

# Ophthalmology with Dr. Reid Wainess

## Ologies Podcast

### August 7, 2018

Oh heeeyyy, it's your uncle's corduroy jacket that smells like pipe smoke and breakfast sausage, Alie Ward, back with another episode of *Ologies*.

This one's special because your ears are about to get a real mouthful about your eyes. It's a very multi-sensory affair. Like, "Hey ears, will you pass this highly informative binder-paper note to eyes?" And ears is like, "Ooooh hell yeah, but I'm going to read it first, and it better not talk shit on me." And I'm like, "Okay ears, thanks, you're great. One day we're going to do an episode about you, I promise. Just not this week." Eyes, all eyes are on you. I mean, all ears are on you.

Eye stuff makes your ol' PodDad a little squeamish. So my goal in doing this episode, I did it intentionally, because I was like [*squeams*]. I wanted to get over my eye squeamishness and stop shoving eyes into a corner. No one puts eyes in a corner. Eyes, here's looking at you.

But first a little business. Thank you to all the Instagram pals. This week, a little milestone, we crossed 10,000 followers. I did a very small, private dance, in an airport, alone, about it, and was like, "Oh!"

Thank you to all the Patrons who support the show and submit questions for *Ologies* at [Patreon.com/Ologies](https://Patreon.com/Ologies). You can support for as little as a quarter a week, 25 cents a week. This is a totally independently published and produced show. I'm literally recording this in my closet, and I record it on the road when I'm working. I just love making it. So thank you for making it possible, literally, by your Patreon support.

If you want to find other ologites in the wild, you can pick up *Ologies* shirts, and dad hats, and pins, and totes, and backpacks, and such at [OlogiesMerch.com](https://OlogiesMerch.com). Also, thank you to anyone who rates, and reviews, and subscribes. That costs no money. It takes a couple minutes, and it helps keep *Ologies* up here in the charts for other people to discover. It takes, like, seconds. Also, I'm a known lurker. I lurk. And when I'm feeling so jetlagged that I want to go live in a hollowed-out tree and talk only to squirrels, your iTunes reviews always remind me that there are folks out there who are listening and cheering me on to keep making more. It helps so much.

To prove it, I read one out loud each week, so you know that I actually look. And this week, I think I'm going to shout out two because they're quick. Eezeonyilo [phonetic] says:

*Literally life changing. 10/10. This podcast inspired me to pursue my interest in bugs, and now I'm working in an entomology lab! ([squeals] That's so exciting.) Thanks to Alie, every episode is super fun, regardless of the topic. Listen to them all.*

Congratulations! That's amazing. Also, Trista Edwards wrote:

*This podcast is like the manifestation of all of my obsessions. Every episode is like experiencing an auditory cabinet of curiosities. As a poet, this podcast generates so much creativity and inspires a poem with every episode. Thanks, Alie! Soon I may have a whole book of poems inspired by *Ologies*.*

Trista Edwards, hell yes to that! Please keep doing that. We'll buy your book.

Okay, back to ophthalmology, which is a word that is like a letter party, where someone invited too many Hs. Like, "Oh damn, why can I not spell this word?" Just keep adding Hs, that's the secret. And the etymology, if you guessed Russian, you are not correct. It's Greek. It's just Greek, guys.

*Ophthalmos* means eye.

But what does it mean to beeeee an ophthalmologist? Well, I called upon a longtime pal of mine, a friend who is not only is super dedicated to his work, but he is one of the few truly sane people I know in LA. He stands out at barbecues because it's like, "What's that guy's deal? He seems nice *and* like he has his life together. It's so weird. He hasn't taken a picture of himself smoking or mentioned an improv troupe." He's also the type of friend that you can text a medical problem to, and if it's related to eyes, he'll weather your questions. He'll hook you up. Solid dude.

And I just read the Yelp reviews for his medical practice. People love him! He's like everyone's favorite super smart cousin. The reviews are like, "5 stars. Would get treated for pink eye again."

So, I sent him a message. I was like, "Hey, can I podcast your brain or what?" And he was like, "Sure, dude." So, I drove the half a mile to his house, have I mentioned I'm based in Los Angeles? Also, it was so hot out. I'm sorry. We sat at his kitchen table and had a merry old talk about eyeballs, and he helped me face my squeamosity head on. We talked about why evolution hasn't weeded out bad vision, and what to do if you screw up on your eye tests, and what to eat to have healthier peepers, and if phones are making us maybe a little cross eyed. And maybe, very briefly, some very bad ocular accidents, and what mascara is really made of, and mari-ju-ana, and do I have eyeball tumors? And we address diabetes, and so-called "color blindness," and why we cry, and dogs who wear glasses. There is so much happening. Please get ready to have a ball, with Ophthalmologist Dr. Reid Wainess.

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**Dr. Reid Wainess:** Let's do this. I'm ready.

**Alie Ward:** Have you done a podcast before?

**Reid:** I haven't. I listen to podcasts every day. I probably listen to an hour-and-a-half's worth of podcasts almost every day, and I literally was listening to a podcast when you walked up to the door.

**Alie:** Oh my God. Okay.

**Reid:** I just have to get right in here, pretend like I'm on the radio now. That's great.

**Alie:** Yep. Look at this. We're rolling. Yay! Okay. Dr. Reid Wainess, you are an ophthalmologist.

**Reid:** Yes.

**Alie:** I know you get this question everywhere, like rental car counters, cocktail parties, whatever. What's the difference between an ophthalmologist and optometrist? I'm sorry, I have to ask you that.

**Reid:** It's the question everybody asks, so it's a good one to start with. Optometrists and ophthalmologists do a lot of the same things, which is examine eyes and treat eye conditions. Optometry school focuses on diagnostic pathways, learning to diagnose certain eye diseases, learning to do refractions, which is where you check patients for glasses and get them seeing well, do vision therapy like contact lenses and low vision specialties, where they really focus on your vision.

Ophthalmology is more of a disease-focused specialty [*crowd cheering "Yaaaaay!"*] and you go through medical school so you're focusing on the diseases and treating the diseases, whether that's medically or surgically. There's definitely overlap but ophthalmology is more of the medical side of things. But that's blurred a little bit more in recent years.

**Alie:** Blurred.

**Reid:** Yeah, nice pun, right? Unintentional ophthalmology pun.

**Alie:** So, refractions are what you call it when they're just checking to see if you can read the eye chart.

**Reid:** Yeah, the torturous, "Number one or number two? Which is more clear?" that everybody hates.

**Alie:** I just did that. I just had an eye appointment on Tuesday.

**Reid:** And you didn't see me?

**Alie:** I did not see you. But do you do refractions too?

**Reid:** I do, I do.

**Alie:** I didn't know that. I thought you only cut eyeballs open.

**Reid:** No. You know, I can. I don't do it as my mainstay of my work, but usually for friends, and family, and people I know, I do that.

**Alie:** I had no idea. Okay, I thought you were the big guns. Like, you go to you when you're like, "I think I have cancer in my eye."

**Reid:** Sure. I mean, for that you'd probably go to an oncologist specialist, which you could see me first and if I see cancer in your eye we'd refer you out to one of those. Thankfully, that's pretty rare. You don't have cancer in your eye.

**Alie:** I will say, I didn't realize until I said that, that I have been told I do have an eye tumor. I forgot.

**Reid:** You have a pterygium. I know, I remember.

**Aside:** I forgot that I'd made Reid look at my gross eyeball like 7 years ago. Also, a pterygium takes its name from the word *pter*, meaning wing. It's this webby, wing-shaped film that grows in your eyeballs if you move somewhere with bleached, bright light and you don't wear sunglasses for a few years. The condition varies in severity.

Mine's not that bad, but it's also called Surfer's Eye, which is appropriate because it is, clinically speaking, hella gnar-gnar. Anyway...

**Alie:** Yeah. Do I still have them?

**Reid:** Well, they don't just go away. Looks like you do. Yeah.

**Alie:** Oh, god. I have a benign tumor in my eye right now.

**Reid:** It's not really a tumor. It's more of a degeneration of the membrane covering your eye. Pterygium is the medical term for it, but it's just UV damage to the white part of your eye that causes it to lose the elastic portion, so it swells up a little bit and grows a little differently than it normally would.

**Alie:** And so, can I use, "I have eye tumors" as an excuse to not go to things?

**Reid:** You can do whatever you want. If there's an ophthalmologist or an optometrist at the party, they'll know you're full of something, but you know, you can pull it off.

**Alie:** I'm full of eye tumors! I can't go to your birthday.

**Aside:** So how did ol' Dr. Wainess, who, let's be honest, I'm just going to keep calling Reid because we're like bros in real life; how did he decide to go to medical school for ophthalmology?

**Reid:** I went to medical school not knowing that I wanted to be an ophthalmologist, but just knowing that I wanted to be a physician.

**Alie:** Really? What convinced you? At what point during medical school were you cutting into a cadaver and you're like, "You know what? Eyeballs."

**Reid:** Definitely not when cutting into the cadavers. Although those were some fun times as a first-year medical student. A few people lost their lunch that first day, I'll never forget that.

**Alie:** Really barfed? Actually barfed?

**Reid:** Oh yeah, 100%.

**Aside:** In his third year of medical school, [*voice of old crone*] "Reid came to a fork in the road, will he take the medical path, or the surgical path?" That was me being like a witchy oracle deciding his future. If you're like, "Medical, surgical, what's the difference?" one involves the phrase: [*"Jerry, hand me a scalpel!"*].

**Reid:** Early on I knew I wanted to do something on the surgical side. I always loved doing model cars and building stuff. I knew I wanted to do something like that, with my medical training.

**Alie:** But with alive bodies!

**Reid:** Yeah, but with live people, exactly.

**Alie:** To me, the leap between, "I like working on model ships," and, "I'll cut into an eyeball," there's a very large, canyon-sized leap that one makes. How did you do that?

