My Child Is Not Old Enough For Contact Lenses: Guess Again!

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Sports Vision Director Optical Academy

On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Conference Advisory Board considers content and speakers for future meetings to provide you with the best education possible.

VISION EXPO

Dr. Vittorio Mena Industry Disclosures

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REDEFINING VISION

MacuHealth

Alcon
SEE BRILLIANTLY

Sports Vision Background

- 2013: AOSA National Liaison Sports Vision Section
- 2014-2016: Examined players/coaches/staff NY Giants
- 2017-Present: Director Sports Vision (Optical Academy)
  - Also work with NYC Dept. of Ed and Health
- 2018: Special Olympics Opening Eyes Clinical Director
  - New Jersey, Pennsylvania, Seattle, Orlando
- 2019: NJSOP Young O.D. of the Year
- 2020: Public Service Award: Salus University
- 2021: AOA Sports & Performance Vision Section
- Mentors/Colleagues:
  - Dr. Stephen Morris (University of Miami)
  - Dr. Paul Berman (NJ Devils & NJ Nets; Global Senior Advisor)
  - Dr. Fraser Horn (Nike, Dean of Pacific University)
  - Dr. Keith Smithson (Washington Wizards, Nationals, D.C. United)
  - Dr. Fred Edmunds (NY Mets, XTREMESIGHT)
  - Dr. David Kirschen (Boston Red Sox, U.S. Olympic Teams)
  - Dr. Michael Galloway (T.E.I. & Special Olympics)
  - Dr./Lt.Col. Richard Baird (U.S. Airforce)

American Optometric Association
Sports Vision Section

Dr. Amanda Nanasy

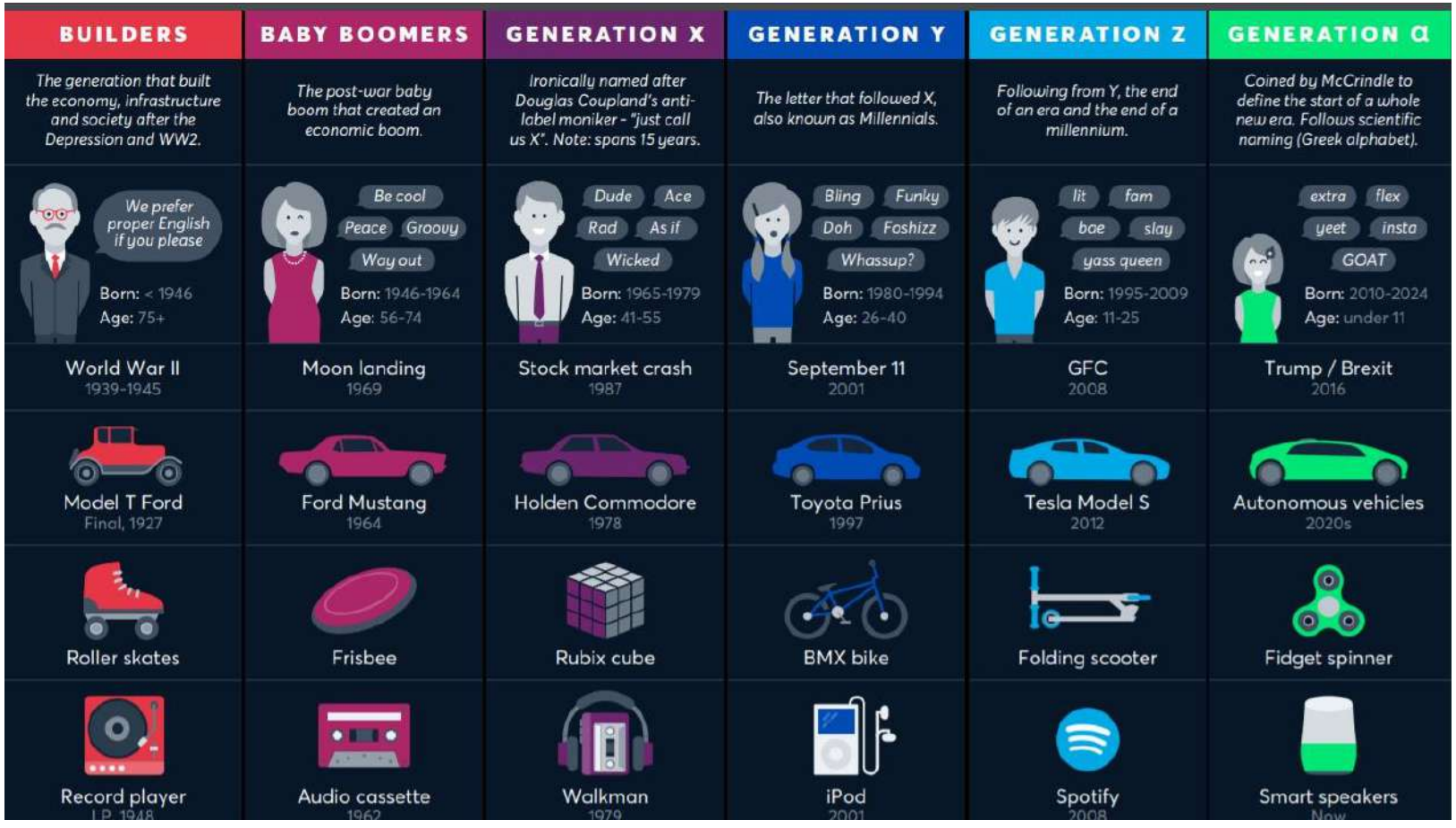
Top Reasons For Adults Wearing Contact Lenses

- 45 Million in the U.S. (2/3 Female)
  - 34% Convenience
  - 31% Cosmetic
  - 17% Other
  - 8% Sports
  - 5% Better Vision
  - 3% Hate Glasses
  - 2% Medical
  - Anisometropia (Not asked)

Bowden & Harknett 2006

Generation Alpha (The New Kids on The Block)

- Generation Z:
  - 2020:
    - 40% account for all consumers
  - 2025:
    - 27% of the workforce
  - Technology:
    - Always on social media
    - Avg 5 screens per day
    - 79% emotional stress when away from their smartphone
- Generation Alpha:
  - Children of Millennials
  - Immersed in technology since birth
    - Apple launched iPad
    - Instagram debut



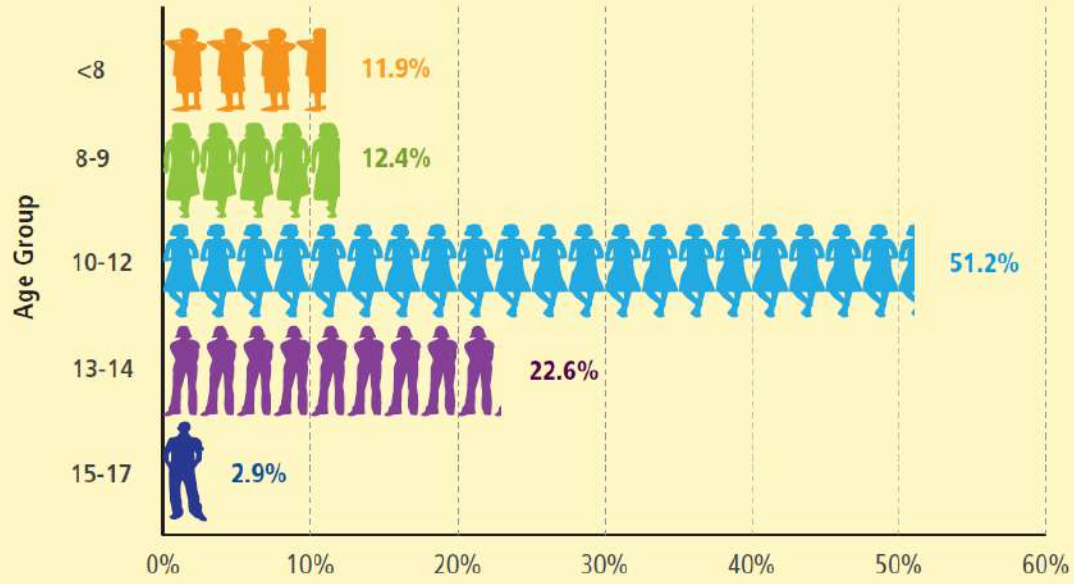
Children & Contact Lens Study

- Trends in prescribing children ranging from 8-17
- Understand factors that influence OD's decision to fit a child in CL's

Appropriate age to introduce a child to soft contact lenses

More than half (51%) of optometrists feel it is appropriate to introduce children to soft contact lenses between the ages of 10 and 12 years old, while nearly one in four (23%) feel 13-14 years old is a suitable age for a child to begin wearing contact lenses. One in ten doctors surveyed think it is proper to introduce 8-9 year olds (12%) or children younger than 8 (11%) to soft contact lenses. Figure 1 below visually displays the age which optometrists say is the appropriate age to introduce a child to soft contact lenses.

Figure 1 Appropriate Age to Introduce Soft Contact Lenses



Ages of Patients Wearing Contact Lenses

- 59% 18 or older
- 19% 15-17 yo's
- 13% 13-14 yo's
- 7% 10-12 yo's
- 2% 8-9 yo's
- <1% 8 or younger

Changes In Fitting Criteria

Patient Age	More likely to fit	Criteria has not changed	Less likely to fit
Younger than 8	8.1%	88.6%	3.3%
8 - 9 years old	15.9%	82.2%	1.9%
10 - 12 years old	20.9%	77.8%	1.3%
13 - 14 years old	14.3%	85.6%	0.1%
15 - 17 years old	12.4%	87.4%	0.2%

