

Taking a "byte" out of segments

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Financial disclosure

I, Valerie Manso am President of Manso Management Resources, Inc. A consulting company specializing in business and people development in the ophthalmic industry. I currently have an ongoing relationship with PECAA as Director of Staff Education

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Objectives

By the conclusion of this session, you will:

1. Comprehend the many multifocal options available in today's ophthalmic market
2. Understand when to use the various multifocal options
3. Grasp the reasons why more than one option may be appropriate for presbyopic patients

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Lens Design Considerations

- Multifocals as the word suggests are used to correct refractive errors for more than one focal distance.
- Multifocal types:
  - Bifocals = two focal lengths
  - Trifocals = three focal lengths
  - Quadrifocal = four focal lengths
  - Progressives = multiple focal lengths as the power changes or 'progresses'
  - Mixed = lined plus progressive, mixed segments styles, or lined plus blended power

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Multifocal Lenses allow us to see at all distances



14-24 inches      16 - 24 inches to arm's length      4 feet to infinity

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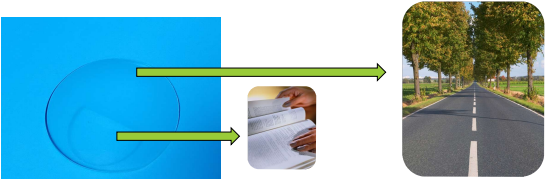
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Bifocals



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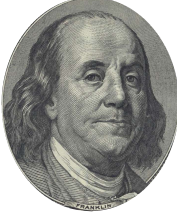
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What does Ben Franklin have to do with this course?

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### Executive Bifocal:

- Executives (Sometimes called the Franklin) date back to Ben Franklin's time. Patented by Ben Franklin in 1784.
- Executives were literally two different lenses split in half and then glued or fused together.



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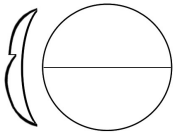
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### Pros and Cons:

Executive bifocal

- Very large lower segment - These are great for accountants, engineers or any other application for reading spreadsheets, charts and blueprints.
- Heavy
- Ugly



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### Executive bifocals – Be aware!

- You generally wouldn't use a focimeter (lensometer/vertometer/lensmeter) to check the near interpupillary distance of an Executive-style bifocal. If you want to verify the near PD (which isn't usually done), you begin by sliding the lens horizontally back and forth over a vertical line.
- The point on the ledge where the vertical line crosses from distance (major portion) to near (segment) without breaking represents the horizontal location of the optical center of the near segment. You would mark this point on each lens and measure between the two in order to determine the near PD.

*However, your lab may or may not have tried to produce a specific near PD with these lenses. When in doubt, give them a call.*

Darryl J. Meister, ABOM, May 2000

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### Round Seg bifocal (1908):

- The near power is placed in a round shaped segment
- Has two distinct powers. Typically distance and near power
- Distance = 4 feet to infinity
- Near = 18 inches – 2 feet



Round Seg Bifocal Lens

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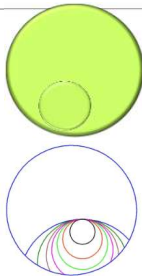
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### Availability:

- Segment size - Standard widths 22 and 25mm
- Custom widths from Quest labs – any size any placement (visible or blended)
- All lens materials: CR39, High index, Polycarbonate, Trivex and glass



Round Seg Bifocal Lens

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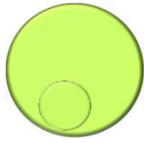
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**Pros and cons:**

- ❑ Less noticeable visually than the Flat Top bifocal
- ❑ Smaller comparative near area than flat top
- ❑ Greater area of image jump than flat top – shape at top of segment



Round Seg Bifocal Lens

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**Flat top bifocal (1926):**

- ❑ Most used lined multifocal; also known as 'Straight Top'
- ❑ Has two distinct powers. Typically distance and near power
- ❑ Distance = 4 feet to infinity
- ❑ Near = 18 inches – 2 feet



Flat Top Bifocal Lens

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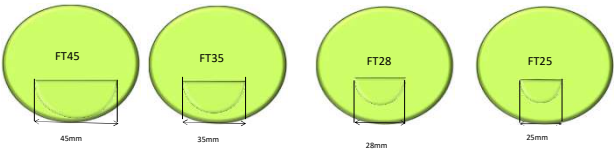
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**Bifocal Vision Lenses**

Flat Top Bifocal Sizes



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**Availability:**

- Variety of segment widths – 25, 28, 35 & 45 mm
- Most commonly used segment width is FT28 or ST28
- All lens materials: CR39, mid-index, High index, Polycarbonate, Trivex and glass



Flat Top Bifocal Lens

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**Pros and cons:**

- An image appears to jump as the eye passes from distance over the segment line into the near power
- The segment is visible indicating to the world the wearer has 'mature' eyes
- Relatively easy patient adaptation
- Clearly defined near area with consistent power throughout the segment