**Reid:** I don't think it feels that distinct when you're doing it. It just feels like a natural progression of life. It's more like, "I want to be a physician and I always liked working with my hands." It's a natural next step for me. All the surgical specialties were much more fun. I just enjoyed those things more. I enjoyed doing things physically to help people be better.

**Alie:** Oh, thank god. Thank god there are people like you that exist.

**Reid:** Well, thank you.

**Alie:** Because I'm like... I can't cut a raw chicken. Thank god that there's someone that's like, "Yeah, I'll hop in there and do that." Because who would fix people's eyeballs? Like, no one.

**Reid:** Yeah. That's what I'm here for.

**Alie:** Was it, kind of, the altruism of it? Knowing that they're going to come out of this surgery... provided you're not drunk, they're going to come out of it better?

**Reid:** Sort of. I mean, I don't think I've ever thought about it from that perspective. It's an interesting way to think about it. It felt normal to want to do something to make a difference in people's lives, but I never thought about, "Oh, the reason I'm doing this is altruism."

It's more about, it just seemed normal. I want to do something where I can help people, and it just fit. There was never a light bulb moment. It just always seemed like this is what I should be doing with my life. Medicine, that is. "Oh, this is what I like." I really like treating eye conditions and helping people see better. It just is enjoyable.

**Alie:** You know what? I just realized; you have glasses.

**Reid:** I do.

**Alie:** How long have you had your glasses?

**Reid:** I've worn glasses pretty much since high school.

**Alie:** Whyyy is it so common? This is my biggest question. So many people have bad vision. If you put me in the wild, or like, on *Survivor*, and you took out my contacts, I would die in the first 24 hours. I have no chance. I can't see anything without them. Why have we evolved to have such shitty vision?

**Reid:** That's a good question. I think a lot of it comes back to what you just said, which is, it's evolved. We didn't necessarily evolve to have that bad of vision. If you go back hundreds of years ago, we probably didn't have people who had -10 prescriptions, and these super strong glasses and contacts. That wasn't as common. We've seen a big boom in myopia, which is nearsightedness. Or having a strong, strong need for glasses in the modern world.

There's debate about what causes that. We think that being indoors more, a lot of close work, like reading, computers, phones, all those things raise the risk of having a stronger prescription. When we're at a young age doing those things, it definitely affects

the eyes. Some of it is not about historical evolution of humanity, but kind of, our behavioral changes over the last hundred years.

**Alie:** Wait, what you're saying is wearing glasses really does mean you're a nerd because that means you were staying indoors, not getting any sunlight, probably reading. Then you're wearing glasses. Thus, you're a nerd.

**Reid:** The chicken or the egg, right? I don't know. But yeah, it probably works that way a little bit. If you're spending more time indoors playing games and doing things up close, you're probably more likely to wear glasses. One of the treatments they recommend for kids to reduce myopia is to spend more time outside.

**Alie:** Really?

**Reid:** Absolutely.

**Alie:** Oh damn. That's the one thing I feel like we're getting worse and worse at, probably.

**Reid:** Probably, yeah. And then we're just going the exact opposite direction of that.

**Alie:** I guess your kid reading an iPad outside doesn't cut it, right?

**Reid:** *[laughs]* Probably not.

**Alie:** So, do you think that dogs, and apes, and giraffes, and stuff have shitty vision and they're just like, "Man, I can't read that sign."

**Reid:** Some do, yeah. You can tell though, if an animal can't function because of their vision. They're going to be walking into stuff. So again, evolution I think hits those kinds of animals a lot harder than they do us at this point since we're pretty domesticated. But a dog that can't see, we all see dogs with cataracts as they get older, you can see the cloudiness in their eye, and they're bumping into walls.

But most young animals don't have problems like that, because their behavior and evolution over the years hasn't created a situation where they're reading things up close. You know, even if your dog's inside all day, they're not reading the newspaper.

**Alie:** *[laughs]* Dude, that dog would rule though.

**Reid:** Yeah, Garfield probably would need glasses eventually, but other than that, most pets are good to go.

**Aside:** I needed to see photos of animals in glasses, so I googled 'animals in glasses,' and it did not disappoint. I soon found myself on a website called Doggles.com, which as you may have guessed, sells goggles for dogs! Just dope as hell prescription lenses, sunglasses for pups, and for a second, I forgot all about the world's troubles. Also, one study found that gorillas - are you ready for this? - need reading glasses when they get older.

So, what is happening when you get older and you have to hold shit further away from your face? The muscles in our eyes make it harder to squish our lenses to change focal length. It's like your hand getting too tired to work a zoom lens. But I feel like instead of reading glasses for gorillas, they would technically be, like, lice-picking glasses. Okay.

**Alie:** How much do you notice eye problems in other people? Like for example, my eyes are garbage. My eyes are tiny balls of garbage. Like, I have pterygium, which are, I'm sorry, they're tumors in the eye. I'm telling everyone. My eyes get red when I'm hungry. I don't know why they get red all the time. How much are you diagnosing people when you're talking to them?

**Reid:** Not that much, surprisingly. I'm not just talking to people out in the street and really looking, "Oh, do they have a red eye? Do they have a contact in their eyes? Do they have a pterygium? Do they have a cataract?"

**Alie:** Now, with the change in policy toward 'wacky tobaccy', do you notice a lot of stony eyeballs in Los Angeles and California, and also Denver?

**Reid:** It's hard to tell. I think I just assume at this point that everyone in Los Angeles is stoned. So, I can't tell who's just got red eyes from dryness out there and who's actually stoned.

**Alie:** Why do people's eyes get red when they're stoned? I can't believe that I... I didn't realize that I meant to ask that.

**Reid:** Sure. So, we have blood vessels on our eyes and when they're dilated, the blood vessels, they look more red. And when they're shrunken, they look less red.

**Aside:** Heads up: It's the THC levels in the wacky tobaccy that lower the blood pressure and cause blood vessels to just bloom and dilate into something beautifully bloodshot. But that varied decrease in the intraocular pressure is what helps the glaucoma patients. So, if you're somewhere it's legal and want the other medicinal benefits of cannabinoids but do not wish to look like a mugshot, you can go for lower THC products, instead of just buying Visine by the liter jug.

**Reid:** If you take Visine, it's just a vasoconstrictor. It shrinks the blood vessels on your eye, so they don't look as red. That's what Visine is doing to people's eyes, or Clear Eyes, any of that stuff.

**Alie:** I hear that stuff is garbage and so bad for you.

**Reid:** Terrible, terrible.

**Alie:** Is it!?

**Reid:** It hides the redness but doesn't actually treat the problem. And then what ends up happening is your eye gets addicted to it. Once you stop taking it, the blood vessels aren't shrunken down anymore, and they dilate up really, really big. And then your eyes look super red, and then you put more in because you're stuck using it. Then you're just in a cycle where anytime you don't use it, your eyes get super, super red, and then you feel like you have to use it every day. It's very addictive. Just don't use it every day because your eyes are going to get hooked on it. Don't use it for dry eyes. Use it for occasional redness relief. That's totally cool.

**Alie:** Okay, in general, treat it like a special occasion type of vasoconstrictor.

**Reid:** Exactly.

**Alie:** I hear you can use it on zits, though, and it makes them less red.

**Reid:** I haven't heard that. I will try it. I've got some samples.

**Alie:** I mean, you're also talking to someone who's put hemorrhoid cream on their face, so don't listen to anything I say.

Let's just back up and look at how vision works, like, in a nutshell? Because it's kind of crazy that we have these eyeballs in our faces. What are they mostly made of? Are they mostly empty?

**Aside:** Okay, this, in a nutshell, in one paragraph, explains the miracle of vision, and it'll change the way you think about your own eyeballs forever. It's crazy. Stay with us. *[drumroll]*

**Reid:** Yeah. The inside of it is mostly just an empty gel that's kind of like a watery, gooey, thin jelly. Your eye is like a camera. We know how cameras work. Well, people don't anymore because they're all digital, but we used to know how cameras work. With film and all that fun stuff. But your eye has a lens. It has a retina which acts like the film in the camera. Light hits your eyeball, and the cornea, the front surface of your eye, and the lens inside they both refract, or bend the light coming into your eye, and help focus it. Light passes into your eye. It gets focused down to your retina. Then the retina has the rods and cones, and it senses the light and the colors and puts it all together. And then the nerves on the retina collate together and send it back through the optic nerve, up to your brain, where the brain interprets the image.

**Aside:** Okay, I'm going to repeat that just in case you spaced, or someone in the park was walking a cat on a leash and you got distracted, because this is real life, that shit happens. The cornea is the clear dome covering the iris, which is the colored part, which lets light into the lens below. The lens is a biconvex, aka M&M shaped, jelly blob that works like a camera lens. Light enters, gets bent, and then goes through your eyeball jelly to the back of the eye. It hits the retina, film, which has all the rods and cones to pick up light and color. Then your brain, if you're sighted, takes that information and forms a picture you perceive as reality.

Now, just as cameras can have different mechanical hiccups, so can eyes. The top few causes of losing sight are cataracts, which is a clouding of the lens. There's glaucoma, macular degeneration, diabetic retinal damage, and in some parts of the world there's also things like river blindness. That's caused by a filarial worm that hangs out in a black fly.

Those are just some of the top causes. Here in the US, a whopping - are you ready for this? - 75% of adults need vision correction, which means Reid can change people's lives, and also has wicked job security.

**Reid:** You've got a lot of cool stuff going on, but it's basically just the poor man's camera. The camera's a poor man's eyeball, I guess. The other way around.

**Alie:** I guess you don't need that much money to have eyeballs which is good. Does the light go through the cornea, through the lens, through the jelly, and then hit the retina film in the back?

**Reid:** Yes.

**Alie:** Rods and cones, what's happening?

**Reid:** Rods and cones are the sensors inside the eye. The rods are sensing the amount of light that are hitting the retina, flying into the light there. And the cones measure the wavelength of the color coming into the eye. Think of ROY G BIV, the rainbow, each of those colors has a different wavelength. The cones in your eye are sensing which wavelength that light ray is coming into your eye at, and that's how it knows what color it is. You've got tons of those little rods and cones in your eye. So, every little detail your vision can pick out, how much light and color, your brain does all the interpreting once it gets up there.