Healthy Contact Lens Wear and Care

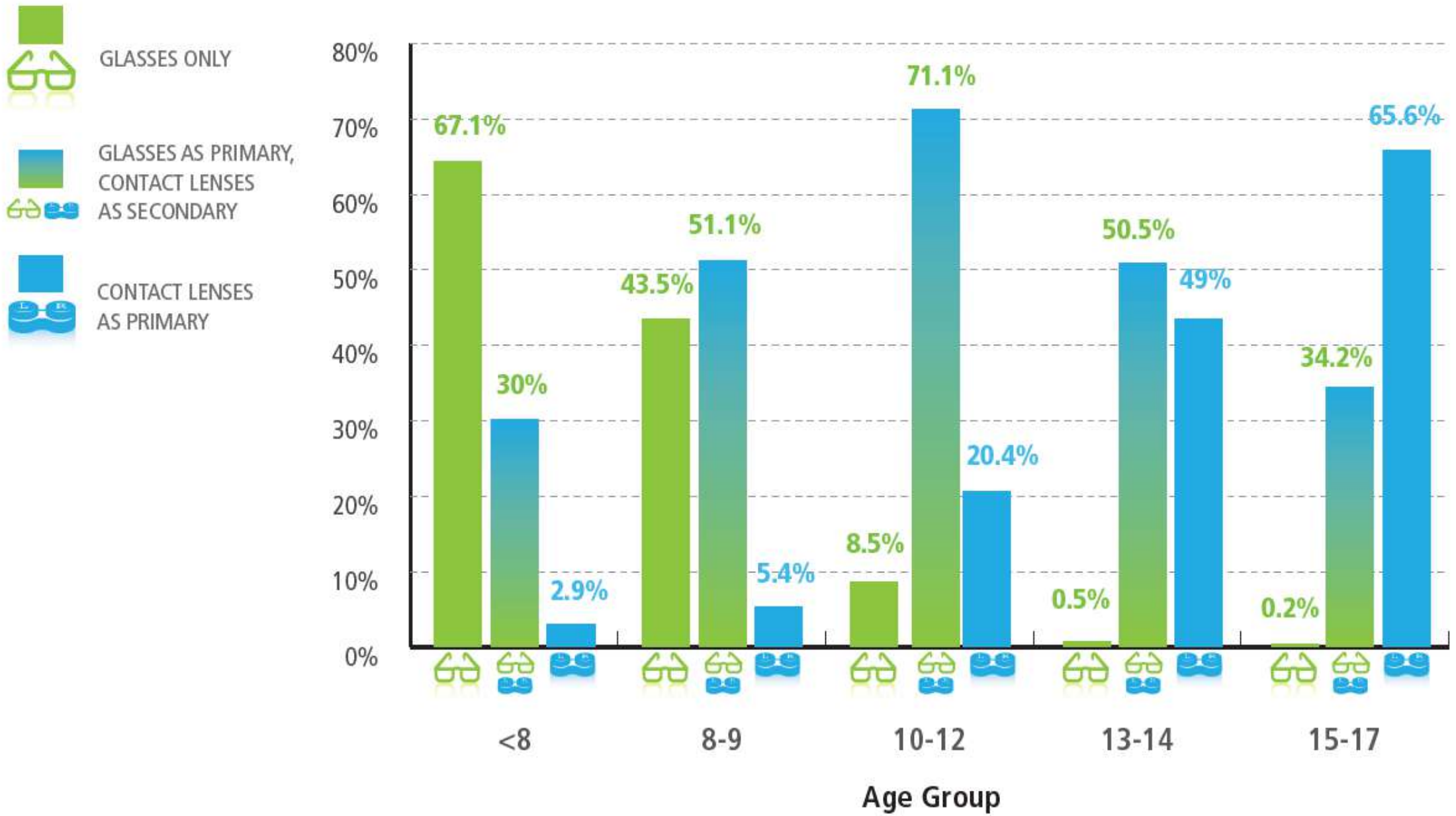
Fast Facts

Who Uses Contact Lenses

- An estimated 45 million people in the U.S. wear contact lenses [1].
- Two-thirds of contact lens wearers are female [1].
- The average age of contact lens wearers worldwide is 31 years old [2].
- An estimated 8% of contact lens wearers are under 18 years old, 17% are between ages 18-24, and 75% of adults age 25 and older wear contacts [1].

1. Cope JR, Collier SA, Nethercut H, Jones JM, Yates K, Yoder JS. Risk Behaviors for contact lens–related eye infections among adults and adolescents — United States, 2016. MMWR Morb Mortal Wkly Rep. 2017;66(32):841-5.
2. Morgan PB, Woods CA, Tranoudis IG, Helland M, Efron N, Orihuela GC, Grupcheva CN, Jones D, Kah-Ooi T, Pesinova A, Ravn O, Santodomingo J, Malet F, Sze L, Cheng P, Végh M, Erdinest N, Ragnarsdóttir JB, Montani G, Davila-Garcia E, Motozumi I, Byoung SC, Bendoriene J, Worp E. International contact lens prescribing in 2012.External Contact Lens Spectrum, 2013.

Figure 2 **Optometrist's Approach to Vision Correction in Children**



Biggest Challenges To Overcome

- Optometrists not prescribing earlier on “too young” or don’t like dealing with contact lenses
  - 57% parent initiates a convo for fitting child under 9 yo
- CL Related Eye Infections: One large Retrospective Study
  - 97 events per 10,000 (8-12 yo’s)
  - 335 events per 10,000 (13-17 yo’s)
  - Incidence of corneal infiltrates events in children no higher than adults
- Pricing:
  - Annual Costs ($1.00-$1.75 a day)
- Child’s Motor Skills:
  - Short attention spans
  - Finger dexterity
  - Small palpebral fissures
- 3 M’s:
  - Mom: (99%)
    - What she says goes
    - Think child can’t handle it or think CL will hurt
  - Maturity: (93%)
    - Personal Hygiene
      - Can the child handle the responsibility of contact lenses
  - Motivation: (96%)
    - Does the child even want contact lenses?

Factors Influencing Contact Lenses Fitting	Very Important	Somewhat Important	Not Important
Child's interest / motivation to wear contact lenses	96%	4%	0%
Child's maturity level	93%	6%	0%
Child's personal hygiene habits	89%	10%	1%
Child's ability to take care of contact lenses by him / herself	89%	10%	1%
Participation in sports	84%	12%	4%
Prescription requirement	77%	17%	6%
Impact of contact lens wear on child's self-esteem	71%	22%	7%
Age	64%	18%	18%
Parental interest in having child wear contact lenses	45%	31%	24%
Frequent frame loss or damage	42%	32%	26%
Frequent spectacle lens damage	40%	32%	28%
Parental experience with contact lenses	35%	34%	31%
Annualized cost of contact lenses	19%	13%	68%
Gender	5%	21%	74%

Reasons For Children In Contact Lenses

- Sports/Dance/Acting/Performing
- Parents Want Their Child in CL's:
  - 39% since they refuse wearing their current glasses
  - 36% since their current glasses interfere with sports
  - 16% since their current glasses interfere with daily activities
- Cosmesis:
  - 31% of children experience bullying (2000)
  - Spectacle Wearers <u>35% MORE LIKELY</u> to be victims of bullying
- Anisometropia: Common
- Aphakia
- UV protection:
  - Important to 85% of parents
- Precision Tinted CL'S:
  - Visibly tinted, color enhancement, opaque
- Myopia Control (Very common & Increasing)
  - Ortho-Keratology (Ortho-K)
  - Soft multi-focal <u>Center Distance</u> contact lenses
    - BLINK Study

CONTACT LENSES AND SPORT

From the highly popular football, tennis, and cricket to the less so running, swimming and cycling right the way through to personal favorites such as fishing, scuba diving and mountain climbing, sports are an integral part of many peoples lives. Each sport puts demands on our vision and may require a unique contact lens solution.

FOOTBALL

Requires the ability to judge distances and speed, and good foot-eye coordination. Daily Contact Lenses. Professionals should consider tinted lenses to make the ball contrast more with the green grass.

TENNIS

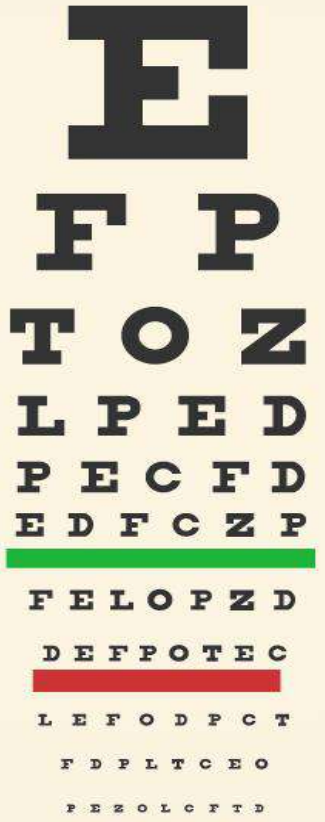
With a tennis ball moving up to 160 miles per hour towards you, incredible dynamic visual acuity is needed to to keep it in focus. Daily Contact lenses, ideally tinted for better contrast, and outdoor players should consider lenses that have UV light protection.

ARCHERY

Archers typically focus on the target with just one eye. Very high levels of visual acuity are needed, and long periods without blinking call for contact lenses with high wettability that won't dry out too quickly. Go for daily or monthly silicone hydrogel lenses.

SAILING

Windy, salty environments can be very harsh on both eyes and contact lenses. UV rays reflected off the water can also cause problems. Daily Contact lenses with UV protection and a pair of polarized wraparound sunglasses to help with wind and water.



SWIMMING

Can increase the risk of losing a lens, infections and dry eyes due to chlorine uptake. Daily Disposable lenses with a good fitting pair of goggles. Ideally replace your lenses after the swim.

SCUBA DIVING

It's perfectly safe and easy to wear contact lenses when diving, although take care when mask clearing. Daily lenses, ideally replaced after the dive - or at least once you get on shore.

FISHING

Contact lenses prevent the risk of losing your glasses in the river or lake. Daily or monthly contact lenses with UV protection, add on a pair of polarised sunglasses to keep track of that fish!

MOUNTAIN CLIMBING

Contact lenses are perfect for rock climbing. At extreme heights, oxygen levels can drop to those of the eye when sleeping. Daily or monthly contact lenses with high oxygen transmission.

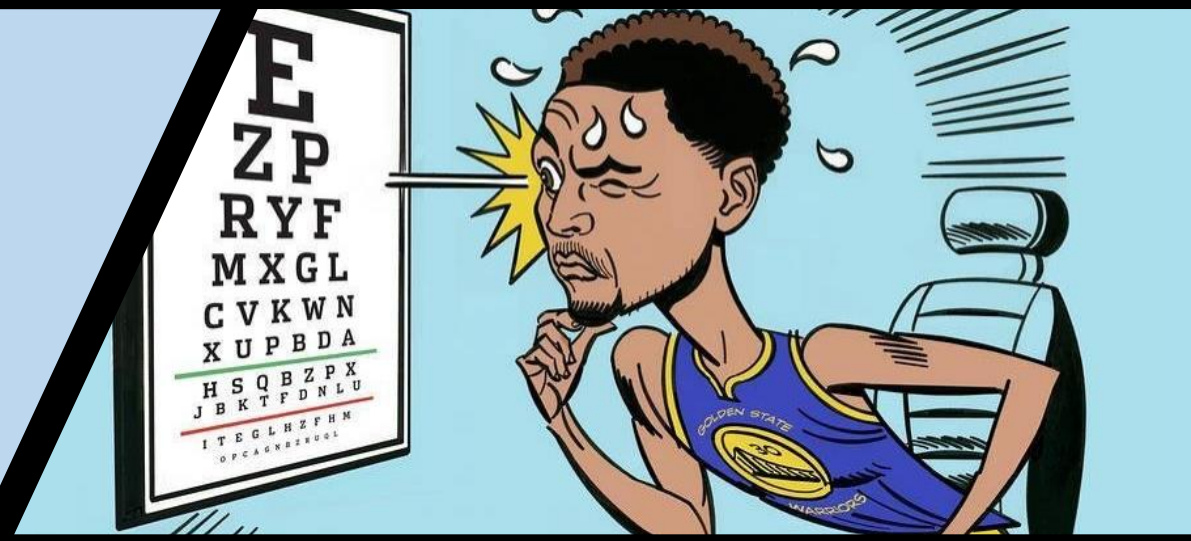
To get the best contact lenses for you, always explain your sporting activities and hobbies to your optician.

