced processed foods, high fiber diet, fermented foods all of that sort of stuff. But the thing which was talked about in the film and covered in our book too is about the potential benefits of something called swab seeding. So this is research by a professor we interviewed at New York University called Maria Gloria Dominguez-Bello. And she's done some research into this thing called swab seeding. This is when an hour before the caesarian section surgery a kind of tampon-like swab is inserted into the mother's vagina to collect all those beautiful vaginal microbes. And then after the baby is born, during the C-section, the swab is removed and kept in a sterile container, then once the baby is born, the baby's mouth and skin and body are wiped with this vaginal...hopefully that the swab which comes from the mother's vagina collected all the mother's vaginal microbes.

And so the theory is that this helps seed the baby's microbiome. And so Dr. Dominguez- Bello, her research suggests that for those babies that have undergone this procedure, which is swab seeding, their microbiome is partially restored. So the microbiome of C-section babies that are being swab seeded, their microbiome looks more similar to vaginally born babies than other C-section babies where they haven't been swab seeded. I should say, this research is very, very new. And at the moment, she's only done some small studies. There are certain risks involved in terms of, if a mother's microbiome is unhealthy, so her vaginal microbiome is unhealthy, then you'd be artificially wiping those microbes onto the baby and potentially transferring pathogens like unhealthy microbes to the baby.

So it's important for the mother's microbiome to be healthy, her mother's vaginal microbiome to be healthy for this procedure. So there are risks involved. It's a very early stage of the process, but the potential benefits are that it does at least partially restore the baby's microbiome. And her research is only looking at elective caesarians at the moment. It's not looking at emergency caesarians. And there's other things which...so the swab seeding doesn't overcome the problem of the baby not having contact with the mother's fecal microbiome. So that the baby is still not gonna come into contact with the mother's poop with the swab seeding for the C-section baby technique.

That said, it could be...research is ongoing. So long term this could be something that is introduced if her research does prove indeed that it can be very beneficial for the baby's long term health, for the baby's immune system. What else they can do... All mothers, and this is something I'm really passionate about, so all mothers whether vaginal birth or C-section, they can have immediate skin to skin with their baby. So uninterrupted, beautiful, skin on skin where the baby gets put straight onto the mother's chest. And there's a new technique, so the genital caesarean technique where this happens, where the baby is delivered straight onto the mother's chest in the operating theatre, and it's beautiful.

So the baby is exposed to the mother's skin microbes, and it's just lovely. And that's the best place to initiate breastfeeding. So aside from potentially swab seeding research, there's a major skin to skin leaving where possible, leaving the mother and baby uninterrupted for as long as possible. So kind of

the tagging can wait, all the other kinda checks can wait. Obviously if there's an emergency situation, absolutely the doctors have to do their thing. But if there's not an emergency situation, maybe an hour or two hours of just uninterrupted, golden, wallowing in all those microbes for either a vaginal birth or a C-section baby.

And exclusive breastfeeding I can't tell you...well, I can tell you because I'm telling you now, but it's amazing. So exclusive breastfeeding is not just a transfer of microbes are found in breast milk, but it's these amazing human milk oligosaccharides so that these special sugars that are there to feed the microbes newly delivered in the baby's gut. And so there were some research which suggest that exclusive breastfeeding goes some way, goes a long way to help restore the baby's microbiome for those babies that need to be born by C-section.

What else? For the mother to eat a healthy diet, again, pets, there's research about exposure to pets. I'm talking about cats and dogs within the family home. That's really good for introducing microbes which can reduce...there's a research, which can reduce the baby's likelihood of developing asthma and other allergic diseases. This research is very new, but is just...yes, all the indications are all that. Yeah, having a pet, breastfeeding, being...no, I hate to say that being a bit dirty...I think there's a tendency now to...no, I'm not talking obviously, if there's a thing like raw chicken, absolutely, you need to kind of like deal with that and to get rid of those potentially pathogenic microbes so microbes that may be harmful. But, if it's just to let an infant be dirty, to play in those dirt to kinda get those lovely microbes from the soil, if it's gonna be organic and pesticide-free soil, fabulous and to not necessarily use antibacterial products, to use just soap and not to...the babies don't need to be, I don't know, sterilized. And obviously if you have formula feeding or bottle feeding, you have to make sure you actually need to follow instructions, you need to sterilize the bottle. But outside of that, let babies be dirty.

So yes, there's lots of things, and that's what's exciting. It's okay. However, whatever happens with your birth, there's things you can do and that idea of things you can do is what I wish I'd known nine years ago. I wish I had the information because it's so empowering and so exciting that you can do something. Whatever happens in your birth, whatever happens with your...in terms of kind of the first hours after birth. If you have this information you can do something. You can make a difference to your child's lifelong health.

