

[Transcript] Huberman Lab / AMA #6: Eye Health, Why We Yawn & Increasing Motivation

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I'm Andrew Huberman, and I'm a professor of neurobiology and ophthalmology at Stanford School of Medicine.

Today is an Ask Me Anything episode, or AMA.

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Now without further ado, I will answer your questions, and as always, I will strive to be as thorough as possible, as clear as possible, and as concise as possible.

The first question is about eye health, in particular eye health protocols for people that are aging, but eye health protocols for people in general.

The question is, I'm noticing that my vision, both close and far, is deteriorating.

What are the best eye exercises, eye health behaviors, supplements, etc. for the aging eye?

So the answer I'm about to provide applies to everybody regardless of age, which is, you want to make sure that you view things both close up and far away across your day. Many many people nowadays spend a lot of time looking at their smartphone, looking at the computer screen, looking at books and paper, in other words, looking at things somewhere between nine inches away from their face and their eyes, maybe two and a half feet away from their face and eyes.

This is an unprecedented event in human history, as far as we know, because it wasn't until the advent of the smartphone that we've spent so much time looking at screens at close range, relative to looking at things at further distances from our face throughout the day.

In fact, it should come as no surprise that the incidence of myopia of nearsightedness is increasing dramatically around the world, but is increasing particularly fast in children and in young adults and even in adults who are viewing things at very close range.

So two and a half feet or less.

I am not saying that viewing things at two and a half feet or less is bad for your eyes.

That is simply not the case.

However, if you want your vision to be maintained or even improve, it's going to be very important for you to view things at a distance as well for ideally several hours per day.

I realize some people just simply won't accomplish this.

In fact, I'd like everyone to just take a moment and do a rough estimation in your head of how much time during your daytime activities you are viewing things at, say, two and a half feet or three feet or less, so smartphone, computer screen, paper, books, etc., versus viewing things that are four feet away, eight feet away.

So maybe conversation across the table with another human being.

Remember those?

Some of us are doing that more now that we seem to be emerging from this whole pandemic phase.

However, many people are still mostly just viewing things within very close range.

And in fact, if you were to ask yourself, how much time do you spend looking at things at the distance of many hundreds of feet or taking a walk where you're not looking at any screen and you're simply letting visual images or the visual imagery rather pass by on your eyes?

I think for most of us, that number is getting progressively smaller and smaller with each passing year.

So this is an issue because the structure of the eye is such that the lens of the eye can move, but also that the length of the eyeball from front to back is actually impacted by how close or how far you happen to view things during the course of your day, especially during development.

There's a classic experiment that I'd like to just briefly describe to you, which has been performed in chickens, it's been performed in mice, it's also been performed on humans where a visual occluder or a visual image, so an occluder is just a black sort of screen or piece of cardboard or an image, maybe some black and white checks or checkers are placed at a certain distance from the eye either up close or far away.

And the impact of that on the length of the eyeball and on the structure of the lens and on the quality and acuity of vision is then measured.

And to make a long story short, what these studies show is that if during development you or an animal exclusively looks at things that are up close, very close to the eye and doesn't ever get long range vision, the eyeball lengthens and when that happens, the lens, which of course is in the front of the eyeball, which focuses the light onto the back of the eyeball, which is where the so-called neural retina is, where the cells that sense light are, that visual image lands in front of as opposed to directly on the light sensing portion of the eyeball that we call the neural retina.

It lands too close or near the lens as opposed to on the back of the eyeball.

And that's part of the reason what we call the consequence of that near-sighted myopia.

In far-sightedness, the opposite happens.

The visual image is actually focused behind the retina.

It doesn't land directly on the retina, which is what you want.

It's focused too far behind the retina and that's due to a shortening of the eyeball.

So what I just described actually explains pretty well why kids who look at computer screens or books up close often need glasses.

And when I was growing up, they call this nerd syndrome, raising my hand for those of you who are listening.

I read an awful lot, but I also spend time outside, fortunately, and running around on the soccer field and looking at things in the distance and playing in the neighborhood with my friends.

