Protecting Your Children's Vision

Learn what eye doctors do
to treat their own children who need glasses.

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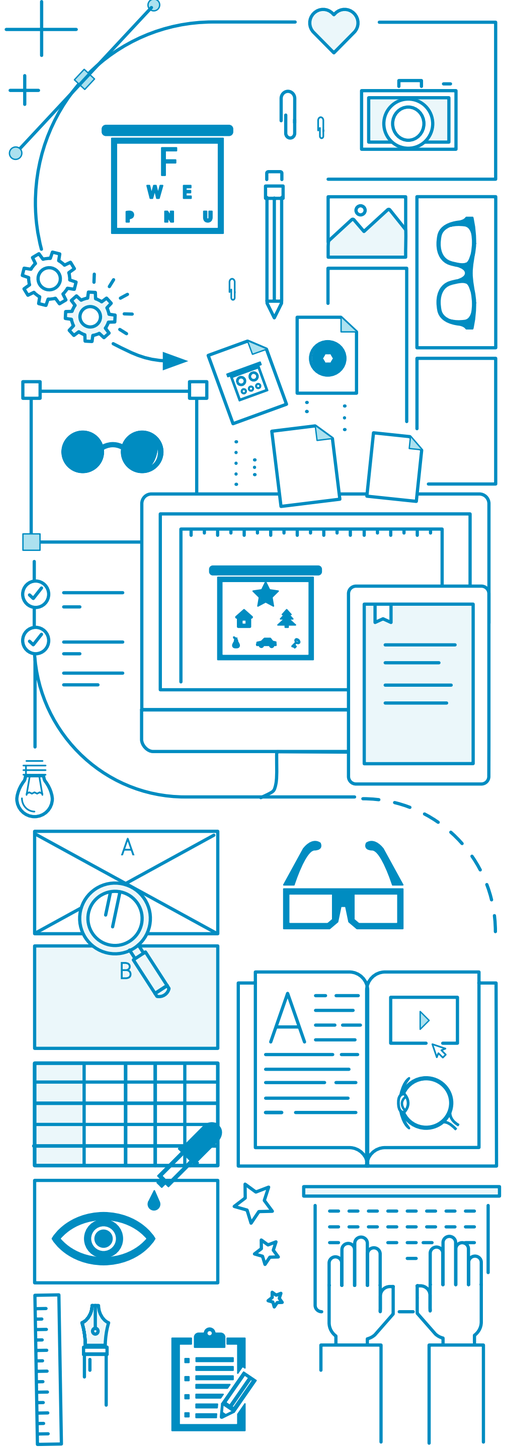

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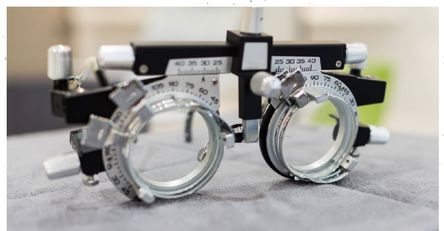
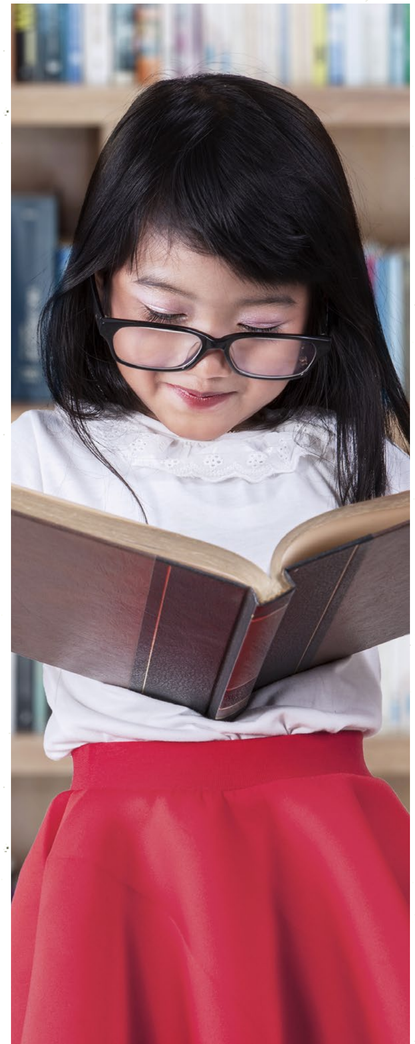
Content

CHAPTER 1

I’m nearsighted too!

by Dr. Thanh Mai





My parents had four children when they moved to the United States from Vietnam. I am the third. Guess who has the worst vision? Bingo, you got it. Me. Ironically the eye doctor. My parents on the other hand both have excellent eyesight and don’t wear glasses.

