Focus on Presbyopia Keeping Patients in Contact Lenses

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Course Description

As one of the fastest growing populations, the current presbyope has different contact lens needs than other generations. First of all, this generation is “accustomed” to wearing contact lenses. They are very mobile, have multiple lifestyles, are visually demanding, physiologically and sometimes physically compromised and if you can keep them in contact lenses, they are very loyal. This course will focus on the specific needs of the presbyope, offering easy to fit options for this particular patient population.

Learning/Instructional Outcomes:

- At the completion of this course, the participant should be able to:
  - Have a better understanding of presbyopia and accommodation and opportunities keeping the presbyope in contact.
  - List some of the concerns of the presbyopic patient.
  - Have a better understanding of some of the ocular health problems associated with the aging eye that affects contact lens wearers.

Introduction

- The physiological effects of aging
- The facts about presbyopia
- Ocular changes of the aging eye
- Motivation
- Ideal candidates
- Options
  - Types of bifocal and multifocal contact lenses
- Giving your patients your best

The Physiological Effects of Aging

- The entire body is affected
  - As well as the perception

The Facts About Presbyopia

The CDC's provisional estimates show that life expectancy at birth in the U.S. decreased to 77.3 years in 2020, down 1.6 years from 78.9 years in 2019.

Census Showed Nation's Population is Aging

- ***2010 Census showed Seven States Had Median Age Over 40***

- In 2010, the median age increased to a new high of 37.2 years, from 35.3 years in 2000, with the proportion of the population at the older ages increasing similarly.
- This indicated that the U.S. population is aging.

- **Newer statistics showed in 2019 that 12 states had median age over 40**
- **Median age as of U.S.A. on 10-6-2021 is 38.3 years**

The 65-and-older population grew by over a third (34.2% or 13,787,044) during the past decade.

First baby boomers turned 65 in 2011

Information from US Census Bureau

How old is America

- What is the make-up of the older population?
- What are some of the traits of each presbyopic generation

“Sandwich Presbyopic Generation”

- **Older Population**
  - **The Silent Generation –Lost Generation**
    - Born 1925 - 1942-6
    - Over 50 million in the USA

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- **Generation "X"? – Slacker generation**
  - Born 1961-4 – 1981
  - WOW – They are the emerging presbyopes

The Effects of Aging

"EVERYTHING" slows down…

- OK, now really…
  - I'll discuss the ocular changes in a moment
- The entire body is affected
  - As well as the perception

Presbyopia

- Definition
  - Greek
    - Presby = Old
    - Opia = Vision
- What causes it?
  - Decline in accommodation
  - Occupation
  - Reading Habits
  - Stature
- Can it be stopped?
- Is there a cure?

Ocular Changes of the Aging Eye

Age-Related Vision Changes

As we age, our visual system undergoes major changes

- Loss of lid muscle tone – as well as all muscle tone
- Senile miosis
- Loss of visual acuity
- Lowered contrast sensitivity
- Increased lighting sensitivity
- Slower speed of visual processing
- On more meds
- Reduced quality tear production

The Effects of Aging - Age Related Changes of the Eye

- Decline of Accommodation
  - Presbyopia
- Accommodation is the mechanism whereby the visual system changes focus from distant to near.
  - Declines as one ages.
  - **Crystalline lens** is most malleable during childhood and early adulthood.
  - Theory of von Helmholtz
    - Most of the accommodative change in lens shape (bulging) occurs at the central anterior lens surface
    - Front surface of the capsule is thinner
    - Very little change on the posterior surface

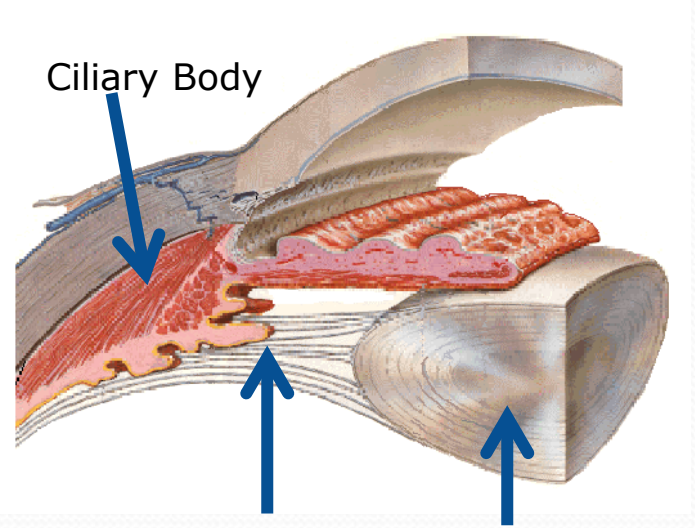
The Effects of Aging - Age Related Changes of the Eye