Kids that spend the vast amount of their time looking at things up close, in particular children who do that indoors for most of their waking time, well, those kids develop myopia.

This is part of the reason why we have such an increase of the incidence of myopia nowadays.

What's interesting, and I think most people don't realize, is that even as a young adult and adult, and perhaps even as an older adult, an elderly person, looking at things up close too much at the expense of getting some time viewing things at a distance, in particular outdoors, can be very problematic because it can exacerbate myopia.

So the short, direct prescription here is to make sure that you're getting at least an hour or so each day, although ideally it would be more of long viewing.

And that could be done by walking outside and avoiding looking at your phone while walking.

It doesn't require that you look at a particular object in the distance, although if you are scanning for and looking for objects in the distance, the way that you might on a hike or you're looking out toward or off a vista or you're looking for someone in the distance, all of that sort of visual scanning behavior is going to be very good for your eye health and for maintaining vision at a distance.

If you're somebody who's farsighted and you have trouble seeing things up close, well then you need to ask yourself whether or not you're spending too much time looking at things off in the distance.

Although I want to be very clear that nearsightedness and farsightedness aren't necessarily the consequence

of this near far viewing, there can be independent causes of nearsightedness and farsightedness.

But for many people out there who are spending progressively more and more time just looking at things up close, you can get this lengthening of the eyeball or challenges in the way that the elasticity of the lens is controlled by the musculature in ways that make it hard to maintain sharp, crisp vision when you are looking at things at a distance or up close.

So I can't because there are simply no studies to support the idea that you need exactly two hours per day of outside long vision at a particular distance or that you want to cut off or have a threshold of four hours per day of looking at things up close.

But we can say with a high degree of confidence that if you want to maintain or enhance your vision at all distances, that for every hour or so that you spend looking at things, say a distance of three feet away or less, you want to get at least one hour per day total.

It doesn't have to be all at once of looking at things out in the distance or looking at things beyond three feet relative to the distance from your eye.

So I think for some people who are already badly myopic, this isn't going to remedy that myopia.

You're still going to need corrective lenses.

But if you're somebody similar to the person who asked the question that they're, quote unquote, noticing their vision is deteriorating, really try and balance out the amount of viewing that you're doing at close distance and long distance.

Again, I would not obsess about the total numbers, it doesn't have to be three hours and three hours, but the more time that you can spend at viewing things at variable distance throughout the day, the better off you're going to be in maintaining and perhaps even enhancing your vision somewhat.

Now there's an additional behavioral tool that we can glean from the recent scientific literature exploring myopia, which points to the fact that children who get two hours a day or more of time outside in sunlight, right?

One of my favorite topics.

I know how many people are probably rolling their eyes right now when they hear me say you really want to do morning sunlight, not through a window or windshield, don't wear sunglasses for that, trying to get as much sunlight as you can in your eyes early in the day, never stare at any light so bright.

It's painful.

Look at it, etc.

We've done a lot of episodes on this.

We have a light for health episode.

This isn't all the sleep episodes.

It's just such a basic foundation of circadian rhythm and health that I just keep repeating it.

However, there are also large scale clinical trials involving thousands of subjects.

They've shown that people, children in particular who get two hours or more of outside time every day have a much lower instance of myopia.

Now what's really interesting about these studies is that while some of those kids are looking at things further off in the distance than they would if they were indoors on their tablets or screens or with their nose in a book, it does not seem to be the case that they have to be looking at things in the distance in order to see this reduced incidence of myopia.

What's probably happening instead is that the particular wavelengths of light that emanate from the sun, that photon energy in particular is triggering the activation of the so-called intrinsically sensitive melanopsin retinal ganglion cells, which we know are important for setting circadian rhythm, for enhancing mood focus and alertness during the day and enhancing the quality and duration of sleep at night.

But those melanopsin intrinsically photosensitive ganglion cells are also involved in networks within the eye that relate to blood flow, that relate to the ciliary body, which is a structure within the eye that controls the aperture and movement of some key components within the eye that also relate to the crispness of vision, that is the acuity of vision at both short and long range.

So there are a lot of technical details there.