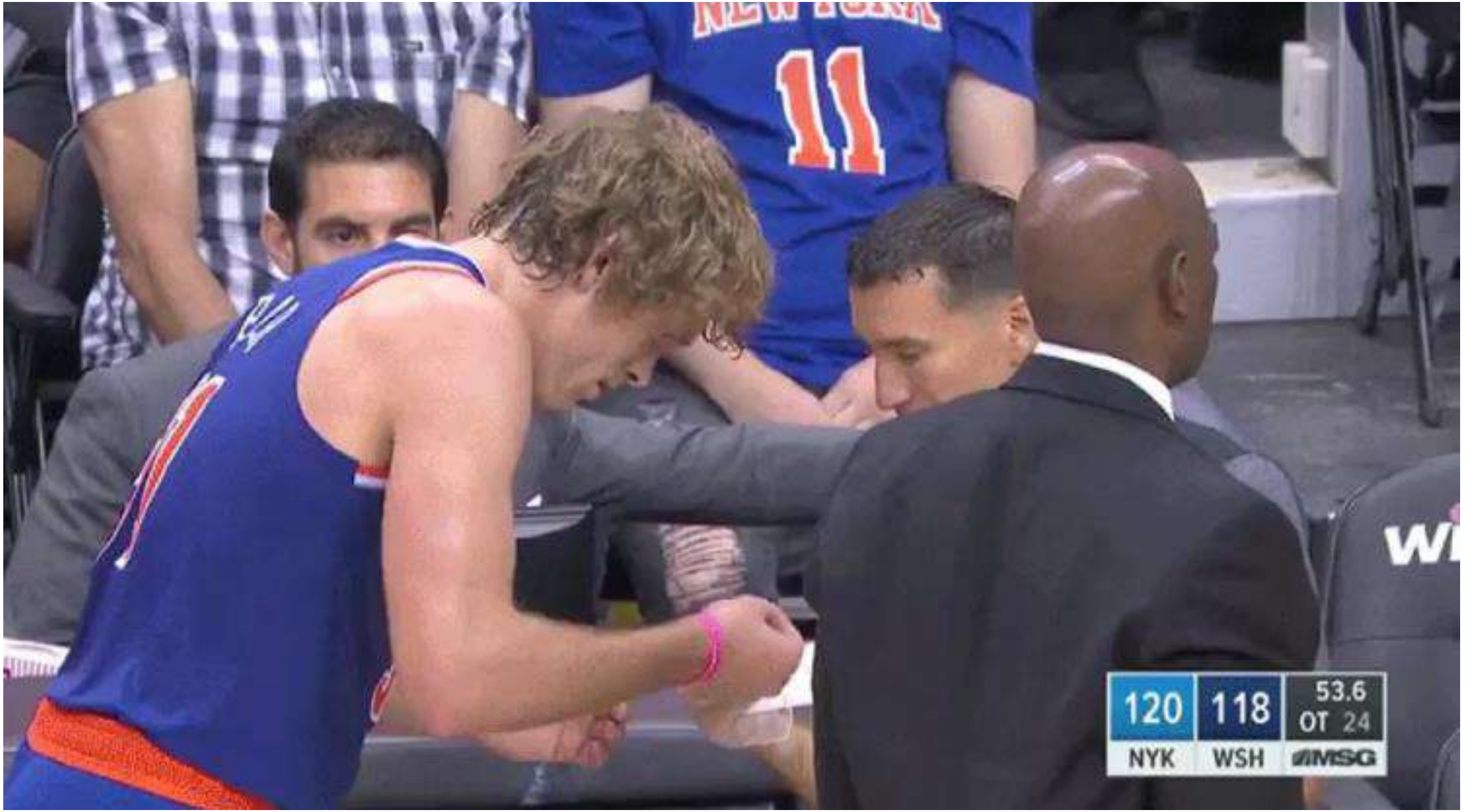
Contact Lenses & Sports

- 2010: AOA reported 70% of children stated their performance improved when choosing contact lenses over glasses
- Contact lenses are vision correction of choice for most sports and athletes
- Better peripheral vision/Natural Unobstructed FOV
- Less chance of fogging
- Less chance of injury
- More stable vision:
  - Less aberrations (No plus/minus effect)
  - Potential for better depth perception
- Better compatibility with safety equipment
- Psychological (Player confidence)
- Optimize CL fit to activity and demands:
  - Silicone hydrogel CW
  - Single-use daily disposable lenses
  - Soft toric (stable designs)

Performance Contact Lenses

- Consider sport specific demands
- Predict what difficulties contact lens wear may present and be able to prevent or address them
- Factors to consider:
  - Gaze positions (Ex: Upgaze for cyclists)
  - Speed of eye movements (Re-orientation)
  - Length of competition
  - Environment (Humidity, temperature, altitude, debris, wind, UV exposure)
  - Replacement possibilities
  - Tint possibilities
- Other modalities:
  - Ortho-K (8 yo good starting age)
  - Scleral lenses:
    - Swimmers, cyclists, military/police




NEW YORK
11
120
118
53.6
OT 24
NYK
WSH
MSG

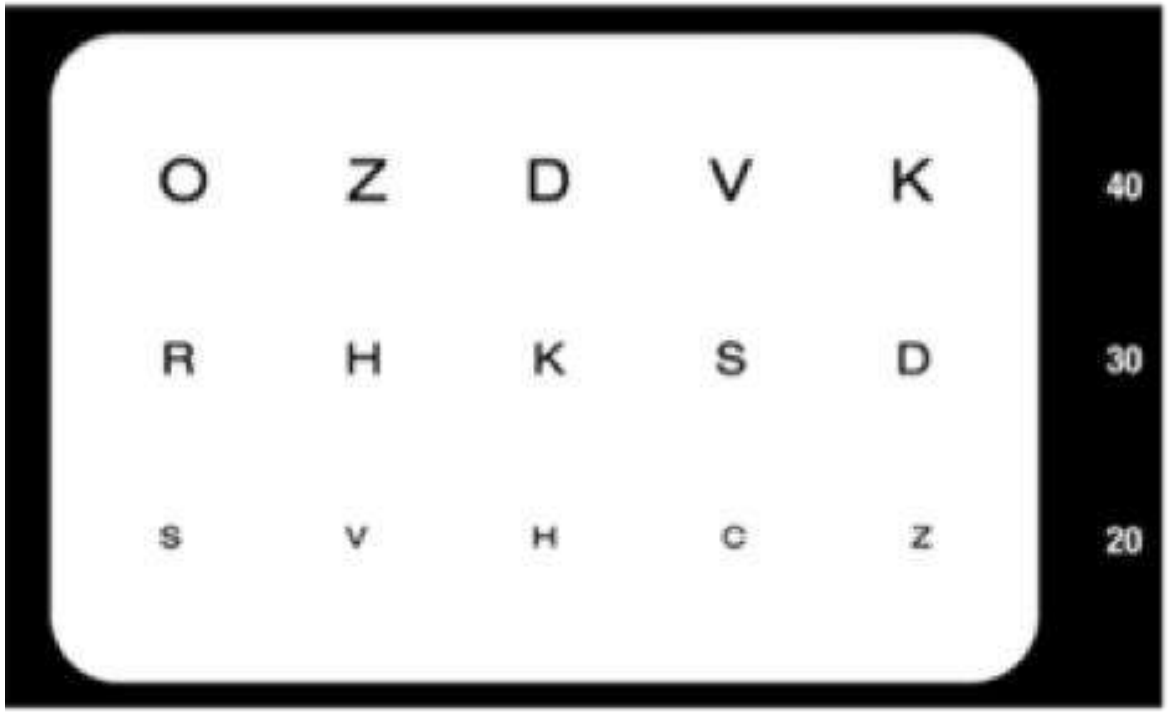
When To Prescribe…

Retinoscopy: The Gold Standard

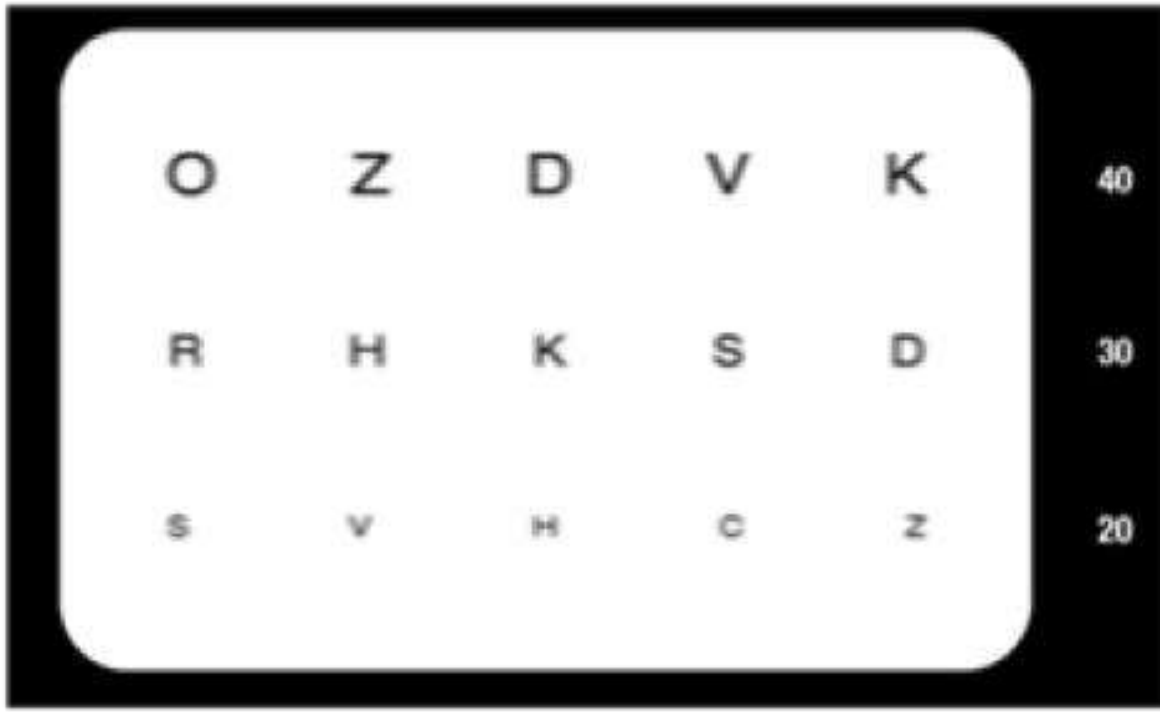
- Based on VA's?
- Based on sport demand?
- Based on patient's motivation?
- Based on refractive error guidelines?
- Based on effort required to achieve clarity?