- **The ciliary muscle** is a ring that when it contracts, rather than tightening its grip, the diameter of the muscle is reduced causing a relaxing of the tension of the **zonules of Zinn** (zonular fibers).
    - Allows the crystalline lens to become more spherical, thereby increasing the power of the lens.
    - Contraction of the ciliary muscle increases the diameter of the lens thereby increasing the power of the lens
    - Relaxation of the ciliary muscle decreases the diameter of the lens thereby decreasing the power of the lens

The Effects of Aging - Age Related Changes of the Eye

- Decline of Accommodation
- Accommodative Anatomy
  - Crystalline Lens
  - Ciliary Muscle
  - Suspensory Ligaments

Accommodative Anatomy



- The Crystalline Lens
- The Ciliary Body
  - Ciliary Muscle
- The Zonules of Zinn
  - Suspensory Ligaments

Change in the Mean Amplitude of Accommodation With Age

Age (Years)	Amplitude (Diopters)
10	10.6 - 13.5
15	10.1 - 12.5
20	9.5 - 11.5
30	6.6 - 8.9
35	5.8 - 7.3
40	4.4 - 5.9
45	2.5 - 3.7
50	1.6 - 2.0
55	1.1 - 1.3
60	0.7 - 1.0

Measured by moving the target toward the subject until first blur is reported (Borish 1970; Turner 1958)

The Effects of Aging - Age Related Changes of the Eye

- Muscle tone
  - Changes to ciliary muscle

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  - Changes to Mueller's muscle
    - Lid droops

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    - Lid droops
  - Changes in muscle tone of eyelids in general
    - Can affect contact lens wear

The Effects of Aging - Age Related Changes of the Eye

- Decrease in tear film

The Effects of Aging - Age Related Changes of the Eye

- Decrease in tear film
- On more medications
  - Antidepressants, Parkinson's Medications, and Sleeping Pills
    - block some signals between nerve cells
  - Antihistamines
  - Birth control pills and Hormone Replacement Therapy
  - Blood Pressure Medicines
  - Diuretics
  - Nasal Decongestants
  - Pain Relievers

The Effects of Aging - Age Related Changes of the Eye

- Decrease in tear film
- Poor diet
  - Excessive fats, salt, cholesterol, alcohol, protein, caffeine, sucrose

The Effects of Aging - Age Related Changes of the Eye

- Decrease in tear film
- On more medications
- Increase in meibomian gland secretion of lipids
  - Opening of meibomian gland changes
    - Puckers
  - Changes in lipid secretions – less efficient – produces more drying
  - More in men than women
  - Women's changes differ from men's changes

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  - Almost half as much

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- Mucin production is compromised

According to CL Spectrum Annual Reporting

- As has been the case for several years now, for presbyopic patients wearing contact lenses, most practitioners continue to indicate a strong preference for multifocal lenses
  - (63% in 2020, compared to 75% in 2019) compared with monovision (28% in 2020, compared to 16% in 2019),
  - over-spectacles (9% for 2020, the same as it was for 2019).
  - In practice, more presbyopic patients are prescribed a multifocal (44% of contact lens-wearing presbyopes versus 46% in 2019) compared with monovision (39% of contact lens-wearing presbyopes versus 33% in 2019).