In fact, I really hope to get the great Russ Van Gelder or Dr. Russ Van Gelder, who's the chair of ophthalmology at the University of Washington in Seattle, who is a world expert in this and the various aspects, both molecular and structural of the ciliary body and the lens and is an expert in uveitis, a very interesting topic in its own right, to come onto the podcast and talk more about eye health and we will do that in the not too distant future.

Meanwhile, if the first behavioral protocol for enhancing and maintaining eye health is to make sure that you're spending at least some time balancing out the near vision and far vision during the day, it also stands to reason that you want to get outside for at least two hours a day, which I know sounds like a lot in order to prevent myopia.

If you're a young person and offset the progression of and maybe even reverse some myopia, we don't know yet based on the data, but there's some indication that's possible by getting outside two hours a day.

And the cool thing is because many people, including myself, have a lot of work to do and we need to be on our phones quite a lot or we choose to be on our phones quite a lot. This effect of getting sunlight outdoors during the daytime for two hours or more does not seem to require that you stay off your phone or tablet or that you're looking at things far in the distance the entire time.

What this means is if you can get outside onto a patio or a deck or an outdoor table, if you can, if weather and conditions permit and do some of your phone time and computer time and reading, et cetera, outdoors.

Now if you're already making an effort to get outside, hike, play sports, take walks, et cetera, that of course counts towards this two hour threshold.

And I know this sounds like a lot, this two hours.

And yet for most people, you know, it certainly will vary depending on time of year, but I think striving to get on average about two hours of outdoor time as much as you can or opening a window, which wouldn't be as good as getting outside, but opening a window and trying to get some natural light exposure to the eye to trigger the activity, these intrinsically photosensitive melnops and retinal ganglion cells, that's going to be a really good idea in trying to offset and maybe even reverse some vision loss.

Now the other behavioral protocols which have shown to be useful in terms of maintaining or improving vision relate to the musculature around the eye and the control of the movement of the lens and actually the lens of the eye has its own kind of flexibility.

It's a really, really interesting structure.

I'll geek out on this far too long if I don't prevent myself from doing so, but the lens is just incredible.

The fact that it has a specific structure of proteins like crystallines and things of that sort and that it can still derive nourishment from blood flow, but does not actually have vasculature within it.

So it's not, if you notice, I mean, the lens of your eyes and filled with blood vessels and capillaries because it needs light to pass through, super interesting structure.

I think the only violation of what I just said is the manatee, right?

Those big sort of underwater elephant-like creatures that I think were or are endangered down in Florida.

They were getting chopped up by speedboats, but I think now there's some effort to preserve

those big gentle giants.

The manatee, as I recall, has a vascularized lens, which is why their eyes look opaque. It looks like they have cataracts in any case.

They're not a manatee.

You have no blood vessel supply to the lens, keeping that lens clear as vital nowadays that they can do lens replacement.

There's really a pretty incredible progress in the realm of ophthalmology and surgical replacement of the lens or the cornea, other aspects of the eye.

But if you're somebody who is interested in maintaining your vision, you're going to want to maintain the musculature that controls the movement and the change of shape in that lens and the movement of the eyes, which allows you to transition your vision from very sharp when viewing things up close to very sharp when viewing things at a distance.

This is where some of the so-called near-far exercises can be very useful.

When we did a full-length podcast on eye health and improving eyesight, which I invite you to listen to if you like, talked about two different types of vision exercises that have been shown to be useful for improving vision at the level of acuity that have a lot to do with improving the musculature and the movement of the eyes and the lens.

That's what's called a smooth pursuit task.

You could go onto YouTube if you like and put smooth pursuit eye task and do this for a few minutes each day if you're trying to keep your vision strong.

What that task involves is, as the name suggests, smoothly tracking a small dot or crosshatch or arrow on the screen, which is very different than the so-called saccade type eye movements that we often make.

Saccades are when you dart your eyes to a particular location to look at something, then dart it to another location to look at something.

Micro-saccades are little tiny versions of those that we're doing most all of the time, believe it or not.