Both my parents were born in Vietnam and all four of their kids were born in the United States. The four children are as blind as a bats when we’re not wearing glasses or contact lenses. Funny how similar genetics but vastly different environmental upbringing affects one’s vision. Have you ever seen the letter chart hanging on the wall at your doctor’s office? Even the big E at the very top I cannot read without my glasses.

I remember going to elementary school. I would sit next to my buddy Tim and bug him all the time when I couldn’t read something the teacher

had just put up on the board. He'd help me out but sometimes he got annoyed and would ask how I come I still couldn't see even though I had my glasses on. "My glasses used to be perfect at the beginning of the year" I would tell him, "but now they aren't strong enough anymore." This pattern with my glasses started to become a yearly trend.

If I could go back in time knowing what I know now, let's just say the discussion with my eye doctor and our treatment plan would be vastly different. If only he had suggested something to help protect my vision when I was young, I could have ended up with a much smaller prescription for life. Instead, every year when I would get my eyes checked, the doctor would just tell my mom that my eyes got worse again and that I needed a thicker pair of glasses. The cycle of madness continued for many years. Never was there a discussion about what I could do to prevent my eyesight from deteriorating. I was simply told "your eyes got worse again, time to buy a new pair of glasses."

The sad thing is that once your nearsightedness gets worse the effects are permanent. If your eyes develop poor vision during the growing years of your childhood, the physical structure of the eye changes permanently.

This E-book was designed to help teach parents more about nearsightedness and how to nurture proper visual development in your children. My hope is that no child, anywhere in any country, will ever develop a high degree of myopia. The great news is that there are ways to control and curb nearsighted progression as you will soon learn from this book. It is my goal as an optometrist to protect as many children's vision and give them the hope that wasn't readily available to me.

CHAPTER 2

Do our children inherit nearsightedness?

How does our environment impact our vision?

by Dr. Valerie Lam

If you think that the number of nearsighted children today is increasing, you are absolutely right. Visit a local high school in your area and stop by the computer lab to see how many students are working on tablets or computer desktops. You'll be surprised at the percentage of those students that wear glasses these days. Studies have shown that the increasing amount of near activities we are doing these days are definitely contributing to our distance vision becoming more blurry.

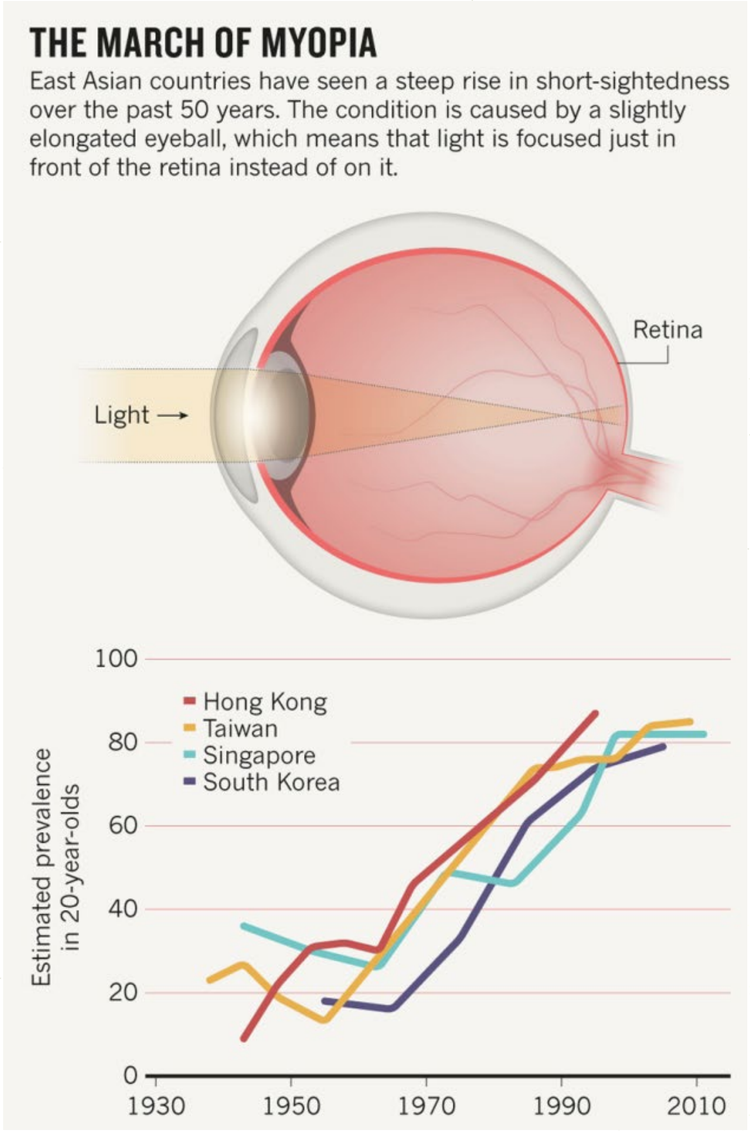
But where does nearsightedness, or myopia, come from? Unquestionably there are genetic and environmental factors that go hand in hand in determining whether your eyesight will be good or not. The percentage of people who are myopic varies greatly between cultures:[1]