Motivation

- Appearance matters
  - They don't want to appear to be getting older
- Oftentimes, they've worn contact lenses for years
- They lead active lifestyles
- They combine social conscious with self-respect
- They want to be involved and to make decisions
- They want information
- They are used to having their own way

Candidates

- Previous contact lens wearers
- Motivated
- Moderate/high to light visual demands
- Moderate to high refractive errors
- Low to moderate adds
  - But not always
- Good ocular surface, eyelid, and tear film integrity
- They should have realistic expectations

Characteristics of Soft Contact Lenses

- Well…they're made of softer polymers than GP lenses
- The perception to patients may be that they are more comfortable
  - Well…
- Lathe cut
- Spin cast
- Molded
- Newer designs
  - Wavefront technology
- Various polymers

Options Available

- Distant contact lenses with readers or PAL's over them for near
- Mono-Vision
- Modified Mono-Vision
- Bifocal/Multifocal
- Combinations
- Others

Mono-Vision

- Advantages
  - Good distance and near vision
  - Good near vision in all positions of gaze
  - Any type of contact lens (soft, toric, disposable, frequent replacement) can be used.
  - Easy to fit
  - Normal peripheral vision
  - No more expense than single vision lenses
- Disadvantages
  - Some adaptation time
  - Some patients cannot adapt (approx. 30%)
  - Decreased Stereopsis
  - Night vision (low light) compromises
  - Works better for low adds
  - Need to advise not to drive with monovision at night.
  - Reduced intermediate vision

Modified Mono-Vision
Also known as Trivision

- Advantages
  - Good distance vision
  - Improved intermediate vision over strictly mono-vision
  - If bifocal works-good intermediate as well as near acuity
- Disadvantages
  - Decreased stereopsis
  - Cost

Bifocal - Multifocal

- Advantages
  - Good distant and near vision
  - Good stereopsis
  - Can achieve good intermediate vision
- Disadvantages
  - Cost
  - More chair time
  - Oftentimes, patients don't achieve 20/20 correction
    - But may be 20/happy

Soft Lens Designs

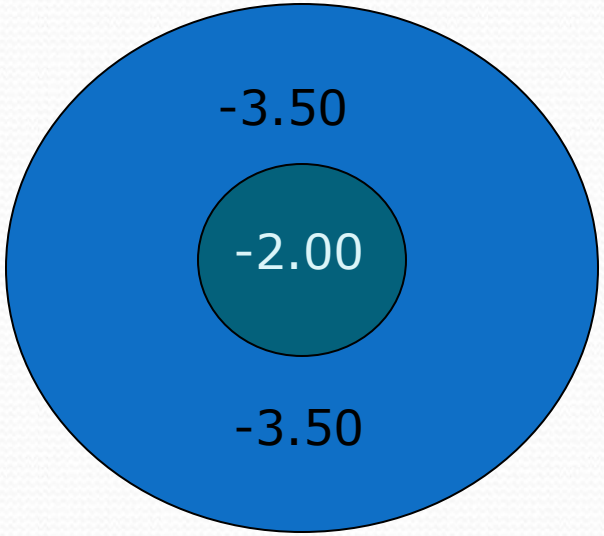
- **Soft simultaneous vision lenses**
  - Most utilize some type of simultaneous vision
  - Two-zone concentric design
  - Multiple zones concentric design
  - Aspheric
  - Others
- Best to educate your patient about expectations

Soft Lens Designs

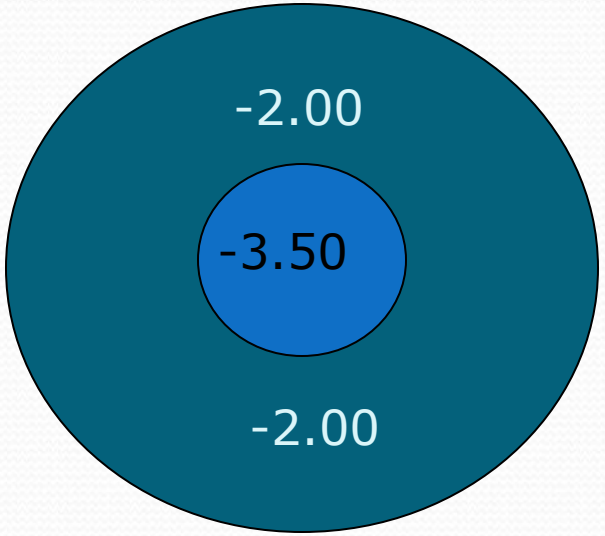
- Newer designs all the time
- Never stay locked into only one