When you look at a visual scene or image, if you did not have those little micro-saccades, your brain would adapt or would attenuate to whatever you were looking at and the visual image would actually disappear, which really speaks to how important it is that your perceptions change in order to maintain them.

This is very similar to where if something is placed on your hand, say a finger, you'll notice that change.

But then if you leave it there for a short while, you'll forget that it's there because the cells there have adapted out.

There's no change.

So your nervous system is largely responding to change.

This is also why when you walk into a room and you often notice a novel smell, let's hope it's a good smell, after a few minutes or so, you don't notice the smell anymore because your olfactory system adapted that away.

So a lot of that adaptation is prevented by those little micro-saccades and the macro-saccades, the bigger saccades are really for moving your eyes around to look for things in visual space.

Smooth pursuit is a very particular kind of visual behavior that you can do in a smooth

pursuit task.

Again, zero cost costs a little bit of time, I suppose, to do this on YouTube.

And most any of them will do.

We can provide a link in the show note captions of one that we like or several that we like.

But by doing that smooth pursuit task for a bit each day, maybe just a minute or two, you're maintaining your ability through the musculature of the eye to do smooth pursuit.

And of course, you do smooth pursuit when you move about your day.

But for people that are trying to offset or reverse vision loss, doing some additional deliberate smooth pursuit exercises can be useful.

The other visual exercise that can be very useful is the so-called near-far exercise.

So this is best accomplished, I think, by holding out a pen or pencil in front of your eyes in front of your head and focusing very intensely through what's called a virgin's eye movement where you bring both eyes to the tip of the pen and then moving that pen closer and closer and closer to your eyes where you get close enough that you actually have to deliberately bring your eyes.

For those of you listening, this is what I'm doing right now.

So the point where it's blurry and you can no longer hold it in sharp, crisp relief, you can't see it sharply, that is, and then you can move it out a little bit distance and kind of play right around that threshold where it's hard to keep it in focus now and then move it back out again and then in.

Doing that for even a minute or two, you'll find is a bit of a strain on your eyes, but you can actually build up the musculature and the neuromuscular connections that allow you to do that more efficiently.

And that has been shown to improve certain aspects of vision, especially when people are diligent about doing those exercises, not necessarily every day, but let's say three days a week or so.

They can be very fast.

I actually find them kind of fun for reasons that escape me entirely.

Now, how close you can bring that object and still maintain it in sharp focus will vary from person to person based on a number of things.

First of all, how healthy and well-performing their neural retina is, whether or not they have myopia or hyperopia, nearsightedness, et cetera, whether or not, for instance, you're like me and you have a fairly close interpupillary distance or whether or not you're more wall eyed and you have your eyes further apart.

All those things will dictate the exact performance of that task, but nonetheless, it's a very useful task to do when trying to maintain or improve vision.

Now, of course, there are a lot more behavioral tools that one could use to maintain or enhance vision, really touching on the biggest and what I consider the most important ones that are most accessible to people without the need for any fancy equipment at all.

And if you want to learn more about other behavioral tools that one can use to maintain or enhance vision, please see the episode that we did on eyesight, you can simply go to hubermanlab.com, put into the search function, eyesight or vision, it'll take you right to it.

In fact, everything on that website is keyword indexed and will take you to the various episodes

and timestamps that you're interested in, according to that keyword.

Now the person who asked this question, by the way, is Page Singer.

Thank you, Page Singer.

And the question got a lot of upvotes because apparently there's a lot of interest in this, understandably.

So asked about nutrition and supplements for maintaining or improving vision.

That could be a very lengthy conversation, but let's just summarize it with a few brief points that we know stand based on the clinical and scientific research.

We've all heard that carrots are good for your eyes.

Well, it's not carrots per se that are good for your eyes.

It's vitamin A that's essential for the so-called phototransduction cascade.

The phototransduction cascade is the process by which the photoreceptors, which are in the back of the retina, at least if you're a human, they're in the back of the retina, take photons, light energy and convert it into electrical signals that's then conveyed to the other cells and neurons within the retina and then passed into the brain to create visual percepts.