PREVALENCE OF MYOPIA	
2%	Nepal
37%	Australia
41%	United States[2]
73%	China
79%	South Korea
82%	Taiwan

In the graph to the right you'll notice that back in the 1940s, the prevalence of myopia in these East Asian countries was between 10–30%. Today, looking at the graph around 2010 it is now over 80%! In Seoul Korea 96.5% of 19 year olds are nearsighted![3] The numbers are truly staggering. It is impossible for there to have been such a sudden shift in the gene pool of these countries causing more nearsighted babies to be born. Which leads us to conclude that changes in environmental upbringing must be the culprit to increased myopia in our youth population.

One thing we know is that in East Asian cultures academic success is heavily emphasized. The need to study for long hours in order to advance to the best schools and obtain the best careers is highly competitive. Studies on incoming university students demonstrate that the average high school student in Shanghai has 15 hours of homework a week, compared to 5 hours per week for a student in the United Kingdom, and 6 hours per week for students in the United States.[4]

One thing is clear based on epidemiological study, 21st century visual demands are driving our children to myopia and poorer vision. Genetics alone cannot account for this explosive myopic epidemic.



Source: Ian Morgan, Australian Natl Univ.

CHAPTER 3

Does wearing eyeglasses make my eyes worse?

BY DR. THANH MAI

You might have heard this from your parents or even from another eye doctor, “stronger glasses will make your eyes worse!”

As an eye doctor, I’ve heard this concern from many worried parents. When we find that a child’s vision has gotten worse and they need a stronger prescription, we have had multiple parents try to talk us into writing a weaker prescription on purpose.

I understand their logic and cannot blame them for pursuing whatever avenue they can to reduce myopia progression. You may have heard of eye doctors prescribing bifocals or telling your child only to wear glasses when needed. Many theories and anecdotal evidence float through the internet on how to reduce myopia progression.

Studies published in the Vision Research Journal have investigated whether wearing glasses leads to more myopic progression. One study compared children who wore their fully corrected glasses prescription versus children who wore a slightly undercorrected prescription and how that affected their myopia over time.[5] What they discovered was that the children in the undercorrected group had more rapid myopia progression compared to the group of children who wore their fully corrected glasses prescription. It pointed out that having blurry vision likely leads to eyestrain and visual stress that could actually promote myopia progression.

Today, when a parent visits our office and asks for a weaker prescription for their child, I cannot in good conscience acquiesce to their demands. It would be doing more harm than good. Still, there must be a better way....

CHAPTER 4

Are TVs, video games, cell phones, and tablets hurting my vision?

BY DR. VALERIE LAM

Children can be glued to playing video games for hours on end. You can yell all you want and even threaten they might miss dinner- but the truth is, your child is so addicted to their games that they simply will not budge. Modern technology is making this behavior widespread and no longer regulated to just your home. Nowadays tablets, cell phones, and portable laptops are everywhere and people of all ages are simply addicted to them. A question we hear often at our office is, “are video games and computers ruining my children’s vision? If my child is intensely staring at a near object for hours on end will this cause their eyes to grow more and more nearsighted?”