Concentric Designs

Center Near

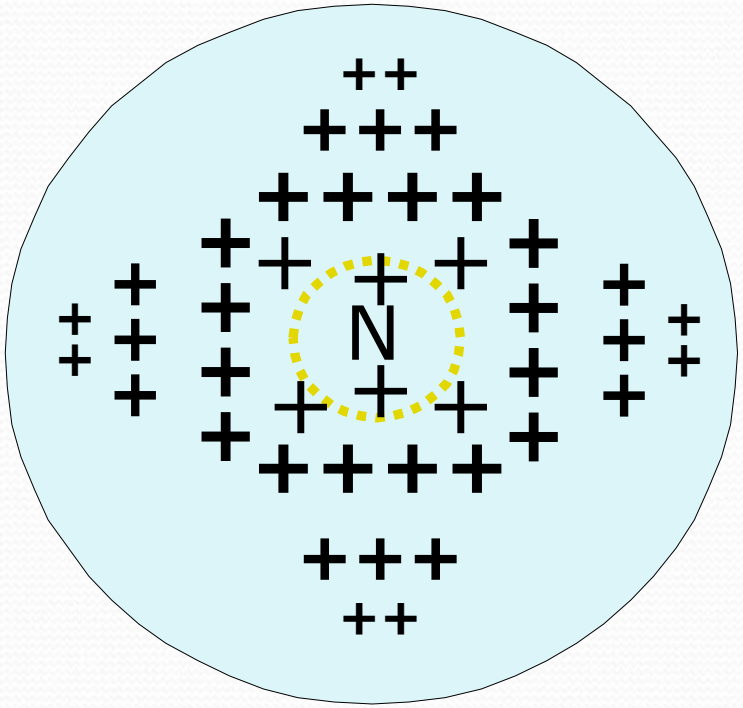


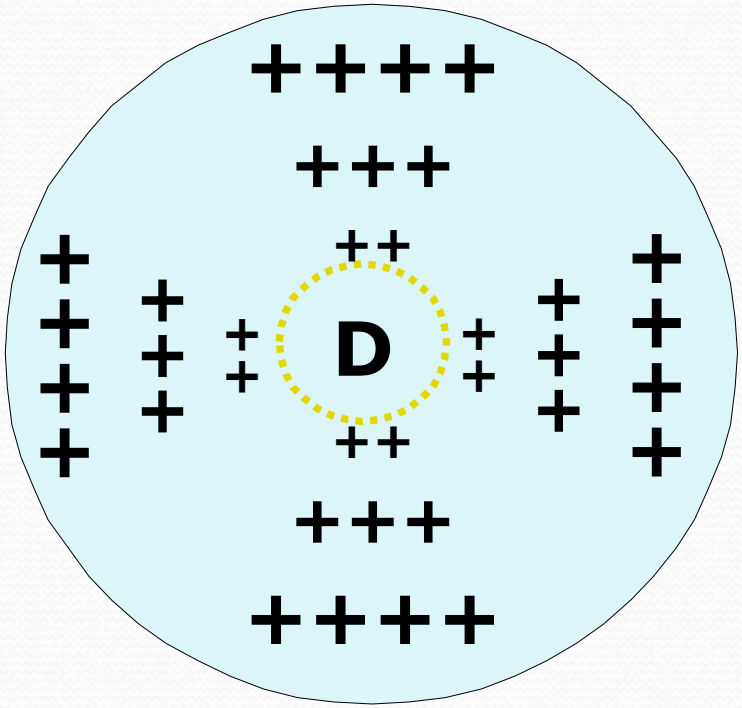
Center Distance



Aspheric Multifocals

- Aspheric designs = progressive designs

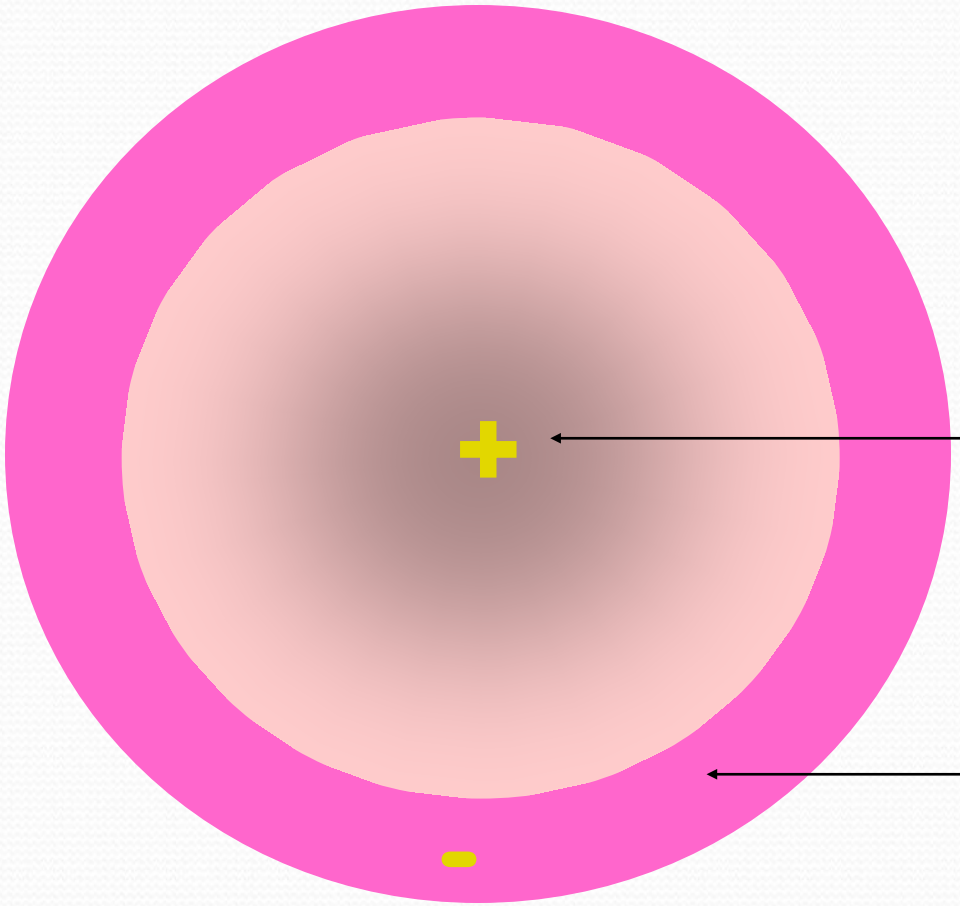




Quick Fit

- Spherical equivalent (vertex'd) + near add / 2
- Allow lenses to settle
