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March 2014

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Strengthening the Base



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Message from Managing Director CCOPL



Ajit Mishra

Dear ECPs,

I'm delighted to present 2nd issue of **NETRA DARPAN**. Overwhelmed response of 1st issue of **NETRA DARPAN** has enabled and boosted our moral in enduring this knowledge platform in field of Eye Care.

I extend my heartfelt gratitude to all the Experts for providing excellent and meaningful articles in this issue of **NETRA DARPAN**.

I am deeply indebted to all members of the **NETRA DARPAN** for their co-operation and whole hearted support they have bestowed.

I am sure you will excuse us for the unintentional errors of omissions and commissions. I shall truly appreciate your feedback to customer@contacare.com.

Wish you all Joyous, Healthy, Wealthy and Prosperous moment in time to come.

**Managing Director
CCOPL**

FROM THE EDITOR'S DESK STRENGTHENING THE BASE



Optom. Niles Thite is currently working as the Director of Educational Programs at the International Association of Contact Lens Educator. Recently he achieved fellowships of the American Academy of Optometry and the British Contact Lens Association. He is a former in-charge of Bharati Vidyapeeth School of Optometry. He has had a corporate stint with Bausch + Lomb India as professional services manager from 2008 to 2010 and continues to offer his consultation to this organization.

Niles has a vast experience in teaching subjects like Dispensing Optics, Contact Lenses and Refraction. In August 2005, he completed his Masters in Optometry from Bharati Vidyapeeth School of Optometry, Pune. He has presented scientific papers/posters in many national and international conferences and has participated as faculty in many national and international practitioner education programs in contact lenses and ophthalmic lenses.

*Success is neither magical nor mysterious. Success is the natural consequence of consistently applying the basic fundamentals - **Jim Rohn***

Knowledge is like raw material for any recipe – the most important ingredient to make it delicious and enjoyable. When we are well informed about a topic, it enables us to have effective communication. It makes us capable and confident about handling questions. As a result, we become more influential and credible.

The tallest of buildings require deeper and stronger foundations. Similarly basics form a strong foundation for absorbing higher knowledge and education. Basics bring clarity of thoughts and ability to process information effectively. They make us more prepared and ready to understand advanced information. A person with strong basic knowledge will never be lost or confused. He can always logically figure out if the provided information is correct or not.

Imagine a cricket batsman with good, solid technique. He can adapt to various type of environmental conditions, opponents and tough situations. Even when he is out of form, his technique helps him to overcome it soon. He can always bank on his basics and face difficulties confidently.

Being eye care practitioners, it is our moral responsibility to take care of people's eyes and provide them appropriate vision correction. It is mandatory for us to understand the way ophthalmic lenses, frames and contact lenses function. We need to have sufficient knowledge about the properties of their materials. This knowledge will enable us to recommend the right option to the right patient.

In this issue of Netra Darpan, we are trying to help you strengthen your base. We hope you enjoy reading these articles and in the process they make you wiser



Disclaimer

The views and opinions expressed in the articles published in this magazine are those of the authors and do not necessarily reflect the official policy or position of the Publisher and / or Company.

FIND THE WORDS...

N O I T C A R F E R E V I T C E J B O
 E T M D D B J J J M J W N N J B I G M
 M L J Q A B B E V A L U E W L N D J J
 O Z K D M I D G B J W M Y J O L G R R
 R R R Z M X P N G V P L G C M Z Q Q L
 H P R T R N J O P Q M B U J Y B B J Y
 C G O B J J N X R P K L X L M Y R R M
 O N L L D L M E Q T A M O Q C D I L K
 U J W R Y N L L X R E N D I T G T Q B
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 B L B O A A L R E Z E B B S Y V M T Q
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 X N M K R H D X P Q E R T K J Y H Y W
 G R M W T Y R M Z O J L W E K Y P T Q

Higher the _____ lesser is the chromatic aberration.
 The minimum center thickness norm should always be followed to avoid _____ in polymer lenses.
 _____ has a refractive index of 1.586.
 _____ is the zone, which contains the required optical power of the contact lens.
 With every blink, the exchange of tears is more in case of _____ lenses.
 _____ exists when there is a difference of more than two diopters in the refractive status between the two eyes.
 _____ lenses are also called as bandage lenses.
 A face with broad forehead and a sharp chin is known as _____ shaped face.
 _____ frames can have layers of clour.
 _____ frames come back into shape even after twisting.
 _____ is a method of measuring the refractive power of the patient's eye without requiring the patient's active participation.
 Spherical end point is determined using _____ test.
 While refining cylindrical axis, the JCC handle is place _____ to the axis of the correcting cylinder.
 _____ test is important to ensure comfortable vision while using of both the eyes.

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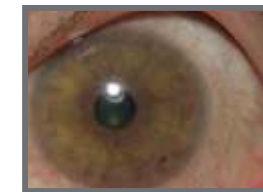


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BASICS OF REFRACTION



Lakshmi Shinde graduated from Elite School of Optometry, Chennai, India in 1991. Following graduation has worked at the Contact Lens Department of L.V. Prasad Eye Institute, Hyderabad, India. During her period with the Institute she was associated with CL clinical research studies. She also was a CL Consultant at the hospital. She completed her Masters in Optometry (through research) from University of New South Wales, Sydney (Australia). She has presented at National and International meetings and also has a few publications in CL journals. Following her completion of Masters she has been associated with International Association of Contact Lens Educators (IACLE) as an "Global Education Manager".

Lakshmi achieved Fellowship of American Academy of Optometry (FAAO) in 2006 and Fellowship of International Association of Contact Lens Educators (FIACLE) in the year 2008. She is also associated with Brien Holden Vision Institute (BHVI).

As eye care practitioners, refraction is undoubtedly our very basic necessity. Be it dispensing a simple pair of glasses, Contact lenses, any Orthoptic or Low vision treatment, it all begins here.

Most of us realize the importance of a good refraction since this is what decides the management (surgical and clinical) results. A good refraction results in clear, comfortable vision for the patient will end up with long term relationship and loyalty with customer.

Here is a quick step by step guide to a comprehensive refraction:

1. Our first step is to take a thorough history. A detailed understanding of the difficulties related to vision, visual requirements and profession of the patient are important. If the patient is already a spectacle wearer then we need to note the prescription currently in use. This gives us an idea about the starting point and also helps us refine our final prescription.