Prescribing Guidelines: “Raising the Bar”

- Myopia: Beginning at -0.25D
- Hyperopia: Beginning at +1.00D
- Astigmatism: Beginning at -0.50D
  - WTR VS ATR VS OBLIQUE
- Anisometropia: Beginning at 0.50D
  - Consider each meridian
- Accurate refraction
- Binocular balance
- Leave low presbyopes (the young ones) unless symptomatic or appreciative
- Avoid progressives when possible



Optimal correction
of -0.75DC



Uncorrected / “Masking”
of -0.75DC

Sharp

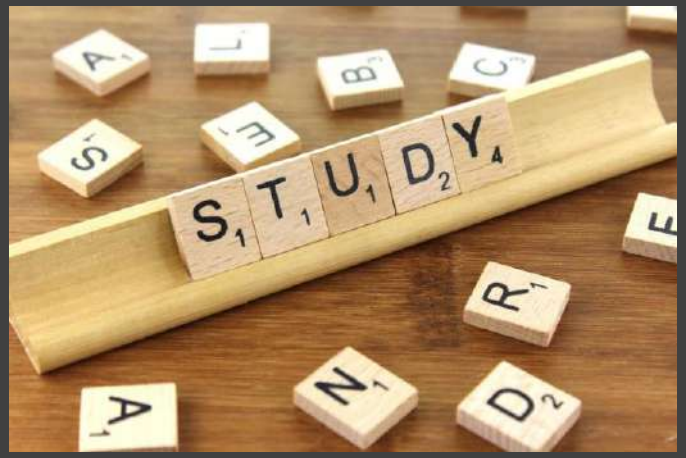
Blur

Ghosted

Other Considerations for the Rx

- Timing of first prescription
- Value of over minus-ing (CSF/Twilight)
- Prescribing for twilight games
- Prescribing for specific distances
- Re-evaluate visual performance with new Rx
- Prescribing modalities:
  - Contact lenses:
    - Fit the tightest lens possible that does not cause physiological damage to the eye
    - If changing base curve is not an option change lens material to improve fit
    - Make sure lens stays in place with a strong blink!
  - Spectacles
  - Sunglasses (Rx or plano)
  - Refractive surgery (Adults)

Quality of Life



484 myopic children ranging from 8-11 yo

All wore glasses before

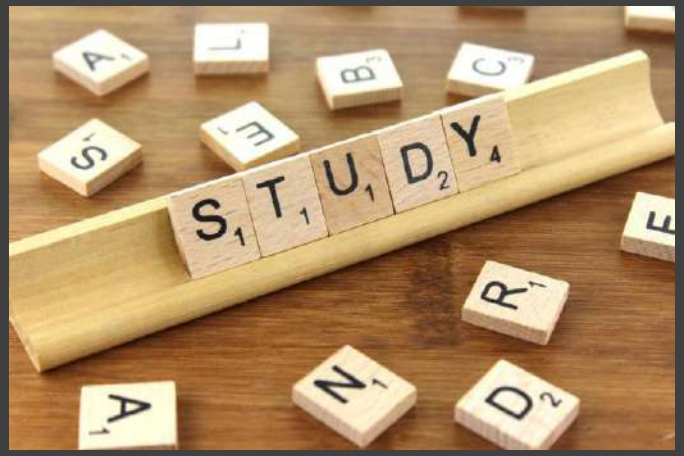
- 50% continued in glasses
- 50% in contact lenses:
  - 93% chose dailies
  - 7% chose 2 week disposables
  - 6.5/10 still chose dailies after cost was explained

Increased in quality of life by 14.2 units in contact lenses vs 2.1 units in glasses wearers

ACHIEVE STUDY:

- Adolescent & Child Health Initiative to Encourage Empowerment
- Found that children 8-11 yo wearing contact lenses scored higher on the self perception profile for children
- Suggests parents are more likely to invest in higher-cost lenses if they perceive a health benefit to their child

CLIP



Contact Lens in Pediatrics Study

Subjects:

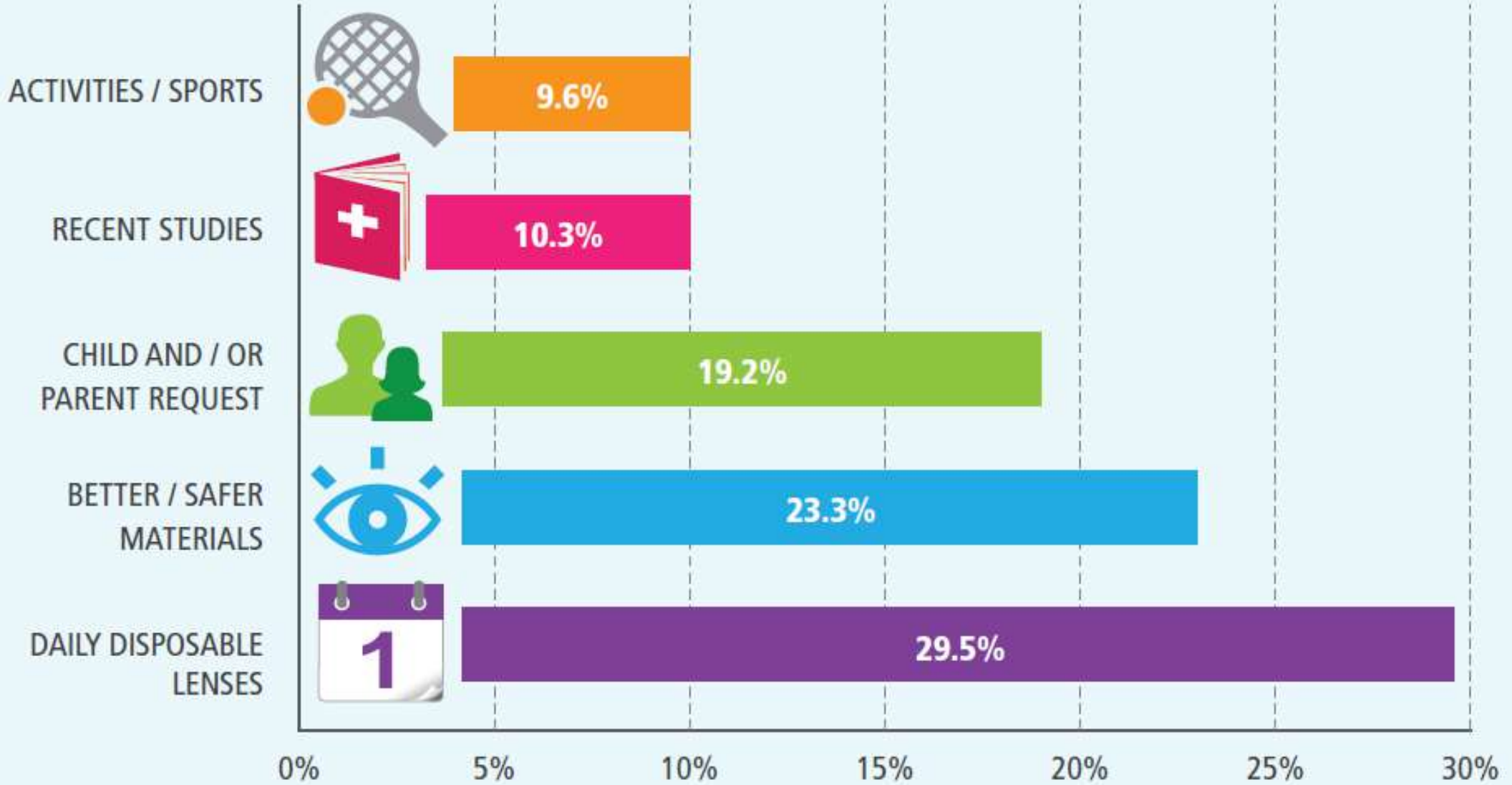
- 84 children 8-12 yo
- 85 teens 13-18 yo

3 Variables:

- Eye Health:
  - No serious eye health issues or adverse side effects
  - Equal adaptation
- Ease of Fit:
  - By 3 months: 83% children vs 89% teens
    - Little to no parental assistance needed
- Quality of Life Issues:
  - Appearance
  - Satisfaction
  - Overall vision

Few extra minutes of additional chair time with child for I&R (8-12 yo's)

Figure 3 Why Optometrists Are More Willing to Fit Contact Lenses in Children



- 1st came out in mid 90's
- 44% of the U.S. Market
- > 80% European Market
- > 90% Asian Market
- OD's are 30% MORE willing to prescribe
- Healthiest option:
  - No buildup of protein deposits or debris
  - Best choice for allergy patients
- Minimal care:
  - No solutions and cleaning protocols
  - Eliminates solution related red eyes/allergies
  - Saves time

Daily Disposables

Acuvue (J&J)	Alcon	Bausch + Lomb	CooperVision
Acuvue Moist	Dailies Total 1	Biotrue ONEday	Clariti 1 Day
Acuvue Moist Toric	Dailies Total 1 MF (L/M/H)	Biotrue ONEday Toric	Clariti 1 Day Toric
Acuvue Moist MF (L/M/H)	AquaComfort Plus	Biotrue ONEday MF (L/H)	Clariti 1 Day MF (L/H)
Acuvue Oasys 1 Day	AquaComfort Plus Toric	Soflens Daily	ClearSight 1 Day
Acuvue Oasys 1 Day Toric	AquaComfort Plus MF (L/M/H)	Soflens Daily Toric	ClearSight 1 Day Toric
Acuvue TruEye	Focus Dailies	Infuse	MyDay
Acuvue Define	Precision 1		MyDay Toric
	Precision 1 Toric		Proclear 1 Day
	Dailies Colors		MiSight 1 Day

Others: Miru 1 Day (Menicon), Extreme H2O Daily (X-CEL), NaturalVue 1 Day MF (VTI Vision)

Group 1 *(Low Water/Nonionic),* ***Group 2*** *(High Water/Nonionic),* ***Group 3*** *(Low Water/Ionic),* ***Group 4*** *(High Water/Ionic),* ***Group 5*** *(Silicone Hydrogel)*

Selecting the Optimal Lens Material

- Low water is preferred to minimize dehydration
- Optimize oxygen performance (Silicone Hydrogel)
  - Less limbal redness or hyperemia
  - Better lens comfort (5x more oxygen)
  - Fewer patients drop out
- RGP's rarely preferred due to risk of dislocation and impact of foreign bodies
- Conventional Polymers
- UV Blocking Contact Lenses:
  - Class I: Must block at least 90% UVA and at least 99% UVB
  - Class II: Must block at least 70% UVA and at least 95% UVB
- Well fitting soft contact lenses cover the entire cornea and limbus
  - Help with peripheral light focusing effect
  - Help protect the cornea, aqueous humor and crystalline lens

Getting the Right Fit For a Soft Lens

- Maximize Visual Performance:
  - Correct even low cylinder with soft toric
  - Consider aspheric design lens
  - Tinted lenses for specific applications
- On-Eye Stability Critical:
  - Poorly fitting soft lenses:
    - Alter ocular physiology/discontinuation of CL wear
    - Both tight and loose lenses are associated with greater fluorescein staining
    - Loose fitting soft lenses can cause bulbar and limbal hyperemia
  - Good centration on primary gaze and good corneal coverage in all directions of gaze
    - Stable and consistent vision before and after the blink! (Adequate movement)
  - Vertical movement on blink = 0.5-1mm
  - Push up test = Fast and smooth re-centering of the lens
  - Undistorted keratometer reflex:
    - Blur before blink = Too tight
    - Blur after blink = Too loose
- Comfort is KEY! (No Distractions)
  - **Silicone hydrogel**! Outstanding oxygen permeability
  - Minimize complaints of dryness, redness and irritation
  - Tears are crucial for maintaining ocular comfort and clear unobstructed vision

Optometrists Take on Contact Lens Properties

Contact Lens Properties	Very Important	Somewhat Important
Comfort	75%	23%
Oxygen Permeability	64%	35%
Ease of Handling	53%	46%
Visual Acuity	53%	47%
Replacement Schedule	47%	49%
Ultraviolet Protection	30%	45%

Cosmetic Contact Lenses

Fairness to CL Consumers Act & CL Rule: FTC & FDA

StopIllegalCLs@aoa.org

BAD HABITS OF CONTACT LENS WEARERS

Contact Lenses are a Safe Form of Vision Correction. But According to the American Eye-Q® Survey[1], Many People Make These Serious Mistakes:

57% WEAR LENSES LONGER THAN THEY ARE SUPPOSED TO

21% ARE GUILTY OF SLEEPING IN THEIR LENSES

53% OF CONSUMERS WHO WEAR DECORATIVE LENSES PURCHASE THEM ILLEGALLY

35% OF CONTACT LENS WEARERS DON'T WASH THEIR HANDS

POOR CONTACT LENS HYGIENE PRACTICES, OR WEARING ILLEGALLY-PURCHASED DECORATIVE CONTACT LENSES, CAN RESULT IN:

- **Bacterial Infections**
- **Pain and Irritation**
- **Permanent Vision Loss**

KEEP YOUR EYES HEALTHY!