- Binocularly asses vision
  - Distant and near
- Over refract with trial lenses

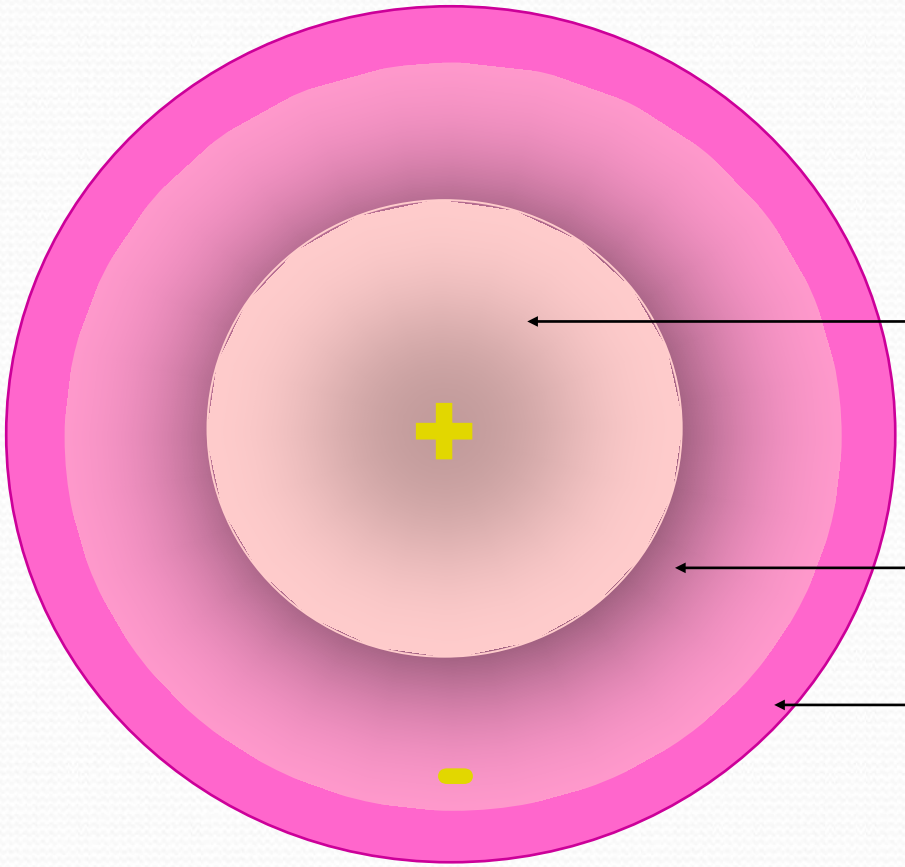
- Front aspheric multifocal design
- Near center
- Features new peripheral geometry to allow for better distance vision in low light conditions
- Constant distance power in the periphery