2. Objective Refraction: It is a method of measuring the refractive power of the patient's eye without requiring the patient's active participation or response. It is most commonly done using a Retinoscope and/or Auto-refractometer.

Retinoscopy

Retinoscopy is an objective method of measuring the optical power of the eye by observing the characteristics of a light beam reflected from the eye. Retinoscopy has the advantages that it minimizes the decisions that the patient has to make and is extremely useful when communication is difficult or impossible like in children, infants, challenged persons, foreigners etc. It also enables us to detect lag and lead of accommodation, aberrations of cornea and lens, opacities of ocular media and some retinal disorders. However, retinoscopy requires practice to master the skills. Accuracy of the result depends on the practitioner's ability. For an inexperienced practitioner, it is also more time consuming as compared to autorefractometer.

Autorefractometer:

It is a computer controlled machine used during an eye examination to provide an objective measurement of a person's refractive error and prescription for glasses or CL. This is achieved by measuring how light is changed as it enters a person's eye.

Autorefractometer has the advantage of being quick, repeatable, easy to operate, reasonably accurate - especially with axes of astigmatism. However, it also has some limitations as cost, power range, media opacities, accommodation - Inaccurate in children, hyperopes.

Both the methods have their pros and cons. While Autorefractometer is used most widely, it cannot be used exclusively. There are cases where retinoscopy gives us a more real and better picture of the situation.

3. **Subjective Refraction:** the subjective refraction consists of 3 distinct phases namely:

- a. Spherical end point
- b. Astigmatic refining: axis and power
- c. Binocular Balancing

a. Once we have achieved an approximate sphero cylindrical refraction value, the next step is refining the sphere. For this, it is advisable to place +0.25 to +0.50 D plus over the refraction and present the duochrome test. Red should appear better than green as this ensures that the patient is not accommodating. This can then be reduced in 0.25D step till letters on both the backgrounds are equally clear or letters on red background are slightly better than green.

b. Astigmatic axis is refined best using the Jackson's cross cylinder (JCC). Here we first refine the cylindrical axis and then the power. While refining cylindrical axis, the JCC handle is placed parallel to the axis of the correcting cylinder in place. The JCC is then flipped and patient is asked to compare the target in position 1 and position 2. The axis of minus correcting cylinder is then rotated by some degree towards the minus axis of JCC in the position, which appears clearer to the patient. Once the axis is refined, placing the JCC handle at 45 degrees to the correcting cylinder axis refines the power. The JCC is flipped and patient is asked to report in which position target is clear. The cylinder is changed corresponding to which cylinder is coinciding with the correcting cylinder in place. Here it is important to modify the sphere by half the amount of cylinder power change to maintain the spherical equivalent. For example: In -0.75/ -1.00 X 90, if the cylinder is changed to -1.50D then the sphere has to be changed to -0.50D (add

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+0.25D) to maintain the spherical equivalent to -1.25D.

c. Once subjective refraction is completed in both eyes, its time to balance both eyes. Firstly fog the patient with +0.75 D in both eyes so that vision reduces to 6/9. Now place prisms in front of eyes, one base up (Right eye) and the other base down (Left eye) to induce vertical diplopia. Ask the patient which of the two images is clear. In case the lower image is clearer, then place +0.25D in front of the right eye seeing the lower image to fog it further. If both the images are equally blur or clear then defog binocularly to achieve best acuity. If Right eye image still remains the clear image, then add a -0.25D to the left eye (to clear its blur image). The end point of binocular balancing is that both images should be equally blurred. Once you achieve this end point, you remove the prisms and then defog to achieve best acuity. It is mandatory to check monocular refraction if a change of more than 0.50D is required to balance the eyes.

Once all the above is done, you will have to refine the prescription according to the occupation of the patient.

Examples:

1. Driver who has complaints of distance vision especially in the evening, you usually overcorrect by -0.25D to make green better in the duochrome test. This will help him with driving.
2. Software engineer: If orthoptic evaluation is normal, add +0.25D to keep red slightly better than green in duo chrome as the person does close work for long hours.

Near Vision Correction:

Near vision correction should be performed one eye at a time and not binocularly. Add power should be prescribed NOT according to age but according to the individual occupation and working distance. Normally, people tend to accept lower adds compared to those prescribed by age, as either the working distance is more or because of a specific occupation.

Take home message:

1. Ensuring that accommodation is relaxed at every step of refraction is crucial.
2. Retinoscopy and auto-ref are equally beneficial and not mutually exclusive. Retinoscopy should be performed especially when objective refraction and subjective acceptance differ too much, or vision doesn't improve to the expected level.
3. Duochrome and JCC are quick and important tests to fine-tune the prescription.
4. In case of oblique cylinders where the existing prescription is comfortable, try not to change the axis unless and until the patient definitely prefers the new axis.
5. Binocular balancing is important to ensure comfortable vision while using both the eyes.

Answer of 1st Issue Puzzle

ACROSS

- 3 Process to increase the material strength of ophthalmic glass - **toughening**
- 5 lenses which are a safer and healthier option and allow for occasional naps - **silicone hydrogel**
- 6 Frame material is very light-weight, strong and practically corrosion-free - **titanium**
- 9 lenses having a continuous gradient power change - **progressive**
- 11 range of Dk of current RGP lens materials – **60-120**

12 Material which is highly impact resistant & provides 100% protection from ultraviolet radiation of sun - **polycarbonate**

DOWN

- 1 best lens wear modality for patients looking for convenience and safety with their lenses – **daily disposable**
- 2 an unbreakable ophthalmic lens material with very less specific gravity - **trivex**
- 4 practice of myopia control by application of lenses - **orthokeratology**
- 7 bifocal with maximum jump effect - **kryptok**
- 8 CL material with zero Dk - **PMMA**
- 10 glass tint prescribed in unfavorable indoor lighting conditions – **SP2**

Finished Single Vision Overview

FSV	Index	Abbe	Gravity	Diameter	Coating
1.498 CR39	1.498	58	1.28	60/70mm	CareTough/ReflectCare (Super Hydrophobic)
Spheric 1.56 Middle Index	1.56	38	1.28	70mm	ReflectCare (Super Hydrophobic)
Aspheric 1.56 Middle Index	1.56	38	1.20	70mm	ReflectCare (Super Hydrophobic)
CareLite 1.59 Polycarbonate	1.59	32	1.20	70mm	ReflectCare (Super Hydrophobic)
Spheric 1.61 2X TOUGH	1.61	32	1.35	70/75mm	ReflectCare (Super Hydrophobic)
Aspheric 1.61 2X TOUGH	1.61	32	1.23	70/72mm	ReflectCare (Super Hydrophobic)

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OPHTHALMIC LENSES



YESHWANT SAOJI is a Senior Optometrist from Nagpur who specializes in the field of Contact lenses. He is holding a Masters degree in Optometry from the School Of Optometry, Bharati Vidyapeeth University, Pune and has 22 years of experience.

