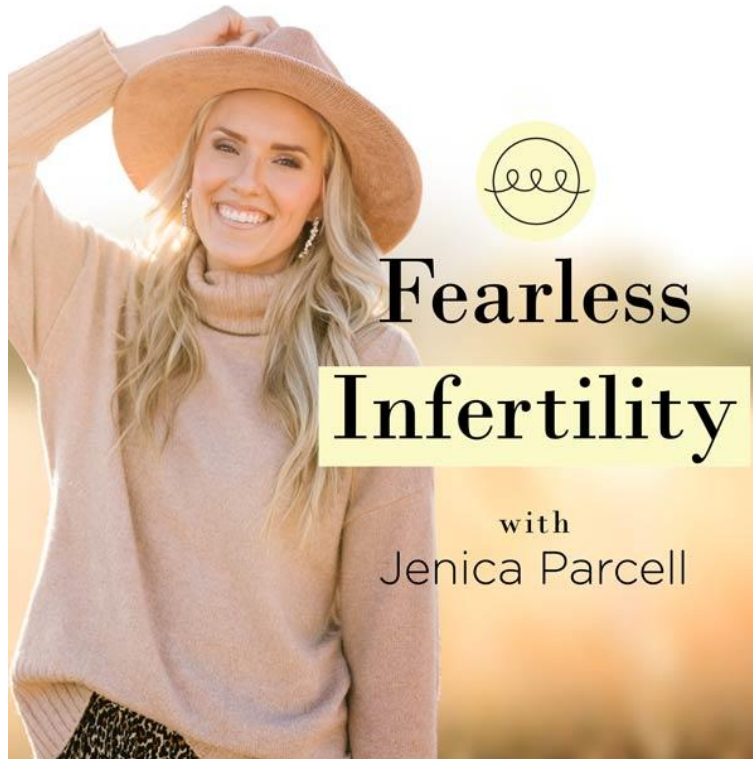


37. The Wizard Behind the Curtain in IVF: Embryologist Shaun Reed



Full Episode Transcript

With Your Host

Jenica Parcell

[Fearless Infertility](#) with Jenica Parcell

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Hi, friends. Welcome to *Fearless Infertility*, a podcast for women struggling with the mental anguish that comes with infertility. My name is Jenica and after suffering in silence for too long I was able to pull myself out of the dark, take control over my mind, and create joy during my infertility experience. I'm here to help you do the same, sister. Let's dive into today's show.

Welcome back to *Fearless Infertility*. I am so excited for you right now because you get to listen to this awesome podcast episode with Shaun Reed. He is one of the embryologists at the Utah Fertility Center, which is where I go for my fertility treatments. He is, A, so cool. B, his job is awesome.

He is so dedicated, so smart, and amazing because he makes embryos and in turn allows those of us who cannot do so on our own the opportunity to have a family. We are able to talk about and answer all of your questions in today's episode about his job, about embryos, and about IVF. So stay tuned.

Hey guys, I'm sitting here in my office, the sun just peeked over the mountain. It has been the best fall here in Utah. I feel like we normally have a week of fall then it goes into winter. And I'm like, "Why do I live here again?"

I honestly love Utah, but it can get a little bit draining living here when it's just literally freezing for six months out of the year. And we've had the most beautiful fall ever. I've been so incredibly grateful. And I just feel great about life right now.

I wanted to start off today's podcast with you in reading a review on Apple Podcasts. And as a repeat, like I always say, if you are new here the reason why I love encouraging you to leave reviews on Apple Podcast is because it helps those women who are experiencing infertility alone and

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have absolutely no idea who I am or about this community, it helps them to be able to find the podcast much more easily.

And so every week I give away a pair of pajamas and socks to one of you who leaves a review. And the winner of today is Rachel Brunn. She says, "Just what I needed in my life at this very moment. Everyone needs a little bit of Jenica in their lives and to know more about infertility. I have struggled mentally for a while now and two years into trying for a baby has not been easy.

Going into IVF this podcast has been absolutely valuable, and has information that I really needed to hear. I have been bitter, angry and sad for too long. I decided after listening to these episodes that I needed to channel my negative thoughts and energy into something positive and good. Thank you and your interviewers for sharing your thoughts and stories with us."

Please email me, Rachel, at hello@thesliceofsun.com with your address and your size and I'll get that sent out to you. And thank you so much for leaving your review.

This month is November and in the Fearless Infertility program we're talking about self-care in a different way than I feel like a lot of people have viewed it in the past. So make sure if you're a part of the program to log in and watch the workshop. We will be working on that together this month and it's honestly such a helpful different perspective than I've ever viewed it as before.

And the doors are currently closed, I'm sorry for those of you who are not in it yet. They will reopen the last week of the month and we'll start working together the first week of December for December's workshop. So make sure to keep your eye open for that.

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And if you are interested, I'm also starting a Morning Mindset Magic Challenge, which are the seven things that I do every single morning without fail even when I don't want to because they help me to get in the best mindset possible.

And we will be starting that so go to fearlessinfertility.com, you can get the free download and follow along on Instagram, @Jenicaparcels, and we will check in with each other every day and make sure we are staying accountable to one another. And then I will email you when doors open for December's workshop in the Fearless Infertility Program. I'm so excited to get to know you guys better.

And let's get into today's podcast episode with Shaun, it is so interesting. I feel like it's like one of those situations where I'm like I'm jealous of you that you're listening to this for the first time because your mind is about to be blown. It's so awesome, like what a cool job. So let's get into it today with Shaun.

Jenica: All right, welcome back to *Fearless Infertility* everyone. I'm so excited to have Shaun Reed here on the podcast today. And Shaun is one of the embryologists at the Utah Fertility Center where I go for my fertility treatments. And we've known each other for a few years, I slightly stalked him a little bit because he went to the same gym that I went to. And I was like, "Hey, can I have your number?" And then I texted him like a year later and here he is on the podcast. So stalking does work, just be careful people.