Katie: Absolutely, I think that's the most exciting part to me too that all is not lost even...because there are gonna be those times when even under the best circumstances a mom has to have a C-section, but there are things you can do. And you'll probably be happy to know at least over here in the US there is an underground movement among doulas and midwives to help get this information into moms' hands, and your DVD gets passed around a lot. But also there's an underground movement of doulas who are helping parents facilitate this swab seeding process even in the hospital when they know they're gonna have a C-section.

So personally, I have done this several times as a doula where a mom had seen your movie and even she though knew she was gonna have to have a C-section, wanted to make sure that she was gonna swab-seed correctly. So she would actually do things like the vaginal swab like you talked about. But a couple of moms even took it a step further, they would sleep with, like hospital type receiving blankets next to their skin where the baby was gonna go anyway, for like a couple of weeks before birth and bring those into the operating room and the husband would kinda switch out the blankets. Like they would put the baby on the mom's chest and then the first blankets that would go over it were already dirty with her seeded bacteria and then the dad would do the swab. If the doctor

was okay with it, they would do it in the operating room, and if not, they would wait till they were back in the room and the dad would just be like, “Oh hi, baby,” and be like swabbing the baby without the nurse really knowing. And so there’s definitely a swelling kind of grassroots movement of people who are starting to understand this and to make that choice themselves.

The irony is that the moms that I know who have asked their doctors about this, most doctors are fine with it. But most of them are also like, “But that’s so gross.” And it just makes me laugh because I’m like, “You see birth all day long, like how is that any more gross than normal birth,” which I think is beautiful and not gross at all. But that’s exactly what happens during birth and a baby doesn’t come out in a sterile environment. They come out covered in liquid and touching all mom’s microbes, and it’s wonderful.

And I love what you talked about getting dirty also because a previous guest on this podcast Jasmina Aganovic is a microbiologist, and she has a company called Mother Dirt and their focus is on the skin biome, mostly of adults but then how you can kind of rehabilitate your skin biome if you have used all these antibacterial products your whole life and sort of destroyed your normal balance. So they have basically a skin probiotic that you spray on your skin to help balance it out but it makes me wonder is there going to be...do you think ever like will we be able to study to the point of knowing what are the best microbes the baby needs and maybe finding ways to help a mom whom if she doesn’t have optimal gut bacteria to get her baby those microbes? Do you ever see that in the future?

Toni: I do see that in the future. I think we’re heading towards personalized medicine. And so, everything you said I think the...can we just get back to what you...I’m gonna come back to that...just about these doctors. So most doctors, a lot of doctors have started to become aware of the microbiome. But there is some resistance from some doctors who have their education, their training is that, yeah babies are supposed to be cleaned so immediately when a baby is born, that it’s really important for them to...this is how they’ve been taught that to wipe the baby down, to clean it off before the baby is introduced to mom, and to separate, to not have the baby have contact with the mom’s fecal matter. And to me, it’s just raising...we’re producing some educational material and having educational tools all about this and some online courses and things, just to kind of raise awareness that actually, that the fact that the mom is covered in vaginal juices and poop and everything else will probably spread from her abdomen and from her breast, her abdomen all across her thighs where the waters have gone, and it’s probably just a gooey, gunky mess during birth, brilliant, brilliant on.

So I love the idea of doulas...I don’t know, just being fully informed about this and practically taking blankets in and promoting dirt. And the thing with microbiome because everyone’s microbiome is unique. So it’s as unique as unique as our fingerprint. So we’ve been using this for our next film which is all about the microbiome so kind of what happens from birth onwards. And we’re releasing it in May. So we’ve been interviewing more scientists recently, and they’re talking about it’s really good for everyone to have their microbiome sequenced so that you know what you might be missing. If you have a microbiome sequence, so that means like to have a breakdown of all the bacterial species in your microbiome, your gut microbiome and your vagina microbiome and in your skin microbiome. So you know what’s there and then if you know what’s there and what you might be missing, then there is a possibility of introducing those missing microbes and that could come from diet or it could come from exposures or it could come from products.

So I think that within the next...I think that’s gonna be five years or ten years. I think personalized medicine based on your microbiome, I think it’s gonna be the best thing, and I can’t wait because

your last guest heard who was talking about flares if you have a topic disease or eczema, that could be because there was an imbalance in your microbiome. So it could be actually you just need to re-introduce microbes. I think it's so exciting and fascinating that our health is this intricate play of microbes and different kind of...your immune system, and you can change things. So you can change your health by changing your diet, changing your exposures and you can kind of, I don't know, just improve certain health conditions just by listening and knowing about your microbiome.

Katie: It's amazing, and there's another blogger named Mommyotamus. Her name's Heather, and she has an awesome post that I'll link to as well about basically exactly like you said, why you should let your baby play in dirt and how she actually did this on purpose and facilitated it in her house especially in the winter when babies weren't crawling around outside. She would bring in organic dirt that she knew was pesticide-free and let them play in it and how not only is that great for their microbiome, but it actually helps with things like them getting enough iron and zinc and their whole like mineral cascade as well. So I'll make sure to link to that but I think that it's so awesome that there's this well of information of trying to understand how we truly are more bacterial than human and how do we support that side.