**Alie:** Do you ever just space out and think it's so weird that we can see anything at all? And what if I'm seeing everything in a totally different color spectrum than other people and like, "What's reality?"

**Reid:** I think about the second half, yes. I think, "What's reality?" consciousness, throws me through a total loop. The fact that we all have consciousness, and thoughts, and all those things, yeah. In my head, I assume we all see things mostly the same. Obviously, we all have different color palettes because there's people with color blindness. I don't know if what I see as red is what you see as red. Who knows?

**Alie:** Right. Now, are you color blind? 1 in 12 dudes, right?

**Reid:** I'm not. Yeah, it's a pretty big number. I don't know if it's exactly 1 in 12, but it's something like that.

**Alie:** I think it's 1 in 12 for men, and 1 in 200 for women.

**Reid:** Yeah, it's pretty common. But again, most people don't know that they have a problem, that's just how they experience the world.

**Aside:** Real quick, those rods in the retina are for low light vision, and the cones detect color. We have three cones that each pick up different ranges of light. Color vision deficiency tends to happen when one of those cones isn't working right.

The story goes that about a decade or so ago, while making protective eyewear for surgeons who worked with lasers, there was a California scientist named Don McPherson who accidentally stumbled upon some greatness. He invented glasses that separate certain wavelengths so that the eye can detect differences between red and green or blue. And so, for people who have an issue with their cones, this makes flowers and sunsets and leaves go from muddy, because those wavelengths are overlapping, to just like *acid trip vibrant*.

If you feel like bawling your face off, look up EnChroma glasses on YouTube or Instagram. Just google colorblind glasses videos. Side note: the more accurate

terminology in recent years is color vision deficiency. But people still use the hashtag colorblindness all over the place, so it's a good breadcrumb trail to follow. Either way, these videos are of these stoic dad types trying on their special sunglasses. It just destroys your composure in, like, the best way. One of the first ones I ever saw posted to YouTube by Aaron Williams-Mele has 2 million hits and features him. He nervously puts on this pair of these \$350 EnChroma glasses and with this quiet dignity just very calmly loses his shit. [clip from YouTube video: Aaron: "It's weird."]

He seems to almost struggle to keep his balance. He's washed over in this orange glow of a Virginia sunset, the first sunset he's ever seen in full color. [clip from YouTube video: "Is it a very noticeable difference?" Aaron: "Oh yeah. I'm shaking."]

Ten out of ten; would weep to anytime. I honestly just watched no fewer than 20 of these videos. My eyes are so swollen. I just kept watching and just kept crying. I knew what I was doing, I loved it!

**Alie:** Yeah, you just see all these videos.

**Reid:** People going like, "Wow!"

**Alie:** Yeah, crying. Oh god, it's wrenching.

What kinds of things do you have to treat? What's a typical day? How often are you scrubbed in *Grey's Anatomy* style in the OR?

**Reid:** I'm in surgery one to two days a week depending on the week. I was in surgery today. Mostly I'm doing cataract surgery; helping people see who can't see anymore, because they have cataracts that developed from aging. I see a lot of cataract patients, glaucoma patients, people with dry eyes, macular degeneration, diabetes, all sorts of stuff that affects their eyes. I spend three or four days in the office seeing patients.

**Alie:** And how many of your patients are just stone cold awake when you're operating on them and how many are just knocked the fuck out?

**Reid:** Probably 50-50, honestly. We give people anesthetic to relax them. You know, an IV and all that fun stuff. Everybody just responds differently to it. And I always tell people we're going to give *just* enough sedation that you're comfortable because the more you give, the riskier it is. And there's no need to do that with eye surgery because it's pretty quick. Cataract surgery takes like, eight minutes.

**Alie:** What!?

**Reid:** Yeah, it's crazy. It's so fast.

**Alie:** Wait. How is that possible? I've waited for smoothies longer than that! How can you do cataract surgery... both eyes or one eye?

**Reid:** Just one eye. Most people do one eye at a time. The surgery is like eight minutes but the whole process is, like, an hour and a half. The surgery is quick. You just go in and make a little incision. It's like 2.5mm. You go in and kind of vacuum out the cataract, and you put a new lens implant to replace it, and you're done. It's quick.

**Alie:** I don't get that though. With a cataract, do you take out the lens that's there or do you put another lens on top of the lens?

**Reid:** We take out the lens. The cataract is the lens itself getting cloudy. I always tell people, like, think of your camera. If you've got an old camera with a cloudy lens, you need to replace it with a new lens. That's what cataract surgery is. It's just a lens replacement. We take out the old one and put in a plastic artificial one, that's clear, so people can see again.

**Alie:** My dad had that surgery done, one at a time.

**Reid:** Not by me.

**Alie:** Not by you.

**Reid:** I'm not offended.

**Alie:** I'm so sorry! We had no idea! I should've been like, "Dad come down here." But in low light he has the most shimmery, cartoony, unicorn eyes. They're like "bling bling bling." Why is that?

**Reid:** The lens is plastic. So, you're catching a reflection off of it. What happens is in the low light his pupil gets big. His pupil dilates and you see more of the artificial lens and you get more reflection off of it.

**Alie:** Oh my gosh. So next time you know someone with cataract surgery, just take a gander.

**Reid:** You'll see a twinkle. There will be a light off in the distance and you'll catch that twinkle in someone's eye and you'll know they had implants from cataract surgery.

**Alie:** You're like, "What are you? Santa Claus? Where did that come from?" [*twinkle sounds*] So different colored eyes... The iris is the color part? What's the function of that? Also, I heard that everyone who has blue eyes is related to each other somewhere down the line by one person who just had crazy eyes.

**Reid:** Well technically, we're all related if you go back far enough. So, probably true. But the different colored eyes, evolutionarily-wise, if you grew up somewhere and your ancestry was Nordic, where there wasn't as much sun, you're more likely to have light-colored eyes because it doesn't matter if too much light is coming in the eyes, because there's not a lot of light. It's just like having darker skin or lighter skin. It's melanin deposits in the eyes. If you grew up with your ancestry around the equator, you'd have darker skin because there's much more light, and your body needs to adapt to that.

**Alie:** And melanin can be blue?

**Reid:** It's not that the melanin is blue, it's the amount of melanin in your eye changes what it looks like. If you have a really light-colored eye, you don't have as much melanin in your eye.

**Alie:** Then why are eyes blue or green? What's causing those colors?

**Reid:** Again, it goes back to the wavelengths coming out of your eye. Like, “Why is the sky blue?” That age-old question. It’s not that the sky is blue, it’s that the light that bounces off the sky is coming off at the wavelength that is blue.

**Alie:** I’m glad someone explained that to me because I still sometimes struggle with that concept.

**Aside:** The physics of the blue sky is called Rayleigh scattering, and that has something to do with the size of the particulates. But in the eye, in the iris, it’s called the Tyndall effect. It’s not that Frank Sinatra or your neighbor’s cool husky has blue pigment up in their ol’ peepers, but really a lack of pigment that lets the shorter wavelengths in blues scatter and reflect back. It’s called a structural color, and it’s why if light changes in the room, or if one were to wear a different shirt, eye color can appear to shift a little because they’re just like freaky translucent bounce boards.

Speaking of colors, I did not know that different colored lasers can do different things. And Reid mentioned that a red laser can penetrate through different types of tissues than say, a yellow laser which then made me be like “Oh shit man, lasers. Okay.”

**Alie:** Have eye lasers been a real game changer?

**Reid:** Yeah, thankfully for me, I didn’t have to experience that too much because they’ve been around for a long time, but eye lasers in some capacity have been around for decades. People used lasers for Lasik, and treating diabetes in the eyes, and all sorts of other things. That’s been around for many years, 30 years, but there’s newer technologies and newer types of lasers all the time and people always try to figure out new uses for that stuff.

**Alie:** When you did your first surgery and were like, “I’m about to work on a living person’s eyeball.” Were you nervous as hell?

**Reid:** Probably. I don’t remember it too well now. It’s been a few years. You have somebody sitting with you. It’s not like you’re just out in the wilderness operating on somebody. And if you’re doing something wrong, they’re going to say, “Okay, step aside. Let me take over,” and they’re going to get things back on course for you. It’s not like you’re all of a sudden just out on your own trying to operate on somebody and you just hope for the best.

**Alie:** I picture there’s just like somebody, maybe a nurse or anesthesiologist in the room, and everyone’s like, “Alright doctor. Go for it.” And you’re just shit out of luck. You can’t look anything up, and if you screw up or you sweat on someone... I just picture you being totally on your own.

**Reid:** Thankfully, unless you went to some terrible training program, by the time you graduate and you go out to the real world where you do have to be on your own, you feel pretty confident. But it’s still a weird feeling the first time you operate out in private without a teacher with you. It’s definitely a weird experience. Anytime you’re doing something you don’t know how to do well yet, you feel out of your element and you feel

like you're pretending a little bit, and you learn and you get better and better until you're really good at it.

**Aside:** Alright, I'm about to spill like a thimble's worth of tea about my personal life here but, Reid and I are like bro-buddies now, but before he met his amazing, smart super badass, hot wife Erin, [ph.] years and years ago, friends tried to set up me and Reid.

**Alie:** I remember because - full disclosure - we've been on a couple dates.

**Reid:** True story.

**Alie:** And I remember, like, eight years ago, being like, "How was your day at work?" and you said the words, "Ruptured globe," and I was like, "Say no more!" And I remember thinking, I would be the worst girlfriend because I can't even... I couldn't process what your job entailed. It seemed like a warzone. Ruptured globe. How does that happen? Was there a paintball accident? Was there a car accident? [*horrificed gasp*] Does this ever affect you? How much of the details of your job do you tell your wife?

**Reid:** When I was in training I trained at a county hospital, so you saw a lot of crazy stuff. I have some crazy stories.