Anyway, so excited to have you here today. Thank you so much for being here, Shaun.

Shaun: Of course, thanks for having me.

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Jenica: Okay, so Shaun's job is so interesting, embryologist, not many people can say that they make babies for a living. And I know so many of you were interested in hearing about his job, and about his take on things, and just about his vast experience in creating embryos that end up creating our babies. So I'm going to go through these questions that many of you submitted through Instagram.

If you guys are not following on Instagram yet, well, I'm going to be changing— I guess by the time this podcast is out the Instagram handle will be @Fearless.infertility. And if you guys have any follow up questions for Shaun, his Instagram account, we were just laughing about, is @Shaun.bob. S-H-A-U-N is how you spell his name. And he's so funny, and I just discovered your Instagram the other day. I was so delighted.

Okay, so we'll just kind of get into it. Okay, so the first question I want to ask you today, Shaun, is how did you get into your profession?

Shaun: Yeah, that's a common question that people ask me. My story is similar to a lot of embryologists, you kind of fall into it. It is changing now that it's becoming more prevalent and people are more aware of the profession. But it's still pretty obscure, and random.

So I graduated high school. Go me, I didn't take high school serious.

Jenica: He graduated, people. Congratulations.

Shaun: Yes. I went, obviously, but coming out of high school I just didn't have an idea of what I wanted to do. You know, you're a kid when you graduate high school, you don't know anything about anything. I didn't know how to study yet, I didn't know how to learn.

Jenica: The fact that we all made it, I'm impressed with all of us, honestly. A pat on the back for all of us.

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Shaun: Yeah, right? Yeah, so everyone goes to college so I said, “All right, I’ll go to college and try and figure it out.” And I did, I did take college seriously. I wanted to figure out what my passion was. I knew I was a passionate person and I needed to find my thing that I love doing, otherwise I wouldn’t be happy.

I did take a health class in high school and the teacher, I remember she said, “Hey, the health field is a stable career because there will always be need for healthcare.” So I thought, “Okay, maybe I’ll go be a doctor, that’s a good job and it’s secure.” So, I picked my major of human biology because to go to medical school you need all these prerequisites. So a lot of them will do the science degrees, because then you get your prerequisites out of the way.

So I picked human biology and I shadowed these two physicians for about a year and a half just to see, hey, is this what I want to do? One was an ER doctor, one was a family physician.

Jenica: Wow, that’s amazing. So did you just do this on your own? Or did the curriculum recommend doing that?

Shaun: No, yeah, I just did it on my own.

Jenica: That’s awesome.

Shaun: Yeah, because how are you supposed to know?

Jenica: Well, yeah, but I didn’t think to do that when I was that age because I’m like, “I don’t what I’m doing.” But it’s so true because, really— And it’s interesting because luckily a lot of the classes I took in college have lended themselves really well to what I do now. A lot of writing, I wrote for the newspaper. Public relations is what I ended up graduating in.

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But I mean, honestly, big pat on the back. A big pat on the back for everyone, but an extra big pat for you because that's incredible.

Shaun: Thanks. Yeah, and I'm glad I did because it made me realize I did not want to be a doctor.

Jenica: Yeah. And it's so awesome too because, I mean, you could have gone to school and that could have been a lot of wasted time.

Shaun: Yeah, exactly. So yeah, I was starting to get higher up in my science classes, and I'd been shadowing these physicians, and that's when I realized, hey, I don't think being a doctor is what I want to do. I don't want to go to that much school to do this.

But because I was higher up in my science classes, I started to learn like, hey, I actually really like science. And I like the microscopic world of it, the nitty gritty. And what really made me switch was when I took virology, so the study of viruses.

Viruses are awesome, they're super interesting. I mean, they also suck, obviously, the world is terrible right now because of a virus. But they're fascinating.

And so I made the switch where, hey, I want to go into science. I thought I wanted to go into research. And so coming out of my undergrad, I graduated with a Bachelor of Science in Human Biology, minor in Chemistry. I don't know how I got that minor in chemistry because chemistry is really hard, but I got it.

And then I still didn't know exactly what I wanted to do. I was thinking virology research, but I was still trying to figure it out and I came across the field of IVF, invitro fertilization. Obviously, I'd kind of heard of it but didn't really know what all was involved.

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I took a closer look at it and I was like, “Hey, maybe this is something I'd be interested in.” Then I got my foot in the door at Utah Fertility Center about eight years ago and I learned that's what I love doing. I started out as an andrologist doing semen analyses, IUI preps, IVF preps. Did that for about six months and then transitioned into embryology.

And that's the common route that embryologist will go. They start out in andrology so that the lab can kind of feel you out, see if you've got good technique, if you can handle the kind of the high pressure and being focused. And then they'll train you. It's just, it's on the job training, that's what you need to become an embryologist.

Jenica: Interesting. Wow, that's so fascinating. So the first time I went to Utah Fertility Center, I believe, was like seven years ago. Six or seven years ago. I feel like I should know this. It's been a while, it's been a little minute. But it's interesting because luckily, I started going right after you started working there ish. So it's just crazy.

And anyway, yeah, anyway, that's kind of like not really relevant. But it's just kind of cool. And you've been there ever since, right?

Shaun: Yes, I did go on and I got a master's also in embryology and andrology.

Jenica: Wow, that's so cool. Oh my gosh. Okay, so we're going to go in and ask you all these questions because truly this job profession, I never had even thought that it was a thing. Like you said, it wasn't really something that was on my radar, and probably because infertility at all wasn't on my radar. And so it's just fascinating. And I'm sure it's rewarding. We'll go into that question in a little bit about what's rewarding in it for you.