Toni: I love the idea. I can just imagine instead of kind of them play in little playgrounds where you take your toddler, I can imagine local mud pits where you get kind of organic mud, and you just let your children play and be dirty.

Katie: Exactly, they're building a nature center close to our house, and I'm kind of in a group just trying to help that process happen, and one thing I keep pushing for is like we need a mud pit. Like a dirt pile for kids to play in, and it's really important. We need the dirt pile.

Toni: But there's also just this idea of...we've been looking for it for our next film but just all the kind of different things you can do for your microbiome. So things like gardening is really good because you are kind of putting your fingers in the dirt, and you're kinda...for one thing, if you're growing vegetables, great, but also your exposure to microbes. So yeah, not just playgrounds where kids grow stuff and get dirty so have your mud pit, but next to it, have some seeds for kids to grow and to, I don't know, turn into mini-gardeners.

Katie: Yeah, absolutely. So to circle back on that, so I wanna follow up on one thing you said. When babies are born, they are covered in this waxy substance which you mentioned a lot of doctors come from a perspective that you should clean baby off immediately. But at least in the midwifery community that I'm involved with, there is definitely a movement to you wanna leave that on as long as possible and actually, they recommend delaying the first bath for as long as possible because they're find that substance has not only a protective effect, but we think it interacts with the microbiome in protecting it and also nourishing the skin. So do you kind of come from that perspective as well that you should protect that as like a protective covering on the baby?

Toni: There's been very little research into the microbiome of vernix. They're searching something new such an evolving field, but it's been very little. So at the moment, it's only theories about how the microbial benefits of vernix I think because it's sticky the microbes will stick to it. That's obvious. But it could be, that actually, it's supposed to be there because it's sticky and waxy so microbes sticking on your mother's skin microbes will be stuck to it and so to be left there. So for your vernix to be left on the baby's skin for as long as possible because if that is absorbing microbes from the air and from contact with the mother and from the home and from the blanket so whatever else, that could be

really beneficial for the skin. So yeah, absolutely up until now the normal tradition is to wipe the baby off, get the baby clean and to bath the baby very quickly.

But actually, I have seen anecdotal evidence where midwives say that it's just really good for the baby's skin. And actually, I can see that. I can see it because if it's attracting microbes from contact or from the air or anything else, probably that's really good to kind of balance the baby's skin. I'm saying probably. It needs research to back this up. But yes, I haven't seen any research about the harm of leaving vernix on to just let it...so yeah, absolutely. It's just this whole thing of we just need to be dirtier from birth and not to be afraid of it and to reconnect with what we are supposed to be.

If you think about kind of our evolution, we haven't evolved as humans to give birth in operating theatres. So operating theatres weren't around however many years, 500 years ago, 1000 years ago. So we've evolved to give birth in our local communities, in our local houses, in our local, I don't know, birth hatch however long ago. And we're supposed to be dirty. And yes, absolutely, if it's a kind of life-death situation, and this is for me, antibiotics are lifesaving fantastic that we have them when necessary. Caesareans are absolutely brilliant because they are life-saving when necessary, and there are so many circumstances where caesareans are needed. So yes, embrace the C-section, but also, embrace the dirt too.

Katie: Exactly, yeah 100% what you said, like my son and I are both alive today because of a C-section, and like you, I respect the medical profession so much, and I think these things are truly important. But also the flipside of that is only when necessary. And I think that's why your work is so amazing because you are helping to give women the information to make their choice and to understand all of the aspects of that choice. So I have kind of a list of questions from readers that I get often when I talk about anything to do with birth or pregnancy. So I'd love to get your take on those and then how they relate to the microbiome. And the first one is, what about when a mother has Group B Strep, and she's Group B Strep positive because in the United States the normal course of treatment is for her to get antibiotics in labor. I think that might actually be a little different where you are but how does that interfere with the microbiome and what are kind of the risk and benefit's there?

Toni: Ok, so, when we do Q&A's for our film and we're doing publicity for our book, we are always asked six questions. I'll see if I can name the six questions. So we're always asked about Group B Strep, swab seeding. What else are we asked about. We're always asked about babies born in the cold, so babies kind of covered in the amniotic sac. Anyway, a Group B Strep is potentially a really dangerous condition. So Group B Strep is a naturally occurring microorganism and probably in the UK, about 22% of women test positive for Group B Strep. And in the UK which is different from America and that's where we have a risk-based system so that if you have certain risk factors, say for example your waters go, you have a high temperature and you've had previous Group B Strep, then you will be tested for Group B Strep and then prescribed antibiotic during birth. In America, everyone gets tested for Group B Strep and if you test positive, you get prescribed antibiotics during the birth process.