A Graduate of the Elite School of Optometry (1991), Sankara Nethralaya, Chennai, he is also a Fellow of The L.V. Prasad Eye Institute (1992), Hyderabad.

He is actively associated with Optometry education, in India and is an Accredited Fellow of International Association of Contact lens Educators, Australia (FIACLE) 2000. He was a Senior Visiting Faculty for contact lenses at the Bharati Vidyapeeth School of Optometry, Pune for 8 years and is now actively involved in Practitioner education programmes.

He is the senior Faculty at The Vision Care Institute of Johnson and Johnson India and a Key Opinion Leader for Bausch and Lomb.

He was awarded the Best Optometrist of the year 2011 by Sankara Nethralaya, Chennai. His areas of practice are Contact lenses in Complicated Corneas and Speciality Contact lenses including Ortho k lenses.

What an ECP needs to know about materials, properties and designs of ophthalmic lenses.

Being a professional who would guide the customer in selection of the right kind of spectacle lenses, it is essential that we know the basics of spectacle lens materials available and their properties. After the customer presents us with the prescription, our mind has to process all this information using the inputs of spectacle prescription, lifestyle and needs of the customer. The answer should be of two or three choices with the best one being stated first.

Materials

a. Glass

Crown glass has a refractive index of 1.523. Used the most in India, also available in high refractive indices.

Advantages

Highly scratch resistant
Excellent light transmission
High refractive indices available

Disadvantages

Low impact resistance than plastic
Heavier material than plastic
UV absorption not 100% to 400 nanometers

Glass is available in indices of 1.6, 1.7, 1.8, & 1.9.

b. CR 39 / Hard Resin / Plastics / Polymer lenses

Commonly called as plastic lenses, they are most extensively used world over due to their close match with the most ideal properties a spectacle lens can have.

Advantages

Light weight - more comfortable
Built in UV protection
High impact resistant

Disadvantages

Many qualities are available
Some of the products can yellow with age
Coating is needed for scratch resistance

More center thickness as compared to glass.

Plastics are available in indices of - 1.49, 1.53, 1.56, 1.6, 1.67 & 1.74.

c. Polycarbonate

Polycarbonate is a good material for use where high level of impact resistance is needed. High impact resistance along with UV protection upto 385 nm makes this a material of choice for children.

Polycarbonate has a refractive index of 1.586.

Advantages

Thinner & lighter material
Excellent impact resistance
Center thickness can be ground to 1.2 mm
Built in UV protection

Disadvantages

Low scratch resistance
Can shatter if hit at an angle

d. Trivex

Trivex® is a new generation plastic lens monomer which is a strong, light and a very high impact resistance equivalent to polycarbonate. This is an ideal premium material for anyone who desires thin and very light spectacle lenses. With a density of 1.11, Trivex® is lighter than most other plastics, and can be made to a minimum centre thickness of 1.0mm. Due to its high impact resistance it should be preferred in children.

Advantages

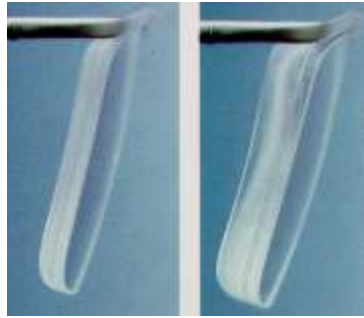
High impact resistance
Thin and light
Good UV protection

Disadvantages

Low scratch resistance
Relatively more expensive
Limited availability

Properties

a. Refractive Index (RI):



Higher the RI, thinner the lens. It is useful to know the likely difference in thickness when a given lens material is compared with a standard crown glass. We can use simple formula or software to demonstrate, how thin would the lens look in a given power in various refractive indices. Higher RI is not always the best. This is because with increase in refractive index, the weight (in glass only), aberrations and reflections in the lens can also increase (especially 1.8 RI onwards). Higher indices are also available in polymer lenses – 1.49 being basic, 1.53, 1.58, 1.6, 1.61, 1.67, 1.74 are available. High index lenses are especially useful in higher prescriptions.

b. Density:

The term refers to the actual weight of the lens material. The value given is the weight in grams of 1cm² of the material. Densities of high refractive index materials are seen to be greater than that of crown glass (about 2.5), but in order to compare the weights of lenses made in different materials it is also necessary to consider the saving in volume. If the saving in volume obtained is greater than the increase in density, the final lens would be no heavier than if it had been made in crown glass. Ideally density should be lowest possible.

c. Abbe number:



Abbe number is an important parameter, which should always be considered, when dispensing spectacle lenses. This informs us regarding the optical properties of the material by indicating the degree of chromatic aberration or the rainbow effect, the wearer will experience. Higher the abbe value lesser is the chromatic aberration. So it is advisable to choose the highest abbe value that can be used for any given prescription.

d. Centre thickness:

This is dependent on the mechanical strength of the lens material. Each material has a minimum center thickness, which is necessary from safety point of view and to prevent lens warpage in plastics. Also a thinner lens will have better cosmetic appeal. The minimum center thickness norm should always be

followed to avoid breakage in glass and to avoid warpage in polymer lenses.

e. Impact resistance:



Any spectacle lens has to have a safety standard (US FDA standards) of withstanding a 16 gm steel ball dropped on the convex surface from the height of 127cm, for normal use and a 44gm steel ball dropped from 130cm for industrial use. Glass lenses do not satisfy these criteria and hence are best avoided.

f. UV protection:

Spectacle lenses have to filter the damaging UV rays to protect the delicate structures of the eye. Generally all type of plastics filter the UV rays to a much higher degree than the glass lenses. The UV filtering capacity would differ from material to material. Polycarbonate and specially treated plastic lenses offer the highest protection from UV rays. UV protection should be minimum upto 385 nm and beyond. Few lenses offering 100% UV protection upto 400 nm are also available.

g. Light transmission:

The transmission value of a lens refers to its ability to allow light to pass through the material. Most lenses have transmissions levels of 85% to 92% and if anti-reflection coated they transmit up to 99%.