But we'll start here with some specific questions about your job and creating embryos. And also with your job, is that what you do? Would you say in general that's what you do mostly, is create embryos?

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Shaun: Yep. There's a couple different steps to IVF. So each day I'm involved in multiple of those different steps, if not all of them throughout the day.

Jenica: Okay. Wow. Okay, so the first question is, what impacts fertilization count? And I guess for those who don't understand IVF a lot and don't understand embryos a lot, to kind of put that in layman's terms it means how many eggs that are retrieved get fertilized by the sperm to make an embryo. Did I do that, right? Did I say that right?

Shaun: Yeah.

Jenica: Yes.

Shaun: Yeah, so I guess maybe it'll help if we give kind of like an example number. Say you retrieve 20 eggs, that's a little bit on the higher end. But for convenience sake, let's say you get 20 eggs. Out of 20 eggs you're looking at probably around 80% of them will be what we call mature.

In order for an egg to properly fertilize it needs to be at the final stages of maturation of meiosis, not to get too technical with it. But an egg starts out as a diploid cell, it has two copies of DNA like any other cell. And then it completes meiosis and it goes down to haploid, where it only has one copy of DNA. Which is what a sperm cell also does, it starts as diploid, goes through meiosis becomes haploid.

Now you've got two halves of the equation come together and you've got two copies of DNA.

Jenica: Wow, that's so cool.

Shaun: Yeah, so say you get 20 eggs through your egg retrieval, about 80% of those are going to be what we call mature where they've completed that final stage, they're a haploid cell. So what does that bring you down to,

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like 17? 15, 17 eggs. And then if you do ICSI, which we can get into the different methods of fertilization, ICSI versus conventional. Both of them are going to bring sperm to the egg, your partner or donor sperm to the egg.

From there if you do ICSI you can expect around 80 to 90% of those to fertilize. So starting with 20 eggs you're probably already down to 10 or 12 that have properly fertilized. Things that affect fertilization are going to be sperm quality, egg quality, combination of the both, could also be embryologist skill level could affect it a little bit.

Hopefully that doesn't play a big factor. Most labs are very good at training, validating, verifying, rechecking, doing data analysis to ensure that everybody is performing at a good level. So I'd like to say you could remove that equation, but you know.

Jenica: Yeah, there's always human error in everything.

Shaun: Yeah, embryologists take pride in their work, so if they were to get a fertilization rate under 80% that's going to take a poke at their ego and they're going to question themselves. But yeah, you should expect around 80% fertilization rate.

Jenica: Okay, awesome. All right. And so since you mentioned ICSI versus the conventional method of fertilization, will you talk about those two and the difference and what they mean?

Shaun: Yeah, so ICSI which is I-C-S-I, is just short for intracytoplasmic sperm injection. It's just easier to say ICSI, obviously. A very fancy way of saying we're going to inject one sperm into each egg. And that's where we're on those big fancy microscopes, I don't know if anyone's really seen those. Maybe I need to do an Instagram.

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Jenica: Yeah, I need to come visit the lab, if I can sneak in there. Not really sneak in there sometime. But it would be so cool to see, or yeah, just on your Instagram would be so cool to be able to see it because sperm are tiny, right?

Shaun: Yeah, yeah, very small. One of my earlier videos that I posted on there I did show the micro tools that we use to inject sperm into eggs and how teeny tiny the tip comes down to. They're these little glass pipettes and they sit on top of your microscope.

So you'll have a dish with your eggs and your sperm in there. And then you can put these pipettes down and then it uses hydraulics to control them with these little joysticks. It's basically like playing a video game.

So you're looking on the microscope and your hands are controlling the pipettes and suction. So you're able to go in and select a good looking sperm cell, pick it up, inject it into an egg. There's videos out there, I'm sure I have one on my Instagram. Actually I do, I have one I remember because I put John Mayer playing in the background to it.

Jenica: Oh, excellent choice.

Shaun: Yeah, John Mayer is very good baby making music out there, pro tip.

Jenica: Oh my gosh, that's amazing. I love that because I just got, well okay, it's not Christmas time yet, but I convinced Tyler to get me tickets to John Mayer in March. Because I'm like, "We've got to go. We've got to go." So anyway, that's my Christmas present. Spoiler alert.

Shaun: I didn't know he's coming.

Jenica: Yeah, okay, that's amazing.

Shaun: Yeah, sorry, that was ICSI.

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Jenica: Okay. Yes, yes. So what's the conventional way of fertilizing an egg?

Shaun: So yeah, so conventional, most places call it conventional insemination, conventional IVF, or just IVF. That is where you've got your eggs in drops of culture media, and we'll isolate the sperm cells from the seminal plasma from the whole semen sample, we'll isolate the sperm cells.

Most places will do techniques to try and isolate the motile sperm cells, ones that are swimming. Because in a semen sample you're going to get a certain percentage that are just dead sperm. That's the male style, just produce millions of sperm and hopefully you get some good ones in there.

Jenica: Okay.

Shaun: So we try and isolate the best ones. And then we will just shoot a little bit of those sperm into that drop with the egg. And I'm pretty sure I have a video on that on my Instagram too. I'm not trying to promote myself, I'm just saying there's some convenient videos.

Jenica: Well you do need to check him out people, it's true. And it's so fascinating. So everyone, I know, will be interested. So I'm glad you're telling us this.

Shaun: Yeah, so we'll just put a little drop of sperm right into that drop with the eggs and let them do their thing overnight. We'll come back the next day and check to see how many of those fertilized.

You will get a lower percentage of fertilization that way, or at least it will look like a lower percentage because, like I said, only about 80% of your eggs are going to be mature. And in order to fertilize, they have to be mature.