Most people can get enough of this fat soluble vitamin, we call vitamin A, by making sure that they eat at least some dark green leafy vegetables and that they do that in their closest to raw form, maybe cooked a little bit, but not overly cooked.

There are other sources of vitamin A out there.

You can look those up online just for sources of vitamin A. Most people will be able to get enough vitamin A from their nutrition and won't require it from a supplement, provided that it's not present at excessively high levels in a foundational supplement or vitamin mineral supplement.

Getting some additional vitamin A from a foundational supplement or vitamin mineral supplement is probably not going to be an issue unless you really take in far too much of that vitamin A and could potentially provide some insurance.

But again, I think most people can get enough vitamin A from their diet if they are taking care to eat the foods that contain vitamin A. Green leafy vegetables being one.

The other food that's known to be highly enriched in vitamin A is liver, one of my least favorite foods, regardless of what animal that liver comes from.

Liver is somewhat of a popular slash controversial organ meat in the nutrition space for reasons that aren't interesting for sake of this discussion anyway.

I suppose for those of you that like liver, you could eat a little bit of liver every once in a while.

It is rich in a number of things that are beneficial to health, although for you vegans out there, I'm sure you'll want to avoid liver entirely.

I avoid liver because I just simply don't like the way it tastes.

I've maybe once or twice I've tasted liver that was appetizing to me and it can be okay, but it's just not, or at least by my read it can be okay, but it's not a food that I actively seek out, order or prepare for myself on a regular basis.

So fortunately there are other sources of vitamin A as well.

And again, I just invite you to all put into a web search, you know, food sources of vitamin A and figure out how to get your daily dose of vitamin A by taking in foods that you like

for you.

And then in terms of supplementation of things that can enhance vision, this is a newer area and frankly it's an area where most of the data point to some supplements that can potentially be beneficial in certain disease conditions.

So for instance, in fairly progressed age-related macular degeneration, age-related macular degeneration is fairly common or more common than we would like, we should say.

And it does appear that supplementing with certain things like lutein, which is present in eggs or egg yolks in particular, especially egg yolks that aren't overly cooked or that can be supplemented can potentially help with some instances of age-related macular degeneration. But the data on this are still emerging.

I consulted with our chair of ophthalmology at Stanford about lutein and some of the other things that you'll see out there like zeaxanthine and astaxanthines and, you know, these xanthines come from certain fruits like blueberries and they're present in supplements and things of that sort.

The consensus I got talking to him and talking to some other ophthalmologists are that if you're really aiming to get a healthy diet, you're avoiding cigarette smoking and by healthy diet, I mean getting sufficient amounts of vitamin A and lutein through food sources.

Again, you can look up where those food sources are.

Egg yolks just being one of them.

Well then chances are you're not going to need to supplement with lutein or the zeaxanthines or the astaxanthines.

However, I have heard anecdotal reports from a number of people that they'll start taking a supplement for eye health.

There are a number of them out there.

We are not as a podcast affiliate with any of those eye health supplements, by the way.

And people are reporting enhanced vision.

You know, I receive emails all the time that say, you know, I'm taking this, you know, lutein at 20 milligrams per day.

And there I should mention that the dosage that's been explored in a couple of studies is 10 to 20 milligrams per day.

Again, you could get that from foods.

You could go above that if you're, you know, more cavalier or you could go toward the lower end of that 10 to 20 milligrams per day.

If you are somebody who tries to, who's more conservative, I should say.

Well, there aren't people out there who are, you know, looking at lutein, they think it's fairly safe and they're taking higher dosages of lutein, so 20, 30 milligrams per day.

They're also taking supplements that contain zeaxanthines and astaxanthines and are reporting anecdotally that their vision is enhanced.

I don't dispute those claims, but as of now, there aren't many papers.

I could only find about four, three really solid ones.

And then a fourth that point to the specific disease instances where supplementing with lutein, zeaxanthine or astaxanthine can be beneficial for slowing the progression of things like advanced onset age related macular degeneration.

And the degree of offset for that macular degeneration was slight.

It wasn't enormous, but it was robust enough that it was, it warranted reporting in the paper or things like leavers, which is a particular eye disease that impacts a whole different set of systems in the eye.