- WASH YOUR HANDS BEFORE HANDLING LENSES
- KEEP YOUR CASE CLEAN USING FRESH SOLUTION EVERY TIME AND REPLACE IT AFTER 3 MONTHS
- DON'T SLEEP IN LENSES NOT MEANT FOR OVERNIGHT WEAR
- ALWAYS GET AN EYE EXAM AND PRESCRIPTION FROM A LICENSED OPTOMETRIST

ALL contact lenses are medical devices. Get an eye exam and only wear lenses that have been properly fitted and prescribed by an optometrist.

Tips for Clean, Comfortable Contact Lenses

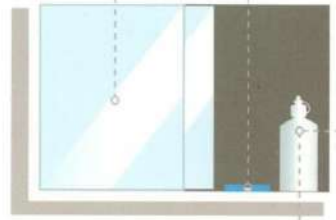
Follow these simple contact lens care practices and get the most from your contact lens-wearing experience.

IF YOU SEE RED, TAKE A SECOND LOOK

If your eyes look red when you look in the mirror, remove your contact lenses, and consult your eye care practitioner immediately.

EMPTY, RINSE & REPEAT

Clean, rinse and air dry your contact lens case each time contact lenses are removed.



EYE ON THE SOLUTION

Make sure to speak to your eye care practitioner before changing contact lens solutions.

WATER & CONTACT LENSES DON'T MIX

Do not rinse your contact lenses or clean your contact lens case with water.

USE FRESH NEW SOLUTION EVERY TIME

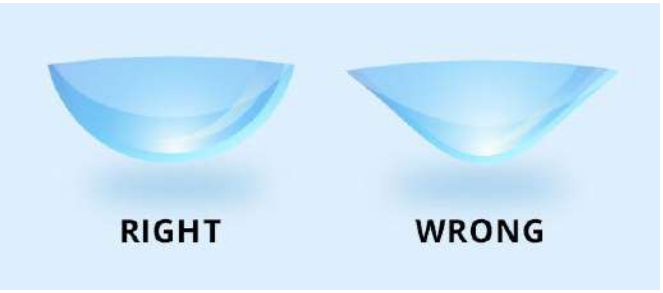
Topping off solution may decrease the disinfection efficacy in the contact lens case.

WATCH WHEN YOU WASH

Always wash and dry hands before handling contact lenses.

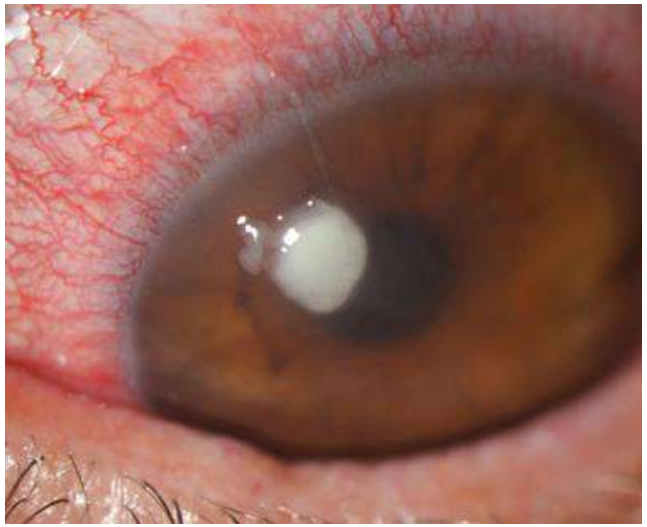
KEEP TALKING

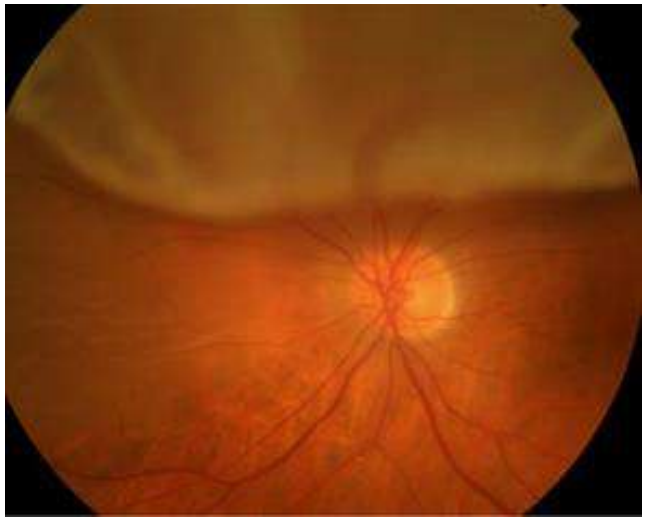
Visit your eye care practitioner at least once a year and ask about contact lens care.



Contact Lens DON'Ts

- Sleep overnight in contact lenses
  - Increases risk of microbial keratitis (10x)
- Water and contacts DO NOT mix!
  - Includes swimming and showering in lenses
  - 1/5 college age wearers rinse in tap water sometimes
- No sharing contact lenses or cases with friends
- Do not use saliva as a wetting solution
- Do not go over your wear-schedule
- Do not order CL's without a current prescription
- Do not wear CL's when your eyes are red or irritated





Docs Are Worried About Microbial Keratitis

- Myopia < -3.00D = 3x more likely to have RD than MK
- Children who progress into -3.00D to -6.00D are equally as likely to have RD than MK with Ortho-K in a lifetime
- Myopia > -5.00D = 4x more likely to develop myopic maculopathy in a lifetime than MK from a lifetime of Ortho-K or daily SiHi contact lenses!
- Annual risk of RD in the -3.00D to -6.00D = 5x higher than risk of MK from daily disposable contact lenses and on par with the risk of MK from Ortho-K

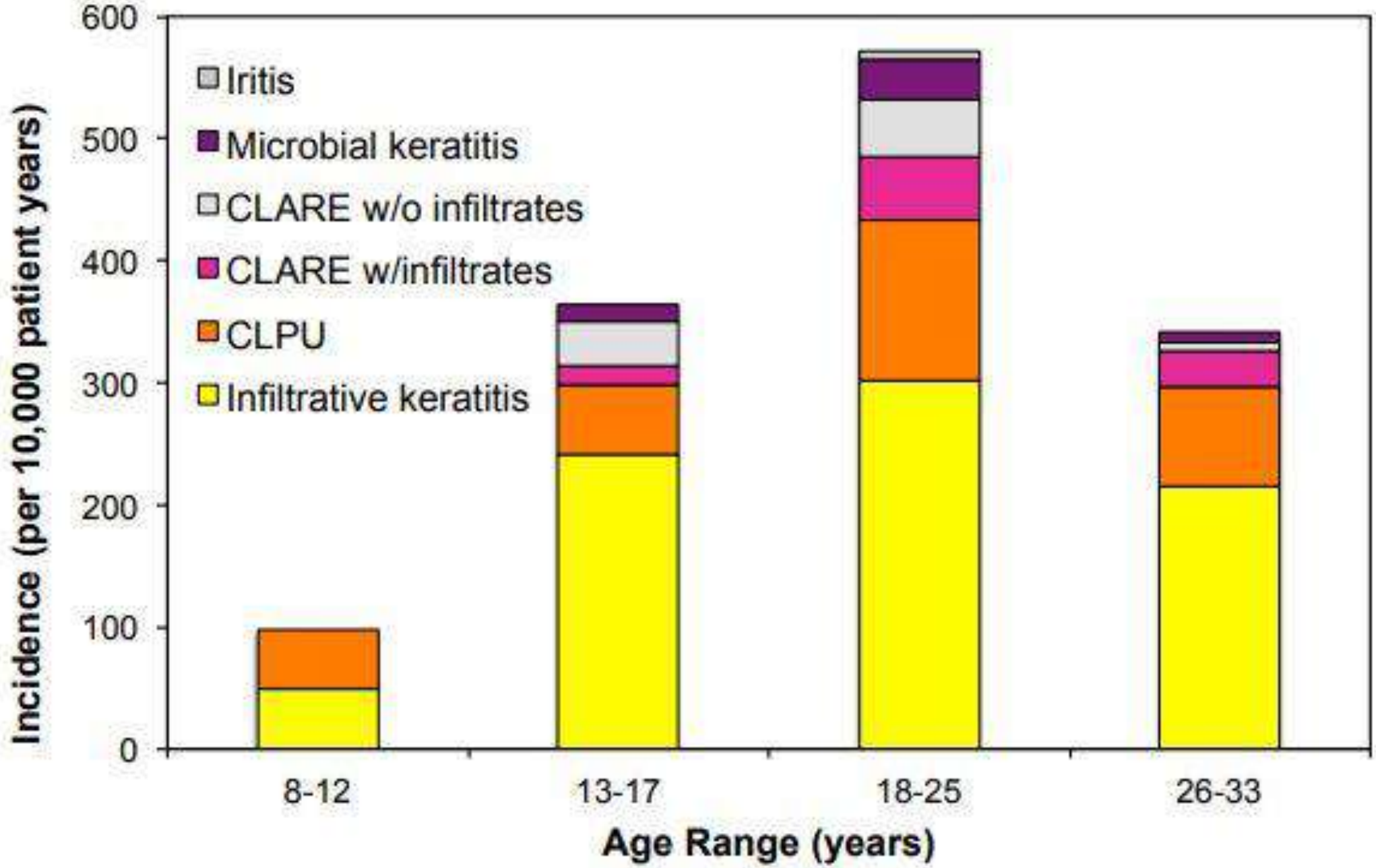

600
500
400
300
200
100
0
Incidence (per 10,000 patient years)
Iritis
Microbial keratitis
CLARE w/o infiltrates
CLARE w/infiltrates
CLPU
Infiltrative keratitis
8-12
13-17
18-25
26-33
Age Range (years)

TABLE 1.

Summary of studies of contact lenses in children

Authors	Country	Age Range (yr)	Duration (yr)	N	Patient years	CIEs	Incidence of CIE (per 10,000 patient years)	95% CI
Prospective studies								
Terry et al. (1997)[28]	US	10–13	3	69		*		
Horner et al. (1999)[29]	US	11–14	3	68		*		
Walline et al. (2004)[30]	US	8–11	3	57	159	0	0	0, 233
Sankaridurg et al. (2013)[31]	PRC	7–14	2	240	369	5	136	50, 300
Walline et al. (2008)[32]	US	8–11	3	247	723	6	83	34, 173
Chalmers et al. (2015)[12]	US	8–17	1	202	171	0	0	0, 216
Anstice and Phillips (2011)[2]	NZ	11–14	1.7	40	57	*		
Sankaridurg et al. (2011)[4]	PRC	7–14	1	45	43	*		
Walline et al. (2013)[5]	US	8–11	2	40	59	*		
Lam et al. (2014)[3]	HK	8–13	2	221	256	*		
Cheng et al. (2016)[33]	US	8–11	1 + 1.5	127	262	0	0	0, 141
Aller et al. (2016)[1]	US	8–18	1	79	78	*		
Walline et al. (2007)[34]	US	8–17	0.25	169	39	1		
Li et al. (2009)[35]	SG	8–11	0.25	59	13	0		
Plowright et al. (2015)[8]	UK	13–19	0.5	55	23	1		
Paquette et al. (2015)[36]	CND	8–16	0.25	179	41	1		
Retrospective studies								
Turnbull et al. (2016)[37]	NZ	6–17		32	43	0		
Chalmers et al. (2011)[14]	US	8–12		243	411	4	97	31, 235
Chalmers et al. (2011)[14]	US	13–17		811	1,372	46	335	248, 443

Where possible, the incidence of symptomatic corneal infiltrative events (per 10,000 patient years) is estimated based on the number of events, the number of patients, and the study duration. Patient years based on study follow-up at each time point, not enrollment.