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But when we do the conventional, we can't check maturation because we don't remove the cells that surround the eggs. They kind of come out with these clouds of cells that are connected to them and we leave those on there when we do the conventional insemination.

So we add the sperm, if you have 20 eggs, we're going to add sperm to 20 eggs because we don't know which ones are mature. So the next day, it'll drop down to that 12 number. So it'll sound like only 12 out of 20 fertilized, when really, it's like probably 12 out of 15 that were actually mature, we just couldn't see.

Jenica: Oh, interesting. Okay, awesome. Wow, I feel like I could talk about this forever. It's so mind boggling that this is what you do for your job.

Shaun: And it's just like a normal day to me.

Jenica: Yeah, I'm just like, oh my gosh, it's amazing. So cool. Okay, so the next question is, how many times can an embryo be frozen and thawed and still be viable? And why would you want to freeze it and thaw it?

Shaun: Yeah, so that question probably came from somebody that has gone through IVF and needed to do that, because that is kind of an obscure question.

So sometimes you do need to thaw and refreeze embryos. Sometimes the scenario is somebody went through IVF and they froze their embryos without doing PGT testing, which we can get into what that is. It's happening less and less, but historically this is kind of the scenario.

A person went through IVF, they didn't elect to do PGT testing. They came back and did maybe one frozen embryo transfer and it was unsuccessful or they had a miscarriage. And then they said, "Okay, you know what, maybe it's best that I do PGT testing now on my other remaining frozen embryos."

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So we'll thaw them out, do the biopsy, the PGT testing, refreeze them. See which ones come back normal and then we can thaw them out and transfer them. Sometimes you have to do that multiple—

It doesn't happen very often but it has happened where we do one biopsy, and you get— Because it's possible the testing company to get a no result on the sample. So then we have to thaw it, re-biopsy it. And there has been times where we've had to do that two times. So the embryo has been frozen, thawed out refrozen three times.

Somebody did publish a paper, a case, just like a one case study where an embryo had been frozen and thawed three times and resulted in a successful pregnancy. So it was kind of a cool publishing.

Jenica: Wow. Oh my gosh, I feel like my mind is like— I'm trying to stay focused because I want to ask you a million questions. So I'm going to stay focused on the questions that people had, and then if we have time later we'll talk more.

But so that's exactly what we did. So the second embryo, or excuse me, the second egg retrieval we got nine embryos. We froze all of them because I got ovarian hyperstimulation syndrome. And actually, will you explain to people with that is? I don't even know exactly what that is. I just know that it was not pleasant.

Shaun: Yeah. So when you go through IVF you have to take a lot of stimulation drugs because you're going on this like super ovulatory cycle so we can get you to grow a lot of eggs and then harvest those eggs. And this isn't part of what I do every day so I'm not the best at it.

But basically what you're doing when you're on the stimulation drugs, a normal ovulation cycle your ovary will actually have multiple of these follicles that contain eggs in them. Because your ovary has a lot of these pre-follicles in them, basically.

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So each month your ovary will actually have multiples of these follicles start to develop, and then one of them will become dominant. And that one is one that will actually ovulate an egg and the other ones will just die off.

So each month you lose a number of eggs when really you only ovulate one. So the stimulation drugs, the idea is they tell your body like, "Hey, don't have those other eggs die off. Let those ones grow also so we can harvest them." So because you're on this like super cycle your hormones are just like raging.

Jenica: Yeah, it's true.

Shaun: You know, you've gone through it.

Jenica: Mm-hmm.

Shaun: So your body can get a little bit out of balance. And ovarian hyperstimulation syndrome, or OHSS, it's fairly common. There are degrees to it, there's some that are much more extreme and would make you very sick on it. Basically your body kind of starts to accumulate a lot of fluid and they do not feel good. You know, it does not feel good.

But because your body's so out of whack and your hormones are all crazy it's best to freeze embryos. Because trying to transfer them you also need proper hormone balance with your uterus. So if your hormones are just all crazy, like you did, let's freeze them, let's do a frozen embryo transfer.

Jenica: Yeah. Yeah, and I ended up having to get the liquid drained out of there. And I had to get an IV because I was getting so dehydrated. So it was just not very fun.

But long story short, we ended up freezing nine embryos. And at the time, I don't know why but we didn't opt to do genetic testing. Isn't that like the short term for it, genetic testing?

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Shaun: Yeah, that's easier to say.

Jenica: Okay. So we didn't do it. And luckily, we transferred two of the frozen embryos and both of them worked, which are now Harris and Goldie. And then we had seven.

And probably looking back now, honestly, I probably would have done the testing because for some reason I didn't really understand it. I don't think that when you transfer an embryo that even though it looks relatively fine, unless you do genetic testing you can't tell if it will be, I guess, I don't even know what you say, like be able to make it to like a live birth.

So anyway, I know that oftentimes if you haven't done genetic testing, then it can end up in a miscarriage because you may have transferred an embryo was never going to make it anyway. So probably looking back, I would have done it, but luckily it worked out for us.

So this time I was more aware of that, I think, and so that's what we did. And we just had them thawed and tested all of them. All the made it but two of them were not, I don't even know, like the highest grade that you would recommend to transfer. So now we have five that are frozen. And yeah, so that's what we just did.

Shaun: Nice. Yeah.

Jenica: Okay, thanks for taking care of all that for us.

Shaun: Yeah, I knew all about that.

Jenica: Oh my gosh, that's so cool. Okay, we're going to keep going through these questions. Oh my gosh, this is going to be like a five hour podcast, but we'll try to get through them because this is just fascinating.

Okay, what if all of your eggs fertilized and made it to day five or six? Is that normal? Or are they abnormal?

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Shaun: Yeah, so if you got 100% fertilization or 100%, that made it to the blast stage or blastocyst stage, that's really good. That's not the norm, but I would take that as a very good sign.