Well these are some important properties of ophthalmic lens materials that we must know. This knowledge will equip us to advise our patients the right material. Next time we will see some lens enhancements that we recommend regularly.



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SPECTACLE FRAMES



Optom. Rajesh Wadhwa is a practicing optometrist qualified from AIIMS in 1983. He holds Masters in Optometry, is a double graduate & is pursuing his PhD. He is a part time educator and routinely lectures at universities in India and in Asia Pacific region. He has organized several conferences, chaired scientific sessions and has several scientific papers to his credit. He is also a Fellow of International Association of Contact Lens Educators (Australia) with life-time achievement award. He has to his credits, "Best Optometrist Of The Year-1997" Award. Among other qualifications, he also holds a PG diploma in management. For upliftment of optometry, he is moderating various optometry groups on internet and has the credit of having introduced the prefix "Optom" for optometrists. He has also helped Indian Optometry by representing to government & other agencies in various capacities including as founder president & as patron of Indian Optometry Federation. He has been advisor to ASCO and to corporates.

Spectacle frames are no more considered to be utility items like utensils. Even small children are particular about their looks with spectacles.



Fig: Spectacle frames are no more as straight forward as utensils. Even Children are selective about them

Spectacle designs and frames materials have gone through a sea of change in last few decades.

We introduce to you, once again the two ladies of author's write-up in Netra Darpan 1. We go through the story of two ladies who are regular kitty-party goers of today. They compete with each other in all spheres of life. So, this story has total 3 main characters: Two are ladies Ms.ABC and Ms.DEF. Third person is an experienced optician Mr.XYZ. We also have their families visiting them.

The Story:

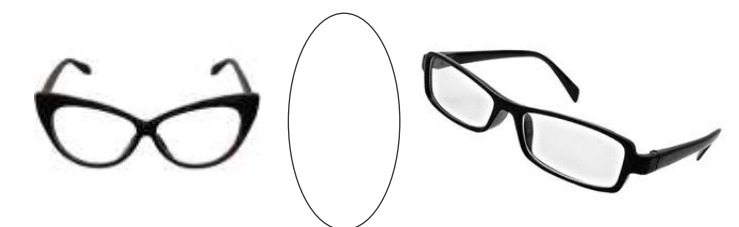
Ms.ABC is busy preparing for the guests to arrive. Her cousins, parents & grandparents are all coming over for the family reunion & she is excited about this. In a few days, the guests start pouring in.

Aunt JKL walks in with one hand supporting her spectacles. After the initial greetings she says "Do you have a good optician who can give me a new

frame?". ABC is glad to take them to XYZ and a full car-load of family walks into the store of XYZ.

XYZ understands the needs and starts showing frames with following commentary:

Ma'm you have an oval face, I would like to give you a square or a rectangle frame.



Oval Face

Fig: Rectangle or cat-eye frames go well with oval face.

Impressed by this sentence aunt JKL says, "what if had a round face?".

XYZ says, "In that case ma'm, I would have suggested a frame with straight lines & sharp angles.



Round Face

Fig: Straight-line frames go well on round faces

Immediately 9 year old niece says "What is shape of my face? What kind of frame can I take?"

XYZ replies: Little Barbie you have a broad forehead and a sharp chin. We call this a heart shaped face. It will be good if you take round frames for yourself.



Heart Face

Fig: Round shapes are good for heart-shaped faces

Uncle MNO blurts out :What do you say about me?

XYZ replies: Sir, you have broad forehead and prominent jaw line with square chin. We would call this a square face. Please choose a frame with curved edges.



Square Face

Fig: Curved edges are good for square shaped faces

Impressed with conversation about shapes, uncle MNO starts collecting more information about spectacle frames. He says "What are these frames made of?"

Our knowledgeable XYZ is happy to reply:

Sir, the frames can be of plastic or metal or a combination. We also have a few other materials that have been used.

Please see these frames. They have lovely colors. These are Zyl frames. These are actually cellulose acetate frames.



Fig: Zylonite or cellulose acetate frames can have layers of colors

Uncle MNO quickly replies: Once I had an allergy with plastic frame. Any remedy?

XYZ replies: Yes sir. We can use cellulose acetate propionate. This material is hypoallergic and more transparent also.



Fig: Cellulose acetate propionate is hypollergic, lighter & quite transparent

Aunt JKL: My frames go loose very fast.

XYZ: Ma'm Nylon based frame is the answer. Now a days we use blended nylon like polyamide.



Fig: Nylon frames are very resistant to hot and cold and are more flexible, yet also stiff.

XYZ: On lighter side, one may have used castor oil as laxative but now even spectacle frames are made out of this substance. Ha! Ha!Ha! Yes that is true.

Aunt JKL: Show me something in metal.

XYZ: Please see these frames in stainless steel.



Fig: Stainless steel frames are good for light weight, low toxicity and strength

And there walks in dear friend Ms.DEF. After loud greetings and pleasantries, DEF states "listen XYZ, we do not want any corrosion due to sweat."

XYZ: Yes ma'm, then I suggest titanium frames.

DEF: Yes I recollect, this has been used in Apollo space capsules and in lot of medical implants.



Fig: Titanium is a silver-gray metal that's lightweight, durable, strong and corrosion-resistant

DEF: Can you give me something that my son can sit on & still it does not disfigure

XYZ: Yes ma'm. We have Flexon material that is alloy of Titanium. This is even called "memory metal".



Fig: Flexon frames come back into shape even after twisting, bending and crushing

One more option is to have aluminium frames. These are light weight and highly corrosion resistant.



Fig: Aluminium frames are high-end designer frames

Allergic reactions are mostly caused by nickel in the material. Nickel-free frames are usually hypoallergic.

Ms. DEF asks, "Are there any unusual materials?"

XYZ: Yes ma'm. When I said castor-oil, I was telling you a fact. Also gold, buffalo horn, semi-precious stones, leather & feathers have also been used in making of spectacle frames.

Fig: Some unusual materials for spectacle frames



Material = Bone



Material = Gold



Material = Semi precious stones in frames



Material = Leather

And ultimately aunt JKL bought a premium frame for herself.