*Data not reported.

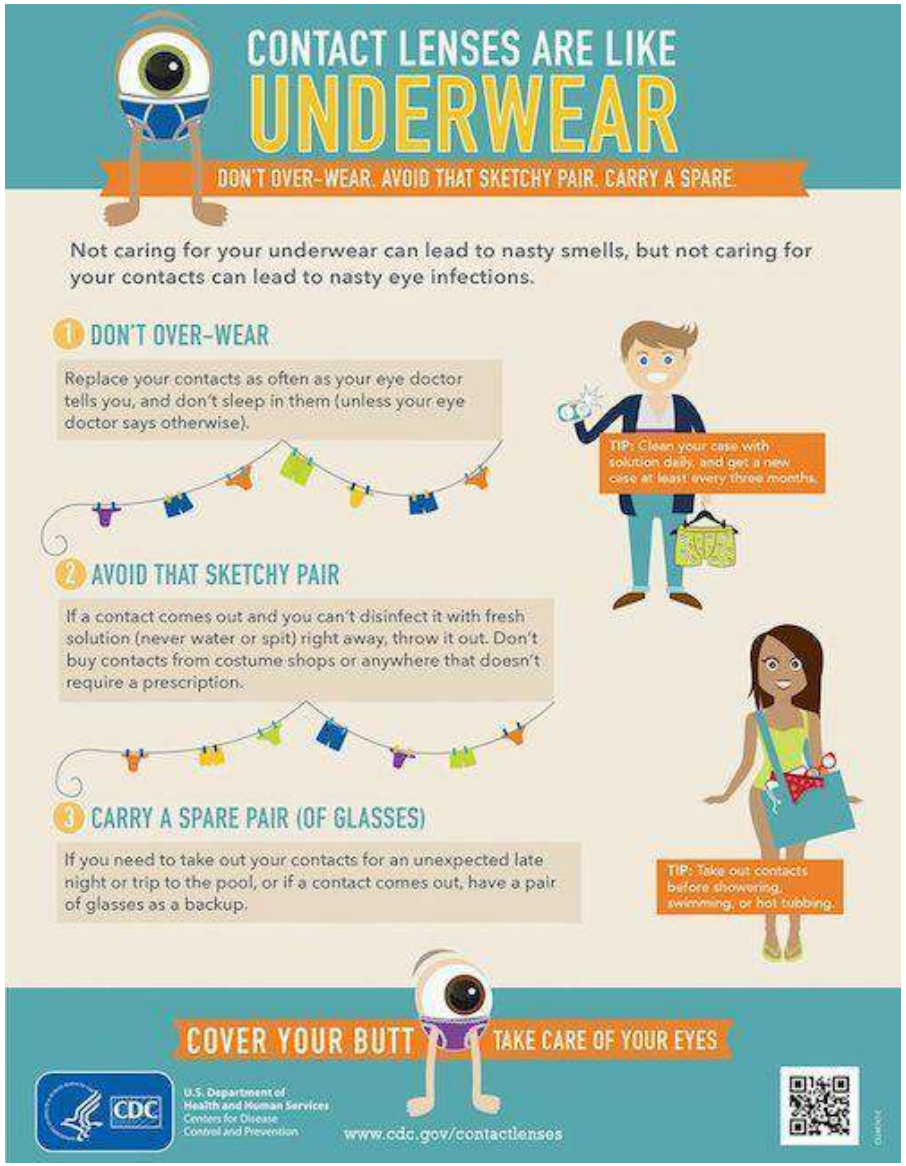
CIEs indicates corneal infiltrative events; CND, Canada; PRC, China; HK, Hong Kong; NZ, New Zealand; SG, Singapore; UK, United Kingdom; US, United States.

Adverse Events & Compliance In Children

- No difference in adverse events & outcomes in CL wearers fitted as teens or adults after 10 yrs of follow up (Walline 2011)
- Overnight OrthoK:
  - 677 children (Bullimore et al 2013)
    - 0.6% Infiltrative keratitis
    - 0.3% Microbial keratitis
    - 0% Vision loss
- Pediatric DW SiHy with Monthly Replacement:
  - 240 children (Sankaridurg et al 2013)
    - 4.1% CLPC
    - 1.3% Infiltrative keratitis
    - 0% Vision loss

How to Introduce Contacts to Children

- Have discussion with the parent and child
- Offer brochures in the office
- Have daily disposable slogans around the office and exam room
- Optometric Staff/Technicians:
  - Show care, guidance and patience during the insertion and removal process
  - Send proper literature home with parent and child on wear time and care for the lenses
    - Compliance contract
  - Call the office if any troubles
- Online resources or Apps:
  - Acuminder (www.acuminder.com)



They say...	You say...
Glasses work just fine	Contact lenses have many practical advantages over glasses. They offer 'all round' vision as they move with the eye. They aren't affected by rain or fogging up. And they can increase a child's confidence and performance in sports and social situations
My child isn't old enough for contact lenses	Eye care practitioners rate 'maturity' and 'motivation' above age in deciding when the time is right to try contact lenses. Children can often be more successful with contact lenses than teenagers and young adults[16]
My child won't look after them	We now know that young people aged 8-11 are just as capable as those aged 12-17 at looking after contact lenses[17]
My child's eyes are still growing	Children's eyes reach adult size from an early age. We'll check your child regularly to make sure the lenses are right for his/her eyes. With disposable lenses we can easily update the lenses if the prescription changes
Contact lenses might get lost at school	This isn't the end of the world! It's easy to slip a spare pair of lenses in their school bag (for younger children, see text). We recommend they keep a spare pair of glasses at school too
Are they safe for my child?	The risk of experiencing a problem that interrupts contact lens wear is extremely low, and for some problems it's less in 8-15 year-olds than for teens and adults.[18] We'll monitor the eyes very closely and advise you and your child of the best way to keep them healthy

The Contact Lens Pledge

I understand that wearing contact lenses at my age means I must engage in safe and responsible behavior that includes:

- Wearing and caring for my contact lenses exactly as my eye care practitioner instructs me.
- Telling my parents immediately if my eyes don't look good or feel good, or if my vision isn't good.
- Handling my contact lenses carefully so I don't lose or tear them.
- Never letting anyone else wear my contacts — not even my best friend.

Here you can add any other promises that you and your parents would like to include:

- _____
- _____
- _____

My parents and I have now thoroughly discussed these points. I understand that if I don't keep these promises, my parents have the right to discontinue my contact lens wear until they feel that I am ready for them again.

Signed,

_____ (teen)

_____ (parent)

_____ (date)

Tips For Success With Pediatric Lens Fittings

- Make sure the child wants contact lenses and not the parent!
- Hire staff members who enjoy and are good at working with children
- Daily disposables especially when parents are worried about compliance
- Possibly train two children at a time so they can learn from their peers
- The child must be able to insert and remove lenses on their own before leaving the office:
  - Can teach parent also how to take them on and off their child so they feel more comfortable if anything goes wrong
- Schedule first follow up visit within 5-10 days
- Children's prescriptions can change quickly so seem them every 3-6 months if possible to avoid progressive myopia
- Require that a child have a back up pair of glasses
- DO NOT use age as a criteria for fitting contact lenses

Anisometropia

- Condition where each eye had unequal refractive power
  - Leading cause of monocular vision loss in young and middle aged Americans
  - Difference of 1D in two eyes = 2% difference in size of two retinal images
  - > 4D not tolerated
- Problems With Anisometropia: 6% 6-18 yo's
  - Strabismus (Crossed eyes)
    - Suppression of binocular vision
  - Squint:
    - Convergence squint in child
    - Divergence squint in adult
  - Diplopia (Double Vision)
    - Eyestrain, light sensitivity, dizziness, headaches, nausea, tiredness
  - Amblyopia (Lazy eye)
- Contact lenses best optical approach for correcting:
  - Binocularity
  - Glasses weird appearance of image sizes
  - Improve vision/optimal clarity

Severity

AGE (YEARS)	MILD	MODERATE	SEVERE
0 to 1	14%	4%	0%
2	40%	18%	6%
3	65%	29%	4%
4	67%	32%	9%
5	76%	30%	14%
6 to 7	68%	45%	9%

Amblyopia: Anisometropia

AGE (YEARS)	MILD	MODERATE	SEVERE
0 to 1	26%	0%	0%
2	32%	5%	0%
3	37%	12%	1%
4	47%	17%	3%
5	44%	15%	4%
6 to 7	47%	16%	0%

Amblyopia: Strabismus

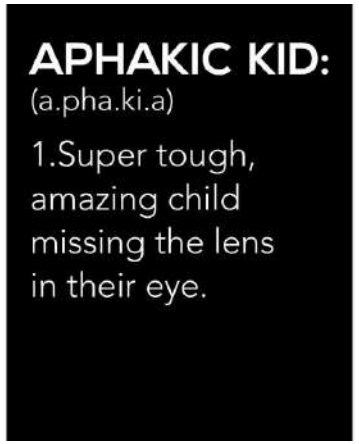
Trans Am Ophthal Soc Dec 2005

Guidelines for Refractive Correction in Infants and Young Children

Condition	Refractive Errors (diopters)		
	Age <1 year	Age 1–2 years	Age 2–3 years
Isoametropia (similar refractive error in both eyes)			
Myopia	–5.00 or more	–4.00 or more	–3.00 or more
Hyperopia (no manifest deviation)	+6.00 or more	+5.00 or more	+4.50 or more
Hyperopia with esotropia	+2.50 or more	+2.00 or more	+1.50 or more
Astigmatism	3.00 or more	2.50 or more	2.00 or more
Anisometropia (without strabismus)*			
Myopia	–4.00 or more	–3.00 or more	–3.00 or more
Hyperopia	+2.50 or more	+2.00 or more	+1.50 or more
Astigmatism	2.50 or more	2.00 or more	2.00 or more