Anytime I see a really high maturation rate, like your eggs are high percentage of them are mature, high percent fertilize, typically good blast development follows, not always. But yeah, I would say if you got a lot or all of your embryos to develop, yeah, that's not normal. But I would say that's a sign that things are good.

Jenica: Yeah. So I did two egg retrievals. My first one, I think both of them I got roughly 30 eggs. The first time only three fertilized, which I feel like— Do you feel like that's a really low percentage?

Shaun: Mm-hmm.

Jenica: Yeah, so it was not best, obviously. And then the second time we did an egg retrieval, because we did two embryo transfers, the first one didn't work, then we transferred two embryos. That cycle didn't work and then we had to do an egg retrieval again.

And so that time Dr. Foulk did human growth hormone injections like a week before egg retrieval. And I think it strengthened my egg quality because we ended up getting nine embryos. So anyway, very interesting.

Okay, so is it good to have a hatched embryo? Does it matter? And will you also explain to me, this is the first time I've even heard of a hatched embryo so can you explain what that means as well?

Shaun: Yeah.

Jenica: Thank you.

Shaun: Yeah, this may be worth just kind of quickly going over the different stages of embryo development, at least in culture. So in the IVF lab we

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culture embryos out until, the standard is day six, you can go out to day seven. Some labs will always go out to day seven. We occasionally go out to day seven if you need to, but typically day six is the standard.

So day zero is your egg retrieval. Day one is when we're checking fertilization. The next notable stage is on day three. On day three, your embryos are around 8 to 10 cells. Most labs don't really check embryos on day three anymore, there's just not much value to it because a lot of embryos will stop developing on day three. Which is another kind of cool topic to get into.

But around 50% of embryos will kind of stop around that day three mark, and then the rest will progress on to day five. So on day five, that's when they're at what's called the blastocyst stage. And that's when they're typically a couple hundred cells.

They look completely different, what they do is they form a cavity in the middle, it turns into this ball. On the microscope it's only a two dimensional image so it just looks like a circle, but really it's a sphere.

It turns into this ball where there's the cells around the outside that are called the trophoctoderm, and that's what will become the placenta. And then there's a clump of cells kind of towards the center, but it's still on the outside. And that's called the inner cell mass, and that part becomes the actual baby.

Jenica: Wow.

Shaun: Yeah.

Jenica: My mind is exploding right now. That's so cool.

Shaun: So the embryo itself has this little shell that goes around the outside called the zona pellucida, everyone just calls it the zona. And that contains

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the embryo throughout that development. And then the natural process is the embryo will keep expanding and it just kind of eventually punctures a little hole and it'll hatch out of that shell.

So in culture we typically have embryos that are hatching when somebody elects to do PGT. PGT stands for Pre-implantation Genetic Testing. Everything has really long names in IVF so everyone just uses short, PGT.

What PGT is looking for is a proper copy of chromosomes. So each cell in your body should have two copies of each chromosome. If you have an improper copy, whether that's one copy, or three or more, that's called aneuploid. Aneuploid embryos typically either won't implant, or if they do they will miscarry pretty early.

There are a few aneuploids that can result in live birth, Trisomy 21 being one of them, down syndrome. Although Trisomy 21 still vast majority of the time results in miscarriage or implantation failure. So the idea is if you do PGT—

And the way it works is what we do is we biopsy each embryo individually. We remove around five cells of those trophoctoderm cells that will just become the placenta. Remove about five of those cells, send them off to labs that then can screen them to see if they have proper copies of each chromosome.

So like I said, if you biopsy 10 embryos, we have embryo number 1, 2, 3, 4, all the way through 10, we can see the results. Okay, embryo 1, 2, and 3 came back normal, four was abnormal, it had Trisomy, I don't know 18 or something. We're not going to want to transfer number four, we'll want to transfer 1, 2, and 3 that came back normal.

So if you have a hatching embryo in culture, it's typically because you did PGT testing. What we do is, at least our lab, on day three we'll go in and

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we'll punch a little hole in that zona, in the shell using a laser. It sounds like sci-fi, I know, it's what we do. We do a lot of sci-fi stuff in the IVF lab.

Jenica: Holy cow, that's amazing.

Shaun: We use a laser to put a little hole in it so when the embryo expands on day five, some of those cells will start to poke through that hole. And then we can easily come in and grab them with those micropipette tools. Again, use the laser to cut them off, and then we can send them off.

So if you have a hatching embryo in culture, it's neither good nor bad. It's a normal process, they're eventually going to be hatching out.

The wording of that question, hatched, I don't know if they mean fully hatched. Sometimes embryos will fully hatch out of that shell, the Zona, in culture. Is that a bad thing? Not necessarily, there are papers that have shown those have just as good success rate.

Sometimes labs will see a little bit lower survival rate when it comes to freezing and thawing. But nobody really has data on it, just kind of they're a little bit tougher to work with because the cells are super sticky. But yeah, if you have a hatching or hatched embryo, that's not bad.

Jenica: Okay. Awesome, thank you.

Shaun: That was a long way to get to that answer, huh?

Jenica: No, it was super informative, though. I thought it was awesome. So okay, and I just have a personal question that nobody asked but I've just thought about multiple times. So I have to ask you, how do you do this when the they're so small? How are you so exact with the tools that you use with these tiny, tiny, tiny embryos?

Shaun: Yeah, very steady hands and using those micropipette tools. Everything's hooked up to hydraulics so it's very smooth when you're doing

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that process. You're not depending on your hand stability, everything is on these stages that are set and the hydraulics are super smooth. So it's a very fine movement.

Yeah, I mean, it's been years of developing these techniques and technologies. And that's why it's a really obscure field and it's hard to— There's a very high demand for embryologists right now because infertility seems to be on the rise.