Flat Top Bifocal Lens

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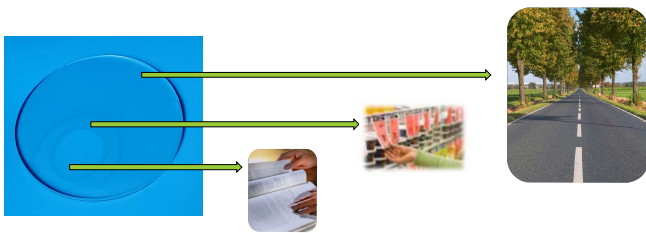
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Trifocals



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### Trifocal Lens Designs

**Trifocals**, patented in 1827 by John Isaac Hawkins.

- Lenses have 3 regions to correct for distance, intermediate (arm's length), and near vision.
- Trifocals are mostly used by people with advanced presbyopia who have been prescribed 2 diopters or more of reading addition.
- The intermediate addition is normally half the reading addition. So, for someone with a distance prescription of +4 diopters and a reading addition of +3, the reading portion of their trifocals would have a net power of +7, and the intermediate segment would be +5.5 diopters.



Round Seg Trifocal

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### Trifocal Lens Designs

- Trifocal lenses are made in similar styles to bifocals, but with an additional segment for intermediate vision above the reading section.
- A common style is the 7x28 flat-top or D-shaped segment, 28 mm wide, with a 7 mm high intermediate segment.
- Deeper intermediate segments are available. Particularly useful for people who spend a lot of time focusing at mid-range.



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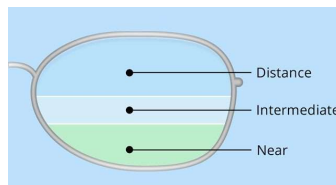
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### Trifocal Lens Designs

- The **executive trifocal** provides for a wide intermediate. This may be beneficial for wearers who perform many tasks in the mid viewing range.
- Perfect for scanning blueprints and other large documents
- However, the lens is very heavy and many wearers experience difficulty when walking because of the wide near vision area.



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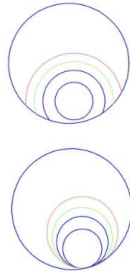
### Trifocal Lens Designs

#### Round Seg Trifocals:

Available in both concentric and crescent designs: Sizes may be customized as small as 10mm and as large as 60mm. (Quest Optical Lab)

Lens materials - CR39, Poly, Trivex, 1.55, 1.60, 1.67 and 1.74

Cosmetically less noticeable than Flat Top or Executive trifocals



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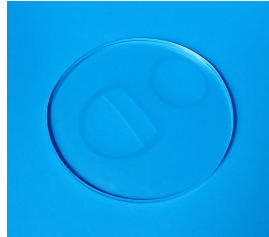
### Quadrifocal

Quadrifocal lenses have 4 areas of varying power

Available in lined and mixed segment options

This quadrifocal allows the wearer to see up top through the round segment and has a standard flat top trifocal.

Ideal for mature presbyopes who require near or intermediate viewing above their heads.



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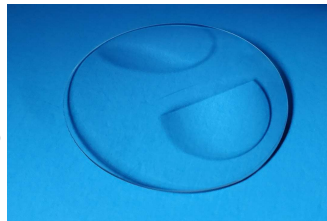
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### Occupational multifocals

As the name suggests – these lenses are designed for very specific task use

Available in lined, no line and mixed segment options

Double Segs allow the wearer to see up close above the head – think plumber, mechanic, electrician or librarian



Mixed Round seg and flat top occupational lens

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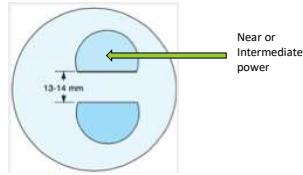
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### Double D Segment Bifocals or trifocals

- Manufactured to have an upside-down flat-top segment for near or intermediate vision in the top third of the lens and another flat-top segment for near vision in the bottom third with the middle or center of the bifocal being used for distance viewing.



- The distance region is usually 13 – 14mm in depth between the segments.

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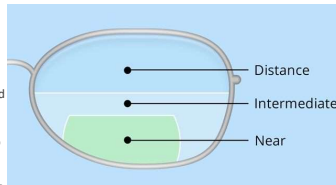
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### ED Lenses With Emphasis on Intermediate Zones

- An E-D trifocal has a distance correction along the top portion of the lens, separated from the intermediate correction in the bottom portion by a line that goes all the way across the width of the lens (called Executive style). A D-shaped segment with near correction is in the lower portion of the lens.
- The E-D trifocal is suitable for someone who needs a clear, wide field of view at an intermediate distance and who also needs to see clearly both close-up and in the distance.
- The E-D trifocal is an excellent choice for someone who needs a very wide field of view for objects at arm's length and must also see clearly both close-up and in the distance. A television production person, for example, who must keep an eye on several TV monitors spread out in front and to the sides while being able to read notes from a clipboard and recognize someone across the room, is a good candidate for this lens.