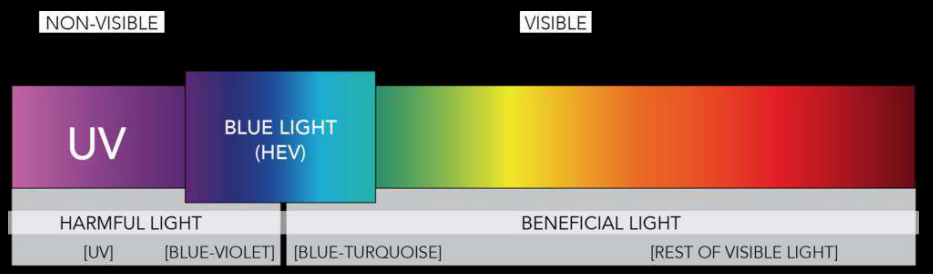
Aphakia

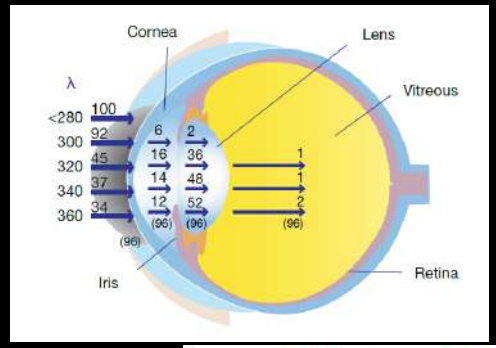
- Congential Cataracts
- Marfan's syndrome, Homocystinuria, Weill-Marchesani syndrome
- Infant Aphakia Trial:
  - 1/57 babies (< 2%) developed presumed bacterial keratitis
- Alden, Continental, Kontour and Optech
- Silsoft & Silsoft Super Plus Contact Lens (B+L)
  - +12.00D to +20.00D (1.00D steps) & +23.00D to +32.00D (3.00D steps)
    - 0-12 months = +29.00D to +32.00D
    - 12-24 months = +20.00D to +26.00D
    - > 2 yrs = +12.00D to +20.00D
  - 100% silicone polymer
  - Highest oxygen permeability available (340)
  - Low water content
  - Resists absorption of topical ophthalmic drugs
  - EW lens and extremely soft



UV & Blue Light: Essential But Harmful

- UVA: Aging of the skin (315-380nm)
  - Gets absorbed the most by the eyes (Ex: Pinguecula/Pterygium)
- UVB: Burn/Blisters (280-315nm)
  - Filtered by the cornea
  - Snow reflects 80-94% compared to water 5-8%
  - Most dangerous to eyes and skin (Ex: SPK, Cortical Cataracts, Erythema)
- UVC: Cancer (< 280nm)
  - Gets blocked by the atmosphere (Ozone) so no major concern
- Highest Energy Visible (HEV) Light (380-500 nm)
  - Harmful Blue-Violet Light (415nm-455nm) Peak 435nm
    - May damage retina over time; irreversible cell damage (Increase AMD)
  - Helpful Blue-Turquoise Light (465nm-495nm)
    - Helps with pupil function, sleep/wake cycle, memory, mood, hormonal balance)
    - Longer wavelengths ranging up to 500 nm needed to help regulate sleep patterns
- IR (> 780nm) = DO NOT STARE AT THE SUN!!! (Ex: Cataract)
- Only 1% of UV & HEV can get to the retina
- UV exposure increases around 4% every 300m gained in altitude





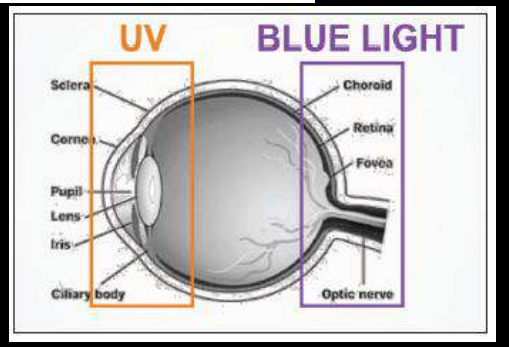
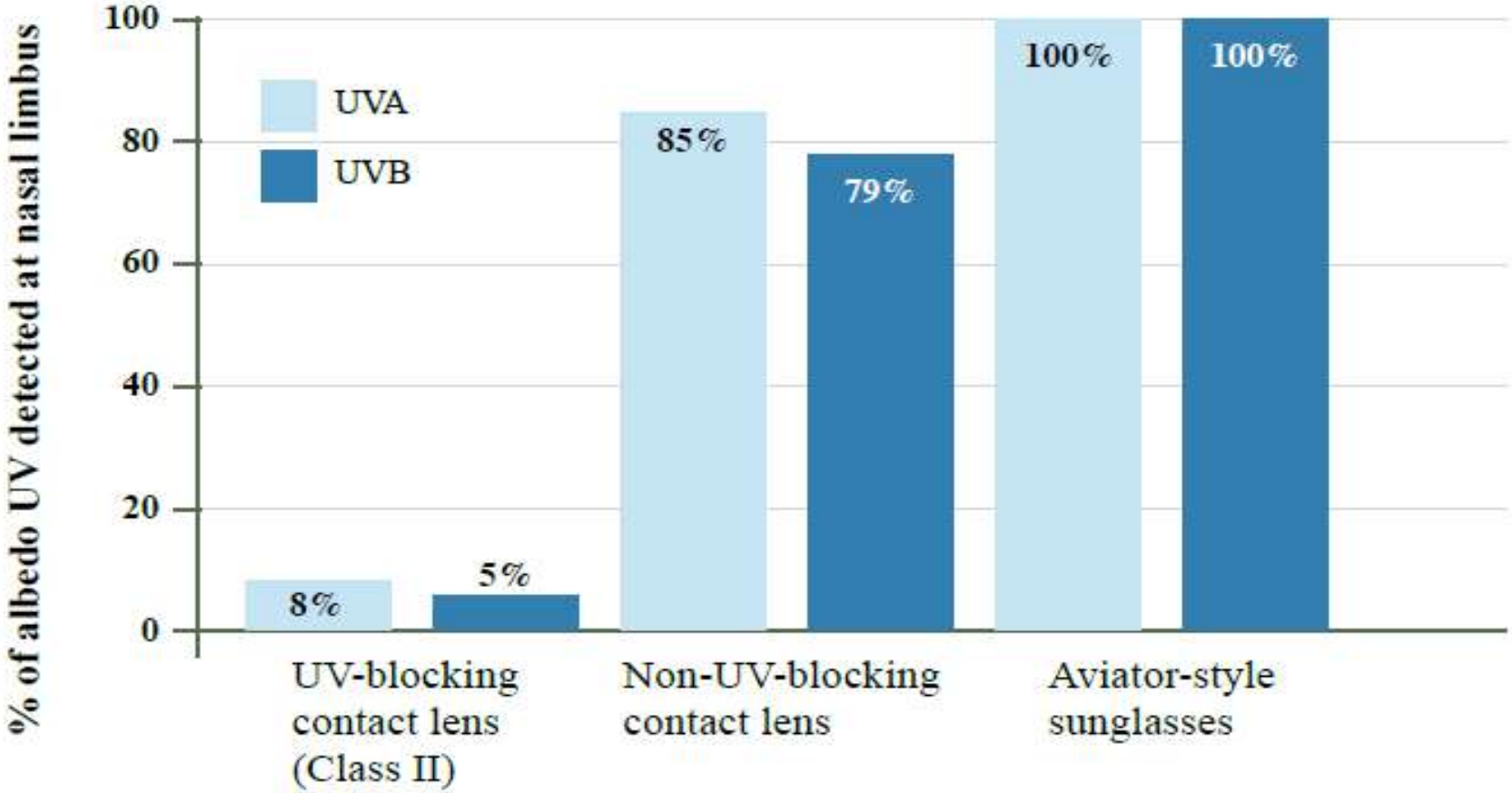


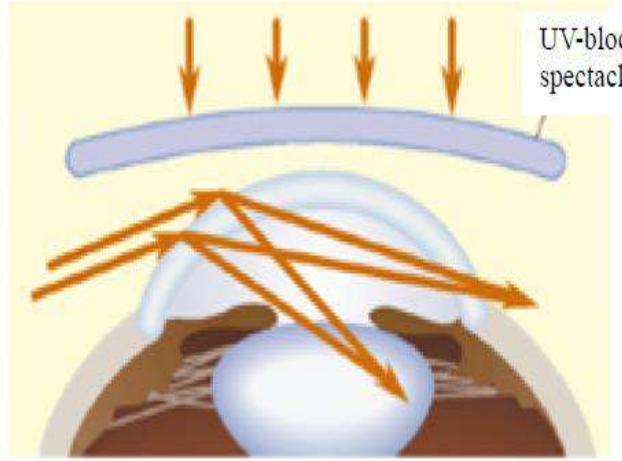
Table 1. Popular e-Readers and Their Peak Spectral Emissions[15]

Device	Size (in)	Spectral Peak (nm)
Book	n/a	612
iPad	9.7	452
iPhone	3.5	452
Kindle	6	612
Kindle Fire	7	448
Nook Color	7	448

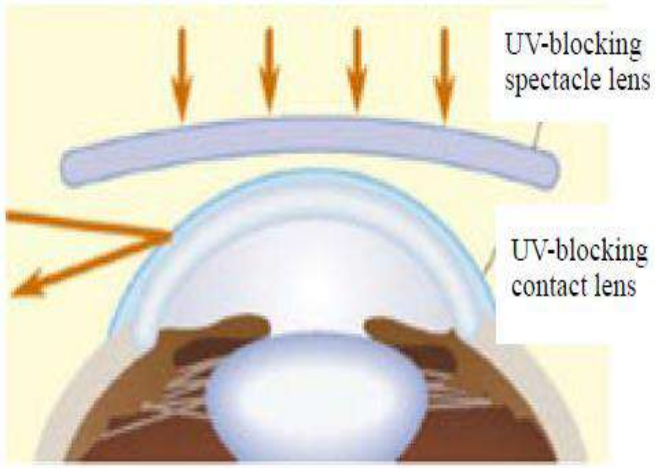
Contact Lens Tints & Filters

- Gray-Green and amber tints in contact lenses improve contrast sensitivity and photo-stress recovery in natural sunlight
  - Gray-green = Golfers better differentiate distance, running, cycling
    - Dark gray best for fishing
  - Amber = Baseball/softball, soccer, shooting and snow sports since amber blocks out blue light "Visual noise"
  - Blue = Tennis
- Filters modify luminance contrast between the background and target to enhance visibility
- Acuvue Oasys with Transitions (Light adaptive contact lens)
  - Target launch date 2019!
  - Dynamic photochromatic filter (Filters blue light and blocks UV rays)
  - Activation and fade rates will be faster than conventional glasses
- BioSport (Marietta Optometry), TechColors,
  - Custom sport tint contact lenses (Edge to Edge tint)
- Athletes perform visual tasks that are driven by selected visual input
  - Must engage in trials to determine which filter is best for their selected sport
  - Better contrast discrimination in bright sunlight and alternating between bright and shaded conditions
  - Better speed recovery in bright sunlight
  - Better overall visual performance compared with clear lenses
  - Contact lens tints also can be seen as an intimidation factor
  - Huge market for baseball, golf and runners





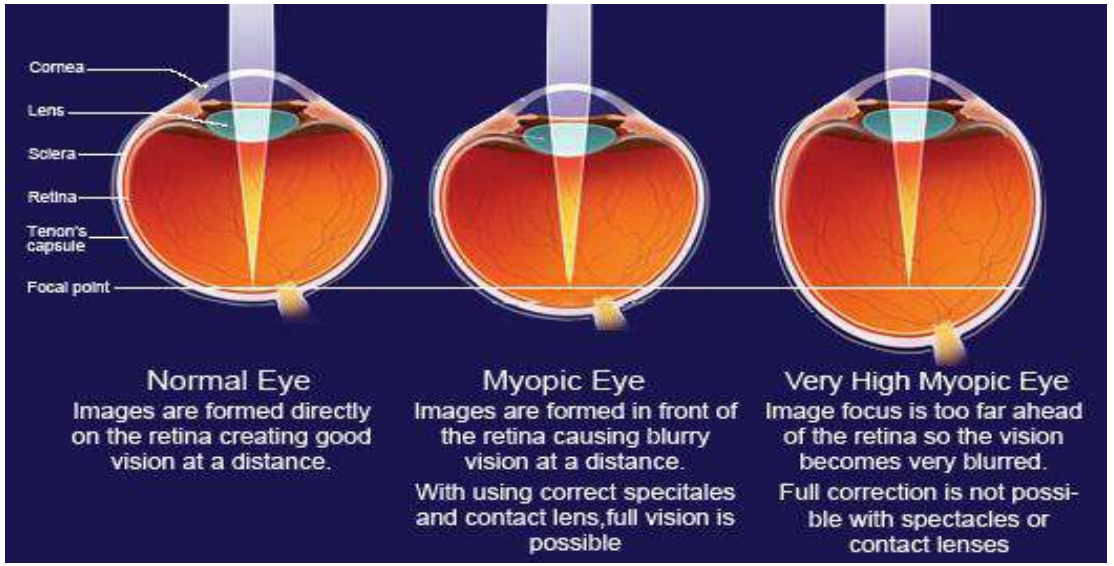
Exposure to UV from peripheral sources is still possible even when wearing UV-blocking spectacle lenses.