And Group B Strep is potentially a fatal disease. So it's a naturally occurring microorganism and a small percentage of babies will get a Group B Strep infection following birth. And a small percentage of those babies will have a serious infection, and a small percentage of that small percentage of babies might die. So potentially, it's a very, very serious condition. So it needs to be kind of considered strongly. That said, taking antibiotics as I said earlier, can have a devastating impact on a baby's microbiome because if a mother takes the antibiotics during the birth process, then it's like an atomic bomb going off in their bacterial ecosystem. It kills off all these species of bacteria, and the

bacteria species that survive including the Group B Strep...and the bacterial species that survive are kind of antibiotic-resistant ones. Which basically means that you're getting rid of, say, 95% or 97% of bacteria and leaving only 2% or 3% of bacteria, and they are the ones that flourish and kind of blossom very, very quickly.

So it does work. So taking antibiotics during the birth process does work. It does kill the Group B Strep and it can save the baby's life. However, it's not just the mother's microbiome is impacted. Her breast milk, her breast milk microbiome, so the microbes in her breast milk will be impacted, and her skin microbiome will be impacted by those antibiotics because you are killing all those bacteria within the skin. And if the baby is given antibiotics as a precaution to develop Group B Strep, the baby's microbiome in that chronic critical first few hours, days, weeks even, they are gonna be impacted by the antibiotics. That being said, Group B Strep is a really, really risky condition. So it has no right or wrong answer. There's no black and white answer.

There's some people who would say, what you can do if a mother tests positive for Group B Strep is the baby is born and the baby is closely monitored by the mother or medical professionals to see if there is any sign of infection. So not to take antibiotics but to monitor that baby. But that comes with a risk too because that baby is gonna be really, really closely monitored. Because if that baby gets a Group B Strep infection and that infection takes hold very quickly and that baby has a very high temperature, if the mother isn't quick enough or the healthcare professionals aren't quick enough to spot that baby, that could escalate really, really seriously. And yes, the baby could die. So it's difficult. So there's no right or wrong answer.

Last year, we interviewed scientists who were working on other possible Group B Strep measures just for this problem. So antibiotics are kind of like too strong and not giving antibiotics is too risky. There must be a middle ground, and they're working on this middle ground. But it's not ready yet, and it could be two or three years before it's ready. So in the meantime, it's just for parents to read up and do their research and to look at alternatives. I have seen terrible things, terrible things suggested. They are not evidence based. So things like inserting a garlic clove into your vagina as a potential...this would treat Group B Strep. I haven't seen any research suggesting that a garlic clove inserted into the vagina will do anything about Group B Strep. And it's difficult. I don't even know if that would work. That is really risky. So yes, it's tricky, it's tricky.

Katie: Well, I hope those researchers are...that their work is quick and effective to figure out some alternatives because I think this is one of those big questions that right now at least there doesn't seem to be a great answer to other than...I know I've personally always tried to do things that are gonna hopefully give me the best chance of not testing positive in the first place for Group B Strep, but I do find it really interesting that, at least the last time I looked at the actual data, the US and the UK have very similar actual rates of babies who have a serious complication or who die from Group B Strep. And you said you guys use a risk based approach and not every mom gets tested and not every mom who's positive gets antibiotics. Whereas here, everybody is tested and if you get a positive you get antibiotics, period. So I think that is also that we can probably learn a lot from looking at other countries and other medical systems and how they evaluate as well and then hopefully within maybe five or ten years, there is a more comprehensive holistic approach that maybe doesn't require antibiotics for everybody who may be at risk and just those who truly need it.

Toni: I think you're absolutely right. I think once we raise the awareness of the microbiome, having your microbiome sequence when you're pregnant. I think that could...if you have it and you know what...okay, say if Group B Strep is present but actually what levels of present are and what else is

there and can it be interrupted, I think that's what's gonna help. So at the moment, we have these pieces of the puzzle, and we don't have all the pieces of the puzzle. So we have the pictures forming but there's missing pieces, and one of the missing pieces is Group B Strep. And yeah, within I hope, about ten years or even shorter, I'm hoping two or three years. But yeah, it may be five to ten years.

Katie: Yeah, I definitely hope so as well. So another question I get a lot is from like a birth perspective. Are there differences where a water birth versus what they call a dry birth, which I think is funny because there is no birth that is truly "dry," but is there a difference from a bacterial standpoint?

Toni: So that's one of the six questions I always get asked. So yes. Water birth. I filmed some beautiful, amazing, fantastic water births. Oh my god. The mothers just look so at peace within the water. But there's been this research. There's been very, very little research into the impact of water birth on the transfer of microbes from the mother to the baby. So I don't know. Scientists don't know what might be the impact. I mean it might be that some of the microbes are washed away in the vagina. Some of the microbes are, I don't know, filtered, you know, just diluted, put it that way.