It’s a common concern and on the surface makes logical sense. The jury is still out in the scientific community whether nearpoint stress can indeed contribute to myopia progression. Clinically, many eye doctors will tell you to have your children reduce screen time as much as possible. What IS known is that lack of outdoor playing time has a strong correlation to myopia progression.[6] Researchers have found that children who spend a couple of hours outdoors are up to four times less likely to become myopic.

Our message to parents regarding visual environment is in part scientifically driven and in part just good common sense. Outdoor activity and exercise are fantastic for visual development versus sedentary indoor activities. This reduces risk factors for myopia as well as improves eye hand coordination, spatial depth perception, and eye pursuit skills. While it is inevitable that many children will gravitate towards tablets and computers, efforts should be made to reduce screen time when possible.

CHAPTER 5

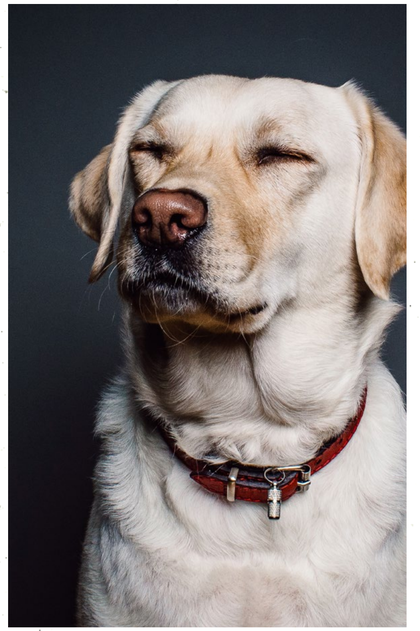
What is nearsightedness?

What really happens to the eye?

by Dr. Thanh Mai

Being nearsighted means that you cannot see objects far away as well as objects up close. In a normal eye, light first reaches the eye at a clear structure known as the cornea. From there the cornea helps to bend light directly to one focal point on the back of your eye. The tissue on the back of your eye that receives light is known as the retina. The retina then translates light into a signal that is sent to your brain.

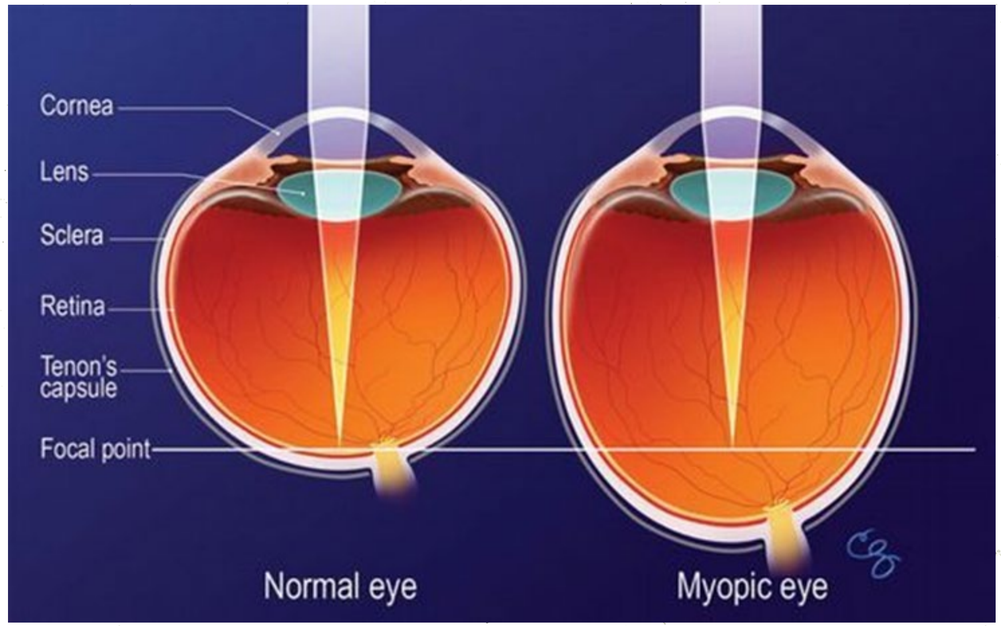
A good way to understand the eyeball is to use the analogy of a camera. The cornea is equivalent to the camera lens which helps to focus the light and allows it to pass through. The retina is equivalent to the film and captures the image. When you plug a digital camera



into your computer, your computer then downloads those images and processes them. Your brain is the high powered computer that processes the retinal images or “film.”