Friends! If our staff and we can repeat this conversation with every potential client, it will not only translate into higher revenues earned but will also project the optical outlet as a very professional enterprise.

For any further queries, the author can be contacted at r_wadhwa@yahoo.com, PH: +91 9868010187 or at 55, Krishna Market, Kalkaji, New Delhi -110019, India.

ContaCare



RGP SPARKLE

Multi-Purpose Solution for Rigid Contact Lenses



Cleans • Rinses • Disinfects
Conditions • Cushions • Stores

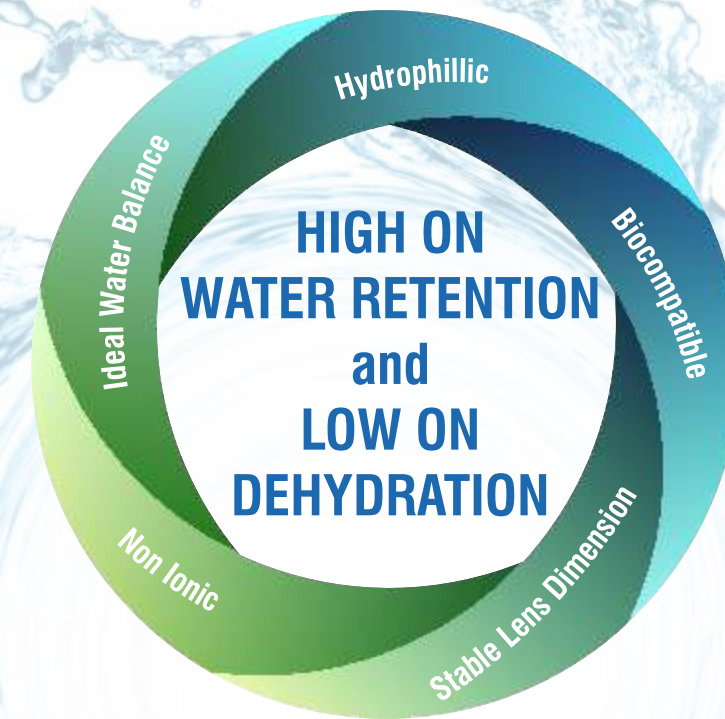
80 ML
STERILE



Conta Aqua

Monthly Disposable Lenses

Disposable Lenses



ASPHERIC DISPOSABLE
SOFT CONTACT LENSES



BASICS OF CONTACT LENSES

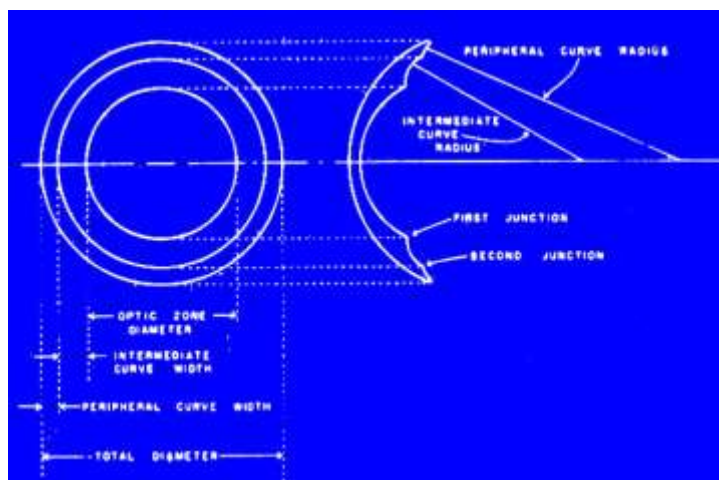
With experience of more than two decades as a practicing optometrist and an academician at All India Institute of Medical Sciences Professor **Monica Chaudhry** is currently Head of Department of Optometry – Amity Medical School, Amity University. Besides this she is advisor and senior faculty for corporate like Johnson and Johnson, Transitions India, DTCL Menicon – Rose k lenses and key opinion leader for Bausch & Lomb India. She is presently the Joint Secretary of Indian Optometry Association and the North region representative of Association of Schools and colleges of optometry.

Her core areas of specialty are fitting contact lenses in irregular corneas and low vision aids for visually challenged. She has presented several papers and chaired many scientific sessions and has also authored 3 books. She also holds a “ShreshtShree” award and has been recently awarded the “Australian Leadership award fellowship”.

Contact lens is an optical medical device, which is placed directly on the surface of the eye and stays on the cornea with the help of tear film and to some extent by the pressure of the eyelids.

A soft lens extends beyond the cornea and the rigid lens is smaller in size than the cornea. There is a tear layer between the lens and the cornea. This layer is very thin in case of soft lenses as they drape around the cornea and thicker in case of rigid lenses. The exchange of tears is therefore more in case of rigid lenses than the soft lenses.

With every blink the lens moves and these tears exchange behind the lens. Every blink flushes out the debris behind the lens and lubricates the surface of the lens too. So it becomes very important for the lens to move adequately on the cornea for the health of the cornea.



Terminology

Base curve:

The base curve is the radius of the sphere of the back of the lens that the prescription describes. It contours the front curve of the cornea. It is abbreviated BOZR (back optic zone radius) or BC. Typical values for a soft contact lens are from 8.0 to 10.0 mm.

Diameter:

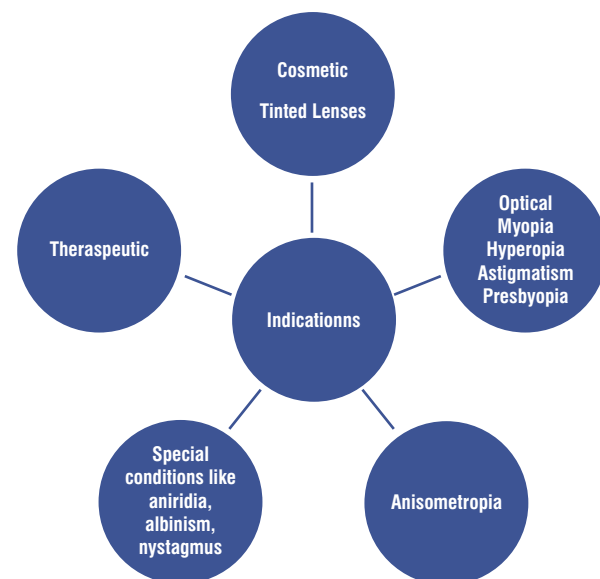
The optic zone is the zone, which contains the required optical power of the lens. The diameter of this zone on the back surface is called the back optic zone diameter (BOZD) and on the front surface is called as the front optic zone diameter (FOZD). It is often difficult to measure these dimensions due to the blending of the line separating the optic zone from the peripheral curves, especially for the back optic zone diameter.