I do have concerns, questions myself in that a lot of birth pools are treated. They have the standard cleaning is using chlorine-based products, and chlorine is like an antibiotic. It's just, it kills bacteria. So if you are giving birth in a birth pool which is being very heavily treated with very heavy chlorine products, there could be traces of chlorine in the birth pool. A lot of public health systems here in the UK use chlorinated water. So effectively your tap water, if your pool is filled with tap water and it's a chlorinated tap water within your bath pool, that could impact. There's been no research on this. I'm saying this from all the interviews with scientists we've done for our book and for our film. A water birth in a pool which may be contaminated by chlorine products could be tricky. So I don't know is the answer.

Katie: Yeah, that's interesting. And I think it makes a lot of sense what you just said, and I'm curious about the research long-term on that because actually my most recent birth was my only water birth, but I had a baby who was breech, and it at least allowed me to be able to birth her naturally. And she did great, had zero complications. But that was in my own bathroom in my bathtub that is not cleaned with chlorine and then we have non-chlorinated water, and I had a lot of control over the environment which wouldn't necessarily be true like you said in a hospital or a place like that. But that actually brings me to my next kind of item on the list which is from a bacterial perspective, what about the difference between homebirth versus hospital birth for bacterial exposure? And obviously there's a lot of other factors besides bacterial exposure as far as safety and quality of care and all that. But just from a bacterial perspective, do we know anything about the difference there?

Toni: Okay, so there's been quite good research about the benefits of homebirth on the microbiome. So if your baby is born within the home environment, the baby is gonna be exposed to the mother's vaginal and fecal microbes, would have been exposed to the kind of microbes within the home, if there's a pet within the home, then all the kind of microbes associated with your pet. The longer you live with somebody, you take on their microbes. They all become part of your microbiome. So there's been some really good research about the kind of microbial benefit of homebirths.

If you give birth in a hospital, then there are likely to be within at least the air environment and the things you touch, microbes within the hospital that are not necessarily beneficial for the baby. So bacterial species like clostridium or, I don't know, C. diff or you know those nasty pathogens which you hear about. Well, I'm not saying the...you know, if you're born in hospital, clearly not every baby

is gonna get ill or die, but it's just those microbes are there in the environment. It's one of those choice things, so yes. Microbially speaking, a home birth can be really beneficial for the baby. But at the same time hospital birth could be a really good microbial exposures if you're aware of it and kind of you know, wrapping the baby with clothes or garments brought from home. But it's just being...stop throwing into the mix that the hospitals are places where maybe pathogens also exists. But more research, more time more research, we'll have more definite answers. So yes, I would say there is research indicating it does make a difference.

Katie: Yeah, it's so interesting, and since you brought it up, I'm gonna ask you, what about babies who are born in the amniotic sac or in caul as they say? What is the microbial difference there? Or do we have any idea, because that's so rare?

Toni: Again, there's been so, so little research because babies born still within the amniotic sac is such a rare occurrence. You don't know who's gonna be born still in the amniotic sac. So the amniotic sac will either be partial, so just covering the face and head or be whole, so the whole babies. Sometimes, you see these photos on Facebook of kind of babies still born in the caul, in the amniotic sac, beautiful. Okay, but the baby is likely to receive a small amount of exposures within the amniotic waters within the amniotic sac so a small exposure, a pre-natal exposure, so a pre-birth exposure.

As soon as the amniotic sac is opened, that's the main seeding event, it would be with the vaginal birth. So if the sac is opened and it's on the mother's...the baby's on the abdomen, and the mother is coated in their vaginal juices and poop and just kind of you know, microbes of vagina, and it's all kind of smothered all over. And that's beautiful kind of organic gloopy mess. And the sac is opened in that environment, you can absolutely see the baby would still be exposed to some of those microbes because the sac is being opened in that environment and especially if the baby then goes on skin to skin. And so if the mother has got that gorgeous microbes on their skin, the baby is gonna be licking and nuzzling and sucking up.

However, if you can imagine if the baby...if the amniotic sac is ruptured and it's away from the mother, maybe on a towel on the other side of the mother so not in direct contact, you can see that those first exposures, and particularly if the mother doesn't have skin to skin straight away and the baby is like tied up and the umbilical cord is cut and off the baby goes and this is tagged and weighed and everything else and doesn't see the mother for ten minutes, and then it could be that the baby is swaddled and there's no skin to skin, then there probably is a difference in the microbial exposures. It's difficult to say for certain because there's been no research on this. So very, very few studies, but I haven't seen a single study on this. So maybe there has been some study that I haven't seen. But they're all these questions I just would love more research and more money pumped into this whole area because it's fascinating and potentially very exciting.

Katie: Yeah, especially when you talk about the long term effects and how it may actually impact, like you said obesity later in life or risk of diabetes or a risk of all these other problems that we're just starting to understand including potentially a lot of autoimmune diseases that we are just really learning about.