In a myopic eye however, light is not focused directly onto the retina. Rather it is focused in front of the retina. This leads to blurred vision for objects at a distance. The main cause of myopia is due to the fact that the eyeball has grown too much in length. The more our eyes elongate as we grow before adulthood, the worse our myopic prescription becomes. Until around the early 20’s, the eye can continue to elongate and grow causing a decrease in vision.

An unfortunate drawback of becoming highly myopic is that there is an increased risk of vision threatening eye disease. With increased myopia, there is higher risk for retinal detachment, glaucoma, and macular degeneration. So even when myopia is correct with glasses, contacts, or even laser eye surgery, the physical condition of the eye is worse off after myopia has progressed.



Source: EndMyopia.org

CHAPTER 4

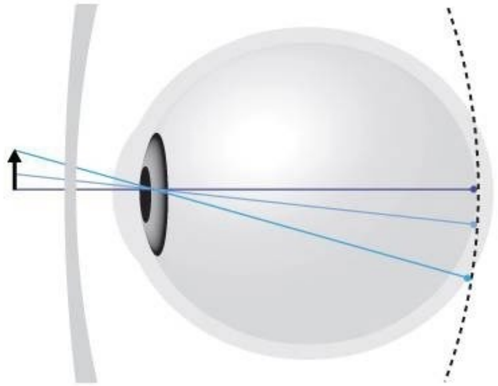
How do glasses correct my myopia?

BY DR. VALERIE LAM

Glasses are truly an amazing invention! For millions of people, their vision is completely blurry but once they put on their glasses it can instantly make the world clear. Glasses correct myopia by changing the focal point of light before it reaches the retina. Glasses and contact lenses help to refocus light further back so that it now lands on the retina instead of in front of it.

One drawback about traditional glasses correction is that it only focuses light directly onto the central part of the retina. Unfortunately, due to the curvature of the lens and how light is refracted off the peripheral edges, there is an inaccuracy to focus the light perfectly on the peripheral retina. This does not help to prevent myopia from getting worse and in fact some scientists believe this peripheral defocus is a stimulating factor to worsening myopia.[7] Traditional single vision contact lenses and laser eye surgery have similar effects, while they do help you to see clearly they do not prevent or slow the signals for eye growth.

You may have heard some doctors even prescribe bifocals or progressive lenses in an attempt to control myopia. A bifocal lens will have the distance prescription up top and the reading prescription on the bottom. The purpose of this is to relax the focusing muscles of the eye to reduce eyestrain. The effectiveness of bifocals in reducing myopia progression is still in debate and at this time we do not have strong scientific evidence supporting that they will make a clinically significant difference over wearing regular glasses.



Source: www.zeiss.com

CHAPTER 7

What can I do to protect my vision?

BY DR. THANH MAI

So here's what we know so far...Myopia is a growing problem and wearing glasses alone will not stop it from getting worse. We know that getting contacts or laser eye surgery will lead to clear vision, but that once the eye permanently elongates it is irreversible and leads to increased risk of eye disease. So what do we do about it?!

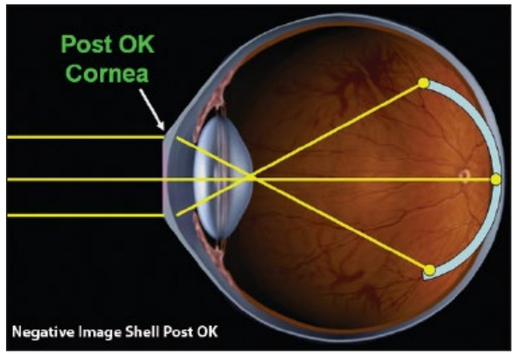
We always counsel our patients first about proper visual hygiene. Daily outdoor activity and exercise is extremely helpful and multiple studies among different countries have supported this. In a sense, one of the best eye doctors you'll ever have is natural sunlight. Staying indoors in dim lit rooms can contribute to myopia progression and poor visual development. When working intensely on a near task such as studying or working on the computer, we recommend the 20/20/20 rule. Every 20 minutes, take a 20 second break by looking far away at an object 20 feet away.

Secondly, some doctors prescribe a mild form of the eye drop atropine (a dilating medication) to try to slow down the progression of myopia. This option needs to be considered carefully however because atropine can cause side effects such as red eyes, light sensitivity, and difficulty focusing up close. If your doctor recommends this approach, we recommend trialing it for a week or so to make sure your child does not experience any adverse effects from the atropine.