The use of a UV-blocking contact lens provides additional protection.

Myopia

- Epidemic & Sight-threatening:
  - 2010 approx. 2 Billion people worldwide
  - 2050 approx. 5 Billion people worldwide
- Economic burden = $2 Billion annually in U.S. alone!
- Biggest myopic change occurs between 8-12 yo's
  - Approx rate of -0.50D per year
  - Myopia progression is not linear
- Genetic & Environmental Factors
- Progressive Myopia/Axial Elongation:
  - Glaucoma (18x greater risk)
  - Retinal holes/tears (8x greater risk)
  - Early onset cataract (3x greater risk)
  - Myopic macular degeneration
  - Dry eye issues



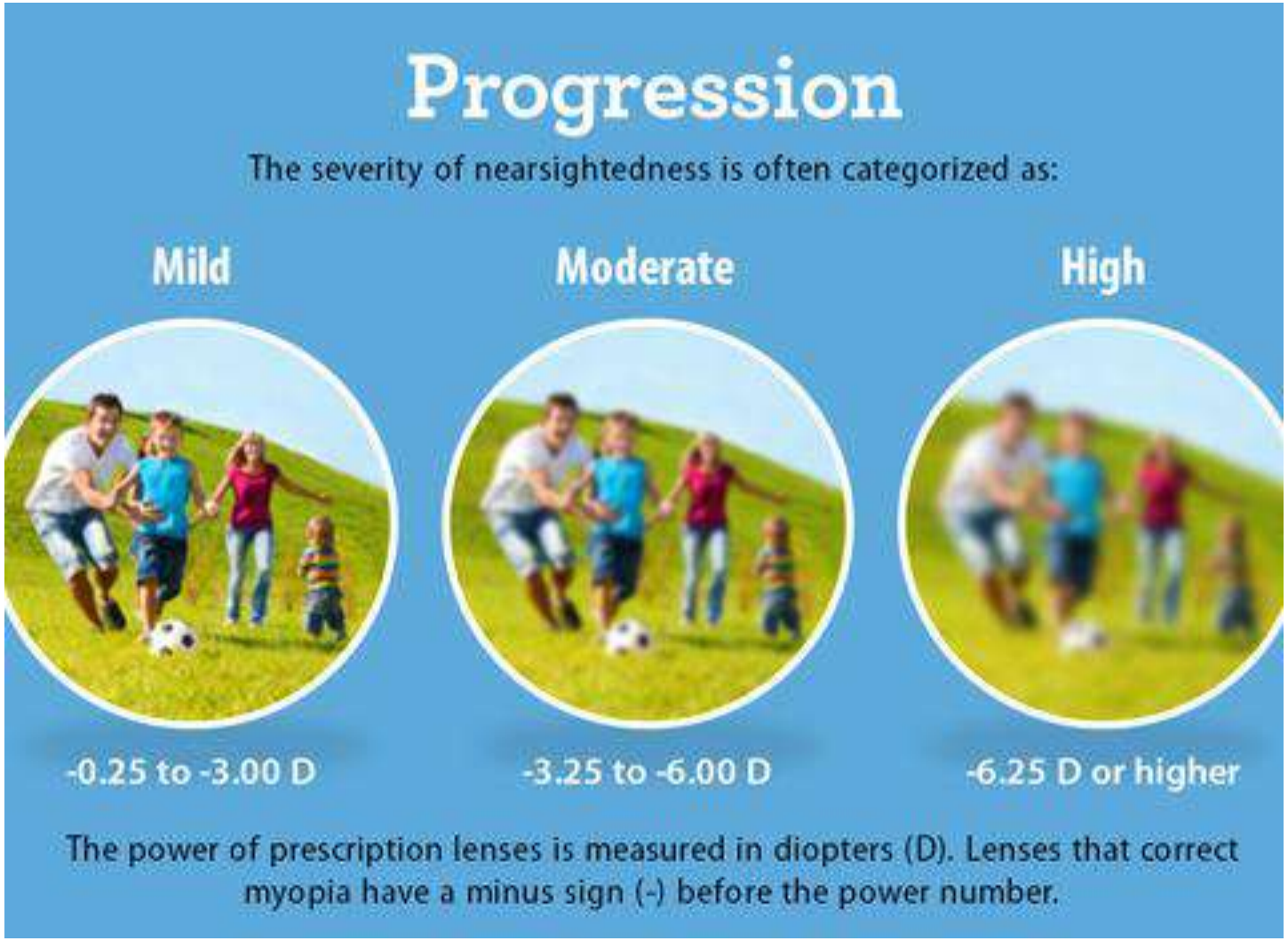
Blue Mountain Eye Study

Low Myopia: -1.00D (.3%)

Moderate Myopia: -3.00D to -5.00D (3%)

High Myopia: -7.00D to -9.00D (28.6%)

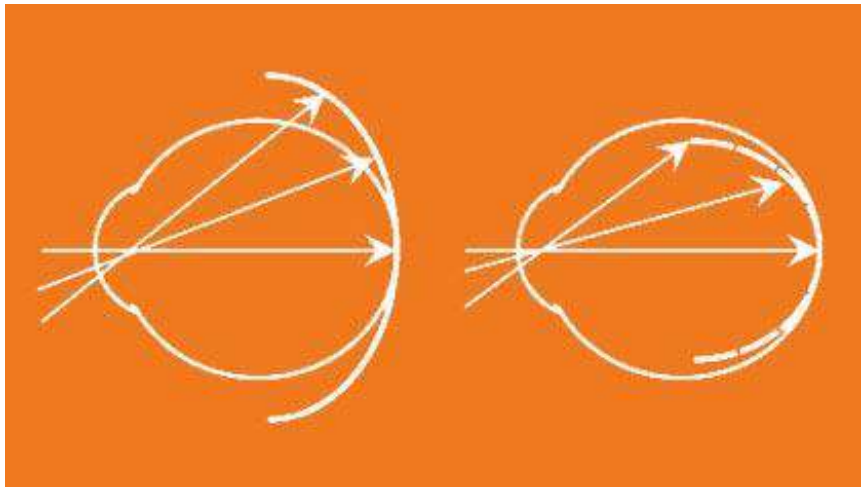
Very High: > -9.00D (52.4%)



**Every -0.25D myopia increase = 17% higher risk*

Myopia Control

- Glasses or contact lenses correct the focus at the fovea but does not correct the relative peripheral hyperopic defocus (RPHD)
- Atropine:
  - Side Effects:
    - Light sensitivity
    - Reduced accommodation
- Ortho-K:
  - Side Effects:
    - Discomfort
    - Increased risk of eye infections
- Bifocal or Progressive spectacle lenses:
  - Noncompliance in terms of “looking round” the near zones of lenses
- Soft contact Center-Distance Multi-Focal lenses:
  - Light focuses in front of the peripheral retina
    - May act as a signal to slow eye growth and progression of nearsightedness



- If near vision is Esophoria or High accommodative lag recommend multi-focals!
  - MF glasses 30-40% reduction
  - MF CL 45-70%
  - Try to eliminate esophoria = Prescribe +2.00 ADD
- Outdoor activities
- Do not under prescribe!!!

NEWS RELEASES

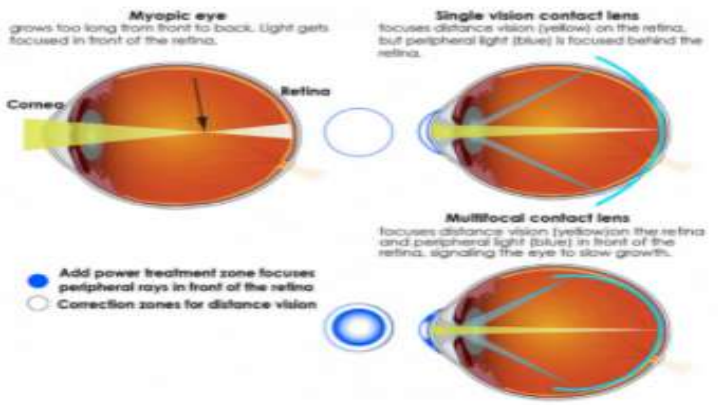
Tuesday, August 11, 2020

Multifocal contact lenses slow myopia progression in children

NIH-funded clinical trial provides independent evidence that multifocal contact lenses reduce worsening nearsightedness.

Children wearing multifocal contact lenses had slower progression of their myopia, according to results from a clinical trial funded by the National Eye Institute, part of the National Institutes of Health. The findings support an option for controlling the condition, also called nearsightedness, which increases the risk of cataracts, glaucoma and retinal detachment later in life. Investigators of the Bifocal Lenses In Nearsighted Kids (BLINK) Study published the results August 11 in JAMA.

"It is especially good news to know that children as young as 7 achieved optimal visual acuity and got used to wearing multifocal lenses much the way they would a single vision contact lens. It's not a problem to fit younger kids in contact lenses. It's a safe practice," said BLINK study chair, Jeffrey J. Walline, O.D., Ph.D., associate dean for research at the Ohio State University College of Optometry



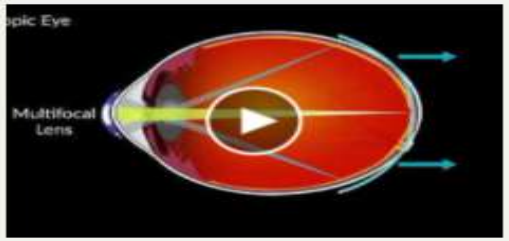
The center portion of the lens corrects nearsightedness so that distance vision is clear, and it focuses light directly on

Institute/Center

National Eye Institute (NEI)

Contact

Kathryn DeMott
301-496-5248



How multifocal contacts can slow the eye growth that causes myopia in children. NEI

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Conclusion

- One study observed children 8-11 yo wearing daily disposables and found that 9/10 were able to use with no problems over the course of 3 months
  - No clinical differences in fitting of young children compared to teens and adults
- Myopic children under 12 yo report better vision related quality of life when fit with contact lenses than when they wear glasses (Optometry & Vision Science 2010)
- Decreasing severity of myopia will have life long ocular health benefits!
- Athletes wear sports equipment so they should have sports specific contact lens Rx as well!
- Daily Disposable Contacts:
  - Healthiest & safest option!
  - Better compliance
  - Improves self esteem/confidence!
  - Excellent peripheral vision
  - Freedom of movement
  - Clearer vision
  - Less distortion than glasses
  - Athletic competence



THANK YOU!