Hey, guys. I wanna pause this episode for just a minute to again thank the sponsor for this episode it makes it possible [perfectsupplements.com](https://www.perfectsupplements.com). They make these amazing natural nutrient-dense super foods made in the USA and incredibly reasonably priced. They are recent additions to our diet, and I'm finding that every product of theirs I love that I've tried. A favorite in our house right now especially

among my husband who does not like liver no matter how I cook it, no matter what I do, is their perfect desiccated liver supplement, which is a capsule.

So if you have listened for long, you know that I use organ meats at our home a lot, and I consider it nature's multivitamin if it's from a really good source. If you have a hard time with the taste of liver, like my husband does, you may want to try their desiccated liver capsules. Other products of theirs we've been using recently are collagen, their greens, powders and even fermented kale because I will admit I don't actually love kale. It's just one of those greens I don't love and so it's made it possible to get it in our diet.

But back to their liver. It's made from 100% grass-fed cattle and nothing else. Their liver is packed with vitamin A, B12 and iron, and this is the same product that has been recommended by Tim Ferriss and Dave Asprey, and I finally broke down and tried it, and I love it and I can see why they recommend it. So I actually found especially with pregnancy and nursing that liver capsules like theirs can really help with energy levels and help mental clarity, which of course all moms need.

So I wanted you guys to be able to try it and love it as much as I have. And they've offered an amazing discount. So you can get 10% off of any order by going to perfectsupplements.com/wellnessmama and using the coupon code, `wellnessmama10`. But the best part, if you're from a big family or even if you only have a couple of kids, you can order in bulk and get even bigger discounts. So they offer 25% off if you order three bottles of their supplements and 30% off if you order six bottles. So if you combine this with the coupon code `wellnessmama10`, you are saving 35% and 40%. And you can mix and match these to get a volume discount. Great way to get discount on their prices and some of the best prices I have found on these supplements especially USA made high quality ones, so just go to perfectsupplements.com/wellnessmama to get all the details.

Also, many special thanks to Pregnancy Exercise for sponsoring this episode. You've got to check this out if you're a pregnant mom or recently pregnant and looking to get back in shape. Their flagship product called No More Mommy Tummy does just that, helping women tone their core and pelvic floor muscles post-pregnancy. They have online programs that help women to have a healthy and pain-free pregnancy, to prevent diastasis and pelvic floor muscle dysfunction and to get back in shape and to kind of remedy those problems post-pregnancy.

The founder, Lorraine Scapens, is an amazing wealth of information on all things exercise and wellness especially related to pregnancy, and her website has a ton of great information for all of the questions you may have about safe exercise during pregnancy, when you can and can't do things and how to get back in shape after pregnancy. They have some great programs that I've been checking out. They have one for post-pregnancy. They have one, like I mentioned called the No More Mommy Tummy Challenge, that is a No-Crunch Core Challenge and one which I wish I had known about in pregnancy which is one for turning your baby if your baby is in a non-optimal position for delivery.

If you want to check them out, make sure to go to pregnancyexercise.co.nz/wellnessmama and use the coupon code, `wellnessmama` as well for 10% off of all of their programs. Another fun fact about this, they're based in New Zealand as you may have guessed by the `.co.nz`, and she's such a joy to listen to. Her courses are really well made and really well explained and if you are like me and have a baby plus maybe some other kids, it's really hard to escape and go for a run or go to the gym and her programs can be done from home while your baby naps. Definitely check it out that's pregnancyexercise.co.nz/wellnessmama. Use the coupon code `wellnessmama` for 10% off. And now,

back to the episode.

Katie: Another question I know a lot of readers and listeners will probably have is, with the swab seeding. If someone is listening and they wanna try that, any tips for getting a doctor or a medical professional on board with that. Unfortunately, I haven't figured out a way to make the most of them watch Microbirth yet, so until that happens, any ideas of ways to get them onboard?

Toni: Okay, so we're releasing a book. So "Your Baby's Microbiome" coming out in February, and so give your obstetrician a copy of the book or a copy of the film. We do some online courses. So again we're trying to kind of raise awareness of this. We do also kind of like some educational training modules ourselves. For me, some doulas and lactation consultants and midwives are all starting to kind of get this. And I think it's going to be a little while before all doctors get this, but it's coming. It might take a little while, but it's coming. If our film, if other people's films, if other people's magazine articles, I think it's just kind of raising awareness. And that this, I'm not making this up. This is based on hundreds and hundreds of studies particularly in the last two or three years that all come out, all pointing in the same direction. And I can say, we don't have all the answers and there are some missing pieces of the jigsaw, but there's so much research coming out that it's like just tide. It's kind of rising tide that is happening, and the sooner you can understand it, the sooner you get on board with it, the more change we can make.