Fortunately, one of the biggest breakthroughs in controlling myopia is a process called orthokeratology. This is the most exciting thing we do at our office! It is a revolutionary system that will correct your vision overnight while you sleep. During the day, you can see clearly without having to wear glasses, contacts, or go through laser eye surgery.

With orthokeratology, the peripheral focal points now contour the retina much better. For this reason it leads to a better image on the eye. This protects the eye from elongating which helps stop the myopia progression. We highly recommend orthokeratology for nearly every myopic child. We have a saying around our office, “Want better vision? How about you sleep on it!”

Orthokeratology, or orthok for short, is safe and FDA approved for all ages. Studies have shown that it will help to slow down or stop the progression of myopia. The beauty is that you can achieve 20/20 vision without having to wear glasses or daytime contacts. For those swimmers, hiking enthusiasts, and heavy computer and tablet users, this is truly the ideal solution.



Source: www.CLspectrum.com

CHAPTER 8

I’ve never heard about orthokeratology before.

How does it work and is it safe?

by Dr. Valerie Lam

Orthokeratology is a wonderful technology to achieve great vision while slowing down myopia progression at the same time. My husband is an active orthokeratology user as well as my sister and both are very happy with the results.

Orthokeratology works by reshaping the front surface of the eye known as the cornea. It does so with a retainer lens that gently shapes the cornea while you sleep. The lenses are placed on the eye right before bedtime and when you awaken you remove the lenses. By reshaping the

cornea to be flatter, light will be redirected to the back of your retina. Your cornea will retain its new shape throughout the day and you will have great vision without any glasses or daytime contact lenses.

Orthokeratology has been around for decades but the most recent designs are much more effective. Previously it would take months to have perfect vision. With our custom designs that we use at our office, many patients are able to achieve great vision within a couple of weeks. In the United States, it has been FDA approved for over a decade but other countries in Europe and Asia have been doing orthokeratology for much longer.

We take the safety of performing this service very seriously. After all, these are young children we are dealing with! However, we know with proper follow-up and training, our patients do very well. If this wasn't the case, we certainly wouldn't be fitting our own friends and family in this modality.

Just like with soft contact lenses, there is risk of eye infection that may occur with use. The safety of orthokeratology is similar to the safety of wearing soft contact lenses. However, with the proper cleaning regimen the risks are extremely minimal. You may hear varying reports questioning the effectiveness of orthokeratology from different eye doctors. Some of the uncertainty amongst other doctors has to do with reading false reports or outdated information from old technology. We recommend always doing your own research before deciding if orthokeratology is right for you.

CHAPTER 9

Do all doctors do orthokeratology?

Who is a candidate for orthokeratology?

BY DR. THANH MAI

Not every eye doctor can perform orthokeratology. The reason is similar to why not all who go through dental school become orthodontists. In order to perform orthokeratology correctly, a doctor must to go through additional certifications and training. In addition, it takes a considerable amount of time and effort to properly care for these patients. Performing orthokeratology also requires a corneal topographer to measure the exact shape of every part of the cornea. This is a specialized instrument that not all offices carry. In addition, some doctors who perform orthokeratology do not have custom designs for every individual. Some doctors use what's called a fitting set which can be effective sometimes- but does not work as quickly or as effectively as custom lenses. Think of it as the difference between wearing a suit "off the rack" as opposed to a custom tailored suit—it's just a better fit all around!

To determine if you are a great candidate for orthokeratology, we must first take a digital map of your eye during our orthokeratology consultation. By looking at your prescription, the shape of your eye, and the health of your cornea- our doctors will be able to determine if orthokeratology will work for you or not. With orthokeratology, there are no age restrictions. It is approved for all ages. However, for a young patient who is already showing myopia progression from year to year, we recommend starting orthokeratology as soon as possible. Once the eyes elongates and vision worsens, the structural changes to the eye are irreversible.

Before enrolling in services, you need to know that getting a steady amount of sleep each night is a large component to whether or not you will succeed. If you get an average of only 3 hours of sleep a night for example, even though your eyes and prescription would be ideally suited for the treatment you would not be giving your eyes enough time to reshape each night. Because this is a non-surgical procedure, if you stop wearing the retainer lenses at night time your vision will revert back to what it once was prior to treatment.