Central Asphere with most plus in the center

Constant distance power in the periphery

Higher Add



Central Asphere with most plus in the center

Step leads to another Aspheric curve

Constant distance power in the periphery

Wavefont Technology

- Patented multi-aspheric aberration control design
  - Optimized to compensate for aberrations caused by flexure
  - 4-zone, non-linear multi-aspheric power
  - Must be fit so optics are centered over pupil

Fitting Tips

- Start with the most plus/least minus spherical equivalent distance Rx
  - Convert to minus cylinder form
- Don’t forget to vertex powers over +/- 4.00D
- Select the lowest reasonable ADD power given the patient's age.
  - Always round down if your patient is between ADD powers.

Fitting Tips

- Remember that baseline V/A's need to be included in final fit V/A's
- Lenses should center well and provide adequate movement

Daily Disposal

- Healthy option
- No solutions

Dry Eyes

Soft Toric Multifocal Designs

- They ARE available
- Cost may eliminate some…
  - But many patients want to stay out of glasses

Gas permeable multifocal contact lenses

Important

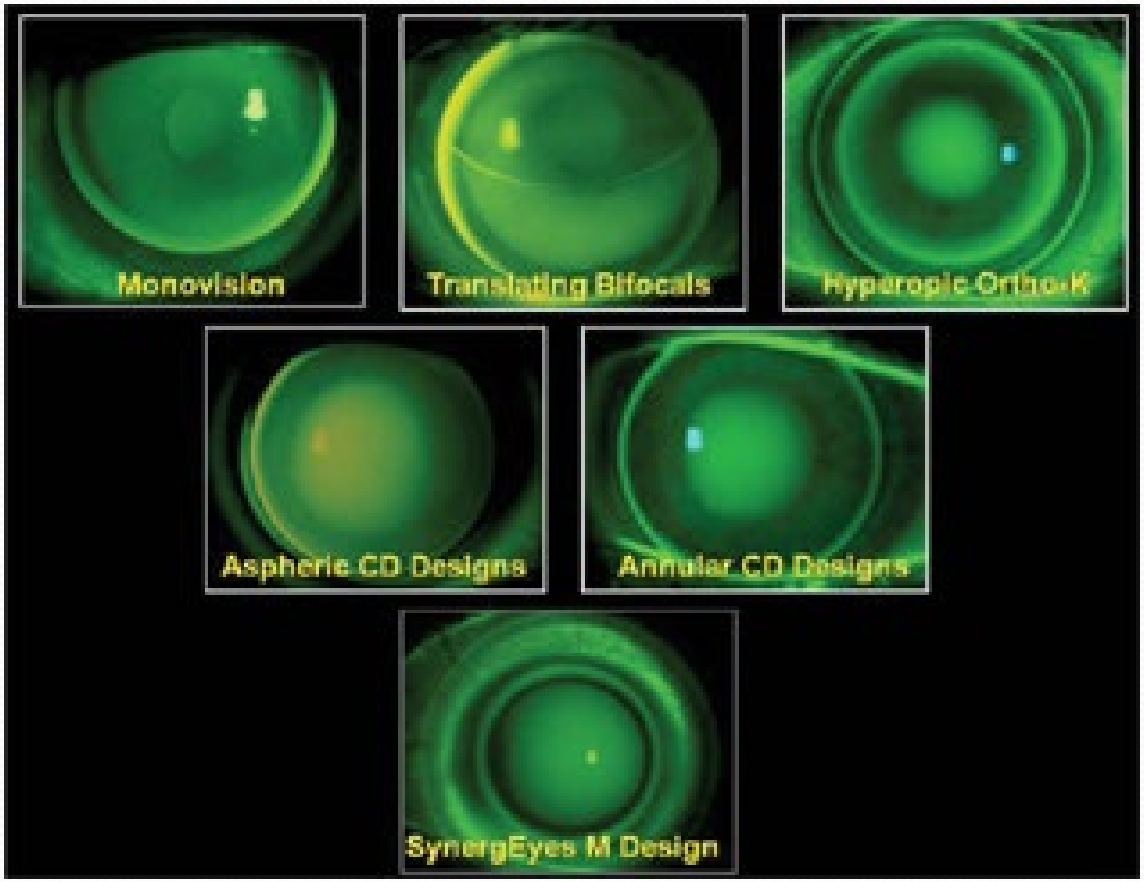
- Patients' expectations
- Wearing time expectation
- Visual demands
  - Distant
  - Intermediate
  - Near
- Amount of add power needed