So basically what I'm trying to say is when it comes to supplements to support eye health, make sure you're getting enough vitamin A from your diet.

If you're not, consider supplementation or consider changing your diet somewhat to make sure you can get that lutein and vitamin A. And if you are interested in it and it's within your budget, I don't know of any evidence that supplementing with additional lutein, zeaxanthine and astaxanthine can be dangerous at all.

So for those of you that are really interested in maintaining or improving your vision, that might be an area that you want to explore.

I personally am not taking lutein, zeaxanthine or astaxanthine, at least not at this time.

I do take a foundational supplement, which is my source of vitamin A in addition to my food sources, but I don't suffer from vision loss anywhere at readers at night and I have for a long time.

I have a little bit of a muscular weakness in one of my eyes that originated in childhood.

So occasionally if I get very fatigued, one of my eyes will deviate a little bit, a little bit of almost strabismus, especially if I've been awake for very long periods of time.

It tends to recover once I get a good night's sleep.

Some of you that have experienced this where you have one eye that might just drift a little bit.

I could do this for the camera if you want.

Okay, this is weird.

My sister across the table when we were at a friend's houses for dinner, so I can actually move one of my eyes in like this, which actually just reflects that there's a muscle, extraocular muscle closer to my nose.

It's rather weak, which allows me to kind of do that.

I can't do it so well with the opposite eye.

Anyway, now I need to blink to kind of clear my vision.

But the point is that if you're somebody who has a slightly deviating eye, slightly, often if you go to the ophthalmologist or optometrist, they're going to give you a prism lens, which is going to redirect the image onto that slightly deflected eyeball.

One thing you'll really want to discuss with that ophthalmologist or optometrist is whether or not there are exercises that you could do to overcome that issue without the need for a prism.

Because what I saw and what many other people see when they put on a prism lens is that indeed it can line up their vision or their visual perception better, but indeed it can lead to progressive weakening of the muscle further and further so then that eyeball starts to deviate further and further.

And that raises a larger question, which is, should we wear corrective lenses?

In fact, if you go online, you'll find or hear about these examples of people that stopped wearing their corrective lenses, their glasses or contacts, in order to bring their vision back or improve their vision on their own.

Now if your vision is quite impaired, you're going to need corrective lenses or contacts.

However, there are a number of people out there who find that if their vision is somewhat impaired, that forcing themselves to view things at a distance to do smooth pursuit, to do near far and to make sure that they're getting adequate nutrition and things of that sort can all come to help offset some of the visual impairment that would occur if they were to just pop glasses on their face and rely on the corrective lenses in order to focus that the light onto the correct area within the eye onto the neural retina.

So I'm not telling people to throw off or get rid of their corrective lenses and contacts, but you can be overly reliant on these things like a crutch in a way that perhaps you want to do a little bit of work to try and overcome and then maybe work with a weaker prescription. And certainly in the case of prism lenses, what I mentioned before is a real consideration. It's one I'm very familiar with.

So as a last, but I think very important and exciting feature of visual improvement is red light.

I talked a little bit about this on the episode of the human lab podcast all about light and health.

There's some really spectacular, I think I consider it spectacular.

Many other people consider it spectacular research out of University of College London.

And the work I'm referring to is Glenn Jeffrey's work.

I've known Glenn for a long time.

These are animal studies and now two human studies exploring how exposure to red light early in the day can offset some of the vision loss related to age related macular degeneration or simply age related visual decline.

And there's a whole mechanism here that's discussed in that episode, but it has to do with the fact that red light and urine for red light together or maybe even separately when viewed for even just a minute to three minutes once or maybe two or three times per week maximum can actually reduce the number of what are called reactive oxygen species in the photoreceptors that convert photons into electrical signals.

The rest of the visual system can understand.

So that's a mouthful.

Basically what they found was for people 40 years or older, if they viewed this red light at a distance of about a foot and a half, although I wouldn't get too specific with us for a few minutes each week total, they were able to offset some of the vision loss within a particular domain of vision.