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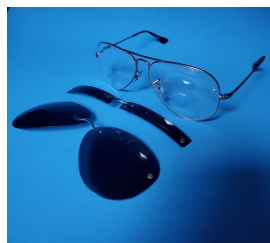
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### Pilot

- The "Pilot" is a patented specialty multifocal and sunglass combination available from Quest Vision Care Specialty Lab.

- There are 3 component parts:
  - Frame with Rx lenses
  - Sunglass clip-on slice
  - Sunglass clip-on



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### Pilot - Quadrifocal

- The frame and inserted lenses may be any power or lens design.
- Most often created in a quadrifocal design. It provides the pilot with distance viewing, near viewing, and 2 intermediate viewing areas. The first is for the lower panel in the plane and the 2<sup>nd</sup> is for the above head panel.
- The sunglass slice is attached with a magnet (imbedded in the temporal portions of the lenses. The two slices are held together by a metal bridge.
  - This configuration is used to shade the pilot's eyes from distance glare. Yet allows for instrument viewing in the cockpit.



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### Pilot - Omnilux

- Combination progressive power and lined segment
- The body of the lens is a "Natural Accommodation Lens (NAL®). Patented in 2022 - funnel-shaped visual field comprised of substantially aspheric, lateral power bands that are aligned along a vertical design backbone.
- The top is a lined segment for viewing the panel above



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### Pilot

- The Pilot system may be used with any frame
- Custom quadrifocal CR39 only
- Other Rx's all lens materials



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### Fitting multifocal lenses

- Bifocals typically fit with top of segment at lower lid.
  - Occupational or situational aspects may cause segments to be fit higher or lower
  - Usually fit using combined Pupil Distance (PD)
- Trifocals typically fit with near power segment placed at lower lid
  - Occupational and/or situational aspects may cause segments to be fit higher or lower
  - Usually fit using combined Pupil Distance (PD)
- Lenses containing progressive power typically fit with pupil center located in the distance power zone.
  - Usually fit using monocular Pupil Distances (MPD)



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### First Fit Plus™

ARE YOU READY TO SEE THE FUTURE OF FITTING TOOLS



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### Designed to Work with Sunglasses and Clear Lenses



Patient looks through viewing slot to align the measuring device for pupil height measurement.

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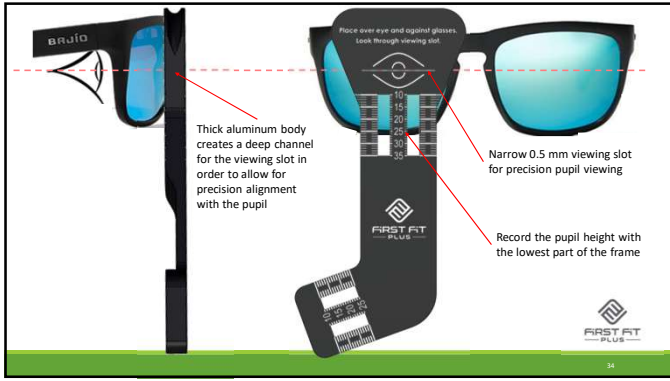
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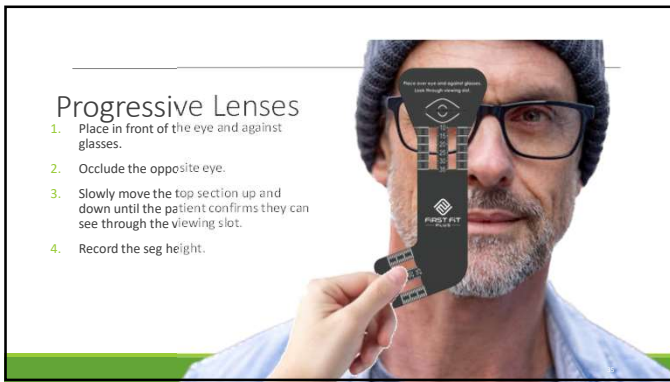
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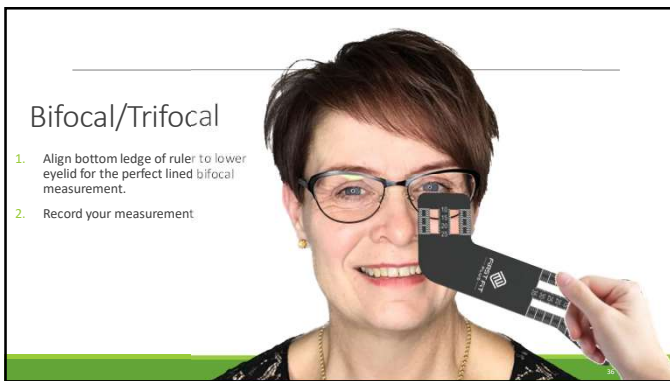
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### Case study 1

- 50-year-old plumber
- Loves to fish
- Reads books for relaxation year round
- Sings in church choir



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### Case study 2

- 55-year-old film Producer
- Loves to garden in her downtime
- Plays piano for local theatre productions
- Often attends red carpet events



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### Case study 3

- 58-year-old pilot
- History buff who loves to travel to ancient sites
- Watches history channel for relaxation
- Plays golf



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