There's a lot of clinics that are popping up throughout the country. You need embryologists to staff your lab, and it takes a long time to train an embryologist. And because it's so obscure, it's hard to, you know, not a lot of kids are growing up saying, “I want to be an embryologist.”

Jenica: Yeah, I know. Maybe we should all start training our kids, like implanting that in their minds, “You’re going to be an embryologist, right?”

Shaun: Yeah.

Jenica: Okay, what specifically do they look at to grade embryos?

Shaun: Yeah, so when we grade embryos that's going to be on day five and day six of culture. We're going to note the stage of development, are they a blastocyst? We'll look at the level of expansion of the blastocyst. So that cavity that forms, is it really expanded? Is it in the earlier stages of expansion?

And then the two things that we look at are the trophectoderm, those cells that become the placenta, and the inner cell mass, the part that becomes the baby.

So in our lab, the first letter grade that we give is for the inner cell mass, and it's just a simple A, B, or C grade scale, A being the best. And then the second letter grade is for the trophectoderm.

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So you may get a report back that says something like XBAB. XB would be the stage of development, expanded blast, in that first letter grade A would be an A for inner cell mass. And then the B would be for trophectoderm.

So those are the two main things, and any clinic that you go to everyone's looking at that same thing. They may use a little bit different system of how they word it, but everyone's pretty similar.

Jenica: Okay, awesome. What are the chances that embryos don't make it through thawing? And why wouldn't they make it?

Shaun: Yeah, so the cryobiology the cryotechnology has gotten really, really good over the years. You should expect a 90 plus percent survival rate. Our lab, we're like 97, 98% survival rate. You do get the occasional embryo that does not survive. Why they don't survive, that's hard to say.

Some embryos just may not take to the process very well. Maybe if it's a lower quality embryo. Again, it could go back to, it could fall back onto the embryologists technique. Hopefully, the lab that you go to— Which I've been in multiple labs, I've gone and worked in multiple labs and embryologists are pretty perfectionists. We all have OCD. Everyone always joked about it and I just kind of rolled my eyes until I've been around a lot embryologists and they are really all the same.

Jenica: Okay, I love that you're saying this because I started following you on Instagram when I discovered it, like a week ago. And he has funny videos about being OCD, but I was thinking to myself, "That is the exact person that I want dealing with my embryos, a perfectionist."

Shaun: Mm-hmm.

Jenica: It's perfect, this job is perfect for you. And we appreciate that.

Shaun: Yeah.

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Jenica: And also I have OCD too, so I can totally relate to that. I'm very meticulous, so I can totally see like my personality type and your personality type would be like the person you want to trust with this very important process.

Shaun: Yes. Yeah. So embryologists, they're a little bit annoying that way. Oh man. So yeah, if an embryo doesn't survive, hopefully it wasn't embryologist's technique. But an embryologist isn't just going to shrug their shoulders and be like, "Well, I don't know what to tell you." They may say that, but deep down they're like, "Oh man, I hope that wasn't my fault."

Yeah, so you should expect 90 plus percent survival rate. It does happen that embryos don't survive, but it's not too common.

Jenica: Okay, awesome. All right, next question is, and I've actually heard this and wondered this myself. So when would transferring a day three embryo be better than transferring a day five embryos day five embryo? Because day five is typically the normal time that you would transfer, right, or freeze?

Shaun: Yeah, so that's become the industry standard, to transfer on day five. The benefit of transferring on day five and why the industry had switched to that is because you know which embryos have continued past day three.

I think this is where it would be worth explaining why embryos stop at day three. So an egg comes with a lot of components for development, it has a lot of the energy components that you need, it just has a lot of the factors to get through a couple rounds of cell division.

So when a sperm fertilizes it, it's kind of ready to go to get to 6 to 10 cells. After that point, after day three, that new DNA that the sperm and egg came together and formed, or that new embryo, that DNA now has to take over the components of development.

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So if the DNA is not good or if the egg quality or the sperm quality weren't very good, this is where you're going to start to see that effect come into play. And that's where we see a lot of embryos will stop developing after day three, because that's where the real proving ground starts.

So in the early days of IVF, very, very beginning, they would basically get sperm to the eggs, get them to fertilize, and then they'd put them back in the uterus. And then technology started to get better on getting a culture system, creating incubators that could mimic the in vivo, the living system, where we can control pH, temperature, humidity, things like that.

And then also, we had to develop culture media that gave the embryos all the nutrients that they needed to develop. This took years of development and technological advancements. And then it advanced to transferring on day three.

And everyone used to transfer on day three. And then technology got better and we were able to culture out to day five, get them to go to blast. And now we're really good at making blastocysts on day five and day six. So most places transfer and recommend transferring on day five.

Occasionally, a doctor will recommend transferring on day three, and this is going to base on your scenario and your doctor's preferences. Some doctors are totally against transferring on day three, some are a little more prone to transfer on day three.

They may do if you're a bit more of a poor prognosis patient, if you don't have very many embryos, maybe two or three. Maybe you've done a round of IVF or two in the past and they see that not many develop past day three. So the idea is, hey, let's get these embryos back into the in vivo system, into the uterus where it should be the ideal environment.

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So is it better transfer on day three or day five? It could definitely depend on the scenario. Best thing to do is ask your doctor and see if they recommend that option, transferring on day three

Jenica: Okay, awesome. Awesome, thank you. Okay, next question. I feel like I've had this question, I think a lot of people have like this worst nightmare in IVF. Have you or anyone you know ever mixed up a sperm or an egg? Or have you ever heard of anybody transferring the wrong embryo to the wrong uterus?

Shaun: Yeah, this is a good question. And it's a very valid concern, obviously. You are trusting us with your genetic material, your gametes to create a human life.