**Alie:** Tell me a crazy story!

**Reid:** Oh sure, I'll get to that. But I'm in a boring private practice now. I don't come home with crazy ruptured globe stories too often. But I come home and my wife is like, "How was your day?" normal husband-wife kind of stuff, and if something crazy happened I'll tell her, but usually it's not that gut-wrenching these days in my day-to-day work. So, ruptured globe stories, I've got those coming out of the ears.

**Alie:** Oh no! What's a story you can tell me where I won't throw up in a garbage can right now?

**Reid:** Should I get a garbage can ready? Do I need to be prepared just in case?

**Alie:** No, I'll throw up down my shirt, it's fine.

**Reid:** Okay. The craziest story I've had...

**Alie:** Oh god... Oh god... Okay.

**Reid:** I'll tell the story the way I like to tell it because I usually save what it actually is 'til the end, you know, to add some drama. So, I'm on call. I'm at the hospital, and I get a call from the emergency room downstairs. And it's getting kind of late in the day, so they call me and they say, "We've got a guy down in the emergency room. He fell off his bike four days ago, and his eye is swollen and red and he can't see very well. He saw an eye doctor in the community, and they told him he needed a CAT scan, so they sent him here." And I said, "Cool. Get the CAT scan and call me back." This was like at 6 or 7pm at night, and I'm checking the radiology program on my computer looking to see when this CAT scan comes up, and I'm just sitting in the on-call room hoping I can get to go catch some sleep soon. I pull up the scan...

**Alie:** [gasps]

**Reid:** And I see...

**Aside:** Alright, just please prepare for this. And also, I was editing while I was making tea and I didn't know that the kettle was done because in my headphones my screams sounded the same as the high-pitched tea whistle screaming. Okay...

**Reid:** I pull up the scan and I see a picture of a nail that's probably five inches long, I swear to God, going through his entire eye and up into the frontal lobe of his brain.

**Alie:** [screams, moans, OMG's throughout the story]

**Reid:** And I was like, "Uhh, I think I need to run downstairs to the emergency room to see what's going on here."

**Alie:** [still horrified] Oh, my god.

**Reid:** Patient had no idea it was in there. He lied when he said he fell off his bike. The real story was that he was working construction, and the nail gun he was using backfired and it hit him in the face so hard that he passed out, so he didn't know what happened. And the nail went... [Alie still gasping and squeaming] I wish the listeners could see your face right now. The nail went through the side of his nasal fold and up through the eye, and it went through so fast that you couldn't even see the incision where it went in because it was right on the fold of the nose. It was like the perfect angle that he didn't know it happened; he just knew his eye hurt.

**Alie:** Oh, my fucking God.

**Reid:** Obviously, we took him into surgery and took the nail out. He kept his eyeball, amazingly. But he's not seeing very much out of that eye because he had a retinal detachment and all sorts of other problems. He stayed at home for *four days* with that thing in his eye before he came to the hospital.

**Alie:** [muffled like her face is in her shirt] I'm on the verge of throwing up but I'm not going to. I'm swallowing a very a lot. Oh my god. Okay. Two questions. Did it touch his brain? Did he get to keep the nail?

**Reid:** So, yes and no. It did touch his brain, but he didn't get to keep it.

**Alie:** Why didn't he get to keep the nail?!

**Reid:** That's a good question. That's a question for the neurosurgeon who took it out.

**Alie:** Oh, he should have given him the thing!

**Reid:** Yeah. I don't remember him getting to keep the nail.

**Alie:** Did it hurt his brain?

**Reid:** No. I mean, the frontal lobe is hard to quantify whether that hurts the brain or not. If you remember back to the story of Phineas Gage, he had the nail...

**Aside:** See the 1848 accident in Vermont where a 25-year-old railroad foreman had a 3-foot metal spike blast through, and out, of his skull and lived for 12 years after.

Albeit, a little less inhibited. Side note: Google image search Phineas Gage and you will pull up, like, a daguerreotype with sultry lighting of a bizarrely hunky dude, and he's just holding this railroad spike like a staff. After the fact, he traveled with it. He held on to it for the rest of his life. Also, I realize it's disrespectful because this involves massive head trauma, but the dude could *still* get it. 100% would still hit that.

**Reid:** And the train spike or whatever it was, the railroad spike went through his frontal lobe and it just changed his personality. Like, you can live a normal life but it just disinhibited him. But this was just barely in his brain. I don't think it probably did much.

**Alie:** Oh my god, what if he's just like so good at dancing and karaoke now?

**Reid:** Yeah and it's all thanks to that nail gun.

**Alie:** He's just like, "I found out I'm an opera singer!"

**Reid:** He could be painting Picassos. He could be the best artist in the world right now.

**Alie:** Were you there to deliver the news?

**Reid:** Oh yeah, I was there. We were more, at this point, just so amazed because he didn't tell us what actually happened. We were like, "Come on, tell us what really happened. We know you didn't really fall off your bike. There's a nail in your eyeball."

**Alie:** Oh my god. When you told him, was he in shock? Did he laugh? Did he cry?

**Reid:** Yeah, he was amazed. But obviously not surprised because he knew what actually happened.

**Alie:** He's like, "Yeah, I did get hit in the face with a nail gun..." Oh my god, full-face helmets from now on with nail guns, guys.

**Reid:** Definitely.

**Aside:** Okay. So, picture an otherwise normal-looking x-ray film with just a giant nail floating in the middle of the brain. Just astonishing survival. And I googled to see if maybe this particular story, like, made the news. And you guys, I didn't find it, but I found several other stories of men who had nail gun accidents and didn't know until the x-rays came back. The wounds were so clean. But nails lodged in their brains. Somehow in the stories I read, everyone survived and was fine. I have no explanation for this.

But I did ask, and Reid and other doctors will always do CAT scans instead of MRIs in the case of any kind of trauma just on the off chance that there's some metal up in your dome. Which, if you remember from the radiology episode, would be a very bad scene. Okay, but all those people that I read about happened to have survived. Whew. Okay.

One more story, but it's very intense and was inspired by that chill Bible verse about any eye that causes you to sin should be, like, 86'd. I'm just going to give you literally the briefest of details.

**Reid:** Um, but... took two pencils. And you can imagine the rest.

**Alie:** No!

**Reid:** The pencils did not touch her eyes amazingly.

**Aside:** The good news, in this story everyone lived. Uhh, bad news, not with great vision.

**Alie:** Have you ever had any close calls with your own eyeballs?

**Reid:** No, I have not thankfully.

**Alie:** Have you ever worn mascara?

**Reid:** I haven't.

**Alie:** Do you ever see eye makeup or beauty treatments, and you're like "That. Is. Not. Good. For. Your. Eye. Don't do it!"

**Reid:** Oh, all the time. We see a lot of patients for dry eyes, people who come in and their eyes are irritated. They burn, they scratch, they're tired, teary, all that normal stuff that we complain about. People come to the office to get examined, and I look at their eyes, and their tear film has just little black specks of mascara floating all in in because they put so much mascara on that it's just floating in their tears. Of course your eyes are irritated; your eyes are just sitting in mascara goop all day long.

**Alie:** Oh no, that makes me want to cry because I think mascara is made of, like, wood pulp.

**Reid:** Is that right?

**Alie:** Yeah, like part of what we adhere to our eyelashes to lengthen them is wood pulp.

**Aside:** True story. I mean, sort of. Mascara can contain rayon fibers which are processed cellulose derived from wood pulp. On your eyeballs. Are we batshit? I mean, maybe. But is mascara batshit? Well, according to the 2010 episode of the Kid Rock-looking, rat trapper show, *Billy the Exterminator*:

*[clip from Billy the Exterminator]*

*Guano is beneficial to man. The number one thing we use bat guano for is mascara. Yes, ladies, when you use your mascara, you're painting bat guano on your eyes. It's okay, they kill the diseases, it goes through a process, but that's all it is. Bat crap."*

I checked into this, and mascara does not contain guano. Rather, it has this shimmery substance called guanine, which, don't worry, this is simply derived from putting dead fish scales in an industrial blender. Like a fishy milkshake. Mmm. Who's hungry? Speaking of a sugar-rush...

**Alie:** How does diabetes affect eyes?

**Reid:** That's a really important question, because diabetes is one of the leading causes of blindness in the world. What ends up happening in the eyes is the retina, which is where the rods and cones are, the film in the camera, there's a lot of blood vessels there. So, the blood's not working properly, the tissues get what we call 'ischemic' when there's not enough blood tissue perfusion.

**Aside:** Blood tissue perfusion just means that blood is getting where it needs to go. Like no traffic on the 405, all is right with the world.

**Reid:** The retina gets damaged from lack of perfusion, lack of proper blood flow. And then the response is a signal to say, "I need more blood vessels. This isn't working for me; I need better blood." All that VEG-F or 'vascular endothelial growth factor' floods into the eye, and kinda floats in the eye, and the eye starts making all these new little wispy, crappy blood vessels. Those blood vessels aren't good healthy blood vessels and they break, bleed, they scar. They cause all sorts of problems.

**Aside:** If left unchecked; these issues can lead to blindness. Go to the doctor if you can. Now, one thing they can do to help is use anti-cancer drugs for it. Like, really? What in the Sam Hill? How does that work?

**Reid:** We actually inject it into the eye, and it turns down that signal, so the blood vessels start to shrink down. Those new little wispy, crummy blood vessels shrink, disappear, and you can reverse some of that. Some of the damage is permanent, but you can reverse some of it.

**Alie:** Huh. I hadn't realized that diabetes and eyesight were so linked. I had no idea. I'm sure you're seeing more and more of that.

**Reid:** We see tons of it, yeah. One of the really important things if your family or friends or yourself are diabetic, yearly eye exams are so crucial. Because if you catch it early, we can treat it with lasers or injections, different things that stop it from happening. So, we can really save people from going blind if we treat it early.

**Aside:** Speaking again of eye lasers... [*laser sounds*]

**Alie:** Okay. Let's talk Lasik. So many people have gotten it. I'm going to let you know, so many people I know who've gotten it and had crappy experiences, and I'm scared of it.