Katie: Yeah, absolutely. One thing I always encourage as a doula is when a mom wants to do the swab seeding and she has plans for that and to bring her own blankets, and sometimes she'll go like, "Well, how should I ask my doctor and what if he doesn't let me?" I always say, "Well, just remember that at the end of the day, this is your baby. And you get to make the choices, and even if you choose not to do this and like be very outspoken about it in front of your doctor, if you decide to swab your baby down and to bring blankets from home, that's absolutely your choice. And you don't have to get a doctor or anyone else's permission for what you wrap your baby in."

And I always try to encourage moms that even if you don't necessarily have a doctor on board, there are things you can do outside of that that still can help your baby's microbiome. And obviously like you said, breastfeeding is something that also we know is super helpful and just making sure baby is in a good bacterial environment when they do come home and exposing them to the normal microbes that they would experience in your home.

And I think that's what I love the most about your work is it's not just about how bad things are, but you do really give people hope and practical steps for what they can do and I would love to kind of end...I wanna end talking about your book. But before we get to that, can you kind of walk us through if a mom is going to have a hospital birth either a C-section or just a natural birth in a hospital, what would be the optimal steps that she can do from what we know that would help give that baby a good chance of having good microbiome seeding?

Toni: Okay, so first off, for the mom to be fully informed to kind of educate herself... And yeah, absolutely. Yeah, fine. Buy our book, read our book, watch our film, read up on the internet. So kinda first step is to be aware, to raise awareness and to... So even before the mom gets into hospital to write their microbial birth plan, to start getting together kind of like things from home to you know, some clothes from home that kind of have been exposed to the mom or the dad, blankets from home. So as soon as you kind of enter hospital, to be aware that you have a right to informed choice. Anything happens, it is your body, your birth and you need to be...some legal is informed consent but actually it's kind of...so I'm gonna go off on a tangent.

One phrase that really annoys me is that when I hear mothers say, “I wasn’t allowed to do that.” And it’s kind of what you said. It’s actually who’s doing the allowing? You should be allowing doctors, so not for doctors to allow you to do something. You should be allowing doctors, your birth, your decisions. What you do, within that kind of those next few hours, next few days and weeks. That’s you. That’s you kind of being empowered to...and being supported in those choices.

Okay, so what else can you do? So when you walk into a hospital, ideally, you would try if possible to have a vaginal birth where possible, and I know in some situations it’s not possible. But where possible, ideally if it’s all possible any intervention, so a use of synthetic oxytocin or epidurals even, they could impact the baby’s microbiome and other body functions. There hasn’t been enough research on this, so we don’t know. We don’t know what effect it might have. So anything from artificially breaking the waters, induction, use of synthetic oxytocin, epidurals, even kind of like ventouse or forceps, all of those could impact the birth process as in it could interfere with the epigenetics, or it could in fact interfere with the kind of main seeding event that happens during the birth process.

So I’m not saying that you shouldn’t do this. It’s just kind of be aware of that anything that happens that is outside of true natural birth could have implications. We don’t know yet. There hasn’t been enough research. So they could have implications. So it’s to moderate use of anything you do. And in terms of C-section, if you are gonna have an elective C-section, I would think to look into the research about swab seeding or do immediate skin to skin in the operating theatre. And I would do exclusive breastfeeding. In terms of the mom’s kind of bringing in clothing or blankets from the home, absolutely when the baby is born.

During pregnancy, I’d look in the mom’s diet and just make sure that she’s eating lots of fresh vegetables and fermented foods. And then so after the baby is born so immediate skin to skin contact and support where possible for exclusive breastfeeding. And I’m saying exclusive breastfeeding, and I know it’s really hard, and I know some people might not choose to breastfeed, and some people can’t breastfeed. And I just believe in freedom from choice but also full support for every woman who wants to breastfeed, who wants to try to breastfeed because by exclusively breastfeeding, you’re introducing all the microbes and the unique components and the human oligosaccharides and everything else that the baby needs. And this is like a living, breathing food that you’re supplying to the baby. And those components are not currently found in formula food. And by not exclusively breastfeeding, there could be...scientists are looking into this, but that could alter the kind of the seeding and feeding process.

These intrinsic exquisitely designed microscopic processes that we’ve evolved to be like that over the last thousands of millions of years. So if you interfere with any of that process, that could have health ramifications later in life. So that’s what I’d say, it’s just vaginal birth. If we’re forced to boil it down and say vaginal birth where possible. Skin to skin, beautiful, lovely skin to skin and all those gloopy juices of vaginal birth and exclusive breastfeed, support for exclusive breastfeeding for as long as possible. And then just lots of beautiful one to one time. I mean this is where it gets tricky because microscopically, you want to kind of limit, within your family unit. You want to limit the exposure the baby receives just within that kind of first day or two or the first week because they’re kind of supposed to be the mother and the father, and there’s supposed to be those kind of microbes. So the least handling if possible. I know it’s hard because your relatives come around, want to hold your baby or even the neighbor comes round or someone friend of a friend wants to hold your baby. And yeah, it’s kind of getting a balance really.