Jenica: I literally just got the chills when you said that. It's crazy, yeah.

Shaun: Yeah, that's what I'm saying, like, yeah, this is a normal thing for me every day and every once while I have to have a moment of like, these are human embryos. It really hits home when you see the babies come back and you're like, "Whoa, oh man, I knew you when you were like very, very, very small."

So, no, I have never mixed up. Our lab has never had that mix up. Has it happened? Yes, it has happened. The IVF community, the industry has gotten very good and very advanced and we've gotten really good at reducing that potential for error.

Witnessing is a very big topic and a very serious subject that labs take very seriously. There's been a lot of companies that tried to make products for like electronic witnessing to try and automate it, get computer system software involved.

So yeah, each lab is going to have a lot of touch points where you have a second person witnessing and ID'ing what you're doing. So when I'm going

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to go do an ICSI, I've got the sperm sample, and I've got my eggs in a dish, and I've got my paperwork.

So I grab a second person like, "Hey, I'm about to do ICSI on Jennifer Smith. Here's her paperwork, here's her name, date of birth. Here's the sperm sample labeled Jennifer Smith, Chad Smith, whatever, here's the dish. The second person is looking at it going, "Yes, yes, correct."

Jenica: That's awesome.

Shaun: Yeah, it's an important thing. Have you ever heard of that happening? Yes, there's crazy stories out there. There was one that happened not too long ago. It was a crazy scenario that clearly this lab was far below standard.

Jenica: Oh man.

Shaun: I think it's worth probably doing your homework to make sure there aren't any new stories out there about the lab that you're going to.

Jenica: Yeah and avoid those labs at all costs.

Shaun: Yeah. But I would say the vast majority, like I said, embryologists are all OCD. There's a lot of regulatory bodies that are very on top of us that are always coming in and auditing to make sure you're doing all these safety checks. So the industry, I'd say you can rest assured your clinic is doing what they should.

Jenica: Awesome, thank you. Okay, it's just I think everyone's probably had that thought like, what if? Or like you deliver a baby and you're like, "That's not my baby."

Shaun: The other common question, and it's always in joking, and it's usually the husband or the wife like, "You're not going to go and mix your own sample into this, right?"

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Jenica: You're like, "No."

Shaun: There have been horror stories in the past that that has happened.

Jenica: Oh my gosh, I have heard of those happening with just like creepy people that are like, "I'm going to have lots of children." That's so weird.

Shaun: Yeah.

Jenica: They don't do that at Utah Fertility Center, people, trust.

Shaun: Yes, no. And then I joke back like, "No, we don't. But just in case we only hire like semi attractive people. So even if someone does..."

Jenica: Even if someone does, your child is going to be beautiful. So are you really going to be that mad? Oh my gosh, that's amazing.

Okay, talk to me about fresh versus frozen embryo transfers.

Shaun: So, there has been also a big shift towards doing frozen embryo transfers. And that goes back to what we were saying before with the OHSS. When you go through IVF to grow eggs, you just kind of become into this super ovulatory state where your hormones are much higher than usual.

So, many clinics have switched to preferring to doing freeze alls, where we freeze all embryos, let the woman's body kind of reset, and do a frozen embryo transfer in a month or two.

So, which is better? There's still a lot of people that will still do fresh embryo transfers. Some doctors prefer it. Not prefer it but some doctors, they're still totally fine with it. And it works, a lot of the time it works.

Frozen embryo transfers, in the recent past there's been a lot of studies showing a higher success rate. And it just goes back to what I said, the

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thought is maybe just we're able to get those hormones into the proper range.

And also there's been a lot of people that do the PGT testing now. And when you do PGT you're going to freeze all of your embryos.

Jenica: Yeah, well and for me even just going through it myself, I feel like based on just common sense, my body after doing the egg retrievals just was not feeling well at all.

Like you said, the hormones were off, I just felt like physically I was very inflamed. I felt like my uterus— Just everything was just off. And so I feel like my body, at that point, was just trying to heal itself and putting all the energy to heal myself. And so to be able to support growing a human being, I feel like is a little bit much to ask of my body. You know what I mean?

So it kind of makes sense that your body would be more opt to getting pregnant during your frozen cycle after your body's healed after that egg retrieval. And that's what happened with us. We ended up doing the frozen transfer. And that's what Dr. Foulk was telling us too, that he has higher success rates with frozen transfers.

Shaun: Yeah, I mean, through the egg retrieval, you know, stimulation, egg retrieval, cultures, the patient is going through a high level of uncertainty through the whole process. How many eggs am I going to get? And then you have to wait to know how many were mature, and then how many fertilized. And now I have to wait five days to know how many actually develop.

And if you're doing a fresh transfer, you kind of like you're just going to show up to the clinic and be like, "Do I have any embryos?" Five days of uncertainty, I just imagine the mental state that you're going into is like that's a lot of stress. Versus if you do a frozen transfer, you've had a month

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of like, “Hey, I know how many embryos I have. I know the grade of them. I know which one we're going to do.” And you're in a little bit more of a mentally calm state is what I imagine.

Jenica: Yeah. Yeah, I totally agree. And I definitely believe that all of our body, all of our mind, it's all connected. And I think that our body has physical responses when we're under a lot of stress. And so, I mean, a lot of people say like, “Oh, it's fine. It doesn't matter.” And I'm like, “No, it does matter. I feel like a different person when my mental health is peaceful and calm and not, like you said, under all this uncertainty.” So it makes sense.

Okay, so we had quite a few questions, but I kind of feel like we've been able to answer most of them. Even if it wasn't the exact question, I feel like your answers were able to cover a lot of the questions people had. So I would love to end with—

Well, first of all, is there anything that you want to add before I ask my last question that you feel like people might want to know about your job? It's not a big deal if you don't have anything else.