**Reid:** That's too bad.

**Alie:** And I'm sure there's so many people, I know, who've gotten it and it's been nothing, but it's only the vocal people who are putting on Facebook that their eyes are bleeding or whatever. But what happens with Lasik? How safe is it?

**Reid:** Number one thing: it's very safe. Like anything, you hear the bad stories and you don't hear the good stories. Everyone who has a bad result is going to talk about it. The 99% of people who have a perfect result are just going along with their lives and are happy. The loud people are the people who are unhappy, for everything, medical procedures included.

**Alie:** How come you haven't gotten it?

**Reid:** I don't mind wearing glasses. I have a small prescription, so I'm happy wearing glasses. I think I look dapper with glasses. I'm happy with them.

**Alie:** It's a good look and it's on brand for you.

**Reid:** Exactly.

**Aside:** So, you might say that, for Dr. Wainess, the “glasses” half full. *[DJ airhorn]*

**Reid:** Lasik is basically re-shaping the eye to build your prescription into your eye. Your glasses work by bending light. The way your eye works is that the cornea and lens bend the light coming into your eye and it focuses on the retina. If you don’t need glasses at all, that means it’s focusing on the right place, it’s focusing right on your retina. If you’re nearsighted it means your eyeball is too long, so the image is actually focusing on the middle of inside of your eyeball and not making it all the way to the back of your eye to where it’s supposed to be.

**Alie:** No way. So, I’ve got long eyeballs?

**Reid:** You’ve got long eyeballs.

**Alie:** No way. I never realized that. How did I not ask that earlier?

**Reid:** The more nearsighted you are, probably the more elongated your eyes are. The average eye is 23-24 millimeters long. I have a patient scheduled for surgery who has an axial length of her eyeball that is 31 millimeters, so they’re really, really nearsighted. The longer your eye is, the higher your prescription. The way your glasses or contacts work, is they bend the light in a different way. The light coming into your eye is hitting the focal point at the wrong spot, so the lenses you put in front of your eye change the way that light is bending so that it focuses at the correct place. Lasik is doing the same thing. We’re reshaping the cornea to change the way the light comes into the eyes, so it focuses in the right place.

**Alie:** But you’re not changing the length of the eyeball.

**Reid:** Correct. We can’t change that.

**Aside:** So, Lasik: they flatten, or they steepen the angle of that cornea, that dome that covers your iris, and that changes the way that the light bends before it hits your little jelly lens inside.

**Alie:** And so why does it not work for some people? Can your body grow it back to whatever bad shape it was to begin with?

**Reid:** Your eye does change. If you laser your cornea to a different shape, it’s not going to regress back to the old shape it was because they actually remove layers of your cornea and they’re gone. That’s what the laser does. The laser is ablating or destroying layers of your cornea to flatten it out. So, it’s pretty crazy stuff when you actually think about what’s happening. It’s amazing that it works and that people figured it out.

**Alie:** And it doesn’t hurt?

**Reid:** It doesn’t hurt. You put an eye drop on there that numbs it, and it will burn for a few seconds when you put the numbing drop on, and then it doesn’t hurt at all.

**Alie:** And when our eyes get worse and worse every year, is it because our eyeballs are getting longer? What is happening?

**Reid:** Most of it is a change in the lens inside of the eye, the cornea inside of the eye.

**Alie:** Alright, let's talk about eyes and phones. I feel like I worry that my phone is making me cross-eyed. Or giving me, like, one wonky eye. Do I have a wonky eye?

**Reid:** You don't have a wonky eye.

**Alie:** Are you lying to me?

**Reid:** I'm not lying to you. And if I was, I wouldn't know which eye to look at.

**Alie:** I feel like in pictures sometimes I'll look, and I'll be like, "Where are my eyes looking right now?"

**Reid:** You might have just not been looking at the camera? That's possible.

**Aside:** PS, we took a quick selfie on his porch for Instagram after we recorded, and sure enough, I was just looking at the screen of my phone instead of the actual camera lens, and my eyes looked weird. And he was like, "Oh my god. What a dipshit."

**Alie:** But are phones doing terrible things to our eyes?

**Reid:** Yes and no. They're not doing anything that bad. They're making our eyes more dry because any time you stare at something intently, your phone, computer, a newspaper, you don't blink as much so your eyes get drier and drier. And the tears have different layers in them, and there's oil that comes from our eyelids, and we know that doing a lot of close up work and using screens makes that oil production not work properly. It works, but it just doesn't work as it's supposed to. So we get blockages in the oil glands in our eyes, it's very common. People at our office, I can see that their oil glands are all plugged up. And you literally just put heat on it and that helps. You put hot compresses on the eyes or nutritional supplements like omega-three fatty acids. That kind of stuff helps.

**Alie:** How can you tell? Are there little bumps?

**Reid:** There's little glands. If you google 'meibomian gland', you'll see tons of Google images of people's meibomian glands, and you'll see these little white dots at the base of every eyelash pretty much. And in somebody with blockages they kind of look big and bulgy. So, it's like a pimple. It looks like a tiny pimple. A little blob of white goop that's stuck there because the oil's not flowing properly.

**Aside:** Okay so I did look this up. And, oh god, so if you've definitely desensitized yourself to Dr. Pimple Popper and you're looking for a stronger, barfier fix, feel free to saunter into the dark underworld that is a YouTube search for meibomian gland expression, wherein a doctor just gently wedges a metal paddle into your eye and then presses your lid into it, erupting what appears to be butter in a linear fashion like the Bellagio fountain in Vegas only tiny, oily, and out of your eyeballs. [*Hallelujah Chorus*]

**Reid:** That's what you're doing to your eye when you stare at your phone. You're making it dry and you're disrupting the oil mechanisms of the eye. You're not causing yourself to go blind. You're not going to cause any permanent problems. You're just irritating your eye.

**Alie:** Oh God, I had no idea. But it's not going to be something permanent.

**Reid:** Well, it's permanent in that you're not going to give up your phone. I don't think we're going to have a purge and all get rid of technology.

**Alie:** I don't know...

**Reid:** Maybe we will. It's possible

**Alie:** I feel like the apocalypse is nigh. I mean that in a good way. Let's just start over.

**Aside:** Sidenote: Reid had also told me that the puff test at the doctor is measuring your intraocular pressure. Like, if the air flattens it, not enough pressure, but if it barely budes, you might have a bulge issue. Like possibly from glaucoma. So, contrary to common beliefs, it's not merely a tool to scare the shit out of you and deliver perverse joy to eye doctors.

**Alie:** Also, are tears different depending on if they're tears of joy or tears of sadness? Have you seen that thing going around?

**Reid:** Tears are different. I don't know about the emotional component of the tears, but there are definitely different proteins in your tears for different things. We all have tears in our eyes 100% of the time, and when we cry we make a totally different type of tear. If you looked at them under a microscope, they would look totally different. And I think this might hold true for different emotions as well.

**Aside:** A few years back photographer Rose-Lynn Fisher released a series of dozens of microscopic images of dried tears, and tears apparently have three types. There are basal tears. Those are the everyday ones that our eyes use just to stay moist. There are psychic tears caused by grief, laughing, or frustration. Then there are reflex tears which are caused by onions or dust. Rose-Lynn Fisher collected over a hundred samples from herself and other volunteers and they all dried in these really beautiful and wildly varying patterns. They look like land from an aerial view, like a stark black and white satellite map, and so she called the project, *Topography of Tears*.

Some of the variation can depend on the drying conditions and the salinity, but psychic tears, the emotional ones, do contain more of a protein-based hormone that acts as a painkiller. When you're out there like having a good face rain, watching a dude having a face rain wearing color vision deficiency glasses, your body is like, [*pretend crying voice*] "This much beauty, this much beauty... it hurts me, make it stop." Humans are so cute. But also, we get befuddled a lot. For example:

**Reid:** But people always get really confused because they come to the doctor and they say, "My eyes are watering," and I'm like, "You have dry eyes," and they're like, "No I don't. I have wet eyes." And it's like, no, your eye is crying because the tears that are supposed to be sitting on the eye all the time, which are a different type of tears, aren't there.

**Alie:** That's so funny because if I were your patient I'd be like, "Look, my whole face is wet."

**Reid:** You're tearing to fix the fact that your eyes are dry with a different type of tear that's not doing what you really need.

**Alie:** Oh, okay. I got it.

**Aside:** Reid started telling me another story about his days in the trenches as an emergency eye doctor and a 16-year-old patient he saw. And I'm going to redact most of it and just let you visualize the rest, but...

**Reid:** A firework wasn't working, homemade firework of course.

**Aside:** Okay. That's all you need. Let's just say he has one glass eye now. Or, does he?

**Reid:** He was an inspirational kid. Just, like, got him an artificial eye and he was happy. It looked good and he lived a normal life.

**Alie:** How do those glass eyes work?

**Reid:** They're not glass eyes. Maybe a hundred years ago people used glass eyes, I don't know when, but nobody uses glass eyes now. Basically, you take out the eye and you put a ball in there. It could be like a silicon implant ball or like a little porous implant, and basically you cover it with the membranes that normally cover the eye. You actually remove the eyeball itself, but you leave all the membranes on it. The whole eye would just be white like your eye is now, just white across the whole thing. Then they get a little prosthetic shell that's like a giant contact lens and it sits on top of that, and they paint it to match your other eye. You probably have interacted with people that you don't even know have a fake eye because it's painted to look exactly like their other eye.

**Alie:** What's that job like? Is that like an artisan?

**Reid:** It's really cool. It's called an ocularist.

**Aside:** Reid told me that this job is called an ocularist. And in case you need someone, Dr. Stephen Hadad in LA is one of the best in the world. And wouldn't you know it, it was Friday night and I just found myself 17 photos deep in this ocularist's website. They have a patient gallery, and I am genuinely thrilled to report that it is extremely unsatisfying. Just a bunch of photos of totally garden-variety, nice-looking people. Nothing out of the ordinary. Everyone just looks like healthy and happy. So... good job.