The region surrounding the central optic zone is the peripheral curves. The diameter of each peripheral zone is referred to as the width of the curve.

Total diameter:

It is the dimension of the lens measured from one edge to the other including the optic zone and the peripheral curves.

Indication of Contact lenses:



Refractive errors:

Contact lens is mainly used for correction of refractive errors like myopia, hyperopia, astigmatism and even presbyopia.

Cosmetic:

Contact Lenses can also be used to enhance or change the colour of the Iris. They may or may not correct the refractive error at the same time. These are called the tinted lenses.

Prosthetic lenses:

Another application of contact lenses is to hide unsightly corneas by using opaque tints. These lenses are often used in patients with a disfiguring corneal scar or an iris coloboma to improve the aesthetics of a nonseeing eye or to occlude an iris coloboma. Conditions such as aniridia, albinism also will benefit through the opaque tint lens with clear pupil.

Occupational and recreational:

Contact lenses are a great advantage to a sport player. It does not fall off and even gives a wider field of vision. It does not fog or get splashed with water in rain.

There are cosmetic advantages also for people in business of entertainment, photographers who have restriction with the rim of glass and many more professions which will find contact lenses more convenient than the spectacles. The lenses are also safer than the spectacles for occupations which are prone to trauma from flying particles or preventing from chemicals splashing on the eye.

Anisometropia and Aphakia:

Anisometropia exists when there is a difference of more than two diopters in the refractive status between the two eyes. This imbalance creates a disparity in image size leading to diplopia or suppression. Uncorrected anisometropia in the infant may lead to amblyopia, especially when one eye is hypermetropic. In adults, differences of greater than three diopters generally are not tolerated with spectacle correction. In such cases, a contact lens may be indicated in order to reduce the development of amblyopia and anisometropic aniseikonia.

Irregular astigmatism:

Rigid contact lenses provide an excellent means of correcting irregular astigmatism. Conditions like Keratoconus, trauma, etc lead to irregular shape of the cornea, giving rise to irregular astigmatism. Spectacles do not provide satisfactory results in these conditions. Contact lenses especially rigid lenses prove to be the best form of correction for such patients.

Therapeutic:

These are also called bandage lenses. A soft lens can be used instead of a bandage to protect or heal the eye. Thus contact lenses have so many indications and not just the refractive error indications.

Contraindications:

Before initiating any contact lens fitting for the purpose of optical correction, it is important to evaluate the patient's motivation, visual needs, and ocular and

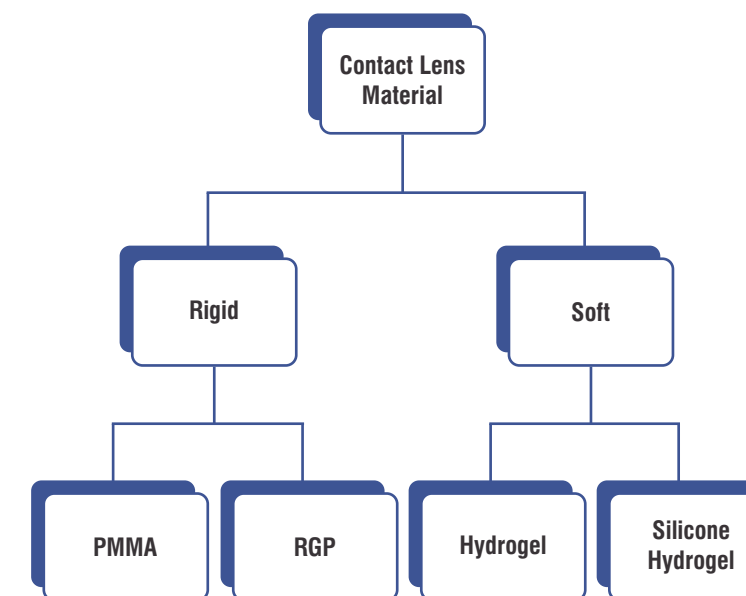
medical history. Unmotivated patients tend to be non compliant and do not to adhere to the prescribed methods of care regimen, putting them at greater risk of complications.

Some conditions where the patient should be thoroughly evaluated, remembering that a successful fitting is almost always based on a strong indication.

1. Any acute or subacute inflammation of the anterior segment of the eye
2. Acute and chronic ocular infections
3. Any eye disease affecting the cornea, conjunctiva, and lids (e.g., epithelial fragility, endothelial failure, dry eye, allergy, pinguecula, pterygium)
4. Psychological intolerance to the placement of a foreign body in the eye
5. Workers in polluted environments, chemicals
6. Immuno-suppressed patients and those on use of systemic medications that alter the tear film
7. Inability to follow the instructions for cleaning, storage of the contact lens

CLASSIFICATION OF CONTACT LENSES

Contact lens materials



PMMA: Poly(methyl methacrylate)

The hard lens material was developed in 1937. The main disadvantage of this material was that it was practically not permeable to oxygen and this led to long term complications which were understood in the late 80's.

RGP: Rigid Gas permeable lenses

Gas permeable lenses, also called GP or RGP lenses, are rigid (hard) contact lenses. GP contact lenses are "gas permeable," allowing oxygen to pass through the lenses to the cornea. GP contact lens materials are classified according to their "Dk" value, which is a measure of their oxygen permeability.

Low Dk is < 12

Medium Dk is 15-30

High Dk is 31-60

Super Dk is 61-100

Hyper Dk is > 100

Rigid gas permeable contact lenses (RGPs) are more durable and resistant to deposit buildup, and generally give a clearer, crisper vision. They tend to be less expensive since they last longer than soft contact lenses. They are easier to handle and less likely to tear. However, they are not as comfortable initially as soft contacts and it may take a few weeks to get used to wearing RGPs.

Rigid contact lenses are indicated in the following cases:

1. Regular astigmatism greater than one diopter (or Toric soft contact lenses)
2. Irregular astigmatism
3. Postsurgical fits (e.g., post-refractive surgery, post-penetrating keratoplasty)

Soft contact lens

A soft or hydrogel contact lens is a type of flexible lens, which conform to the shape of the cornea. It is mainly made up of a lens polymer and water.