And I don't have time to go into the details here, but because I do that in the light for health episode, but you have different types of photoreceptors, cones and rods.

You have different types of cone photoreceptors that spawn to different wavelengths of light short, medium and long wavelengths of light, so called blue, green and red cones are sometimes called when these people who are 40 years or older viewed red light on a consistent basis early in the day.

And it did have to be early in the day.

There was a real circadian effect there.

There was a offset of some of the vision loss that would normally occur in a particular wavelength of light range that resulted in better visual acuity overall.

So if you're very concerned about your vision or you're into red light therapies, et cetera,

there are a number of different red light devices out there at some future point. The Huber and Lab podcast may partner with one of these red light companies. So right now I'm not going to mention any of them, particularly they're prominent online. What you're looking for is a red light unit that provides red light and maybe far and near infrared, excuse me, light as well.

So something in the 650 to 720 ish nanometer range.

So it's going to look red or almost invisible to you if it's really far into the infrared. And you'll want to view that at a distance about a foot and a half to two feet, and you don't want it to be so bright that it's painful to look at, because you don't want to damage your eyes.

But that's essentially what they used in these studies from the Jeffrey Lab.

And they showed some pretty impressive offset of some of the aspects of vision loss in these people 40 and older.

So that's an area that you may want to explore as well, especially for folks 40 and older.

And again, this red light exposure had to be done early in the day.

So hopefully that collection of behavioral tools near far, smooth pursuit, some of the discussion about lutein, nutrition, vitamin A supplementation, Zaxanthine, Zaxanthine's, getting two hours of light exposure outside sunlight exposure, get outside to do some of your work, and perhaps even deliberate red light exposure for certain people can be used to offset your concerns and your actual potential vision loss and maybe even improve your vision regardless of what age you are.

Everything I described is supported from the peer review literature.

And again, if you want to get the deep dive on mechanism and further information about dosages, please check out the episode on eyesight and improving your eyesight and the light for health episode again at hubermanlab.com.

Thank you for joining for the beginning of this Ask Me Anything episode to hear the full episode and to hear future episodes of these Ask Me Anything sessions plus to receive transcripts of them and transcripts of the Huberman Lab Podcast Standard Channel and premium tools not released anywhere else, please go to hubermanlab.com slash premium.

Just to remind you why we launched the Huberman Lab Podcast Premium Channel.

It's really two-fold.

First of all, it's to raise support for the Standard Huberman Lab Podcast Channel, which of course will still be continued to be released every Monday in full length.

We are not going to change the format or anything about the Standard Huberman Lab Podcast and to fund research.

In particular, research done on human beings, so not animal models, but on human beings, which I think we all agree is a species that we are most interested in.

And we are going to specifically fund research that is aimed toward developing further protocols for mental health, physical health and performance.

And those protocols will be distributed through all channels, not just the premium channel, but through all channels, Huberman Lab Podcast and other media channels.

So the idea here is to give you information to your burning questions in depth and allow you the opportunity to support the kind of research that provides those kinds of answers in the first place.

[Transcript] Huberman Lab / AMA #6: Eye Health, Why We Yawn & Increasing Motivation

Now, an especially exciting feature of the premium channel is that the tiny foundation has generously offered to do a dollar-for-dollar match on all funds raised for research through the premium channel.

So this is a terrific way that they're going to amplify whatever funds come in through the premium channel to further support research for science and science related tools for mental health, physical health and performance.

If you'd like to sign up for the Huberman Lab Premium Channel, again, there's a cost of \$10 per month, or you can pay \$100 up front for the entire year.

That will give you access to all the AMAs.

You can ask questions and get answers to your questions.

And you'll of course get answers to all the questions that other people ask as well.

There will also be some premium content such as transcripts of the AMAs and various transcripts and protocols of Huberman Lab Podcast episodes and not found elsewhere.

And again, you'll be supporting research for mental health, physical health and performance.

You can sign up for the premium channel by going to [hubermanlab.com slash premium](https://hubermanlab.com/premium).

Again, that's [hubermanlab.com slash premium](https://hubermanlab.com/premium).

And as always, thank you for your interest in science.