**Reid:** There's just amazing, artistic people who do phenomenal work.

**Alie:** So, over the implant is actually your tissue?

**Reid:** Yeah. Most people don't really understand the anatomy of the eye, but the white of your eye is the sclera, but then there's the conjunctiva which is the membrane that covers it. You've actually got different layers there. You can remove the eye but leave the conjunctiva. The sclera would be gone because the eyeball itself is removed, but the membranes that sit on top of that can be closed up. You put a fake eye behind it, and you close those membranes on top of it.

**Alie:** And then how often do you have to put in that kind of covering?

**Reid:** Most people wear it all the time, depending on the person's comfort level since it's like a giant contact lens. But they give you a little plunger so you can pull it out like a contact lens.

**Aside:** So, some fun celeb trivia. Sammy Davis Jr. and Peter Falk, who played the Detective Columbo, both had eye implants, and what's even cooler than that is that you've probably met a ton of people in real life who have them, but ocularists are such skilled wizards that you'd never know. It's like no biggie. Okay onto one more thing that you don't know.

**Alie:** Okay. Are you ready for rapid fire round?

**Reid:** Let's do it.

**Alie:** Okay. Now, you've looked at these questions.

**Reid:** I cheated, yeah.

**Alie:** I saw you became a patron and I was like, "Number one, it's fine if you want to become a patron to look at your questions..." but you don't have to give me five bucks a month. You could do it for a dollar a month.

**Reid:** It's okay, I support you.

**Alie:** I was like, "You could have gotten in for a lot less."

**Reid:** No, you asked me to do this podcast and I started listening and now, I enjoy *Ologies*. So, I'm a patron now.

**Alie:** All right. But I was like, "You didn't have to come in ballin' so hard."

**Reid:** No, I can. I can handle \$5.

**Alie:** Okay, well if you need to drop it down to one, if for some reason if you don't like it.

**Reid:** Yeah, if we need to start a college fund or something for the baby. *[laughs]*

**Alie:** *[laughs]* Drop it down to one. I love also that if anyone hears any munching or bowl scraping, that's your li'l pup. Your pup that has cataracts.

**Reid:** Definitely does. He's 16 years old. He's an old little guy.

**Alie:** Do you ever want to do cataract surgery on your dog?

**Reid:** I don't. I don't know much about operating on dogs, and also people are much easier to anesthetize and keep still than a dog. I can't even brush my dog's teeth because he's a spaz. The thought of operating on his eyeball does not excite me.

**Alie:** He's like, a living demonstration of what cataracts are. Okay, so rapid-fire questions. Here we go. We're going to try and get through as many as we can. We'll see.

Kolleen Thompson asks: Can you really get a weed card for glaucoma? Asking for a friend. It's me.

**Reid:** Well, thankfully you can pretty much get a weed card for anything, so you just have to tell them, "I have anxiety," and they'll give you a weed card. It's actually a common question about marijuana and glaucoma. Marijuana does help glaucoma. Glaucoma is a disease where the nerve in your eye gets damaged, and the way we treat that is by lowering the eye pressure, and smoking marijuana or ingesting marijuana lowers your

eye pressure. [*Whoa!*] However, it does it for a very short period of time. We have medications that work much, much better. You put an eye drop in your eye once a day and it's going to lower your eye pressure for 24 hours. You smoke a joint, it's going to lower your eye pressure for maybe an hour. We don't prescribe it for that because it's not as good of a treatment as the other treatments we do have.

**Alie:** But also, it gives you feathery, feathery eyelashes, right?

**Reid:** The glaucoma drops do. Yeah, they absolutely do. And that's what Latisse is too. It's the same thing. If you ever go in and buy Latisse you're just buying a glaucoma medication. The reason they came up with Latisse is that glaucoma patients were getting thick eyelashes. People were taking these medications, they noticed their eyelashes were growing and getting thick and so they were like:

**Aside:** "Well hot diggity dog we can make some real cheddar off this!" That's what I'm guessing they said. Also, April Fahr asked: How does Latisse work? I thought you just painted it on your eyelid skin to make the hair grow thicker. But a listed side effect is possible darkening of your eye color. Should people be fooling around with this, for the sake of spidery lashes?

**Reid:** It can be true, yeah. The medication, it doesn't do this on most people, but it can. The lighter your eye is to begin with, the more likely it is to happen. The medication has been shown to do this in people with glaucoma, same thing. It's a risk if you're taking it as Latisse because it's the same medication. It does get into the eye, that's how it treats your eye disease, and it can change the melanin in your eyeball, in your iris, and it can darken the color of your eyes.

If you have brown eyes to begin with, it's not going to lighten your eyes, it's not going to change them, so it is rare. But you can have people with blue eyes kind of get darker eyes while they're taking that medication. From glaucoma it can happen, and if you're using it with Latisse it can happen as well. With Latisse, you're applying it more on the eyelashes so it's probably less likely to happen if you actually think about it because you're not soaking your eye in it. But it absolutely is a risk.

**Alie:** I mean I've looked into it. It's so expensive. It's like \$100 a month.

**Reid:** That's why it's nice that I get samples of the glaucoma medication, so if my wife wants it, I can just bring her home some samples. We have lots of people who do that. Like, we'll have technicians in our office who take a bottle home and just put it on a mascara dropper and then rub it on their eyelashes. A lot of the reps do it. All the reps for the glaucoma medications do that. Absolutely.

**Alie:** And I hear that it's way more expensive when it's Latisse versus when it's a glaucoma medication.

**Reid:** Well of course it is. Yeah, obviously when they're selling anything for cosmetic purposes, they are going to jack up the price.

**Alie:** Susan Curro wants to know: How bad are lash extensions for your eyes? Professionally done.

**Reid:** Probably fine most of the time. Again, any foreign body or foreign substance around the eye can cause irritation. It's not gonna cause you to go blind, but you can have an allergic reaction. I've had people come in with lash extensions with super swollen eyelids and itchy, burny kinds of allergic reactions. If you've had them multiple times and you've never had a problem, it's not going to cause any problems.

**Alie:** It's so weird to be like, "Oh, we're just going to glue some human hair on our eyeballs."

**Reid:** Most people will do fine. I wouldn't worry too much about it.

**Alie:** Jessica Bomgardner and Liz both said: My eyes are green, but sometimes I think they change to blue or gray depending on what I'm wearing. Is that bogus or is the color really bringing out my eyes?

**Reid:** As far as bringing out the eye color, your eye is not changing, your eye is the same. If you wear a different color shirt, it's going to bring it out because of the contrast between the different colors, or it might be reflecting off something. If you catch it in a different light, things like that, your eyes can look different. You sense the color based on the light bouncing back to you, not what the color actually is. You can see the same item in two different lights and it looks a little different because different colors come out differently when they're refracted by a different amount of light.

**Alie:** It's like when I turned the lights off in this room, this table gets darker. Is the table actually getting darker? No. One day we're gonna have chromatophores like octopuses, and we're going to be able to change them at will.

**Reid:** That'd be pretty cool.

**Alie:** One day. I'm sure the Latisse people are going to get on that. Anna Thompson wants to know: Do contacts makes your eyesight worse over time or was that just something my parents told me so I would get glasses instead of contacts in high school?

**Reid:** People do what's called orthokeratology where they wear hard contact lenses overnight while they sleep, and it actually flattens your cornea out. So, when you wake up you don't need glasses the next day. It's actually a big thing in Asian populations, especially in Los Angeles. We have some offices out in the Rowland Heights and Saint Gabriel which are a big Chinese and Korean populations, and it's really big out there.

A lot of these patients, their kids are 15 and they are nearsighted and they don't want to be, so instead of having to wear glasses or contacts during the day, they sleep with these orthokeratology contacts and then they wake up the next day and they can see. And then if you don't wear them for three days, you're gonna go back to being nearsighted again. But as long as you wear them every night, your eye kind of stays up and the cornea stays flattened out. So, you can see well.

**Alie:** It's like a retainer for your eyeball?

**Reid:** Yeah, I like that analogy.

**Alie:** It's like a waist trainer. It's like a Kardashian corset.

**Aside:** PS, before you go google these old-school corsets that are racking up all kinds of new money, please know that a year or two ago, the ones that Kimmy K and the Krew endorsed, got sued for false claims and misleading consumers, and they lost. So don't squeeze your organs into an elastic vice because you're fine the way you are, and social media is a lie. Okay, bye.

**Alie:** I can't imagine it's comfortable, but whatev. Okay, Lauren Eggert-Crowe wants to know: How can you keep the whites of your eyes super white, like what causes them to be yellow and dingy and bloodshot?

**Reid:** Sure. So, your eyes are white in the sclera, but then as we talked about, there's little membranes that cover it, like the conjunctiva. There are blood vessels that flow through all of that. The blood vessels are red. When the eyes are red, it's those blood vessels getting dilated. And that can be because they're irritated. It can be because you ingested a drug that makes your blood vessels dilate. If your blood vessels are big, you're going to have redder eyes. The yellow is usually little fat and cholesterol deposits in there as well.

And that stuff just kind of comes out when your eyes are tired or dehydrated because there's less fluid around there and things kind of stand out a little bit more. The best thing you can do to control that stuff is to make sure your eyes aren't dry. Try putting in artificial tears, not the redness removers, lubricating the eyes. Refresh, Systane, any of those artificial tears that you see when you go to the drugstore and there's like a wall of 8 billion different products that you have to decide which one's going to work for you, but any of them that say artificial tears to lubricate the eyes, will help.

**Alie:** I can't believe that the yellowness is like fatty deposits. That's gross.

**Reid:** It's not that gross.

**Alie:** Iiiiiit's a little gross. I mean, thinking of like just having like chicken fat under there.

**Reid:** It's not chicken fat.

**Alie:** Okay, but it's like eye schmaltz.

**Reid:** Maybe a little bit.

**Alie:** [*squeams*] Okay. So, hydrate, hydrate.

**Reid:** But again, it's not just about that. Diet plays a big role too, it's not just about how much water you drink, it's about what vitamins you're eating. Americanized, Westernized diet is very low in omega-three fatty acids for example, and we know that having a high dosage of those things can help dry eyes.