Advantages of soft lenses

1. "Initial" Comfort
2. Visual acuity or comfort affected little by lens movement
3. Simple to fit
4. Little adaptation
6. Occasional wear possible
7. Little chance of dislodging the lens
8. Chance of trapped foreign body or abrasion less

Disadvantages of soft lenses

1. Bacterial contamination and infection
2. Increased care time
4. Less durability than rigid lenses
5. Greater risks with noncompliance
6. Prone to deposits and complications
7. Limitations of correction of cylindrical numbers

Silicone Hydrogels:

New soft contact lenses called silicone hydrogel lenses are fast becoming popular. These lenses include silicone within the hydrogel material to increase the oxygen transmissibility of the lenses.

Owing to the increased passage of oxygen through these lenses, their obvious benefit is the reduction of hypoxia-related problems as associated with soft hydrogel lenses.

Replacement schedule

This is based on how often one changes the lens. It depends on the contact lens material and design, as well as lifestyle and the condition of patient's eyes.

Conventional soft contacts can last up to a year; conventional rigid gas permeable (RGP) contact lenses can last even longer.

Frequent or planned replacement - Replacement of lenses at regular intervals such as monthly.

Disposable lenses are replaced every day (daily disposable)

Disposable Vs Conventional Lens

The number of complications per person per year of lens wear was higher for conventional lens wearers than for disposable wearers. There is increase symptom of itching, burning and dryness, poor vision, foreign body sensation, torn and lost lenses, giant papillary conjunctivitis, mucus, and superficial punctate keratopathy in conventional lenses.

Another benefit about all disposable lenses is that you always have a spare pair on hand, should one be lost or damaged.

Classification based on the wear modality

Daily wear Vs Extended Wear.

Daily Wear

The most popular lens option, these lenses are worn daily for all waking hours, generally 12-14 hours and removed during the time of sleep.

Flexible/Extended Wear

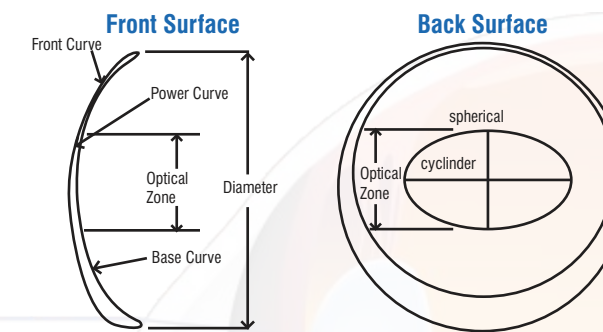
Lenses are worn continuously for 3-7 days or can be worn occasionally on extended wear (i.e., flexible wear); for example, weekends.

Extended wear contact lenses are usually soft silicone hydrogel contact lenses, which allow maximum oxygen to pass through them. It is important to monitor extended wear and prescribe it with utmost caution, as the chances of infection are high in extended wear.

CONTACARE[®] Toric Soft Contact Lens

- Back surface for Toric design
- Enhanced equilibrium as combined with prism blast design
- Integrity of Technology with an up-to-date style

Remarkable Design for Enhanced Wearing Comfort



- Prescription with an outstanding convenience
- Thinner and Round shape of edge design with an accurate curvature in order to improve wearing comfort without any pain

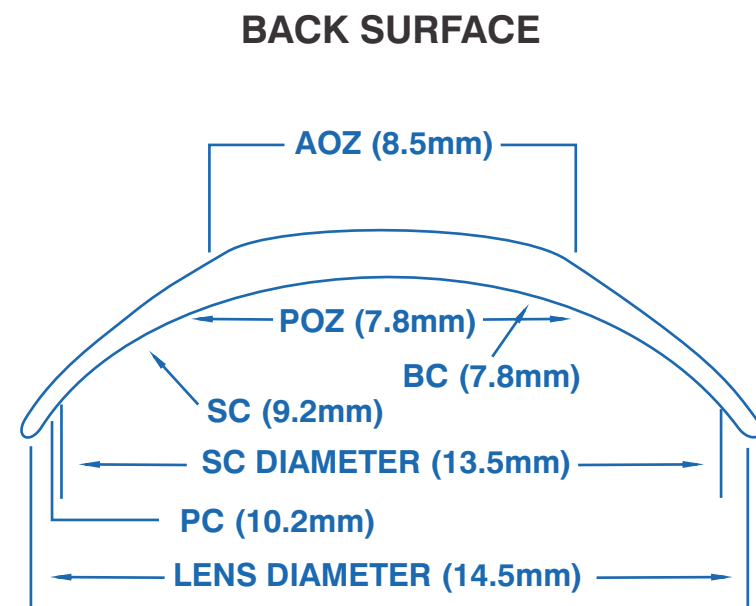
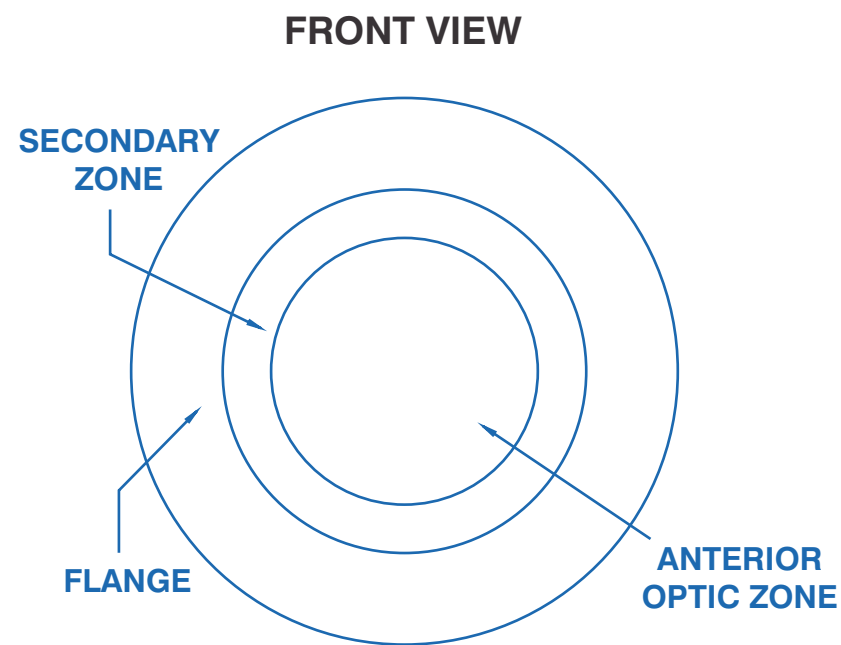
Lens Specification