In addition, if your child is too scared to put on the retainer lenses, it will not be a pleasant experience in the office or at home. We recommend waiting until your child is ready to participate willingly before starting orthokeratology. Forcing a child to do something they are extremely uncomfortable with usually leads to poor compliance and improper lens care.

CHAPTER 10

Life after treatment

Our orthokeratology patients are ecstatic with their results!

Clear vision all day with complete freedom from glasses or daytime contact lenses. Parents are less nervous when their kids are studying for school on the computer or reading books because the chances of myopia progression are diminished.

Meet some of our patients!

Our sweet Sarah is a point guard basketball player for her high school team. But when she used to play with glasses, her glasses would literally fly off her face or the lenses would get all fogged up. Her frame temples would always be coated with sweat after a game and were sticky. She noticed her vision would slowly get worse every year and her parents were worried because her eyesight kept getting worse.

After just one week with her retainer lenses, Sara went from 20/100 to 20/20. She now plays basketball without any glasses which helps improve her peripheral awareness and vision on the court. We're very proud of Sarah!

Meet Ethan. He is a fast swimming junior lifeguard who is ecstatic with his new vision. Because wearing contact lenses while swimming is never recommended, Ethan now enjoys how crisp his vision is while swimming because of our orthokeratology treatment.

"I love not having to rely on my glasses. They were always so easy to lose!"

Meet Jasmine. She was referred by her optometrist to our office because we do custom designs that can treat higher prescriptions. Her myopia was progressing rapidly but since starting orthokeratology has leveled off considerably.

"We were worried about how fast her vision had changed over the last 12 months. We researched online what to do about it and found orthokeratology. We read mixed reviews but after our initial consult with Dr. Mai we were put at ease. Jasmine is really happy she can play her sports without glasses now."
—Mike, Jasmine's father

"I am able to see much better than with my glasses or contacts. I no longer have headaches other contacts gave me during school. Knowing this will stop my eyes from getting worse is really cool too." — SARAH

About our authors

Dr. Thanh Mai went to UCLA on an academic scholarship and graduated Summa Cum Laude from the prestigious Southern California College of Optometry at Marshall B. Ketchum University for his Doctorate in Optometry. He's worked for the Veteran Affairs Hospital in Las Vegas, Hu Hu Kam Memorial in Sacaton, and the Center for Visual Developmental in San Diego. He was the president of the Orange County Optometric Society and was the Vision Category Expert for Answers.com.

Dr. Mai is the co-founder of Insight Vision Center Optometry in Costa Mesa, CA. At his office, he focuses on orthokeratology and vision therapy. He particularly enjoys treating patients "beyond 20/20" and nurturing healthy vision development in children. As someone who is highly myopic himself, Dr. Mai is particularly sensitive to children who have worsening vision at a young age. In addition, he has a passion for treating those with amblyopia (or lazy eye), strabismus (and eye that turns), and those who have problems with double vision and reading difficulties. He is licensed to treat glaucoma, macular degeneration, and infectious eye disease.

Outside of optometry, Dr. Mai married a fellow UCLA Bruin, Jennie, where they met on the yearbook staff and together they have one son. He loves playing sports and is part of a coed soccer team called "Not So Athletico!" During the football season you may find Dr. Mai at the Rose Bowl cheering on his Bruins!

Dr. Valerie Lam received her Doctorate of Optometry, Magna Cum Laude from the prestigious Southern California College of Optometry at Marshall B. Ketchum University as well. She further went on to pursue a residency in Pediatrics and Vision Therapy where she gained a variety of experience treating strabismus (crossed eye), amblyopia (lazy eye), patients with special needs (autism, cerebral palsy), pediatric low vision, and traumatic brain injuries. Dr. Lam's passion lies with being able to see kids and their families and being able to work in vision therapy to help patients overcome vision issues.

Dr. Lam is a Fellow of the American Academy of Optometry, which is a distinction of her commitment to research and learning and also a Fellow of the College of Optometrists in Vision Development, the organization of optometrists dedicated to vision therapy. She received her bachelor's degree in Biology from the University of California, San Diego.

Dr. Lam married her childhood sweetheart and together they have two adorable daughters. Her husband is a math teacher in the Garden Grove school district so Dr. Lam is always up to date with the latest changes in school curriculum! Dr. Lam enjoys spending time outdoors, biking, and loves to dance. She can speak 3 languages: English, Spanish, and American Sign Language.

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Love the Way You See.

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