**Alie:** Oh, the next question on my list from Julie is: What habits or foods can the average human do to extend their eye health?

**Reid:** Thank you Julie for that wonderful segue. But you know, eating healthy, obviously is important for the health of everything in our body, and the eyes work just like everything else does. Vitamin A, for example, is good for the health of the retina, and that's why they say eat your carrots because carrots have vitamin A. Eating things that

have... green leafy vegetables, which have high antioxidant level in them, are very important for the health of the eye. Diseases like macular degeneration...

**Aside:** Macular degeneration, by the by, tends to affect more folks over 60 and it's when the central portion of the retina - remember the film in the camera at the back of the eye - deteriorates. It kind of looks like the center of your vision blurs. I started looking up images of simulations, and then I started thinking of grandmas and grandpas not being able to see their own birthday cakes or trees or their grandkids, and I then I started having these painkiller saltwater things come out of my lacrimal glands. So, how can we prevent this?

**Reid:** We know that antioxidants are really important. Whenever somebody comes in and is diagnosed with macular degeneration, we put them on an antioxidant supplement.

**Alie:** Like, eat more blueberries!

**Reid:** Well, we give them a pill, but that's important too. So yeah, eat blueberries, raspberries, eat green leafy vegetables, all that stuff is really important for you and the aging health of your eye. Studies have come out that have shown that you're more likely to get a cataract if you have a diet that's low in vitamin C. Just eat healthy. That's really what it comes down to. There's no magic bullet. Just eat healthy, and your eyes will be given the best chance you can. And you know, sometimes you have genetic diseases that you can't control, but the healthier you eat, the better you're going to do.

**Alie:** You know, I did have a makeup artist I worked with who had really lovely skin and she was telling me that she just takes a lot of vitamin C and it helped her skin a lot and I was like, "Oh, I never thought about vitamin C being helpful for anything other than colds."

**Reid:** Oh yeah. You know, think about it, if we didn't have vitamin C people would get scurvy. It's so important for the health of your body.

**Alie:** I only think about it when it comes to being like, "Oh, I got a cold." Yeah.

**Aside:** I'm sorry Vitamin C for just booty calling you when I'm sick.

**Alie:** Hereiskarl asked a semi-serious question: When will eye doctors get equipment that can automatically detect what your vision is so you don't have to go through those nerve-wracking questions about which is better; number one or number two?

**Reid:** Good news, Karl, we already have it.

**Alie:** What!? I had to go through this two days ago!

**Reid:** Yeah. Well, here's the problem. It's not as accurate. We use that as a starting point, and then we fine tune it. You can go on the machine that will spit out what it thinks is your exact prescription for your glasses. It's going to be pretty close to perfect. Sometimes you'll do that and you put that in the little machine, which called the phoropter, where we do the one and two, and you don't have to make any changes, and it's right on the money. But sometimes you do.

**Aside:** Yes, okay. Briana Pfaus wants to know:

**Alie:** What is happening when you're saying, "Better one, better two?" And also, for me, I thought I was the only person who felt this way, but every single time I'm like, "What if I'm saying the wrong thing and I can't tell?"

**Reid:** It doesn't matter. So, one or two, what we're doing is we're comparing two lenses. We're flipping little dials inside that machine. Basically, we're just playing hot and cold. That's what we're doing. We're going higher and lower with the numbers till we kind of get to where we know you are, and if you think you're wrong, we double check.

**Alie:** Oh, you do?

**Reid:** Yeah, so you don't have to worry. I mean if you're like really, really bad at it, you could screw it up, but 99% of people say, "One," and then we test it again and then if they say "Two," we're like, "Okay this person needs a triple check or a quadruple check."

**Alie:** [laughing] Oh my God, I had no idea!

**Reid:** Sometimes we'll see what's called 'going around in circles' on the dial. So, we'll be spinning the dial and you'll go right past where you started, and you'll just keep going. And we know, "Okay, this person needs a little more help to figure out where the prescription is because they're struggling to tell the difference between these numbers."

**Aside:** Essentially, if you're a train wreck about it, they'll discretely keep asking without you knowing.

**Reid:** We do things to figure all that out so you don't need to stress about it because we know that it's not as easy as it should be.

**Alie:** Do you ever see a certain temperament that's worse at making that call?

**Reid:** No, not a temperament. I think the older you are, the harder it is sometimes.

**Alie:** Ugh, it's so scary. Every time I'm like, "What if I just was spacing and gave him the wrong answer?"

**Reid:** What's the worst-case scenario? Your glasses aren't right, and then we re-make them? Like, come on, it'll be okay. [laughs] It's not the end of the world.

**Alie:** And then sometimes there's this little part of me that's like, "Did I say it wrong and I'm going to offend them?"

**Reid:** No. What's worse is when I go, "One or two?" and the patient goes, "Yes." [laughs] Happens all the time, all the time.

**Alie:** That's hilarious. You're like, "It is binary question, it's a true or false."

Zak Martellucci asks: Is it true that your eyeballs are the same size throughout your whole life?

**Reid:** It is not true. So, your eyes do grow over the first few years of your life. They're pretty much fully grown at some point in your childhood, but yeah, they definitely grow after you're born.

**Alie:** Okay. But apparently, we are more likely to take care of a baby if it looks like it has big eyes because it's cuter.

**Reid:** That's probably true. I believe that. [*"Jerry, did you know that the human head weighs eight pounds?"*]

**Alie:** But why are babies with glasses the best?

**Reid:** I think anytime you see something that's out of the norm of what you're expecting, it's just adorable. Like a dog with glasses would be adorable.

**Aside:** Once again, Doggles.com. Killin' the game.

**Alie:** Aki wants to know: Why is looking at the sun a bad idea? Is it worse to look at the sun during a solar eclipse? Are we just looking at the sun more during a solar eclipse?

**Reid:** It's easier to look at the sun during a solar eclipse because it's not as strong feeling, but the light rays hit you just as hard. That's the problem with a solar eclipse. Normally if you try to look at the sun it's going to really hurt and you're going to turn away. It's really, really bad for the eyes. Looking at the sun for a few seconds can blind you, and it literally just torches the center of your fovea, the center of your retina where you have this really dense layer of rods and cones where you can see everything. You lose just the center of your vision. You wouldn't go blind completely, but the center of your vision would be torched.

What ends up happening, obviously, during an eclipse is everyone's like, "Oh, let's look at the sun." And then people try to look at it and because it's not as bright feeling, you look at it even harder and that can cause problems. And then people buy glasses on Amazon they don't realize are counterfeit, and then look at the sun, and damage their eyes that way too. And then you had like, you know, videos with the president staring up at it without glasses at all, which was hilarious.

**Aside:** [*clip from a news report: "Even the president saw it, but then in a move that is not a complete surprise, he looked directly at the sun without any glasses. Perhaps the most impressive thing any president's ever done."*] That is a real clip, from, shoot what network was it? Where are my notes? Oh, yeah, it was Fox News. Right.

**Alie:** He's that strong.

**Reid:** It's impressive. I wish I was that strong.

**Alie:** Not just anyone can stare straight into the sun when told not to over and over again.

**Reid:** That's true. He showed us.

**Alie:** Oh God. Hilarie Mazur wants to know: Why do some newborns eyes change color in the first few months? Is it always blue to brown or can other things happen?

**Reid:** It's usually blue to something darker, but essentially it comes back to the amount of melanin in the iris. They are still growing melanin and producing melanin when they're a baby. My son came out with blue eyes and they're kind of like a brownish hazel, but still a little blue. But they've definitely changed at eight months old.

**Alie:** Oh, crazy. You're just populating it with melanin as you grow. Aerial wants to know: I always get these painful sties in my eyes. What's that about?

**Reid:** That's a good question. It's very common. We have these little glands in our eyelids called them meibomian glands, which we talked about earlier a little bit, when we talked about dry eyes. Basically, oil comes out of those glands and sits on top of your tears. Your tears have layers. And the oil is the outer layer that kind of protects them from the world, so your tears don't evaporate. We all remember from cooking that oil and water don't mix, so the oil is there as the final barrier for your tears to protect them.

That oil comes from your eyelids because it's kind of on the outer part of your eye, and those oil glands can get plugged and when that happens, they back up with oil and they form a sty. It's basically just a ball of that oil that's just kind of formed and gotten stuck in there and can't drain out. The number one way to treat that is heat. If you feel that starting, put hot compresses on your eyes like crazy, the more the better. And give it a chance to kind of melt that stuff out so it can drain out a little bit.

**Alie:** Oh, that'll help it get out of the little hole?

**Reid:** Correct.

**Alie:** Why do they get plugged in the first place?

**Reid:** Again, we think it comes back a lot to some dietary issues as well, but some people are just prone to it. The enzymes that live on your eyelid aren't doing what they're supposed to. All the proteins on the eyelid aren't doing what they're supposed to. And again, we know that staring at a screen all day makes this more likely. Some people have bacteria that live on their eyelashes that grow way more than they're supposed to, or they can get little mites on their eyelashes that grow, all sorts of gross stuff, but that stuff all causes inflammation, which causes that to happen.

**Alie:** Do you ever see mites on people's eyelashes? Or are they too small?

**Reid:** Yep.

**Alie:** You see them!?

**Reid:** Well, you don't see the literal bug crawling around, but you know what they look like. They look little giant clumps of dandruff in a little cylinder on the base of the eyelash. If you took them and put them under a microscope, you'd see the little bugs, but we know what it is when we see it and it's pretty common. It's very common.

**Alie:** I love that we're never alone. Like, you have mites just hanging tough out there.

**Reid:** Your entire gut is just filled with bacteria that are with you all the time.

**Alie:** I know, you're never alone. We've gotten a lot of these questions, which is awesome. Hilary Blake wants to know: Was there anything in your training that stood out for you, like gave you that, "Yep, this is what I'm here for" moment?