Material	2 - HEMA	
Manufacturing Process	LATHE CUT (CNC)	
Water Content	38%	
Base Curve	8.6 mm	
Diameter	14.2 mm	
Center Thickness(@ -3.00 D)	0.09 mm	
Design	Prism ballast with back surface toric design	
Orientation Mark	6 O'clock	
Power Range	Clear	Coloured
Spherical	0.00 to -6.00 (0.25D Steps) -6.50 to -10.00 (0.50D Steps)	0.00 to -6.00 (0.25D Steps) -6.50 to -10.00 (0.50D Steps)
Cylindrical	-0.75 to -3.25D (0.50D Steps)	-0.75 to -2.25D (0.50D Steps)
Axis	10° to 180° (10° Steps)	170°, 180°, 10°, 20° & 90°
Color	Clear Toric	Blue, Green, Grey & Hazel

K-Conta

Contact Lens Designed for Keratoconus

K-Conta: Contact Lens for Irregular Cornea



Parameter Availability:

Base Curve, Diameter, Power, Center Thickness & Edge Lift as per ECP prescription.

Material:

K-Conta is made of Vista-75

THE PERFECT PRESBYOPE



Roshni Nair, An optometrist from Lotus College, Mumbai. Presently works at **CONTACARE OPHTHALMICS PVT. LTD.** as 'Professional Services Manager'. Her experience in the optical industry has been enriched by previously working for Multi National like Hoya & Zeiss, where she earned the opportunity to receive training at International training platform in field of Professional services and training.

Presbyopia can be defined as a vision condition in which the crystalline lens of our eye loses its flexibility, which makes it difficult to focus on near objects. It results from the gradual decrease in accommodation expected with age and can have multiple effects on quality of vision and quality of life. Presbyopia without optical correction results in an inability to perform once-effortless near tasks at a usual working distance without experiencing visual symptoms. The word presbyopia originates from the Greek word 'presbys' that stands for old man or elder & the word 'ops' means eye.

In simple words it's just your body's way of saying that you are getting old!!

Presbyopia can be classified into Incipient, Functional, Absolute & Premature. Incipient Presbyopia, also called as borderline Presbyopia marks the earliest stage of Presbyopia. Categorically reading fine print or small font requires a little extra effort. Sometimes a subject may not even realize that he/she is in the incipient stage of Presbyopia.

Functional Presbyopia marks the second stage of Presbyopia. Common sign is gradually declining accommodative amplitude. Clinical findings confirm the functional Presbyopia. The age at which presbyopia becomes symptomatic varies. Some patients are symptomatic at an earlier stage - others later than expected, largely due to variations in distance vision status, environment, task requirements, nutrition or disease state.

Absolute Presbyopia is the advanced stage in which virtually no accommodative ability remains. Corrective measures must be adopted by way of spectacle or contact lenses.

Premature Presbyopia is the latest addition to the classification of Presbyopia. Near vision tasks are difficult at an earlier stage than expected. Signs of this difficulty can be displayed as early as the mid-thirties. Premature Presbyopia is predominantly caused by environmental, nutritional, disease-related reasons. Occasionally it may also be drug induced.

Presbyopia can be primarily corrected with spectacles or contact lenses. Each method given below details the advantages and disadvantages of each option in correction of Presbyopia.

Option#1	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Single Vision Lenses	Emmetropes (Reading Glasses)	Basic Distance & Near Requirement	Cost Effective Easy adaptability	Intermediate Zone Correction Absent
	Ammetropes (Separate Glasses)	Inactive Lifestyle		Cumbersome to change spectacles

Option#2	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Bifocals	Astigmatic Rx	Basic Distance & Near Requirement	Not Expensive	Intermediate Zone Correction Absent
	Hyperopes	Active Lifestyle	Multiple Designs Available	Kryptok will have disturbing jump effect
	Myopes			

Option#3	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
PALs	High Myopes	Active Lifestyle	Cosmetically Appealing	Expensive
	Low Myopes	Intermediate Zone Requirement	Wide Variety of Designs & Corridor Lengths	Adaptation time
	Low Hyperopes			High Astigmatism can attract higher distortion levels
	Emmetrope		Options for Customization Available	High Hyperopic Rx with High add may make progression difficult
	High Hyperopes			
	Astigmatic Rx			

Option#4	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Occupational Lenses	Moderate Hyperopes	Sedentary Lifestyle	Wide Intermediate/ Near Zone	Distance Vision is compromised or absent
	Moderate Myopes	Work in a cubicle/enclosed environment		Can only function well as a supplementary pair
	Emmetropes (with extensive specific area requirement)			

Option#5	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
No Additional Spectacles	Low Myopia	Sedentary Lifestyle - Basic requirements only	Simple/Cost free solution	Viewing distance may need adjustment Temporary solution

The final option in terms of spectacle & contact lens correction of Presbyopia is a combination of both as detailed in the table below:

	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Combination of CL & Spectacles (CL-distance, spectacles-near)	High Myopes	Clear & Sharp Distance & Near Vision Needed	No Additional Adaptation Time Necessary	Handicapped for near work without spectacles
	Low Hyperopes			
	High Hyperopes	Simple		
	Astigmatic Rx			

As we see in each scenario there are pros & cons and a very important lifestyle consideration in each method of correction. This simply goes to prove that there is always some compromise in the visual correction and "Perfect Presbyope" does not exist!

Options in contact lenses correction of Presbyopia include the following options

Option#1	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Monovision	Myopes	Active Lifestyle	Single Vision Lens (Brand/Product type) need not change	Stereopsis, Contrast Sensitivity Compromised Adaptation Time Necessary
	Low Hyperopes			
			Simple Functional Solution	

Option#2	Rx Consideration	Lifestyle Consideration	Advantage	Disadvantage
Multifocal Lenses	Myopes	Active Lifestyle	No Compromise on depth of perception	Adaptation Time Necessary Functional Solution
Alternating	Low Hyperopes			
Simultaneous				



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