Shaun: Yeah, I don't think so.

Jenica: Yeah, I feel like the questions were awesome.

Okay, so I guess kind of it's a two part question. So what would you say is the most difficult part about your job?

Shaun: I'd say the most difficult part is the disconnect between the IVF lab and embryologists and patients. And it's just kind of the nature of the beast. We are kind of the wizards behind the curtain.

We're back in the lab, patients don't really see us, we don't really see patients. And if your clinic is busy and you're seeing a lot of patients, your days get pretty busy in the lab and you're trying to, again with your OCD,

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you're trying to do things perfectly. And you want to follow protocol and get things done exactly on time when they need to happen.

And you're trying to be super careful, you don't want to make a mistake. My mantra is there's no such thing as a small mistake in the IVF lab. If you write one number wrong, you wrote their date of birth wrong, that's a problem. How are we supposed to confirm this is the correct patient if you wrote, it's supposed to be 1984, and you wrote 1985. Is this the right Jennifer Smith? So it's kind of high stress.

And then on top of it there's that kind of disconnect between us and the patient. And so, as an embryologist you really take pride in what you do and in theory you know you're making a difference. But you don't really get to see it very much.

So about a year ago we had had a patient who had gone through multiple rounds of IVF. Just a very poor prognosis, we couldn't get eggs, couldn't get embryos to develop. She was on like her fourth or fifth round of IVF. When she came through, I was like, "That's it, everyone step aside. I'm going to handle this case. I'm going to just kick some butt. I'm going to make it work."

Jenica: Yeah, we're going to make it happen.

Shaun: Yeah, I'm going to make it work. Like she's going to get all the TLC, it's going to work. And it did, she got pregnant, had a baby. And she came back to the clinic to show her baby, and I happened to wander out, I think I went to the bathroom. Went to the clinical side and I saw her and she was with her baby with the nurses. I was like, "Oh my gosh, your baby! That's so exciting." And she looked at me like, "Yeah, can I help you?"

Jenica: Oh my gosh, you're like, "You have no idea what I did for you."

Shaun: Yes, you don't know who I am.

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Jenica: Yeah, I'm the godfather of your child.

Shaun: Yes, that baby, you're welcome. It's not like I need a gold star or a thank you, it's just like I want that connection.

Jenica: Yeah, absolutely. I mean, it's a huge deal. I think you play just as big of a role as the doctor that we see all the time. And so you literally, you made the baby, you made the embryo.

So yeah, and I've been lucky to get to know you a little bit too because when I did a dinner for Bundled Blessings, you came, which was awesome. And then you're a social person, so it makes sense that you would want to connect with your patients.

And we so we've been lucky enough to connect through Instagram and through randomly seeing each other at the gym and stuff like that. And it's so cool for me too. As a patient I want to know you because it's cool to be like, "Okay, thank you." And be able to thank you and also just have like a face to the person who, like you said, is the wizard behind the closed doors that we don't ever see. So that makes sense.

Shaun: Yeah, and it, it helps motivate me to be really good at what I do. And that's why I go to social events and I go to things like Bundled Blessings. And I just, I want that patient exposure because it reminds me why I do what I do and the difference that we make.

So, yeah, that connection helps remind you, especially on those hard, busy long days. Like, hey, these aren't just names and egg numbers, these represent a journey, a struggle that somebody is going through and some of them for years have gone through, and it's accumulating to what I'm about to do right now. It's a big deal.

Jenica: Yeah, it is a big deal. And I'm sure for you it's hard to find that balance of not feeling this immense, crippling pressure all the time, and

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also having it be precious to you. I mean, that's got to be honestly mentally kind of exhausting.

Shaun: Yeah. Yeah, there are days when I need to unwind.

Jenica: Yeah.

Shaun: But for the most part it's good.

Jenica: That's so cool. Well, thank you for Harris and Goldie.

Shaun: Of course, you're welcome.

Jenica: Just thinking about it, they're honestly the joy of me and Harris— I mean, oh my gosh, I always call Tyler Harris now. They are the joy of me and Tyler's life. And they've changed our whole world.

Shaun: They're two very cute kids too.

Jenica: You're amazing, thank you. Okay, so what is the most exciting and rewarding part of your job?

Shaun: Yeah, it's the babies when it works. It's just, yeah, I wish I could get to see it more. A couple of weeks ago I was at a LGBTQ family building panel. They usually have it every year, they didn't have it last year because of Covid. But it's just a really good event.

Jenica: Was it at the Utah Infertility Resource Center?

Shaun: Yes.

Jenica: Okay, cool.

Shaun: They're the ones that hosted it, it was up in Salt Lake. It's a really good event because people get to share their unique challenges to having

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children and then getting to hear it work, like it's emotional. It makes you emotional when it's like, "I do this all day. How does this seem so foreign?"

Again, there was a gay couple on the panel and I recognized their names. Like dude, I probably made your kids that you're talking about and I wish we were bonded. But that's definitely the rewarding part, when you get to— As an embryologist you get to work with your hands, it feels like there's an art form to it. You get to master your technique. And when it works, it just feels good.

Jenica: Well you create a human life, you create families. It's honestly beautiful and amazing. So thank you for your work and for being that perfectionist that we need in your position. Oh my gosh, you just honestly, truly are a gift, so thank you.

So if you guys want to follow Shaun, I highly recommend doing so. He's on Instagram @Shaun.bob. It makes me laugh every time because he posts the funniest videos. That's what I love about you, is you are a perfectionist, you do have OCD apparently, now that you told us this, but you're also hilarious. So you have a good balance in life. So you're doing a good job.

Shaun: Thanks, thanks.

Jenica: Okay, well, thank you so much. And we will see you guys next week on *Fearless Infertility*.

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