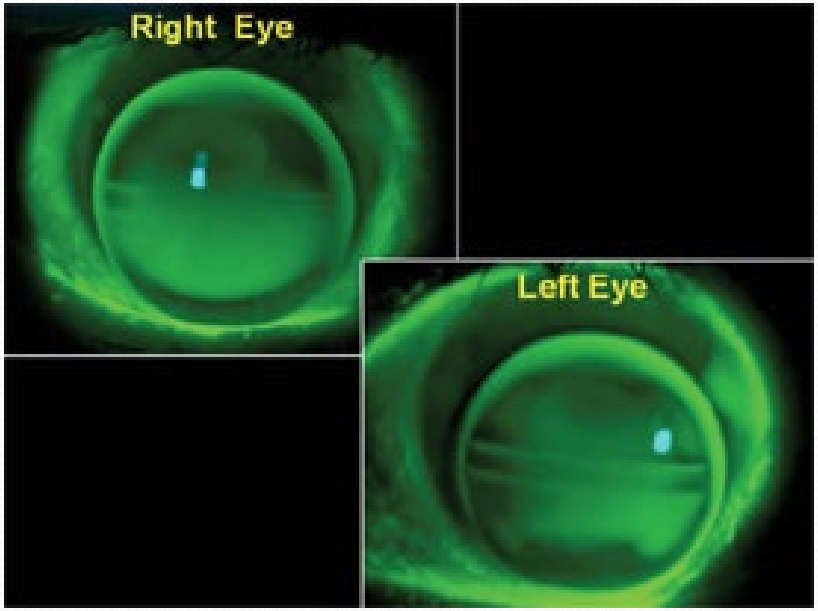
Important information to include

- Spectacle refraction
- K readings or topographies
- Add power
- Pupil size
- Horizontal visible iris diameter (HVID)

Important information to have

- Pupil size
- Corneal diameter
- Fissure size
- Tear film assessment
- Lower lid tonicity
- Lid-to-limbus position (superior and inferior)
- Lid-to-pupil relationship
- Eye dominant
- Positioning of the current GP lenses
- Type of current lenses worn (parameters and fit)
- Whether they are a past monovision wearer or other CL type wearer


Monovision
Translating Bifocals
Hyperopic Ortho-K
Aspheric CD Designs
Annular CD Designs
SynergEyes M Design


Right Eye
Left Eye

Giving your patients your best

- When to fit
- Patient history
- What to fit
- Every presbyope is a candidate
- Determine expectations
- Diagnostically fit/Trial lens
- Wait
- Evaluate
- Resist temptation to “fine tune”
- Try different brands until successful
- One size does not fit all

Be the Best for Your Patients

- Don't say it can't be done
- If they wore contact lenses before, they still can
  - Becoming presbyopic doesn't change that
- Determine their expectations
  - Be realistic

Be the Best for Your Patients

- Think of all of the options for your presbyopic patients
- Experiment
  - Mono-vision still works
- Dry eye patients can wear contact lenses
- Toric patients can wear soft contact lenses
- Dailies

Be the Best for Your Patients

- Determine powers
- Use trial lenses
- Allow the lenses to settle
- Evaluate
- Educate
- Follow-up

Be the Best for Your Patients

- If the patient is happy, stop.
  - If the fit is optimal and v/a's are acceptable
- Try different brands until successful
- One size does not fit all

Conclusion

- Utilize sufficient lens designs
  - Remember “One size does NOT fit all”
- Be well versed in all designs
- Be ready to switch if something doesn’t work
- Encourage your patient
  - Let them know that you are there for them

Thank you