**Reid:** Definitely. I think the best thing about ophthalmology is when you take someone who can't see, and you make them see again. I'll give you the happy feely story here. I was in

second or third year in my training as a resident and I did cataract surgery on this woman. We had to send her home with a patch over her eye, and we have her in the office the day after surgery to take her patch off. And she had *really* bad vision. I think she was legally blind from cataracts if I remember correctly. And I'm sitting in the exam room with her, we take off her patch and she starts crying and I'm like, "What's wrong? What's going on?" And I'm like, "Are you okay?" And she's like, "I've never seen my grandson's face before." And I was like, "This is the best. This is why I'm doing this." Like, nothing felt better than that.

I still have those experiences today. I have people that just come in so happy because they can see again. And that's the best part about being an eye doctor is you can literally, with a 10-minute surgery, take someone from blind to having normal vision.

**Alie:** Oh my god. I'm going to cry. I can just already picture the montage of moments that you could put together to just make people bawl their faces off.

**Reid:** Oh, definitely.

**Alie:** One more question because I know I'm peppering you with a million, but this is a question that we got from Colette Ayers, Melissa Cowan, Dan Engler, Bob Carleton, Tarmo Toikkanen, and Kira Lichtenfeld. So many people are like: What are floaters? Why do we get them? Should we be concerned about them? Give us the scoop on floaters.

**Reid:** Sometimes you should be concerned about them, but most of the time, no, thankfully. A floater is just a little piece of the gel inside of your eye causing a shadow. Our eyeball is big and it has to be filled with something to stay big. But otherwise it would just deflate if it didn't have anything inside of it. [*deflating whoopie cushion*]

**Alie:** Weird.

**Reid:** If an eye has really, really low pressure it can actually kind of get a little mushy, and if it's got really, really high pressure like from glaucoma for example, it'll feel really firm. So again, we need something to fill that space to hold it from deflating. So, there's a thick gel inside there. As we get older it kind of breaks apart, it becomes more watery. Think of it like a kind of a thick jelly, and then as we get older it becomes more and more watery, and little clumps of it break apart, and those clumps casts shadows onto your retina where you see light.

If light comes into your eye and there's a little stringy floaty thing inside of that gel, where a little piece of the gel broke apart, it casts a shadow, which is what you're seeing. And then as we get older, you can get the big floater or a big series of floaters, and that's because that jelly, when we're younger is like really thick and attached to the wall of your eye, and it detaches from the wall of your eye at some point as we get older.

**Aside:** So, it's pretty normal, unless it's not. If you start to see rando disco lights, and you are not in a disco, call the doctor.

**Reid:** If you see like flash bulbs go off in the corner of your eye and it has a giant new sea of floaters, you need to get checked because you may have a tear in your retina, which could lead to a full detachment.

**Alie:** Mary M. and also Anna M. McDavid ask: What's the deal with detached retinas? Why do they happen? Can they be prevented?

**Reid:** So, a detached retina is... think of the retina like wallpaper, and if you get water behind it, it's going to detach, right? It's going to kind of pull off the wall. Inside the eye, the retina is attached to the wall of the eye and it's held in place by that gel, the vitreous gel. And as the vitreous pulls on it, it can cause a tear. And if that tear forms, fluid gets behind it. And just like your wallpaper with water going behind the wallpaper it can pull it off the wall, if water goes behind the retina, it separates it off from the wall of the eye and it detaches. If we see a hole or a small tear, we laser it closed. We tack it down with a little ring of laser to hold it in place.

**Alie:** Whoa! God, that's crazy. You just shoot a laser and be like, "Alright, I glued it back."

**Reid:** Yep. Literally just tacking down the retina with laser.

**Alie:** That's crazy. Lasers in your eyeballs! It's crazy that this is the world that we live in. Okay. Now, what about your job sucks? Like, what is the worst thing about your job?

**Reid:** The overhead. Dealing with insurance companies, pharmacies, all of those things that are just not why anybody went into medicine. It's just such a pain. No matter what your political beliefs are, affiliations, even if you think we have the best system in the world or the worst system in the world. It sucks.

**Aside:** We talked about how shitty the business side of medicine and insurance was for like 17 more minutes, but you know, episodes can only be so long, and I don't want to make any of you shed psychic tears.

**Alie:** Okay. What is the best thing about being an ophthalmologist?

**Reid:** The best thing is just helping people see again. Honestly, it's amazing when somebody comes into your office, and they come back to see you, and they're better. I mean, it's like any field of medicine when you can make someone better in a tangible way. It's awesome. But the instant gratification of having people come to me every day happy because I made an immediate impact on their lives is awesome.

**Alie:** Well, thank you for fixing so many people's visions.

**Reid:** I love to do it. You don't need to thank me. I thank them.

**Alie:** I hope I'm never under your knife, but if I have to be under a knife in my eyeballs, I will let you know.

**Reid:** If you want those pterygiums removed, you know where to find me.

**Alie:** Should I get them cut off?

**Reid:** You don't need to get them cut off just because they're there. You don't need them removed. You get them removed when they're causing severe irritation or blurring your vision.

**Alie:** They look bad?

**Reid:** No, they're barely noticeable. I only know they're there because I'm an eye doctor.

**Alie:** Thank you for being on.

**Reid:** It's a pleasure. It's been a lot of fun.

**Alie:** My favorite ophthalmologist.

**Reid:** Am I the only one you know?

**Alie:** Yes. But you're my favorite.

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So, to gently stalk your new favorite ophthalmologist, if you're in the LA area and have an eye ish, you can find him at [AcuityEyeGroup.com](http://AcuityEyeGroup.com) I'll put the link in the show notes. Or you can call - are you even ready for this dad-pun? Get this, their phone number is 1-800-898-2020! I'm literally proud of him for that pun of a phone number. Like, way to go. You can also google Dr. Reid Wainess, his [Yelp](https://www.yelp.com) comes right up, and I'll link it in the show notes too. Take care of your eyes and don't be afraid of them. And if yours don't work so great or at all, I'm really sorry. And if they work even a little bit well, dingdang, boy howdy, there's a thing to appreciate. If you're having any kind of bad day, just take a sec, pick a sense, whether its vision, or hearing, or smell, and just go, "Woah dude. That works, and I am just a big lump of bones, and water, and carbon molecules who experiences stuff, and has secret thoughts, and eats bananas, and gets to dream. So, that's cool." Senses are cool, whichever ones you have, let's appreciate them.

And remember to ask smart people stupid questions because they have incredible, crazy stories and no question is actually stupid and our time here is short, so whatever. Thank you to Erin Talbert and Hannah and River Lipow, for moderating the very great group of folks in the Facebook group.

Special thanks go to Gage Martin this week, who posted something in the [Facebook group](#), asking why we didn't cover the HIV/AIDS epidemic in last week's epidemiology episode. And I read that and literally hit my own forehead being like, "Oh my God, I'm so sorry." I just want to say I'm so so sorry that we didn't. That was a huge oversight on my part. I had a Patreon question selected about it but we went too long in the interview, and I rushed the rapid fire. I'm so sorry I didn't address it in an aside because HIV awareness and research is a cause I've been committed to personally. My omitting it really disappointed me. I really fucked that up there. Thank you Gage for being so cool and asking, and we had a really nice chat about it on Facebook Messenger.

Anyone can check out *This Podcast Will Kill You's* episodes on HIV and AIDS. They're well researched and great. Also, on Instagram I posted a [photo](#) of the CDC's tick-laden muffin and y'all lost your shit just barfing in the comments, and for that I am not really sorry. I'm just not. I did it because I love you. Be careful of ticks!

Also, thank you Boni Dutch. Happy birthday! And Shannon Feltus for helping run the merch site, [OlogiesMerch.com](http://OlogiesMerch.com). Thank you as always to the man, the mustache, Steven Ray Morris, for editing these episodes together. I would be screaming into the void were it not for him. Nick Thorburn of the band Islands wrote and performed the theme music.

And if you listen to the very, very end of the show you know I tell a secret at the end of each episode. And this is both relevant, and timely, and kind of gross. But literally, I'm writing and recording this episode. I wake up with a sty in my eye! I haven't had one in, I swear to god, like a decade. And I was like, "Are you fuck fucking kidding me with this, eye episode?" So, I looked in my super up-close mirror, the one that is horrifyingly informative, and then I had to take a Q-tip and kind of swab at it. Very gratifying, but also really bizarre timing. Like is this how manifesting works? Did I use The Secret to get an eye pimple? What is life?

Okay berbye.

*Helen Yan is the transcriber who teaches high school chemistry but who is nothing like John Keating or Glenn Holland. She does the best she can with what she has in her classroom every day. And every now and then what she has is podcasts. And now, podcast transcripts.*

*Final touches by Kaydee Coast, the outgoing, rubber duck collecting, accountant.*

***Some links which you may find useful:***

[\*How many people have shit vision?\*](#)

[\*Tyndall affect: aka why your eyes change colors\*](#)

[\*Does weed make you look like a mugshot?\*](#)

[\*Aaron Williams-Mele sees his first Virginia sunset\*](#)

[\*How EnChroma glasses work\*](#)

[\*A link to EnChroma glasses\*](#)

*"Colorblindness" aka [\*Color Vision Deficiency\*](#)*

[\*Common causes of blindness\*](#)

[\*What is river blindness?\*](#)

[\*The wonderfully garden-variety happy people who are prosthetic eye patients\*](#)

[\*The business of being an ocularist\*](#)

[\*Phinneas Gage: still hot\*](#)

*Billy the Exterminator: [\*cool dude, but spreads guano and misinformation\*](#)*

[\*So what is guanine?\*](#)

[\*Snopes says: Guanope\*](#)

[\*Topography of Tears: very cool photos\*](#)

*Topography of Tears* artist, [Rose Lynn Fisher](#)

[Why do we cry tho](#)

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