Katie: Yeah, and how wonderful that, at least from my experience, you have such a strong instinct in those first few days to just hold your baby and kiss your baby and touch your baby's face and all those things that can support that bacterial transfer in those first couple of really important days. So your new book is "Your Baby's Microbiome: The Critical Role in Vaginal Birth and Breastfeeding for Lifelong Health," and I'm so excited about this book. Can you talk a little bit about the book and how it compliments the film and what readers can expect from the book?

Toni: So our film, with any film you paint in broad brush strokes. So you don't have time to go into the kind of minutiae and the detail of all the things. So the film kind of covers the whole process, just about the microbiome and what happens during birth. But in kind of broad brush strokes, you paint the picture. So the book is all about going on to everything in much more detail and to talk about what happens with GBS, with the water birth, what happens with babies born in the cold, to talk about swab seeding, to talk about what foods during pregnancy, to talk about breastfeeding and to have support for breastfeeding and also the kind of consequences, the lifelong consequences that are being linked to C-section so an increased risk of celiac, asthma, obesity and Type 1 diabetes.

But the most important thing is to kind of give parents the information so they can make the informed choices and to say what you can do because that is what is exciting. It's like if you know this stuff, if you kind of read about it if you watch the film or you read articles or blog posts or your blog posts, Katie, it's kind of, okay, if you've got that information, then you can act on it. And if you can take actions during those first critical first few...last weeks of pregnancy and during the birth and the early infancy process. If you can kind of get the best possible microbial exposures to your baby during that process, then that could have a lifelong impact for your baby's health. Not just that, because of the kind of trans-generational impact, you could actually impact because the microbiome of your baby is passed on to their own baby and to their grandchildren and their great-grandchildren if they will have vaginal birth because it's kind of trans-generational then you could effectively be impacting your great-grandchild's health by what you do during the birth process.

So it's exciting. That's what we want you to do with the book is to give people a roadmap of what they can do, and it's exciting because you can make choices and what you do during those first thousand and one days, they matter. They matter for your baby's health. They matter for your child's child's health, and they could potentially have matter for our future generations.

Katie: It's really incredible especially when you explain all those different aspects. And I definitely want to go in the record to say that I think that "Microbirth" should be required watching for any pregnant parents and that your books should be required reading because you're the best resource I've seen on this, and I think this is critically important for parents to understand so that they, like you said, can make their choices and hopefully make ones that will help support their babies' microbiome. Do you have any thoughts on what's next for books or documentaries or what you see as the future in this field?

Toni: We're releasing our next film in 2017. So be May-June 2017, and we're looking at what happens from birth onwards and how your microbiome and how protecting and maintaining your microbiome can influence human health. So we're looking at, again what you can do to live a more microbiome-friendly life and how that can impact your brain, impact your health, impact kind of, I don't know, your sense of wellness by living for your microbes.

Katie: That's wonderful. I'll make sure to link to everything in the show notes, but I also encourage

moms to just find...if you're not finding it through my links just find the movie "Microbirth" and find the book, "Your Baby's Microbiome" and keep an eye for your next documentary because like I said, I think this is critically important information that all parents really, really need. And Toni, I've taken so much of your time, but I'm so, so grateful for you being here and explaining all this and for all the work that you do to help parents understand this really important research.

Toni: Also, I'm so honored to be part of your show because I'm a huge fan but more than that, thank you for giving me the opportunity to talk about this because I was really passionate about this. Anybody listening to this, I want you to go and tell your friends just to start looking about the microbiome because it is revolutionary, and it's so exciting what you can do in your own just simple things. I started fermenting. I started making my own sauerkraut and my own kefir, and it's like so easy, and it's like, "Gosh, let's just do it." Let's just kind of revolutionize everybody, and yeah. So they'll be healthy and be happy and give birth and, I want to say, better. But just give your child the best possible start in life whilst embracing medicine and embracing the benefits of fantastic kind of new advances in science.

Katie: I love it, thank you so much, Toni. And I will have links to everything we talked about and to your book and your movie in the show notes like I said and maybe we can do a round two of this in the next documentary or in the future for any follow-up questions readers have. And like I said again, thank you so much for your time and being here and for all your work in this area.

Toni: Oh, thank you, thank you, thank you, thank you, and I'm sending it right back to you. I'm sending you much love back.

Katie: Awesome, thank you and thank all of you for listening and I will see you next time on The Healthy Moms podcast.

Thank you so much for listening to this episode of The Healthy Moms podcast. Did you know that you can become a Wellness Mama VIP member for free? Just go to wellnessmama.com/podcast to subscribe to the podcast and then click Free Membership to gain access to a membership library of health and wellness resources. You'll get the latest from Wellness Mama each week as well as special discounts and offers. Also, find Wellness Mama on social media to stay updated with the latest podcast episodes, blog posts and more. Thanks again for listening. I'll see you next week.